Accident investigation - The drivers, methods and outcomes

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Accident investigation - The drivers, methods and outcomes

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In July 2000, the Health and Safety Executive (HSE) commissioned research into current industry practice in incident investigation, with particular emphasis on the resources expended and the quality of the investigations. The study was initiated to provide background information for the proposed new legislation requiring employers to investigate the causes of work-related accidents and ill health, and to provide guidance for HSE as to the type and level of practical support which industry may need to successfully implement the new requirements.

The study design consisted of two separate but complementary stages: a large-scale telephone survey (1500 cases) followed by a smaller face-to-face interview survey (100 companies). The purpose of the telephone survey was to obtain a comprehensive and nationally representative overview of investigation practices and procedures. The interview survey was designed to provide general verification of the information obtained via the telephone survey, to provide further details of typical investigation processes and procedures and, lastly, to generate some exemplar case studies which could be used to illustrate these processes and procedures. This report covers the second stage of the study - the interview survey. It describes the technical approach adopted in the survey, a comprehensive summary of all the key findings, a comparison of these findings with the output from the telephone survey and, finally, the implications of the findings for the HSE. The results of the telephone survey were reported to the HSE in December 2000. The report consisted of two volumes: Volume 1 provided a review of the study methodology and a commentary on the most significant findings; Volume 2 consisted of the tabulated data; for completeness, these are appended to this report.

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EXECUTIVE SUMMARY

In July 2000, Human Reliability Associates was commissioned by the Health and Safety Executive (HSE) to carry out a study of current industry practice in incident investigation, with particular emphasis on the resources expended and the quality of the investigations. The study was initiated to provide background information for the proposed new legislation requiring employers to investigate the causes of work-related accidents and ill health, and to provide guidance for HSE as to the type and level of practical support which industry may need to successfully implement the new requirements.

The study design consisted of two separate but complementary stages: a large-scale telephone survey (1500 cases) followed by a smaller face-to-face interview survey (100 companies). The purpose of the telephone survey was to obtain a comprehensive and nationally representative overview of investigation practices and procedures. The interview survey was designed to provide general verification of the information obtained via the telephone survey, to provide further details of typical investigation processes and procedures and, lastly, to generate some exemplar case studies which could be used to illustrate these processes and procedures. This report covers the second stage of the study – the interview survey. It describes the technical approach adopted in the survey, a comprehensive summary of all the key findings, a comparison of these findings with the output from the telephone survey and, finally, the implications of the findings for the HSE.

In general terms, the interview survey demonstrates that companies employ a range of approaches to incident investigation, from a largely unstructured and ad-hoc approach, to one that is well supported in terms of clear procedures and associated analysis tools and techniques. However, most companies were found to either have no support or only the minimum level of support for incident investigation. The likelihood of using a more sophisticated approach to incident investigation increased with the size of the company. Approaches to investigation were underpinned by a number of different causal models from system-based (which examine all potential contributory factors) to more traditional models (that focus on the individual concerned and most immediate cause). However, the majority of companies were found to operate closer to the traditional end of this continuum. It was also found that the individual driving the investigation has a major impact on the approach that is adopted, although this influence is moderated by the presence of a robust structure to support the investigation process.

The findings of the interview survey also suggest that the majority of companies do not effectively discriminate in the investigation process between immediate and underlying causes. However, the recommendations that follow from the investigation often reflect a more system-based approach than would be expected given the dominance of the traditional model. Despite the limitations of many of the investigations examined in the study, the vast majority of companies still consider they have a structured approach to incident investigation.

The interview survey also covered details of resources (in terms of personnel and associated time) used in investigation. This showed that the most common investigation team consisted of a health and safety specialist and a line manager. Safety representatives or other employee representatives were involved in only a relatively small percentage of cases. Some differences in the composition of the investigating team were identified between the telephone and the interview survey. The interview survey also suggested that the investigation process takes longer than the estimates of time that were reported in the telephone survey. The possible sources of these differences are considered.

The report also examines barriers to improving the current standard of incident investigation. Issues considered include: the current and developing legal environment; the potential isolation of incident investigation from risk assessment; the lack of a common model and structure to

underpin and support incident investigation; the currently low level of competence and the lack of available training; the general level of complacency in many companies about their standard of investigation and the resource implications of improving standards, particularly in small companies.

Lastly, the report considers the implications of these findings for the work of the HSE. These include the need to reinforce the links between risk assessment and incident investigation, the need to provide industry with additional technical support and better access to information already held by the HSE, the provision of better support for training in incident investigation and lastly acting as a key 'change agent' in improving the current legal climate. A fuller summary of the results of the interview survey is provided in section 7 of this report.

Full details of the 100 case studies documented in the interview survey are included in Appendix A. Appendix B includes the interview schedule used in the survey and the telephone protocol used to arrange the interviews. The results of the telephone survey were reported to the HSE in December 2000. The report consisted of two volumes: Volume 1 provided a review of the study methodology and a commentary on the most significant findings; Volume 2 consisted of the tabulated data. For completeness, these reports are appended to this report as Appendix C and Appendix D.

EXECUTIVE SUMMARY

CONTENTS

1 INTRODUCTION AND OBJECTIVES OF THE STUDY

In July 2000, Human Reliability Associates, in collaboration with Metra Martech Limited, was commissioned by the Health and Safety Executive (HSE) to carry out a study of current industry practice in accident and disease investigation, with particular emphasis on the resources expended and the quality of the investigations. The study was initiated to provide background information for the proposed new legislation requiring employers to investigate the causes of work-related accidents and ill health, and to provide guidance for HSE as to the type and level of practical support which industry may need to successfully implement the new requirements.

The aims and objectives of the study, as laid out in the project tender document, were as follows:

"The research should identify the amount of resource used in accident investigation across all industry sectors in the UK and how these resources are used. This should include a comparison of the practices in small and large organisations and extend to cover the practices when accidents involve contractors or supplier organisations. The research should enable an estimate of the likely resource needed to fulfil any proposed new duty to investigate accidents. In particular, the research should allow a comparison of practices in both large and small organisations, including:

- Any variation in the level and nature of accident investigation processes and procedures, including resource comparisons;
- The key drivers, deterrents, perceived benefits, uses and usual outcomes of accident investigations;
- An overview of the range of investigation practices and in particular:

    - Who carries out investigations within organisations, safety specialists or line managers and what training/competence is required/provided?
    - What gets investigated and is the effort put in determined by the severity of the outcome and not the potential of the event?
    - What tools and techniques are used?
    - What is the level of employee or employee representative involvement?
    - Are investigations an objective look at both immediate and underlying causes or do they concentrate on determining only immediate causes or stop when there is someone to blame?
    - How are investigations recorded, remedial actions identified, prioritised and implemented?
    - How do investigation findings influence risk assessments; are lessons shared with others?"

In line with the requirements of the tender, the study design consisted of two separate but complementary stages: a large-scale telephone survey followed by a smaller face-to-face interview survey. The first stage, which was carried out by Metra Martech Limited, consisted of 1,500 telephone interviews with companies reflecting the whole spectrum of commerce and industry, including micro-businesses, SMEs and larger companies. The purpose of this stage (referred throughout this report as *the telephone survey*) was to obtain a comprehensive and nationally representative overview of accident and work-related ill health investigation procedures. The second stage of the study was carried out by Human Reliability Associates. This stage consisted of on-site interviews with safety or line managers at a sub-set of 100 companies selected from the original telephone sample of 1500 companies. The purpose of this stage of the study (referred to within this report as *the interview survey*) was threefold:

- To provide general verification of the information obtained via the telephone survey
- To provide further details of typical investigation processes and procedures
- To generate some exemplar case studies which could be used to illustrate these processes and procedures

This report covers the second stage of the study – the interview survey. It describes the technical approach adopted in the survey, details of the final sample, and a comprehensive summary of all the key findings and their implications for HSE. Full details of the 100 case studies are included in Appendix A. Appendix B includes the interview schedule used in the survey and the telephone protocol used to set up the interviews. The results of the telephone survey were reported to the HSE by Metra Martech Limited in December 2000. The report consisted of two volumes: Volume 1 provided a review of the study methodology and a commentary on the most significant findings; Volume 2 consisted of the tabulated data. These reports are appended to this report as Appendix C and Appendix D. For completeness, the key results from both studies are briefly summarised in Section 3.1 of this report.

2 TECHNICAL APPROACH

The approach adopted in the interview survey was to build on the results of the telephone survey by focusing on the following main issues:

- Those aspects of accident and ill-health investigation that were considered to be particularly critical for the successful implementation of the proposed new legislation, for example, resource implications and the type of support needed from the HSE
- Issues that needed to be covered in greater detail than was possible during a short telephone interview, for example, details of the investigation process and its associated documentation
- The development of a database of case studies that could be used to practically illustrate the range of investigation processes and procedures currently used across industry

2.1 THE INTERVIEW SCHEDULE

A draft interview schedule was produced based on the principles outlined above. This was piloted at six companies and subsequently revised on the basis of the pilot results and additional feedback from the HSE technical project manager. The final interview schedule contained questions covering the following general areas:

- An extensive series of questions covering the specific incident that had been identified during the telephone interview. Preliminary details of these incidents had been elicited by asking telephone respondents the following question:

  "When was the last accident, work related illness or near-miss at your location which was formally investigated to identify the underlying causes? – Can you describe the incident briefly?"

  Further details were obtained relating to the nature of the incident, its consequences in terms of the individual and the company, details of the investigation process and the subsequent actions and lessons learnt. The analysis of these case studies form the substantive part of this report

- The extent to which the company investigated different types of incidents such as near-misses, accidents to the public, to contractors and incidents involving violence

- The use of accident and ill-health data to monitor trends and particularly to identify any underlying causes of accidents and ill-health

- The extent to which the company had provided opportunities for in-house or external training in accident and ill-health investigation

- The extent to which legal or insurance implications influenced the accident investigation process

- The practical changes which would be required within the company if accident investigation were to be made mandatory

- The nature of the support required from the HSE to improve the quality of internal investigations

The final interview schedule was designed to be completed in approximately one to one and a half hours, depending on the complexity of the case study and the sophistication of the accident

investigation process. All of the interviews were conducted by a professional Human Factors consultant.

2.2 THE INTERVIEW SAMPLE

At the end of each telephone interview respondents were asked if they were prepared to co-operate with a follow-up stage of the study. A total of 1083 respondents gave agreement to such follow-up. These companies were then used as the sampling framework for the interview survey.

Companies were subsequently selected for preliminary contact on the basis of the following:

- The 'risk' category to which they had been assigned for the telephone survey – the aim was to include a reasonable distribution of both high and low risk companies
- The size of the company – the aim was to include a reasonable distribution of different company sizes (defined in terms of the categories: <10/10-49/50-199/>200)
- The nature of the incident that had been identified by the company respondent in the telephone survey (in particular if they had identified a RIDDOR incident including the following: severe/lost time incident/work related ill-health/dangerous occurrence/accident to a contractor/accident to a member of the public/incident involving violence)
- Geographical distribution (the aim was to obtain a reasonable geographical distribution but at a minimum to avoid clustering cases in particular areas)

A sample of companies and named respondents were provisionally selected on the basis of the above criteria. In the first instance, priority was given to those companies that had identified a serious incident as a potential case study. Companies were then contacted by telephone using the protocol included in Appendix B. In practice, however, some companies declined to contribute further (typically small to medium sized companies who felt unable to devote the additional time that was needed). Named respondents were also sometimes unavailable. Given the time constraints on the study, a pragmatic approach was therefore adopted in which additional companies from the sampling framework were progressively contacted until an acceptable sample of 100 companies had been obtained.

Individuals who agreed to the follow-up interview were sent two faxes, one from the HSE confirming the validity of the study and one confirming the details of the appointment which had been made and providing contact details should the respondent need to cancel or rearrange the appointment.

The final sample of 100 companies contacted within the interview survey classified by size of company is shown in Table 1. Comparable data are also provided from the telephone survey.

Table 1 Interview sample classified by size of company

Size of Organisation	Interview survey		Telephone survey	
	No.	%	No.	%
<10	2	2%	168	11%
10-49	13	13%	384	26%
50-199	38	38%	553	36%
200+	47	47%	399	27%
Total	100	100%	1504	100%

Table 1 shows us that by comparison with the telephone survey, the interview survey has a higher percentage of larger companies and a significantly smaller percentage of smaller companies. This reflects the general difficulty in obtaining access to the smaller companies because of time and resource implications. The percentage of medium size companies is almost equivalent. Tables 2 and 3 provide similar comparisons between the two survey samples for risk category and industry group.

Table 2 Interview sample classified by risk category

Risk classification of organisation	Interview survey		Telephone survey	
	No.	%	No.	%
High/ medium	71	71%	949	63%
Low	29	29%	555	37%
Total	100	100%	1504	100%

Table 2 shows that in terms of risk there is no great discrepancy between the two samples, although the interview survey had a greater percentage of higher risk companies. Again, this probably reflects reluctance on the part of low risk companies, who sometimes were unsure what they could contribute to the survey. Table 3 also shows that there is very little difference between the interview survey and telephone survey in terms of industry group.

Table 3 Interview sample classified by industry group

Group classification of organisations	Interview survey		Telephone survey	
	No.	%	No.	%
Agriculture	8	8	69	5
Construction	8	8	111	7
Mining / Utilities / Transport	10	10	156	10
Manufacturing	47	47	613	41
Services	27	27	555	37
Total	100	100%	1504	100%

Table 4 Interview sample classified by the nature of the case study that provided the basis for the interview

Type of incident	No.	%
Major injury	12	12%
Over-three-day injury	49	49%
Disease	3	3%
Dangerous Occurrence	14	14%
Minor incident involving employee	14	14%
Minor incident involving contractor	3	3%
Minor incident involving member of public	3	3%
Violence	2	2%
TOTAL	100	100%

Table 4 shows the distribution of the interview sample by the nature of the case study that provided the basis for the interview. These case studies have been classified as follows:

- Major injuries, over-three-day injuries and disease mirror the RIDDOR classification system
- Case studies classified as dangerous occurrences are made up of an amalgam of cases. These include: -
  - Cases that were reported under RIDDOR as a dangerous occurrence by the relevant company
  - Cases that were not reported under RIDDOR but were technically a dangerous occurrence within the RIDDOR classification
  - Cases that, although not listed under the RIDDOR classification, were felt by the interviewer to have potential for serious consequences
- There are also a number of non-reportable, minor injuries or near-misses involving a contractor, employee or member of the public
- Lastly, there were two cases of violence that had been investigated

Throughout the report, the term incident is used as a generic term for all of the categories described above.

Table 4 shows that the majority of the case studies involved over-three-day injuries (49%), however a reasonable sample of both major injuries (12%) and dangerous occurrences (14%) were also followed up. The major limitation of the interview sample is the small number (only three in total) of cases of disease that were followed-up. This reflects the relatively small number of cases that were identified in the telephone survey.

Table 5 Interview sample classified by the role of the main interviewee

Role of the main interviewee	Telephone survey		Interview survey	
	No.	%	No.	%
Health & Safety Specialist	424	28%	58	58%
Senior Management	447	30%	16	16%
Line Management	494	33%	20	20%
Other	139	9%	6	6%
TOTAL	1504	100%	100	100%

Table 5 compares the role of the main interviewee between the two surveys. In comparison with the telephone survey, the interview survey involved a much higher percentage of safety specialists (this category includes both dedicated safety managers and those nominated as company safety managers or advisors in addition to other roles). This reflects the fact that the interview survey involved a higher percentage of larger companies with safety specialists who were more likely to commit the time necessary.

3 KEY CONCLUSIONS AND STRUCTURE OF REPORT

In this section of the report the key conclusions reached in relation to the overall aims and objectives of the study (as laid out in section 1) are first briefly summarised. This summary integrates the key results from both the telephone survey and the interview survey. The structure of the remainder of this report, which specifically covers the results of the interview survey, is then outlined. Readers who require a more detailed summary of the interview survey results and their implications for the HSE can refer directly to Section 7 of this report.

3.1 KEY CONCLUSIONS FROM THE TELEPHONE AND INTERVIEW SURVEY

In the following summary, and throughout this report, the term 'incident' is used as a generic description for all injuries, diseases and dangerous occurrences reportable under the RIDDOR regulations.

In interpreting the following it should be borne in mind that the data from the telephone and interview surveys differ in two respects. First, the former employed a large statistically representative sample, whilst the latter was based on a small sample of 100 companies. Second, the methodologies differed; whilst the telephone survey asked for estimates based on the general experience of investigating incidents, the interview survey focused on the actual practice involved in the investigation of a specific set of 100 incidents. The data referred to below therefore needs to be interpreted in the light of these differences in approach.

3.1.1 General approach to incident investigation

The telephone survey identified the overall pattern of incident investigation in companies of different sizes. For example, it demonstrated that whilst 74% of companies have standard rules for the composition of the investigation team, fewer companies have a standard set of questions or protocol that has to be completed in an investigation (from 18% in small companies to 73% for large companies). By examining the actual investigation process in a sample of 100 incidents, the interview survey provided a much richer picture of what happens in practice.

The level of structure and support provided by the 100 companies in the interview survey was classified into four main categories representing increasing levels of formal structure and sophistication of approach: Approach 1, Approach 2.1 and 2.2 and Approach 3. In general terms, in Approach 1 there is a complete absence of any documented structure or support for incident investigation. In Approach 2.1 there is minimum formal support with the focus on identifying immediate cause. Approach 2.2 is more structured, with a more sophisticated approach to identifying immediate and underlying causes. In Approach 3 the causal analysis is supported by further analysis tools and techniques.

The general findings in relation to the provision of structure and support for investigations are summarised below:

- Approach 2 is the most commonly used
- Within Approach 2, most companies use only the minimum level of structure and support
- A large percentage of companies still use Approach 1, i.e. a largely informal unstructured approach. This includes smaller companies with the least resources, but also includes a relatively large proportion of bigger organisations
- The likelihood of using a more sophisticated approach increases with the size of company
- Approaches 2.2 and 3 represent the best practice identified in the interview survey. Where incidents are potentially complex, the tools and techniques used in Approach 3 may be valuable

- These approaches are driven by a number of different causal models from system-based (which examine all potential contributory factors) through to wholly traditional models (that focus on the individual concerned and most immediate cause). However, the majority of companies still operate closer to the traditional end of this continuum rather than using a system-based approach
- The individual driving the investigation has a major impact on the approach that is adopted, although this influence is moderated by the presence of a robust structure to support the investigation process. Hence companies that employ Approaches 2 and 3 are more likely to maintain a consistent and through investigation process

3.1.2 Who typically carries out the investigations?

The analysis of the 100 cases in the interview survey suggests that the company health and safety specialist is involved in the overwhelming majority of cases, usually having overall responsibility for carrying out the investigation. Line management is involved in approximately half of all incidents and senior management in roughly one quarter of incidents, the latter are least likely to be involved in a minor incident. Technical experts are also involved in approximately one quarter of all incidents.

However, the most common team composition is a health and safety specialist together with a representative of line management. Safety representatives or other employee representatives are only involved in 11% of incidents. Although those individuals involved in an incident and co-workers (where relevant) are nearly always asked to contribute by describing 'what happened?', they are rarely formally involved in the investigation process.

The composition of the investigation team is most likely to change as the incident increases in severity; this change would typically involve the addition of a more senior manager to the team. Team composition may also change dependent on the exact nature of the incident.

A number of differences were observed between the findings of the interview survey and the telephone survey in respect of the above; these include the following:

Safety specialists were involved in a higher percentage of cases in the interview survey than in the telephone survey. This can be partly explained by the fact that the interview sample was skewed towards larger companies and more severe cases. Line managers were also involved in more incidents in the telephone survey compared to the interview survey. There was also a difference between the data on senior management involvement in incident investigation between the two surveys. Senior management was involved in a much higher percentage of cases in the telephone survey than in the interview survey. This result may be partly explained by the nature of the interview sample, in that it involved a much greater proportion of larger companies with a greater likelihood of having safety specialists. It may also indicate that telephone survey respondents over-estimated the involvement of senior management. Safety representatives were also more likely to be involved in investigation in the telephone survey compared to the interview survey.

3.1.3 Time spent on investigation

Based on the analysis of 100 cases the interview survey showed that overall some 42% of incidents took less than 5 hours of investigation time, 35% took between 5 and 20 hours and 18% over 20 hours. The data from the telephone survey indicated that less time than the above was usually committed to investigation. Since companies rarely monitor the amount of time spent on investigations, and respondents in the telephone survey also indicated difficulty in making time estimates, it is likely that the interview survey provides a more accurate picture of resources used. However, the difference may also be partly explained by the selection of more severe incidents for the interview survey.

The general trend that emerged was that investigation time increases with the severity or potential severity of the incident. This finding is consistent with the pattern that emerged from the telephone survey in that the amount of effort and resources applied in an investigation is strongly related to severity of outcome.

3.1.4 Identification of immediate and underlying causes

The depth of causal analysis was not explicitly addressed in the telephone survey. The findings of the interview survey however suggest that the majority of companies do not effectively discriminate, or indeed understand, the distinction between immediate and underlying causes. However, despite the limitations of many of the investigations examined in this study, the vast majority of respondents felt that their current approach had led them to identify the underlying cause of the relevant incident.

There is also a tendency for incident reporting and incident investigation to be conflated. Companies that perceive themselves as having effective systems and skills in reporting often overestimate the quality of their investigations.

3.1.5 Recommendations and actions taken

The interview survey identified the specific recommendations and actions that were taken following the investigations. In general terms, the results obtained indicate a more system-based approach than was apparent in the interviews or in the causal analysis documented in the case studies.

In the telephone survey companies rated their effectiveness in monitoring the impact of actions following an incident investigation at 4 out of 5. In the context of other scores recorded in the survey this was judged to be a relatively poor result. This finding is confirmed by the results of the interview survey. These results suggest that companies that employ Approaches 1 and 2.1 (that is the majority of companies) tend not to have formal systems to ensure that recommendations are acted upon. In addition, only a small number of companies have a formal system in place to ensure that recommendations have been effective in reducing the likelihood of similar or related incidents.

3.1.6 Training in incident investigation

The results of the telephone survey indicate that there is little training in incident investigation with over half the organisations in the survey reporting a lack of training in incident investigation. Such training as there is, is mostly part of more general management training or concerned with the recording of accidents. The level of training is somewhat higher in larger organisations.

These findings are generally confirmed in the interview survey. Although some two thirds of investigation teams in the interview survey have some training in incident investigation, with the percentage of individuals trained increasing by size of company, the bulk of this training relates to generalised health and safety training such as NEBOSH or IOSH courses. In practice, even if demand were high, there is currently a lack of easily accessible and affordable training courses on incident investigation.

3.2 STRUCTURE OF THIS REPORT

The results of the interview survey are discussed in four main sections:

Analysis of the case study material (section 4 of the report)

This forms the substantive part of the report. The case study data have been used to illustrate:

- Inputs to the investigation and resource implications
- The investigation process and different approaches to investigation
- Actions taken following the investigation
- Storage and use of incident data

Where appropriate, and where data are available, comparisons are made with the results obtained within the telephone survey.

A full description of each case study is provided in Appendix A. Each case study is described in terms of the following:

- A brief narrative description of the incident
- The consequences of the incident
- The individuals involved in the investigation and the time involved
- A brief description of the investigation process
- The conclusions reached and the actions taken
- The lessons learnt by the company

To illustrate the range of incidents that were followed up, a brief summary of each case study classified by type of incident is shown in Table 6.

General evaluation of company approaches to incident investigation (section 5 of the report)

This section summarises the extent to which the approaches adopted by companies generally meet the requirements of a 'good incident investigation process' as previously defined within the report. The advantages and disadvantages of the different approaches are also identified.

More general issues covered in the interview (section 6 of the report)

This section includes a discussion of the following issues:

- Training issues
- Near-miss reporting
- Changes companies would make if incident investigation were made mandatory
- Support requested from the HSE

Summary of findings and their implications for the HSE (section 7 of the report)

This section provides a detailed summary of the major findings of the interview survey and their implications for the HSE.

Table 6 Summary of case studies classified by RIDDOR classification (reference number refers to Appendix A)

Ref No.	Incident Classification	Incident description
1.1	Dangerous Occurrence	Employee nearly run over by a forklift
1.2	Dangerous Occurrence	Rope used for hauling trucks from mines corroded, causing truck to runaway
1.3	Over-3-day injury	Employee cut hand using unauthorised blade
1.4	Over-3-day injury	Person run-over by reversing forklift truck with reverse indicator not working
1.5	Over-3-day injury	Damaged back through overstretching whilst on ladder
1.6	Minor incident involving employee	Trapped hand between door and trolley
1.7	Dangerous Occurrence	After grinding work with hot sparks a fire was discovered which spread to nearby oxy-acetylene kit
1.8	Major	Finger severed by food mould press (circumvented guarding)
1.9	Violence	Farm Manager attacked by member of public involved in illegal activity
1.10	Over-3-day injury	Employee had shoulder pain from throwing dirty linen upwards into a cage
1.11	Minor incident involving employee	Slipped of a tractor injured back
1.12	Minor incident involving employee	Employee working on own with mains and exposed wires reported dangerous working to HSE
1.13	Over-3-day injury	Static electricity ignited pressurised canister, causing burns to employee's arm
1.14	Over-3-day injury	Tractor driver connected hydraulic mechanisms the wrong way round causing tractor to tip rather then brake
1.15	Dangerous Occurrence	Fork lift driver moved into small space and severed cable supplying electricity to building
1.16	Major	Banksman had finger severed by rolling pipes during unloading
1.17	Major	Operator lost tip of finger while catching falling metal coil
1.18	Over-3-day injury	A client slipped whilst being carried by care workers causing back injury to one of the workers
1.19	Over-3-day injury	Fall from ladder as it slipped
1.20	Dangerous Occurrence	A misfire causing the failure of explosives to detonate
1.21	Public	Child fell from slide in playground
1.22	Over-3-day injury	Employee fell from back of lorry after fitting sheeting over load
1.23	Over-3-day injury	Operator complained of hip, elbow and back problems when having to work with heavy items in constrained space

1.24	Over-3-day injury	Material shot out of machine and hit agency worker
1.25	Major	Fatality as a result of fall from skip
1.26	Over-3-day injury	Knife left in cow carcass cut next employee to handle carcass
1.27	Over-3-day injury	Forklift truck driver banged head as he brought vehicle to emergency stop due to obstruction
1.28	Over-3-day injury	Employee got finger caught in machinery whilst repairing it
1.29	Public	Elderly member of public fell over in surgery
1.30	Dangerous Occurrence	Jib line snapped off vehicle cab
1.31	Major	Dislocated shoulder while performing routine task
1.32	Over-3-day injury	Employee strained back while operating vehicle tail lift
1.33	Minor incident involving employee	Employee knocked tray that she was holding the glass fell and cut her leg
1.34	Over-3-day injury	An employee knocked a shelf of blades and cut his hand trying to stop them fall
1.35	Minor incident involving employee	Car accident in company car park
1.36	Minor incident involving employee	Work conducted without required permits
1.37	Over-3-day injury	Hand injury sustained in printing machine
1.38	Minor incident involving employee	Finger injury sustained whilst using a knife
2.1	Over-3-day injury	Model Rigger cut hand on aeroplane model
2.2	Over-3-day injury	Handle of large steel door spun off and hit employees legs
2.3	Over-3-day injury	Burn caused by explosion during battery drop test
2.4	Minor incident involving employee	A contractor attempted to replace a fallen barrier to avoid a collision with train but the barrier sprang into his path and hit him in the chest
2.5	Major	Banksman fell to death whilst working on steel beam 6 metres above ground
2.6	Over-3-day injury	During foot trimming of sheep, sheep struggled causing worker to cut himself with trimming knife
2.7	Dangerous Occurrence	Reel of film fell to ground after improvised maintenance
2.8	Dangerous Occurrence	Worker caught not following working practices (excavating spoil from trench mechanically)
2.9	Public	Member of public fell after work carried out on her front step by this company
2.10	Over-3-day injury	Employee tripped on delivery ramp at front of building and injured shoulder
2.11	Minor incident involving employee	Employee lifted heavy parcel from a height which fell onto his hand

2.12	Over-3-day injury	Workman struck by falling crane block after rope had come away from ferrule
2.13	Over-3-day injury	Articulated truck slipped down slope and turned on side, injuring employee
2.14	Minor incident involving employee	Tractor overturned
2.15	Dangerous Occurrence	Acetylene cylinder ignited by spark from grinder
2.16	Major	Employee hit overhead lighting causing shards of glass to penetrate eye
2.17	Major	Splash of chemical ran down forehead into eye of employee
2.18	Disease	Rash caused by exposure to chemical that employee was sensitive to
2.19	Over-3-day injury	Contractor used subcontractors ladder which snapped causing contractor to fall and hit head
2.20	Over-3-day injury	Work equipment fell on employees foot
2.21	Minor incident involving contractor	Contractor cut wood a piece of which ricocheted causing a cut to the head
2.22	Over-3-day injury	Operator cut finger in machinery (circumvented guarding)
2.23	Minor incident involving contractor	Agency worker trapped hand in conveyor sustaining cuts and bruises
2.24	Over-3-day injury	Kerb layer hurt back removing road from set concrete
2.25	Disease	Rash on the wrists of contractor working at chemical plant
2.26	Over-3-day injury	Contractor was using chainsaw and blade jammed and kicked back cutting his leg
2.27	Over-3-day injury	Cleaner slipped whilst standing on edge of bath to clean
2.28	Over-3-day injury	Tyre press slipped and hit employee on hand
2.29	Over-3-day injury	Furnace exploded in the face of an maintenance technician
2.30	Over-3-day injury	Employee slipped on wet floor whilst running to answer phone
2.31	Over-3-day injury	Contract agency worker had security shutters fall on her causing injury to face
2.32	Dangerous Occurrence	Hired equipment caught fire burning customer
2.33	Over-3-day injury	Forklift truck driver was lifting a heavy roller when top of forklift hit roof caused roller to fall off and cut colleagues leg
2.34	Major	Glove pulled into machinery causing amputation of finger
2.35	Minor incident involving employee	A smoker stepped on a rusty nail
2.36	Over-3-day injury	Back strain from pushing trolley into lift
2.37	Dangerous Occurrence	Explosion behind an electrical panel while conducting routine maintenance
2.38	Over-3-day injury	Employee fell 20 feet down stairwell

2.39	Major	Employee had arm crushed by machinery while carrying out repairs
2.40	Major	Whilst drilling a metal hole on a makeshift workbench metal whipped round and amputated employees little fingers
2.41	Over-3-day injury	Employee attempted to pick up stone from front of testing vehicle and dropped it on his foot
2.42	Over-3-day injury	Employee caught leg when walking through unauthorised walkway
2.43	Violence	Employee slashed in face by relative
2.44	Over-3-day injury	Contractor had foot run over by Forklift truck
2.45	Dangerous Occurrence	Employee attempted to lift 25 litre receptacle from height and fell on head
2.46	Over-3-day injury	Engineer crushed arm in machine during maintenance
2.47	Major	Contractor fatality whilst conducting routine maintenance
2.48	Disease	Rash from use of lubricating oil spray on machine
2.49	Minor incident involving employee	Fall from pipe while carrying out maintenance work caused damage to employees knee
2.50	Over-3-day injury	Slip on water caused back injury
2.51	Minor incident involving employee	Employee experienced pain after driving excavator over rough ground over long distances
2.52	Over-3-day injury	Back injury sustained as a wrench slipped
2.53	Minor incident involving employee	Cut caused by exposed metal in old boiler
2.54	Over-3-day injury	Trapped hand in textile processing machine
2.55	Over-3-day injury	Fall from height following failure to adhere to prescribed working practice
3.1	Over-3-day injury	Powder explosion in the face of technician dismantling site machinery
3.2	Over-3-day injury	Wrench snapped whilst placed under extreme force by employee
3.3	Dangerous Occurrence	Overhead crane had chain caught on vehicle pulling off the crab unit
3.4	Over-3-day injury	Contractor used incorrect work practice to lift pipe which fell on to his hand requiring operation
3.5	Over-3-day injury	An operator taking a sample caused a release of high pressure water/oil causing burns
3.6	Minor injury involving contractor	Contractors were spotted not following agreed safe working practices for trenches
3.7	Dangerous Occurrence	Duct fell from the ceiling narrowly missing an employee

4 ANALYSIS OF CASE STUDIES

In very general terms, it is possible to allocate approaches to incident investigation to two main categories. The first, which will be referred to throughout this report as the ***'traditional'*** approach, almost exclusively focuses on the individual or behavioural contribution to an incident and largely ignores, or downgrades, other potential contributory factors. For example, the impact of known influences on performance such as poor procedures, inadequate equipment, undue production pressure, fatigue or distractions will not be systematically addressed within the investigation. Nor will any management or organisational contributions that led to such conditions be routinely considered. In summary, the emphasis in this type of investigation is on the person or persons involved, identifying their contribution to the incident and highlighting only those immediate causes that are obviously and unambiguously implicated. Once these conditions are satisfied, the investigation is typically seen as complete. Underlying causes, such as those illustrated above, that may have influenced behaviour or led to unsafe conditions are rarely fully captured within this type of investigation.

There are a number of fundamental problems with this approach. These include: a tendency to focus on 'what' and 'how' rather than 'why' the incident occurred; to restrict the investigation to a limited set of causes, to focus prevention on disciplinary or procedural approaches and to assign responsibility and blame to those most immediately involved. Lastly, this approach tends to lead to short term, and ultimately ineffective, interventions since the underlying conditions that may create vulnerability to a wider range of incidents remain un-addressed.

In contrast, the second approach, which will be referred to throughout this report as the ***'system-based'*** approach, tries to embrace the full range of factors that may increase the risk of an incident occurring and also to trace the drivers of these conditions. This approach typically incorporates a number of important concepts, including the following:

- *Concept of multiple-causation* - Incidents are seen as not just arising from a single cause, but from a combination of conditions. These may be associated with individual behaviour, characteristics of the task or working environment, or wider organisational issues
- *Concept of performance-influencing factors* – There is recognition that individuals all have intrinsic error vulnerability and hence under certain conditions, even experienced, well motivated individuals may be involved in incidents
- *Concept of both immediate and underlying causes.*- Whilst most incident investigations typically identify the immediate triggers or causes of an incident such as the failure to follow a procedure or the use of the wrong equipment, many investigations fail to address the underlying causes of these conditions. These causes are typically characterised as those organisational and management policies (that is the system factors) that create the preconditions for accidents
- *Emphasis on the modification of system factors as a major prevention strategy* - It is an underlying principle of system-based approaches that organisational resources should be directed towards the proactive identification and resolution of underlying causes, rather than at the prevention of individual unsafe acts
- *Recognition of an informal structure of rules and procedures* - There is recognition that many organisations have a structure of informal rules and working practices that may differ considerably from the 'official' procedures. Although these practices may increase the risk of an incident, they are perceived as delivering a 'benefit' to the organisation and are often implicitly recognised and condoned by line management

Organisations that advocate a system-based approach will generally employ a more rigorous and thorough approach to an investigation. They will be more open-minded about the causes of unsafe behaviour, recognising that individuals often work in circumstances that promote the

likelihood of such behaviour. They are therefore likely to be more effective in identifying both immediate and underlying causes, and hence more successful in reducing the risk of a wider range of incidents. System-based approaches to incident investigation are generally therefore acknowledged to represent current best-practice.

It is perhaps more useful to think in terms of these two approaches representing the two ends of a continuum, with the traditional approach at one end and the fully realised system-based approach at the other end. In reality, company approaches will be distributed at various points along this continuum. In order to represent the findings of the study it is therefore helpful to try to define the specific requirements that might make up a fully realised system-based approach and to assess the degree to which companies within the interview study currently fulfil these requirements.

Based on the experience and professional judgement of Human Reliability Associates, a successful incident investigation process should incorporate the following basic requirements.

- A causal model that represents a system-based approach to incident investigation
- The involvement of relevant individuals within the investigation
- Procedures or protocols to structure and support the investigation
- The identification of both immediate and underlying causes
- The development of recommendations that address both immediate and underlying causes
- The implementation of these recommendations and the updating of relevant risk assessments
- Follow up to ensure that actions taken are successful in reducing the risk of further incidents
- Feedback to relevant parties to share immediate learning
- The development of an accessible database

These requirements, and the extent to which they are currently being met in practice, are now discussed in turn. Examples of specific case studies that illustrate the main points being made are provided in Section 4.10.

4.1 A CAUSAL MODEL THAT REPRESENTS A SYSTEM-BASED APPROACH TO INCIDENT INVESTIGATION

4.1.1 Description of requirement

In general terms, individuals and organisations look for results and patterns that fit with their own implicit or explicit 'model' of how incidents are typically caused. The term model is used here in its broadest sense to mean the frame of reference that is applied to define, shape and interpret the information that is collected. For example, as already discussed, traditional accident approaches, and the causal models that flow from them, almost exclusively focus on the individual contribution to an incident In contrast, system-based approaches and the associated models try to fully represent all possible contributory factors.

4.1.2 Case study findings

It is difficult to measure, in absolute terms, the extent to which companies employ a system based, rather than more traditional approach to incident investigation. The reasons for this difficulty are:

- Few companies explicitly state or represent a causal model within their written documentation or company policy
- The individual cases that were followed up in this study varied in the extent to which they provided an opportunity for the company to demonstrate its general approach. For

example, if the case study involved a simple technical failure little insight could be gained into how the company may have investigated an incident involving a procedural violation

However, whilst it was not feasible to quantify this dimension on a case-by-case basis, the overall impression gained was that although a spectrum of approaches exist, the majority of companies operate closer to the traditional end of this continuum rather than using a system-based approach.

It also became apparent during the progress of the interview survey that the individual driving the investigation has a major impact upon the approach adopted. Although it is recognised that a defined investigation process or structure may moderate this individual influence, it is unlikely to ever wholly remove it (this issue is discussed further in Section 5.1). The significance of this influence is illustrated by case studies 1B (negative influence) and 2A (positive influence) in Section 4.10. In practice, the causal model adopted during a specific investigation will therefore be influenced by a number of different factors: these include the attitude and values of the individual conducting the investigation, the causal model they hold, the company culture, the company investigation process and procedures and the training provided. These factors are illustrated in Figure 1.

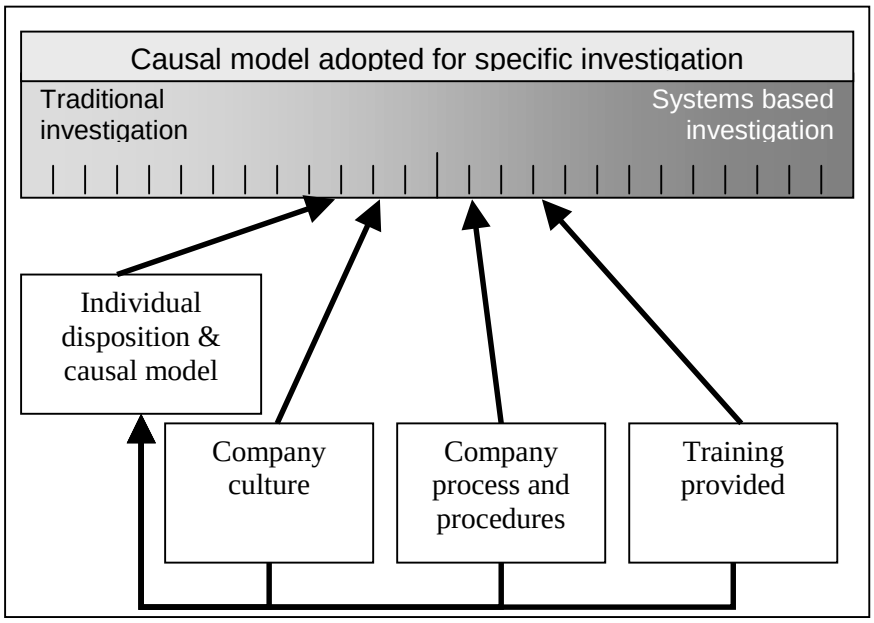


Figure 1 Factors influencing causal model used during accident investigation

The study findings demonstrate that, in the absence of any formal approach or training, the direction the investigation follows is totally dependent on the lead individual. In addition, even where there are formal investigation systems in place, the disposition of the individual will still have a significant impact on the process and output of the investigation. Because of its importance this issue is discussed in some detail in Section 5.1.

4.2 THE INVOLVEMENT OF RELEVANT INDIVIDUALS IN THE INVESTIGATION

4.2.1 Description of requirement

The principle of identifying both immediate and underlying causes that underpins the system-based approach to incident investigation, also has implications for the composition of the investigation team. In particular, it can be argued that, in order to identify job design, or

management and organisational factors that increase the risk of an incident, the team should include an individual or individuals with direct experience or knowledge of the relevant task or work environment. The inclusion of such an individual will also increase the objectivity and face validity of the investigation.

The individuals involved may include:

- Someone familiar with the task and the working environment
- Someone who is responsible for the performance standard within that work environment (for example, a supervisor or departmental head)
- Someone who is perceived as having authority or influence within the organisation
- Someone with health and safety expertise
- An employee representative, for example a health and safety representative
- The person involved in the incident (if feasible)
- An appropriate technical expert where necessary (medical, engineering, etc)

Different functions can be performed by the same individual. In small companies this is the only feasible way of conducting an investigation.

4.2.2 Case study findings

Composition of the investigation team

The composition of the investigation team in the case studies is shown in Table 7. This table shows the following:

- Taken overall the person most likely to be involved in the investigation was the company health and safety specialist. (87% of incidents).
- Line management was involved in approximately half of all incidents (57%); they were more likely to be involved in a dangerous occurrence than any other type of incident
- Senior management was involved in 26% of incidents; they were least likely to be involved in a minor incident
- Technical experts were involved in 26% of all incidents; they were most likely to be involved in disease, dangerous occurrence and over-three-day incidents
- The most typical team composition was a health and safety specialist together with a representative of line management
- The person involved in the incident was rarely involved in the process of active investigation
- Health and safety representatives or other employee representative were only involved in 11% of incidents

Comparing the data in Table 7 with the equivalent data from the telephone survey reveals some differences.

- In the telephone survey, safety specialists were involved in a smaller percentage of incidents (a range between 46% and 55% depending on the nature of the incident). This can be partly explained by the fact that the interview sample was skewed towards larger companies and more severe cases, and also that some non-dedicated safety specialists may have been coded under ‘line management’ in the telephone survey
- Line managers were involved in more incidents in the telephone survey (a range of 62-68% depending on the nature of the incident) compared to the interview survey (57%). This may be partly explained by the point made above
- Senior management were involved in a greater percentage of cases in the telephone survey (a range of 42-79% depending on the nature of the incident) than in the

interview survey (26%). This difference may be partly explained by the nature of the interview sample in that it involved a greater proportion of larger companies with a greater likelihood of safety specialists. It may also indicate that telephone interviewees over-estimated the involvement of senior management

- Health and safety representatives were also more likely to be involved in an investigation in the telephone survey (a range of 25 –31% depending on the incident), compared to 11% in the interview survey. The likeliest explanation here is that the telephone survey respondents overestimated their involvement
- Because of the variety of different industries involved, comparison of the involvement of technical experts is difficult between the two surveys

It should be noted that whenever comparisons are drawn between the results of the two surveys, there are two potential sources of discrepancy. First, the telephone survey was based on a large, statistically representative sample of 1500 respondents; in contrast the interview sample was small and not statistically representative of the target population. Second, the methodologies are completely different and variations in findings could be attributable to the greater time available and level of personal contact within the interview survey. It is also important to recognise that the data on team composition and time expended from the interview survey are based on actual cases; in the telephone survey the data reflect estimates based on the general experience of investigating accidents. Any points made in the report in respect of differences in findings between the two surveys need to be interpreted in the light of the above.

Table 7 The composition of case study investigation team

Members of investigation team	Line management		Senior management		Dedicated H&S individual		Non-dedicated H&S individual		Safety Rep or employee rep		Experts		Person involved in incident		Others		Base
Type of incident	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	
Major injury	4	33%	5	42%	8	67%	5	42%	1	8%	2	17%	0	0%	2	17%	12
Over-three-day injury	30	61%	15	31%	24	49%	19	39%	7	14%	17	35%	3	6%	10	20%	49
Disease	1	33%	0	0%	0	0%	3	100%	1	33%	2	67%	0	0%	2	67%	3
Dangerous Occurrence	12	86%	3	22%	10	55%	2	14%	0	0%	5	36%	1	7%	2	14%	14
Minor incident involving employee	6	7%	2	14%	3	21%	7	50%	2	14%	0	0%	1	7%	3	21%	14
Minor incident involving contractor	3	100%	0	0%	1	33%	1	33%	0	0%	0	0%	0	0%	1	33%	3
Minor incident involving member of public	1	33%	0	0%	1	33%	2	67%	0	0%	0	0%	0	0%	1	33%	3
Violence	0	0%	1	50%	0	0%	1	50%	0	0%	0	0%	0	0%	0	0%	2
TOTAL	57		26		47		40		11		26		5		21		

Organisational level of the person responsible for the investigation within the interview survey

The organisational level of the person who was identified as having overall responsibility for the investigation is shown in Table 8.

Table 8 Organisational level of person responsible for the investigation

Overall responsibility for investigation	%
Line Management	18%
Health & Safety specialist	46%
Personnel manager	4%
Senior management	24%
Safety Rep	3%
Other	3%
No overall responsibility	2%
Total	100%

This table shows that, in nearly half of the case studies, the health and safety specialist was perceived as having overall responsibility. Senior managers had overall responsibility in 24% of cases (even though such managers were involved in 26% of the case study investigations) and 18% of cases fell within the responsibility of the relevant line managers.

Circumstances under which the composition of the investigation team may change

Participants in the interview survey were asked: "under what circumstances would the composition of the investigation team change?" The results are shown in Table 9. This table shows that the interviewees felt that the composition of the team was most likely to change if the incident severity was greater (in this case a typical response was that a senior manager would become involved). Less commonly, but still significant, the exact nature of the incident may affect the team composition. For example, a machinery failure would require a technical expert or if vehicles were involved, the police would be called in to help.

Table 9 Circumstances under which the composition of the investigation team may change

Circumstance	**%**
Typical team/Always stays the same	18%
Depends on the nature of the incident	17%
Severity of incident	44%
No experience of other type of incident	1%
If insurance/HSE involved	3%
Local or site practice may vary	3%
Now aiming to train safety reps in incident investigation	1%
Not known	13%
TOTAL	100%

Other contributions to the investigation

The other parties who contributed to the case studies covered in the interview survey are identified in Table 10. This table shows that the injured (or involved) party was interviewed as part of the investigation in the vast majority of cases (77%). This finding contrasts with the investigation team make up (see Table 7) where the individuals involved in the incident are very rarely formally involved in the investigation process. This difference suggests that those involved in incidents are often formally asked to *describe* an incident, but rarely formally involved in any causal analysis. Whilst it may not be necessary to involve the injured party in a formal investigation team, it is important that the investigation process provides an opportunity for these individuals to contribute their views about both the immediate and underlying causes of an incident. However, it is recognised that whilst the contribution of the injured party or other relevant individual may increase the probability of identifying underlying causes, there may be legal or cultural reasons why such involvement is relatively rare.

Co-workers or witnesses were also interviewed in 74% of cases. This is very typical of the investigation process in a large number of organisations. Often 'investigation' equates to collecting statements from those involved or witnesses to the incident and examining the scene. This technique for conducting an investigation is so accepted that asking the question "Could you explain how the incident was investigated?" during an interview, was frequently met with a puzzled look followed by a description of the statement collecting and scene examining process.

Table 10 Other individuals that contributed to the investigations

Other individuals that contributed to the investigation	Injured or involved party		Co-workers		Witnesses		Union Reps		Line Management		Other		Base
Type of incident	No	%	No	%	No	%	No	%	No	%	No	%	
Major injury	8	67%	8	67%	4	33%	0	0%	2	17%	4	33%	12
Over-three-day injury	43	88%	30	61%	8	16%	3	6%	9	18%	12	24%	49
Disease	3	100%	3	100%	0	0%	0	0%	1	33%	2	67%	3
Dangerous Occurrence	10	71%	8	57%	2	14%	0	0%	3	21%	5	36%	14
Minor incident involving employee	8	57%	4	29%	1	7%	1	7%	1	7%	0	0%	14
Minor incident involving contractor	2	67%	0	0%	2	67%	0	0%	0	0%	2	67%	3
Minor incident involving member of public	1	33%	1	33%	2	67%	0	0%	0	0%	0	0%	3
Violence	2	100%	1	50%	0	0%	0	0%	0	0%	0	0%	2
TOTAL (%)	77		55		19		4		16		25		

Table 11 Total time spent on investigations by type of incident

Time spent on investigation / Type of incident	Under 1 hour		1-2 Hours		2-5 Hours		5-10 Hours		10-20 Hours		Over 20 hours		Unknown		Base
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	
Major injury	0	0%	1	8%	3	25%	3	25%	2	17%	3	25%	0	0%	12
Over-three-day injury	1	2%	5	10%	11	22%	11	22%	8	16%	11	22%	2	4%	49
Disease	0	0%	0	0%	0	0%	1	33%	0	0%	1	33%	1	33%	3
Dangerous Occurrence	0	0%	3	21%	1	7%	4	29%	5	36%	1	7%	0	0%	14
Minor incident involving employee	3	21%	6	43%	2	14%	0	0%	0	0%	1	7%	2	14%	14
Minor incident involving contractor	0	0%	0	0%	2	67%	0	0%	0	0%	1	33%	0	0%	3
Minor incident involving member of public	0	0%	1	33%	2	67%	0	0%	0	0%	0	0%	0	0%	3
Violence	1	50%	0	0%	0	0%	0	0%	1	50%	0	0%	0	0%	2
TOTAL (%)	5		16		21		19		16		18		5		

Time spent on investigation

The overall person hours spent on investigating the case studies in the interview survey is shown in Table 11. This table shows that overall some 42% of incidents took less than 5 hours of investigation time, 35% took between 5 and 20 hours and 18% over 20 hours. The general trend that emerged was that investigation time increased with the severity or potential severity of the incident.

It is difficult to carry out a valid comparison with the data from the telephone interview survey because of the relatively small number of incidents in most categories. However, if just the data on lost time incidents are examined, of which there are 48 cases in the interview sample, the data in Table 11 suggest that the telephone interviewees tended to underestimate the time involved in the investigation. In the interview survey, 34% of over-three-day injuries involved less than 5 hours of investigation time, 38% involved between 5 and 20 hours and 22% over 20 hours. The equivalent percentages in the telephone survey were 70 % under 5 hours, 20% between 5 and 20 hours and 9% over 20 hours. This difference may be partly explained by the selection of more severe incidents for the interview survey. It may also suggest, however, that there is significant underestimation of the time incident investigation actually takes.

In practice, since few companies monitor and record the resources used in incident investigations, respondents in the telephone survey found making time estimates difficult. In contrast, the time data from the interview survey is based on time estimates for specific and fairly recent incidents. Interview respondents also often had time to access actual records or investigation details. It is therefore considered that the data from the interview survey probably provides a more accurate and reliable estimate of resources used on investigations.

4.3 PROCEDURES OR PROTOCOLS TO STRUCTURE AND SUPPORT THE INVESTIGATION

4.3.1 Description of requirement

In order to increase the likelihood that an investigation addresses both immediate and underlying causes, and that the appropriate recommendations are developed and acted upon, it is important that the investigation team is supported by a procedure or other documented structure that guides the investigation and the subsequent response. By definition, the procedure or structure should incorporate a causal model that is system-based. In the absence of such a structure the quality of the investigation is entirely dependent on the informal model and experience of the individual driving the investigation.

4.3.2 Case study findings

In order to provide an overview of the range of approaches to incident investigation represented in the case studies, they were grouped into four basic categories. Each of these four categories are defined below:

Approach 1

In these companies, there may be a formal structure or procedure for ‘reporting’ incidents (for example, an accident book or accident report form) but there is an absence of any formal documented structure and support for ‘incident investigation’. Examples of this approach can be seen in Examples 1A and 1B which can be found in Section 4.10.

Approach 2

In these companies there is a documented structure for incident investigation. This may be a written procedure, a form or a combination of both.

The level of structure and support provided within this approach varies considerably. However, two general types of support can be distinguished. These are illustrated in Figure 2 (Approach 2.1) and Figure 3 (Approach 2.2) each of which represents an amalgam of the most common features identified in the forms and procedures collected in this study. The primary distinguishing feature between these two levels of support are the level of detailed causal analysis they require.

Organisations that follow the pattern exemplified by **Approach 2.1** (illustrated in Figure 2, Page 29) tend to exhibit the following characteristics:

- The guidance is largely concerned with the collection of basic descriptive data
- The focus is on representing the events surrounding the incident, using witness statements, photographs, reconstructions, etc
- Although some causal analysis is always carried out this is typically limited to immediate cause and associated recommendations and there is little or no support to help identify underlying causes

This type of support was by far the most common in the companies included in the interview survey.

Approach 2.2 (illustrated in Figure 3, Page 30) has the following characteristics:

- There is a shift in emphasis away from narrative and description (to the extent that this is usually dealt with in a separate investigation form) and towards a more sophisticated causal analysis
- Immediate and underlying causes are usually distinguished
- The contribution of both individual and job-based factors are considered
- There is more formal support for the causal analysis, typically in the form of checklists of potential contributory factors
- There is a formal requirement to define the corrective actions required and in the most sophisticated versions of this approach, a requirement to estimate the cost of these actions
- There is a clear assignment of responsibility and accountability for carrying out the corrective actions with associated timescales
- There is a formal review process to ensure that the actions have been successfully completed and to assess whether these actions have been effective

This type of support was relatively uncommon in the interview survey but was represented in a small number of companies as discussed below.

Approach 3

This category combines the structure of Approach 2 (most frequently Approach 2.2) with the routine application of complementary analysis tools that extend the depth of the investigation. Companies that employ this approach have explicitly recognised the need to support a more structured approach to causal analysis.

This approach, therefore, represents the most sophisticated identified in the interview survey. In total only 7 of the 100 companies reported adopting such techniques. Brief details of these companies and the types of tools used are listed in Table 12.

Table 12 Tools used in Approach 3

Case Study No.	Size	Risk	Description of tool used
3.1	200+	High	Timeline representation of incident sequence
3.2	50-199	High	Timeline representation and causal tree analysis of possible contributory factors
3.3	50-199	Low	Detailed analysis of underlying causes and their effects
3.4	200+	High	Detailed analysis of immediate and contributory causes and linked to recommendations dealing with engineering issues, materials issues, information, supervision, management systems and policies
3.5	200+	High	Timeline analysis of event sequence linked to contributory factors at each key event
3.6	50-199	High	Extensive causal analysis of personal and job factors as underlying causes
3.7	50-199	High	Use of a proforma that allows the chain of events to be described. Each event is described in terms of direct, indirect and basic causes

It is apparent from Table 12 that such approaches are used primarily in large organisations and higher risk industries. Such industries tend to have more experience in incident investigation; a greater understanding of the need to identify underlying causes so as to reduce the risk of recurrence, more dedicated health and safety specialists and a greater awareness of human factors issues.

In terms of the best practice identified in the interview survey, this is represented primarily by Approaches 2.2 and 3. Where incidents are potentially complex, the tools and techniques described in Table 12, and which are associated with Approach 3 may be valuable.

FORM 2.1	
Date of accident:	Name of Casualty:
Time of Accident:	Address:
Place of Accident:	
Nature of Accident:	
Supervisor:	
Date of Report:	Job:
Details of accident:	
Details of injury:	
Details of treatment:	
Hospital referral: Yes / No	
Witnesses account (continue on separate sheet if necessary)	
What was the cause of the accident?	
Recommendations to reduce future risk:	
Action taken:	
Signed	
Supervisor	Casualty
Date:	Date:
Safety Representative	First aider
Date:	Date:

Figure 2 Example form demonstrating a typical level of investigation support within Approach 2.1

FORM 2.2			
Date of accident:			
To be investigated by:		Date of report:	
To be reviewed by:		Date of review:	
Brief description of incident			
What was the immediate cause of the accident?			
What where the underlying causes of the accident? (see attached list) (List may include Personal & Job factors such as skill, knowledge, motivation, stress, leadership, equipment standard, etc. These classifications may be subdivided and arranged as a checklist)			
Probability of occurrence High /medium/ low		Cost of control: High /Medium /Low	
Witness statements (continue on subsequent page if necessary)			
Corrective actions to be taken:	Responsibility	Target date	Date Completed
Review (have actions been completed successfully & have they been effective? Are any further actions required?):			
Signed:		Date:	

Figure 3 Example form demonstrating a typical level of investigation support within Approach 2.2

Relative frequency of different approaches

Table 13 shows the relative frequency of the different approaches adopted by companies in the interview survey.

Table 13 Frequency of size of approach by size of company

Size of organisation						%
Approach		<10	10-49	50-199	200+	
	1	1	11	15	11	38%
	2.1	1	2	16	25	44%
	2.2			3	8	11%
	3			4	3	7%
Total		2	13	38	47	100%

This table confirms that, as previously discussed:

- Approach 2 is the most commonly used (55% of companies)
- Within Approach 2, most companies use only the minimum level of structure and support (44% of all companies fall into Approach 2.1)
- A large percentage of companies (38%) still use Approach 1, i.e. a largely informal unstructured approach. This includes smaller companies with the least resources, but also included a sizeable proportion of the bigger organisations
- The likelihood of using a more sophisticated approach increases with the size of company

Why was the current approach to incident investigation adopted within the company?

Interviewees were asked why the current approach or procedure was used within the company. The responses are shown in Table 14.

Table 14 Why was the current approach to incident investigation adopted

Reason	%
Based on RIDDOR/other HSE guidance	6%
Based on principles from safety training	4%
Common sense/self evident	11%
Based on other job experience	3%
Developed in-house/company policy	21%
Advised by insurance company/other	9%
Industry based practice	3%
Not known	43%
Total	100%

Nearly half of the respondents did not know the origin of their approach to incident investigation. Of those who offered a response, the most common responses were that the process was company policy and had been developed in-house, that the process was essentially

common sense or that they had acted on the advice of their insurance company or other outside party. Only a relatively small number identified the HSE as a source of information.

Variation in incident recording and investigation across different types of incident

Because they were generally under-represented in the case study sample, interviewees were specifically asked if their companies did anything different in terms of incident recording and investigation (over and above that used in the case study) in terms of the following incidents:

- Accidents involving members of the public
- Accidents involving contractors
- Incidents involving violence
- Incidents involving a potential legal claim against the company

The results are shown in Table 15.

Table 15 How organisations would change their incident investigation systems under a variety of conditions

41 respondents indicated that they would change their investigation process if an incident involved a MEMBER OF THE PUBLIC	
Suggested change	**Number**
Document investigation more closely	12
Involve external body	16
Involve internal body	6
Unknown	7
42 respondents indicated that they would change their investigation process if an incident involved a CONTRACTOR	
Suggested change	**Number**
Expect contractor to do investigation	12
Conduct a joint investigation	7
Conduct own report and examine if the incident had been our fault	4
Seek external advice	2
Look for contractors negligence	2
Obtain a copy of the contractor's report	4
Unknown	11

72 respondents indicated that they would change their investigation process if an incident involved an act of VIOLENCE	
Suggested change	**Number**
Involve disciplinary proceedings	32
Involve the Police	11
Involve personnel department	9
Involve security	4
Involve insurance company or Union	2
Unknown	14
23 respondents indicated that they would change their investigation process if it was felt likely that an incident may lead to a legal claim	
Suggested change	**Number**
Involve insurance company	8
Seek professional advice	2
Conduct a more thorough investigation	11
Don't know	2

The data in Table 15 suggest the following:

- About 40% of the companies would use a different approach if an accident occurred that involved a member of the public; this would typically involve gathering more details of the incident and consulting with other external bodies
- About 40% of companies would use a different approach in the case of an incident involving a contractor. This would typically involve getting the contractor to carry out their own investigation or consulting in a joint initiative
- A very high percentage of companies (over 70%) reported that they would employ a different approach in the event of an incident involving violence. Typically, this involved invoking a disciplinary measure, involving the police or security and/or personnel
- In the case of potential legal disputes, approximately 25% of companies said they would alter their procedure. Typically this involved carrying out a more thorough in-house investigation or involving their insurance company

Are companies open to a more structured approach to incident investigation?

Interviewees were asked if they thought their companies would be prepared to use a more structured approach. The responses, classified by current approach to incident investigation are shown in Table 16.

Table 16 Openness to using a more structured approach classified by current approach to incident investigation

Approach	Yes	No	Don't know	Not asked*
1	21	12	2	3
2	31	17	4	3
3	4	1	1	1
TOTAL (%)	56	30	7	7

* typically because of lack of time in interview

Table 16 suggests the following:

- Over 50% of companies would be prepared to use a more structured approach. This percentage is almost identical across all categories of current approach, suggesting that interviewees have some reservations about the value of their existing process. Typical qualifications to the response included the following:
  - If we could see the benefit
  - If the incident were severe enough
  - If the procedure were simple to follow
  - If it prevented recurrence

- Some 30% of companies would not be prepared to use a more structured process. Typical qualifications to this response included:
  - Not enough time / resource
  - Simple processes are sufficient

- The larger the company, the more receptive the company would be to using a more structured approach

4.4 THE IDENTIFICATION OF BOTH IMMEDIATE AND UNDERLYING CAUSES

4.4.1 Description of requirement

The importance of this requirement has already been highlighted in earlier sections of the report. In practice, most companies need to be working at both levels, addressing the immediate causes to reduce the risk of an identical or similar incidents and addressing the underlying causes that may be increasing the risk of a wider range of incidents.

4.4.2 Case study findings

The lack of a structure to support the identification of immediate and underlying causes has already been assessed in the previous sections. In general, the findings of the interview survey and the impression gained from the interviewees suggests that the majority of companies do not effectively discriminate, or understand the distinction, between immediate and underlying causes.

However, when asked whether they felt the underlying causes of the case study incident had been identified they produced the responses shown in Table 17:

Table 17 Do you feel the underlying cause of this incident was identified?

Response	Number (%)
Yes	90%
No	4%
Don't know/qualified response	6%
Total	100%

So, despite the limitations identified in the study, the vast majority of interviewees felt that their current approach had led them to identify the underlying cause of the incident.

The relative confidence in their current approach is also illustrated in the results shown in Table 18. This shows the responses obtained when interviewees were asked whether they consider they already have a structured approach to identifying the underlying causes of accidents and ill-health.

Table 18 Do you consider that you have a structured approach to identifying the underlying causes of accidents and ill-health

Response	Yes (%)	No (%)	Don't know/ unknown (%)
Accident	85	13	2
Ill-Health	53	38	9

Some 85% of interviewees felt their companies had a structured approach to identifying the underlying causes of accidents. In contrast, however, only approximately half considered they had a structured approach to identifying the causes of ill-health.

4.5 THE DEVELOPMENT OF RECOMMENDATIONS THAT ADDRESS BOTH IMMEDIATE AND UNDERLYING CAUSES

4.5.1 Description of requirement

It is not necessarily the case that once causes have been identified, the appropriate recommendations will follow. Companies may still tend to focus on individual and behavioural recommendations and be reluctant to address underlying causes. The former are typically perceived as easier and cheaper to implement, whilst the latter may require a company to change long-standing practices or invest in process or equipment changes. However, addressing underlying causes will ultimately reduce the likelihood of a far wider range of incidents compared to incident-specific interventions.

4.5.2 Case study findings

Interviewees were asked to identify the recommendations and subsequent action that was taken following the investigation into the case study incident. The results are shown in Table 19.

The results indicate the following:

- The most common recommendations and actions taken following an incident were changing equipment or modifying procedures, and/or further training and awareness-raising
- Changes to equipment and procedures were more common in companies employing Approaches 2 and 3
- Raising awareness and further training were more common in companies employing Approach 1.
- Risk assessments were revised in 24% of the cases; this was most common in companies employing Approach 3

In general these results suggest a more system-based approach than was apparent in either the interviews themselves or in the causal analyses described in the case studies. What appears to be happening is that, whilst individual factors are highlighted in the accident report as immediate causes, the recommendations often address underlying causes, implying a recognition of the importance of these factors (see Example 1A, Section 4.10).

Interviewees were also asked to indicate what they considered the most common recommendation made following an incident investigation. The results of this question are shown in Table 20.

Table 20 suggests a slightly different pattern to that shown in Table 19. The most common recommendations centre on person-based initiatives; only 8 interviewees stated that a change in the task or work environment would typically take place and only 11 suggested that risk assessment would be updated or reviewed.

Table 19 Actions taken following incident investigation by Approach

Action taken	Approach			TOTAL (%*)
	1	2	3	
Risk assessment revised	8	12	4	24
Procedures modified	9	15	3	27
Equipment changed	7	24	3	34
Environmental change	3	5	0	8
Work organisation change	4	9	0	13
Process changed	4	7	1	12
Process eliminated	1	2	1	4
Person disciplined	2	4	0	6
Training	12	12	2	26
Person changed roles	2	4	0	7
Awareness raising	10	15	3	28
Other	8	10	1	19

- *These figures do not total 100% because the responses were not mutually exclusive

Table 20 Most common recommendations made by interviewees following an incident investigation

Recommendation	Total (%*)
Be more careful/aware	23
Reinforce safe behaviour	18
Training/refresher training	22
More safety communication	8
Review procedures/instructions	5
Review risk assessment	11
Change in equipment/work organisation	8
More supervision	3
Industry-specific recommendation	2
Range of responses/difficult to answer	8
Not known	9

* These figures do not total 100% because the responses were not mutually exclusive

4.6 THE IMPLEMENTATION OF THESE RECOMMENDATIONS

4.6.1 Description of requirement

Once recommendations have been made it does not follow that they will be subsequently acted upon. Good practice would ensure that responsibility for implementing recommendations is clearly assigned, and that there is a system in place to ensure these actions are followed through. Issues of company culture and senior management commitment will also have an impact here.

4.6.2 Case study data

Data on specific actions taken following the case study investigations was considered in the previous section (in practice, the issues of recommendations and actions were addressed in a single question within the interviews).

In general terms, the study results suggest that company's that employ Approaches 1 and 2.1 tend not to have formal systems to ensure that recommendations are acted upon.

4.7 FOLLOW UP TO ENSURE THAT ACTIONS TAKEN ARE SUCCESSFUL IN REDUCING THE RISK OF FURTHER INCIDENTS

4.7.1 Description of requirement

A company also needs to ensure that its interventions have successfully reduced the risk of a similar or related incident. In order to do this effectively it needs to ensure that the specific recommendation has been effective and that it has a monitoring system in place that allows it to identify any recurrent patterns, either in immediate or underlying causes.

4.7.2 Case study findings

Interviewees were asked whether the actions that had been taken had been effective in preventing recurrence. In practice, nearly all respondents responded 'yes', qualifying the response by saying that 'the same incident has not recurred'. Only a small number of companies had any formal system in place to ensure that there was an active follow-up. The issue of whether companies have systems in place to allow them to monitor recurrent patterns is discussed in Section 4.9.

4.8 FEEDBACK TO RELEVANT PARTIES TO SHARE IMMEDIATE LEARNING

4.8.1 Description of requirement

An investigation may have uncovered risk factors that are relevant to other parts of a site or organisation. Good practice would ensure that details of the incident and any relevant findings are disseminated to appropriate parties. The wider circulation of incident details can also be an important way to raise awareness within a company.

4.8.2 Case study findings

Interviewees were asked 'who was informed about the incident and the results of the investigation?" The responses to this question are shown in Table 21.

Table 21 Feedback of investigation findings by size of company

Size of company	Destination of feedback									Base
	Senior management	Safety Commitee	Head Office	Line Management	Safety Consultant	Workforce	Safety Rep	Insurers	Others	
<10	2	0	1	0	0	1	0	0	0	2
10-49	10	2	3	3	1	5	1	0	3	13
50-199	30	23	7	7	1	5	5	2	11	38
200+	41	23	10	15	1	7	7	5	19	47

This table indicates that:

- In the majority of companies senior management are informed about the results of the investigation; the likelihood that this will happen increases with the size of the company
- In small companies health and safety representatives and safety committees are rarely involved. In medium size companies (50-199) approximately three quarters (74%) are likely to inform the health and safety representatives or committee. The equivalent percentage in large companies is 64%
- About 20% of companies with over 50 employees inform head office (note this table does not identify when companies were part of a wider organisation)
- A relatively small percentage of companies inform relevant line management of the results of the investigation; however it should be borne in mind that the immediate supervisor or line manager is typically actively involved in the investigation process
- Results are only communicated to the workforce in a small percentage of cases

Table 22 compares the results from Table 21 with the roughly equivalent results from the telephone survey.

Table 22 Comparison between telephone survey and interview survey in terms of dissemination of results

Size of company	Results reviewed by senior management		Results reviewed by safety committee**		Results referred to head office	
	Tel. (%)*	Int. (%)	Tel. (%)	Int. (%)	Tel. (%)	Int. (%)
<10	54	100	9	0	25	50
10-49	83	77	34	16	51	23
50-199	91	79	57	61	59	19
200+	88	87	71	49	73	22

* % of total cases reporting involvement in relevant size category

** Respondents were not specifically asked whether the company had a safety committee, therefore these results need to be interpreted accordingly

Table 22 shows that:

- The percentage of companies informing senior management are generally similar; the telephone survey identified a higher percentage of medium sized companies involving senior management (91% compared to 79% in the interview survey)

- The results are also not too dissimilar for safety committees within medium sized companies, but the telephone survey identified a greater involvement in companies of over 200 than was found in the interview survey. However, if the involvement of safety reps is added to the interview survey results, this increases the percentage to 64% making the results more similar
- The telephone survey identified a much stronger pattern of reporting to head office than was identified in the interview survey

4.9 DEVELOPING AN ACCESSIBLE DATABASE

4.9.1 Description of requirement

Companies can often invest significant resources in incident investigation. This investment of time and effort may be driven by a desire to ensure that there is no reoccurrence of a similar incident, by the need to satisfy legal or insurance requirements or as the basis for disciplinary action. Whatever the reason, the information that is collected, the interpretation that is put on this information, and the actions subsequently taken, represent a part of the organisations history or 'memory'. In order to ensure that this 'memory' is accessible in a way that allows the organisation to learn from its experiences, companies need to think about how incident data are documented and stored.

When a company genuinely wants to learn from its experience, it ensures that details of incidents and investigations are maintained in a way that allows easy and meaningful access, i.e. *'it consciously writes the incident into its organisational memory*. In larger companies this may mean developing a sophisticated database that allows the company to build up its incident profile, and to integrate this with data from risk assessment, near-miss reporting and other types of performance monitoring.

4.9.2 Case study findings

Table 23 and Table 24 show the way in which incident data are typically stored within the participating companies.

Table 23 Methods of storing incident investigation data by size of company

Approach	10<	10-49	50-199	200+	TOTAL (%)
Hard copy	2	9	17	14	42
Soft copy	0	1	6	8	15
Both	0	3	15	23	41
N/K	0	0	0	2	2
TOTAL	2	13	38	47	100

Some 42% of companies use a primarily paper-based system; 15% primarily use a computer-based system and 41% use a combination of both. The reliance on a paper-based system is more common in smaller companies, although about 30% of larger companies (over 200) still use a paper-based approach. Table 24 shows the data storage pattern by the Approach category defined in Section 4.3. This shows that those companies are less structured in their approach to incident investigation are much more likely to rely on paper-based approaches.

Table 24 Methods of storing incident investigation data by approach

Approach	Approach 1	Approach 2	Approach 3
Hard copy	29	13	0
Soft copy	3	8	4
Both	6	32	3
N/A	0	2	0
TOTAL	38	55	7

Interviewees were asked if they used incident investigation data to identify trends in either frequency of occurrence or underlying causes. The results are shown in Tables 25 and 26.

Table 25 Is data used to identify frequency of different types of incident (classified by approach)

Approach	Yes	No	N/K
1	23	16	0
2	50	2	2
3	7	0	0
TOTAL (%)	80	18	2

Table 26 Is data used to identify underlying causes of incident (classified by approach)

Approach	Yes	No	N/K
1	19	19	1
2	36	15	3
3	5	2	0
TOTAL (%)	60	36	4

Table 25 shows that; in terms of monitoring the relative frequency of different types incidents, overall about 80% of companies use the data for this purpose. Again, Table 25 also shows that companies that are less structured in their approach (and therefore, by definition smaller companies in which incidents are themselves less frequent) are less likely to carry out this type of analysis. Table 26 shows that overall, companies are less likely to use their incident data to monitor patterns in underlying causes, although 60% of companies suggest they do use the data for this purpose. However, given that the interview survey suggested there is a lack of understanding of the concept of 'underlying causes', the extent to which companies really use their incident data to monitor causal patterns and trends may be less well established than the survey results suggest.

4.10 EXAMPLES OF CASE STUDIES

Example 1A

(Appendix A Reference 1.1)

Commentary

This exemplifies the lack of structure to Approach 1 and hence the amount of influence that the individual has over the investigation process. Here the RIDDOR form provides the structure for the investigation record. The investigator has responsibility for H&S but is also the supervisor of the injured party so conducts the investigation himself without reference to others, typical for a small organisation. The investigation concludes that the injured party was at fault (that she shouldn't have walked up the ramp) but makes systems recommendations (that a new walkway should be added), this pattern is relatively commonplace throughout the case studies and indicates that many people are aware of systems causes but, for some reason, fail to include them explicitly as report conclusions

Sector Agriculture
Size 10-49
Risk category High
RIDDOR category Dangerous Occurrence
Job title of interviewee Operations Manager
Total time spent on investigation 4-5 hours

Narrative

This organisation picks and packs produce ready for distribution. This incident involved a lady who was part of a team of packers. Her task involved packing lettuces onto palettes to be picked up by a forklift. These palettes were then stored in a warehouse awaiting distribution.

On this occasion, she had more boxes of lettuces than she felt was correct. To establish whether the warehouse was one box short she walked up the ramp (generally used by forklifts) to the warehouse. The temperature in the warehouse is maintained at a low level. One of the means of maintaining this temperature is to have flexible plastic slats in the doorways that forklifts can push through. As the Packer walked up the ramp and approached the slats, a forklift pushed through from the opposite direction at approximately 3-4 mph. The Packer was struck a glancing blow by the forklift.

Consequences

The Packer was bruised by the blow and taken to hospital. She had one day away from work. Upon her return, she resumed the same tasks she had been conducting prior to the incident. Normal work processes were only affected for the length of time it took to tend to the injured party.

Inputs

The incident was investigated by the Operations Manager (OM); he spent between 4 and 5 hours on the investigation in total. During the course of the investigation, he spoke to the injured party and her co-workers for a few minutes. He also spoke to the forklift driver for as long as it took to obtain his version of events.

Process

The OM spoke to the forklift driver first and then the co-workers of the packer. He spoke to the injured party when she returned to work. He wanted to establish her motive for walking up the ramp. He also tried walking up the ramp himself, to retrace the injured party's steps. The OM filled in the RIDDOR form using the information he had gathered from his enquiries. The organisation does not have any formal procedures or forms to deal

with accident investigation.

Conclusions and actions taken
The conclusion reached by the investigation was that the Packer should not have tried to walk up the ramp. The driver was not found to be at fault as he had sounded his horn prior to pushing through the slats.

As a consequence of this incident it was recommended that a walkway be built along the side of the ramp leading to the warehouse.

Lessons learnt
The interviewee felt that the organisation had learnt that accidents can happen anywhere and that people had to be guided towards safety - it is not enough to tell people what to do and expect them to follow.

Example 1B
(Appendix A Reference 1.8)

Commentary
This example illustrates the potential influence an individual can have upon the investigation process. The motivation for conducting an interview with the injured party seemed to be a desire to gain a 'confession', rather than to understand what had occurred (with the aim being to protect the organisation, apparently when the injured party was being interviewed he said "I can tell from the questions you're asking that this will mean money"). Moreover, the investigation recommended that employees should sign for their training. this implied that the employees knew what they should be doing. The use of magnets as a method for circumventing guarding was well known but the investigation had made no attempt to address why this practice was commonplace and how it might be stopped. The interviewee related how he was still confiscating magnets.

The investigator in this organisation was a part time H&S manager. For a large organisation such as this one this meant that H&S and incident investigation competed for priority with a range of other tasks.

Sector Manufacturing
Size 200+
Risk category High
RIDDOR category Major injury
Job title of interviewee Fleet Manager
Total time spent on investigation 12 hours

Narrative
This organisation makes pet food. One of the processes that they have is a forming machine that sculpts dough into bone shapes before they can be cooked to create dog biscuits. The forming machine moulds have sharp edges and are required to be cleaned regularly. The prescribed method for undertaking this cleaning is to open the lid of the machine and then hose out the shapes. The system is protected by an interlock device that means when the lid of the machine is open the power is automatically switched off. According to this interviewee, it is common practice amongst the workforce to use magnets to override the mechanism. The operator involved in this incident had used a magnet to override the interlock and was picking out some detritus from the from the bone mould when the ram came down and pressed his finger against the forming machine severing it.

Consequences
The operator was taken to hospital where he underwent an operation. However, the surgeons were unable to save his finger. The injured party was away from work for several months following the incident. He was subsequently able to return and resume all of the tasks he had previously carried out; he later left the organisation of his own accord.

Work processes were affected by the incident. The forming machine was shut down pending an assessment and did not resume work until the following day.

Inputs
The incident was investigated by the Fleet Manager whose responsibilities include H&S. He estimated that he had spent a day and a half on the investigation. During the course of the investigation, he interviewed the injured party for 2 ½ hours, five co-workers for 15 minutes each and one co-worker who was responsible for training for an hour.

Process
The incident investigation process was to examine the process on the day of the incident, to visit the injured party the day after the incident and to interview the injured party's co-workers. The interviewee suggested that the main reason for getting a statement from the injured party so quickly was to try and get an admission of culpability from the injured party of not following procedures. There was no formal procedure for accident investigation but the Fleet Manager had a background in the Police Force.

Once the investigation was complete, the Fleet Manager informed senior management and the department manager of the scene where the incident occurred.

Conclusions and actions taken
The Fleet Manager concluded that individuals should be trained in the tasks they carry out and more importantly, they should sign for the training they undertake. This signing will show that the individuals know how they should do their tasks.

The investigation recommended that all staff should be reminded how the task should be conducted and that frequent checks should be made for the use of magnets and that these should be confiscated when found.

Lessons learnt
The interviewee said that the company had learnt lessons about the need to get employees to sign for their training. He suggested that if the investigation were repeated he would have sacked the supervisor for promoting the use of magnets.

Example 2A
(Appendix A Reference 2.12)

Commentary
The previous example (1B) illustrated how an individual can have influence the direction an investigation take in Approach 1. Approach 2, characterised by a more structured approach, should be less prone to the attitude of the investigator. However, this does not mean that an investigator cannot positively or negatively influence the outcome of an investigation. In this example, the investigator went beyond what was required of the investigation by the form structure and identified potential systems causes for the failure of a crane rope.

Sector Construction
Size 200+

Risk category High
RIDDOR category Over-three-day injury
Job title of interviewee Senior Safety Advisor
Total time spent on investigation 80 hours

Narrative
The person involved in this accident was a subcontractor working at a site being managed by this organisation. At the time of the incident, he was conducting work on the outside of a parapet wall. He was working in a basket suspended by a crane on the outside of a road bridge. The work had been completed and the crane was returning him to the ground on the roadside of the bridge. The basket was a foot from the ground when the crane rope came away. The basket fell to the ground, swiftly followed by the crane block attached to the rope. The block structure struck the Subcontractor on the shoulder. An ambulance was called and the individual was taken to hospital.

Consequences
The injuries sustained by the sub-contractor meant that he was away from work for around a week, his injuries were fortunately nothing worse than bruising. Once he returned to work he was able to resume his full role. In terms of work processes, the incident led to the three cranes used by the company to be removed from service while their hoist ropes were replaced. The job being undertaken was left one week behind schedule.

Inputs
The incident was investigated by a combination of a site team (The Project Manager and the Senior Foreman) and the Safety Advisor for that section of the country (this organisation has six safety advisors that cover the whole country). The site team spent approximately 4-5 person days on the investigation the Safety Advisor spent approximately 5 days on the investigation. In addition to the investigation team, several other groups had an input into the investigation. The injured party and the crane driver were both interviewed for between ½ to 1 hour. In addition, the rope supplier and the crane company spent almost a day each upon their contributions.

Process
Following the incident the site-team took the steps necessary to make the site safe and insure that the injured party was taken to hospital. They contacted the Safety Advisor who travelled to the site to examine it. The safety advisor completed the organisation's accident investigation form. He based his findings upon the interviews he had conducted, the certification of the cranes and a visit to the rope-making factory.

Conclusions and actions taken
The investigation reached the conclusions that the crane certification was fine and that the rope had come away from the 'ferrule' that was holding it in place. The interviewee speculated that there were two potential causes of the rope coming away from its ferrule. Firstly, it was possible that the crane had been subjected to a gross point load, although he could find no evidence of this. The second hypothesis was that when the ferrule was fitted the process had in some way failed, it was impossible to tell which of these hypotheses was correct. As a result of the investigation the rope termination points were changed from ferrules to socket and pear connections. The interviewee said that this enables a person to see the rope slipping before it comes away.

Lessons learnt
The interviewee felt that the organisation had learnt about the importance of having good accident investigation procedures and also about safe areas to use harnesses. He wouldn't have done anything differently if the investigation were to be repeated.

Example 2B
Appendix A reference (2.22)

Commentary
Whilst a structured investigation process is generally a good thing, the underlying rationale needs to be appropriate. The structure in this example seems designed to apportion blame rather than identify systems causes to be tackled. A structured approach that fails to prompt the investigator to seek underlying causes may be worse than no structure at all.

The motivation for this structure may be to reduce the company's liability. In this case discipline was administered and a signed 'confession' of error obtained from the injured party. However, in addition to these person-oriented consequences an implicit recognition of potential system fallibility was indicated by the hardware changes administered to machine guarding.

Sector Manufacturing
Size 200+
Risk category High
RIDDOR category Over-three-day injury
Job title of interviewee General Department Manager
Total time spent on investigation 9 ½ hours

Narrative
This company produces shoes. The operation that was involved in this accident was the moulding of a plastic shape into the support at the back of a shoe. The plastic is picked up by a sucker and placed in a mould. The mould cools the plastic and ejects it away from the guarded machinery.

Prior to this incident, the sucker had dropped a piece of plastic. To deal with this problem the machine operator (who was working alone) reached under the guarding to remove the plastic. The guarding covered most of the machinery but an 18-inch gap at the bottom made reaching inside possible. The guarding was part of an interlock system, once the guarding is removed the machinery stops. If the guarding is circumvented then the machinery continues working. As the operator reached under the guarding, she caught her fingers in the conveyor. From this position, she was able to reach the emergency stop and turned the machine off. However, rather than call for assistance at this point she chose to restart the machinery believing that it would free her finger. Unfortunately, it severed the top of her second finger and badly cut her third finger. At this stage, her cries were noticed and she was taken to hospital for treatment.

Consequences
The first-aider, helped the injured party and took her to hospital (1&1/2 hours). The machine operator spent 2-3 weeks away from work because of this incident. It was not possible to repair the severed finger. She was, however, able to return to work at the end of this period of convalescence and resume her old position. Production was not greatly affected by the injury because production could be moved to a reserve machine whilst the incident was investigated.

Inputs
The investigation team was as follows:

- Departmental Manager, (1/2 hour)
- General Manager (4 hours)
- Chief Engineer (5 hours)

The General Manager was responsible for H&S and consequently accident investigation. The Chief Engineer investigated the guarding and looked at potential improvements. The injured party was interviewed by the General Manager for around 1/2 hour. In addition, all her co-workers were spoken to briefly; none of them had witnessed the accident. The Departmental Supervisor was spoken to for around 1/2 hour, as he was responsible for the work carried out in this department.

Process
Immediately following the incident the first aider helped the injured party whilst the Departmental Manager filled in the companies accident form. The individuals listed above were spoken to by the General Manager who investigated their statements before reaching conclusions and filling in the RIDDOR form. Subsequently, the Chief Engineer investigated the guarding around his machinery

All of the company's middle managers received a copy of the accident form and the matter was discussed at the next H&S meeting (these occur every six weeks). At the meeting recommendations were made and responsibility for the actions apportioned. These recommendations and alterations were then subject to a quarterly audit.

Conclusions and actions taken

- The actions taken were as follows:
- A new skirt was added to the bottom of the existing guarding to completely prevent access whilst the machine is in operation
- The employee signed a statement admitting negligence
- The example was integrated into the companies induction program for new employees to raise awareness of the importance of guarding

Lessons learnt
The interviewees suggested that they would not do anything differently if they were to repeat this investigation. They stated that they had learnt that it was important to communicate to employees the importance of guarding.

Example 2C
(Appendix A Reference 2.17)

Commentary
Often where a prescribed investigation structure exists it is hard to distinguish it from an accident report. This example is typical of the majority of structures in Approach 2. The investigation form is a mixture of extensive incident description and a brief section for the assessment of the cause of the incident and/or any actions necessary. This lack of distinction between report and investigation is reflected in the attitude of many of those questioned during this survey. There often seemed to be confusion between reporting and investigation and where the distinction was clear there was a feeling that recording the immediate cause was enough. This appeared to be particularly the case in small organisations that had very few accidents.

Sector Manufacturing
Size 50-199
Risk category High
RIDDOR category Major injury
Job title of interviewee Operations Manager
Total time spent on investigation 9 hours

Narrative
This organisation creates and packs various chemical products. On this occasion, a Filling Operator was filling 750ml bottles with industrial cleaning products. These particular bottles had spray head fitted to them, the operator picked up one of these bottles by the head. As he did so the head came away in his hand and the bottle fell to the floor. Some product splashed out of the container onto the Filling Operator's forehead. He was wearing protective glasses that protected him from the majority of the liquid; the product that had landed on his forehead ran down his face and into his right eye. The Filling Operator was assisted by a first aid specialist in having his eye washed out and was subsequently taken to hospital.

Consequences
The injury meant that the individual concerned required one day off work. He returned to work and resumed the same tasks he was carrying out before the incident. Production was not affected in any way by this incident.

Inputs
The incident was investigated by:

- The Filling Operator's Supervisor (1 hour)
- The Production Manager (5 hours)
- Maintenance Department Safety Manager (2 hours)

The Maintenance Department Safety Manager was asked to provide a parallel report. The Production Manager had overall responsibility for the investigation. In addition to the investigation team the injured party was interviewed for between 1/2 – 1 hour.

Process
The Production manager and the Supervisor interviewed the injured party, asking for a blow-by-blow account of the events leading up to the accident. They used this interview to draw their conclusions and to fill in the company accident form. The form requires the investigator to:

- Provide details of the accident
- Provide details of the injury
- Provide details of any treatment required
- Gather statements from any witnesses present
- Make recommendations to reduce further risk
- List any actions taken

Once the investigation is complete the results are circulated to senior management (who will re-open the report if they are unhappy with it), the safety reps (who will discuss the findings at a monthly safety meetings) and line managers (who will inform the workforce).

Conclusions and actions taken
The investigation concluded that lifting bottles by the head is unsafe and that goggles instead of glasses should be considered as appropriate PPE. The only action to come out of this investigation was the recommendation regarding PPE. At the time of the interview this action had not been enforced.

Lessons learnt
The interviewee felt that the company had learnt from this accident that glasses aren't always adequate protection and that the handling of a container has to be done in a specific manner. He did not feel that the investigation was lacking in any area.

Example 3A
(Appendix A reference 3.2)

Commentary
This is an example of a particularly sophisticated approach to accident investigation. The incident involved a wrench snapping when under pressure. Most of the organisations surveyed in this report would have probably stopped at identifying the cause of the incident as the wrench snapping and possibly recommending that a new wrench should be purchased. Here, an investigation team was convened (including the injured party), a time line of events completed and a causal tree analysis conducted. This approach meant that many possible reasons for the incident were considered, including the method of use, before the final conclusion was reached. The investigation highlighted not only failings in the equipment, but also in the quality control systems of the supplier and in purchasing policy for that type of equipment.

Sector Manufacturing
Size 50-199
Risk category High
RIDDOR category Over-three-day injury
Job title of interviewee H&S Manager
Total time spent on investigation 11 hours

Narrative
The process being conducted was to test a novel lubricant. This is done by taking an engine, taking it apart, and measuring and photographing all moving parts. The engine is then rebuilt and run using the lubricant. The engine is taken apart once more and the moving parts photographed and measured for comparison.

The incident occurred when an engineering technician was attaching a bolt to a flywheel. The procedure for this process had been developed to an industry standard. The technician used a wrench to apply the required forces to the bolt. An extension socket was used to enable the bolt to be turned an additional 90 degrees (as required by the procedure).

This task requires a great deal of force to be applied to the wrench. As the technician applied the required force, the bar snapped, propelling the technician two or three feet through the air.

Whilst the technician received superficial injuries from the landing, the main injury sustained was a wrenched back caused by the sudden release of pressure when the bar snapped.

Consequences
Production itself was largely unaffected by the incident (the only time lost was whilst the technician was tended to). The technician carried on at work for two days before he had recurrence of pain in his back and took four days off. The pain returned when he came back to work. Consequently, he was signed off for two further days.

Inputs
The incident was investigated by a team comprising:

- The H&S Manager (3 hours)
- The injured party (2 hours)
- The supervisor (2 hours)

- The Engineering Safety Committee Chairman (2 hours)
- The Assistant Director (2 hours)

The individuals were involved for the following reasons; H &S Manager, in a co-ordinating role; the injured party, because of his knowledge of the processes involved and the incident in question; his immediate supervisor, again because of understanding of the work process; the Engineering Safety Committee Chairman, as a piece of equipment had been involved and the Assistant Director of an unrelated department, to act as an impartial observer. The make-up of this team and the investigation process are suggested by an international company standard.

At this organisation, there were no interviews, as all of the people that witnessed the incident were involved in the investigation process.

Process
At the first convenient time following the incident, the members of the investigation team convened to conduct the investigation. Initially, they establish a timeline of events from the start of the injured individual's shift to the return of the technician to work. Once this has been agreed, they developed a cause and effect tree where all potential contributory factors were discussed and their likelihood of occurrence assessed.

Following this process (which is recorded by the H&S Manager), recommendations are made for actions to reduce or eliminate the likelihood of this event happening again. These actions are assigned to individuals and dates for their completion set.

Once the H&S Manager has completed his report it is disseminated to Divisional Vice Presidents, The Vice President of the H&S committee, H&S Managers at relevant sites, the Engineering Safety Committee and to the management of other sites that may have an interest in the findings.

Conclusions and actions taken
The conclusions of this investigation were firstly, that the tool was not suited to the pressures that were applied to it during the course of this process. Secondly, that the Quality Control systems of the equipment supplier were not of a sufficient standard.

Any investigation automatically triggers a review of relevant Risk Assessments. In addition, all branded bars, such as those used in this incident, were identified and replaced with those of another supplier. All tools that are used for high torque applications were reviewed for suitability.

There had been no recurrence of this incident in the months following this investigation.

Lessons learnt
If the investigation had been repeated the H&S Manager would have waited longer for information from the tool supplier. The conclusions about their Quality Control system were described as 'informed guesswork'.

5 EVALUATION OF DIFFERENT APPROACHES AGAINST REQUIREMENTS OF A GOOD INVESTIGATION

In Section 4.4 the procedures that are used within companies to structure and support incident investigation were classified into four main approaches. These approaches are summarised below:

Approach 1: No formal support or procedure for incident investigation
Approach 2.1 Support focuses on representation of events and causal analysis typically limited to immediate cause and associated recommendations
Approach 2.2 Support encourages richer causal analysis with immediate and underlying causes usually distinguished; can include formal assignment of responsibility and accountability for implementing and reviewing corrective actions
Approach 3 Combines the structure of Approach 2 with the application of specific causal analysis tools that support the identification of underlying causes

Approach 2 is the most commonly used (55% of all companies use either Approach 2.1 or 2.2); within this category most companies use only the minimum level of support (44% of all companies fall within Approach 2.1); some 38% of companies still use Approach 1; only 7% of companies use Approach 3. In general terms companies that employ Approach 2.2 and Approach 3 are more likely to incorporate a system-based, rather than traditional model of incident investigation.

Best practice identified in the interview survey is represented primarily by Approaches 2.2 and 3. Where incidents are potentially complex, the tools and techniques described in Table 12; and which are associated with Approach 3 may be valuable.

This section now briefly examines the extent to which these different approaches are likely to meet the specific requirements of a good investigation as defined in Section 4 of the report.

5.1 THE BALANCE BETWEEN INDIVIDUAL INFLUENCE AND TYPE OF APPROACH

Before evaluating the impact of different approaches on the quality of the investigation process, it is important to understand the potential contribution of the individual leading the investigation.

The case studies show that, whatever the support or structure available within an organisation, the individual driving the investigation has an influence over both the way an investigation is conducted and its outcome. So, for example, it is entirely possible for an individual working within a company that has little or no structure to support its incident investigation, to carry out an investigation that is overwhelmingly system-based and in which there is systematic follow up of recommendations and their impact. Conversely, it is also feasible for an individual working within a company that has a very structured and clearly system-based approach to undermine the integrity of this approach by sloppy application of the methodology. The values and attitudes held by the lead investigator can therefore help or hinder an investigation. However, in practice, the strength of this influence will usually be moderated by the robustness of the processes and procedures that support the investigation process. This relationship is shown in Figure 4 on the following page.

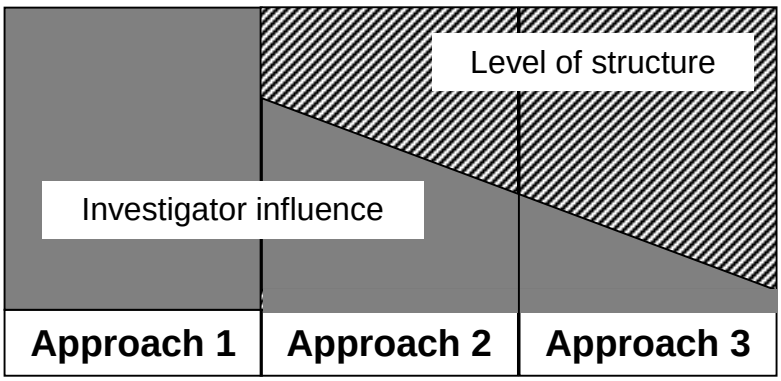


Figure 4 Influence of investigator upon outcome of an accident investigation

In Approach 1 the influence of the investigator is all encompassing. He or she will determine the focus of the investigation and shape the collection and interpretation of any information. In Approach 2, the influence of the investigator is moderated by a certain level of structure which may ensure that particular aspects of the investigation process have to be carried out. In Approach 3, which is typically highly structured, the influence of the investigator is likely to minimised.

Having a robust, structured process to support incident investigation therefore introduces consistency to the process, helps ensure that the right questions are asked and that immediate and underlying causes are identified. Moreover, once the investigation is complete, a good structure can improve the likelihood of recommendations being acted upon, their effectiveness being monitored and the lessons learnt being captured by the organisation for future reference. Whilst it is possible for an individual to achieve all of this without such support, one would expect it to be less likely, and to occur with less consistency, particularly in relation to achieving systematic follow-up.

It is also worth noting that having a poor structure may be worse than having no structure at all. For example, if the investigation process is perceived as being satisfied once a description of the incident is completed, then this may constrain the investigation or deter the investigator from considering a wider range of contributory factors.

5.2 THE LIKELIHOOD OF DIFFERENT APPROACHES MEETING THE REQUIREMENTS OF A 'GOOD INVESTIGATION'

Table 27 now summarises the likelihood of each of the four Approaches identified above meeting the requirements of a 'good' incident investigation as defined in Section 4. The assessment has been made based on the evidence provided by the case studies and on the subjective judgement of the human factors specialists who carried out the interview survey. It should also be noted that the table provides only a relative comparison of approaches rather then an absolute indication of quality. For example, the interview survey suggests that companies as a whole, regardless of the approach they employ, are not particularly effective at following up recommendations and monitoring their impact.

5.2.1 Application of a causal model that represents a system-based approach to incident investigation

The fact that the individual driving the investigation may personally approach the process using a traditional or system-based model, independently of the formal system used within the company has already been highlighted. In Table 27, the impact of the lead investigator holding either a traditional model or a system-based model is considered within each Approach. In

keeping with the points made in Section 5.1 above, the greater the level of structure the less the impact of the individual. For example, Table 27 shows that in Approach 2.1, an individual employing a traditional model is unlikely to identify underlying causes but in a company that employs Approach 2.2 or 2.3, the likelihood of this depth of analysis will be greatly increased.

5.2.2 Likelihood of involving relevant individuals in the investigation

- The combination of an individual with health and safety responsibility and a relevant line manager constituted the typical investigation team. This finding held across all the Approaches, supplemented by a technical expert when the incident required it
- The more sophisticated Approaches (2.2 and higher) were more likely to involve employee representation in their investigation team, but were far from certain to do so

5.2.3 Likelihood of identifying immediate causes

- All approaches were equally likely to identify the immediate causes of an incident

5.2.4 Likelihood of formally identifying underlying causes

- This is far less likely without the support provided by Approaches 2.2 and 3. The involvement of a lead investigator using a systems-based model increases the likelihood of underlying causes being identified
- Some companies, operating at Approach 2.1 and below, mentioned underlying causes informally but had not captured them in the formal investigation. This may have been because the investigation process did not require it, because the issues were perceived as too difficult to address, or because exposing certain issues could make the company vulnerable to a legal claim. One interviewee commented that in the current 'claims' culture he was considering producing two incident reports; one official, to protect the company against claims and one unofficial, to enable the organisation to tackle systems failings

5.2.5 Likelihood of developing recommendations that address both immediate and underlying causes

- This is clearly more likely in companies that employ Approach 2.2 or 3 that routinely incorporate consideration of both immediate and underlying causes
- Some companies, however, blamed individual factors for incidents then made systems-based recommendations to improve the situation (See Examples 1A and 2B in Section 4.10)

5.2.6 Likelihood of implementing recommendations

- An investigation structure (Approach 2.2 or 3) that requires the documentation of recommendations, and details responsibility for carrying them out, makes implementation more likely

5.2.7 Likelihood of follow-up that ensures that actions taken reduce the risk of further incidents

- Checking the effectiveness of an intervention is more likely in companies that adopt Approach 2.2 or 3
- However, some individuals (from companies with structured processes) did comment that this element, and the previous one, implementation, were far more difficult to achieve than simply making a recommendation

5.2.8 Likelihood of feedback to relevant parties to share immediate learning

- A formal system of feedback is more likely in companies employing Approach 2.2 or 3
- A structured approach to feedback is more important for larger organisations; in smaller organisations dissemination of feedback tends to be rapid and informal

5.2.9 Likelihood of developing an accessible database

- This is inconsistent in Approach 1, where any record depends on the discretion of an individual. Approaches 2.1, onwards should be able to at least guarantee some record of the incident, the formality and completeness of the documentation is likely to increase with the sophistication of the investigation system

Table 27 The relative likelihood of incorporating the main requirements of a good investigation by Approach

	Approach 1		Approach 2.1		Approach 2.2		Approach 3	
Requirement	Traditional*	System*	Traditional*	System*	Traditional*	System*	Traditional*	System*
Likelihood of successfully selecting investigation team								
Likelihood of identifying immediate causes								
Likelihood of formally identifying underlying causes								
Likelihood of making recommendations that tackle underlying causes								
Likelihood of implementing recommendations								
Likelihood of successful follow-up								
Likelihood of successful feedback								
Documentation of findings for future reference								

* traditional or system-based refers to the causal model used by the investigator

Key

Low probability	Medium probability	High Probability

5.3 TECHNICAL ADVANTAGES AND DISADVANTAGES OF DIFFERENT APPROACHES

Table 28, on the following page, provides an overview of the possible technical advantages and disadvantages of each of the four Approaches discussed above. It also identifies the potential barriers to companies to increasing the level of sophistication within their current approach.

Approach	Technical Advantages	Technical Disadvantages	Barriers to change
1	• May be better than a structured process that directs the investigator away from underlying causes	• Underlying causes may fail to be identified • Totally dependent upon abilities of person leading investigation • Leads to inconsistency in depth & nature of investigation • Particularly sensitive to time and other organisational pressures • Not auditable in terms of decisions made and actions taken • May leave no clear organisational memory • Technical skill of incident investigation is not retained by the organisation when the individual leaves • If the investigation is not underpinned by an appropriate causal model may not drive the investigation to the right level • Minimum standards can easily be bypassed	• Expense of implementation (person and other resource implications) • Investigators feel the incidents they investigate do not need extra causal analysis, 'we identify the cause with our current systems' • Time pressure • No perceived benefit in further analysis for the organisation • Identifying underlying causes may make the organisation more vulnerable to legal claims

Table 28 Overview of the technical advantages and disadvantages to the four approaches (continues on following page)

2.1	• Less sensitive to organisational pressures • Captures basic descriptive and immediate causal data to ensure formal record	• Focuses on the description of the incident rather than establishing why it happened • Underlying causes may fail to be identified • Leads to inconsistency in depth & nature of investigation • Not auditable in terms of decisions made and actions taken • Not auditable in terms of decisions made and actions taken • If the investigation is not underpinned by an appropriate causal model may not drive the investigation to the right level • Minimum standards can easily be bypassed • An overly prescriptive structure may unduly restrict the investigation	• Identifying underlying causes may make the organisation more vulnerable to legal claims • Investigators feel the incidents they investigate do not need extra causal analysis, we 'identify the cause with our current systems'
2.2	As 2.1 plus: • May be good causal analysis • More systematic in terms of implementation, recommendations and follow-up	As 2.1 plus: • May still be insufficient depth of causal analysis • An overly prescriptive structure may unduly restrict the investigation	• Happy with current situation, cannot see any added value in changing to another system
3	As 2.1 plus: • Ensures that underlying causes are addressed • The consistent application of analysis tools reinforces a system-based culture	• May require more resource than the incident warrants • An overly prescriptive structure may unduly restrict the investigation	• Happy with current situation, cannot see any added value in changing to another system

6 OTHER ISSUES

There were a number of other more general issues covered in the interview schedule that were not considered in the previous section. These are discussed below. They include:

- Training issues
- Near-miss reporting
- Changes required if incident investigation were to be made mandatory
- Type of support required from the HSE

6.1 TRAINING ISSUES

Respondents in the interview survey were individuals who had been identified as having the primary responsibility for accident investigation within their company. Generally speaking, they were also identified within the company as the principal health and safety specialist, typically being labelled as the health and safety manager or health and safety advisor. In this capacity they have primary responsibility for ensuring relevant investigations are carried out, that appropriate investigation methods are used and that the correct conclusions are reached and subsequently acted upon by the relevant parties. Within the sample of 100 interviews a wide range of individuals were interviewed. Some 58% had designated health and safety responsibility, with some of these individuals holding a number of other responsibilities. In some cases, primarily small companies, health and safety was clearly a peripheral responsibility.

Table 29 Number of individuals who reported receiving some training in incident investigation by size of company

Approach	10<	10_49	50_199	200	TOTAL
Y	0	4	25	34	63
N	2	9	12	12	35
Don't know	0	0	1	1	2
TOTAL	2	13	38	47	100

Table 30 Type of incident investigation training reported received by interviewees

	Formal safety training by accredited organisation	Other External training	Internal training	Other
No of responses	44	12	12	4

*responses are not mutually exclusive

Table 29 and Table 30 show the number of companies where a member of the case study investigation team was reported as having received some training in incident investigation and the type of training reported.

In the majority of cases these data also refer to the nominated safety specialist who was interviewed. Table 29 is classified by size of company and Table 30 by the type of training received. Overall some two thirds of teams appear to have some training in incident

investigation, with the percentage of individuals trained increasing with size of company. Table 30 shows, however, that the bulk of this training relates to generalised health and safety training such as NEBOSH or IOSH courses. Although valuable, because of both time constraints and the extent of topics to be covered in such courses, exposure to different investigation approaches and insight into different causal models is likely to be minimal. Those who have received a Diploma or other higher-level qualification in safety management (9 individuals) are likely to have received more in-depth training.

None of the interviewees reported that they had received dedicated training in incident investigation or root cause analysis. This finding is not surprising since, in reality, the availability of such courses is scarce. There is also a tendency to see incident investigation as common sense with individuals perceiving themselves as competent in this area without recognising the limitations of the approach they have adopted. This is reflected in the finding that only a few of the interviewees felt that they needed a more structured approach and the majority felt that the mandatory requirement to investigate accidents and ill-health would require little or no change in their part.

Taken overall the results of the study indicate a range of issues related to training and competency that need to be addressed. These include the following:

- In practice many of the individuals who have responsibility for leading or supporting incident investigations are not dedicated safety professionals. Their exposure to any training in incident investigation is minimal and the time available for such training is restricted
- In small companies incidents and even near-misses are rare events and maintaining appropriate awareness and skills in incident investigation becomes a real issue
- There is no real way in which competence in incident investigation is routinely externally or internally evaluated; individuals or companies are likely to get little or no feedback on the quality or effectiveness of their investigations
- In practice, even if demand were high, there is currently a lack of easily accessible and affordable training courses on incident investigation
- There is tendency for incident reporting and incident investigation to be conflated. Companies that perceive themselves as having effective systems and skills in reporting often overestimate the quality of their investigations

6.2 NEAR-MISSES

6.2.1 Value of near miss reporting and barriers to reporting

Investigations into major accidents often highlight the fact that similar scenarios have occurred in the past, but, for a variety of reasons, not resulted in serious consequences. This point is being increasingly recognised in high-risk industries where the value of near-miss reporting systems is now widely accepted.

Various definitions of what constitutes a near-miss have been proposed. However all agree on the core principle, namely that they are incidents that, under different circumstances, could have had far more serious consequences. The basic premise underpinning the establishment of a near-miss reporting system is therefore that near-misses provide valuable learning opportunities without the repercussions associated with major incidents. There are also a number of clear practical advantages: it is usually easier to get at the truth of what has happened with near-misses because there are no injuries or other negative outcomes and there is also potentially a much larger sample of incidents to identify recurring underlying causes.

However, despite the undoubted benefits of establishing such systems, many organisations have found it difficult to promote a climate that encourages the reporting of near-misses. The practical problems that occur include:

- The fact that the benefits of such reporting are less obvious; there may be less motivation to collect data and the system may fall into disuse
- It is often difficult to specify the exact threshold for near-miss reporting, so there may be confusion over whether an accident needs to be reported

There may also be some deep-rooted organisational issues to overcome. These include:

- An inappropriate accident model – Organisations that hold a traditional model of accidents will tend to assign blame and responsibility to the individual or individuals concerned thereby reducing the motivation to report near-misses
- Lack of motivation to report incidents – Organisations can develop a working climate which encourages employees to hide near-misses. For example, through the use of incentives at an individual, team or site level to be accident 'free'
- Quality of management-employee relations – Organisations that encourage a high level of consultation and participation are more likely to foster a climate in which near-misses will be reported
- Organisational design – Organisational structure, and in particular, aspects of role and status can inhibit the flow of information. For example, in a traditional hierarchical structure, employees tend to see their responsibilities, and the need to share knowledge, as limited to the boundaries of their position

6.2.2 Results from the interview survey

Interviewees were asked if their company investigated near-misses, and what would trigger such an investigation. The results are shown in Table 31 and Table 32.

Table 31 Do companies investigate near-misses? (by size of company)

Approach	10<	10-49	50-199	200	TOTAL
Y	1	12	32	44	89
N	1	1	6	3	11
TOTAL	2	13	38	47	100

Table 32 Range of responses obtained in response to question on potential trigger for a near miss investigation

Range of response	Number of responses
If we get to know about the incident	20
Potential consequence/severity	18
If incident has been observed (by manager/supervisor/other)	14
No formal system	2
Any report is investigated (same system as other incidents)	14
Separate reporting system	6
Encourage people to report anything significant	8
Hard getting people to report	2
Equipment malfunction	1
Never had or only few near-misses	4
Trend analysis	1
Thinking about introducing	1
Unknown or not-applicable	9
Total	100

The data in these two tables show that nearly all interviewees (89%) recognised the potential value of following up near-misses and the majority of companies attempt to investigate them, if incidents are brought to their attention.

The results in Table 32 show that companies are generally aware of the difficulties in obtaining high levels of reporting. Most of the above responses also suggest companies have a pragmatic outlook. They will investigate incidents that come to their attention, primarily driven by potential severity, but do little proactively to encourage effective reporting and in particular, little to address the practical and cultural issues discussed in Section 6.2.1. Generally speaking there is an assumption that, because there is an incident reporting system in place, within which employees are encouraged to report anything felt to be significant, this means that they address near-misses.

In summary, most interviewees conveyed a feeling that whilst near-miss reporting is a laudable objective, in practice it is almost impossible to achieve. They tended to acknowledge the culture change that is required to make such systems work, but offered few practical suggestions as to how such change might be achieved

6.3 CHANGES COMPANIES WOULD NEED TO MAKE IF INCIDENT INVESTIGATION WERE TO BE MADE MANDATORY

In practice, in the majority of cases, interviewees already assumed they had a legal requirement to investigate accidents and ill-health. However, since they were not explicitly asked under what legislation they felt they had this obligation, it is not possible to comment on this finding further.

Table 33 Changes companies feel they would need to make if incident investigation were made mandatory

Change / Approach	No difference	Training	Equipment	Time	Additional person	Database	Other	Base
1	7	12	0	15	1	2	9	38
2	28	10	1	7	3	1	8	55
3	5	0	0	0	0	0	2	7
Total (%)	40	32	1	22	4	3	19	

Table 33 shows the changes that interviewees felt would need to be made within their company if incident investigation were to be made mandatory.

The table shows that overall approximately 40% of interviewees feel that the legislation would make no difference to their companies; the implication being that they feel their current approach to incident investigation would satisfy the needs of the legislation. However, this percentage drops to approximately 18% for those companies that currently have little or no structure or support for their incident investigation (Approach 1). This group see the major implications as being the need for additional time and more training. Companies that employ more structure (classified as Approach 2) also identify the need for training and then more time as the main implications of any change in requirement. Companies that have been classified as most sophisticated in their approach, (Approach 3) generally feel they are currently adequately resourced for any new demands.

Although interviewees were asked to estimate the cost of changes that would be required, too few responses were obtained to make the reporting of the data meaningful. In general, people felt unable to cost any changes without clarification of what the legislation may require.

6.4 SUPPORT REQUIRED FROM THE HSE

In the interview survey respondents were asked 'In what way could the HSE support your company in improving incident investigation?' The specific responses related to incident investigation are shown in Table 34. Over and above these responses, there was also a wider range of comments about the way in which respondents perceive the current support provided by the HSE and their attitude to the proposed regulations. These comments are also considered below.

Table 34 Support required from the HSE

Type of support	Number of responses (%)
More advice and guidance on incident investigation	50%
Better sharing of information already held by HSE	9%
Provision of training or videos on incident investigation	12%
Improved process for reporting incidents	3%

These results indicate that companies feel the need for better support and guidance from the HSE as to how incidents can be most effectively investigated and documented. This finding was consistent across companies that adopted Approaches 1,2 and 3.

Although most respondents talked in general terms about the need for 'better guidance', probably reflecting their experience of other typical HSE output, a number of specific themes emerged, in particular:

- The need for a more structured and standardised approach so that companies can make the best use of their time and resources, and compare their findings and performance with those of other relevant companies

- The need for industry specific guidance so that the incident investigation covers issues that are already known by the HSE to be important within that industry context

- The provision of clear examples and case studies to illustrate appropriate standards of investigation and different approaches which may be applicable in different situations

- The standardisation of forms and documentation to comply with the HSE requirements and compatibility with RIDDOR

- The need for simplicity and clarity to avoid too much bureaucracy and burden on small companies

- Finally, the tone and responses of many interviewees suggested that, given the proposed legislation, companies feel a need to ensure their methods and approaches to incident investigation will satisfy the requirements of the HSE. They would therefore welcome any support or advice that would allow them to verify this

About 10% of interviewees also suggested they would like to see better access to information already held by the HSE. Specific points made include:

- The need for the HSE to share its own experience of incident investigation in general
- The need for the HSE to provide insights into incident investigation at other sites and within other companies
- The need for the HSE to share information on similar incidents that may have been reported by other companies both to improve the quality of subsequent investigations and also to identify any obvious patterns or trends

A similar proportion of interviewees (around 12%) suggested that the HSE provide dedicated courses (and/or videos) on incident investigation. There seem to a number issues emerging here:

- The need for training or other support such as software or videos that is developed and endorsed by the HSE
- The cost of and lack of confidence in commercially available products
- The need to provide practical support over and above guidance and documentation

Lastly, there were a small number of specific comments made about the need to streamline or improve the current system for reporting incidents within RIDDOR.

The additional comments made about the general support provided by the HSE are summarised below:

- There were a number of interviewees (about 10%), who felt that companies are still reluctant to contact the HSE for advice and help, either because they still see the organisation in the role of legislator and enforcer or because the organisation is not sufficiently responsive
- Several interviewees complained about lengthy delays in the response from the HSE following the reporting of a specific incident. This has the effect of undermining company confidence in the HSE, and in some cases, delaying the circulation of information about an incident within the relevant company
- Several also commented that there is inconsistency in the way in which investigations are carried out by different inspectors and in the range and type of advice provided
- A small number of interviewees were also explicitly opposed to the principle of more legislation and greater prescription on health and safety issues.

7 OVERVIEW OF THE STUDY FINDINGS AND IMPLICATIONS FOR THE HSE

The main findings of the interview survey, and key differences between these and the comparable results of the telephone survey, are first briefly summarised. The major barriers to improving the current quality of incident investigation are then discussed. Lastly, the implications of these findings for the HSE are then considered.

7.1 SUMMARY OF MAIN FINDINGS

The following does not aim to provide an exhaustive summary of results but is intended to highlight those findings that are considered most significant for the HSE policy and practice. In general terms, the summary covers the extent to which companies currently meet the main requirements of a successful incident investigation as identified in Section 4 of the report. For reference these requirements are listed below:

- A causal model that represents a system-based approach to incident investigation
- The involvement of relevant individuals within the investigation
- Procedures or protocols to structure and support the investigation
- The identification of both immediate and underlying causes
- The development of recommendations that address both immediate and underlying causes
- The implementation of these recommendations and the updating of relevant risk assessments
- Follow up to ensure that actions taken are successful in reducing the risk of further incidents
- Feedback to relevant parties to share immediate learning
- The development of an accessible database

It should be noted that whenever comparisons are drawn between the results of the two surveys, there are two potential sources of discrepancy. First, the telephone survey was based on a large, statistically representative sample of 1500 respondents; in contrast the interview sample was small and not statistically representative of the target population. Second, the methodologies are completely different and variations in findings could be attributable to the greater time available and level of personal contact within the interview survey. It is also important to recognise that the data from the interview survey is mainly based on an analysis of 100 actual incident investigations, whilst the data in the telephone survey are estimates based on a company's general experience of investigating incidents. Any points made in the report in respect of differences in findings between the two surveys need to be interpreted in the light of the above.

7.1.1 Causal model adopted by companies

- There is a range of approaches to incident investigation, from system-based through to wholly traditional models. However, the majority of companies operate closer to the traditional end of this continuum rather than using a system-based approach

- The individual driving the investigation has a major impact on the approach that is adopted; in the absence of any formal approach or training, the direction the investigation follows is totally dependant on an individual. Even where there are formal investigation systems in place, the disposition of the individual will still have a significant impact on the process and output of the investigation

7.1.2 Composition of the investigation team

- The company health and safety specialist is involved in the overwhelming majority of cases; in 46% of cases the health and safety specialist is also seen as having overall responsibility for the investigation
- Line management is involved in approximately half of all incidents
- Senior management is involved in approximately 26% of incidents; they are least likely to be involved in a minor incident
- Technical experts are involved in approximately one quarter of all incidents
- The most typical team composition is a health and safety specialist together with a representative of line management
- The person involved in the incident is rarely involved in the process of active investigation
- Safety representatives or other employee representation are only involved in 11% of incidents
- Although those individuals involved in an incident and co-workers (where relevant) are nearly always asked to contribute by describing 'what happened?', they are rarely formally involved in the investigation process
- The composition of the investigation team is most likely to change as the incident increases in severity; this change would typically involve the addition of a more senior manager to the team. Team composition may also change dependent on the exact nature of the incident

A number of differences were observed between the findings of the interview survey and the telephone survey in respect of the above; these include the following:

- Safety specialists are involved in a higher percentage of cases in the interview survey than in the telephone survey. This can be partly explained by the fact that the interview sample was skewed towards larger companies and more severe cases
- Line managers are involved in more incidents in the telephone survey compared to the interview survey
- There is a difference between the data on senior management involvement in incident investigation between the two surveys. Senior management is involved in a higher percentage of cases in the telephone survey than in the interview survey. This result may be partly explained by the nature of the interview sample, in that it involved a much greater proportion of larger companies with a greater likelihood of having safety specialists. It may also indicate that telephone survey respondents over-estimated the involvement of senior management
- Safety representatives are also more likely to be involved in investigations in the telephone survey compared to the interview survey. The likeliest explanation here is that the telephone survey respondents overestimated their involvement

7.1.3 Time spent on investigation

- Overall some 42% of incidents took less than 5 hours of investigation time, 35% took between 5 and 20 hours and 18% over 20 hours. The general trend that emerged was that investigation time increases with the severity or potential severity of the incident
- It is difficult to carry out a valid comparison with the data from the telephone interview survey because of the relatively small number of incidents in most categories within the interview survey. However, when investigation time on 'over-three-day injuries' are compared (the biggest category in the interview survey), there is a discrepancy between the results. The data suggest that the telephone survey respondents tended to underestimate the time involved in the investigation
- Since companies rarely monitor the amount of time spent on investigations, and respondents in the telephone survey also indicated difficulty in making time estimates, it is likely that the interview survey provides a more accurate picture of resources used

7.1.4 Structure and support for investigations

- The level of structure and support provided for incident investigation was classified into four main categories representing increasing levels of formal structure and sophistication of approach: Approach 1, Approach 2.1 and 2.2 and Approach 3

- The specific characteristics of each approach are described in the Section 4.3 of the report. However, in general terms, in Approach 1 there is a complete absence of any documented structure or support for incident investigation. In Approach 2.1 there is minimum formal support with the focus on identifying immediate cause. Approach 2.2 is more structured, with a more sophisticated approach to identifying immediate and underlying causes. In Approach 3 the causal analysis is supported by specific analysis tools and techniques

The general findings in relation to the provision of structure and support for investigations are summarised below:

- Approach 2 is the most commonly used (55% of all companies employ Approach 2.1 or 2.2)
- Within Approach 2, most companies use only the minimum level of structure and support (44% of all companies employ Approach 2.1)
- A large percentage (38%) of companies use Approach 1, i.e. a largely informal unstructured approach. This includes smaller companies with the least resources, but also includes a relatively large proportion of the bigger organisations
- The likelihood of using a more sophisticated approach increases with the size of company
- All the companies that use Approach 3 are either large or high-risk organisations, and typically both large and high-risk
- About half the companies in the interview survey would be prepared to use a more structured approach with qualifications about value and the need for simplicity. Those 30% who said they would not be prepared to incorporate more structure tend to be satisfied with their current approach or feel that a different approach would involve too much time or resources. The larger the company, the more receptive it would be to using a more structured approach
- There are variations in what happens, and who is involved in an investigation, if the incident involves a contractor, a member of the public, violence or has potential for further litigation
- Approaches 2.2 and 3 represent the best practice identified in the interview survey. Where incidents are potentially complex, the tools and techniques used in Approach 3 may be valuable. An overall evaluation of the four main approaches against the requirements listed above concluded that, in relative terms, Approaches 2.2 and 3 were most likely to result in the identification of both immediate and underlying causes, to result in recommendations that address these causes and to ensure that such recommendations are implemented and subsequently followed up. However, as indicated below, the results of the interview survey suggest that, even when a high level of support for incident investigation is in place, this does not guarantee that companies always meet these requirements to a satisfactory standard

7.1.5 Identification of immediate and underlying causes

- The findings of the interview survey, and the impression gained from the respondents, suggest that the majority of companies do not effectively discriminate, or indeed understand, the distinction between immediate and underlying causes
- The vast majority of companies also feel that they currently have a structured process in place to identify the underlying causes of accidents; respondents are less confident about their approach to identifying the underlying causes of ill-health (only 53% were happy with their current approach)

- Despite the limitations of many of the investigations examined in this study, the vast majority of respondents felt that their current approach had led them to identify the underlying cause of the relevant incident

7.1.6 Recommendations and actions taken

- The most common recommendations and actions taken following an incident were changing equipment or modifying procedures, and/or further training and awareness-raising
- Changes to equipment and procedures were more common in companies employing Approaches 2 and 3
- Raising awareness and further training were more common in companies employing Approach 1.
- Risk assessments were revised in 24% of the cases; this was most common in companies employing Approach 3

The above results indicate a more system-based approach than was apparent in the interviews or in the causal analysis documented in the case studies. However, when respondents were asked to indicate what they considered to be the most common recommendations made following an incident investigation, the results indicate a stronger bias towards more person-centred recommendations. In general terms, the study results also suggest that companies that employ Approaches 1 and 2.1, tend not to have formal systems to ensure that recommendations are acted upon. Only a small number of companies have a formal system in place to ensure that recommendations have been effective in reducing the likelihood of similar or related incidents.

7.1.7 Feedback to relevant parties

- In the majority of companies, senior management are informed about the results of the investigation; the likelihood that this will happen increases with the size of the company
- In small companies safety representatives and safety committees are rarely involved; in medium size companies approximately three quarters (74%) are likely to inform the health and safety representatives or safety committee; the equivalent percentage in large companies is 64%
- A smaller percentage of companies than would be expected inform relevant line management of the results of the investigation, although these are generally involved in the investigation team
- Results are only communicated to the workforce in a small percentage of cases
- The results of the comparison between the interview and telephone survey show that:
  - The percentage of companies informing senior management are generally similar; the telephone survey identified a higher percentage of medium sized companies involving senior management (91% compared to 79% in the telephone survey)
  - The results are also similar for safety committees within medium sized companies, but the telephone survey identified a greater involvement in companies of over 200 than was found in the interview survey. However, if the involvement of health and safety representatives is added to the interview survey results, this increases the percentage to 64% making the results more similar
  - The telephone survey identified a much stronger pattern of reporting to head office than was identified in the interview survey

7.1.8 Storage of data in an accessible database

- About 40% of companies use a primarily paper-based system; 15% primarily use a computer-based system and about 40% use a combination of both to store information on incident investigations. The reliance on a paper-based system is more common in smaller companies, although about 30% of larger companies still use a paper-based approach.

Companies that are less structured in their approach to incident investigation are more likely to rely on paper-based approaches.

- Some 80% of companies use the data for monitoring the frequency of different types of incident; companies that are less structured in their approach (and therefore, by definition smaller companies in which incidents are themselves less frequent) are less likely to carry out this type of analysis
- Companies are less likely to use their data to monitor patterns in underlying causes, although nearly 60% of companies suggest they do use the data for this purpose. Even this figure may be over-inflated since there is some doubt over the understanding of the concept of 'underlying causes'

7.1.9 Training

- Some two thirds of investigation teams in the interview survey have some training in incident investigation, with the percentage of individuals trained increasing by size of company; the bulk of this training relates to generalised health and safety training such as NEBOSH or IOSH courses
- In practice, many of the individuals who have responsibility for leading or supporting incident investigations are not dedicated safety professionals. Their exposure to any training in incident investigation is minimal and the time available for such training is restricted
- In small companies incidents and even near-misses are rare events and maintaining appropriate awareness and skills in incident investigation becomes a real issue
- There is no real way in which competence in incident investigation is routinely externally or internally evaluated; individuals or companies are likely to get little or no feedback on the quality or effectiveness of their investigations
- In practice, even if demand were high, there is currently a lack of easily accessible and affordable training courses on incident investigation
- There is tendency for incident reporting and incident investigation to be conflated. Companies that perceive themselves as having effective systems and skills in reporting often overestimate the quality of their investigations

7.1.10 Near-misses

- Nearly all companies recognise the potential value of following up near-misses and the majority of companies attempt to investigate them, if incidents are brought to their attention
- Companies are generally aware of the difficulties in obtaining good levels of reporting, but do little proactively to encourage such reporting. There is an assumption that, because there is an incident reporting system in place, this means that they address near-misses

7.1.11 Perceived implications of forthcoming legislation

- In the majority of cases companies already assume there is a legal requirement to investigate accidents and ill-health
- Approximately 40% of companies feel the legislation would make no difference to their companies; this percentage drops to 18% for those companies that currently have little structure or support for their incident investigation. This group see the major implications as being the need for additional time and more training
- Companies that employ more structure also identify the need for training and more time as the main implications of any change in requirement
- Companies that have been classified as most sophisticated in their approach, generally feel they are currently adequately resourced for any new demands
- Respondents felt unable to cost the implication of these changes without further clarification of what will be required by the legislation

7.2 SUMMARY OF MAIN BARRIERS TO IMPROVING THE QUALITY OF INCIDENT INVESTIGATION

On the basis of the results summarised above, this section now briefly summarises the main barriers to improving the general quality of incident investigation.

7.2.1 Current and developing legal environment

Many companies readily acknowledge that the increasingly litigious business climate makes them more conscious of the need to protect themselves from potentially unfair and punitive employee claims. In such a climate it is possible to argue that there is a powerful disincentive to both identifying, and subsequently documenting, management and organisational factors that may have contributed to an incident.

Although the interview survey did not directly address this sensitive issue, there are a number of results that suggest that legal pressures could become a significant issue. Nearly a quarter of companies suggested that they would change their investigation process, if it were likely that an incident could lead to a legal claim. Often, these changes, which appeared primarily to be driven by the requirements of insurers, resulted in what was described as 'a more thorough' investigation, but not necessarily a more system-based investigation.

There was also a noticeable discrepancy between the profile of causes identified in the case studies and the profile of interventions subsequently made. Typically, companies tend not to identify and document work-related issues as immediate or underlying causes but paradoxically, are prepared to make secondary recommendations that directly address these issues. This suggests a tacit acknowledgement that these are significant contributory factors but a reluctance to formally highlight management or organisational deficiencies.

The likelihood either of companies failing to fully investigate potential management or organisational deficiencies, or of failing to document or disclose such findings, also needs to be considered in the light of the Lord Woolf's Final Report on Access to Justice. In the case of potential litigation, the Woolf Report makes recommendations that aim to ensure that litigation will be less adversarial and more co-operative. In particular, there is an expectation of openness and co-operation between parties from the outset. This move to more openness is supported by pre-litigation protocols on disclosure and expert evidence.

If successfully implemented, this should increase the likelihood that all critical aspects of an incident are brought to light at the earliest possible opportunity. It should also ensure that there is a deterrent against the suppression of, or failure to disclose, significant information.

7.2.2 Isolation of incident investigation from risk assessment

In most companies proactive risk assessment, performance monitoring and audit and near-miss reporting are effectively de-coupled from the process of incident investigation which is typically perceived as a stand alone process. However, in practice, all these processes can inform a company about accident drivers and potential mitigating measures. Conceptually they can be seen as a continuum as illustrated in Figure 5, with each process potentially providing feedback into risk assessment and the development of risk control measures.

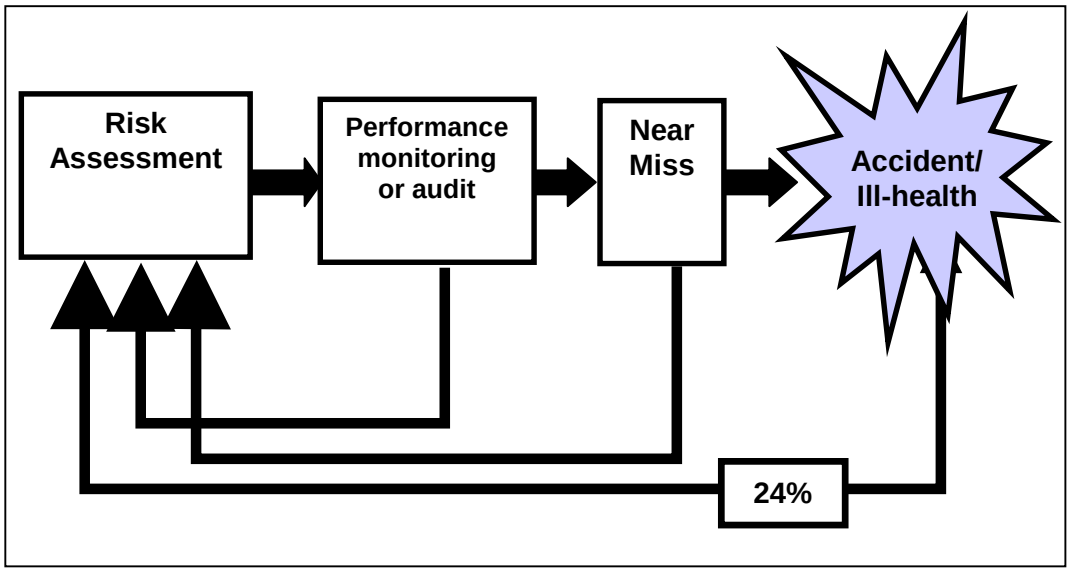


Figure 5 An integrated approach to Risk Assessment and Accident Investigation

In reality, only a small proportion of companies have comprehensive near-miss reporting, reducing the effectiveness of this feedback loop. The interview survey also showed that only 24% of companies used the output from their incident investigation to update their risk assessment, suggesting that even the use of this feedback is far from standard practice. There is also a more fundamental problem, because companies do not see these processes as an integrated whole, each separate process is based on a different model or structure, with little consistency in the taxonomy or approach used. In practice, this means that risk assessment and performance monitoring and audit may use one set of factors and incident investigation a completely different set of issues. This further undermines the effectiveness of any feedback loop.

7.2.3 Lack of common model and structure

The interview survey revealed that companies have a wide range of approaches to incident investigation, from those that are totally unstructured to quite formal and well-supported systems. It has also highlighted the importance of the individual driving the investigation, the focus on incident reporting rather than investigation, and the general failure to distinguish or understand the difference between immediate and underlying causes. These results suggest two further barriers. First, there is a significant lack of awareness and understanding of system-based rather than the more traditional accident models, and the value of using such models. Second, there is a lack of practical support, in terms of usable systems and documentation, to encourage the application of such models.

7.2.4 Current levels of competence and availability of training

It has already been noted that many of the individuals who have responsibility for leading or supporting incident investigations are not dedicated safety professionals. Their exposure to any training in incident investigation is minimal, and the time available for such training is restricted. Moreover, in small companies, incidents and even near-misses are rare events and maintaining appropriate awareness and skills in incident investigation becomes a real issue. These findings therefore reinforce the need for comprehensive support in terms of advice, guidance and documentation to encourage effective incident investigation.

7.2.5 Current level of complacency

One of the main barriers to overcome is the overall level of satisfaction with current approaches. Despite the limitations of many of the investigations examined in this study, the vast majority of respondents felt that their current approach had led them to identify the underlying cause of the relevant incident. The majority of companies also feel that they currently have a structured process in place to identify the underlying causes of accidents, although they are less confident about their approach to identifying the underlying causes of ill-health. Many companies also feel that the forthcoming legislation will make little or no difference to them. This finding implies the need for a significant shift in awareness, so that more companies recognise the need for, and value in, moving from an approach that focuses on merely describing the chain of events that happened to one that tries to identify why these events happened.

7.2.6 Resource implications

Although, in general, companies already assume that they have a legal responsibility to investigate accidents, it is likely that the new requirement will still have resource implications for many companies, both in terms of training needs and time expended on investigations. This conclusion is supported by both the survey findings on training needs, and the finding that companies actually spend more time on investigations than was estimated in the telephone survey. In order to persuade companies to allocate these resources, the HSE will therefore have to demonstrate that improving incident investigation will be of benefit to a company.

7.2.7 Particular problems of SMEs

Lastly, there are particular challenges to be faced in improving the quantity and quality of incident investigation in small to medium sized companies. These include:

- The difficulty of allocating appropriate time and resources for training and investigation
- Maintaining skill and awareness levels when incidents are rare events
- Convincing companies of the need to identify and monitor underlying causes when incidents are rare events
- Convincing companies that they have a responsibility to address underlying causes even if to do so would have significant short and medium term cost implications

7.3 IMPLICATIONS FOR THE HSE

Although the previous section focused on the more negative results from the interview survey, there are also a number of positive messages for the HSE. For example, there are some illustrations of good practice, and many of the interviewees were professional and diligent in their approach to incident investigation. They were also positive about the contribution the HSE could make to improving company policy and practice.

It is also clear that line and senior management are increasingly involved in investigations, although the results are less optimistic than those of the telephone survey (the telephone survey also appeared to overestimate the involvement of health and safety and employee representatives). Companies were also ready to consider changing the work environment many cases. They were also aware of the need to follow up near-misses, although they were not addressing some of the fundamental issues that deter reporting of such incidents. Lastly, virtually all companies maintained formal records of the incident, investigation and outcome.

This final section of the report now considers some of the practical ways in which the HSE could support companies in improving incident investigation.

7.3.1 Reinforce links between risk assessment and incident investigation

In line with the arguments made in section 7.2 above, HSE should reinforce the links between risk assessment, performance monitoring and audit, near-miss and incident investigation through the further development and dissemination of integrated models, assessment and investigation tools. In particular it should reinforce and further promote the value of near-miss reporting as an essential risk assessment tool. In the context of the legal pressures discussed above, near-misses have powerful advantages. They provide almost equivalent learning opportunity without the legal and liability implications. HSE field staff have a significant part to play here by ensuring that risk assessment policy and procedures, and near-miss reporting, are routinely reviewed when incidents are being investigated.

In order to achieve change at these fundamental levels, there also needs to be a shift in the understanding of the importance and value of addressing both immediate and underlying causes. This requires a major awareness and educational initiative.

7.3.2 Provide additional technical support

There is also a range of more practical support and advice that could be provided by the HSE, and which was specifically requested by respondents in the interview survey.

- The provision of a more structured and standardised approach to incident investigation based on a clear set of accident causation models, so that companies can make the best use of their time and resources, and compare their findings and performance with those of other relevant companies. It was also noted by some respondents that HSE inspectors were themselves not consistent in the way they investigated incidents. Although there may be perfectly legitimate reasons for these differences in approach, given the legal context within which inspectors may be working, it is still important that companies receive a consistent message in terms of what constitutes a good investigation process
- The provision of industry specific guidance and support so that the incident investigation systematically covers issues that are already known by the HSE to be important within that industry context
- The provision of clear examples and case studies to illustrate appropriate standards of investigation and different approaches which may be applicable in different situations
- The standardisation of forms and documentation to comply with the HSE requirements and compatibility with RIDDOR; the provision of enhanced electronic access to, and linkage with, RIDDOR so that immediate feedback can be obtained from the HSE on related incidents, factors which should be investigated in that category of incident, and guidance to prevent reoccurrence

In all of the above, the emphasis should be on the need for simplicity and clarity to avoid too much bureaucracy and burden on small companies. There were also a number of more general comments made about the service provided by HSE. These are summarised below:

- There were a number of interviewees (about 10%), who felt that companies are still reluctant to contact the HSE for advice and help, either because they still see the organisation in the role of legislator and enforcer or because the organisation is not sufficiently responsive
- Several interviewees complained about lengthy delays in the response from the HSE following the reporting of a specific incident. This has the effect of undermining company confidence in the HSE, and in some cases, delaying the circulation of information about an incident within the relevant company
- A small number of interviewees were also explicitly opposed to the principle of more legislation and greater prescription on health and safety issues

7.3.3 Provide better access to information already held by the HSE

Individual companies will, by definition, tend to have access to details of only a small number of cases and a limited database. The HSE should develop a more interactive relationship with companies to share information on similar incidents that may have been reported, both to improve the quality of subsequent investigations, and also to identify any obvious patterns or trends.

7.3.4 Provide better training in incident investigation

Respondents identified the need for training or other support, such as software or videos, developed and endorsed by the HSE. This reflects the both the lack of confidence in the currently available commercial products and a desire to ensure that company methods and approaches will satisfy the requirements of future health and safety legislation.

7.3.5 Act as a key 'change agent' to improve the current legal climate

Lastly, there is the critical issue of how the HSE can be influential in de-coupling issues of blame and liability from the process of objective investigation. It has already been noted that the increasingly litigious climate may deter companies from identifying, and documenting, management and organisational factors that may have contributed to an incident. It is therefore important that the legal system is perceived as encouraging and not penalising companies that adopt a system-based approach to incident investigation. It may be also appropriate to think of developing more practical incentives to improve investigation and risk management by introducing relevant insurance incentives.

The HSE could play a strategic role in facilitating such change by generating an active and high-level dialogue between industry, legal and insurance representatives, with a view to identifying and committing all parties to a coherent and productive approach to this difficult challenge.

APPENDIX A: CASE STUDIES

Case Study 1.1	
Group	Agriculture
Size	10-49
Risk category	High
Incident category	Dangerous Occurrence
Job title of interviewee	Operations Manager
Total time spent on investigation	4-5 hours

Narrative

This organisation picks and packs produce ready for distribution. This incident involved a lady who was part of a team of packers. Her task involved packing lettuces onto palettes for collection by a forklift. These palettes were then stored in a warehouse awaiting distribution.

On this occasion, she had more boxes of lettuces than she felt was correct. To establish whether the warehouse was one box short she walked up the ramp (generally used by forklifts) to the warehouse. The temperature in the warehouse is maintained at a low level. One of the means of maintaining this temperature is to have flexible plastic slats in the doorways that forklifts can push through. As the Packer walked up the ramp and approached the slats, a forklift pushed through from the opposite direction at approximately 3-4 mph. The Packer was struck a glancing blow by the forklift.

Consequences

The Packer was bruised by the blow and taken to hospital. She had one day away from work. Upon her return, she resumed the same tasks she had been conducting prior to the incident. Normal work processes were only affected for the length of time it took to tend to the injured party.

Inputs

The incident was investigated by the Operations Manager (a line manager); he spent between 4 and 5 hours on the investigation in total. During the course of the investigation, he spoke to the injured party and her co-workers for a few minutes. He also spoke to the forklift driver for as long as it took to obtain his version of events.

Process

The Operations Manager spoke to the forklift driver first and then the co-workers of the packer. He spoke to the injured party when she returned to work. He wanted to establish her motive for walking up the ramp. He also tried walking up the ramp himself, to retrace the injured party's steps. The Operations Manager filled in the RIDDOR form using the information he had gathered from his enquiries. The organisation does not have any formal procedures or forms to deal with accident investigation.

Conclusions and actions taken

The conclusion reached by the investigation was that the Packer should not have tried to walk up the ramp. The driver was not found to be at fault as he had sounded his horn prior to pushing through the slats.

As a consequence of this incident it was recommended that a walkway be built along the side of the ramp leading to the warehouse.

Lessons learnt

The interviewee felt that the organisation had learnt that accidents can happen anywhere and that people had to be guided towards safety - it is not enough to tell people what to do and expect them to follow.

Case Study 1.2	
Group	Mining / Utilities /Transport
Size	50-199
Risk category	High
Incident category	Dangerous Occurrence
Job title of interviewee	Colliery Manager
Total time spent on investigation	6 Hours

Narrative

At the time of this incident trucks were being hauled out of a drift mine. The roads by the mine were on a 1:6 incline. The hauling rope attached to one particular truck broke and the truck travelled for 100 yards before being stopped by a safety gate. The rope was corroded. This corrosion was thought to have occurred because it had been left lying in pit water. The pit water was unusually acidic with a pH of 3.

This activity is carried out 4 times per day at site. Usually the maintenance and inspection of these ropes was good and had prevented such an incident happening before, although this sort of incident has happened in this particular industry many times.

Consequences

There were no injuries as a result of this incident. The broken rope was replaced and the safety gate was knocked back into shape. Production was not affected by this incident.

Inputs

The following individuals were involved in the investigation:

- A Line Manager - 2 hours
- A Mechanical engineer (an expert)- 2 hours
- The dedicated Safety Officer - 2 hours

During the course of the investigation, the hauler (classed as a co-worker) was interviewed for a total of 2 hours.

Process

In addition to the interview noted above, the equipment was examined in detail by the investigation team. In particular, the full length of rope was examined for evidence of corrosion or damage.

Conclusions & actions taken

As a consequence of the investigation the rope was replaced with one of the same design and material. In addition, rope examination was conducted more frequently. Employees were also given awareness training to ensure that ropes are inspected before use.

Lessons learnt

The interviewee felt that the investigation had made the organisation more aware of the damage caused to ropes that are left in water, and of the consequent need to ensure that ropes are removed from water when not in use. He also felt that lessons had been learnt about the importance of inspecting ropes prior to use, and that even the most routine tasks could be dangerous.

Case Study 1.3	
Group	Manufacturing
Size	10-49
Risk category	High
Incident category	Over-three-day injury
Job title of interviewee	Quality Manager & Director
Total time spent on investigation	2 hours

Narrative

The employee was working on a lathe on the shop floor. He was trying to smooth a rotating plastic disc using a blade. Instead of using the knives provided for the task by the organisation, he was using a large razor blade that he had brought in from home. This blade did not have a handle. As he used the blade to carry out this operation, it caught on the chuck of the machine. This made the blade rotate rapidly causing a deep wound to his hand. There have been other cases of cuts on the shop floor but none performing this particular operation.

Consequences

The employee was away from work for 23 days, some of this time was due to illness unrelated to the injury. First aid was supplied on site and the wound was dressed at the local hospital. Work cover for the individual had to be supplied.

Inputs

The following individuals investigated this incident:

- A Line Manager
- Quality Manager & Director (with responsibilities for safety)

The team interviewed the injured party, the head of the employees department (another line manager), and the first-aider, this took around 30 minutes of their investigation time. In total 2 hours was spent on the investigation.

Process

The investigation followed the standard company procedure for accident investigation. The injured party was sent to hospital and the first-aider informed the relevant individuals. The Health and Safety Director talked to the shop supervisor. The details were entered into the accident book. The injured party was interviewed on his return. The accident was then reported under RIDDOR and an internal accident report form was completed by the investigation team.

The incident report was presented at a three monthly review health and safety review and at a management review. The injured party was also informed about the outcome of the investigation.

Conclusions and actions taken

The investigation concluded that the individual had been careless and used an inappropriate tool. The interviewee felt that the underlying cause of the accident was this carelessness. The individual had admitted this and had lost a finger on a previous occasion.

As a result of the investigation all employees received refresher training on ‘hand awareness’. There have not been any recurrence and it was noted that the individual has since left the company.

Lessons learnt

The lessons that the company felt they had learnt from investigation this incident were the importance of prevention, the need to see where blame lies and develop the correct remedial actions. If the investigation were to be repeated the investigators would made more precise notes. They may also use a form in the future and take as many pictures as possible.

Case Study 1.4	
Group	Mining / Utilities / Transport
Size	50-199
Risk category	High
Incident category	Over-three-day injury
Job title of interviewee	Personnel Manager
Total time spent on investigation	2 hours

Narrative

This organisation is a freight forwarding company. The person injured in this incident was the supervisor of the company's forklift truck operation at this site. A driver was loading and unloading vehicles, and stacking pallets. During one reversing manoeuvre, the driver ran over the foot of the supervisor.

This sort of incident has happened before in this organisation. The injured party was taken to hospital where they were treated for a crush injury to the ankle.

Consequences

The Supervisor was off work for six weeks because of this incident. At the end of this period, he returned to work and resumed his previous job. In terms of work processes, there was a small amount of down time whilst he was tended to and taken to hospital. Work resumed quickly after he had been taken away.

Inputs

The incident was investigated by:

- The Warehouse Manager (a line manager) - 1 hour
- Personnel Manager (with responsibility for safety) - 1 hour

The Warehouse Manager was involved due to his understanding of the work processes and responsibility for the area. The Personnel Manager was the national and local H&S representative. They spent approximately one hour each on this investigation. During the course of their investigation, they interviewed the driver of the truck (1/2 hour), the injured party (1/4 hour) and two co-workers who had witnessed the incident (1/4 hour each).

Process

The Personnel Manager and Warehouse Manager spoke to the parties described in the previous section and took witness statements. The Personnel Manager then completed the RIDDOR form and wrote an internal report (there was no formal investigation procedure). The incident was then discussed at the next local H&S meeting and recommendations made. All warehouse staff were made aware of the outcome of the investigation through updated risk assessments.

Conclusions and actions taken

The Personnel Manager and Warehouse Manager reached the conclusion that the bleeper on the forklift that signifies reversing motion wasn't working. The supervisor for each shift should have carried out inspections on all forklifts. This had been conducted but nobody had taken

responsibility for carrying out the changes. No blame was placed on the driver, it was decided that he had looked before reversing and the supervisor had been unfortunate enough to step into the path of the machine.

The risk assessments for this process were reviewed and additional checks were put in place to ensure both that equipment checks were carried out and that there was appropriate responsibility assigned for carrying out the recommendations.

Lessons learnt

The interviewee suggested that one lesson to come from the investigation was not to assume that just because a system is in place that it is being carried out correctly. This explains the need for audits and risk assessments.

Case Study 1.5	
Group	Services
Size	10-49
Risk category	Low
Incident category	Over-three-day injury
Job title of interviewee	General Manager
Total time spent on investigation	Unknown (spread over a period of three weeks)

Narrative

This hotel had employed a contractor to change the building's lighting system. Whilst working on a ladder, the contractor overstretched as he reached for a light bulb. The ladder could have been moved closer to the bulb. The contractor, however, chose to attempt to reach for the bulb, consequently damaging the small of his back.

Consequences

The injured party required medical attention and had six weeks off work. The injured party had not returned to work for the company and the payment of sick pay has now ceased. Refurbishment work that was being carried out was stopped that day. The injured party had commented following his injury that he was overworked; three contractors were then employed to carry out his duties.

Inputs

The investigation was conducted by the General Manager (senior manager) who spent was involved in the investigation and the injured party was interviewed. The investigation was spread over a total of three weeks. Two hours of this was spent interviewing the injured party.

Process

The accident was entered in the accident book and the injured party interviewed to ascertain why the incident had occurred and to identify any preventative measures that could be put in place. Details of the incident investigation were given to the company directors who considered the financial implications, in terms of other contractors who worked for the hotel. A further copy was sent to an architect to assess other parts of the building for similar risk.

Conclusions and actions taken

The investigation concluded that the incident was the result of poor workmanship. Specifically, that the individual should have moved his ladder. The individual had overstretched and compromised his own safety. The interviewee felt that the underlying causes had been identified.

The investigation recommendations led to new aluminium (lighter) ladders being purchased. This also led to a general review of purchasing strategy in terms of fitness for purpose. In addition, the workforce was tripled to cover the same duties that were being conducted by the injured party. There have been no recurrences.

Lessons learnt

The interviewee felt that this incident had reminded the company how responsible it has to be for the well being of all individuals who work for it. If this investigation were repeated then they would take a lot more notes from the interviews.

Case Study 1.6	
Group	Services
Size	200+
Risk category	Low
Incident category	Minor incident involving employee
Job title of interviewee	Security Manager
Total time spent on investigation	Unknown

Narrative

This is a hotel in the centre of London. The company only has one smaller hotel, also in London. In the incident a person was pushing a trolley with items for guest rooms along a corridor. Whilst negotiating a set of sprung fire doors the person's hand was trapped between the door and the trolley.

Consequences

The person received bruises to their hand. These were minor and after a quick check over by a first-aider the person continued with their work. There was no equipment damage. This type of incident is a relatively common occurrence in this organisation.

Inputs

This incident was reported to an on duty security guard (with safety responsibilities) who is also a first aider. Having checked for wounds an incident report was completed giving a brief statement of what happened from the injured party and the nature of the injury. On receiving the report the security manager followed the report with a brief inspection of the scene of the incident and the equipment involved.

Process

For this incident the process was simply a report of the incident. The very brief investigation carried out by the security manager was merely to confirm the details of the report.

Conclusions and actions taken

The main cause was considered the person not paying enough attention to what they were doing. The investigation concluded that the cost required to fit devices to fire doors to prevent such incidents cannot be justified by the relatively minor injuries usually received. No action was taken as a result of this investigation.

The incident report was sent to senior management, discussed at a health and safety committee (minutes of which are posted on staff notice board) and to Human Resources.

Lessons learnt

None

Case Study 1.7	
Group	Retail
Size	200+
Risk category	Low
Incident category	Dangerous Occurrence
Job title of interviewee	Assistant Group safety Manager
Total time spent on investigation	60 hours

Narrative

One of the employees of this organisation was involved in basic engineering work involving grinding (i.e. hot sparks). Thirty minutes after he had completed his work, a fire was discovered. The hoses on nearby oxy-acetylene kit had caught fire. Emergency services called. The oxy-acetylene kit had not been used that day the previous day, however, all of the equipment had undergone annual testing.

Consequences

The fire was contained and caused minimal damage. However, because of oxy-acetylene bottles involved the main A road had to be closed for 2 hours (during rush hour) and an exclusion zone set up to mitigate the effects of a potential explosion. The fire service was at the site for 12 hours. The incident was very bad publicity for the organisation.

Inputs

The following individuals were involved in the investigation:

- Supervisor (Line Manager) - 6 hours
- Engineering Manager (an expert) - 6 hours
- General Manager (Senior Manager) - 6 hours
- Two safety specialists from head office - 24 hours
- Auditor - 12 hours
- Insurance Risk Manager - 6 hours

The HSE were also involved and took away equipment. They promised to return the equipment for further investigation a week later (the organisation was still waiting after 3 months). The bottles were taken away by the supplier to make safe and for investigation of their condition. The worker involved in the dangerous occurrence was interviewed along with the two line managers. These interviews took 3 hours in total.

Process

During the course of the investigation, all of the people working in workshop at time of incident were interviewed, including their supervisors. The site was examined by the investigation team and photographs were taken. The equipment taken into custody and the site was searched for debris.

Conclusions & actions taken

The investigation concluded that procedures should have ensured that the bottles were checked at the end of the day to ensure that they were turned off. The team also questioned the competence

of the contractors who had carried out annual checks, although they acknowledged that the company were responsible for the equipment. The report also raised the issue of housekeeping, as lots of flammable material was found in the area around the cylinders, which may have started smouldering before spreading to the bottles.

Lessons learnt

The interviewee felt that the housekeeping issues noted above and the procedures regarding management of flammable gas bottles were lessons that the company had learnt. He also felt that it highlighted the complacency of local management.

Case Study 1.8	
Group	Manufacturing
Size	200+
Risk category	High
Incident category	Major injury
Job title of interviewee	Fleet Manager
Total time spent on investigation	12 hours

Narrative

This organisation makes pet food. One of the processes that they have is a forming machine that sculpts dough into bone shapes before they can be cooked to create dog biscuits. The forming machine moulds have sharp edges and are required to be cleaned regularly. The prescribed method for undertaking this cleaning is to open the lid of the machine and then hose out the shapes. The system is protected by an interlock device that means when the lid of the machine is open the power is automatically switched off. According to this interviewee, it is common practice amongst the workforce to use magnets to override the mechanism. The operator involved in this incident had used a magnet to override the interlock and was picking out some detritus from the from the bone mould when the ram came down and pressed his finger against the forming machine severing it.

Consequences

The operator was taken to hospital where he underwent an operation. However, the surgeons were unable to save his finger. The injured party was away from work for several months following the incident. He was subsequently able to return and resume all of the tasks he had previously carried out; he later left the organisation of his own accord.

Work processes were affected by the incident. The forming machine was shut down pending an assessment and did not resume work until the following day.

Inputs

The incident was investigated by the Fleet Manager (whose responsibilities include H&S). He estimated that he had spent a day and a half on the investigation. During the course of the investigation, he interviewed the injured party for 2 ½ hours, five co-workers for 15 minutes each and one co-worker who was responsible for training for an hour.

Process

The incident investigation process was to examine the process on the day of the incident, to visit the injured party the day after the incident and to interview the injured party's co-workers. The interviewee suggested that the main reason for getting a statement from the injured party so quickly was to try and get an admission of culpability from the injured party of not following procedures. There was no formal procedure for accident investigation but the Fleet Manager had a background in the Police Force.

Once the investigation was complete, the Fleet Manager informed senior management and the department manager of the scene where the incident occurred.

Conclusions and actions taken

The Fleet Manager concluded that individuals should be trained in the tasks they carry out and more importantly, they should sign for the training they undertake. This signing will show that the individuals know how they should do their tasks.

The investigation recommended that all staff should be reminded how the task should be conducted and that frequent checks should be made for the use of magnets and that these should be confiscated when found.

Lessons learnt

The interviewee said that the company had learnt lessons about the need to get employees to sign for their training. He suggested that if the investigation were repeated he would have sacked the supervisor for promoting the use of magnets.

Case Study 1.9	
Group	Agriculture
Size	50-199
Risk category	High
Incident category	Violence
Job title of interviewee	Farm Operations Manager
Total time spent on investigation	½ hr

Narrative

This organisation manages a large farming estate. One of the organisation's Farm Managers was patrolling the site. He saw a 4-wheel drive vehicle on the estate and went to investigate. The Farm Manager was relatively new to the organisation and wasn't aware that usual practice was to wait for assistance before approaching groups of individuals. Illegal hare coursing was an offence that was relatively commonplace on the estate, as it was difficult for the whole site to be policed at once. The Farm Manager approached the individuals to remonstrate with them and was physically attacked.

Consequences

The Farm Manager was hit about the face but was able to return to work the following day. He was taken to hospital as a precaution but sent home the same day. Upon his return to work he resumed the same duties. There was no cost to the organisation in terms of work processes.

Inputs

The investigation as such was conducted by the Office Manager (who had responsibility for health and safety). The interviewee suggested that there was little to investigate, as the Farm Manager had been unable to catch the licence plate of the car that had been driven. The Office Manager spent ½ hour talking to the injured party.

Process

The Office Manager entered the details of the incident in the company accident book. Head Office was notified of the incident, in addition to the organisation's Safety Officer. The organisation had no formal procedure for accident investigation.

Conclusions and actions taken

The Office Manager concluded that in principle groups of individuals acting illegally should not be approached by individuals. There is, however, a certain amount of discretion that each Farm Manager needs to exercise. Trespassers on their own, for example, can probably be safely approached.

Because of this incident a memo was distributed to all Farm staff advising them not to approach strangers when on their own. In addition, each head of department is now supplied with a mobile phone to make communication faster.

Lessons learnt

The interviewee felt that the organisation had learnt important lessons from this investigation about the supporting lone workers. The interviewee felt that the investigation had done all it could do given the lack of information in the first place.

Case Study 1.10	
Group	Services
Size	50 –199
Risk category	Low
Incident category	Over-three-day injury
Job title of interviewee	Managing Director
Total time spent on investigation	10 hours

Narrative

An occasional task that needed to be carried out at this company was the throwing of sheets into a cage on wheels. The cage was taller than the person was. It was an occasional activity, but the person carrying out the task complained of a repetitive strain injury to her shoulder.

Consequences

The person reported the injury. She consulted her GP and the company used a consultancy to carry out an assessment. She also visited a consultant surgeon.

She missed 7 days work and was advised to take 3 months physiotherapy. The company offered to pay her sick leave for those 3 months but she chose to return on light duties. She has since stayed on those light duties.

Inputs

This incident was investigated by

- The Managing Director (senior manager) - 3 hours
- The Safety Rep - 7 hours

During the course of the investigation, the injured party was interviewed for ½ hour.

Process

The cage being used was examined, including its height and condition, and the weight of the sheets was assessed. The task was demonstrated to the investigation team. Other people who also carry out the same task were talked to.

Conclusions and actions taken

The investigation concluded that this was a nuisance case. The injured party had only being doing the job for a couple of weeks, hence it was questioned how she had suffered a repetitive injury. The interviewee felt that she had not wanted to do the task involving the cage and had used this incident, along with threatening to sue the company, as a way of getting her old job back.

In this case, there was no history of problems with the task and inconclusive evidence of injury (no evidence of repetitive injury).

Lessons learnt

The interviewee felt that the company was now more wary of who they employ to carry out assessments, the company used in this case to provide a medical assessment gave very poor service and had to be asked to rewrite their report.

Case Study 1.11	
Group	Agriculture
Size	<10
Risk category	High
Incident category	Minor incident involving employee
Job title of interviewee	Secretary / administrative assistant
Total time spent on investigation	None

Narrative

This incident involved a small company in the agriculture sector, growing and producing a range of crops, including potatoes. An employee was preparing to plant potatoes using a tractor and planter. Prior to filling the planter with a new variety of potatoes, he had to ensure that the planter was cleared out, so that it did not contain any potatoes of the previous variety planted. To carry out this operation, he had to climb onto the planter, as he did this, his foot slipped and he twisted his back.

Consequences

The employee carried on working and indeed did not report the incident to the secretary (who has responsibility for the accident book) until 2 days later. However, the same employee now has a history of back problems and has since lost time from work (a period of some 3 weeks was lost about a year later). It is not known if these incidents were connected but it was discovered at the time of his absence that he had a "slipped disc".

Inputs

There was no investigation and thus no investigation team.

Process

There was no formal process for incident investigation within the company. Any documentation is limited to an accident book; this was completed by the secretary 2 days after the incident when she was told informally about the incident.

Conclusions and actions taken

The informal conclusion was reached that the employee should have been more careful; the M.D. of the company said that "cleaning the planter needs to be done and there is no other was to do it". Therefore, the employee was simply told "to be more careful".

Lessons learnt

The only lessons learnt were considered by the interviewee to be that "care needs to be taken when carrying out work on the farm".

Case Study 1.12	
Group	Services
Size	50-199
Risk category	High
Incident category	Minor incident involving employee
Job title of interviewee	Quality Manager
Total time spent on investigation	None

Narrative

This company operates within the telecommunications industry. The incident occurred within its business unit which installs and maintains telecommunications equipment within shops and outside premises. The incident involved an employee who was working on his own (a colleague with whom he would normally work was on holiday) in a company depot repairing large scale TV's typically used in betting shops. The employee reported directly to the HSE that he was working alone with mains equipment in contradiction of safety regulations. This employee had claimed that he had reported these working conditions previously to the manager, but no action had been taken. In frustration, he reported the situation directly to the local HSE office.

Consequences

After reporting the incident, the employee stopped work and went home. He was subsequently dismissed on the grounds of misconduct. He had sabotaged tools and equipment belonging to the company and had called 20 clients to complain about his employers.

Inputs

The HSE visited the company premises and carried out an investigation after the formal report. The company itself carried out no internal investigation.

Process

The HSE asked the company to clarify the following: -

1. Had they evaluated the risks of lone working?
2. Had they provided a mains isolated transformer?
3. Did they have the relevant health and safety information displayed at the workplace?

The interviewee maintained the company had provided (2) and (3) above, so (1) was the only legitimate complaint.

The company itself has no formal support for either incident reporting or investigation and the quality manager, who had recently been given a widespread responsibility for safety management, has no experience or training in this area. His task is to develop a safety management system and ethos from scratch.

Conclusions and actions taken

Because of the HSE intervention the company has now developed a lone working policy and clarified the circumstances under which employees are allowed to work on live mains equipment. The managing director of the relevant business unit was informed about the incident.

Lessons learnt

The interviewee suggested that the organisation learnt that it needed to restructure its operations. After this incident, they closed some local depots and centralised repairs in a specialised centre. The interviewee also felt that they should have handled the incident better in the first place and not ignored the problem. The relevant area manager got “talked to” but is still with the company.

Case Study 1.13	
Group:	Manufacturing
Size:	50-199
Risk category	High
Incident category:	Over-three-day injury
Job title of interviewee	Works Chemist
Total time spent on investigation	1 hour

Narrative

This organisation makes adhesives; they melt together raw materials, cool and pack them. This incident involved the packing of slats of adhesive. The conventional packing machinery had broken down; to keep the process going a temporary process was in operation. The machinery would position slats horizontally, spray a layer of oil between each slat (to prevent adhesion) and then pack them. As this machinery wasn't functioning, the whole operation was being carried out manually, with an aerosol can being used to spray the oil and the slats being packed into a large sack as an interim measure.

The aerosol being used to spray the oil ignited, the operative who was using the aerosol received burns to the arm as a consequence. The butane gas within the canister to keep the oil under pressure had ignited.

Consequences

The injured party required one months sick leave because of the burns to his arm. Production was affected only briefly whilst the situation was assessed.

Inputs

The incident was investigated by:

- The Logistics Manager (senior manager) - 30 minutes
- The Safety & Quality Manager (who had non-safety responsibilities) - 30 minutes

The HSE conducted an investigation into the incident.

The investigation team in the organisation spoke to the four or five immediate co-workers for approximately five minutes each. Once the injured party returned to work, they interviewed him for ten minutes. In addition, there was a twenty-minute phone conversation with the suppliers of the release agent.

Process

This organisation has no standard documented procedure for investigating accidents. The investigation team attended the scene of the incident, spoke to witnesses to ascertain what had happened and decided that there was no need for any immediate action, other than to stop the use of those aerosols. They called the suppliers of the aerosol, spoke to the injured party (some time later) and drew their conclusions. The RIDDOR form was completed by the H&S Manager.

The incident was brought up at the next Safety Committee meeting by the Safety & Quality Manager, the minutes of which were distributed to all directors and a copy pinned to the H&S notice board.

Conclusions and actions taken

The investigation team decided that the aerosol had caught fire and that the most likely ignition source was a build up of static electricity. Anything that might act as an ignition source is strictly banned from the site and there was no evidence to the contrary. The HSE investigation also concluded that the most likely ignition source was static.

Because of this incident, all aerosols were totally banned from the site and the process changed to a water-based system.

Lessons learnt

The interviewee felt that one important lesson to be learnt from this incident was the need to control and assess materials entering the site from outside sources. The reduction in use of CFC propellants in sprays had led to the introduction of a butane alternative. There had been no assessment of the risks involved in this new equipment, largely because there had been a lack of communication and awareness of the change.

Case Study 1.14	
Group	Agriculture
Size	200+
Risk category	High
Incident category	Over-three-day injury
Job title of interviewee	H & S Officer
Total time spent on investigation	16 hours

Narrative

This organisation is a large farm. A tractor driver was required to take some waste to a dump. He was a fieldsman and he had never driven a tractor off the field before. The tractor connects to the trailer using hydraulic connections. There were two connections, one operated the brake and the other operated the tipping mechanism. The driver connected the brake to the tipping mechanism. He set off to the dump and pressing the brake, this operated the tipping mechanism dumping the waste on the road and causing the vehicle to come to a sudden halt. The driver banged his head and suffered analgesia as result of this incident.

Consequences

The injured party was off work for one week. The injured party returned to work but was removed from tractor duty. The tractor was out of commission for several days.

Inputs

The incident was investigated by the dedicated H&S Officer who spent two days on the investigation. The injured party was interviewed for 4 hours. In addition, a tractor mechanic (an expert) spent 4 hours mending the tractor.

Process

Once H&S Officer was advised of the incident he travelled to the site and took photographs. He aided in the recovery of the vehicles and conducted the interview with the injured party at hospital. Upon his return to the office, he completed the RIDDOR form and a covering letter describing the circumstances. The H&S Officer verbally informed senior management and the fieldsman responsible for this driver of this incident.

Conclusions and actions taken

The H&S Officer concluded that the driver was not competent and that he had made an error in connecting the two hydraulic mechanisms. Following the incident an interim work method was introduced whereby drivers were only allowed to connect one hydraulic mechanism whilst the vehicle was being driven and one whilst it was being tipped. This was eventually changed for a new connection method that did not involve hydraulics. There has not been a recurrence of this incident.

Lessons learnt

The interviewee wouldn't do anything differently if this investigation were repeated. He thought that the company had learnt not to assume that their employees are competent.

Case Study 1.15	
Group	Services
Size	200+
Risk category	Low
Incident category	Dangerous Occurrence
Job title of interviewee	H & S Training Manager
Total time spent on investigation	11 Hours

Narrative

This company is a wholesale organisation dealing with the building trade. It was a quiet Saturday morning and one of the staff had taken a forklift truck to re-fuel it. The company have fuel tanks on their premises but positioning the forklift for re-fuelling is quite difficult due to space constraints. As he moved the vehicle to the re-fuelling position, the forks on his forklift caught a 25 kW cable that was attached to the outside of the building. This cable was the mains power supply for the building and it knocked out the electricity in a half-mile radius of the site. The driver jumped clear of the forklift and was unharmed.

Consequences

Although the driver was unhurt in the incident he was sent to the doctor on Sunday and was diagnosed as suffering from shock. Following the incident all computers and telephones within the organisation were down for two hours.

Inputs

This dangerous occurrence was investigated by:

- The Site Manager (line manager) - 3 hours
- The H&S Manager - 8 hours

The H&S Manager had overall responsibility for the investigation. During the investigation the driver was interviewed for one hour, the assistant manager (another line manager) that was on duty at the time was spoken to for 1 ½ hours and the electricity company who had installed the cabling in were spoken to for one hour.

Process

The electricity company made the cable safe on Sunday. The H&S Manger was notified of the incident on Monday, carried out interviews detailed above, and examined the scene of the incident. The H&S Manager spoke to the electricity company to determine whether the cable should have been better protected. The H&S Manager completed the RIDDOR form and checked the license of the driver.

Following the investigation Senior Management were informed in a monthly report to the board. All members of staff at the branch were notified informally about the results of the investigation.

Conclusions and actions taken

The investigation concluded that the incident was not the fault of the company; the driver was properly certified and was driving with due care and attention. The incident was the fault of the

electricity company who had not adequately protected the cable with high impact plastic casing. As a result of the investigation all other sites were assessed for the same risk but were found to be safe. There has not been of repeat of this incident.

Lessons learnt

The interviewee felt that the company had leaned the importance of keeping an auditable system for the assessment of risk. If this investigation was repeated they would do nothing differently, except maybe to ensure that the H&S Manager is notified immediately even if this is at a weekend.

Case Study 1.16	
Group	Construction
Size	10-49
Risk category	High
Incident category	Major injury
Job title of interviewee	Safety Advisor
Total time spent on investigation	10 hours

Narrative

This construction company had received a lorry load of four metre cast iron pipes. They were contractors working for a large utility company. The lorry driver, a crane driver and a junior worker were unloading the pipes. The pipes were supposed to be delivered flat but had arrived on top of each other. As the junior worker attempted to hold the pipe, it began to roll over to the side. His thumb was trapped between a stationary pipe and the rolling one; the motion severed the top of thumb.

The company had had several problems in the past with the delivery of these pipes and the way in which the manufacturer had arranged them.

Consequences

He was taken to hospital, where he received treatment, but it was not possible to save his thumb. The junior worker required two weeks off work as a consequence of this incident. Once he had recovered, he returned to work and resumed his normal duties. Normal work processes were not really affected by this incident.

Inputs

The incident was investigated by:

- The Site Safety Advisor - 8 hours
- The Safety Officer (with non H & S responsibilities) - 2 hours
- The manufacturer of the pipes (an expert) was called for an opinion

In addition to the investigation team the following individuals contributed to the investigation:

- The injured party was interviewed for 45 minutes
- The two witnesses/co-workers were also interviewed for 30 minutes each

Process

Once the incident had occurred the Site Safety Officer (SSA) was informed. He carried out his investigation by examining the scene of the incident and interviewing those individuals listed above. In addition, he took photographs of the scene. Once he had completed his investigation he contacted the company's Safety Officer (SO) and informed him of the details of the incident and the outcome of his investigation. The SO then completed the relevant RIDDOR form and informed their insurance company of the details of the incident.

Once the investigation was complete, the SO advised the Contracts Managers, the Company Directors and other interested parties, which included the Utility and the Principal Contractor.

Conclusions and actions taken

The investigation concluded that the pipe supplier had not delivered the pipes in the manner that they should. This being the case the workmen attempted to unload the pipes as normal without thinking about the implications of the pipes being delivered in this manner.

The outcome of the investigation was that procedures and training should be reviewed and that there should be a meeting to discuss purchasing and safety. These actions were pending at the time of this interview.

Lessons learnt

The interviewee felt that lessons learnt about managing the condition of materials brought on site was an important one. He felt that there was nothing that the investigation had missed.

Case Study 1.17	
Group	Services
Size	200+
Risk category	Low
Incident category	Major injury
Job title of interviewee	National Operations Manager
Total time spent on investigation	3 hours

Narrative

One of the tasks carried out at this organisation is the slitting of coils of sheet metal into smaller coils as required by their customers. These coils of metal generally weigh around 20 kilograms. The process itself involves loading the cutting machine with the coils using a forklift. The machine uncoils the sheet metal, cuts it to size and then recoils the cut metal. The operative in charge of this task is then required to unload the metal by hand, weigh and pack the material (it is not possible to use devices such as magnets to manipulate these materials as the are generally non-metallic metals such as stainless steel or aluminium).

On this occasion the operative was rocking a coil from side to side on its spool (as he would normally do to remove it) when the coil began to slip. He instinctively tried to catch the spool as it fell. One of the sharp edges severed his little finger as he caught the spool. This organisation had had a similar incident about two years previously where a worker had lost the tip of a finger, again severed by a metal edge.

Consequences

The incident cost little in terms of upset to production, it was apparent that machinery had not failed, so once the injured party had been taken to hospital the process could restart. The individual concerned was taken to hospital to have his little finger repaired. He returned to work in the same role after six-twelve week's leave, but has subsequently left the organisation (a decision unrelated to this incident). His departure has meant that the company has been unable to follow the progress the injury to his finger although it is understood that there was considerable nerve damage.

Input

The investigation team consisted of:

- The Foreman (line manager)
- The Operations Manager (with health and safety responsibilities)
- The National Production Manager (senior manager)

The main responsibility lay with the National Production Manager who had overall responsibility for the site. He was aided in his investigation by the Foreman who had a full understanding for the work processes involved. The Operations Manager, who was responsible for H&S on the site, reviewed the investigation.

The Foreman spoke to the co-workers at that location to determine their version of events and at the first possible opportunity spoke to the injured party to determine the event sequence. The

injured party was spoken to for approximately ten minutes and his colleagues for about ten minutes as a group.

Process

This organisation had no documented investigation process. The investigation team looked at the circumstances surrounding the incident, made the site safe. They then conducted the interviews detailed above before reaching their conclusions.

Conclusions and actions taken

The investigation concluded that the incident was the operator fault, an instinctive reaction to try and stop the metal falling. The method for carrying out this task was reviewed, along with the corresponding risk assessment and both were deemed to be acceptable. There has not been a re-occurrence of this incident.

Lessons learnt

The interviewee felt that the company had not learned any lessons from this incident and would not have done anything differently if the investigation were to be repeated.

Case Study 1.18	
Group:	Services
Size:	50-199
Risk category	Low
Incident category:	Over-three-day injury
Job title of interviewee	H & S Specialist
Total time spent on investigation	4 hours

Narrative

This incident occurred in a private nursing home. Whilst two care workers were transferring a client from a commode back into bed, the client slipped. One of the care workers tried to steady the client and reported a back injury several days later. Lifting hoists are used to transfer some patients, however, in this particular case; the client's care plan did not require such mechanical aids to be used.

Similar accidents have been reported in the past. Manual patient handling is the main source of risk to staff and it was mentioned that if the patient input (which may be unpredictable) in the transfer fails, then the carers are put at risk.

Consequences

The injured party reported a back injury a week after the incident and was absent from work for 3 days. They did not require medical attention and returned to their normal working role. There were no adverse affects to working processes.

Inputs

The Matron (who had health and safety responsibilities) investigated the incident. She also telephoned a H&S consultancy (experts) with whom they have a contract for advice. The total time taken in the investigation was estimated at half a day, but it was stressed that this involved half-an hour here and there. She interviewed the injured party, the client and co-workers.

Process

The incident was reported in the Accident Book. The Matron interviewed the injured party, the client, the other care worker involved in the patient transfer and their two colleagues (who were not witnesses). There is no standard procedure for investigating an incident, the Matron would just make notes.

Conclusions and actions taken

The investigation concluded that the accident would not have happened had the care workers ensured that the client was wearing their slippers as required in the clients care plan (the reason being that the client slipped on the floor). Therefore, all care workers were reminded that clients should have appropriate footwear when being transferred. This client's care plan was also amended to stress this requirement. It was felt by the interviewee that the underlying causes have been addressed. No similar incidents have occurred since. The Proprietor (Matron's employer and manager) was informed of the incident.

Lessons learnt

The lessons learnt are the same as the conclusions, that all workers ensure that clients wear appropriate footwear during patient handling/transfer. The Matron would not do anything differently if repeating this investigation.

Case Study 1.19	
Group	Manufacturing
Size	10-49
Risk category	High
Incident category	Over-three-day injury
Job title of interviewee	General Manager
Total time spent on investigation	8 hours

Narrative

A fitter checking a newly installed unit was injured when his ladder, resting against a steel surface, slipped and he fell to the ground. He did not fall a great distance but landed awkwardly on his elbow. The ladder had not been tied off at the top, as the fitter only had a brief task to complete.

Similar incidents have occurred before, two cases where employees have been injured when a ladder that has not been tied off at the top has slipped.

Consequences

The injured party required medical attention to a badly damaged elbow and was off work for 4 to 5 months. He has now returned to work and resumed his normal role. The injured party has suffered permanent damage, as he cannot straighten his arm fully. There have been significant financial costs to this small company, as they were required to locate a temporary replacement for the injured party.

Inputs

The Service Manager (who had health and safety responsibilities) spent approximately one day investigating the incident, including an hour discussion with the injured party.

Process

The incident was recorded in the accident book. The injured party was interviewed and a statement taken from him. There were no witnesses in this case. There is no standard procedure, it was stated that all Managers are well educated and are used to writing reports. The company insurers do provide some guidance including a form to complete, listing the circumstances of the incident etc. The HSE subsequently conducted an investigation.

There are only 5 Service Managers in the company and they were all informed of the incident. Other people performing similar work were also informed.

Conclusions and actions taken

It was concluded that if a ladder is stood against a steel surface then it must be tied off at the top, and that this would have prevented the accident. The operator would usually tie off ladders for prolonged work but in this case he would only be working for a few minutes and so took a risk. The need to work safely at all times was reinforced and other personnel were made aware of the consequences of not securing a ladder when working at heights (including the fact that the injured party only fell from a short height and sustained a painful/serious injury).

Lessons learnt

Such unsafe behaviours (not tying off ladders) have been condoned by managers and it is recognised that line managers need to take more responsibility for ensuring such behaviours do not continue. No changes would be made to the investigation process if it were to be repeated.

Case Study 1.20	
Group	Mining / Utilities / Transport
Size	50-199
Risk category	High
Incident category	Dangerous Occurrence
Job title of interviewee	Quarry Manager
Total time spent on investigation	20 hours

Narrative

The use of explosives in the quarrying industry is widespread. On this occasion, the explosives being used by a particular quarry failed to detonate completely. In the quarrying industry this occurrence is termed a misfire. This is a hazardous situation (and is automatically classified as a dangerous occurrence under RIDDOR) because the explosives that did not detonate have to be recovered (this is the industrial equivalent of returning to a firework that has not gone off). The situation was made more hazardous (and the investigation more difficult) by the explosives that did go off, causing extensive rubble and an unstable surface. Similar incidents have occurred at this organisation, at least two known in the previous two years, and it is a recognised problem in the industry.

Consequences

There were no injuries to personnel, there was considerable lost production as the area had to be examined carefully to locate and initiate the unfired explosives.

Inputs

The investigation involved

- Two quarry managers (line managers)
- The shot-firer (an expert)

A selection of co-workers were involved in discussions.

Process

The quarry manager inspected the site and led the investigation, supported by the manager from a nearby quarry that had recently merged with his company. He determined which explosives had not fired, by determining broken links in the chain of a sequence of explosives. He also took photographs and interviewed the shot-firer. The incident was then discussed by the Safety Committee (composed of the two quarry managers, engineers, foreman and other quarry staff) and the minutes were recorded. This is standard company procedure, although the Operations Manager of the Group would be involved if the consequences were more severe.

The HSE were notified (all misfires are classed as a Dangerous Occurrence) and were involved in the investigation of this incident.

Conclusions and actions taken

In all such misfires, the causes are difficult to determine as some of the evidence is invariably destroyed. It was felt that this misfire was due to a manufacturing failure in the tube of explosive.

The interviewee noted that the industry, as a whole is unhappy with the method of detonation used in this incident, they want the HSE to insist intrinsically safer methods. Although the root causes may have been identified, the interviewee did not consider that a recurrence as would be prevented as the same type of initiation must continue to be used.

Lessons learnt

The interviewee stated that nothing would be done differently if the investigation were repeated. In addition, this is a specialised form of incident investigation and requires specific experience of the industry. The interviewee did feel, however, that formal training in accident investigation may be useful in order to help determine what to look for and what questions to ask.

Case Study 1.21	
Group	Services
Size	10-49
Risk category	Low
Incident category	Minor incident involving member of public
Job title of interviewee	Director
Total time spent on investigation	1 ¼ hour

Narrative

A child who was visiting this site with his family fell off a slide whilst unsupervised. The company had had similar incidents to this on other sites.

Consequences

The child required medical attention.

Inputs

The incident was investigated by the Site Warden (who responsibilities included health and safety), his investigation lasted for approximately one and a quarter hours. During the course of the investigation he took statements from the injured party's grandparents who witnesses the incident.

Process

The Warden examined the site and recorded details of the accident were put into the accident book. He rang the hospital to ensure that the injured party was not severely injured. Head office received a copy of the investigation and took steps to prevent recurrence.

Conclusions and actions taken

The interviewee felt that the underlying cause of the accident was a lack of supervision by the child's grandparents. The investigation concluded that the equipment was older than it would normally have been on other sites. As a result of the investigation procedures in general were revised and notices, advising of the importance of supervision, were placed on the playground. There have been no re-occurrences.

Lessons learnt

The interviewee felt that the company had learnt, through investigating this incident, that they should be generally more aware of the causes of incidents. If they were to repeat this accident investigation, nothing would be done differently.

Case Study 1.22	
Group	Construction
Size	10-49
Risk category	High
Incident category	Over-three-day injury
Job title of interviewee	Workshop Manager
Total time spent on investigation	4 hours

Narrative

The individual involved in this incident was working at a site where he had to remove some asbestos material to another location. Company procedure required him to cover the material with a sheet and netting to secure it during transportation. He was getting down from the back of the lorry having secured the netting when his hand slipped and he fell to the ground.

Consequences

The individual damaged his back in the fall. The incident happened in May 1999 and at the time of this interview he had yet to return to work. At the time of the incident he was taken to hospital and had his back x-rayed.

Normal work processes were not affected by this incident.

Input

The incident was investigated by the company's Workshop Manager (who had health and safety responsibilities). He spent approximately 4 hours on the investigation.

During the course of his investigation he spent ½ an hour talking to the injured party, a few minutes talking to the injured party's co-workers and ½ an hour discussing the incident with the site line manager.

Process

Once the Workshop Manager was informed of the incident, he travelled to the site. There, he conducted the interviews with the Site Manager and the other workers before examining the location of the incident and the loading procedure. He then travelled to the hospital to speak to the injured party.

This organisation have no defined procedure for investigating accidents, they use the RIDDOR form as their main record. This was completed following the steps outlined above.

Once the RIDDOR report has been completed the office administrator and the Managing Director of the company receive a copy. In addition, all drivers were informed informally of the reports findings.

Conclusions and actions taken

As a result of this investigation the risk assessment for this task was reviewed and the drivers were reminded that this task requires caution. It was also suggested that a mobile sheeting gantry should be used during the securing of sheeting or netting. However, the interviewee expressed

doubts about the practicality of such a step. He noted that this would be fine if a site was visited regularly, but would be difficult if a site visit was a one off.

Lessons learnt

The interviewee felt that the company were already aware that this was a dangerous task but could not watch over their employees constantly to ensure they were following best practice. He also mentioned that by showing the insurance company they were taking steps to make tasks safer (i.e. by introducing a gantry) this had a positive affect upon their insurance premiums.

He stated that he was happy with the investigation and would do nothing differently if he were to repeat it.

Case Study 1.23	
Group:	Manufacturing
Size:	10-49
Risk category	High
Incident category:	Over-three-day injury
Job title of interviewee	Quality & Safety Manager
Total time spent on investigation	16 hours (Approx.)

Narrative

An operator in a printing company was required, as part of his job, to handle very heavy cylinders (between 54 kg and 70 kg) in a confined space (inside a printing machine). There was not enough headroom to stand up and so handling was performed with a stooped posture. In addition, 6 smaller cylinders weighing 6-8 kg each were lifted every 20 minutes. The operator has complained of hip/elbow/groin/back problems.

No similar incidents have been reported in the company. Lifting hoists are available on similar equipment, and other equipment is higher (less confined) so a normal upright posture can be maintained when lifting.

Consequences

The injured party is suffering from manual handling injury sustained in 1998 and was initially off work for 10 days. They have returned to work but have been off work several times since the injury. They have received anti-inflammatory treatment from the GP and are awaiting a hospital appointment. The injured party has been employed on light duties since the incident in 1998, but has recently been instructed by the Factory Manager to perform normal duties due to increased production pressures.

Production has been affected, along with a great deal of management time associated with investigating the incident and the litigation against the company.

Inputs

The incident was investigated by:

- The Safety Manager
- The Supervisor (line manager)
- A specialist from the parent company spent one day examining the equipment.

The investigation has taken the Safety Manager several hours. The injured party, co-workers and Union Representatives have been interviewed in the investigation.

Process

The Safety Manager interviewed the injured party and co-workers and examined the machine where the injury occurred. He determined whether any similar incidents have occurred. There is no standard company procedure for investigation; the Safety Manager based the investigation on his own experience.

Conclusions and actions taken

The Safety Manager requested that the injured party be rotated onto light duties but the supervisor and Factory Manager refused this. The injured party was instructed not to perform any lifting himself but to request help from his colleagues (however, due to the frequency of lifting this was not practical). The company is examining possibilities to use lighter cylinders (fibre or aluminium ones are available), or a lifting hoist as used on other machines, but management is concerned about the costs of these. These recommendations were made over two years ago and are still being debated.

Lessons learnt

The Safety Manager is concerned about the case for compensation from the injured party and also from other employees carrying out similar work. He is also concerned that insurance premiums will escalate as a result and that management may face legal penalties. He reported that a lesson that management have learnt is to respect his advice, as he will fight for health and safety. Since this case, he has become more forceful in his dealings with management

Case Study 1.24	
Group	Manufacturing
Size	50-199
Risk category	High
Incident category	Over-three-day injury
Job title of interviewee	Works Director
Total time spent on investigation	1 ½ hours

Narrative

This organisation had hired an agency worker to operate one of their machines. The machine was designed to accept trays (prepared by the machine operator), and then cut the metal that had been arranged in the tray. The agency worker had been working on this machine for 6 weeks, he was considered to be quite experienced. On this occasion, the agency worker had left some pieces of metal on the side of the tray after he had finished preparing it. When the tray was pushed into the machine the machine head came down and cut the extra pieces of metal. This caused fragments of metal to be ejected from the machine at high speed. The metal hit the person's arm. The interviewee could not recall any similar incidents.

Consequences

The agency worker was taken to hospital for treatment and was away from work for 2 weeks. The agency worker did not return to the same company after this period. The company had to provide work cover to maintain production levels. In addition, there were costs associated with the spoilt metal materials.

Inputs

The investigation was conducted by:

- The Production Manager (line manager) - 45 minutes
- The Works Director (who had health and safety responsibilities) - 45 minutes

The Works Director had overall responsibility for the investigation. During the course of the investigation the injured party and team leader (another line manager) were interviewed for 10 minutes each. The team spent a total of 1 ½ hours on the investigation.

Process

The first-aider advised arranged for the injured party to be taken to hospital and alerted the production manager about the incident. The injured party was interviewed by the production manager. The team leader made sure that the area was kept clear and the investigation team inspected the machine and metal sheets. The details were entered into the accident book, the first aid sheet and the RIDDOR form.

The results of the incident investigation were communicated to the Managing Director to obtain approval for the recommended remedial actions. The results of the investigation were also discussed at the next Health and Safety Committee meeting.

Conclusions and actions taken

The investigation concluded that leaving metal sheets on the side of the tray was common practice, as it was convenient for the operator. The agency worker had forgotten that the materials were positioned on the side of the tray. The interviewee felt that the underlying causes of the incident had been identified.

As a result of the investigation, tables were put at the side of some of the machines to give the operators an alternative location for the metal. Information notices were put on the machines to raise awareness amongst workers of the importance of checking that the trays were clear before being placed in the machine. There had been no recurrence of the incident at the time of this investigation.

Lessons learnt

The interviewee felt that the company had learnt that it only takes one misjudgement to cause an accident. It the materials had been placed 1.5 inches in the other direction the accident would not have happened. The interviewee would not have done anything differently if the investigation could be repeated.

Case Study 1.25	
Group	Manufacturing
Size	200+
Risk category	High
Incident category	Major injury (Fatality)
Job title of interviewee	H & S Officer
Total time spent on investigation	4 hours

Narrative

The employee involved in this incident was transferring debris to a skip with the aid of a forklift truck (FLT). He lifted a metal bin, filled with the debris material using the FLT and a pallet. He raised the pallet to the level of the skip and climbed up onto the edge of the skip in to transfer the debris. At the top of the skip, he fell the distance of 2.5 meters to the ground and was knocked unconscious. The interviewee could recall other fall incidents off ladders, but never from a skip.

Consequences

The person was taken to hospital and died later of internal injuries to the head and chest. There was no effect on production as the activity he was performing was a secondary activity, disposing of waste.

Inputs

The Safety Specialist was involved in this investigation. Witnesses, first-aiders and the individual's line manager were all interviewed. The Safety Specialist spent half a day (4 hours) on this particular investigation of which two hours were spent conducting interviews.

Process

The site was sealed off and witnesses were interviewed. Photographs were then taken of the area and the HSE were contacted. Arrangements were made for changing the activity after discussion with the management. Statements were taken from the witnesses and a report was compiled. Statements from the interviewees were attached to this report. The information was passed onto Senior Management who reviewed the accident at the next monthly H&S Committee meeting. Staff, Line Managers and the deceased family were also given a copy of the report.

Conclusions and actions taken

The investigation concluded reached that the organisation's risk assessments for non-routine activities were inadequate and, as a consequence, an unsafe system of work had been permitted to continue.

After the investigation had been completed, the 40 cubic yard skip involved in this incident was replaced with a 20 cubic yard skip. Secondly, the type of bin used was changed to a tipping bin, removing the need to transfer the debris manually. A program for improvement of other hazardous activities via risk assessment was in the process of being implemented at the time of this interview.

Lessons learnt

The interviewee felt that this incident had taught the organisation the value of risk management systems and that theirs were not adequate. The Management were not aware of all the activities being carried out on the site. If this investigation were being repeated then formal interviews would have been conducted at an earlier stage.

Case Study 1.26	
Group:	Agriculture
Size:	200+
Risk category	High
Incident category:	Over-three-day injury
Job title of interviewee	Production Manager
Total time spent on investigation	2 ½ hours

Narrative

Whilst preparing a carcass for hanging a knife was used to cut the carcass and pull through some string that would enable the carcass to be suspended. An inexperienced employee performed this operation but neglected to remove the knife afterwards. During the quartering operation, that was conducted later, another employee pulled the carcass towards him. As he did so he cut his hand on the knife that had been left in the carcass. The interviewee could not recall any similar incidents, but cuts themselves were very frequent.

Consequences

The individual required medical attention at a hospital and took one week off work. Work cover had to be provided for the injured party.

Inputs

The investigation team consisted of:

- The Line Manager - 1 ½ hours
- H&S Representative - 1 hour

During the course of the investigation, they spent 1 ½ hours interviewing the injured party, a co-worker and the individual who had left the knife.

Process

The first-aider was called and the injured party taken to hospital. The accident was written up in the accident report book, the area was studied and interviews conducted. A HSE Officer, the injured party and the foreman were made aware of the results of the investigation.

Conclusions and actions taken

The investigators concluded reached that the employee that had left the knife in had been careless. The interviewee agreed and felt that the underlying cause of the accident was general carelessness. As a consequence of the investigation, training was given to the inexperienced operator. There have been no recurrences.

Lessons learnt

The interviewee felt that when training inexperienced operatives it is important to understand that they will need more training than an experienced person will. In addition, these staff require more supervision. If this incident investigation were to be repeated then nothing would have been done differently.

Case Study 1.27	
Group	Manufacturing
Size	200+
Risk category	High
Incident category	Over-three-day injury
Job title of interviewee	H & S Manager
Total time spent on investigation	3 hours

Narrative

This organisation usually uses Forklift Trucks (FLTs) to move pallets around their warehouses. However, one pallet had been inserted manually, this operation had caused a pallet to push out on the other side into the aisle between the stacks. One of the stacker drivers had driven up that aisle 4 or 5 times previously that day. On this occasion, he drove his FLT down the aisle and noticed the protruding pallet in his way. He braked suddenly to avoid it, in doing so he jerked forwards and banged his head on the back of the FLT as he fell backwards.

Consequences

The injured party required medical attention form a first-aider and a doctor. The worker required 5 days off work because of this incident. Production was halted for a short period; the only damage caused was a broken pallet. No products on the pallet were damaged.

Inputs

The investigation team consisted of:

- The supervisor responsible for this warehouse (line manager) - 1 hour
- A member of staff from human resources (who had health and safety responsibilities) - 2 hours

During the course of their investigation, both the injured party and the first-aider were interviewed. These interviews took 45 minutes in total. The total investigation took 3 hours of the team's time.

Process

The supervisor looked at the area and then talked to the driver and the first aider. He checked for witnesses but nobody had seen the incident. The supervisor examined the scene for damage to equipment. The information was relayed to the member of Human Resources staff who conducted similar enquiries. The Human resources staff interviewed the driver upon his return to work. The details of the accident were recorded on a piece of paper at the site and used to complete the companies internal form later.

Conclusions and actions taken

The investigation concluded that training for drivers should be reviewed, supervisor presence should be increased and pallets should no longer be manipulated manually. The interviewee considered that the underlying cause was a failure to follow procedures whilst the pallet was being pushed in.

The investigation recommended that training for drivers and supervision should be improved. In addition, attempts were make drivers more aware of pallets. There have been no recurrences.

Lessons learnt

The interviewee felt that the main lesson, learnt from this incident, was that training in investigation is needed. Specifically a more structured process to get the right questions asked at the right level. If the investigation were to be repeated then the safety staff would have liked to be included in the process.

Case Study 1.28	
Group	Agriculture
Size	50 –199
Risk category	High
Incident category	Over-three-day injury
Job title of interviewee	Operations Director
Total time spent on investigation	22 hours

Narrative

A cheese-packing operator took the guarding away from a machine in order to change a cog. The operator did not isolate the machine before taking off the guarding. When the chain was returned to the new cog he caught his finger.

Consequences

The injured party was away from work for six weeks and required hospital treatment for his injuries. Production was unaffected by the incident.

Inputs

The incident was investigated by the following individuals:

- The Packing Room Manager (line manager) - 20 hours
- The Quality Assurance Manager (who had health and safety responsibilities) - 2 hours

During the course of the investigation the team spent six hours interviewing the injured party (3 hours) and 2 co-workers (1 ½ each).

Process

The co-workers were asked to explain how the incident had happened. The injured party was then asked for his version of events. Preventative measures were put in place immediately to stop recurrence. The accident was completed, along with the HSE paperwork by the investigation team. The investigation findings were discussed with the Managing Director at a quarterly board meeting.

Conclusions and actions taken

The investigation team concluded that the individual was at fault, as he had not followed instructions for maintaining the machine. The company did not feel they had done enough as employers to train the individual informally and provide high visibility signs.

As a result of the investigation the company put up signs to remind the operators to isolate machines before removing guarding. In addition, a visual system was set up to indicate when a machine has been isolated.

Lessons learnt

The interviewee felt that the company had learnt that they shouldn't take for granted that everybody is doing what they have been instructed to do. If the investigation were to be repeated nothing would be done differently, the interviewee felt that they had a 'textbook' investigation system that reached logical conclusions.

Case Study 1.29	
Group:	Services
Size:	10-49
Risk category	Low
Incident category:	Minor incident involving member of public
Job title of interviewee	Practice Manager
Total time spent on investigation	3 hours

Narrative

An elderly member of the public walked into the surgery and fell as she came through the doorway. There have been other instances of people slipping on this floor; this is particularly difficult to guard against when children are in the surgery area.

Consequences

The injured party was taken to hospital. Work processes were adversely affected as the doctor and nurse had to see to the injured party and could not see other members of the public awaiting surgery time. They also had to wait with the injured party while the ambulance arrived.

Inputs

The Practice Manager (who had health and safety responsibilities) was involved in the investigation. The injured party's daughter, who was a witness to the incident, and co-workers were interviewed for approximately 10mins. In total, the Practice Manager spent 3hours on the investigation

Process

The Practice manager notified the cleaning company responsible for the floor area and inspected the area. The injured party's Daughter and the surgery staff were interviewed to make sure to try and ascertain what factors had contributed to the fall. Details were entered in the accident book and an internal report form completed, this included sections on:

- The type of incident
- The person involved
- Outcome of the incident
- A description of what had happened
- Treatment received
- Names and addresses of the witnesses.

Details of the incident were considered at the next Health & Safety Committee meeting and the conclusions were disseminated amongst the Doctors and Staff involved in the incident.

Conclusions and actions taken

The investigation concluded that more notices should be put up to raise awareness of the slipping potential.

The interviewee felt that this incident had several potential causes underlying causes. No matter how careful you are with older people there is still a chance that they may fall. There is an

argument that maybe if the District Nurse had gone to see this particular injured party at home then she wouldn't have slipped but this is very difficult issue due to time and resources available.

As a consequence of this investigation, more signs were put up in the area to raise awareness. There have been no recurrences of this particular incident. They have a new policy requiring "slippery floor" signs to be put up if liquid is spilt.

Lessons learnt

The lessons that the company felt they learnt as a result of investigating this incident was how vulnerable the organisation are to this type of accident and how careful they need to be to stop this occurring. If this accident investigation were to be repeated then the organisation's new reporting form would be used.

Case Study 1.30	
Group	Mining / Utilities /Transport
Size	200+
Risk category	High
Incident category	Dangerous Occurrence
Job title of interviewee	Health and Safety Officer
Total time spent on investigation	16 hours

Narrative

The employee involved in this incident was operating a machine that was excavating sand and gravel. The jib line on the machine had a bucket attached to the end, this allowed the gravel to be loaded into a hopper. The bracket that attached the jib line to the body of the machine snapped on one side. Then the increased pressure on the other side caused that side to break as well. Fortunately, there was nobody else in the vicinity and the jib line fell to the floor. The machine had been in service for 14 years and the company had not experienced any incident similar to this in the past.

Consequences

The machine was taken out of service and the production line was not worked for 1 week. A replacement machine was available which was used for 5 months. However, this machine was a spare and was not as effective as the original, consequently production rates were affected. A new jib line also had to be purchased before the machine could re-enter service.

Input

The following individuals were involved in the investigation:

- Production Manager (senior manager) - 8 hours
- The Health and Safety Officer - 8 hours
- Technical experts

The operator (involved party) was interviewed and technical experts were used to establish the cause of the jib line collapsing. In addition the suppliers were informed about the incident. Those investigating the incident spent a total of 2 days on this incident. The operator and the technical expert were interviewed for 1 hour.

Process

The operator informed the production manager at the site of the incident. Photographs of the area were taken and the technical expert (engineer) was involved. The details were entered into the first aid book. The engineer established when the machine was last serviced and what was involved in this service he also made sketches. He checked the other machines to see if there was any damage. The supplier was then contacted to illustrate what had happened and to secure further information. Finally, the incident was written up on a blank sheet.

The Managing Director was informed about what had happened. The manufacturers were informed and used the information to compile a service bulletin that was issued to owners of that

type of machine. The secretary used the information to liase with the insurance company, and to complete the RIDDOR form.

Conclusions and actions taken

The first conclusion reached as a result of the investigation, was that it was a manufacturing problem. This second conclusion was that machines must have regular inspections by a competent person. It was not clear if there was undue pressure on the area that had caused the cracks, or if there were metal flaws. The area of fatigued metal was exposed to grease and dust that could hide any cracks.

The investigation findings resulted in a service bulletin being issued by the supplier. This advised that if a machine develops a crack it should be stopped, should not be re-welded and a new jib should be fitted. There has been no recurrence of this sort of incident.

Lessons learnt

The interviewee felt that the investigation had highlighted the need for regular inspections. If the investigation had to be repeated nothing would be done differently.

Case Study 1.31	
Group	Manufacturing
Size	50-199
Risk category	High
Incident category	Major injury
Job title of interviewee	Production Manager
Total time spent on investigation	2 ½ hours

Narrative

The Production Operator involved in this task was cutting rubber sheets. He held one end of the rubber sheet as it came out from the mill at arms length, above his head. He free hand to cut off the sheet from the roll. As the operator got to the top of his reach, he dislocated his shoulder.

Consequences

The injured party was taken to hospital where the shoulder was re-located. He was away from work for three days. Work cover for the injured party had to be provided during that time.

Inputs

The Production Manager, who was also the Safety Representative, spent 2 ½ hours conducting the investigation. A sports injury specialist was also involved in establishing the cause of the injury.

As part of he investigation the injured party and co-workers were interviewed for 1 hour.

Process

After the injured party had been taken to hospital, the Production Manager interviewed the co-workers and interviewed the injured party when he had returned to work. The injured party was sent to a sports injury specialist assessment centre. He had not previous dislocated this shoulder and was deemed fit to return to the same job. The dislocation could not be linked directly to his work. The details of the incident were typed up on a blank sheet.

A copy of the report was sent to the Managing Director and the Administration Director.

Conclusions and actions taken

The investigation concluded reached was that there was no evidence to suggest that the operator's work had caused the accident. The interviewee did not feel that the root cause was identified. No actions were taken as a result of the investigation.

Lessons learnt

The interviewee did not feel any lessons were learnt from this incident and nothing would have been done differently if the investigation had to be repeated.

Case Study 1.32	
Group	Mining / Utilities /Transport
Size	50-199
Risk category	High
Incident category	Over-three-day injury
Job title of interviewee	Traffic Manager
Total time spent on investigation	8 hours

Narrative

A driver of a mini bus with specialised tail lift equipment fitted felt a twinge in his back as he was operating the machinery. The driver had lowered the tail lift using a motorised hand control, he then lifted out the two guard flaps manually. It was at this point that he felt a pain in his back. At this stage he carried on working. Later on in the day, the pain in his back began to worsen. At this stage, he left to consult a doctor.

Consequences

The driver required 3 weeks sick leave. Work cover was provided by paid overtime.

Inputs

The investigation team consisted of:

- The Line Manager - 7 hours
- The Traffic Manager (who had health and safety responsibilities) - 1 hour

During the course of the investigation, ¼ hour was spent interviewing the injured party.

Process

The investigation team completed the accident book, then examined the task that the driver was performing. They also checked the vehicle. Using this information the team decided upon remedial actions. The details of the investigation and its outcome were filed away.

Conclusions and actions taken

The investigating team reached the conclusion that the driver was operating the vehicle incorrectly. The interviewee felt that the underlying cause was that the large build of the injured party, his size making him more susceptible to this type of injury.

The investigation recommended a method for using the guard flaps down, one that would eliminate the sort of reach that had led to the injury in this case. The new procedure required that the driver to position one guard at a time. Training on the correct procedure was given to all drivers. There had been no recurrence at the time of this interview.

Lessons learnt

The interviewee felt that the company now appreciated the worth of teaching individuals to do things properly, particularly if time off through injury is reduced. If the accident investigation were to be repeated then a new system, implemented since this incident, would be used. This involves more documentation of the investigation process.

Case Study 1.33	
Group	Services
Size	10-49
Risk category	Low
Incident category	Minor incident involving employee
Job title of interviewee	Human Resources Manager
Total time spent on investigation	1 hour

Narrative

One of the waitresses at this hotel was clearing tables of glasses using a tray. She walked through some swinging doors on the way to a washroom. As she walked past a work surfaces the tray was knocked and the glass on the tray fell on the floor. The glass bounced off the ground and cut her leg. The interviewee could not recall any similar incidents.

Consequences

First Aid treatment was given, but the injured person was able to continue working immediately.

Inputs

The following individuals were involved in the investigation:

- The Restaurant Supervisor (who had health and safety responsibilities) - 30 minutes
- The First Aider who attended to the injured party - 30 minutes

During the course of the investigation the investigation team spent 15 minutes talking to the injured party, a Chef and a kitchen porter who witnessed the incident. The investigation took a total of one hour.

Process

The investigation team examined the scene of the incident and the task that had led to the injury. They looked at what happened when the person came in with the tray and what could make it awkward. The details of the accident were recorded in the accident book. The General Manager and the Food and Beverage Manager were informed about the incident. They used this information to suggest remedial actions.

Conclusions and actions taken

The interviewee felt that the underlying cause was identified. After the investigation, the team recommended that work organisation should be changed. It became the porter's duty to keep the place tidy. Empty plates and glasses were now no longer stacked on the side, instead they were put straight into the cleaning machine as they entered the kitchen. In addition, glasses were now stacked differently. There had not been any recurrences of this particular accident at the time of this interview.

Lessons learnt

The interviewee felt that the company had learnt that accidents can occur at any time, and cannot always be prevented. This incident, along with others, have led the company to make Health & Safety a priority focusing on maintenance issues, to be more vigilant to situations and spend more time on H&S induction sessions. If this accident investigation were to be repeated then someone would be made formally responsible for the investigation, as currently there is no set structure.

Case Study 1.34	
Group:	Services
Size:	50-199
Risk category	Low
Incident category:	Over-three-day injury
Job title of interviewee	H & S Advisor
Total time spent on investigation	4 hours

Narrative

The injured party was on work experience from an agency, on a job scheme. He went into a warehouse to select a blade from the shelving at floor level, requiring him to adopt a kneeling position. Whilst doing so, he knocked some other blades on a shelf behind with his feet or back and then turned around to try to stop them from falling. The injured party tried to hold the blades (that were stored upright), but they are extremely heavy and crushed his hand between the falling blades and the racking (shelves). There was no damage to equipment or products. Similar incidents have not been reported, but they do have occasional accidents where fingers are nipped between two blades. It was noted that most of the blades are stored flat, except this shelf where they are stored upright.

Consequences

The injured party did not suffer any long-term damage, but was signed off work for four weeks. As the employee was temporary, his contract ended before he was able to return to work. However, he did obtain employment elsewhere.

Inputs

The following individuals were involved in this investigation:

- The Health and Safety Officer - 2 hours
- Two Safety Representatives - 1 hour each

½ hour was spent interviewing co-workers and ¼ hour interviewing the injured party.

Process

First aid was applied on site and then the injured party was taken to the local hospital ER. Two co-workers (who applied first aid) were interviewed on the day of the incident, but there were no direct witnesses. One of these co-workers completed an initial Accident Report Form. The injured party was interviewed two days after the incident by the Health and Safety Officer in order to confirm what had happened and to try to prevent a recurrence. The Health and Safety Officer made notes when investigating and then wrote them up later on a computer. The Health and Safety Officer uses his experience and NEBOSH Certificate training to help him complete the accident report form. It was stated that the company does not have very many accidents and so they do not have a requirement for a more structured approach.

The accident was reported to the Operations Manager (the Health and Safety Officer's manager) who in turn reported the incident to senior management at the monthly Board Meeting.

Conclusions & actions taken

Dividers were produced for the shelving to ensure that the stored blades would remain in the upright position. It was stated that the root causes had been identified and that the action taken would prevent a recurrence.

Lessons learnt

The interviewee stated that these are covered in the conclusions above and that the dividers produced would prevent a recurrence. It was a short-term cost, but worth it as it would prevent it happening again.

Case Study 1.35	
Group	Manufacturing
Size	10-49
Risk category	High
Incident category	Minor incident involving employee
Job title of interviewee	Support Manager/ H&S Rep
Total time spent on investigation	Unknown

Narrative

A young male employee reversed a company pool vehicle (van) into the side door of another employee's car in the company car park. The other employee was in their stationary car at the time of the incident.

There have been several previous incidents where employees' vehicles have been damaged in the company car park. However, none of these incidents had been witnessed nor had anyone owned up to causing the damage.

Consequences

There was severe damage to the car door, requiring replacement, but no personnel injuries.

Inputs

The driver was interviewed by a team composed of:

- Immediate Supervisor (line manager)
- The H&S representative
- The Factory Manager (senior manager)

The interviewee could not specify how long each individual spent on the investigation. This team approach was used to prevent the likelihood of personal attack. The first two interviewers witnessed the incident. Co-workers were also interviewed.

Process

Several members of the company, including our interviewee and at least two others, witnessed the incident. The investigation was therefore very straightforward. The team above held a brief meeting to decide what action to take prior to interviewing the driver involved. He did not deny that he caused the damage in the previous two incidents. The incident was reported in the Accident Book. There is no formal procedure for carrying out an investigation and no form for recording the results of an investigation.

Conclusions and actions taken

The young driver was required to take refresher lessons in driving, particularly with regard to reversing and manoeuvring vehicles, before he would be allowed to drive company vehicles again. The company was concerned that the driver may have been responsible for the damage to other parked vehicles on at least two previous occasions.

Lessons learnt

Following this incident, it was recognised by the company that practical training may be required for all staff that drive company vehicles. It was recognised that visibility is impaired when manoeuvring these vehicles and that they are not the same as driving a normal car. The interviewee acknowledged this could have been foreseen and that training in driving these vehicles should have been provided.

Case Study 1.36	
Group	Manufacturing
Size	250-300
Risk Category	Low
Incident category	Minor incident involving employee
Job title of interviewee	Health and Safety Manager
Total time spent on investigation	9 days

Narrative

The work being carried out was the refurbishment of a Scottish Hydroelectric power station. 5 miles from the station there is a gatehouse with two gates that control the flow of water from the dam to the power station. A work permit was obtained to carry out electrical work to the lighting at the gatehouse. When this work was completed the electrician proceeded to undertake electrical work on the gate controls without obtaining a permit. This was discovered later in the week at a progress meeting.

Consequences

The incident was treated as a near miss and investigated at the request of the customer.

Inputs

- The Health and Safety manager took overall responsibility
- The site manager (who had health and safety responsibilities)
- Safety Rep
- The customer

Including travelling time for the Health and Safety Manager from the Midlands to Scotland the time involved was 9 days. The HS manager took responsibility as his duties required it, the site manager was involved as he was responsible for health and safety at the site.

Process

None of the investigators had any training in accident investigation or Root cause analysis. The process consisted of asking those involved what had happened and scrutinising the permit system of the customer. A report was produced by the investigation team and verified by those involved.

Conclusions and Actions Taken

The work should not have been carried out without a permit, the electrician opted for expediency – he simply didn't want to return to the station to fill out another permit form. The site manager condoned the electrician's actions. The interviewee felt that the underlying causes of the incident had been identified (however there was no mention of poor work planning in the conclusions). The incident and results of the investigation were reported to senior management (project manager) at head office and to the customer.

Workers were reminded about the importance of following of permit systems. More supervision is now given to sub-contractors (although in this incident the supervisor actually condoned the actions taken). The site manager was switched to a different role and the electrician given a

written warning. The electrician received induction training again and an additional course on permit systems. The incident was discussed at toolbox talks.

Lessons Learnt

The interviewee felt that the organisation had learnt the importance of reviewing procedures to prevent the recurrence of incidents.

Case Study 1.37	
Group	Manufacturing
Size	60
Risk Category	High
Incident category	Over-three-day injury
Job title of interviewee	Operations Manager
Total time spent on investigation	4-5 hours

Narrative

This incident involved the operation of a printing machine. The printer was being operated by a senior printer and a print assistant, the task being carried out was to check a print roller for dirt by wiping the roller with a cloth. The print assistant lifted the guard with the machine still running, his hand was dragged into the machine. He sustained a crush injury to his hand and was sent to hospital for two days. It subsequently transpired that another printer had removed the safety mechanism from the machine two months earlier to enable the guard to be lifted with the machine running. A similar, less severe injury had been recorded previously although this occurred when the machine was in 'inching' mode rather than when safety systems were being bypassed.

Consequences

Production was unaffected by the incident other than the 15 minutes it took to reinstall the safety mechanism that connects the guard to the printer. The print assistant returned to work after 6-7 weeks.

Inputs

- Operations Manager (who had health and safety responsibilities)
- The Production Manager (line manager)
- Director (senior manager)
- HSE Factory Inspector (an expert)
- Equipment manufacturer

The investigation took a total time within the company of 4-5 hrs.

The production manager was involved as he disentangled the man from machine; the company director liased with the HSE on the issue. The factory inspector was called in because of the severity of the injury and the equipment manufacturer was consulted to see if the design could be improved to prevent the recurrence of the incident.

Process

The investigation involved observation of the scene and talking to the injured party and co-workers (i.e. the printer and the print assistant and confirming the findings with printers on other shifts). None of the investigators had any formal training in incident investigation. The company uses guidelines from an independent consultancy that provides advice and recommendations on safety issues. Although the operations manager was aware of root cause analysis no particular structure had been used for the investigation. He was of the opinion that a checklist of potential causes could have made the investigation more comprehensive. The nature of the incident appeared straightforward and not to require an in-depth investigation. The factory inspector gave

the company advice on improving their safety checks on equipment and installing a system to monitor and record safety checks.

Conclusions and Actions Taken

The primary conclusion of this investigation was that management were not aware that safety systems were being breached. This led to the implementation of a new safety monitoring system of all safety critical equipment. It highlighted a need for more awareness of safety and a clear message from the management that in no circumstances must safety mechanisms be removed. In this case the injured party was not disciplined, but the person who had initially removed the safety mechanism was given a written warning and given a different role within the organisation.

Lessons Learnt

The interviewee felt that RCA would have made the investigation more comprehensive although he was of the opinion that the root causes were identified. The immediate cause of the incident was obvious and the motivation for bypassing the safety mechanism was expediency. If the factory inspector had not been called in they may not have realised the importance of checking the safety mechanisms and relied on reinforcing the importance of using the guards properly.

Case Study 1.38	
Group	Manufacturing
Size	50-199
Risk Category	High
Incident category	Minor incident involving employee
Job title of interviewee	Quality Manager
Total time spent on investigation	1 hr

Narrative

A technical author was preparing an operating and maintenance manual for a customer. Included in this are manuals from the equipment suppliers and these are often of varying sizes that need to be trimmed to fit. He had to trim down some sheets to fit in the folder and to do this he laid the paper on the table and ran a sharp knife along a ruler. The ruler had a bevelled edge facing upwards and the knife slipped and cut his finger.

Consequences

The man was seen by a first-aider who applied a plaster, no time away from work was required.

Inputs

The injured party was seen by a first-aider, the quality manager (who was responsible for Health and Safety) carried out the investigation.

Process

The investigation process was simply one of talking to the injured party as the interviewee felt that this incident was very straightforward and unlikely to recur. In more complicated incidents the process involves:

- Talking to those involved and technical experts
- Gathering statements as appropriate
- Fill in accident reporting form (primarily to involve them in the process rather than to collate information
- Looking at the incident site and equipment

This is the standard protocol for investigation although it was not a written procedure

Conclusions and Actions Taken

The conclusions drawn were that the ruler was an inappropriate tool for the task and that there had been a lapse of attention. There was no mention of buying a guillotine as a potential remedial action.

Lessons Learnt

None

Case Study 2.1	
Group	Services
Size	50-199
Risk category	Low
Incident category	Over-three-day injury
Job title of interviewee	H&S Manager/Project Supervisor
Total time spent on investigation	3 hours

Narrative

This organisation provides aviation research for most of the major companies in this sector. They have a wind tunnel, which is used in this research. On this occasion, three Model Riggers were fitting an aeroplane model to a wall-mounted fixture in preparation for wind tunnel testing. At this particular stage of the process it was necessary to rotate the model 180 degrees. The fixture prevents the model from rotating using a clamp. To rotate the model it is necessary to rotate the clamp.

This model was unusual in that it was offset from the usual axis of rotation. During the operation one model rigger was detailed to remove the clamp and the other two were supposed to guide the plane's motion. The offset nature of the model meant that when the clamp was released the model moved quicker than expected. A sharp edge on the model cut into one of the model rigger's arms caused a deep wound.

Whilst the offset nature of this plane was recognised as a danger (around 1 in 5 models were shaped in this manner) there hadn't been any previous injuries.

Consequences

The rigger was taken to hospital and then referred to specialist hospital as it was felt that there was the likelihood of tendon damage. The injured rigger needed to take three days off work because of this incident. He returned to work in the same role he had fulfilled previously. Work processes were only affected for the period of time it took to take the injured party to hospital and whilst a quick assessment of the incident took place.

Inputs

The incident was investigated by:

- The H&S Manager - 2 hours
- The Senior Rigger (an expert) - 1 hour

During the course of the investigation the following individuals were interviewed:

- The injured rigger - 1/2 hour
- The third rigger (a co-worker) - 1/2 hour
- Other Co-workers - 10 –15 minutes in a group
- The Departmental Supervisor (line manager) - 10-15 minutes

Process

Following the incident the H&S manager attended the scene. Assisted by the senior rigger, he took statements from the relevant individuals detailed above, with the exception of the injured rigger who was interviewed upon his return to work. He spoke to the departmental supervisor to try to establish whether any work pressures (e.g. time) may have influenced the performance of the riggers.

The RIDDOR form was completed and the company's own accident form filled in by the H&S Manager. This led to recommendations being made. The findings of the report were communicated to the company's six safety representatives and to the H&S manager's immediate manager. In addition, the findings and recommendations were discussed at the next H&S meeting (which occur every six months).

Conclusions and actions taken

The investigation concluded that the individuals should have been using gloves during this operation and that models should not rotate freely when the clamps are removed.

Because of this incident, an interim measure was introduced stating that all offset models should be mounted onto a fixture where the rotation could be controlled. The company had five wall fixtures one of which had a hand rotation device; this was to be used for offset models. It was also recommended that all fixtures should have a controlled rotation mechanism; this requires an engineering modification and was subject to review at the time of this interview.

In addition to these equipment modifications, a memo was circulated to all riggers reminding them to wear gloves during operations of this sort.

Lessons learnt

The interviewee felt that this incident had reinforced to the company the importance of PPE. He acknowledged that riggers were reluctant to wear gloves, because a great deal of the work conducted by riggers requires fine manipulations of equipment. He was happy with the investigation and stated that if the investigation could be repeated he would do nothing differently.

Case Study 2.2	
Group	Manufacturing
Size	200+
Risk category	Low
Incident category	Over-three-day injury
Job title of interviewee	Dedicated health and safety manager
Total time spent on investigation	49 Hours

Narrative

The interview was carried out at the headquarters of a facilities management and maintenance company. However the company has also spread into a number of other diverse areas including:-

- Distribution of domestic /industrial lubricants
- Building maintenance
- A mobile emergency fleet (servicing and equipment testing)
- Installation and maintenance of IT systems
- Building refurbishments

The incident involved an employee (a service engineer) who, together with a colleague was carrying out work on a large steel (2 ton) hanger door prior to the warehouse site being vacated by the current tenants. The work involved welding the door shut and lowering the counterweight. Having checked the cables controlling the door were not taut, the employee cut through them in order to lower the counterweight to the floor. The employee intended to release the footbrake one notch at a time to safely lower the counterweight. However, as he activated the brake, and it released, the weight began to fall and the winding handle spun out of control. The brake failed to engage and the counterweight fell to the ground. The handle came away from its shaft, striking the employee and causing injury. The retaining bolt on the handle was tight but proved not capable of holding the handle.

This particular piece of work was being carried out by this company on behalf of another facilities management company.

Consequences

The employee was badly injured in the lower leg. He was taken directly to hospital where he was admitted. Following surgery he was kept in hospital for 2 weeks. He had not returned to work at the time of the interview and was expected to be away from work for at least 6 to 12 months.

Inputs

The incident was investigated jointly by the facilities management company and the company involved in the interview. The investigation team included:

- Line Manager
- Senior Manager
- Health and Safety Officer
- Safety Rep
- An expert from the facilities management company

Both the injured employee and his colleague were interviewed during the course of the investigation, as was their immediate line manager.

Process

The investigation was led by the company health and safety manager working jointly with the facilities management representative. A lengthy visit was paid to the site and the door was closely examined. Numerous photographs were taken for reference and witnesses and immediate line managers were interviewed. The company does not have any formal process for identifying immediate and underlying cases. The health and safety manager reported that "he does not like checklists" – he considers they lead to a "closed mind". He uses the basic structure of the HSE RIDDOR form to structure his reports and follows up relevant lines of investigation as they present themselves. The internal accident report form is limited, however the impression gained in the interview was that the investigation process was carried out thoroughly and systematically.

Conclusions and actions taken

The following conclusions were reached following the investigation: -

1. It was not possible to lower the counterweight safely using the brake
2. The mechanism for securing the winding handle to the spindle of the winding gear was of crude design
3. The retaining bolts were worn
4. No information had been made available concerning construction of the doors

With hindsight, the interviewer suggested that the method used would have been perceived as safe, since the worst that could happen would be that the weight would fall in the cage in a controlled manner.

After the incident all work on the facility was suspended. A review was carried out by the company and the facilities management company as to the methods which were used to assess the risks associated with the work they undertake. Now when an unusual piece of work is undertaken the company health and safety manager, or the facilities manager health and safety manager, visit the site and carry out a specific pre-job risk assessment.

Following the incident, details were widely circulated to directors, senior and line managers and to employees through the safety bulletin and site team briefings.

Lessons learnt

The interviewee felt that the company had learnt not to put their employees at risk to satisfy the client and that questions should be asked if the job seems unusual or different from routine tasks.

Case Study 2.3	
Group	Mining / Utilities / Transport
Size	50-199
Risk category	High
Incident category	Over-three-day injury
Job title of interviewee	Workshop Manager
Total time spent on investigation	6 hours

Narrative

This organisation provides transport vehicles. An individual within the engineering department was carrying out a "drop test" on a vehicle battery. The engine was running but it was "over charging", this process means that gases are given off by the battery. The "drop test" caused a spark to be generated. This subsequently caused a small explosion of the gases (mostly hydrogen) being given off by the battery.

Consequences

After the ignition, the battery exploded. The engineer received chemical burns from the battery acid, and lacerations. He was taken to Accident and Emergency but was not kept in. He required a week off work to recover from his injuries.

Inputs

Two individuals were involved in this investigation:

- A Vehicle Electrician (who was the safety rep and First Aider) - 3 hours
- The Workshop Manager (who had other health and safety responsibilities) - 3 hours

They interviewed two witnesses who were in the area at the time, the injured person when he returned to work and other depots.

Process

The investigation team took photos and examined the scene, tools and equipment. Other depots were asked if they used the same equipment and whether they had had similar incidents (none had). The battery was sent to the suppliers for analysis but no results were received.

Conclusions and actions taken

The person involved was disciplined, as he was a trained electrician and should have known not to carry out the test whilst the vehicle was over charging (although it is not clear to the interviewer how he should have known this).

The equipment for carrying out a drop test has now been replaced for a new design that does not cause a spark. All depots are now using this new equipment.

The company procedures had always stated that safety equipment must be worn, but it never had been. This incident has highlighted the need for the equipment, and compliance has improved considerably.

Lessons learnt

The interviewee felt that this incident had reinforced to the workshop management the importance of procedure checking, in particular that they are being followed.

Case Study 2.4	
Group	Services
Size	200+
Risk category	Low
Incident category	Minor incident involving employee
Job title of interviewee	HSE co-ordinator
Total time spent on investigation	4 hours

Narrative

This incident occurred at a fuel terminal. The operator was bringing in rail trucks for offloading. As trucks were moving in, a barrier (usually across track but lifted at the time for access) was blown by the wind and started to fall into path of train. A contractor, employed full time in this activity, ran to replace the barrier before the train hit it. He was too late and the barrier sprang into his path and hit him on the chest.

At the time of the incident, the contractor was supervising the train entering the terminal and noting truck numbers as they went past.

Consequences

The person was bruised but was fit enough to finish the shift and return to work the next day. No time was lost, except for a minor delay in unloading the train.

Inputs

The two individuals involved in this investigation were:

- The Senior Supervisor (who had other health and safety responsibilities) - 2 hours
- The Acting Supervisor (line manager) - 2 hours

This is as per company procedures that require two people to investigate all incidents. They interviewed the injured party and the railway staff (co-workers). They checked the records of hazard logs to find out why the barrier had fallen. They also examined the barrier itself for defect.

Process

The company incident report form was completed. This is quite comprehensive and nothing further was required for this incident, based on its severity.

Conclusions and actions taken

The immediate cause was found to be a loose base on the barrier. This had been reported previously but no action had been taken. The barrier was repaired.

During the incident the trains emergency brake did not function properly. Although this did not cause the incident the company instructed the railway company to investigate this and it was found to have an intermittent fault.

Lessons learnt

The interviewee felt that this incident highlighted how incidents can happen, even during tasks which have been performed many times before without a problem. It also highlighted the importance of taking action once faults have been reported in hazard logs.

Case Study 2.5	
Group	Construction
Size	200+
Risk category	Low
Incident category	Major injury (Fatality)
Job title of interviewee	Regional Safety & Environmental Manger
Total time spent on investigation	92 hours

Narrative

This company is a construction organisation. On this occasion they were working for a pre-cast concrete floor installing company. There were two people working together, a crane driver and a banks man. The banks man was working on a piece of steel work six meters above floor level. He was wearing a safety harness, lanyard and safety helmet. The harness was not connected. At the time of the accident he was standing on the bottom flange of a steel 'I beam'. The 'I beam' had been sprayed with a light oil preservative. The banksman slipped on the beam and fell to the ground six meters below. His helmet came off during the fall. An ambulance arrived 8-9 minutes later.

Consequences

The banksman suffered fatal injuries and was pronounced dead at the scene. The work area was frozen for a week.

Inputs

The incident was investigated by a large team:

- The Site Manager (senior manager) - 4 hours
- The Foreman (line manager) - 8 hours
- Safety Officer (80 hours)

The bulk of the investigation was conducted by the regional Safety Officer who spent ten days on the investigation. In addition the insurance company were represented.

During the course of the investigation the investigators interviewed the crane operator (involved party) and two co-workers for about an hour each.

Process

The investigation team collated the evidence from the scene of the incident and the interviews into the company's investigation form. The HSE were notified and conducted their own investigation, as did the sub-contractors. Senior Management was informed, H&S Committee discussed the incident and the Director of the organisation was notified

Conclusions and actions taken

The investigation concluded that the incident had been caused by human error. The banks man had been reprimanded twice in the weeks leading up to the incident for not attaching his harness. He had been doing the job for 30 years and had never worn a harness. As a result of this

investigation a permit to work system was introduced for jobs involving safety harnesses and a new double lanyard was introduced. In addition, a safety alert memo was disseminated amongst the workforce. There have been no similar incidents since these measures were put in place.

Lessons learnt

The company felt that they had learned that it is important to manage relationships with sub-contractors carefully and to be robust in approach to repeat offenders. If the investigation was repeated nothing would be done differently.

Case Study 2.6	
Group	Agriculture
Size	50-199
Risk category	High
Incident category	Over-three-day injury
Job title of interviewee	Fleet Engineer
Total time spent on investigation	3 hours

Narrative

This farm has a flock of sheep to maintain. On this occasion, a farm worker was attempting to trim the feet of the sheep. This task is conducted once or twice throughout the course of the year. The trimming is done using a knife and requires considerable force to be applied by the farm worker to make the cut. The sheep has to be held firmly whilst the trimming is carried out. Here, the sheep struggled at the point the farm worker was applying the necessary force. The motion caused the knife to slip onto the hand of the farm worker. The knife left the farm worker with a deep cut to the palm and to a finger. The interviewee could remember no other injuries caused in this manner.

Consequences

The injury to the hand meant that the farm worker was taken to hospital; he spent 4 days away from work in total. Upon his return, he resumed the same roles and duties he had conducted prior to the incident. Normal work processes were largely unaffected by the incident, the only time lost was in somebody driving the injured party to hospital.

Inputs

The investigation team comprised of:

- Fleet Manager (who had health and safety responsibilities) - 1 hour
- Farm Manager (line manager) - 1/2 hour

During the course of their investigation the team interviewed the injured party for approximately 15 minutes and spoke to his 3 co-workers informally for the same amount of time.

Process

The incident occurred on a Thursday, the investigation began on the subsequent Monday. The Fleet Manager spoke to the Shepherd in charge of the sheep and the other interviews detailed above were conducted. The Fleet Manager consulted the Farm Manager and they filled in the company's own accident form. The company's form contains the following sections:

- Location
- Details of person(s) involved
- Nature of injury
- Brief description of circumstances
- Corrective actions
- Signature of departmental manager

Once this was complete they filled the RIDDOR form in. The Company Director receives a copy of all accident investigations. The incident was discussed at the next Health & Safety Committee meeting. The workforce was also informed of the outcome in an informal manner.

Conclusions and actions taken

The conclusion of the investigation was that the process was not as safe as it might be. This operation involved strength and a good way with sheep to ensure that they didn't struggle. Whilst the shepherd had never had a problem with this, other workers found it less easy.

Following this investigation a new piece of machinery was bought to make the task easier. A sheep cradle holds the sheep in place and tips them over. This removes the necessity of holding the sheep whilst conducting the operation. The use of this equipment makes the task slightly longer but less physically demanding.

Lessons learnt

The interviewee suggested that the company had learnt that having equipment like this is useful, and that while one individual may be able to carry out the task easily without it, others may require support. He would not have done anything differently in the investigation were he to repeat it today.

Case Study 2.7	
Group	Manufacturing
Size	50-199
Risk category	High
Incident category	Dangerous Occurrence
Job title of interviewee	H & S Advisor
Total time spent on investigation	1 hour

Narrative

One of the jobs carried out by this organisation was the printing of plastic film. The film spools off one reel, the printing occurs and the film then re-spools on a second wheel. The second reel is then removed by taking away a supporting bolt clamp. On this occasion the machinery was working as usual when the second reel came away from its fitting as the supporting clamp had broken away. The reel fell 2-3 feet to the floor.

Consequences

There was no injury associated with this incident. The machinery was inoperable for an hour whilst an Engineer re-threaded the bolt.

Inputs

This dangerous occurrence was investigated by:

- The H&S Advisor - ½ hour
- The Print Manager (line manager) - ½ hour
- Engineer (an expert)

The Print Manager was responsible for the machinery. During the course of the investigation the operator of the machine at the time of the incident (the involved party) was interviewed. The Engineer was asked his opinion about the bolt failure for a few minutes.

Process

The Print Manager and the H&S Advisor spoke to the individuals listed above and visited the scene of the bolt failure. After they had reached their conclusions, the H&S Advisor filled out the RIDDOR form and the company accident report form.

All accidents are reported to the company's head office. In addition, copies of the investigation form were distributed to the Managing Director, Operations Manager and the Departmental Supervisor. These three individuals all attend monthly H&S meetings to assess whether recommendations made in the report have been followed up.

Conclusions and actions taken

The investigation concluded that the bolt used to support the spool had worn out. The operator, rather then replacing the bolt, had been using washers to prolong its life. Following the investigation the hole was rethreaded and a new bolt fitted.

Lessons learnt

None

Case Study 2.8	
Group	Services
Size	200+
Risk category	Low
Incident category	Dangerous Occurrence
Job title of interviewee	Risk Management/Clerical Support
Total time spent on investigation	8 ½ hours

Narrative

This organisation was re-developing an old colliery. The workers arrived on a hot day to install cables in an existing trench. The task involved burying the cables in a shallow excavation. Part of the bank on the right hand side of the trench had fallen. The operator in charge of this task decided to excavate the spoil using mechanical equipment, this was contrary to the written procedure that required workers to excavate manually. The mechanical equipment caught the cables in the trench. No injuries occurred but the incident could have been serious and hence was reported as a dangerous occurrence.

Consequences

There were no injuries but normal work processes were adversely affected as a result of the incident.

Inputs

The incident was investigated by the following individuals:

- The Regional Line Manager (line manager) - 1/2 hour
- An individual from the Risk Management Department - 8 hours

During the course of the investigation the team leader responsible for the decision to excavate mechanically (the line manager) was interviewed for around 45 minutes. In addition, his two co-workers were interviewed for 45 minutes each.

Process

Following the incident the Line Manager completed an internal incident report, which was then sent to the risk management department. The incident report required the Line Manager to complete sections on:

- Describing the incident and persons involved
- Check lists of occupational, environmental and personal factors that may have contributed to the incident.
- Witnesses details
- Actions to prevent recurrence and details of these corrective actions explained

Once the risk management department receive this form they investigate further at their own discretion in addition completing relevant RIDDOR forms. Once the investigation is complete the findings are discussed at the next H&S Committee meeting. In addition, risk managers verbally bring every reportable incident to the attention of management at a monthly meeting.

Conclusions and actions taken

The investigation concluded that the correct procedure had been ignored. The Team Leader was dismissed and relevant parties were informed informally of the need to follow procedures in these cases.

Lessons learnt

The interviewee felt that the organisation had learned lessons about the sort of individuals they should employ and that they should keep on top of employee education. She would not have done anything differently if the investigation were to be repeated because in cases such as this where 'human factors' are involved all that one can do is re-educate.

Case Study 2.9	
Group	Construction
Size	200+
Risk category	High
Incident category	Minor incident involving member of public
Job title of interviewee	H&S Officer
Total time spent on investigation	2hrs 40mins

Narrative

One of this organisation's main contracts is to carry out repairs on council estates. This organisation had been informed by some architects that the steps leading up to a property required alteration. The plans specifically indicated that a door should be moved to within four 4 ½ inches of the top of the first step. The lady who was resident in these premises missed the first step on the way out of this door after it's alteration. She fell and tore a ligament in her right knee.

Consequences

The lady was taken to hospital where she received treatment for her knee. She also embarked on a course of physiotherapy. She put in a claim against this organisation for damages.

Inputs

This incident was investigated by:

- Safety Officer - 90 minutes
- Section Leader (line manager) - 10 minutes
- Contract Manager - 60 minutes

During the course of the investigation the injured party was interviewed by the safety officer for 15mins.

Process

Once the safety officer had become aware of the incident he had a conversation with the contracts manager about the work in question to establish what had been done with the door and for what reasons. He then visited the injured party to obtain a statement. Using this information he completed the organisations accident investigation form. This included:

- Details of injured person
- Date and location of accident
- Description of the nature of work
- Description of incident causes
- Estimated repair or replacement cost
- Names of any witnesses

Once this report was completed one copy remained on site and one copy was sent to the insurance company.

Conclusions and actions taken

The report concluded that perhaps the individual who carried out the work should have identified the risk rather than carrying out the work regardless. The report recommended, specifically, that no step should be built as narrow as this again.

Lessons learnt

The interviewee felt that the organisation had learned the importance of taking all necessary details about an incident at the time of its occurrence. The claim relating to this incident had been posted sometime after the actual incident. Moreover, he felt that it may have been useful to obtain a statement from the injured party earlier in the investigation process. This could then be compared with later statements to identify inconsistencies. This he felt may help the companies legal position with respect to a claim.

Case Study 2.10	
Group	Manufacturing
Size	200+
Risk category	High
Incident category	Over-three-day injury
Job title of interviewee	H&S Manager
Total time spent on investigation	12 hours

Narrative

This organisation produces and sells electrical equipment. They have staff who conducting a range of roles at this location. One member of staff, who worked in a tele-business role, walked past the front of one of the organisation's buildings. As she did so, she tripped on a delivery ramp that cut across the walkway. She fell and injured her shoulder.

Consequences

The injured party required two weeks leave because of this incident. She was taken to hospital for an x-ray and a check up but was not very seriously injured. Normal work processes at this site were unaffected by the incident.

Inputs

The incident was investigated by the following individuals:

- The Line Manager - 1 hour
- The site's Safety Manager - 8 hours
- The site's Facilities Manager (an expert) - 3 hours

During this time, the injured party was interviewed for 1 hour and two of her co-workers were interviewed for ½ hour each. The injured party's Line Manager was part of the team due to his knowledge of the individual involved and the actual incident.

Process

The Safety Manager received notification about the incident from the injured party's Line Manager. The Safety Manager requested that the company investigation form was completed. The Safety Manager went to examine the area with the Facilities Manager and conducted interviews with the individuals detailed above. He then reviewed the Line Manager's original accident investigation and completed the relevant sections. The Safety Department is required to fill in the following sections:

- The details of the injured person
- A description of the incident
- Details of any witnesses
- Details of any injury
- Whether or not RIDDOR forms need to be completed and a record of this

Details of where the form should be sent following its completion are also included on the sheet. A copy of the form is sent to Head Office for their records and to the Line Manager to keep him 'in the loop'.

Conclusions and actions taken

The investigation concluded that the trip hazard needed to be removed. As a consequence of this investigation an architect was called in to redesign the area where the fall had occurred.

Lessons learnt

The interviewee felt that the organisation had learnt the importance of carrying out risk assessments for buildings as well as processes. He would not have done anything differently if he had the opportunity to investigate the accident again.

Case Study 2.11	
Group	Services
Size	200+
Risk category	Low
Incident category	Minor incident involving employee
Job title of interviewee	H&S Manager
Total time spent on investigation	1 hour

Narrative

This incident involved an employee who was involved in the transport of materials. He was unloading a van and attempted to remove a parcel from the top of a stack pile. As he moved the heavy parcel it fell and crushed his hand. There have been similar incidents to this in the past.

Consequences

The person did not lose any time off work and production was not adversely affected.

Inputs

The injured party's Line Manager spent one hour investigating the incident. During the course of his investigation he spent ½ hour interviewing the injured party and co-workers.

Process

Immediately after the incident first aid treatment was given and the incident was recorded in the accident book. The Line Manager collected witness statements from co-workers and filled in an internal report form. The report forms consisted of the following information:

- Personal details
- Accident details
- Hours of work
- Injury details
- Witness statements
- Section for Managers report to include:
    a) Statements
    b) Whether the correct equipment was being used
    c) A sketch of the incident
    d) Factors contributing to the incident
    e) Training and remedial actions
    f) A space to note whether information had been sent to the HSE

The incident report would have been discussed at the next H&S Committee meeting, these occur every three months. The details would have been collated, along with other accident statistics, and presented to Senior Management at a quarterly H&S meeting.

Conclusions and actions taken

The investigation concluded that training of this individual had been deficient; this was the result of a failure to appoint a new training officer after the previous incumbent had left the post. The interviewee felt that the underlying cause was this failure to give the necessary training in manual

handling. The injured party attended a training course once a training officer had been appointed. This remedial action was not a direct result of the incident; the injured party was scheduled to receive training anyway. There have not been any recurrences of this type of accident.

Lessons learnt

The company learnt that the training is very important. If the accident investigation were to be repeated then they would try to ask for more details such as height of parcel, weight of parcel. In addition, more thought would be put into reviewing systems of work to reduce the attendant risk.

Case Study 2.12	
Group	Construction
Size	200+
Risk category	High
Incident category	Over-three-day injury
Job title of interviewee	Senior Safety Advisor
Total time spent on investigation	80 hours

Narrative

The person involved in this accident was a subcontractor working at a site being managed by this organisation. At the time of the incident, he was conducting work on the outside of a parapet wall. He was working in a basket suspended by a crane on the outside of a road bridge. The work had been completed and the crane was returning him to the ground on the roadside of the bridge. The basket was a foot from the ground when the crane rope came away. The basket fell to the ground, swiftly followed by the crane block attached to the rope. The block structure struck the Subcontractor on the shoulder. An ambulance was called and the individual was taken to hospital.

Consequences

The injuries sustained by the sub-contractor meant that he was away from work for around a week, his injuries were fortunately nothing worse than bruising. Once he returned to work he was able to resume his full role. In terms of work processes, the incident led to the three cranes used by the company to be removed from service while their hoist ropes were replaced. The job being undertaken was left one week behind schedule.

Inputs

The incident was investigated by:

- The Project Manager (line manager)
- The Senior Foreman (line manager)
- The Safety Advisor

The Safety Advisor was the advisor for that section of the country (this organisation has six safety advisors that cover the whole country). The site team spent approximately 4-5 person days on the investigation the Safety Advisor spent approximately 5 days on the investigation.

In addition to the investigation team, several other groups had an input into the investigation. The injured party and the crane driver (co-worker) were both interviewed for between ½ to 1 hour. In addition, the rope supplier and the crane company spent almost a day each upon their contributions.

Process

Following the incident the site-team took the steps necessary to make the site safe and insure that the injured party was taken to hospital. They contacted the Safety Advisor who travelled to the site to examine it. The safety advisor completed the organisation's accident investigation form.

He based his findings upon the interviews he had conducted, the certification of the cranes and a visit to the rope-making factory.

Conclusions and actions taken

The investigation reached the conclusions that the crane certification was fine and that the rope had come away from the 'ferrule' that was holding it in place.

The interviewee speculated that there were two potential causes of the rope coming away from its ferrule. Firstly, it was possible that the crane had been subjected to a gross point load, although he could find no evidence of this. The second hypothesis was that when the ferrule was fitted the process had in some way failed, it was impossible to tell which of these hypotheses was correct. As a result of the investigation the rope termination points were changed from ferrules to socket and pear connections. The interviewee said that this enables a person to see the rope slipping before it comes away.

Lessons learnt

The interviewee felt that the organisation had learned about the importance of having good accident investigation procedures and also about safe areas to use harnesses. He wouldn't have done anything differently if the investigation were to be repeated.

Case Study 2.13	
Group	Construction
Size	200+
Risk category	High
Incident category	Over-three-day injury
Job title of interviewee	Group H&S Manager
Total time spent on investigation	7 hours

Narrative

At the time of this incident, a machine operator was driving an articulated truck. His task was to shift debris. To do this he reversed the machine into such a position to enable dumping down a slope. Unfortunately, he reversed the truck too far over the edge of the slope and the vehicle turned onto its side. It subsequently slid 25 metres down the slope. This type of vehicle had been known to fall over onto its side; it had never previously fallen over the edge in this fashion.

Consequences

The machine operator was taken to hospital for treatment. After 74 days away from work the injured party terminated his contract with the company. About 45minutes production time was lost on the day of the accident. The vehicle was not used the next day but spare vehicles on site were able to take on its workload.

Inputs

The investigation team consisted of:

- The Site Manager (line manager) - 2 hours
- The General Foreman (line manager) - 2 hours
- The Health and Safety Advisor - 2 hours
- The Training Officer - 1 hour

The investigation team spent 2 hours interviewing both the injured party and a Plant fitter (who was responsible for maintenance of the vehicles).

Process

The accident was reported to the site manager and recorded in the accident book. The Health and Safety Officer and the investigation team inspected the area and the machine. They established the root causes and filled in the internal accident report form with an attached report on the accident. The HSE were informed.

The attached report of the details and recommendations were circulated to the Managing Director, Health & Safety Director, Plant Executive and Contracts Manager. These individuals approved the recommendations.

Conclusions and actions taken

The conclusions reached as a result of this investigation were that

1. The work was not being satisfactorily supervised
2. The brake test procedure and maintenance were less than satisfactory
3. There should have been a mound of earth in place at the edge of the slope to stop vehicles from going over
4. The drivers level of competency was not as expected

As a result of the investigation, new brake testing equipment was purchased and drivers were ordered to build mounds at the edge of the slopes. In addition, a memo was sent to the site Managers about the use of mounds and associated training issues.

Lessons learnt

The interviewee felt that the company had learnt that the brake test equipment was not up to scratch and that the Site Manager had not understood the purpose of the use of the mounds at the edge of the slope. They had also learnt that the operators were not aware of the possibility of constructing a mound as most had come from a landfill background, in that industry the face of the slope moves so quickly there is never time to build a mound.

The interviewee felt that if the investigation were to be repeated, nothing would be done differently as the investigation was felt to be exhaustive and had identified several causes rather than just blaming the driver.

Case Study 2.14	
Group	Agriculture
Size	50-199
Risk category	High
Incident category	Minor incident involving employee
Job title of interviewee	Health and safety officer
Total time spent on investigation	1 ½ hours

Narrative

This company provides seeds for the agriculture industry. An employee was using a MF390 tractor, with the front-end loader, to move soil. At the time of this incident the tractor bucket was full. The tractor was on uneven ground and the employee's foot slipped off the clutch, apparently due to muddy boots, this loss of control caused the tractor to tip over onto its side.

Consequences

The tractor driver was uninjured and there was no obvious damage to the tractor. It was subsequently lifted back upright with a crane and work resumed.

In all it was estimated that the tractor and driver were unavailable for work for approximately 30 minutes whilst the tractor was righted.

Inputs

The investigation team consisted of:

- Line Manager (who had health and safety responsibilities)
- Tractor Driver (involved party)

The incident was investigated by the immediate line manager of the tractor driver who interviewed the tractor driver and monitored the righting of the tractor. In all this took approximately 1 ½ hours.

Process

There is no formal support for accident investigation in this company and this particular incident was not recorded within the accident book until approximately one week after the incident. The investigation was limited to a discussion between the line manager and the employee and a confirmation that the individual and tractor were unaffected by the incident.

When the health and safety officer, who was interviewed in the survey, got to know about the accident through an informal route he asked for a formal description of events. This was sent by the supervisor in the form of an internal e-mail.

Conclusions and actions taken

This incident was perceived as a typical occupational risk within the agricultural industry, in terms of the combination of slippery boots and uneven ground. Although the conclusion was reached that this was a typical risk, the tractor has been modified so that it incorporates a

balancing concrete weight on the back of the tractor to make it more stable when moving heavy loads. The assumption was made that this would help avoid any similar incident.

The health and safety officer and the senior management were informally notified about the incident.

Lessons learnt

The interviewee suggested that the company had learnt that near-misses should be subject to the same level of investigation as incidents resulting in more serious consequences.

Case Study 2.15	
Group	Manufacturing
Size	<10
Risk category	High
Incident category	Dangerous Occurrence
Job title of interviewee	Works Manager
Total time spent on investigation	16 hours

Narrative

This organisation carries out repairs for a wide range of clients, welding is an important process in their job. They order cylinders for acetylene and oxygen welding from a large supplier. Prior to this incident, they had received a new consignment of cylinders and had left them in a corner of their workshop. The cylinders had yet to be used by the workers and at the time of the incident were turned off. One of the workers was using a grinder nearby; a spark from the grinder landed on one of the cylinders and ignited a leak of acetylene. The fire was noticed and extinguished by one of the workforce and the cylinder taken outside and placed in a bucket of water.

Consequences

There were no injuries because of this incident and work processes were affected only briefly whilst the workforce waited for the fire brigade to arrive and assure them that the cylinder was safe. There was the potential, however, for a serious explosion if the fire had not been spotted when it was.

Inputs

The incident was investigated by:

- The Works Manager (who had health ad safety responsibilities) - 8 hours
- A Senior Partner (senior manager) - 8 hours

The interviewee estimated they had both spent a day on the incident, including time spent in discussions with the cylinder supplier. Each of the co-workers who were present during the incident were spoken to about the incident. The small nature of the company meant that it was an informal chat involving all of the interested parties for approximately twenty minutes.

Process

The WM and SP looked at the cylinder equipment and spoke to the workers who had been present. They reached their conclusions and the WM filled in their own incident report form. They considered reporting it under RIDDOR but were unsure about its classification as a Dangerous Occurrence. The incident form requires them to fill in the following sections:

- Location/address:
- Names of person(s) affected
- Description of incident
- Emergency action taken
- Remedial actions
- Date remedial work carried out

The size of the company meant that the entire workforce were aware of the outcome of the investigation. In addition, the cylinder suppliers were contacted.

Conclusions and actions taken

The conclusions of the investigation were that the cylinder had been leaking for some reason and the cylinder had been faulty upon its arrival at the organisation.

Whilst it was unclear why the cylinder had been leaking the interviewee speculated that the acetylene was emerging from a safety valve and that, either the valve was faulty, or the cylinder had been overfilled by the cylinder supplier. The cylinder supplier did not admit liability but had offered to pay for the majority of the damaged equipment.

Because of this investigation, the company has instigated a program of regular equipment checks. It has also been a factor in a decision to rearrange the layout of the workshop. Potentially flammable materials have been moved away from areas where sparks might fly. Consideration has also been given to the dangers of putting such materials in positions that may affect exits.

Lessons learnt

The interviewee suggested that this incident has made them generally more aware of the need to check new materials that come from outside of the organisation, even things that come from reputable organisations. It has also made them more likely to establish what is causing unusual smells in the workshop. He suggested that if he had repeated the investigation he would have got more information form the fire brigade confirming what had happened. He felt this would have aided the company in their dealings with the cylinder supplier, if they had independent evidence.

Case Study 2.16	
Group	Manufacturing
Size	200+
Risk category	High
Incident category	Major injury
Job title of interviewee	Production Supervisor
Total time spent on investigation	2 hours

Narrative

This organisation is a textile manufacturer. At the time of this incident they were in the process of a major re-organisation of their business, one of their sites was being shut down and all of the materials and machinery moved to another site. To this end, a team of contractors were working at the site from which the materials were being moved. The task involved moving some metal fabrication. The contractors did not possess a forklift truck at that time, so asked a driver (an employee of the organisation) to help them move the material. He agreed, lifted the material up and reversed the forklift. As he carried out this action, the top of the forklift severed a chain holding up a fluorescent tube in the ceiling. The tube swung down smashing into the forklift's safety cage. The tube shattered upon impact and fragments of glass pierced the driver's right eye.

The driver was taken to hospital where his eye was washed out and x-rayed; he had to wear a patch for several days after the incident.

Consequences

The driver did not require any time off work except for the visit to hospital. He was able to return to work with the patch on his eye but was suspended from forklift duties. The incident had no effect on work processes or production.

Inputs

The incident was investigated by the H&S representative for the site (who had other non-safety responsibilities). He spent approximately two hours in total on the investigation. During the course of the investigation, he spent ½ hour talking to the injured party day after the incident. He also spent ½ hour discussing the incident with the driver's line manager.

Process

The H&S representative investigated the incident by visiting the site of the accident, taking photographs of the scene and speaking to the team leader. He then used this information to fill in the company's investigation form, which includes the following sections:

- Details of the injured person and injuries
- Details of the accident and the task being carried out
- Details of the agents involved in the accident (e.g. tools, machinery, ladder, electric supply, live animals, etc.)
- Causes of the accident (human error, faulty equipment, incorrect operation, dangerous working practice, design of equipment, guard missing)

If the incident is RIDDOR reportable then statements are required to be taken from witnesses and corrective actions listed.

One copy of the accident investigation goes to the personnel manager who enters it in the company accident book and fills out a RIDDOR form, senior management are sent a copy of all accident investigations. In addition, all investigations discussed at bi-monthly H&S Committee meetings. These meetings are attended by the operations director, the engineering manager, H&S representatives, union reps and group secretaries.

Conclusions and actions taken

The investigation concluded that this driver was a particularly accident-prone individual and that he should be removed from forklift driving duty. He was also given a verbal warning regarding his behaviour.

Lessons learnt

The interviewee felt that the training for forklift driving was perhaps too easy to complete and that this was reflected in the standard of some of the driving.

Case Study 2.17	
Group	Manufacturing
Size	50-199
Risk category	High
Incident category	Major injury
Job title of interviewee	Operations Manager
Total time spent on investigation	9 hours

Narrative

This organisation creates and packs various chemical products. On this occasion, a Filling Operator was filling 750ml bottles with industrial cleaning products. These particular bottles had spray head fitted to them, the operator picked up one of these bottles by the head. As he did so the head came away in his hand and the bottle fell to the floor. Some product splashed out of the container onto the Filling Operator's forehead. He was wearing protective glasses that protected him from the majority of the liquid; the product that had landed on his forehead ran down his face and into his right eye. The Filling Operator was assisted by a first aid specialist in having his eye washed out and was subsequently taken to hospital.

Consequences

The injury meant that the individual concerned required one day off work. He returned to work and resumed the same tasks he was carrying out before the incident. Production was not affected in any way by this incident.

Inputs

The incident was investigated by:

- The Filling Operator's Supervisor (line manager) - 1 hour
- The Production Manager (senior manager) - 5 hours
- Maintenance Department Safety Manager - 2 hours

The Maintenance Department Safety Manager was asked to provide a parallel report. The Production Manager had overall responsibility for the investigation. In addition to the investigation team the injured party was interviewed for between 1/2 – 1 hour.

Process

The Production manager and the Supervisor interviewed the injured party, asking for a blow-by-blow account of the events leading up to the accident. They used this interview to draw their conclusions and to fill in the company accident form. The form requires the investigator to:

- Provide details of the accident
- Provide details of the injury
- Provide details of any treatment required
- Gather statements from any witnesses present
- Make recommendations to reduce further risk
- List any actions taken

Once the investigation is complete the results are circulated to senior management (who will re-open the report if they are unhappy with it), the safety reps (who will discuss the findings at a monthly safety meetings) and line managers (who will inform the workforce).

Conclusions and actions taken

The investigation concluded that lifting bottles by the head is unsafe and that goggles instead of glasses should be considered as appropriate PPE.

The only action to come out of this investigation was the recommendation regarding PPE. At the time of the interview this action hadn't been enforced.

Lessons learnt

The interviewee felt that the company had learnt from this accident that glasses aren't always adequate protection and that the handling of a container has to be done in a specific manner. He didn't feel that the investigation was lacking in any area.

Case Study 2.18	
Group	Manufacturing
Size	200+
Risk category	High
Incident category	Disease
Job title of interviewee	Group H&S Advisor
Total time spent on investigation	8 ¼ Hours

Narrative

This organisation deals with chemicals. The individual involved was a supervisor working in an area where a known sensitiser existed (once somebody has received a substantial exposure to a sensitiser, any subsequent exposure will cause a reaction). This Supervisor had a history with this particular sensitiser, although the process he was supervising did not involve the chemical itself, it was present in the general area.

Consequences

The Supervisor did not require any time off work, but did need medical attention. He was assessed by his own GP and the Work's Doctor. After he had been assessed he returned to work but was kept away from duty in this area until his inflammation had subsided. Works processes were not affected in any way by this incident.

Inputs

The investigation involved the following individuals:

- Supervisor's Line Manager - ½ hour
- A Safety Specialist - 4 hours
- Works Doctor (an expert) - 2½ hours

The Supervisor's Line Manager, he had responsibility for that work area. In addition to the investigation team the injured party was interviewed for 1 hour and his co-workers were spoken to for 15 minutes in a group.

Process

After the Safety Specialist had been made aware of the incident by the Works Doctor he began an investigation with the assistance of the Line Manager. He carried out the interviews described above and had swabs taken of the area where the supervisor was working. Once the Safety Specialist had the results from the swabs and the interviews, he completed the company's accident investigation form and the RIDDOR form. The accident investigation form required him to complete the following sections:

- Description of Incident
- Cause of incident
- Risk
- Conclusion/actions

Whilst the form was being filled in the safety Specialist asked the Doctor to conduct a patch test on the injured party. The Doctor had to wait for the inflammation to subside before conducting the patch test. The findings of the investigation were disseminated to Senior Management and the Safety Committee.

Conclusions and actions taken

The investigation concluded that no sensitiser was present where the Supervisor was working and that the skin irritation was real. This was based on the swabs taken from the worksite, the doctor's examination and the individual's previous medical records.

The individual was told he was not to work in the area until the inflammation had gone down and the patch test had been conducted, this action was still pending at the time of this interview.

Lessons learnt

The interviewee felt that the company were well aware of this issue and that the investigation was adequate.

Case Study 2.19	
Group	Manufacturing
Size	50-199
Risk category	High
Incident category	Over-three-day injury
Job title of interviewee	Engineering Manager
Total time spent on investigation	3 ½ hours

Narrative

The organisation was clearing an area to create a new production line. Contractors were brought in to carry out this work. The contractors were informed that they should only use the company's equipment for this task. In particular, it was stressed aluminium ladders should be used at all times, unless if they were working with electricity, in which case wooden ladders should be used.

One of the contractors needed access to a crane beam at the top of the factory. He asked an employee of another contracting company, who happened to be working at the same factory, if he could borrow a ladder. This ladder was in poor condition. The contractor propped the ladder up at a flat angle, the wrong way round and climbed up to the crane beam.

As the contractor began his ascent, the ladder started to slip along the floor and broke at the bottom. Because the ladder was inverted, its straining wire did not provide any support. The contractor fell from the ladder as it slipped and landed on a metal part on the floor of the factory. There had been one other ladder related incident at the factory.

Consequences

At the time of this interview, the contractor has not returned to work (the accident occurred 7 months previously). Paramedics had to be called to the scene to assist the contractor. Production was not adversely affected and the contractor had to supply another individual to carry out the work.

Inputs

The investigation team consisted of the following individuals:

- Line Manager - 30 minutes
- Senior Manager - 2 ½ hours
- Safety Specialist - 30 minutes

During the course of the investigation, they interviewed a witness for 15 minutes. The injured party was not interviewed, as he was not one of their own employees. In total, they spent three and a half hours on the investigation.

Process

First Aid was administered and the Safety Specialist was made aware of the accident. The accident book was filled in by the first aider and an internal accident investigation form was completed by the Senior Manager. This included the following sections:

- Details of the injury
- Details of the accidents location
- Hours of work
- Type of tool used
- Who the accident was reported to
- Investigation details
- Conclusions
- Recommendations and responsibilities for conducting actions

The Managing Director was notified informally and the accident was reviewed at an annual H&S Committee meeting. Details of the report would also have been sent to the contractor who supplied the faulty ladder and to the Personnel Officer for filing.

Conclusions and actions taken

The investigating team concluded that the injured party had not been inducted by anyone at this organisation; he arrived and asked his fellow contractors what to do. He did not use an company approved ladder, instead borrowing one that was in poor condition. He ignored this condition, used it upside down and positioned it poorly.

The interviewee felt that the underlying cause was that wrong equipment was being used.

The investigation recommended that any new equipment, brought onto the site, needs to be examined and cleared. The interviewee wondered about the practicality of this suggestion, given time constraints. The ladder was confiscated at the time of the incident, however the owner of the ladder asked for it back, meaning the ladder wasn't examined at the time. There have not been any recurrences of this type of incident.

Lessons learnt

The interviewee felt that the investigation had taught the company:

- The importance of well defined and policed procedures for sub-contractors
- That no matter what precautions are in place one incident will always slip through

If this accident investigation were to be repeated, the company would have retained the ladder for use as evidence against any future claim.

Case Study 2.20	
Group	Services
Size	50-199
Risk category	Low
Incident category	Over-three-day injury
Job title of interviewee	H&S Manager
Total time spent on investigation	½ hour

Narrative

This incident involved an employee working in a pit in own of the organisation's workshops. A yolk that was normally inserted into a hole in the pit and used as a lifting device, was left balanced on the edge of the pit, not fully inserted in its hole. The yolk fell into the pit and landed on the employee's foot.

Consequences

The injured party was taken to hospital and was away from work for one week. The organisation had to arrange work cover for the injured party.

Inputs

The Senior Manager of the site conducted the investigation; it took half an hour of his time. During the course of this investigation, the injured party and the Foreman (line manager) were each interviewed for around 10 minutes.

Process

After the Senior Manager had conducted the interviews, he completed an internal accident investigation report form. This included the following information:

- A brief description of the accident
- A description of the nature of the injury
- Immediate actions taken to make the area safe
- Remedial actions taken
- The names of witness
- Lost time in days

The Senior Manager also completed the relevant RIDDOR form. The Group Secretary was sent a copy of the investigation; he then made a report to the insurers. The incident was discussed at the next Health and Safety Committee meeting.

Conclusions and actions taken

The investigation concluded that the accident was a one off. The interviewee considered these accidents inevitable whilst working in a pit. The yolk (as a detachable piece) should not have been left loose. The investigation specified no definite remedial action. There have been no recurrences.

Lessons learnt

The interviewee felt that the company learnt, from investigating this accident, the importance of reinforcing care in manual handling issues. If the incident investigation were repeated then nothing would be done differently.

Case Study 2.21	
Group	Services
Size	200+
Risk category	Low
Incident category	Minor incident involving contractor
Job title of interviewee	Safety Advisor
Total time spent on investigation	2 ½ hours

Narrative

A contractor was repairing a door on one of the companies premises, was using a rotor saw to cut a piece of wood. As he was cutting the wood, a piece of it broke away and hit him in the face. His glasses provided some protection but the wood cut his head around the eye area.

Consequences

The contractor received treatment from the first-aider, however, he refused to go to the hospital and continued working. He required no time off work subsequently.

Inputs

The incident was investigated by the following individuals:

- The Safety Advisor (2 hours)
- The Engineering Manager (1/2 hour)

During the course of the investigation they spent half an hour interviewing the injured party, a witness and the first aider.

Process

The first aider was alerted to the incident and cordoned off the area whilst the injured party was treated. Once the safety advisor had been informed, the witness was interviewed and demonstrated what he had been doing prior to the accident. Photographs were taken of the area and the injured party. The Safety advisor then filled in the accident book, filled in a investigation form and entered additional information on a blank sheet of paper. The incident was discussed at a Senior Management meeting. Details of the incident were also discussed at a monthly Health& Safety Committee meeting to raise awareness of investigations findings.

Conclusions and actions taken

The investigation concluded that the incident would have been less serious had the individual been wearing goggles. The interviewee felt that the underlying cause of this incident had been identified.

The investigation recommended that all contractors should wear goggles when carrying out this task and that if they did not have any they would be supplied by the organisation.

Lessons learnt

The interviewee felt that the company had learnt the importance of keeping an eye on contractors and their working methods. If the investigation were to be repeated, nothing would be done differently.

Case Study 2.22	
Group	Manufacturing
Size:	200+
Risk category	High
Incident category	Over-three-day injury
Job title of interviewee	General Department Manager
Total time spent on investigation	9 ½ hours

Narrative

This company produces shoes. The operation that was involved in this accident was the moulding of a plastic shape into the support at the back of a shoe. The plastic is picked up by a sucker and placed in a mould. The mould cools the plastic and ejects it away from the guarded machinery.

Prior to this incident, the sucker had dropped a piece of plastic. To deal with this problem the machine operator (who was working alone) reached under the guarding to remove the plastic. The guarding covered most of the machinery but an 18-inch gap at the bottom made reaching inside possible. The guarding was part of an interlock system, once the guarding is removed the machinery stops. If the guarding is circumvented then the machinery continues working. As the operator reached under the guarding, she caught her fingers in the conveyor. From this position, she was able to reach the emergency stop and turned the machine off. However, rather than call for assistance at this point she chose to restart the machinery believing that it would free her finger. Unfortunately, it badly cut her second finger and third finger. At this stage, her cries were noticed and she was taken to hospital for treatment.

Consequences

The first-aider, helped the injured party and took her to hospital (1&1/2 hours). The machine operator spent 2-3 weeks away from work because of this incident. The operator returned to work at the end of this period of convalescence and resumed her old position. Production was not greatly affected by the injury because production could be moved to a reserve machine whilst the incident was investigated.

Inputs

The investigation team was as follows:

- General Manager (who had health and safety responsibilities) - 4 hours
- Chief Engineer (an expert) - 5 hours

The General Manager was responsible for H&S and consequently accident investigation. The Chief Engineer investigated the guarding and looked at potential improvements. The injured party was interviewed by the General Manager for around 1/2 hour. In addition, all her co-workers were spoken to briefly; none of them had witnessed the accident. The Departmental Supervisor was spoken to for around 1/2 hour, as he was responsible for the work carried out in this department.

Process

Immediately following the incident the first aider helped the injured party whilst the Departmental Manager filled in the companies accident form. The individuals listed above were spoken to by the General Manager who investigated their statements before reaching conclusions and filling in the RIDDOR form. Subsequently, the Chief Engineer investigated the guarding around his machinery

All of the company's middle managers received a copy of the accident form and the matter was discussed at the next H&S meeting (these occur every six weeks). At the meeting recommendations were made and responsibility for the actions apportioned. These recommendations and alterations were then subject to a quarterly audit.

Conclusions and actions taken

The actions taken were as follows:

1. A new skirt was added to the bottom of the existing guarding to completely prevent access whilst the machine is in operation

2. The employee signed a statement admitting negligence

3. The example was integrated into the companies induction program for new employees to raise awareness of the importance of guarding

Lessons learnt

The interviewees suggested that they would not do anything differently if they were to repeat this investigation. They stated that they had learnt that it was important to communicate to employees the importance of guarding.

Case Study 2.23	
Group	Services
Size	200+
Risk category	Low
Incident category	Minor incident involving contractor
Job title of interviewee	Distribution Health & Training Officer
Total time spent on investigation	4 ½ hours

Narrative

An agency worker on general warehouse duties was given a verbal induction when he came onto site. At the time off this incident, he was taking plastic boxes off a conveyer. As he was carrying out this task he trapped his hand under one of the boxes.

Consequences

The injured party was taken to hospital. The agency worker did not lose any days off work, but did not return to work for this company again. In terms of production, time was lost as the supervisor had to investigate. The hospital had called the police who had to photograph the area, thus halting production.

Inputs

Two supervisors were involved in the investigation:

- The Morning Supervisor - 2 ½ hours
- The Evening Supervisor - 2 hours

During the course of the investigation, the team spent 1 hour talking to the injured party and a witness.

Process

The site supervisor was alerted, and an ambulance called. The hospital informed the police who photographed the area and made some measurements. The accident was entered into the accident book. The supervisor interviewed the injured party at home the day after the incident. The internal incident sheet was completed along with the internal accident investigation form. This form captured the following information:

- The details of the person involved
- The details of the accident
- Details of how the accident had occurred
- Need for RIDDOR notification
- Actions taken to prevent repetition

The equipment was checked to make sure it was in working order.

Conclusions and actions taken

The investigation found that the agency claimed that the individual had warehouse experience, when interviewed, however, the injured party said he had no experience. The worker was only going to be there for the day so a verbal induction was given rather than verbal. The conclusion, therefore, was that the agency could not be trusted to supply experienced staff. This lead to the second conclusion that the onus is on the company to ensure that the workers are competent leading to more stringent inductions safety.

The actions taken as a result included a re-check of the risk assessment but nothing was changed.

Lessons learnt

The interviewee felt that the company had learnt that if there is no documentation then there is no defence. If the investigation were to be repeated then nothing would be done differently.

Case Study 2.24	
Group	Mining / Utilities /Transport
Size	200+
Risk category	High
Incident category	Over-three-day injury
Job title of interviewee	Safety Advisor
Total time spent on investigation	9 hours

Narrative

This organisation is a construction company, one of the tasks they carry out regularly is road building. One of the kerb layers bent down to remove the road form (a concrete mould made of metal that allows the kerb to set before the kerb stones can be added). As the kerb layer pulled at the road form he wrenched his back. The road forms are two meters in length and around 20cm high, after being involved in the setting process they are often stuck to the concrete and require some force to remove them. Typically the kerb layers might tap the road forms with a hammer to loosen them, this kerb layer appears not to have done this. The organisation had never had anyone hurt a back in this specific way before.

Consequences

The injured party required three weeks off work as a result of this incident. On the day of the incident the injured party continued working, he stiffened up overnight and went to hospital the following day. Work processes were unaffected by the incident.

Inputs

The incident was investigated by:

- Site Agent (line manager) - 1 hour
- The Health & Safety Advisor - 8 hours

During the course of the investigation the injured party was interviewed, upon his return to work, for approximately ¾ hour, one of his co-workers was interviewed for approximately ½ hour.

Process

Once the site agent was aware of the incident he informed the H&S Advisor and helped him with his investigation. The H&S Advisor is required to fill in an accident investigation form. This involves:

- Description of the site
- Personnel involved in the incident
- Equipment involved
- Statements
- Conclusions
- Recommendations

Once the report is complete copies are sent to the insurance company, the site agent, personnel department and the site manager.

Conclusions and actions taken

The report concluded that the kerb layer should have assessed the situation and asked for help. Secondly, that any concrete overspill should be cleared before attempting to remove the road form and that road forms should be tapped before being removed. At the end of the investigation it was unclear what lifting technique the kerb layer had adopted.

As a result of these conclusions guidance on manual handling was issued to site managers and posted in mess cabins. The interviewee was unsure whether these actions would be effective in preventing recurrence

Lessons learnt

The interviewee felt that this case had illustrated the importance of education. The workforce should follow best practice at all times and not just when someone is watching. He wouldn't have done anything differently if the investigation were to be repeated except possibly collecting a statement from the injured party earlier.

Case Study 2.25	
Group	Manufacturing
Size	200+
Risk category	High
Incident category	Disease
Job title of interviewee	Safety Manager
Total time spent on investigation	21 hours

Narrative

This organisation is a large chemical company. This incident involved a contracted scaffolder who was working on one of the companies sites. He noticed a rash on both of his wrists and went to see the company's nurse who prescribed topical cream. The nurse advised him to come back later that week to see a doctor. His initial rash cleared up within two days. He later had a similar rash on his face that cleared up equally quickly. The doctor diagnosed the rash as an allergic reaction. At this point, according to the companies standards, the incident requires investigation.

Consequences

The person required no time off work, the rash was irritating rather then debilitating. There were no costs in terms of loss of production.

Inputs

The incident was investigated by a large team of individuals:

- Shift Manager (a safety rep) - 1 ½ hours
- Two Production Representatives - 1 ½ hours each
- Engineering Resources Manager (who had health and safety responsibilities) - 5½ hours

The Shift Manager was the safety rep for that area of the plant and spent time in a meeting about the incident. The Production Representatives were from the area of the plant where the exposure was thought to have occurred. The Engineering Resources Manager was responsible for relations with contractors and attended the meeting as well as writing the report. In addition to employees of the company the contractor was represented by the following individuals:

- The injured party's Line Manager - 1 & ½ hours and 4 hours travelling time
- Contractors Area Safety Manager - 1& ½ hours and 4 hours travelling time

During the course of the investigation, the injured party was interviewed for approximately 15 minutes by the Engineering Resources Manager. In addition, his co-workers were spoken to briefly.

In total, therefore, the investigation took up 10 hours of the organisations time and 11 hours of the contractor's time (including travel).

Process

The investigation process was triggered by the injured party's visit to the occupational nurse. A visit to the nurse means that the incident is reported as a minor incident, with an associated

accident report form filled in. Once the Doctor saw the individual and diagnosed the rash as an allergic reaction, a full investigation was triggered. The responsibility to conduct the investigation belonged to the Engineering Resources Manager, as the incident had involved a contractor. He conducted the interviews listed above and arranged a meeting to be attended by the investigation team.

The results of this meeting are then fed into an incident report form, to complement the accident report form filled in by the occupational nurse. This form requires the description of the incident to be completed, a cause to be entered and recommendations/ actions to be noted.

Once the report was completed, a copy was circulated to the contractors, to the Department Manager and to the Site Management team. This information is used in group safety meetings and at monthly contractor meetings of all the contractors on site. In addition all recorded incidents are reviewed at plant H&S meetings that occur every ten weeks.

Conclusions and actions taken

The investigation concluded that the direct cause of the rash was unknown. The most likely hypothesis was that the Scaffolder had been exposed to an old scaffold board. The reason for the uncertainty was that the Scaffolder had been working all over the site in question, and that swabs taken by the doctor indicated that he had encountered every chemical used at the site over the previous few days. The conclusion was based on the notion that his wrists had a rash in the location that he rested a scaffolding board whilst carrying it. The scaffolder also remembered wiping his face after carrying the boards and felt this may have caused the facial rash.

Consequently, all old scaffold boards on site were replaced. In addition, memos were sent site wide to remind individuals of the importance of protective clothing and of not washing work clothes at home.

Lessons learnt

The interviewee felt that the accident investigation did all it could have done to identify the underlying causes and felt that the company had learnt important lessons about dealing with old scaffold boards and monitoring how contractors clean their work overalls.

Case Study 2.26	
Group	Construction
Size	10-49
Risk category	High
Incident category	Over-three-day injury
Job title of interviewee	Health and safety advisor (Secretary and Administrative Assistant)
Total time spent on investigation	13 hours

Narrative

The company concerned manufactures and installs waste incinerators. The individual concerned was working for one of their sub-contractors. He had been cutting down projecting vertical pile reinforcement during the morning part of the shift. He was asked to continue in the afternoon to cut down projecting vertical pile reinforcement to the pit-capping beam. Prior to the incident, he had cut approximately 60 T32 bars. During the cutting of the last bar to the head of Pile 192, the blade of the petrol-driven saw he was using 'bit' into the reinforcement, then eased, then 'bit' again. The force in the saw was enough to cause the saw to swing around, striking his lower right leg, resulting in a serious laceration. The saw was being used in the horizontal plane, cutting left to right at a height of approximately 450 mm above blinded ground level. The individual was standing at the time on the blinded ground. At the time of the incident, the individual was wearing the following personal protective equipment: safety helmet, safety wellingtons, overalls, gloves, safety spectacles and ear protection. There were no distractions at the time of the incident.

Following the injury, the individual put the saw down and turned it off. He was given some assistance by a colleague, who then went to raise the alarm. First aid was administered at the site office and the individual was then taken to the local hospital by ambulance.

Consequences

The individual was treated at hospital; following an X ray, the wound required nine stitches but the individual need not need to be admitted. He subsequently lost 7 days from work but then returned to his original role. Work on the site continued with another employee of the sub-contractor as substitute until the individual returned to resume his job.

Inputs

The following individuals investigated this incident:

- The Line Manager (within the firm of sub-contractors)
- The Safety Manager (within the firm of sub-contractors)
- The Police (who attended with the ambulance and took notes of the incident)

During the course of the investigation the injured party and a Union Representative were interviewed.

Process

As far as the interviewee was aware, the incident was investigated by the line manager and safety manager of the relevant sub-contractors. She was not aware of the procedure or methods that were used. Her company were sent copies of the investigation report, as is standard practice for all incidents involving sub-contractors. Her company would only become actively involved in the investigation when an accident report is ambiguous or inconsistent. However, it is also standard practice for the company representative on the site to make a separate but brief report about any incident involving a sub-contractor on the site, using information from the accident book, or if present based on their own observations. If an accident is particularly serious they would inform the Director of Operations.

Conclusions and actions taken

She was not sure what recommendations or actions had followed the incident, although she thought that procedures and equipment could have been changed and additional training provided. Following a number of further incidents involving this particular sub-contractor they were removed from the site. The company have also installed a full time safety advisor on the site to monitor the work.

Lessons learnt

It was subsequently established that the sub-contractor concerned had not completed their submissions on safety performance prior to starting work on the site. The company have now revised its procedures to ensure such documentation is returned before sub-contractors are selected and allowed to start work.

Case Study 2.27	
Group	Services
Size	200+
Risk category	Low
Incident category	Over-three-day injury
Job title of interviewee	Area Health Food & Safety Manager
Total time spent on investigation	16 ½ hours

Narrative

This incident took place in a hotel that was part of a large chain. The maid who was involved in the interview had been working for one and a half months. Her training had been conducted by a housekeeper. On this occasion she was cleaning a bathroom, she was standing on the edge of a bath, slipped and damaged her forehead, wrist and hip. During her training she was taught not to stand on the edge of baths, instead she should have got a stool to stand on. There have been no similar incidents prior to this one.

Consequences

The injured party left work with these injuries on 20th May and was still away on 27th July according to the hotel records. This was the last time they had contact with her and she never returned to work. At the time of the incident she was taken to hospital where she received treatment for a ligament injury. Normal work processes were unaffected by this incident.

Inputs

The following individuals investigated this incident:

- The Duty Manager (line manager) - 1/2 hour
- The Area Safety Manager - 16 hours

During the course of the investigation the injured party was interviewed for an hour (she was Spanish so the interviewer required a translator). In addition, two senior housekeepers (line managers) were interviewed for 20 minutes each.

Process

Immediately following the incident an accident report was filled in by the Duty Manager. The Area Safety Manager was then informed, she spoke to the Duty Manager and examined the scene of the incident. Statements were then taken from the individuals described above. The investigation process involves establishing what had happened and detailing the steps to be taken (this information is captured in an investigation form).

Conclusions and actions taken

The investigation concluded that the injured party may have been taking a short cut to get her work done more quickly. It was felt that the training system, whereby maids receive on the job training, might have promoted this approach. It was also noted, during this interview, that stools for high cleaning took time to access.

The investigation suggested the following actions:

- Re-training in the use of step stools and their storage
- Re-training in high level cleaning
- Re-training in cleaning bathrooms
- Review of the risk assessment for cleaning
- Review of the procedures for cleaning
- Purchase new equipment for high level cleaning
- Review training practices

The incident was discussed at the next H&S Committee meeting and at a weekly Head of Department's meeting. The minutes of these meetings were disseminated around the hotel.

Lessons learnt

The interviewee felt that the organisation had learnt lessons about the importance of monitoring training. In particular, the importance of ensuring that individuals were being taught the correct way and not the quickest way. She would have changed nothing about the investigation if it were to be repeated.

Case Study 2.28	
Group	Manufacturing
Size	200+
Risk category	Low
Incident category	Over-three-day-injury
Job title of interviewee	Health and safety advisor
Total time spent on investigation	39 hours

Narrative

This company provides a mobile service for the repair and replacement of tyres. The incident involved an employee, working on his own, in his own dedicated tyre repair vehicle. The employee was fitting a solid tyre inside the mobile solid tyre press, part of the press slipped (out of its appropriate holding slot) and hit the employee on the knuckles. The press was 2 weeks overdue for its maintenance check and in fact was found to be worn. In addition the design of the press and the van means that the procedure for using the press safely is routinely violated. The press is intended to be used with 6 'arms'. However, in the current physical set-up it is currently used with 4 arms, because if the 6 arms are used there is no room to insert the locking key.

Consequences

The individual was treated at hospital; he had broken his knuckles and may require his fingers to be fused together. At the time of the interview he had not returned to work having already been off work for approximately 6 months. Because of the serious of the incident, both mobile vehicles that use this type of press were taken off the road prior to refitting them with redesigned presses.

Inputs

The following individuals investigated this incident:

- Line Manager
- Senior Manager
- Safety Officer
- Expert

In all the investigation took approximately 5 person days to complete. The HSE were also actively involved in investigating the incident. The injured party was also interviewed.

Process

The injured individual was interviewed at hospital; the vehicle and equipment were closely examined and sent to specialist engineers for review and redesign.

Conclusions and actions taken

It was concluded it was a technical design fault and the kit was redesigned

Lessons learnt

If ordering further vehicles would be more aware about potential design problems and ask if better design were available

Case Study 2.29	
Group:	Manufacturing
Size:	200+
Risk category	High
Incident category:	Over-three-day injury
Job title of interviewee	H & S Officer
Total time spent on investigation	28 hrs (approx)

Narrative

This incident involved a maintenance person who was burnt whilst working upon a furnace. According to the statements given by the injured party and his co-worker, the procedures for lighting a furnace were followed to the letter. The procedure requires anyone lighting a furnace to turn on the furnace fan, this evacuates any gas from the area. They are then required to ensure that the gas supply isn't switched on. Finally, they place a piece of burning paper in the furnace to act as an ignition source, prior to switching on the gas supply. On this occasion, as the maintenance technician threw the paper into the furnace, it exploded, burning his face. He was taken to hospital for treatment.

The organisation had experienced one similar incident in a different area, but the consequences had not been quite as severe.

Consequences

The burns that the technician received were severe enough for him to need two weeks off work. Upon his return, he was able to resume the same roles and tasks he had carried out prior to the incident. The furnace that was involved in the incident was taken out of commission to be examined for faults. This did not greatly affect normal work processes, as other furnaces were able to deal with the workload.

Inputs

The investigation into this incident was conducted largely by one of the company's Safety Specialists. The investigation was ongoing at the time of interview, but it was estimated that this individual had spent three to four person days on the investigation. Other people to have an input were the First Aider (an expert) that tended to the injured party (45 minutes), the Technician's Line Manager (10 minutes) and an individual in the personnel department (5 minutes).

In addition to the individuals listed above, whom the interviewee classified as the investigation team, several other interested parties had had, or will have an input prior to the completion of the investigation. The injured party was scheduled to be spoken to upon his return to work (which was the day of this interview). His co-worker had already been interviewed for 1 hour. It was also anticipated that the furnace manufacturers would be examining it for technical problems.

Process

The incident investigation form within this organisation has spaces to be filled in by the First-aider and the Line Manager immediately following the incident. They make a note of the injuries and the basic circumstances of the incident. The form then passes through the company's personnel department (who make a note of the individuals involved), before reaching the Safety Specialist whose duty it is to fully investigate the circumstances surrounding the incident.

Once the report has been completed, it is discussed at a quarterly meeting of all safety representatives. If the incident is considered by the investigating safety specialist to be severe enough, then senior management would formally receive a copy of the investigation.

Conclusions and actions taken

The investigation was still to be completed at the time of this interview but the interviewee suggested that a likely conclusion was that the practice of lighting furnaces in the fashion described above would have to change. He said that this may involve both equipment and procedural modification.

The furnace experts were yet to examine fully the equipment but there had been no indication, at that time, that there had been any failure in the equipment itself.

In addition to the potential equipment and procedural changes all staff had been reminded of the dangers inherent in lighting furnaces.

Lessons learnt

The interviewee felt that the company had learnt that the practice of throwing paper into a furnace to light it was less safe than an automatic lighting mechanism. He also felt that the investigation was fine as it was and he wouldn't change anything were he to repeat it.

Case Study 2.30	
Group	Manufacturing
Size	50-199
Risk category	High
Incident category	Over-three-day injury
Job title of interviewee	H & S Manager
Total time spent on investigation	4 hours

Narrative

This organisation specialises in the development of fragrances and flavours. The operation that is relevant to this incident is the process of turning liquid flavours into powder, a form that is more useful to some of their clients. An important part of this batch process is cleaning the equipment and floor to prevent cross contamination of ingredients. Once the equipment is clean, the surplus water is swept into drains. This process is conducted within this department four or five times a day.

On this occasion, there were two individuals conducting this cleaning, the Departmental Manager (DM) and a Process Operator (PO). The DM was cleaning the floor between the equipment room and the office. The excess water was in the process of being evacuated into the drains when the phone in an adjacent office started to ring. The PO ran out of the equipment room to answer the phone. The PO slipped as he ran on the wet floor and collided with a piece of machinery. This caused an extensive cut to the head of approximately 10cm in length;

Consequences

The PO was then taken to hospital where he received stitches and X-rays. He required 18 days of sick leave following this incident. Work processes were not affected by the incident but the incident resulted in a successful legal claim against the organisation by the injured party.

Inputs

The incident was investigated by the company's H&S Manager. He estimated that he had spent ½ a day on the investigation in total. During the course of the investigation, he spent ½ hour interviewing the Departmental Manager (a line manager) and ¼ hour speaking to the injured party upon his return to work.

Process

The H&S Manager was called over to the incident site after the injured party had been taken to hospital by the DM. The DM then gave the H&S Manager a statement and they recreated the incident to enable photographs to be taken. The H&S Manager then filled out the company accident investigation and RIDDOR forms. The form has the following sections:

- Incident area, materials and equipment involved
- Nature of injury
- Cause
- Corrective actions

Before the final investigation form is deemed complete, it is reviewed by a legal specialist to ensure that there is nothing in the text that may damage the company.

The information was disseminated to the organisation's head office (located abroad) and the investigation was also discussed at a bi-monthly H&S Committee meeting and a quarterly management meeting.

Conclusions and actions taken

The investigation found that the cause of the incident was running on a wet floor. Consequently, recommendations were made to reinforce to staff that running is prohibited on site, especially in units where floors have to be washed properly.

The interviewee suggested that the injured party had complained that he has to run to answer the phone because he gets in trouble if it is not answered quickly. However, this information is not included in the official report. He also suggested that the legal case was likely to be successful because nowhere is it stated explicitly that running is forbidden. New signs will be posted following the court case, although this is not an action listed in the official investigation.

Lessons learnt

The interviewee intimated that the claim culture that is developing in the country is making it more difficult than ever to establish the events leading up to an incident. He also suggested that it is becoming necessary for risk assessments to cover every eventuality, he voiced the opinion that not running on a wet floor should be self-evident to experienced individuals such as those involved in this case.

Case Study 2.31	
Group	Manufacturing
Size	200+
Risk category	High
Incident category	Over-three-day injury
Job title of interviewee	Marketing HS & Environmental Manager
Total time spent on investigation	20 hours

Narrative

A contract employee was working in one of this company's filling stations. She opened the shutters on the cigarette display case behind the counter. The shutters were slightly stiff and as she tugged them upwards, the shutters uncoiled and came away from its runners. The shutters fell onto the contractor and cut her face.

Consequences

The injured party was taken to hospital and her injury required stitches. She took one week off work. There were adverse affects on production and normal work processes in terms of shift cover that were provided for the contract worker and lost time for the manager, who was investigating the accident. There was also damage to the shutter equipment.

Inputs

The investigation team consisted of:

- The Area Manager (line manager)
- A Safety Advisor
- An Engineer (an expert)

The investigation team spent approximately 20 hours on this accident. During the course of the investigation the injured party and one of her co-workers were interviewed. In addition the manufacturer of the shutter equipment was interviewed. 3½ hours of this time was spent taking details form the various interviewees.

Process

Interviews with the injured party and the co-workers were conducted to establish facts. The equipment was inspected and then isolated. Warnings were given to others about the potential for accidents to occur with the equipment. The engineer liased with the manufacturers of the shutters and other cases of a similar nature were looked at. The information gather was collated and entered on the central accident database system. Decisions about remedial actions to stop recurrences were then made.

Line managers and senior managers were notified of the accident automatically by the accident database system via e-mail. The Health and Safety Committee were also made aware of the incident via this process.

Conclusions and actions taken

Conclusions not yet been entered on the database so the interviewee could not say whether the underlying causes had been identified.

The remedial actions involved checking the shutter equipment – the results of these checks had not yet returned from the manufacturers at the time of this interview. A memo was sent to all sites with the equipment advising of best practices to adopt until the root cause had been identified.

Memos were also sent regarding the investigation to try and establish why the report had taken so long to be completed and on the definitions of RIDDOR levels.

Lessons learnt

The main lesson learnt was that the company had tended to think about security at these locations (shutters to protect stock) rather than safe operation. Finding the right balance needed to be addressed.

Case Study 2.32	
Group	Services
Size	10-49
Risk category	Low
Incident category	Dangerous Occurrence
Job title of interviewee	Quality/H&S/Relief Manager
Total time spent on investigation	7 hours

Narrative

This organisation hire out machinery for use in a variety of tasks. On this occasion, they had hired out a piece of equipment called a 'trench rammer' to a cabling company. The equipment is used to compact the earth in the bottom of trenches after a cable has been put down. The cabling company called the hire company around lunchtime to inform them that the machine had caught fire and that the fuel pipe had consequently melted. The hire company offered a new machine as a replacement so that the first could be returned to the depot. This machine was only available later in the afternoon, a situation that was unsatisfactory to the cabling company as they were to leave that site that afternoon and start at an unknown location the following day.

Rather than waiting for the new machine the cabling company managed to get the machine going again (using methods that the hire company were unable to ascertain). Once again, the machine caught fire, this time substantially burning the face of the machine's operator.

Consequences

The operator received burns to the face. As he wasn't their employee, the hire company were unsure of the extent of these burns. In addition, communication between the two organisations broke down following the incident. Because of this, it is unclear how much sick leave the injured party had.

Inputs

The incident was investigated by:

- The Depot Manager (line manager) - 2 hours
- The Quality & Safety Manager - 2 hours
- A further representative of the Depot - 3 hours

The Depot Manager (DM) was chosen due to his experience with the customer and knowledge of the equipment used. The Quality & Safety Manager has responsibility for the investigation of accidents. The Depot Representative (DR) attended the scene to support the Depot Manager due to the emotionally volatile nature of the incident.

During the course of the investigation, the manager of the cabling company was spoken to for ¼ hour. The Hireshop Assistant, a co-worker who dealt with the request for new equipment, was interviewed for ½ hour. In addition, the manufacturers of the 'trench rammer' were addressed using correspondence.

Process

The DM and DR went to the site together, the H&S Manager was on holiday at the time of the incident and unable to attend the scene. Upon his return, the DM spent 2 hours verbally informing the H&S Manager of the incident's details. The H&S Manager collated statements from the Hireshop Assistant and the DM before completed the RIDDOR form. He also received a report from the equipment manufacturers.

Following this investigation a procedure for investigating accidents was written down by the H&S Manager.

The Managing Director of the Hire Company was the only other individual who received a copy of the investigation findings.

Conclusions and actions taken

The investigation concluded that the incident was the fault of the cabling company, specifically, that they had continued to use the equipment after they knew it to be faulty. The fire itself had damaged the machinery making impossible to ascertain exactly what had caused the primary and secondary fires.

The interviewee speculated that the equipment may have been damaged and they had improvised pipe for the petrol to move through, this had subsequently failed and the petrol had found an ignition source in a spark plug. He also suggested that the reason for this improvisation was the time factor and work pressures.

Lessons learnt

The H&S Manager suggested that because this was the first accident he had had to investigate it had made him aware of the need to develop an investigation procedure that could be followed even in his absence. He also felt that in future it would be useful to send copies of investigations to other interested parties such as manufacturers and customers.

Case Study 2.33	
Group	Manufacturing
Size	50-199
Risk category	High
Incident category	Over-three-day injury
Job title of interviewee	Management Services Manager
Total time spent on investigation	21 hours

Narrative

Two employees were performing a familiar task of moving a large roller from its machine housing. To complete this task they required the assistance of a forklift truck (FLT), the task required a boom to be fitted to the FLT to facilitate the roller extraction. One employee was detailed to operate the forklift truck and the other was standing next to the machine to assist where necessary.

The machine was housed in an area of the building with a low roof. The FLT had engaged the roller and was moving upwards in the process of removing the roller from the machine. The top part of the FLT caught the roof frame. This caused the boom and roller to fall forwards. The roller hit the worker by the machine, causing a deep cut to the thigh.

Consequences

The injured party was taken to hospital in an ambulance. They were unable to return to work for 5-6 weeks. About 8 hours production time was lost while the investigation was conducted.

Inputs

The following individuals were involved in the investigation:

- The Managing Director (senior manager) - 10 hours
- Financial Director - 1 hour
- Safety specialist - 10 hours

During the course of the investigation, two co-workers were interviewed including the driver of the FLT. There was one witness to the accident – the manageress of the department. The investigation team spent 4 ½ hours conducting these interviews. In total 21 hours were spent on the investigation.

Process

The Directors and safety specialist were contacted as soon as the incident happened. They sealed off the area and called the ambulance, police and HSE to the premises. The HSE conducted their own interviews first, whilst the safety specialist looked at the beam and took photographs of the area. The FLT was analysed by an independent organisation. The boom was also re-tested and re-calibrated. The witnesses were interviewed and all the details were entered in the accident book and an internal report form. The main headings on this form were:

- Injury details
- Accident location

- Primary factors
- Contributory factors
- Accident details
- Remedial actions

As the Managing Director and Financial Director were part of the investigation team, the results of the investigation were only distributed to the HSE.

Conclusions and actions taken

The investigators concluded that the FLT had hit the beam. Paint from the vehicle was found on the beam to confirm this hypothesis.

As a consequence of the investigation a risk assessment for using a FLT with a beam was completed. In addition, two employees were sent on a training course on operating FLT with the use of attachments. The procedure for this kind of operation was also changed, so that only those qualified could use a FLT with an attachment. Finally, the equipment was modified and a lid welded to the top of the FLT to stop the top coming out. There has not been a recurrence of this type of accident to the interviewee's knowledge.

Lessons learnt

The interviewee felt that this accident investigation had illustrated the need to give specific and specialised training. The interviewee felt that if the investigation were repeated then obtaining statements would be done in a different manner. In this case, the witnesses had claimed that the FLT had not hit the beam. Often there is a need to go deeper than witnesses statements and not accept them at face value. If the statements had been accepted at face value then the cause of this accident would not have been established.

Case Study 2.34	
Group	Manufacturing
Size	50-199
Risk category	High
Incident category	Major injury
Job title of interviewee	Personnel
Total time spent on investigation	48 hours

Narrative

This employee was engaged in polishing a foil blade. To achieve this goal he had attached the blade to the spindle that was being rotated mechanically. The employee was wearing a glove that caught on the airfoil spindle, the spindle pulled the glove and his fingers into the machine.

Consequences

Half of the employees finger was amputated and the injured party required between two to three months off. The machine was taken out of use for a few days affecting production, work cover also had to be supplied for the injured party.

Inputs

This incident was investigated by following people:

- The Health & Safety Committee - 10 hours
- Human Resources (who had responsibility for health and safety) - 38 hours

During the course of the investigation the injured party, co-worker and a witness and one of the first aiders were interviewed. The investigation took 48 hours in total, two hours of this was spent on conducting interviews.

Process

The injured party was taken to hospital and the Health& Safety Committee took the machine out of service. The maintenance team then looked at the machine. Photographs were taken and the glove that was used was retained. The investigation team took statements from the individuals detailed in the previous section. The incident was recorded in the accident book and an internal report written up. The Health& Safety Committee advised the Management of the details of the incident at a meeting. The investigation process and remedial actions were discussed.

Conclusions and actions taken

The investigation concluded that gloves should not have been worn in this particular task. The interviewee considered the underlying cause of the incident to be the use of gloves. The investigation recommended that employees should no longer be allowed to wear gloves when carrying out this particular task. In addition, training was provided for individuals who performed this task and efforts were made to raise awareness of this issue. There have been no re-occurrences.

Lessons learnt

The interviewee considered that the company had learnt to consider the adequacy of training. He also felt that there were several important communication issues to arise from this investigation. Firstly, operators should have clear, unambiguous instructions. Secondly, if an operator has an idea they should be encouraged clear it with the charge hand before carrying out the action. The accident investigation would be completed in the same fashion were it to be repeated. However, the accident has raised awareness of the importance of near misses and made follow-ups on cut fingers more likely.

Case Study 2.35	
Group	Services
Size	200+
Risk category	Low
Incident category	Minor incident involving employee
Job title of interviewee	Corporate Safety Advisor
Total time spent on investigation	1 ½ hours

Narrative

An employee on the night shift was having a cigarette outside the building. There was a palette on the floor and the employee stepped over it, did not see the nail protruding from the palette and the nail entered his foot. This organisation have had similar incidents in the past, particularly with people stepping on protruding items or nails

Consequences

The employee received first aid treatment on site but did not lose any time off work. However, the employee was given a different role to perform whilst he recovered, one that required less movement. Production was slightly affected as work levels for the mobile members of the night shift increased.

Inputs

The following individuals took part in this investigation:

- Supervisor (line manager) - 30 minutes
- Production Manager (senior manager) - 30 minutes
- Corporate Safety Advisor - 30 minutes

During the course of the investigation, the injured party and co-workers were interviewed for 30 minutes in total.

Process

The first aider was called and the injured party was taken to hospital. The Corporate Safety Advisor and the Supervisor examined the area and took photographs. The broken palette that had caused the injury was identified. When the injured party returned from hospital, the supervisor checked to see of he was still able to work. The supervisor then handed over to the morning shift and the Production Manager took over the investigation. The first-aider filled in the details of the incident in the accident book whilst the Production Manager filled in the internal investigation form. This form included the following information:

- Injured person's years of service
- The nature of the injury
- Shift details
- Corrective actions, to be carried out immediately
- Instructions to prevent future recurrences

The Senior Management Team and Safety Committee were advised of the incident and the investigation findings. Details of the incident would also have been sent to the European Health & Safety Manager who collates Europe-wide incident and accident statistics. The shop floor would also have been informally made aware of the incident.

Conclusions and actions taken

The investigation concluded that the practice of workers sitting outside on pallets, to have cigarettes, was not satisfactory. The second conclusion reached was that the broken pallet should not have been in this location.

The interviewee considered the underlying cause of this incident to be a failure to follow the stipulated procedure for the removal of broken pallets.

The investigation recommended that further steps should be taken to establish whether the pallet was broken during production and not disposed of, or whether the smokers had removed the pallet to its location and it had been broken there. The results of these inquiries would determine whether dedicated smoking facilities would be built.

Lessons learnt

The interviewee felt that the company had learnt that prevention and safety awareness is important. The interviewee didn't think that much would be done differently if the incident investigation were repeated. However, they would try to emphasise that their investigation was there to find facts and not to find faults. Disciplinary action should only be taken if proven with all reasonable doubt that an incident is wholly the responsibility of an individual.

Case Study 2.36	
Group	Services
Size	200+
Risk category	Low
Incident category	Over-three-day injury
Job title of interviewee	HS Risk Manager
Total time spent on investigation	2 hours

Narrative

This organisation is a large financial institution. This incident occurred as backroom staff were transferring toys from the ground floor to the basement floor using a trolley. One member of staff was pushing the trolley into the lift; the individual was finding the task quite difficult. As he pushed the trolley up over the ridge into the lift, he strained his back. This particular location had had similar incidents occur previously.

Consequences

The injured party required three days away from work because of this incident; he did not require medical attention. No extra work cover was provided but it did mean extra work for the remaining staff.

Inputs

The investigation team consisted of the following individuals:

- Line Manager - 1 hour
- Safety Specialist - 1 hour

The team interviewed the injured party, as co-worker and in this case a union/staff rep. The incident investigation took 2 hours in total. Half an hour of this time was spent conducting interviews.

Process

The H&S Advisor talked to the Line Manager to get an understanding of the operation and incident. The injured party and co-workers were interviewed by the investigation team and the area and equipment examined. Photographs were taken and an internal accident report form was filled in. This form consisted of the following information:

- Background events leading up to the accident
- A description of the accident itself
- Details of the injury,
- Response to the accident
- Interview statements transcripts
- A blank section for assessing immediate and underlying causes
- A review of the risk assessment

Copies of the report were distributed to the Local and Regional Managers. The incident would also have been discussed at the H&S Committee quarterly meeting.

Conclusions and actions taken

The investigation concluded that the lift was not standard. Consequently, the trolley was not suitable for use in this lift. The fixed wheels at the front meant that the trolley could not be pushed into the lift without giving it a physical shove.

The interviewee felt the underlying cause of the incident had been identified. The investigation recommended that the risk assessment should be revised and the equipment should be changed. A bespoke trolley was made for carrying out the operations in that particular location. There have not been any recurrences since.

Lessons learnt

The interviewee felt this incident had taught the company the importance of identifying underlying causes. If the causes can be identified, they can be eliminated and prevent future recurrence. If this accident investigation had to be repeated, nothing would be done differently.

Case Study 2.37	
Group	Services
Size	200+
Risk category	Low
Incident category	Dangerous Occurrence
Job title of interviewee	Deputy Group Safety Advisor
Total time spent on investigation	1 ¾ hours

Narrative

An employee was carrying out routine maintenance on an electric panel on the roof of one of the offices. The employee opened casing that should not have been live. An explosion occurred behind the panel and resulted in the employee receiving minor injuries. The employee was a qualified electrician and experienced in this sort of operation.

Consequences

The person was treated at the scene by a first-aider, but did not require any time off work. The effects on production were that the electric panel was out of action. Back-up systems were brought into operation to support the loss. It was between two to three days before the electrical system could be put back into commission.

Inputs

The individuals on the investigation team were:

- The Facilities Manager (line manager) - 45 minutes
- Engineering Group Safety Advisor - 30 minutes
- General Group Safety Advisor -30 minutes

During the course of the investigation 1 ¼ hours was spent interviewing the injured party, co-workers and the procurements department.

Process

Interviews were carried out and the accident form was filled in. It was checked that the system complied with regulations. Details of the incident were given to senior management to ensure that procedures were followed, also to the Health & Safety Committee where the information was compiled as part of accident statistic data. This incident was also reported to the 24 hour control room who passed the information on to insurance and risk management unit. The Safety Advisor examined details of the FT508 Form for potential trends.

Conclusions and actions taken

The investigation concluded that this accident could not have been prevented by the worker. A second conclusion was that more emphasis need to be placed on procurement policy and random checking of equipment. The interviewee felt that the underlying root cause of this accident had been identified.

As a result of the investigation the risk assessment was checked, the procurement policies were looked at, the equipment was changed. The damaged unit was replaced and three other units, that had the potential for a similar fault but were not yet operational due to being in a new building, were also replaced. Random checks on equipment were set up. There have not been any recurrences of this particular incident.

Lessons learnt

The interviewee felt that the company had learnt not to trust what people tell you. Also not to tell a contractor how to do their job, tell them what is required. If they are told how to do their job, legally the company 'does not have a leg to stand on'. If this incident investigation were to be repeated, nothing would be done differently.

Case Study 2.38	
Group	Services
Size	200+
Risk category	Low
Incident category	Over-three-day injury
Job title of interviewee	Safety Advisor
Total time spent on investigation	40 hours

Narrative

An employee was stood in the stairwell talking. He fell over the rail 20ft down the stairwell.

Consequences

The employee was taken to hospital and was off for 7 months off work. Work cover had to be provided during this period.

Inputs

The following individuals were involved in the investigation which took 5 days in total:

- The Head of Safety
- The Site Safety Advisor (who had other non-safety responsibilities)

Three witnesses that were stood talking to the injured party on the stairs were interviewed. A technical expert from the engineering department and a medical advisor were also interviewed. 1 ½ hours were spent conducting these interviews.

Process

Interviewee statements were taken to try and identify what had happened – where, when, how. The regulations of banister height was looked at. An accident report was produced which was about 10 pages long.

The report was sent to the Site Director for them to consider what action should be taken. A copy was also sent to the safety representative and the health and safety committee to demonstrate that the case was being investigated. In this case a copy was sent to the line manager of the injured party although this was not normally typical.

Conclusions and actions taken

It was felt that the root cause of the accident was identified but they still did not know why the employee fell over the rail in the first place. The conclusions reached as a result of this accident investigation was that there may be opportunity fir falling in other stairwells Consequently there was a company programme to raise all the banister to the new regulation height. An additional recommended action was in connection with the response time and involvement of the occupational nurse.

Lessons learnt

On of the lessons learnt form investigating this accident was that even though there is a system for investigation most are accidents are not serious enough to test the system. The need for counselling for and care for injured parties was another issue that the company realised as a result of this accident. If the accident investigation had to be repeated then nothing would have been done differently.

Case Study 2.39	
Group	Manufacturing
Size	200+
Risk category	High
Incident category	Major injury
Job title of interviewee	H&S Officer
Total time spent on investigation	7 hours

Narrative

This incident involved a maintenance engineer carrying out a repair on one of this company's machines. After he had finished the repair work, he ran the machine to check that it was functioning correctly. To enable him to see the internal workings of the machine, he left the guard off. Once he was satisfied that the repairs were successful, he attempted to replace the guard. He did not switch the machine off during this action. He waited until the moving part of the machine was at the end of its cycle to give him the most to replace the guard. The moving part completed its cycle quicker than he imagined and crushed his arm, causing a fracture injury.

Consequences

The injured party was taken to hospital for treatment and had yet to return to work at the time of this interview. There was no damage to equipment or any down time.

Inputs

The incident was investigated by the following individuals:

- Department Manager (senior manager) - 2 hours
- Safety specialist - 3 hours
- Division Maintenance Manager (senior manager) - 2 hours

During the course of the investigation, they interviewed the injured party, and a co-worker who had experience of the machine, for a total of 1 ¼ hours.

Process

The injured party was taken to hospital and photos were taken of the area. The safety specialist checked the risk assessment, entered the details into the accident book and completed an internal accident form. This form consisted of the following information:

- Details of the injured party
- The injuries sustained
- The treatment that was received
- A blank space for the managers comments
- Details of the witnesses
- An additional sheet recorded additional detail about the investigation process, conclusions and recommendations

Conclusions and actions taken

The investigation concluded that the accident could have been avoided.

The interviewee felt that the underlying cause was the failure to replace the guarding, an error of judgement by the engineer. The engineer was the safety representative and should have been setting a good example for others to follow.

The company is currently looking into changing the machine guarding systems. They may use photoelectric beams or a fixed locking guarding system. There had not been any recurrences at the time of this interview.

Lessons learnt

The interviewee did not feel that the organisation had learnt very much from this incident. They realised that they did not follow their own safety rules. If the incident investigation were to be repeated they would not do anything differently.

Case Study 2.40	
Group	Manufacturing
Size	200+
Risk category	High
Incident category	Major injury
Job title of interviewee	HS Officer
Total time spent on investigation	11 hours

Narrative

The incident involved a skilled duct erector was fitting ductwork at a client's premises. The banding that was used to suspend the duct, did not fit tightly. However, there was no requirement for this to be tight. The worker made a makeshift drilling bench, clapped the banding down and tried to drill a larger hole so that the banding would them be able to fit snugly. The drill slipped and the mental banding spun around cutting off two of his fingers.

Consequences

The injured party was taken to hospital. One finger was re-attached; the other had to be amputated. The injured party had not returned to work at the time of this interview (4 months after the incident). He is expected to return to work and he will continue in his same role. Another worker had to be called in to finish off the job at the site.

Inputs

The two individuals involved in the accident were:

- The Charge Hand (line manager) - 4 hours
- The Health and Safety Officer - 7 hours

During the course of the investigation, the team spent 3 hours interviewing the injured party and one witness.

Process

The witness alerted the supervisor and the first aider and the injured party was taken to hospital. An accident notice form was raised by the charge hand. Four days after the incident the witness statement was taken followed by the injured party statement. The Health and Safety Officer visited the site. Mock-ups of the events were made and photographs were taken.

The Contracts Director (SM) was informed about the incident and used the investigation information to raise a remedial action memo. Personnel were also given details of the incident; this was then stored on files.

Conclusions and actions taken

The investigation concluded that the practise of drilling out the punched strip was unacceptable. The interviewee felt that the underlying cause was that the person was not complying with the work specification. This unsafe act had become custom and practice. There was no need to make any amendments to the banding pre-punched strips were readily available.

A memo was sent to all site supervisors to remind them that there was no need to have banding tightly fitted around ductwork.

Lessons learnt

The interviewee felt that there is a need to look at what the employees are doing to ensure that unwanted custom and practices do not develop. In turn there is a need to make the supervisors aware that people are doing things that do not need to be done.

If the accident investigation were to be repeated the investigator would have made a greater effort to pin down the underlying root causes and try to complete the investigation more quickly.

Case Study 2.41	
Group	Manufacturing
Size	200+
Risk category	High
Incident category	Over-three-day injury
Job title of interviewee	Risk Manager
Total time spent on investigation	5 ½ hours

Narrative

An employee of this organisation had the task of testing vehicles. On this occasion, he was driving a vehicle with a blade attached to the front. As he drove around the testing site, a large stone became lodged between the vehicle blade and the floor of the vehicle. The employee noticed that the stone had lodged and stopped the vehicle to remove it. As he removed the stone, he lost grasp upon it and it fell, landing on his foot.

Consequences

The injured party was taken to hospital and lost 5 days off work because of the damage to his foot. Production was affected as work cover had to be provided for the injured party.

Inputs

This incident was investigated by the following individuals:

- The Line Manager - 3 hours
- A Safety Rep - 2 hours
- A Vehicle Risk Assessor - 0.5 hours

During the course of the investigation, the injured party and co-workers were interviewed. In total the investigation took approximately five and a half hours to complete, one hour of this time was spent conducting interviews.

Process

Following the incident the Line Manager and Safety Rep responsible for this individual and work area were notified. They went to the area where the incident had occurred to assess the scene. They interviewed the injured party and the co-worker. The investigation team then sought the opinion of the Vehicle Risk Assessor upon appropriate remedial action. Using this information the Line Manager completed the company's internal accident investigation form. This form required the team to detail:

- The incident
- The root causes of the incident
- Necessary remedial actions

Copies of this investigation report were sent to the Medical Department, Safety Department and one to Senior Management. Senior Management would have looked at the incident and considered the financial implications. The incident was also discussed at the next H&S Committee meeting.

Conclusions and actions taken

The investigation concluded that the frequency of stones trapping could not be addressed. The testing environment was designed to assess, amongst other things, this frequency for different vehicles and vehicle configurations before commercial use. The other conclusions reached were that there needed to be a greater awareness amongst test drivers that crow-bars could be used to help them to remove stones and that PPE was a requirement for test drivers.

In this case, the injured party had been wearing steel toe-capped PPE. The investigation team looked into the possibility of using boots where the steel came all the way up to the top of the foot. However, this restricted movement when the drivers tried to operate the pedals of the vehicles and was consequently rejected.

The investigators considered that the underlying cause was the injured party lifting a stone that was too heavy for him to carry.

The investigation recommended that no stones should be lifted by drivers and all should be removed using a crow bar. This new process and change in safety was indicated to the work force. At the time of the interview, there had been no re-occurrence of this type of incident.

Lessons learnt

The interviewee felt that the company had learned three lessons from investigating this incident:

1) The need to understand the person's behaviour to ensure that processes put in place are the best to improve this persons behaviour.
2) The need to investigate as thoroughly as possible
3) The importance of not becoming complacent

If this accident investigation were to be repeated, the investigators would have taken photographs of the area as these often help to explain the situation.

Case Study 2.42	
Group	Manufacturing
Size	200+
Risk category	High
Incident category	Over-three-day injury
Job title of interviewee	H&S Co-ordinator
Total time spent on investigation	5 hours

Narrative

The employee involved in this incident was walking past a product in one of the work areas. The space through which the employee was trying to move was not a designated walkway, the employee was under the impression that it was. The edge of the product (a round metal coil with pipe protruding from its middle) caught his knee. Stitches were required at the hospital. There have been no previous incidents similar to this.

Consequences

The employee had 5 days away from work as a consequence of this incident. This had an impact on production in terms of providing extra work cover and overtime in order to meet delivery dates.

Inputs

The investigation team consisted of the following individuals:

- Operations Manager (line manager) - 1 hour
- The Health and safety co-ordinator - 2 hours
- The company solicitors - 1 hour
- The injured party - 1 hour

During the course of the investigation, the first-aider was interviewed for half an hour. The team spent a total of 5 hours on the investigation.

Process

The H&S co-ordinator was informed of the incident, he went to the shop floor and examined the accident scene. The injured party was asked why the accident had occurred, the site was examined to ensure that there could be no repetition.

Using the information collected, the H&S Co-ordinator completed the accident book entry and the internal accident report form. In addition, personnel files were updated to reflect the events. The investigation team then considered the recommendations that would be necessary to stop the accident happening again. This involved discussion amongst the investigation team and, in particular, input from the injured party.

The senior management and the line manager were informed about the accident. The HSE were also notified under RIDDOR.

Conclusions and actions taken

The investigation concluded that there is a need to legislate for all types of people, even the agile individual (whom the injured party was considered to be) who had a tendency to dash around the factory.

The interviewee considered the underlying causes of the incident to be manner in which these components were stored, coupled with the individual's tendency to dash everywhere.

This investigation led to the work environment being altered. The equipment in the area was arranged so that a walk way existed rather than simply a gap. This was marked as a walkway on the floor of the factory. In addition, workers were asked to be aware of the areas in which they worked and not to run in the factory. There had not been any recurrences of this type of accident at the time of this interview.

Lessons learnt

The main lesson that the company learnt was that there are wide differences in the type of personnel and that these differences need to be catered for. The interviewee felt that if the investigation were to be repeated, photographs of the area would be taken, an idea suggested by the insurance company.

Case Study 2.43	
Group	Mining / Utilities / Transport
Size	50-199
Risk category	High
Incident category	Violence
Job title of interviewee	Group S.H.E Manager
Total time spent on investigation	16 hours

Narrative

The employee was attempting to take the name and address of the driver of a vehicle on site. The driver lashed out at the employee and slashed his face with a knife.

Consequences

The employee was taken to hospital for treatment but was back at work with in 2 hours. Normal work processes were unaffected by the incident.

Inputs

The Area Manager (senior manager) investigated the incident and interviewed the injured party but could not find any witnesses. During the course of the investigation the Area Manager spent ½ an hour interviewing the injured party and co-workers.

Process

The police were called and the injured party gave a description of the attacker. Photographs of the injured party were taken when he returned from hospital. The injured party was interviewed. A report was compiled; this report mentioned a previous case of violence involving the injured party.

Conclusions and actions taken

Unofficial conversations with co-workers revealed the attacker was the injured parties brother in law. The underlying cause of this incident was, therefore, considered to be a domestic dispute.

As a consequence of this investigation, the process for addressing people on site was changed so that only the vehicle registration is required, rather than the individual's name. In addition, training for customer care has been introduced. There had been no other cases of violence at the time of this interview.

Lessons learnt

The interviewee felt that no lessons were learnt from investigating this incident and nothing would be done differently if the investigation were repeated.

Case Study 2.44	
Group:	Manufacturing
Size:	50-199
Risk category	High
Incident category:	Over-three-day injury
Job title of interviewee	Quality Safety & Health Manager
Total time spent on investigation	35 hours

Narrative

It was a windy day and a van driver working for this organisation as a contractor was holding open the door to his vehicle while a fork lift truck (FLT) was loading goods into the back. As the FLT driver drove towards the back of the vehicle he ran over the contractor's foot. The contractor's toe was fractured and there was considerable bruising. The interviewee could not recall any similar incidents at the site, however there have been some near misses where the FLT drivers have narrowly missed people walking past.

Consequences

The injured party was seen by a first-aider and taken to hospital. He had one day off work; the incident was recorded as an LTI because the weekend followed. The Contractor did not return to work for this specific company, yet he continued to work in the same role.

Inputs

The investigation team consisted of:

- The Line Manager
- Team Leader (another line manager)
- Quality, Health & Safety Manager

During the course of the investigation, the injured party and the FLT driver (co-worker) were interviewed for 9 hours.

Process

The First-Aider and Quality, Health & Safety manager were notified of the incident. The injured party was taken to hospital and the First-Aider filled in the accident book. The Line Manger was notified and a discussion what had happened with the Quality Health and Safety Manager. The contracting company was notified, they requested that a witness statement be provided by the injured party. In addition, a statement from the forklift truck driver was taken and the two were compared for consistency.

The FLT driver was interviewed a second time and asked his opinion on possible preventative measures that could be implemented. The Quality, Health & Safety Manger then produced a six-page report on the incident. The results of the investigation were sent to the Managing Director and Board Members and they decided upon remedial actions. The Managing Director issued e-mails to every manager to demonstrate Board level support for the remedial actions. The incident was also discussed at a Health & Safety Management review.

Conclusions and actions taken

The investigation concluded that there is a need to clearly demarcate people and FLT authorised areas. In addition, contractors must be aware of the actions and movements of forklift trucks.

The interviewee considered that the underlying cause of the accident was the small work area and the difficulty in preventing people working near FLTs. At the time of this interview, the company were moving to a bespoke building, where these issues had been addressed.

After the investigation, new walkways were introduced. Secondly, separate doors for FLTs and people were introduced in the warehouses. Moreover, risk assessment policy was re-assessed; in future, the organisation has decided to involve FLT drivers when altering risk assessments. Finally, all employees were reminded of the potential dangers of working alongside FLTs. There had been no recurrences of this type of incident at the time of this interview.

Lessons learnt

The interviewee felt that the company had learnt firstly that prevention should always be the first strategy. Secondly, people are not always diligent and often revert to their old ways despite their training. This tendency needs to be monitored to avoid risks. If this accident investigation were to be repeated, they would try to see who caused the accident to see if the same person was involved. Not with a view to sack that individual but to the root cause of any problems that individual may have.

Case Study 2.45	
Group	Manufacturing
Size	50-199
Risk category	High
Incident category	Dangerous Occurrence
Job title of interviewee	Safety Advisor
Total time spent on investigation	1 hour

Narrative

This organisation stored 25 litre receptacles of liquid on palettes in a storeroom. An employee noticed that a palette on the top shelf of a unit was broken. The employee decided to remove the receptacles one at a time to enable him to reach and replace the broken palette. To perform this operation he needed to climb the unit to reach. As he performed this operation, a receptacle fell, striking the employee on the head. He was left with a mild headache because of the blow. The incident had the potential to be far more serious so was reported and investigated as a dangerous occurrence.

Consequences

The individual did not lose any time off work, nor did he require any medical attention. Production was not adversely affected in any way.

Inputs

The following individuals were involved in this investigation:

- The Safety Manager - 30 minutes
- The Factory Manager (line manager) - 15 minutes
- Works Engineer (line manager) - 15 minutes

During the course of the investigation, the injured party and a witness to the event were both interviewed. The investigation took one hour in total; thirty minutes of this time were spent conducting interviews.

Process

Following the incident the first priority was to ensure that the injured party had suffered no major ill effects. Next, the situation was assessed for further risk and the site made safe. The incident was recorded in the accident book and statements from the injured party and the witness were taken. An internal accident report sheet was then filled in. This contained the following sections:

- Personal details of injured party
- Accident details and treatment received
- The employers investigation
- Actions taken
- Time lost from work.

The Director was informed about the investigation through a monthly accident report prepared by the Safety Manager. Staff in the department were informally notified of the incident by the Factory Manager.

Conclusions and actions taken

The investigation concluded that the employee had not followed the company's best practice for dealing with loads at a height. He had climbed up the unit rather than using an aid such as a ladder. The interviewee considered the underlying cause of the incident was likely to be a training issue. Although, it was noted by the interviewee that it might have been a case of the employee choosing to neglect his training, rather than the training itself being at fault. Because of this incident, procedures were modified to make it much more explicit that there should be no climbing on the racking systems. Extra training was given, and a general awareness memo was disseminated amongst the staff to re-enforce to them that they should follow their training at all times.

Lessons learnt

The main lesson that the company learnt from this investigation was that training did not prepare staff for unusual situations. The interviewee felt that members of staff needed to take a step back and think before they act. If this incident investigation were to be repeated, nothing would be done differently.

Case Study 2.46	
Group	Manufacturing
Size	200+
Risk category	High
Incident category	Over-three-day injury
Job title of interviewee	Safety Co-ordinator
Total time spent on investigation	Unknown

Narrative

During a recent take over the company had made engineers, who were previously specialised in one area, become multi-skilled and be able to work in a variety of areas. On this occasion, an engineer was sitting on a piece of machinery and had entered through an interlock gate to carry out some maintenance. The interlock gate he normally worked with, before multi-skilling, had a hydraulic interlock system that would isolate the machine automatically when passed through. However, on the piece of machinery that he was currently working with, the air needed to be manually dumped to stop the machine from operating.

The engineer carried out the required maintenance on the machine; this cleared blockage left the machine free to operate. Because he was unaware that the machine wasn't isolated, the machine cycled and crushed his arm.

Consequences

The injured party was taken to hospital and he lost more than three days off work (time could not be specified). He has since returned to work but did not resume the same role to start with because of psychological trauma. Production was adversely affected that day with the down time of three to four hours. The company also had to supply work cover for the injured party.

Inputs

The investigation team consisted of:

- The Chief Engineer
- Maintenance Manager (line manager)
- The Safety Co-ordinator
- A technical expert

During the course of the investigation, the team spent approximately 1 ½ hours conducting interviews with the injured party, the operator of the machine, a co-worker and six witnesses. There is no total time specified for the investigation.

Process

The HSE were informed of the incident and conducted their own investigation, the company saw no point in repeating what they had already done. After the HSE had spent three to four days conducting their own investigation the company spoke to the interviewee. The incident investigation had not been finished at the time of this interview, therefore it was not clear who eventually would be informed about the incident.

Conclusions and actions taken

The interviewee felt that the underlying cause had been identified. Specifically, that the air should have been dumped but had not been.

Because of this investigation, procedures for isolating machinery were modified and the equipment was changed (so that it was in line with all the other hydraulic dump systems). In addition, training was provided and the company were looking into investing in an isolation system that demonstrates if any energy is left in the machinery before work is carried out. There have been no recurrences.

Lessons learnt

The interviewee felt that the company had learnt dangers of multi-skilling. If this investigation were to be repeated then nothing would be done differently.

Case Study 2.47	
Group:	Services
Size:	200+
Risk category	Low
Incident category:	Major injury (fatality)
Job title of interviewee	Hygiene & Safety Controller
Total time spent on investigation	56 hours

Narrative

A contractor from an international company was carrying out routine maintenance on 2 lifts within this organisation's store. The contractor was familiar with the lifts, having worked on them the day before the incident. The lift was at the top of its cycle where it stayed for 15mins before descending. The contractor was in the lift pit, saw that the lift was coming down towards him, as he tried to escape the pit he was trapped between the edge of the lift and the pit and crushed.

Consequences

The individual was crushed to death. Production was not adversely affected, another lift was still in use however the incident had considerable impact upon employee morale.

Inputs

The investigation team consisted of:

- The H&S Manager the Safety Practitioner
- The Director of Engineering (senior manager)
- The Maintenance Controller (contractor)
- The Insurance Company
- HSE Inspector (experts)

During the course of the investigation, the team spent 9 days interviewing witnesses, technical experts, members from the contracting company and the HSE for expert opinion.

Process

The H&S Manager was notified about the accident and other members of the team were contacted. A call point was set up to deal with any external people seeking information. The team visited the site together and liased with the Environmental Health Dept. Firemen and the Police. They arranged for the contractor's procedures and the companies own Health & Safety manuals and procedures to be looked at. Lift contractors were called in and the HSE and Environmental Health Department got their own consultant engineers to look at the lift and establish if there were any faults with the equipment itself. The Environmental Health Department were involved in interviewing all of the witnesses and they reviewed the lift standards. Remedial actions were looked at. Details of this incident were recorded in a separate report. Results of the investigation were passed on to the contractor and to the Environmental Health Department. In addition, a group was set up internally to identify where there could have been improvements in performance based upon this particular incident report.

Conclusions and actions taken

The investigation concluded that the engineer had made certain decisions that were not correct. He had over ridden certain safety devices and didn't use others.

The interviewee felt that the underlying cause of this accident was that the contract engineer had overridden three safety devices.

The investigations recommended that procedures should be modified and that there should be greater control of contractors. In addition, all existing contracts were reviewed, particularly statements about safe working practices. Finally, the company reviewed their own internal investigation methods and mechanisms. There have not been any recurrences.

Lessons learnt

The interviewee felt that the company had learnt the following lessons from this accident:

1) The need to respect the feelings of witnesses to traumatic events. In this particular event the company employed a firm to carry our counselling.
2) The monitoring and control of external contracts

The interviewee felt that if the investigation were to be repeated then an additional person would be responsible for recording the incident details. In this incident investigation, the person leading the investigation was also the person recording; this was felt to be too much pressure for one individual.

Case Study 2.48	
Group	Manufacturing
Size	50-199
Risk category	High
Incident category	Disease
Job title of interviewee	Health & Safety Officer
Total time spent on investigation	Unknown

Narrative

A Machine Operator at this organisation had been on sick leave for a period. The H&S Officer at the company realised that this individual had dermatitis. The machine that the operator used, lubricated the materials that passed through them with a cutting oil spray. The guarding of the machine protected the workers from being in contact with this oil/water substance most of the time, however, when the door opened to extract the piece of work workers became exposed. Fans had been put on some of the machines to extract the fumes from this oil but not on all of them.

Consequences

The individual lost time off work and production was also adversely affected. There was extra work for the others to do and the machine had to be taken out of service for one day.

Inputs

The following individuals were involved in the investigation:

- The Facility Manager (who had health and safety responsibilities)
- An external Medical Expert
- The Supplier of the oil

The injured party, co-workers and Production Engineer were all interviewed during the course of this investigation. It was not clear how long was spent on this particular investigation.

Process

After the H&S Officer became aware of the problem, a Medical Expert was called in to test the remaining eight employees who had worked on that machine. Seven were found to suffer from dermatitis and three had respiratory problems. The suppliers of the oil were then asked to conduct an investigation. They looked at the oils and produced a report on the quality of the oil to see if any contamination had taken place. The H&S Officer used this information, along with the interviews detailed above, to complete the organisation's internal report form. The form included the following sections:

- Personal details of injured person
- Description of events
- First-aid required
- Outcome of incident
- Investigation details

Senior Management was sent a copy of the report to ratify the suggested actions. The H&S Committee also reviewed the report; it was their responsibility to disseminate the information to the shop floor and staff office.

Conclusions and actions taken

The investigation reached the following conclusions:

1) The quality of the extraction fan could have been responsible for the respiratory problems
2) There was a lack of monitoring of oil quality and specifically oil contamination
3) The workers required protection from the effects of this material

As a consequence of the investigation, barrier cream was made available to all the employees and instruction was provided in its use. Venting systems were placed on all of the machines. The supplier undertook to check the quality and composition of the fluids in the machine during regular, routine maintenance. The company also actively investigates developments of new barrier creams and cleans equipment around the factory regularly. The same individual has suffered one recurrence.

The interviewee felt that the underlying cause of the ill-health had been identified.

Lessons learnt

The interviewee felt that the company had learnt lessons about how to investigate health issues. He also believed that they now know how to seek root causes and how to take appropriate preventative measures. He felt that some of these issues could have been foreseen in terms of risk assessment, and that this technique could be applied to other areas that they are not necessarily required by law to assess. If the were incident investigation were to be repeated they would not do anything differently.

Case Study 2.49	
Group	Manufacturing
Size	200+
Risk category	Low
Incident category	Minor incident involving employee
Job title of interviewee	HSE Risk Manager
Total time spent on investigation	4 hours

Narrative

A maintenance worker in a chemical company fell whilst standing on a pipe in order to gain access to something. When he stepped down from the pipe he stumbled and fell, twisting his leg and knocking his knee against the pipe. There have been similar fall accidents in this organisation, but none at this exact location.

Consequences

The injured person (IP) suffered damage to his knee requiring medical attention and two days off work, he then returned to resume his original role. It was stated that the company does not distinguish between less than three days or more than three days – any time off work is classed as an Lost Time Incident. There were no production losses as a result of the accident.

Inputs

The following individuals were involved in the investigation:

- The IP's Immediate Supervisor (line manager)
- Site Safety Manager

During the course of the investigation, there was a brief discussion with a Trade Union Representative. The investigation team spent a total of ½ day examining this case, most of this was taken up with interviewing the injured party and his supervisor (line manager). There were no witnesses in this case but they would have interviewed them if present.

Process

All sites in the Group have developed their own process for accident investigation, but this is becoming standardised. Two forms have recently been developed by the Group HSE Manager. The first form is completed within 24 hours, which consists of the descriptive information. Form 2 was then completed by the Site Safety Manager in order to determine underlying causes and to specify corrective actions. It was noted that they have a very structured process for assigning corrective actions to particular people with completion dates and a system for ensuring that these actions are completed. All sites will be using these forms by the end of 2000 and this will include ½ day training. These standard procedures have been developed because of a focus on accident investigation across the whole Group.

The investigation focussed on determining why the IP was standing on the pipe in the first place. In the interview with the IP open questions were used and they stressed to the IP that the root causes were important, rather than blame.

The Group Chief Executive sees all reports into LTAs, and has set a target of no LTAs. The Site Manager, local H&S representative and the Group HSE Manager were also informed about this incident.

Conclusions and actions taken

A mini platform has been erected over the pipe to enable ease of access and this incident added weight to the proposal to implement a behavioural safety approach ('B-Safe') in the company. The root causes were seen to be fairly obvious in this case. The risk assessment was revised, as they have tended to focus on major hazards. It is too early to say whether these actions have prevented a recurrence as the incident only occurred three months ago.

Lessons learnt

This incident reinforced the fact that the company needs to work more with supervisors, as they are good at their jobs technically but require more safety training. Line managers condone unsafe working practices by not disciplining individuals and they recognise that this requires a culture change. They will be training them in their legal responsibilities and how to conduct risk assessments. They have always had good Health and Safety Officers, but need to encourage the thinking that H&S is everyone's responsibility.

Now that they have developed a new, standardised procedure and forms for investigation they would take a little more time over it if they did the investigation again – maybe they have been too quick to come up with the answers in the past.

Case Study 2.50	
Group	Manufacturing
Size	200+
Risk category	High
Incident category	Over-three-day injury
Job title of interviewee	Personnel H&S Manager
Total time spent on investigation	8 hours

Narrative

The employee involved in this incident slipped on water on a landing at the bottom of some concrete stairs. Similar incidents have not occurred before; areas where slips may be a problem have been identified in risk assessments and are painted in non-slip paint or non-slip mats are provided. Additionally, machines that use water as part of the process (glass cutting machines) have a sluice to collect water.

Consequences

The employee suffered a back injury because of this fall. The interviewee alleged that the injured person (IP) falsified this claim in order earn financial compensation. The H&S Manager drove the IP to hospital, where he received medical attention. He was off work for 3 weeks and then returned to his normal role. He has since taken more time off work. The IP is apparently not satisfied his GP's recommendation to return to work and so he has been seeking private treatment, including physiotherapy. It is alleged that the private physiotherapy has only been accepted in order to support a subsequent claim for compensation. Note that the IP has been awarded two successful compensation claims and has one more in process at the moment.

Inputs

First aid was applied on site, and the team leader (line manager) investigated the incident, which included interviewing the IP and his co-workers. The H&S Manager drove the IP to hospital and then reviewed the accident report. Due to the employee's history of compensation claims, photographs were taken of the site. The investigation took a total of one day, including ½ hour interviews with the IP and co-workers.

Process

Following first aid on site, the H&S Manager drove the IP to hospital (stated that 'he (the IP) should have been awarded an Oscar for his performance on the way to the hospital'). A team leader carried out the investigation, which was reviewed by the H&S Manager. The accident was documented in the accident book. Not all incidents are investigated, mainly those where it is expected that there will be a compensation claim against the company.

Senior management would become aware of the incident at the monthly H&S meeting, which includes Safety Representatives at each of the three sites. Minutes of the accident would be sent to all managers and directors.

Conclusions and actions taken

The floor area involved and other similar areas affected (particularly those made slippery by wet footwear) were immediately painted with anti-slip paint. Non-slip mats were proposed for other

areas. Risk assessments were revised as a result of the accident (see lessons learnt). The interviewee felt that the investigation got to the root causes of the incident; it highlighted other areas that may be hazardous and these were also treated with the non-slip paint.

Lessons learnt

The interviewee felt that the risk assessments had not identified all of the areas where there was a risk of slipping. They had mainly concentrated on machines that used water as part of the process. Some risk assessments were revised. It was reported that nothing would be changed if the investigation were repeated.

Case Study 2.51	
Group	Manufacturing
Size	50-199
Risk category	High
Incident category	Minor incident involving employee
Job title of interviewee	UK H&S Administrator
Total time spent on investigation	2 hours

Narrative

In this incident a male general operative, aged 56, reported back pain throughout the day when driving an excavator over rough ground in a quarry. This type of incident has occurred before due to the nature of the work – such lifting and excavating equipment is often driven over large distances of rough ground. The suspension and seating etc. were not designed for such travelling, rather for stationary work. Furthermore, operators spend a great deal of time seated in such vehicles.

Consequences

The operator reported experiencing back pain, but did not take time off work, nor did they require medical attention.

Inputs

The Site Manager (who had health and safety responsibilities) performed the investigation, spending a total of 2 hours, including discussion with the injured party.

Process

This is a two-stage process; Form 1 is completed within 24 hours and lists descriptive elements. Form 2 is then completed within one week, containing information on contributory causes and required corrective actions (including persons responsible for taking actions and completion dates).

The completed forms are passed to the Area Manager, Safety Department and Regional H&S Advisor. More severe accidents would be reported higher up the hierarchy, from Area Director, to Regional Managing Director to UK Managing Director. When one of these directors receives notification of an incident, they are obliged to ask three questions: 'How is the injured person?', 'How did the injury happen?' and 'What is being done to prevent a recurrence?'

Conclusions and action taken

Conclusions are listed on Form 2 under contributory causes and include the fact that the seat was new and in order. The injured person has a history of back problems and hurt his back in an accident 2 months prior to this incident. It was stated that these conclusions are partly formed from the use of a root cause analysis tree, but there was no evidence of such an analysis in this case. The interviewee felt that the underlying causes were identified in this incident, although it is too early (1 month) to state whether the actions have been effective in preventing a recurrence. The actions taken because of this investigation included the provision of a new cushion on the seat.

Lessons learnt

It was commented that the incident merely reinforced what the company knew; it did not provide any new information. If the incident were being investigated again, a new action to monitor the health of the employee would be included in the report.

Case Study 2.52	
Group	Manufacturing
Size	50-199
Risk Category	High
Incident category	Over-three-day injury
Job title of interviewee	Site Manager
Total time spent on investigation	8hrs

Narrative

A fitter was sent to the stockyard to remove a track bar from a caterpillar chain. He went on his own and used a long handled torque wrench to remove the bolt. As there was very little clearance the wrench slipped off the bolt when the fitter pulled against it. He slipped backwards and fell hurting his back. Two other fitters were passing the other side of the yard and he called out to them for help. An ambulance was called and he was airlifted to hospital. He was discharged from hospital just over an hour later. The fitter was a temporary worker and his co-workers felt he had rushed off to do the job without telling anyone. Had the correct tool for the job been used the incident would not have happened.

Consequences

The fitter was off work for 8 days, but returned to his original role. Production was not adversely affected in any way.

Inputs

The site manager (who had health and safety responsibilities) was responsible for investigating the incident. He is the sole person on site with NEBOSH training although he has passed his knowledge on to the works foreman and the admin manager who take charge if he is not present. The injured party was interviewed in addition to the first-aider and co-workers to identify what the standard procedure is for removing a track bar and whether this had been followed.

Process

The process of investigation involved discussion with those involved, photographing the site of the incident and an informal task analysis. This is the standard method for investigating incidents as recommended by the interviewees NEBOSH training.

Conclusions and Actions Taken

The main conclusion was that the wrong tool for the job had been used. It was felt that this was partly because of the inexperience of the fitter, he was a temporary worker who had been with the company for a couple of months. There is now more effort to supervise temporary and new workers

Lessons Learnt

The incident highlighted that fact that the fitter was working in the stockyard on his own and that it was pure chance that anyone was passing when he injured himself. The company now uses a buddy system to ensure that if an accident happens in future it would not go unnoticed.

The need for more adequate supervision of temporary and new workers was recognised although improved training was not mentioned.

Case Study 2.53	
Group	Manufacturing
Size	50-199
Risk category	High
Incident category	Minor incident involving employee
Job title of interviewee	Safety, Health & Environment Manager
Total time spent on investigation	1 hour

Narrative

In this case a boiler had been shut down for annual inspection. A maintenance technician was entering the boiler through a small hole to conduct the inspection. As he pulled himself in he cut himself on a sharp piece of metal sticking through the refractory lining. Erosion of the refractory had occurred during operation, this had left the piece of metal exposed.

Consequences

The person was cut on the wrist. After receiving first aid he returned to work. Although only a minor cut it was appreciated that the consequences could have been worse.

Inputs

The following individuals were involved in the investigation:

- Injured party - 30 Minutes
- Injured party's line manager - 30 minutes

In this case the investigation simply involved identifying what caused the cut and an incident report form was completed. The line manager was a witness to the incident therefore there was no need to interview anybody else.

Process

The injured party and his line manager examined the scene and the hazard. The other boilers on site were examined and none had a similar problem. The company incident report, which asks for type of work, hazard type and its source, unsafe acts and conditions, and relevance of other peoples' activities, was completed

Conclusions & actions taken

No conclusions were reached regarding the hazard development. The investigation concluded that the injured party should have foreseen the risk of unknown hazards whilst carrying out such a non-routine activity and worn gloves.

Lessons learnt

The interviewee felt that this incident had highlighted the need to wear gloves in such situations. This contributed to a site initiative aimed at encouraging wearing gloves to prevent hand injuries.

Case Study 2.54	
Group	Manufacturing
Size	50-199
Risk Category	High
Incident category	Over-three-day injury
Job title of interviewee	General Manager
Total time spent on investigation	14hrs

Narrative

This incident involved an operator on a textile-processing machine. The machine is designed to roll material to uncurl edges and remove creases before drying. The roller rolls outwards and in a risk assessment had been judged as not presenting a nip hazard as there was no access to this part of the roller. On returning from his break the operator threaded the roller the wrong way causing it to rotate in the opposite direction. As it was turning the wrong way the material was not being de-creased. Not realising his mistake the operator kept putting his hand in the machine to push out the creases in the material as the machine did not seem to be doing it. His hand was trapped between the roller and a fixed part of the machine. He managed to reach the emergency stop button with his other hand and other workers rushed to help him. He was attended to by a first-aider and taken to hospital. The incident happened during the night shift.

Consequences

The operator had a fractured finger and was taken to hospital. He returned to work a few days later and did light duties until his hand was better. Production was not affected in any way.

Inputs

The General Manager was the Safety representative at the factory and so was in charge of the investigation. He reported to the Production Director. He does not have any training in incident investigation or root cause analysis. The HSE were also consulted. The process of investigation involved discussions with the co-workers at the scene and with the injured party on his return to work.

Process

As the incident happened on a night shift the general manager spoke to the witnesses and obtained an accurate description of what had occurred. He then examined the machinery. When the injured party returned to work he was interviewed and a report compiled. At the time of the incident an incident record was filled in.

Conclusions and Actions Taken

The investigation concluded that the operator had not been operating the machine in accordance with his training. This has caused the trapping hazard, which led to the injury The process for arriving at this conclusion was not structured in any way, relying on observation and talking to those on the scene. As a result of this the guards on the machine have been modified and the induction training has been improved.

Lessons Learnt

The general manager felt that these measures were effective in preventing recurrence of the incident. There was no mention of why operators choose not to wear the PPE they are provided with. They have realised the importance of having a first-aider on every shift and that the induction training needed improving. They have since bought a digital camera to help record incidents. They recognised that the approach used was not structured at all and thought that a more structured approach would enable underlying causes to be determined.

Case Study 2.55	
Group	Mining / Utilities / Transport
Size	200+
Risk category	High
Incident category	Over-three-day injury
Job title of interviewee	Group Risk / Safety Manager
Total time spent on investigation	10 hours

Narrative

This incident involved a plumber fitting a new radiator in an office. The job had been planned and agreed. The local manager asked the plumbers to fit it to a different wall than that agreed in the job plan. They agreed to do this task without informing their own supervision.

The original location only involved routing pipes through a wall. The new location required routing via a roof space. The Plumber accessed the roof space and used available planks as crawling boards. The cross members in roof were approximately 3 feet apart. After working in roof space for about half an hour, one of the plumbers lost his balance and fell 12 feet to the ground.

Contractors in another part of the building were fitting heating ducting. The room where the radiator was being fitted was being used to store the ducting. The plumber fell onto this stored ducting. This caused a severe laceration including tendon damage.

Consequences

The injured party was treated by company nursing staff who were on scene within 2 minutes. The ambulance arrived in less than 10 minutes. The injured party spent approximately 36 hours in hospital having his tendons re-tied.

The injured party was away from work for three months. He had some slight loss of movement in his leg but resumed his previous job. No special arrangements were required to cover his absence.

Inputs

The following individuals were involved in the investigation:

- Injured party's line manager - 3 hours
- Building's manager (senior manager) - 1 hour
- Group risk & safety manager - 6 hours

During the course of the investigation, the team interviewed the injured party, co-worker, supervisor (line manger) and a contractor working in building who had witnessed the accident. The scene was examined and photographed.

Process

The interviews identified what happened and why the activities were being carried out. These identified that the organisation of work was fine (risk assessments etc.) until the location of the radiator was changed, from which point the job was carried out in an unplanned manner.

The accident report was written. The Safety manager then discussed this with the Group manager to identify root causes and management failures, and to determine the best method of dealing with them.

Conclusions and actions taken

The investigation report was circulated throughout the company, from summaries in safety bulletins posted on notice boards, right through to the managing director. The main outcome has been a clarification of the lines of communication. Greatest focus has been on the tradesmen themselves as they are company employees, where many of the people in "management" positions are creative and often freelance (i.e. safety is not high on their agendas). A requirement to risk assess all work over 2 metres with supervisor had been introduced.

Lessons learnt

The interviewee felt that one problem had been the poor enforcement of rules and procedures.

Case Study 3.1	
Group	Manufacturing
Size	200+
Risk category	High
Incident category	Over-three-day injury
Job title of interviewee	Engineering Manager
Total time spent on investigation	24 hours

Narrative

In this incident, an engineer was burning through some metal stanchions during dismantling work using oxyacetylene in a disused building at the rear end of an engineering workshop. Whilst this task was being conducted, some dust and powder fell from the upper floor trusses and ignited. This caused a small dust explosion and a fireball. The engineer moved away from the hazard during which time the automatic sprinklers activated and doused the fire. The engineer was taken to the local hospital for further treatment to burns to his face and arm.

Consequences

The injured party was away from work for 2 months because of this incident. Whilst he had been wearing PPE at the time of the incident, the heat through his gloves had been sufficient to cause burns. Upon his return to work, he started on lighter duties than normal but was eventually able to resume the same role.

Work Processes were largely unaffected by this incident. The area was due to be demolished anyway. The work being carried out was salvage work. This work ceased following this incident.

Inputs

The incident was investigated by:

- The Manufacturing Manager (line manager) - 8 hours
- Engineering Manager (who had health and safety responsibilities) - 8 hours
- The Area Manager (senior manager) - 8 hours

The overall responsibility for the investigation was held by the Engineering Manager, during the course of his investigation he spoke to the injured party, his co-worker and one other witness, each for around 1 hour.

Process

The investigation team obtained a statement from each of the parties identified above on the day of the incident. The only exception was the injured party who gave a statement as soon as he was able. The Engineering Manager took photographs of the scene and sealed off the area until it could be made safe. The Manufacturing Manager was then asked to fill in the companies internal accident report form. This form contains brief details of the incident and injuries, as well as preventative measures to be taken.

The investigation team then convened to complete the investigation. This involved constructing an event time line, reaching conclusions and proposing actions. Some time later a follow-up review was convened to ensure that the recommended actions had been followed through.

Once the investigation was complete Managers, Directors and the personnel department were made aware of the results.

Conclusions and actions taken

The investigation concluded that the accident happened because of powder escaping. This had been possible due to a crust forming on top of the powder so that when it was cleaned out the powder remained beneath the crust. This crust was then disturbed by the use of the oxyacetylene cutting equipment and subsequently ignited. The workmen were found to have followed accepted working practice for clearing out an area and were deemed ‘unlucky’.

As a consequence of this incident the area was curtained off and a Permit-to-enter system introduced to regulate access. It was felt that this was unlikely to happen again due to the site’s impending demolition and because it was an area that had been unused for some time.

Lessons learnt

The interviewee felt the company had learnt important lessons about incident management and dealing with the emergency services. They would not have done anything differently had they repeated the investigation.

Case Study 3.2	
Group	Manufacturing
Size	50-199
Risk category	High
Incident category	Over-three-day injury
Job title of interviewee	H&S Manager
Total time spent on investigation	11 hours

Narrative

The process being conducted was to test a novel lubricant. This is done by taking an engine, taking it apart, and measuring and photographing all moving parts. The engine is then rebuilt and run using the lubricant. The engine is taken apart once more and the moving parts photographed and measured for comparison.

The incident occurred when an engineering technician was attaching a bolt to a flywheel. The procedure for this process had been developed to an industry standard. The technician used a wrench to apply the required forces to the bolt. An extension socket was used to enable the bolt to be turned an additional 90 degrees (as required by the procedure).

This task requires a great deal of force to be applied to the wrench. As the technician applied the required force, the bar snapped, propelling the technician two or three feet through the air.

Whilst the technician received superficial injuries from the landing, the main injury sustained was a wrenched back caused by the sudden release of pressure when the bar snapped.

Consequences

Production itself was largely unaffected by the incident (the only time lost was whilst the technician was tended to). The technician carried on at work for two days before he had recurrence of pain in his back and took four days off. The pain returned when he came back to work. Consequently, he was signed off for two further days.

Inputs

The incident was investigated by a team comprising:

- The H & S Manager - 3 hours
- The injured party - 2 hours
- The supervisor (line manager) - 2 hours
- The Engineering Safety Committee Chairman (an expert) - 2 hours
- The Assistant Director (senior manager) - 2 hours

The individuals were involved for the following reasons; H & S Manager, in a co-ordinating role; the injured party, because of his knowledge of the processes involved and the incident in question; his immediate supervisor, again because of understanding of the work process; the Engineering Safety Committee Chairman, as a piece of equipment had been involved and the Assistant Director of an unrelated department, to act as an impartial observer. The make-up of this team and the investigation process are suggested by an international company standard.

At this organisation, there were no interviews, as all of the people that witnessed the incident were involved in the investigation process.

Process

At the first convenient time following the incident, the members of the investigation team convened to conduct the investigation. Initially, they establish a timeline of events from the start of the injured individual's shift to the return of the technician to work. Once this has been agreed, they developed a cause and effect tree where all potential contributory factors were discussed and their likelihood of occurrence assessed.

Following this process (which is recorded by the H&S Manager), recommendations are made for actions to reduce or eliminate the likelihood of this event happening again. These actions are assigned to individuals and dates for their completion set.

Once the H&S Manager has completed his report it is disseminated to Divisional Vice Presidents, The Vice President of the H&S committee, H&S Managers at relevant sites, the Engineering Safety Committee and to the management of other sites that may have an interest in the findings.

Conclusions and actions taken

The conclusions of this investigation were firstly, that the tool was not suited to the pressures that were applied to it during the course of this process. Secondly, that the Quality Control systems of the equipment supplier were not of a sufficient standard.

Any investigation automatically triggers a review of relevant Risk Assessments. In addition, all branded bars, such as those used in this incident, were identified and replaced with those of another supplier. All tools that are used for high torque applications were reviewed for suitability.

There had been no recurrence of this incident in the months following this investigation.

Lessons learnt

If the investigation had been repeated the H&S Manager would have waited longer for information from the tool supplier. The conclusions about their QC system were described as 'informed guesswork'.

Case Study 3.3	
Group	Services
Size	50-199
Risk category	Low
Incident category:	Dangerous Occurrence
Job title of interviewee	Environment, Health & Safety Leader
Total time spent on investigation	18 Hours

Narrative

An overhead crane was being used to help with re-furbishing at one of this company's sites. A 4-wheel drive vehicle was underneath the cranes path as it moved. The chains of the crane caught on the vehicle as the crane head moved by. This caused the crab unit of the crane to be pulled off its rails. The crab unit was left swinging below the crane still attached by some of the chains. Nobody was injured in this incident.

Consequences

Operations had to be stopped for 3 days. A smaller but quicker crane unit was then used for about 2 weeks. This crane was faster but as it was smaller, time had to be spent making the items that it was carrying smaller. Repair of the original crane had to be undertaken. The installation and re-commission of the original crane took a day.

Inputs

The incident was investigated by:

- The Site Manager (line manager) - 3 Hours
- The Environment, Health & Safety Leader - 15 Hours

Two witnesses to the event were interviewed along with the operator of the 4-wheel drive vehicle and the crane (involved parties). During the course of the investigation 1½ hours were spent conducting interviews.

Process

The site manager called the Environment, Health & Safety Leader for help with the investigation. Statements were taken from the witnesses the next day. Then the crane operator and the 4-wheel drive vehicle operator were interviewed. Scaffolding was built around the crane so the investigators could see the damage safely. Lifting equipment was used to lift the crane equipment to the floor. An inspector from the repair company looked at the damage. Then an internal incident report forms was completed. This recorded the following details:

- Details of those involved
- Number of hours worked
- Types of injuries
- Equipment or PPE used,
- Circumstances surrounding the incident,
- An analysis of causes to consider immediate and contributory factors
- Actions taken to prevent recurrence

Each site was given a paper copy of the report and details were added to a web database. The General Manager and the Project Manager were given copies. Lastly, the incident investigation was reviewed at a Health & Safety Committee meeting.

Conclusions and actions taken

The conclusions reached as a result of the investigation were that the two operators had acted carelessly, and that no responsibility had been assigned. The underlying causes were considered a lack of communication between the crane operator and the driver of the 4-wheel vehicle and the lack of a system.

As a result of the investigation, the risk assessment for the task was revised and the procedures modified so that one person has been assigned responsibility for ensuring that the path under the crane is clear. Awareness of the need for good communications was also heightened. There has not been a recurrence of this dangerous occurrence.

Lessons learnt

The system that the company thought was good, was shown to be inadequate on this occasion. There was not a suitable method of co-ordination in place even though the individuals had the right skills.

If the investigation were to be repeated more time would have been spent on documenting the detail. This is due to the change of company ownership. If the company had not changed then nothing would have been done differently.

Case Study 3.4	
Group	Construction
Size	200+
Risk category	High
Incident category	Over-three-day injury
Job title of interviewee	Health & Safety Manager
Total time spent on investigation	54 hours

Narrative

At one of this company's construction sites, pipes had been stacked after being unloaded from a lorry. The company had hired special plant equipment with a driver to move the pipes. In addition the labour at the site was being carried out by sub-contractors. To perform the task of moving the pipes a chain had to be attached to either end of the pipe. Next, the pipe was lifted and timber put in at the front edge to raise it so that a sling could be attached and protect the pipe coating. Instead, of using the timber at the side edge of the pipe the sub-contractor was putting the timber in the end of the pipe when it had been lifted slightly. He signalled for the hired operator of the plant equipment to let the pipe down and as the pipe settled it rocked forwards onto the sub-contractors hand.

Consequences

The injured party went to hospital and had to undergo an operation on his hand. He was away from work for three months. There was a delay in unstacking the pipes but they were not needed for a few days. As the injured party was a sub-contractor the replacement work cover was not a cost to the company.

Inputs

The following individuals were involved in this investigation:

- The company's Site Agent (line manger) - 6 hours
- The company's Divisional Safety Officer - 12 hours
- The clients Site Manager - 6 hours
- The contractors Health & Safety Officer - 12 hours
- The sub-contractors Health and Safety worker - 12 hours
- A representative from the sub-contractors insurance company - 6 hours
- A technical expert from CITB

4 ½ hours was spent conducting interviews. The injured party and the co-worker operating the lifting equipment were initially interviewed. Later a technical expert from CITB was interviewed regarding recommended lifting techniques. Other workers on the site who performed that same operation were asked informally about their usual work method.

Process

The Safety Manager was notified and took details of the injury. The individual was taken to hospital and the HSE were informed. The investigation team was then established. Interviews were carried out and the details and the accident book and the internal accident form completed. This form consisted of:

- Details of the injured party
- Description of the incident
- Causes of the accident
- Any further investigation

Further interviews were then conducted at this stage. Training details of the injured party and the driver were looked at. The lifting shoes and chains provided for the task were checked to see if they were in working ordered. Details of the accident were added onto the database system and a F2508 was sent to the HSE. Lastly, a report was written by the Health & Safety Manager under the heading 'summary of accident'. This included facts and sources of information, conclusions (including immediate and contributory causes) and recommendations.

The information from the investigation was given to the senior management and other business areas of the company. The Health & Safety committee were informed and they talked through the case at the bi-annual meeting. Also at a joint contractors meeting the information was discussed and swapped for information on other cases.

Conclusions and actions taken

The conclusions reached as a result of the investigation were as follows.

1. The specified procedures for the task and method statements were reasonable
2. The briefing induction covered the relevant and necessary topics
3. The correct equipment was available and of a suitable standard
4. An unsafe act had occurred (probably not for the first time)
5. Site supervisors needed to address theses as and when they arose.
6. Training for the task had not been uniformly provided, newer workers had received this training but not all of the established workers

The interviewee felt that underlying cause was an unsafe act. It was felt that looking at the reasons why the act occurred would not be of benefit, given the time they would take to establish.

The risk assessment was revised and the training program was looked at to ensure all employees had received training on this task. Lastly, the information from the investigation was passed down through the company to create awareness of this issue. There has not been a recurrence of this accident.

Lessons learnt

The interviewee felt that the lesson learnt from this investigation was the identification of an unsafe practice and a training requirement. If the investigation were repeated then structure would have been more an issue.

Case Study 3.5	
Group	Manufacturing
Size	200+
Risk category	High
Incident category	Over-three-day injury
Job title of interviewee	Group H&S Advisor
Total time spent on investigation	160 hours

Narrative

An operator was requested to look for a sampling point; and he took it upon himself to take a sample from a valve that was not designed for that purpose. No similar incidents have been reported.

Consequences

A high-pressure water/oil mixture at 300^0C was released causing minor burns to the injured party (IP) and resulting in an Environment Agency reportable incident. The IP was off work for one week, requiring medical attention to burns to his foot. He then returned to work, resuming his original role. There were significant financial implications as the plant was shut down for two weeks in order to perform a full investigation.

Inputs

Several personnel were involved in this investigation, which involved 20 man-days in total including:

- The Divisional Managing Director (senior manager)
- A key Director on site (senior manager)
- Environmental Manager
- Injured Party

The time taken to interview the injured party, direct witnesses and co-worker was ½ to 1 hour.

Process

The company has a standard process for conducting such investigations and an associated safety management system. Detailed guidance is available on to how to report an incident and follow it up. This consists of interviewing people involved, co-workers and witnesses; completing SHE Incident Report Form, and conducting a root cause analysis. These standards (Group Policy) have developed over time through reference to industry best practice, discussion with the Regulators and consultation with the various sites in the Group. Reference has been made to HSE Guidance documents, in particular HSG/48 and HSG/65.

A summary of the incident has been circulated to all sites in the Group for review. These sites are instructed to determine whether a similar incident could occur and if so, to implement measures to prevent it on their site. Senior management on the site concerned would receive a summary of the incident and the actions taken in regular review meetings.

Conclusions and actions taken

The investigation into this accident led to a change in the procedures. All valves that could cause a dangerous release if opened in error have been reviewed and blocked. Process and Instrumentation Diagrams (P&IDs) have been updated. It is considered that the root causes have been identified and appropriate action taken to prevent a recurrence (they have 'managed out' the opportunity for front-line operators to open valves that should not be opened). Risk assessments have been updated to reflect the changes made. Awareness training has been provided to operators to inform them of the nature of the incident.

Lessons learnt

The incident has led to a review of the site Emergency Response procedures. A review of the P&IDs found these to be outdated and they have been revised where necessary. As an additional benefit, this exercise has also led to a better knowledge of the plant. The investigation would not be performed differently, as this is the standard company procedure that has evolved by consultation and it is a tried and tested method. The interviewee was unable to suggest how this investigation process could have been improved.

Case Study 3.6	
Group	Mining / Utilities /Transport
Size	50-199
Risk category	High
Incident category	Minor incident involving contractor
Job title of interviewee	H & S Co-ordinator
Total time spent on investigation	24 hours

Narrative

This organisation is involved in the engineering of high-pressure oil and gas pipelines. On this occasion they were project managers for a job at an airport installing oil pipelines. They had appointed a main contractor to carry out the task. The airport landowners had required that the site contractor should be installed as the sub-contractor. The sub-contractors were found to be working in trenches that had not been shored in the fashion agreed by all parties at the start of the project. This was reported to the main contractor and consequently to this organisation in their role as project managers. The sub-contractors involved had been spotted working in the same fashion on two previous occasions. Each time they had been advised to change their working practices.

Consequences

There were no injuries as a result of this incident. Work processes were affected whilst the incident was investigated.

Inputs

The incident was investigated by the following individuals:

- The Construction Supervisor (who had health and safety responsibility) - 4 hours
- The Project Engineer - 16 hours
- The Line Manager - 4 hours

During the course of the investigation the airport H&S expert who had spotted the infraction was informally interviewed for a few minutes. The principal contractor, sub-contractor, land-owner and the project supervisor met for meetings about working practices.

Process

Once the incident had occurred the construction supervisor informed the line manager who had overall responsibility for conducting the investigation. The initial investigation was conducted by the project engineer, with input and review by the line manager. The company's accident investigation form requires the investigator to describe the incident and to identify and discriminate between the immediate and basic causes of the incident. Further actions are recommended and detailed to certain individuals, these individuals are also given dates by when these actions should be completed. Two assessments are required of the investigator; firstly, to describe associated risk and secondly, estimated cost. Finally H&S meetings are held to discuss the recommended actions and 'close out' any recommendations.

In addition to these H&S committee meetings the findings of the report are disseminated to the divisional manager.

Conclusions and actions taken

This investigation concluded that the method statement agreed between the interested parties was not being followed. The report recommended that enhanced supervision be put in place to ensure that these method statements were being adhered to. In addition, the parties with a stake in this incident met to discuss the issues involved and to acknowledge the problem.

Lessons learnt

The interviewee felt that this investigation had illustrated the need to ensure that in managed projects certain issues are kept on top of, particularly the adherence to method statements.

If the accident investigation were to be repeated then they would try to complete it more quickly.

Case Study 3.7	
Group	Manufacturing
Size	50-199
Risk category	High
Incident category	Dangerous Occurrence
Job title of interviewee	Hygiene & Safety Officer
Total time spent on investigation	8 hours

Narrative

A recently installed section of ducting (12 foot section in length, 3 foot diameter) fell from the ceiling, narrowly missing an employee. The ducting was constructed from several sections connected together.

Consequences

No injuries were caused by this incident, but potentially the incident could have led to a fatality had an employee been struck. Damage was sustained to the section of ducting.

Inputs

The following individuals were involved in this investigation:

- The Supervisor (line manager)
- 2 Health and Safety team members (who had other non-safety related responsibilities)
- Injured party

During the investigation, the interview with the injured party and his co-workers took approximately ½ hour. The rest of the time was taken performing the analysis and documentation. Both members of the safety team often get involved in all investigations, as 'two heads are better than one'.

Process

Once an incident report form has been received, the company has a structured process for investigating incidents, which they call 'Sequence of Events'. This is presents the chain of events that led to the incident, and contributing factors are identified for each link in the chain. Direct, indirect and basic causes are examined. The Hygiene and Safety Officer interviewed the employee and co-workers and examined the site of the incident. He performed the Sequence of Events analysis and identified the causes. Note that this is a straightforward incident. Not all incidents would be investigated to this level of detail; the company uses a frequency/outcome matrix to decide which events to investigate in detail.

The Manufacturing Manager is made aware of all accidents and disabling injuries. In addition, the H&S Committee discussed the incident at a monthly meeting.

Conclusions & actions taken

Because the ducting was classed as new equipment, no pre-commissioning checks were performed and it was recognised that such a check would have prevented the incident. All ducting is now secured with chains to the ceiling rather than just connected together, so that if a

section does come lose it will just swing from the ceiling rather than drop to the ground. The interviewee felt that the underlying causes of this near miss were addressed. The incident has been widely publicised and the company reiterated to all employees the need to report near misses.

Lessons learnt

The company now performs pre-commissioning checks on all new or modified equipment. The interviewee does not foresee any changes to the investigation procedure, as it is a standard company procedure.

APPENDIX B: PROTOCOL FOR ARRANGING INTERVIEWS / FINAL INTERVIEW SCHEDULE

Protocol for HSE telephone calls

Please may I speak to xxxxxxxx (as per contact sheet; you should have both a named individual and job title)

If asked who you are, and why you wish to speak to them, you can provide the following information;

My name is …….. I work for Human Reliability Associates. We are carrying out a project on behalf of the Health and Safety Executive (HSE) reviewing how companies investigate accidents at work. xxxxxxxxx (Name of individual) has already helped in a previous telephone survey and indicated that they were happy to co-operate with a follow up survey. I am ringing to arrange a convenient date to visit the company to talk to xxxxxxxx.

When you have got through to the named contact:

My name is ……from Human Reliability Associates. We are working together with Metra Martech on behalf of the Health and Safety Executive (HSE) reviewing how companies investigate accidents at work. You may remember helping us in a telephone interview recently. During the interview you were asked if you would be prepared to help by discussing accident investigation within your company in more detail. I am ringing to see if it would be possible to visit you in the near future to carry out a more detailed interview than was possible on the telephone. The interview will take approximately 1-1.5 hours during which we will discuss the procedures you use after an incident has occurred, and any approaches you may use to investigate the incident and prevent re-occurrence. As with the telephone interview, no information gathered in the survey will be given to HSE in a form that would enable them to identify the source of the information and indeed, they will not even be given the names of the companies which have participated.

Before making appointment confirm the details from the database, namely that they have had experience of the accident that was described and/or they have previously investigated the range of incidents that have been recorded.

Arrange a suitable date and time in suitable survey slot

If hesitant about what they can contribute, assure them that for the survey to be valid it is important that we include companies of different sizes and different experience of accident investigation. However, if you meet real resistance, thank them for their help and move on to next contact.

If they wish to verify the validity of the study you can offer to fax a description of the study and if necessary give them the phone number of our project officer at HSE: Karen Clayton 0151 951 4317.

Final Interview Schedule

Circle yes or no as appropriate

Introduction

Demographics

Ref No.

Company name and address

Sector/Industry

Size/Group

Company contact

Position

Case study description

RIDDOR category

Date of interview

Interviewer

Start of interview

Finish of interview

Notes

Background to interview

Purpose of interview

To follow up a small number of telephone interviews to:
Verify the accuracy of the telephone interviews
Expand on the information obtained in the telephone interviews
Collect the specific case study data

What we will cover in the interview

Cover the case study you mentioned in your interview
Look at how this case study and was investigated and recorded

Look at the general procedures and systems in place for investigating work related ill health and accidents
Look at the general views and attitudes within the company about incident investigation

A. Case Study

General information

1. Can you give a more detailed description about what actually happened? e.g. the role of the person(s) (do not collect names as this will cause problems under the Data Protection Act) what were they doing at the time etc.

2. Has this incident or anything similar happened before?

Consequences of incident

3a . Did the person lose time off work? Yes/No
3b. If yes, how long?

4a. Did they require medical attention? Yes/No
4b. If so, what?

Did person return to work? Yes/No

6a. Did person resume original role? Yes/No
6b. If no, what role did they return to and why?

7a. Was production or normal work processes adversely affected in any way as a result of the accident/ill health? Yes/No

7b. If yes, how? e.g. down time/lost product/damaged equipment

Investigation Team

8. Who was involved in investigating this accident/ill health? Checked have identified everybody involved?

	Give details	Time
Line management		
Senior Management		
Safety specialist (internal or external)		
Safety Rep		
.Health & safety committee		
External experts		
Medical experts		
Other (check for employee involvement)		

9. Can you estimate the time involved for each of the individuals we have identified? Note this include interviewing and documenting

10. What was the organisational level of the person who had the overall responsibility for the investigation? Does this responsibility change through different types of accident/ill health or severity of outcome/potential outcome?

11. Why were these people chosen?

12 . Under what circumstances would a different type of team investigate? E.g. profile change if different incident type, different consequences or potential outcome?

13a . Did any member of the team have any training in incident investigation and root cause analysis? Yes/No

13b. If yes give details

14. Does a typical investigation team have training in incident investigation?

Who else contributed to the investigation - interviewees

15. Who was interviewed during the course of the investigation or made any other contribution to the investigation? READ OUT

	Give details	Time
Injured party		
Co-workers		
Witnesses		
Union/Staff reps		
Technical experts		
Other		

16. Can you estimate the time involved for each of the individuals we have identified?

Investigation process

17. Can you describe how this accident/ill health was actually investigated?

18a. Is this the standard company protocol/procedure for investigating accidents/ill health? Yes/No

18b. *If no*, who or what dictated how the investigation proceeded?

18c. If yes, can we have a look at this procedure/form?
(Discuss procedures/form if possible note headings, and make brief description)

18d. Why were these standard procedures adopted?

18e. If company procedure was not followed for this case why not?

Drawing conclusions

19. What conclusions did you reach as a result of investigating this accident/ill health?

20 What process did you use to arrive at these conclusions?

21. Do you feel that the real underlying or root cause/s of this accident/ill health were identified? Yes No

22. Do you consider your organisation to have a structured process for identifying root causes of accident/ill health?

	Yes/No –give details
Accidents	
Ill health	

Actions taken

23. Who was informed about the incidents and results of the investigation?

	Give details who involved and what information used for
Senior management	
Safety rep	
Health & safety committee	
Head office	
Other	

24a. Is this a typical with happens to incident report? Yes/No

24b. If no, give details

25. What action was taken as a result of accident and investigation?

	Give details
Risk Assessment revised	
Procedures modified	
Equipment changed	
Environmental change	
Work organisation changed	
Process changed	
Process eliminated	
Person disciplined	
Training	
Person changed roles	
Other	

26a. Have these actions been effective in preventing re-occurrence? Yes/No

26b. If no why not?

27. What are the most common recommendations made following investigations?

Learning Lessons

28. What lessons do you think that the company learnt from investigating this incident?

29. If you were repeating this accident investigation what would you do differently?

30. Do you think a more structured investigation process would have helped you get to the underlying causes more effectively?

31a. Do you think, if using a structured process took more time people would be prepared to use it? Yes/No

31b. If no, why not?

32. Do you think company saved any money by carrying out this accident investigation?

General Questions on Investigation

Incident types

33a. Do you investigate near misses/high potential consequences/dangerous occurrences? Yes/No

33b. If yes what triggers the investigation of these incidents?

34. Is there anything different that you do in terms of incident recording and investigation for incidents involving public, contractors, violence? (check that these incidents are investigated)

Type	Recording	Investigation
Public		
Contractors		
Violence		

Trends

35. How is your accident/ill health data typically stored - -manually or on computer? Give details

36. Is the data used to identifying frequencies of accidents/ill health? Yes/No

37. Is the data used to identifying underlying causes of accidents/ill health? Yes/No

External Training

38. Who decides which individuals have any training in incident investigation?

39. Do you know what your company's current budget for safety training is?

40. If you needed to have additional training in incident investigation whose budget would this training be allocated too?

41. Which individuals would typically get priority to receive training in accidents/ill health investigations?

	Give Details
Line management	
Senior Management	
Safety specialist	
Safety Rep. or safety committee	
External experts	
Medical experts	
Other	

Legal

42. Does anything different happen in terms of accident/ill health recording and investigation if there is a potential legal claim against the company?

43. As far as you are aware do companies have a legal requirement to either report or investigate certain kinds of accidents/ill health?

Type	Report	Investigate
Accident		
Ill health		

Tick as appropriate

44. If accidents/ill health investigation is made a legal requirement what practical changes would this mean for your company?

Change	Details	Estimated expense/time
Training		
Equipment		
,Time to document		
Additional personnel		
Database costs		
Other		

45. Can you estimate the additional cost that would be involved for your company if accident investigation were to be made a legal requirement?

Benefits

46. Do you have any actual examples where the investigation of an accident/ill health has lead to direct benefit for the business? (we are ideally looking for costed examples in terms of investigations costs and potential benefits costs)

47. How would *you* rank order the benefits of incident investigation (see separate sheet)? How do you think *the company* would rank order the benefits of incident investigation (see separate sheet)

Lastly

48. In your telephone interview you rated your company's investigation process as ___ on a scale of 1-5 (where 5 = very effective). When you made this rating what were you using as a benchmark?

49. What ways could the HSE better support you to improve incident investigation?

Is there any chance of getting a blank copy of the investigation form that you showed me earlier or the guidelines you talked about?

Interview Reflections (do you feel they had got the underlying cause & had a structured process)

RANK ORDERING SHEET

How would *you* rank order the benefits of incident investigation

Rank order from 1-10 where 1 = most important

	You	Company
Improved health and safety performance		
Improved company morale		
Better employee relations		
Saves money		
Improves production		
Better company reputation		
Better relations with regulators		
Avoid litigation/better defense in litigation		
Peace of mind		
Encourages general carefulness		

APPENDIX C: TELEPHONE SURVEY – VOLUME 1 (MAIN REPORT)

CONTENTS

1. INTRODUCTION

In July 2000 Human Reliability Associates (HRA) and Metra Martech Limited (MML) were commissioned by HSE to carry out a study of the way that companies investigate the causes of accidents in the workplace and work related illnesses. The work was planned in two phases. In the first of these Metra Martech Limited was to interview 1,500 companies by telephone to obtain an overview of the accident investigation practices across the whole spectrum of commerce and industry, including micro-businesses, SMEs and larger companies.

In the second phase of the work HRA will carry out 100 face-to-face interviews with a selection of people who participated in the telephone survey. The people selected for this second phase will be chosen to give a range of practices and types of accidents.

This report covers the first phase of the study and includes a description of the method and a summary of key findings with an appendix which includes the questionnaire used in the interviews. Detailed tabulations of the results are in a second volume.

2 METHOD

2.1 Questionnaire Design

A draft questionnaire was prepared, discussed with HSE and revised.

Thirty telephone interviews were carried out. After analysis of the responses and discussion with HSE a revised version was prepared. This also took into account points made by the interviewers concerning difficulties with specific questions the most important of which was to keep respondents focused on investigation of accidents, not just on recording of them.

The revised version of the questionnaire was again discussed with HSE before the "Final Pilot" questionnaire was prepared and a further 71 interviews completed.

All 101 interviews were analysed and, in particular, answers to all the open ended questions coded and grouped. Tick lists were generated for all the open-ended questions to facilitate recording and analysis of data and incorporated into the final questionnaire. No open-ended questions remained although space was left, where appropriate, for writing in "other" answers. Additional changes to wording were made to keep respondents focused on accident investigation. The final questionnaire is attached as Appendix 1.

2.2 Sample Structure

The structure of the interview sample was discussed with HSE. Organisations were classified into the 17 sectors listed below which cover all SIC codes. These were further classified into five groups as indicated on the table. The first four of these, which all involve physical activity by employees, were also classified together as "higher" risk while the purely service activities were classified as "lower" risk. Initially an attempt was made to subdivide the "higher" risk organisations but examination of accidents statistics by industry did not reveal any rational basis for this.

Four size bands, based on numbers of employees, were agreed and initial targets set for numbers of interviews by sector and size.

A total of 7,200 names were purchased from Dun and Bradstreet structured appropriately in terms of SIC and size. In practice the number of interviews achieved was somewhat different from the initial targets for some sample cells, reflecting the numbers of companies in the cells and the ability or willingness of some types of respondents to answer the questions. This applied particularly to smaller companies many of whom claimed to have no experience of accidents or their investigation and who thus declined to participate.

CLASSIFICATION OF ORGANISATIONS		
SIC	**GROUP**	**SECTOR**
01, 02, 07, 08, 09	Agriculture	Agriculture, Agric Services, Forestry, Fishing
15, 16, 17	Construction	Construction
10, 11, 12, 14	Mining/Utilities/Transport	Mining and Quarrying
40, 41, 42, 43, 47		Rail, Road, Air, Water Transport, Post, Freight Forwarders
46, 48, 49		Utilities, Pipelines, Communications
13, 28, 29, 30	Manufacturing	Petroleum, Chemical and Petrochemicals
32, 33, 34, 37		Mineral, Metals, Transport Equipment
20, 21		Food & Tobacco
22, 23, 31, 24, 25, 26, 27		Textile & Clothing, Leather & Footwear, Paper, Printing, Timber, Furniture
35, 36, 38, 39		Machinery & Equipment, Electronics, Other
75, 76		Auto and Other Repair, Parking
50, 51	Services	Wholesale
52, 53, 54, 55, 56, 57, 59		Retail
58, 70		Hotels, Restaurants, Cinemas, Museums
60, 61, 62, 63, 64, 65, 67, 86		Finance, Insurance, Real Estate, Membership Organisations
72, 73, 81		Personal or Business Services, Legal, Other Services
80, 82, 83		Health, Education, Social Services

We have the number of employees in the whole organisation from the Dun and Bradstreet sample and we also have, from the interviews, the number of employees for whom the respondent had direct knowledge of investigation procedures. The size of organisations were normally classified on the basis of the D&B data as it was considered that where a respondent was part of a large organisation but was only responsible for a few employees, procedures were more likely to reflect those of a large organisation rather than a small one.

For a few organisations the respondent reported responsibility for more people than D&B indicated were employed in the whole company. In these cases we used the respondent's employee figure for classification of the company size, on the basis that this figure was more likely to be up to date.

2.3 Analysis of Results

The results of interviews were entered into an Access database and tabulations prepared using SPSS software. The final tables were exported into an Excel spreadsheet which is available to HSE.

The tables are included in Appendix D and give an analysis of answers to all the questions in the same order as used in the questionnaire. Each set of answers cover two tables. The first gives totals by risk, size, sector and group. The second shows a breakdown of groups and risk by size.

2.4 Statistical Significance

Statistical theory can be used to calculate the margin of error on an observation. For example if 1,000 people are asked whether they prefer oranges or bananas and the answers are equally divided then we can say that if the whole population were asked then the number preferring bananas has a 95% chance of lying between 47% and 53%. The answer is normally presented as 50% ± 3%. If only 100 people had been asked the answer would have been 50% ± 9% whereas with a sample of 10,000 the confidence limits would be ± 1%. Again with a sample of 1,000 if the answer had been 10% prefer oranges then the limits on the answers would have been 10% ± 1.8% prefer oranges and 90% ± 1.8% prefer bananas. Confidence limits depend on both the sample size and the value of the answer. The theory also assumes that the sample is completely random and is more complex when there are several possible answers.

The following table gives confidence limits for different sample sizes and different values of the answer based on the simple theory:

Sample Size	Value of Answer				
	10%	**25%**	**50%**	**75%**	**90%**
10	-10+19%	-25+27%	±32%	-27+25%	-19+10%
20	-10+13%	±19%	±22%	±19%	-13+10%
30	-10+11%	±16%	±18%	±16%	-11+10%
50	±8%	±12%	±14%	±12%	±8%
100	±6%	±9%	±10%	±9%	±6%
200	±4%	±6%	±7%	±6%	±4%

As discussed in Section 2.2 the 17 sector categories used in the analysis covered all SIC codes. They were defined in these groups to ensure a wide spread across different types of activities, however, the numbers of interviews in some sample cells, particularly when further sub-divided by size, is small. As a result differences between such cells containing only small numbers of responses may not be significant but the table above can be used to assess significance.

In order to generate cells with increased sample size five groups of organisations have been used, Agriculture, Construction, Extraction/Utilities/Transport, Manufacturing, Services. Agriculture and Construction have been kept separate even though numbers are small as special considerations apply to these industries.

We have also combined the first four of the above groups into "higher risk" leaving just services as "lower risk". The higher risk category includes all businesses where objects are made or transformed or machinery is used as a principal part of the business.

3. RESULTS

3.1 Key Conclusions

- Prevention versus Blame

The priority given to various factors when investigating accidents was as follows:

- Preventing Recurrence 4.86
- Identifying direct contributory factors 4.68
- Identifying underlying causes 4.61
- Identifying persons responsible 4.19

These figures suggest that "Blame" is significantly less important than "Prevention".

- Safety Specialist and Line Managers

Overall H&S specialists are involved in the investigation team in 50% of cases with the figure rising to 55% for Very Serious or Fatal cases and falling to 46% for Minor cases. The figures are much lower in small companies and a little higher in larger ones. The overall figure for Line Managers is 64% rising to 67/68% for Minor or Lost Time accidents and falling to 60% for accidents involving Members of the Public.

- Resources, Prevention and Severity

The relative amount of time spent on accident investigation, in descending order, for each type of accident is as follows:

- Very Serious of Fatal 100
- Work Related Illness 37
- Violence to Employees 35
- Near Misses 28
- Lost Time Accidents 23
- Minor Accidents 6

Accidents to Members of the Public or Contractors' Employees are treated in a similar manner to accidents of comparable severity to employees.

The amount of effort is strongly related to severity rather than to potential for prevention. In this context the effort devoted to Near Misses is perhaps surprising but may be because only "Serious" Near Misses are considered.

- Employee Involvement in Investigation

A Safety Rep or Committee is part of the team for investigation of 28% of accidents, almost independent of severity. The figure is very low for small companies rising to 30% for 10-200 employees and almost 40% for large companies. The injured party is also consulted in 90% of cases together with Co-Workers (60%) and Union or Staff Reps (15%).

- Training

There is little training in accident investigation with over half the organisations having had no one trained. Such training as there is, is mostly part of more general management training or concerned with the recording of accidents. The level of training is somewhat higher in larger organisations.

- Effectiveness in Implementation

Overall organisations rate their effectiveness in monitoring the impact of actions taken as the results of accident investigation at 4 out of 5. In the context of scores recorded elsewhere in this study this is not a very high figure and excludes cases where no action is taken.

3.2 Preliminaries - Q1

- Size of Company -Tables 1A to 1C

Table 1A shows the correlation between the total number of employees in an organisation (from Dun & Bradstreet) and the number for which the respondent has knowledge (Q1.4). The top half of the table shows that some respondents claim to have knowledge for more than the total number of employees. In these cases we have adjusted the D&B categories to take this into account giving rise to the figures in the lower half of the table.

Table 1A shows that most people were answering for all the employees in the company and this is confirmed by Table 1B. Not surprisingly the proportion answering for only part of the company increases with company size.

Table 1C shows the distribution of respondents by size (D & B categories adjusted as above) according to Risk, Sector and Group.

Throughout the tabulations respondents have been grouped by Risk (higher/lower), Size (five categories based on employees), Sector (17 categories based on SIC code) and Group (Agriculture, Construction, Utilities etc, Manufacturing, Services) as discussed in Section 2.2. The reasons for the groupings are discussed in Section 2.4 together with an indication of the statistical significance of answers and the relationship to the number of respondents in a sample cell.

- Role of Respondents - Table 2

Table 2 shows that the proportion of Health and Safety experts responding to the interviews is greatest in the larger companies. Most replies came from H&S Specialists, Senior Managers (Owners in the case of small businesses) or Operational Managers. Nine percent of respondents are classified as other. These tend to be in the smaller companies but there were some where the job title made other classification impossible.

3.3 The Investigation Processes - Q2

This question covers four aspects for each of eight types of accident. The eight types are:

a Minor accidents
b Lost time accidents
c Incidents of work related ill health
d Fatal or very serious incidents
e Accidents to contractor's employees
f Accidents to members of the public
g Incidents of violence to employees
h Near misses involving no injury

The types are further defined in the questionnaire.

The four aspects of investigation covered in this questionnaire are:

- Level of reporting/investigation
- Members of investigation team
- Other sources of information
- Time spent on investigation

There were two additional parts to Question 2 covering standard procedures for investigation and recording of incidents.

- Overall Level of Reporting - Tables 3A and 3B

For each type of accident respondents were asked if an accident of that type had occurred. If it had occurred then they were asked if it had been recorded. If they said "Yes" again, they were asked if it had been investigated. This gives three possible combinations of answers:

- Occurred but not recorded
- Recorded but not investigated
- Recorded and Investigated

If there had been no occurrences of accidents of a particular type, respondents were then asked if cases would be recorded if they did occur and would they then be investigated. This gives two more combinations of answers:

- Would record but not investigate if it occurred
- Would investigate if it occurred.

When a particular type of accident had not occurred a small proportion of people declined to speculate on how it would be handled. These are classified as "No Opinion" for that type of accident.

Table 3A shows the numbers and proportion of each type of accident falling into each category. Table 3B shows similar figures but excluding "No Opinions". Most people do or would investigate all types of accidents except minor ones but even here two thirds would be investigated.

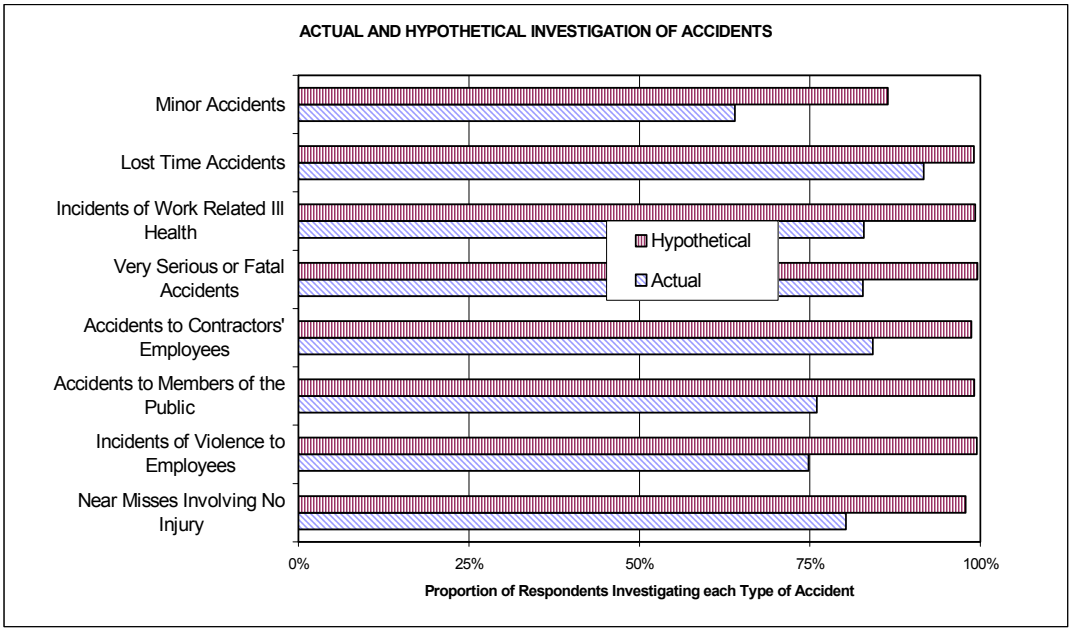
The proportion which has actually investigated accidents of a given type is generally quite low for many of the types simply because such accidents have never occurred, particularly in smaller companies. When a particular type of accident had not occurred respondents were asked what their response would be if such an accident occurred and many were willing to give their hypothetical response.

The table below shows that the proportion who claim to have investigated accidents when they have occurred is quite high and is over 75% except for Minor Accidents.

INVESTIGATION OF ACCIDENTS									
	Response when Accidents have Occurred			Hypothetical Response			Overall Response		
	Total	Invest-igate	% Invest-igated	Total	Would Invest-igate	% Would Invest-igated	Total	Invest-igate	% Invest-igated
Minor Accidents	1,303	834	64%	133	115	86%	1,436	949	66%
Lost Time Accidents	805	738	92%	525	520	99%	1,330	1,258	95%
Incidents of Work Related Ill Health	263	218	83%	1,017	1,009	99%	1,280	1,227	96%
Very Serious or Fatal Accidents	197	163	83%	1,115	1,110	100%	1,312	1,273	97%
Accidents to Contractors' Employees	279	235	84%	918	906	99%	1,197	1,141	95%
Accidents to Members of the Public	175	133	76%	985	976	99%	1,160	1,109	96%
Incidents of Violence to Employees	143	107	75%	965	960	99%	1,108	1,067	96%
Near Misses Involving No Injury	456	366	80%	734	718	98%	1,190	1,084	91%
Source : Metra Martech									

For most types of accidents the incidence is low with under 20% of respondents having experience of all types except Minor and Lost Time Accidents and Near Misses. Only about a third claimed to have had experience of Near Misses but this is almost certainly an underestimate as many such cases are never officially recorded or noted.

The proportion who would hypothetically investigate accidents is substantially higher than the proportion who actually do so and is over 90% for all types except Minor Accidents. The figures are shown in the table above and illustrated in the chart below.



- Reporting of Accidents by Type - Tables 4A-1 to 4H-2

These sixteen tables show corresponding figures for each type of accident classified by Risk, Employees (Size), Sector and Group in one table and by Risk and Group, both by Employees, in a second table. Summary tables are shown in Appendix 2 with the proportions of accidents of each type which are actually investigated or which, hypothetically, would be investigated if they were to occur. As in the Table above the actual levels of investigation are below the hypothetical figures in almost all cases.

Minor accidents (Tables 4A-1 and 4A-2), which have occurred in over 90% of organisations, are less likely to be investigated in small companies, only 44%, but this figure rises to 74% in the largest organisations.

Almost everyone does or would investigated Lost Time Accidents (Tables 4B-1 and 4B-2) though the proportion who would not is substantially higher in the Repair and Metals/Minerals etc, sectors.

Similar patterns emerge for Work Related Illness (Tables 4C-1 and 4C-2) but it must be noted that 80% or responses were "hypothetical". Care should also be taken to avoid drawing too definite conclusions from the small number of cases in some categories. It should also be noted that where cases have occurred only 83% were investigated whereas 99% of the remainder claim they would investigate if they were to occur.

Not surprisingly almost all Fatal and Very Serious Accidents (Tables 4D-1 and 4D-2) are or would be investigated but such accidents had only occurred in 10% of the organisations interviewed.

Accidents to Contractors' Employees (Tables 4E-1 and 4E-2) are also taken seriously and have occurred in 23% of organisations though this proportion varies widely with size of organisation from 1% in the smallest to almost 50% in the largest.

Almost all Accidents to Members of the Public (Tables 4F-1 and 4G-2) are or would be investigated but have occurred in less than 15% of organisations. The proportion is higher in the Services and Extraction/Utilities/Transport groups where employees and the public are in frequent contact

Violence to Employees (Tables 4G-1 and 4G-2) would almost always be investigated but such cases are rare occurring in only 13% or organisations. Again the proportion is higher in the Services and Extraction/Utilities/Transport groups.

Near misses are reported to have occurred in only a third of organisations but were investigated by 80% of these respondents.

- Overall Composition of the Investigating Team - Table 5

The composition of the investigating team involves line management in about two thirds of cases, irrespective of type of accident. HSOs are involved in about half of all cases reflecting mainly the fact that many of the other companies do not have such a person. The involvement of Safety Reps is fairly constant at between 25% and 30%. Senior Managers are much more involved in Fatal or Very Serious (79%) compared to only 42% for Minor cases. Senior Managers are also more likely to be involved in cases of Violence or Accidents to the Public. Medical and Other External Experts are most likely to be involved in Incidents of Ill Health or Fatal or Very Serious cases.

- Composition of the Investigating Team by Type - Tables 5A-1 to 5H-2

The composition of the investigating team is strongly influenced by size of organisation with a progressive shift away from the involvement of senior management towards line managers and HSOs as organisation get larger. The involvement of safety reps or committees is negligible in small companies but otherwise fairly constant across the other three size bands as is the use of medical or other outside experts.

- Overall Other Sources of Information - Table 6

The injured party is involved in investigations in almost all cases where this is possible. The figure is much lower for Near Misses where there is no injured party but some respondents were including the potentially injured party under this heading. Co-workers are involved in about two thirds of cases while the proportion of witnesses is rather higher. Witnesses and co-workers may be the same people.

Union or staff reps are seldom involved but medical experts are more likely to be involved in Very Serious or Fatal cases or in Work Related Illness.

- Other Sources of Information by Type - Table 6A-1 to 6H-2

These tables show very little systematic variation with size or sector except that Union or Staff reps are seldom involved in small organisations.

- Time Spent on Investigations - Table 7

Respondents were asked to estimate the total time spent on investigation of accidents of different types. Respondents found this difficult to answer especially when they were asked to speculate for types of accidents for which they had no direct experience. Answers were given in only about half of the cases. To make the answering easier respondents were asked to fit their answers into the bands shown in the table.

The amount of time increases with severity. For Minor accidents the time spent is less than an hour for over 70% of cases and less than two hours for almost 90% of them. For Lost Time accidents almost 60% involve over two hours with 15% involving more than 5 hours. For Work Related Illness the times are longer still with 20% involving over 20 hours. For Very Serious or Fatal cases over 80% require more than 20 hours.

Accidents to Contractors Employees or to Members of the Public are treated much the same as accidents to employees with around 5% spending less time and 10% to 14% spending more time.

Incidents of violence against employees are treated more seriously than Lost Time accidents with 83% involving over two hours.

Near Misses are treated similarly to Lost Time incidents although a considerable proportion of these are based on hypothetical times.

A particular problem was with accidents to the public or to contractors employees where many people said it depended on the severity of the accident and many related their answer to how they would respond to a similar accident to an employee. Where this was the case the majority said they would spend a similar amount of time on

accidents to both employees and outsiders although there were a significant proportion who would spend more time on accidents to outsiders, particularly members of the public.

- Time Spent on Investigation - by Type - Tables 8A-1 to 8H-2

Figures are very different for each type of accident as discussed above but, within a type, there is little systematic variation with size or sector except that the smallest size of company spend consistently less time on investigation than the larger organisations for all types of accidents where there is sufficient sample to draw a conclusion.

- Standard Investigation Procedures - Tables 9A-1 to 9B-2

Respondents were asked eight questions with regard to their procedure for investigating accidents.

74% have standard rules for the composition of the investigating team but the figure goes from 41% for the smallest organisations to 89% for the largest.

The proportion who have standard rules for selecting the others to be involved is rather lower ranging from 27% for small companies to 82% for large ones.

Only 18% of small companies claim to have standard questions to be addressed in investigations while the figure rises to 73% for large ones.

Results are usually reviewed by senior management (88% for large companies but only 54% for small) but less often by a safety committee (9% and 71%).

Results are usually referred to head office where appropriate although with single sites the head office and this single site are the same.

88% claim to use the results to assist prevention with a figure of 64% for small companies and almost 90% for the remainder.

The proportion of companies analysing for accident trends rises from 16% for small companies through 41%, 62% and 80% for the other size bands.

The higher risk companies are similar to the lower risk organisations except that results of investigations are more likely to be reviewed by senior management or the safety committee and much more likely to be analysed for trends.

- Where are Results of Investigations Recorded - Table 9C-1 and 9C-2

Almost everyone claims to record all incidents in an accident book and almost half record the results of investigations in the same book. The proportion is slightly lower for larger and higher risk organisations.

Two thirds (also) record the results of investigations separately but the figure varies widely from 22% in small companies to 82% in the largest. The figure varies from 72% in higher risk companies to 56% in lower risk organisations.

Near misses are recorded in the same book by 52% with the figure ranging from 20% in small organisations to 66% in larger ones. Higher risk companies are also more likely to record near misses in the file (58% as against 43%).

3.4 Training - Q3

- Numbers Trained - Table 10

Overall half the organisations have not provided training in accident investigation to any of their employees. For the small companies only 11% have had any training but the figure rises to 71% for the largest organisations. Only in 18% of cases has training been given to more than 5 people but for the largest companies this figure is 45%.

There is slightly more training in the higher risk group though the difference is not as marked as might be expected. The level of training appears to be somewhat higher in the construction sector than in other sectors though the figures are based on fairly low numbers.

- Training Providers - Table 11

Very few training providers were mentioned particularly among the smaller companies. The following summaries the findings;

Training Providers			
Provider	**<10 staff**	**200+ staff**	**Overall**
BSC	1%	6%	3%
RoSPA		3%	1%
IOSH		9%	5%
NEBOSH	1%	20%	10%
CITB		2%	2%
DuPont		1%	
Local FE College	4%	15%	10%
Internal H&S Course	3%	32%	15%
Internal General Course	1%	14%	8%
None	93%	36%	65%

Most of the training comes from Local or Internal courses and of the others almost none are specifically training on investigation.

In Tables 11-1 and 11-2 percentages are given to aid comparison between sectors and groups. The base is also given on each table and it will be apparent that many of the percentages are based on very small numbers. Care must be taken not to use percentages out of context.

3.5 Priority Area in Investigation - Q4 - Tables 12A-1 to 12C-2

Respondents were asked to rate six factors on a scale of 1 to 5 for the importance given to each during accident investigations. It was found in the pilot interviews that the ratings were generally high so respondents were also asked to identify the two most important factors and the two least important ones.

Priorities in Investigating Accidents						
	<10 Staff			200+ Staff		
Factors in descending order of importance	**Rat-ing**	**Most Imp.**	**Least Imp.**	**Rat-ing**	**Most Imp.**	**Least Imp.**
Preventing recurrence	4.82	52%	4%	4.90	74%	2%
Identifying underlying causes	4.46	21%	20%	4.75	48%	11%
Identifying direct factors	4.60	25%	14%	4.71	21%	16%
Fulfilling statutory obligations	4.34	14%	24%	4.55	21%	18%
Avoiding litigation	4.45	12%	30%	4.13	14%	48%
Identifying person responsible	4.33	20%	26%	3.67	6%	62%

Results from the three questions are entirely consistent for the large companies with preventing recurrence the top priority. Results for the small companies are similar but with direct factors and underlying causes reversed. The results are also less polarized for smaller companies.

3.6 Circulation of Results - Q5 - Tables 13-1 and 13-2

Respondents were asked how widely results of investigations are circulated. Findings are summarized below:

Circulation of Investigation Results				
	Number of Employees			
Level of circulation	**<10**	**10-49**	**50-200**	**200+**
Team + top management	21%	8%	12%	7%
Line managers involved	4%	4%	9%	8%
All involved	10%	16%	26%	33%
Widely internally	46%	62%	48%	48%
Widely externally	10%	3%	2%	3%
DK/NA	9%	6%	3%	2%

Mostly results are circulated to all those involved or to the whole organisation with little external circulation. Results are similar for all sizes of organisation bearing in mind that for the small businesses there are not many people to circulate information to internally.

3.7 Barriers to Implementing Results - Q6 - Table 14-1 and 14-2

The table below lists the factors considered to be barriers to implementation of the results of investigations. The list of factors was developed during the pilot interviews and then appeared as a multiple choice question in the final interviews. They are listed in descending order of importance for the largest companies.

Barriers to Accident Prevention				
	Number of Employees			
Barrier	**<10**	**10-49**	**50-200**	**200+**
Cost/time	27%	23%	26%	32%
Reluctance to change	6%	21%	31%	32%
Carelessness	10%	23%	27%	26%
Blame culture	2%	12%	14%	16%
Lack of skills	6%	15%	16%	15%
Irresponsibility of employees	3%	7%	10%	14%
Lack of mgt commitment	4%	6%	7%	12%
Concealment of facts	2%	7%	11%	10%
Activity on many sites	1%	3%	4%	9%
Union Resistance	1%	1%	2%	3%
None	51%	36%	33%	25%
DK/NA	8%	65	5%	4%

The order is similar for all four categories except for differences resulting directly from the number of employees. Large companies have more reasons and fewer of them see no barriers. Cost/time is at the top of the list. It might be considered surprising that the figure is higher in larger companies but this is perhaps because they have better costing mechanisms and are more aware of cost implications. The other factors are mainly questions of "attitude".

The fact that 51% of small firms see no barriers to implementation may seem surprising. This may be because the respondent in small businesses was frequently the owner and once he had made a decision it was done. In larger organisations, on the

other hand, more people are involved and decisions take longer. A small employer is unlikely to see "lack of management commitment" (i.e. himself) as a barrier while this is more significant in larger businesses. There is an increasing resistance to change as businesses grow, hardly surprising, and evidence of more carelessness.

3.8 Identifying Causes and Preventing Recurrence - Q7 - Tables 15-1 to 16-2

Respondents were asked to rate, on a scale of 1 to 5, the effectiveness of their investigating procedure in identifying the underlying causes of accidents and in preventing their recurrence.

The average rating for identification of cases was 4.10 and ranged from 4.31 for the smallest companies to 4.00 for the largest. Ratings for prevention of accidents was very similar with an average of 4.09 and a range from 4.56 for small companies to 3.94 for large ones.

Respondents were also asked what improvements could be made in their investigation and prevention procedures. The results are summarized as follows:

Improvements Needed to Prevent Accidents				
	Number of Employees			
Improvement needed	**<10**	**10-49**	**50-200**	**200+**
More training	17%	34%	43%	43%
Increased awareness of risk	24%	30%	38%	38%
More people and money	14%	17%	19%	24%
Improved investigation	6%	12%	14%	14%
None	36%	19%	16%	11%
DK/NA	8%	6%	5%	4%

Smaller companies are more relaxed about the situation but overall training (increased awareness of risk is part of training) is the key issue followed by resources. Table 15-1 shows that large companies rate their effectiveness in identifying causes and reducing accidents less highly than the smaller organisations. This is consistent with the fact that the large businesses also identify more "needs" to help them in reducing accidents.

A few companies, particularly hotels or pubs, also mentioned alcohol as a contributory factor, particularly in cases of violence against employees.

3.9 Implications of More Investigation - Q8 - Tables 17-1 to 19-2

Respondents were asked what the implications would be of a requirement to investigate all accidents including near misses and work related illness. The following table summarises the responses.

Implications of More Investigation				
	Number of Employees			
Implication	**<10**	**10-49**	**50-200**	**200+**
None - do it already	21%	25%	30%	46%
No real problem	40%	35%	33%	25%
None - so few incidents	25%	19%	12%	4%
Would comply reluctantly	2%	3%	3%	2%
More cost and time	20%	20%	22%	28%
More training	1%	3%	6%	7%
DK/NA	11%	5%	5%	3%

This is not seen as a major problem. Many people claim to do it already, particularly larger companies, and many others see it as no real problem. A fifth of the respondents, however, recognise that it would cost them time and money and larger companies say that they would need to invest in more training.

Respondents were then asked the benefits of accident investigation. The findings are summarized below.

Benefits of Accident Investigation				
	Number of Employees			
Benefits	**<10**	**10-49**	**50-200**	**200+**
Improve H&S performance	73%	75%	85%	81%
Improved morale	8%	11%	15%	22%
Improved production	4%	13%	10%	20%
Save money	4%	9%	11%	18%
Encourages general carefulness	7%	8%	9%	15%
Better employee relations	8%	7%	55	11%
Peace of mind	14%	6%	8%	9%
Better reputation	8%	5%	4%	6%
Avoid litigation	1%	2%	4%	7%
Better relations with regulators	4%	2%	2%	4%
None	7%	4%	2%	1%
DK/NA	8%	8%	5%	3%

The overwhelming perception is that investigation leads to improved health and safety performance and brings with it generally better staff morale and improved production, which then saves money. This table should be looked at in conjunction with the previous one.

3.10 **The Last Incident Investigated - Q9 - Tables 19A-1 to 19B-2**

A third of respondents were unable to recall when they had last had an incident to investigate but the figure ranged from 77% for the smallest companies to only 16% for the largest.

Of the remainder, three quarters were able to describe an incident in 2000 though some of these were very minor.

Seventy two percent of all respondents were prepared to have a further discussion but not all of these could remember a recent incident so out of the original 1,504 respondents only 652 were appropriate as potential recruits for the second stage of the project. This number will be further reduced when geographic factors are taken into consideration.

QUESTIONNAIRE

Final Questionnaire

Ref. No (1st column on sample)	
SIC (2nd column on sample)	
Sector (2 digits from quota list)	

Name	
Organisation	
Postcode	
Job Title	
Tel No	
Fax No	
Date of Interview	
Interviewer	

Screening at the switchboard

My name is ……. from Metra Martech. We are management consultants and we have been asked by the Health and Safety Executive (HSE) to survey how companies investigate accidents at work.

A. Who has responsibility for safety or the management of safety in your organisation? What is his/her name?

B. What is his/her job title? *(Write in above and code below)*

H&S Specialist	1
Senior Management	2
Operational Management	3
Other	4

C. May I speak to ……

D. If unavailable what is the direct phone number for him/her? _____

My name is ……. from Metra Martech We are management consultants and we have been asked (in conjunction with HRA) by the Health and Safety Executive (HSE) to survey how companies investigate accidents at work. We are also interested in dangerous occurrences and near misses and in work related illnesses. *[If needed our contact at HSE is Karen Clayton 0151 951 4317]*. We are concerned with the procedures you adopt after an incident to identify the underlying causes and to prevent recurrence.

1.1 May I confirm that you are one of the people who knows how such incidents are investigated in your organisation and the procedures adopted to prevent recurrence
[if "No" find out who is and begin again]

Yes 1
No 2

I would be grateful if you could spare about 15 minutes to answer some questions related to how you investigate accidents and work related illness.

In line with the code of practice of the Market Research Society, no data gathered in the survey will be given to HSE in a form that would enable them to identify the source of the information and indeed, they will not even be given the names of the companies which have participated.

1.2 At how many locations does your organisation operate [ ]
[If "One" go to 1.4 - for Construction companies or similar count operating bases as sites rather than individual contract sites]

1.3 For how many of these sites do you have knowledge of incident investigation procedures? [ ]

All the subsequent questions will relate to incidents at these sites where you have knowledge of accident investigation procedures

1.4 What is the total number of employees at this site/these sites [ ]

1.5 Can I confirm the main business/activity of your company/organisation

_____

I would now like to talk about incidents at (your site) OR (all the sites about which you know)

2.1 Which types of incidents are you aware of having occurred at your site(s)? *[ask for all types listed and circle under Q2.1]*

2.2 Are details of [type] incidents usually recorded? *[ask for types circled under Q2.1 and circle under Q2.2]*

2.3 I would like to discuss your procedure for investigating incidents when attempting to identify the immediate or underlying cause. *[Ask questions below grid]*

2.4 **A. Do you investigate *[type]* incidents to identify the immediate or underlying cause?**
[ask for all types circled under Q2.2 and circle on grid under Q2.4]

B. Would you investigate a *[type]* incident to identify the immediate or underlying cause if one were to occur? *[ask for all types not circled under Q2.1 and circle on grid under Q2.4]*

2.5 Those involved in an accident investigation might include Line or Senior Management, your HSO, your Safety Rep or Safety Committee, External Experts or Medical Experts. Which of these types of people make a significant contribution to the investigation of *[type]* incidents? *[Ask for all types circled in Q2.4 and circle on grid as appropriate under Q2.5 – do not read list of potential team members again unless asked]*

2.6 For *[type]* incidents can you tell me who else is normally (or would be) involved in giving information to the investigating team? *[Ask for all types circled in Q2.4 and circle on grid as appropriate under Q2.5]*

2.7 For a typical case how many person hours are involved in the investigation? *[Repeat for each level of severity - prompt with following ranges and write codes in grid or actual number above 20 if given]*

A = <1
B = 1 – 1:59
C = 2 – 4:59
D = 5 – 9:59
E= 10 - 20
F = > 20

For Contractors and Public:
G = same as for own employees
H = less than for own employees
I = more than for own employees

2.8 Where do you record the results of accident investigations *[ask questions below grid]*

		Occurrence			Investigating Team							Other Witnesses						
		Occurred	Record-ed	Investig-ated	Line Manage-ment	Senior Manage-ment	HSO	Safety Rep or Comm-ittee	External Experts	Medical Experts	Other	Injured Party	Co-Work-ers	Witnes-ses	Union/ Staff Reps	Medical Experts	Other	
		Q2.1	Q2.2	Q2.4	Q2.5							Q2.6						
	Minor	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	9	10	11	12	13	14	15	16	
	LTI	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	9	10	11	12	13	14	15	16	
	Illness	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	9	10	11	12	13	14	15	16	
	Fatal/V Ser.	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	9	10	11	12	13	14	15	16	
	Contractor	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	9	10	11	12	13	14	15	16	
	Public	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	9	10	11	12	13	14	15	16	
	Violence	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	9	10	11	12	13	14	15	16	
h	njury	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	9	10	11	12	13	14	15	16	

Q2.3 When an incident is investigated: -		Y	N	DK/NA
a	Do you have standard rules about who carries out the investigation?	1	2	3
b	Do you have standard rules about who else should be in involved?	1	2	3
c	Do you have standard questions which should be addressed?	1	2	3
d	Are the results of investigations reviewed by senior management?	1	2	3
e	Are the results of investigations reviewed by a safety committee?	1	2	3
f	Are the results of investigations referred to head office?	1	2	3
g	Are the results used to modify procedures with a view to preventing recurrence	1	2	3
h	Are accident statistics analysed to identify trends	1	2	3

Q2.8 - After an incident: -		Y	N	DK
a	Is the occurrence of the incident normally recorded an accident book?	1	2	
b	If an incident is investigated are the results normally recorded in the same accident book?	1	2	
c	Is there an additional file or book where statements, other evidence, conclusions and recommendations resulting from accident investigations are recorded?	1	2	
d	Are results of investigations into near misses included in this file or book?	1	2	
e	*[If No to d]* Where are the results of investigations into near misse normally recorded: _____			

3.1 How many people who work in your organisation (at the sites for which you have information) have received formal training in accident **investigation** in the last 3 years? Do not include first aid courses etc as these are not concerned with investigation of accident causes.

Number having some training in accident investigation*[If zero go to 4]* [ ]

3.2 **Who were the providers of these courses *[Do not read out - circle code below or write in other providers]***

British Safety Council	1
RoSPA	2
IOSH	3
NEBOSH	4
CITB (Construction Industry Training Board)	5
DuPont	6
Kelvin Topset	7
Taproot	8
Tripod	9
Local Technical Colleges, Councils etc	10
Internal Company H&S Courses	11
Part of Internal Management Course	12

4.1 On a scale of 1 to 5, what level of priority is given to the following when investigating accidents (where 1 = low priority and 5 = high priority) *[write in under rating]*

4.2 Which are the two most important of these factors? *[Circle under "Most Imp". Do not ask if obvious from Q4.1 but still circle - force selection of only 2]*

4.3 Which are the two least important of these factors? *[Circle under "Least Imp". Do not ask if obvious from Q4.1 but still circle - force selection of only 2]*

		Rating	Most Imp	Least
A	**Identifying the person or persons responsible**		1	1
B	Evaluating the conditions that could have contributed directly to the accident or dangerous occurrence, e.g. fatigue, poor lighting, faulty plant or equipment		2	2
C	Identifying the underlying causes, e.g. inadequate or non-existent training policies, production/safety conflicts or ineffective policies for identifying risks		3	3
D	Fulfilling statutory obligations		4	4
E	Protecting the company from litigation or insurance claims		5	5
F	Ensuring that the accident does not recur by implementing remedial actions and monitoring their effectiveness		6	6

5. When an accident has been investigated how widely are the findings normally circulated? *[Ask as open ended and circle one as most appropriate – probe but do not read out – circle only the one representing widest circulation - the highest code]*

Circulation restricted to investigating team and top management	1
To line managers directly involved	2
To line managers and personnel directly involved	3
Widely within the organisation (newsletters, circulars, emails, notice boards etc)	4
Widely inside and outside the organisation	5

6. What are the main barriers to implementing the findings of accident investigations? *[Read list]*

Commercial Pressures (Cost/time)	1
Too many other initiatives or recommendations	2
Lack of skills or trained personnel	3
Reluctance of operators personnel to change established practices	4
Union resistance to change	5
Blame culture	6
Lack of management commitment	7
Alcohol abuse by customers	8
Activity across many sites	9
Carelessness, forgetfulness	10
Irresponsibility	11
Deliberate concealment of facts relating to incidents	12
None	99
DK/NA	999

7.1 On a scale of 1 to 5, (where 5 = "very effective" and 1= "not at all effective") how effective do you think your investigation process is in identifying the underlying cause of accidents, near misses or illness [ ]

7.2 On a scale of 1 to 5 (where 5 = "very effective" and 1= "not at all effective") how effectively do you monitor the impact of any action taken to prevent the recurrence of accidents, near misses or illness? [ ]

7.3 What would you say were the most important changes your organisation could make to improve the quality of incident investigation and prevention? *[Read list]*

None - our system is as good as it could be	1
More training	2
Increasing general awareness of hazards	3
Improving the system for recording accidents and investigations	4
Additional resources of people or money	5
Controlling alcohol (for some customers)	6
DK/NA	999

8.1 If you had an obligation to investigate all accidents or near misses or work related illness what would be the implications for your organisation? *[Read list as necessary]*

None - we do it already	1
No problem - we would comply	2
None - we have so few incidents	3
We would comply reluctantly	4
Additional time and cost	5
More training	6
NA/DK	9

8.2 What do you see as potential benefits resulting from accident investigations? *[Ask as open ended and code as appropriate – probe but do not read out]*

Improved health and safety performance/less incidents	1
Improved staff morale	2
Better employee relations	3
Save money	4
Improved production	5
Better Reputation	6
Better relations with regulators	7
Avoiding litigation or defence in litigation	8
Peace of mind	9
Encourages general carefulness	10
None	99
NA/DK	999

9.1 When was the last accident, work related illness or near miss at your location which was formally investigated to identify the underlying causes? [ ]
[enter year]

9.2 Can you describe the incident briefly

9.3 In a subsequent stage of this work, we plan to discuss accident investigation practices and procedures in more detail. Would you be prepared to discuss this with us at a later date? None of the information you give will be passed to HSE in a form where you or your organisation could be identified.

Yes	1
No	2

Thank you for you assistance

TYPES OF ACCIDENTS, NEAR MISSES AND ILLNESS

a. Minor injury or minor instances of ill health with no significant lost time (includes first aid only cases)

b. Lost time accidents when an employee is off work for a significant period

c. Instances of ill health reported repeatedly or by more than one employee

d. Fatal or very serious leading to permanent disability etc

e. Injuries to a contractor's employee

f. Injuries to member(s) of the public

g. Violence by a member of the public against an employee

h. Dangerous occurrences, including near misses, where there is no actual injury but the incident has potential for serious consequences.

ACTUAL AND HYPOTHETICAL INVESTIGATION OF ACCIDENTS

PROPORTION OF RESPONDENTS WHO HAVE ACTUALLY INVESTIGATED OF ACCIDENTS

		Minor Accidents	Lost Time Accidents	Incident of Work Related Illness	Very Serious or Fatal Accidents	Accidents to Contractors' Employees	Accidents to Members of the Public	Incidents of Violence to Employees	Near Miss Involving No Injury
Agriculture	Under 10	25%	80%	100%	100%	100%	100%	100%	100%
	10-49	63%	75%	50%	33%	25%	40%	79%	50%
	50-200	68%	100%	100%	67%	86%	80%	94%	100%
	Over 200	100%	100%	100%	100%	100%	100%	100%	100%
Construction	Under 10	29%	100%		50%			100%	
	10-49	48%	84%	100%		100%		93%	20%
	50-200	29%	100%	100%		100%	100%	100%	50%
	Over 200	58%	87%	100%	100%	100%	50%	100%	93%
Ext./Util./Trans	10-49	55%	92%	75%	75%	75%	50%	96%	58%
	50-200	74%	96%	69%	90%	85%	84%	98%	93%
	Over 200	70%	96%	86%	100%	90%	77%	95%	83%
Manufacturing	10-49	63%	92%	54%	82%	40%	50%	94%	86%
	50-200	66%	86%	83%	66%	77%	36%	95%	78%
	Over 200	72%	98%	96%	100%	100%	78%	99%	93%
Services	Under 10	32%	75%	50%			25%	94%	6%
	10-49	59%	82%	69%	50%	75%	89%	98%	73%
	50-200	72%	89%	79%	76%	75%	76%	92%	79%
	Over 200	81%	99%	90%	98%	95%	93%	99%	91%
Higher Risk	Under 10	33%	88%	67%	75%	100%	100%	100%	44%
	10-49	60%	89%	59%	70%	54%	45%	93%	69%
	50-200	65%	89%	82%	71%	80%	69%	96%	82%
	Over 200	70%	97%	94%	100%	98%	76%	99%	91%
Lower Risk	Under 10	32%	75%	50%			25%	94%	6%
	10-49	59%	82%	69%	50%	75%	89%	98%	73%
	50-200	72%	89%	79%	76%	75%	76%	92%	79%
	Over 200	81%	99%	90%	98%	95%	93%	99%	91%
ALL		**64%**	**92%**	**83%**	**83%**	**84%**	**76%**	**96%**	**80%**

Source : Metra Martech

PROPORTION OF RESPONDENTS WHO WOULD HYPOTHETICAL INVESTIGATE ACCIDENTS

		Minor Accidents	Lost Time Accidents	Incident of Work Related Illness	Very Serious or Fatal Accidents	Accidents to Contractors' Employees	Accidents to Members of the Public	Incidents of Violence to Employees	Near Miss Involving No Injury
Agriculture	Under 10	100%	100%	100%	100%	100%	100%	95%	100%
	10-49	100%	100%	91%	100%	100%	100%	100%	89%
	50-200		100%	100%	100%	100%	100%	94%	100%
	Over 200	100%	100%	100%	100%	100%	100%	86%	100%
Construction	Under 10	100%	100%	100%	100%	100%	100%	100%	100%
	10-49		100%	100%	100%	100%	100%	100%	100%
	50-200		100%	100%	100%	100%	100%	100%	100%
	Over 200		100%	100%	100%	100%	100%	100%	100%
Ext./Util./Trans	10-49	100%	100%	100%	100%	100%	100%	94%	100%
	50-200	100%	100%	100%	100%	100%	100%	85%	100%
	Over 200	100%	100%	100%	100%	100%	94%	77%	100%
Manufacturing	10-49		100%	100%	100%	100%	100%	94%	
	50-200	82%	95%	98%	98%	98%	98%	96%	100%
	Over 200		100%	100%	100%	100%	100%	91%	97%
Services	Under 10	50%	98%	99%	99%	97%	97%	96%	98%
	10-49	88%	99%	99%	100%	96%	100%	91%	100%
	50-200	90%	100%	99%	100%	99%	99%	95%	94%
	Over 200	92%	100%	100%	100%	100%	99%	78%	98%
Higher Risk	Under 10	100%	100%	100%	100%	100%	100%	97%	96%
	10-49	100%	100%	100%	100%	100%	100%	95%	100%
	50-200	82%	97%	98%	99%	98%	98%	93%	99%
	Over 200	75%	100%	100%	100%	100%	99%	89%	98%
Lower Risk	Under 10	67%	98%	99%	99%	97%	97%	96%	99%
	10-49	88%	99%	99%	100%	96%	100%	91%	100%
	50-200	90%	100%	99%	100%	99%	99%	95%	94%
	Over 200	92%	100%	100%	100%	100%	99%	78%	98%
Base		**100%**	**99%**	**99%**	**100%**	**99%**	**99%**	**91%**	**96%**

Source : Metra Martech

APPENDIX D: TELEPHONE SURVEY – VOLUME 2 (TABLES)

TABLE 1A : ORGANISATIONS INTERVIEWED BY SIZE

		Number of Employees for whom Respondent has Knowledge				Base	
		Under 10	Oct-49	50-200	Over 200		
		No.	No.	No.	No.	No.	%
D&B Categories Without Adjustment	Under 10	168	17			185	12%
	Oct-49	29	338	39		406	27%
	50-200	8	70	436	35	549	37%
	Over 200	1	9	52	302	364	24%
Base		206	434	527	337	1,504	100%
D&B Categories After Adjustment	Under 10	168				168	11%
	Oct-49	29	355			384	26%
	50-200	8	70	475		553	37%
	Over 200	1	9	52	337	399	27%
Base		206	434	527	337	1,504	100%
Source : Metra Martech - 27/10/00							

TABLE 1B : PROPORTION OF EMPLOYEES FOR WHICH RESPONDENT HAS KNOWLEDGE

		Knowledge of all Employees		Knowledge of only some Employees		Base
		No.	%	No.	%	No.
D&B Categories After Adjustment	Under 10	168	100%			168
	Oct-49	352	92%	32	8%	384
	50-200	483	87%	70	13%	553
	Over 200	322	81%	77	19%	399
Base		1,325	88%	179	12%	1,504
Source : Metra Martech - 27/10/00						

TABLE 1C : ORGANISATIONS INTERVIEWED BY RISK, SECTOR, GROUP AND SIZE

		Total Employees in Organisation								Base		
		Under 10		Oct-49		50-200		Over 200				
		No.	%	No.	%	No.	%	No.	%	No.	%	%
Risk	Higher	60	6%	238	25%	396	42%	255	27%	949	100%	63%
	Lower	108	19%	146	26%	157	28%	144	26%	555	100%	37%
Sector	Agriculture	23	33%	15	22%	22	32%	9	13%	69	100%	5%
	Construction	26	23%	32	29%	29	26%	24	22%	111	100%	7%
	Mining			5	18%	13	46%	10	36%	28	100%	2%
	Transport			27	26%	54	53%	21	21%	102	100%	7%
	Utilities			6	23%	5	19%	15	58%	26	100%	2%
	Pet. & Chem.			20	16%	51	41%	54	43%	125	100%	8%
	Metals etc			30	27%	62	56%	19	17%	111	100%	7%
	Food			22	23%	30	32%	43	45%	95	100%	6%
	Textiles etc			25	20%	72	58%	27	22%	124	100%	8%
	Machinery etc			49	37%	52	40%	30	23%	131	100%	9%
	Repair	11	41%	7	26%	6	22%	3	11%	27	100%	2%
	Wholsale	16	15%	28	26%	30	28%	35	32%	109	100%	7%
	Retail	26	23%	24	22%	32	29%	29	26%	111	100%	7%
	Hotels etc	25	33%	32	43%	4	5%	14	19%	75	100%	5%
	Finance etc	6	6%	13	14%	34	37%	40	43%	93	100%	6%
	Services	22	26%	12	14%	29	35%	21	25%	84	100%	6%
	Health etc	13	16%	37	45%	28	34%	5	6%	83	100%	6%
Group	Agriculture	23	33%	15	22%	22	32%	9	13%	69	100%	5%
	Construction	26	23%	32	29%	29	26%	24	22%	111	100%	7%
	Ext./Util./Trans			38	24%	72	46%	46	29%	156	100%	10%
	Manufacturing	11	2%	153	25%	273	45%	176	29%	613	100%	41%
	Services	108	19%	146	26%	157	28%	144	26%	555	100%	37%
Base		168	11%	384	26%	553	37%	399	27%	1,504	100%	100%

Source : Metra Martech - 27/10/00

TABLE 2 : RESPONDENT'S FUNCTION

		Respondent's Function								Base	
		H&S Specialist		Senior Management		Operational Management		Other		Number	%
		Number	%	Number	%	Number	%	Number	%		
Risk	**Higher**	311	33%	242	26%	315	33%	81	9%	949	100%
	Lower	113	20%	205	37%	179	32%	58	10%	555	100%
Employees	**Under 10**	3	2%	131	78%	16	10%	18	11%	168	100%
	Oct-49	29	8%	176	46%	135	35%	44	11%	384	100%
	50-200	144	26%	117	21%	237	43%	55	10%	553	100%
	Over 200	248	62%	23	6%	106	27%	22	6%	399	100%
Sector	**Agriculture**	11	16%	27	39%	17	25%	14	20%	69	100%
	Mining & Quarrying	15	54%	6	21%	5	18%	2	7%	28	100%
	Construction	35	32%	46	41%	21	19%	9	8%	111	100%
	Petroleum & Chemicals	55	44%	21	17%	46	37%	3	2%	125	100%
	Metals, Transport Equipment	31	28%	35	32%	37	33%	8	7%	111	100%
	Food & Tobacco	39	41%	14	15%	39	41%	3	3%	95	100%
	Textiles, Paper, Timber	33	27%	24	19%	52		15	12%	124	100%
	Machinery, Equipment, Electronics	44	34%	22	17%	56	43%	9	7%	131	100%
	Transport, Freight	31	30%	28	27%	29	28%	14	14%	102	100%
	Utilities	14	54%	2	8%	7	27%	3	12%	26	100%
	Wholsale	24	22%	38	35%	41	38%	6	6%	109	100%
	Retail	23	21%	40	36%	31	28%	17	15%	111	100%
	Hotels, Catering, Entertainment	7	9%	54	72%	13	17%	1	1%	75	100%
	Finance, Real Estate, Membership Organisations	30	32%	14	15%	30	32%	19	20%	93	100%
	Personal, Business Services	17	20%	34	40%	27	32%	6	7%	84	100%
	Auto & Other Repair	3	11%	17	63%	6	22%	1	4%	27	100%
	Health Education, Social	12	14%	25	30%	37	45%	9	11%	83	100%
Base		424	28%	447	30%	494	33%	139	9%	1,504	100%
Source : Metra Martech - 27/10/00											

TABLE 3A : LEVEL OF RECORDING OR INVESTIGATION BY TYPE OF INCIDENT (including "No Opinion")

	Occurred but not Recorded		Recorded but not Investigated		Would Record but not Investigate if it Occurred		No Opinion		Has Occurred and Was Investigated		Would Investigate if it Occurred		Actually of Potentially Investigated				Base
													Yes		No		
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	
Minor Accidents	120	8%	349	23%	18	1%	68	5%	834	55%	115	8%	949	63%	555	37%	1504
Lost Time Accidents	7	0%	60	4%	5	0%	174	12%	738	49%	520	35%	1,258	84%	246	16%	1504
Incidents of Work Related Ill Health	6	0%	39	3%	8	1%	224	15%	218	14%	1,009	67%	1,227	82%	277	18%	1504
Very Serious or Fatal Accidents	2	0%	32	2%	5	0%	192	13%	163	11%	1,110	74%	1,273	85%	231	15%	1504
Accidents to Contractors' Employees	1	0%	43	3%	12	1%	307	20%	235	16%	906	60%	1,141	76%	363	24%	1504
Accidents to Members of the Public	1	0%	41	3%	9	1%	344	23%	133	9%	976	65%	1,109	74%	395	26%	1504
Incidents of Violence to Employees			36	2%	5	0%	396	26%	107	7%	960	64%	1,067	71%	437	29%	1504
Near Misses Involving No Injury	40	3%	50	3%	16	1%	314	21%	366	24%	718	48%	1,084	72%	420	28%	1504

Source : Metra Martech - 27/10/00

TABLE 3B : LEVEL OF RECORDING OR INVESTIGATION BY TYPE OF INCIDENT (excluding "No Opinion')

	Occurred but not Recorded		Recorded but not Investigated		Would Record but not Investigate if it Occurred		Has Occurred and Was Investigated		Would Investigate if it Occurred		Actually of Potentially Investigated				Base
											Yes		No		
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	
Minor Accidents	120	8%	349	24%	18	1%	834	58%	115	8%	949	66%	487	34%	1436
Lost Time Accidents	7	1%	60	5%	5	0%	738	55%	520	39%	1,258	95%	72	5%	1330
Incidents of Work Related Ill Health	6	0%	39	3%	8	1%	218	17%	1,009	79%	1,227	96%	53	4%	1280
Very Serious or Fatal Accidents	2	0%	32	2%	5	0%	163	12%	1,110	85%	1,273	97%	39	3%	1312
Accidents to Contractors' Employees	1	0%	43	4%	12	1%	235	20%	906	76%	1,141	95%	56	5%	1197
Accidents to Members of the Public	1	0%	41	4%	9	1%	133	11%	976	84%	1,109	96%	51	4%	1160
Incidents of Violence to Employees			36	3%	5	0%	107	10%	960	87%	1,067	96%	41	4%	1108
Near Misses Involving No Injury	40	3%	50	4%	16	1%	366	31%	718	60%	1,084	91%	106	9%	1190

Source : Metra Martech - 27/10/00

TABLE 4A-1 : RECORDING AND INVESTIGATION OF MINOR ACCIDENTS

		Response to Minor Accidents										Actually or Potentially Investigated				Base
		Occurred but not Recorded		Recorded but not Investigated		Record only if it Occurred		Has Occured and Was Investigated		Would Investigate if it Occurred		Yes		No		No
		No	%	No	%	No	%	No	%	No	%	No	%	No	%	
Risk	Higher	71	8%	255	27%	10	1%	558	60%	35	4%	593	64%	336	36%	929
	Lower	49	10%	94	19%	8	2%	276	54%	80	16%	356	70%	151	30%	507
Employees	Under 10	43	32%	29	21%	3	2%	28	21%	32	24%	60	44%	75	56%	135
	Oct-49	50	14%	74	20%	7	2%	190	52%	45	12%	235	64%	131	36%	366
	50-200	20	4%	155	29%	3	1%	342	64%	16	3%	358	67%	178	33%	536
	Over 200	7	2%	91	23%	5	1%	274	69%	22	6%	296	74%	103	26%	399
Sector	Agriculture	14	21%	14	21%			33	49%	6	9%	39	58%	28	42%	67
	Construction	12	11%	47	44%	3	3%	43	40%	2	2%	45	42%	62	58%	107
	Mining	2	7%	6	21%			17	61%	3	11%	20	71%	8	29%	28
	Transport	7	7%	25	25%			58	59%	9	9%	67	68%	32	32%	99
	Utilities			4	15%			21	81%	1	4%	22	85%	4	15%	26
	Pet. & Chem.	1	1%	16	13%			101	81%	6	5%	107	86%	17	14%	124
	Metals etc	1	1%	34	31%	1	1%	75	68%			75	68%	36	32%	111
	Food	17	18%	50	54%	3	3%	22	24%	1	1%	23	25%	70	75%	93
	Textiles etc	9	7%	21	17%			92	75%			92	75%	30	25%	122
	Machinery etc	4	3%	31	25%	3	2%	83	66%	5	4%	88	70%	38	30%	126
	Repair	4	15%	7	27%			13	50%	2	8%	15	58%	11	42%	26
	Wholsale	6	6%	18	19%	1	1%	66	68%	6	6%	72	74%	25	26%	97
	Retail	11	11%	34	35%	2	2%	42	43%	9	9%	51	52%	47	48%	98
	Hotels etc	12	17%	8	11%	4	6%	30	42%	17	24%	47	66%	24	34%	71
	Finance etc	5	6%	20	24%			47	56%	12	14%	59	70%	25	30%	84
	Services	10	13%	10	13%			40	53%	16	21%	56	74%	20	26%	76
	Health etc	5	6%	4	5%	1	1%	51	63%	20	25%	71	88%	10	12%	81
Group	Agriculture	14	21%	14	21%			33	49%	6	9%	39	58%	28	42%	67
	Construction	12	11%	47	44%	3	3%	43	40%	2	2%	45	42%	62	58%	107
	Ext./Util./Trans	9	6%	35	23%			96	63%	13	8%	109	71%	44	29%	153
	Manufacturing	36	6%	159	26%	7	1%	386	64%	14	2%	400	66%	202	34%	602
	Services	49	10%	94	19%	8	2%	276	54%	80	16%	356	70%	151	30%	507
Base		120	8%	349	24%	18	1%	834	58%	115	8%	949	66%	487	34%	1436

Source : Metra Martech - 27/10/00

TABLE 4A-2 : RECORDING AND INVESTIGATION OF MINOR ACCIDENTS BY SIZE

		Response to Minor Accidents										Actually or Potentially Investigated				Base
		Occurred but not Recorded		Recorded but not Investigated		Record only if it Occurred		Has Occured and Was Investigated		Would Investigate if it Occurred		Yes		No		No
		No	%	No	%	No	%	No	%	No	%	No	%	No	%	
Agriculture	Under 10	13	59%	2	9%			5	23%	2	9%	7	32%	15	68%	22
	Oct-49	1	6%	5	29%			10	59%	1	6%	11	65%	6	35%	17
	50-200			7	32%			15	68%			15	68%	7	32%	22
	Over 200							3	50%	3	50%	6	100%			6
Construction	Under 10	9	35%	8	31%			7	27%	2	8%	9	35%	17	65%	26
	Oct-49	2	6%	15	43%	2	6%	16	46%			16	46%	19	54%	35
	50-200			15	68%	1	5%	6	27%			6	27%	16	73%	22
	Over 200	1	4%	9	38%			14	58%			14	58%	10	42%	24
Ext./Util./Trans	Oct-49	7	18%	7	18%			17	44%	8	21%	25	64%	14	36%	39
	50-200	1	1%	19	24%			56	71%	3	4%	59	75%	20	25%	79
	Over 200	1	3%	9	26%			23	66%	2	6%	25	71%	10	29%	35
Manufacturing	Under 10	2	20%	2	20%			6	60%			6	60%	4	40%	10
	Oct-49	24	15%	31	19%	2	1%	94	59%	9	6%	103	64%	57	36%	160
	50-200	8	3%	84	31%			175	66%			175	66%	92	34%	267
	Over 200	2	1%	42	25%	5	3%	111	67%	5	3%	116	70%	49	30%	165
Services	Under 10	20	22%	20	22%	4	4%	19	20%	30	32%	49	53%	44	47%	93
	Oct-49	16	12%	27	20%	3	2%	63	46%	28	20%	91	66%	46	34%	137
	50-200	10	7%	27	19%	1	1%	93	65%	12	8%	105	73%	38	27%	143
	Over 200	3	2%	20	15%			101	75%	10	7%	111	83%	23	17%	134
Higher Risk	Under 10	24	41%	12	21%			18	31%	4	7%	22	38%	36	62%	58
	Oct-49	34	14%	58	23%	4	2%	137	55%	18	7%	155	62%	96	38%	251
	50-200	9	2%	125	32%	1	0%	252	65%	3	1%	255	65%	135	35%	390
	Over 200	4	2%	60	26%	5	2%	151	66%	10	4%	161	70%	69	30%	230
Lower Risk	Under 10	20	22%	20	22%	4	4%	19	20%	30	32%	49	53%	44	47%	93
	Oct-49	16	12%	27	20%	3	2%	63	46%	28	20%	91	66%	46	34%	137
	50-200	10	7%	27	19%	1	1%	93	65%	12	8%	105	73%	38	27%	143
	Over 200	3	2%	20	15%			101	75%	10	7%	111	83%	23	17%	134
Base		120	8%	349	24%	18	1%	834	58%	115	8%	949	66%	487	34%	1436

Source : Metra Martech - 27/10/00

TABLE 4B-1 : RECORDING AND INVESTIGATION OF LOST TIME ACCIDENTS

		Response to Lost Time Accidents										Actually or Potentially Investigated				Base
		Occurred but not Recorded		Recorded but not Investigated		Record only if it Occurred		Has Occured and Was Investigated		Would Investigate if it Occurred		Yes		No		No
		No	%	No	%	No	%	No	%	No	%	No	%	No	%	
Risk	Higher	4	0%	46	5%	3	0%	547	63%	263	30%	810	94%	53	6%	863
	Lower	3	1%	14	3%	2	0%	191	41%	257	55%	448	96%	19	4%	467
Employees	Under 10	1	1%	2	2%	1	1%	9	9%	84	87%	93	96%	4	4%	97
	Oct-49	2	1%	15	5%	1	0%	117	35%	198	59%	315	95%	18	5%	333
	50-200	3	1%	32	6%	3	1%	315	62%	158	31%	473	93%	38	7%	511
	Over 200	1	0%	11	3%			297	76%	80	21%	377	97%	12	3%	389
Sector	Agriculture	1	2%	3	5%			33	51%	28	43%	61	94%	4	6%	65
	Construction			6	7%			50	57%	32	36%	82	93%	6	7%	88
	Mining			1	4%			21	75%	6	21%	27	96%	1	4%	28
	Transport			1	1%			51	54%	43	45%	94	99%	1	1%	95
	Utilities			2	8%			20	80%	3	12%	23	92%	2	8%	25
	Pet. & Chem.							98	80%	24	20%	122	100%			122
	Metals etc	1	1%	17	17%			62	61%	21	21%	83	82%	18	18%	101
	Food	1	1%	5	6%			49	61%	25	31%	74	93%	6	8%	80
	Textiles etc			5	4%			74	64%	37	32%	111	96%	5	4%	116
	Machinery etc	1	1%	4	3%	3	2%	81	63%	39	30%	120	94%	8	6%	128
	Repair			2	13%			8	53%	5	33%	13	87%	2	13%	15
	Wholsale	1	1%	3	3%	1	1%	48	52%	39	42%	87	95%	5	5%	92
	Retail			1	1%			33	42%	45	57%	78	99%	1	1%	79
	Hotels etc			3	5%	1	2%	16	25%	44	69%	60	94%	4	6%	64
	Finance etc	1	1%	6	8%			46	58%	26	33%	72	91%	7	9%	79
	Services			1	1%			27	36%	47	63%	74	99%	1	1%	75
	Health etc	1	1%					21	27%	56	72%	77	99%	1	1%	78
Group	Agriculture	1	2%	3	5%			33	51%	28	43%	61	94%	4	6%	65
	Construction			6	7%			50	57%	32	36%	82	93%	6	7%	88
	Ext./Util./Trans			4	3%			92	62%	52	35%	144	97%	4	3%	148
	Manufacturing	3	1%	33	6%	3	1%	372	66%	151	27%	523	93%	39	7%	562
	Services	3	1%	14	3%	2	0%	191	41%	257	55%	448	96%	19	4%	467
Base		7	1%	60	5%	5	0%	738	55%	520	39%	1258	95%	72	5%	1330

Source : Metra Martech - 27/10/00

TABLE 4B-2 : RECORDING AND INVESTIGATION OF LOST TIME ACCIDENTS BY SIZE

		Response to Lost Time Accidents										Actually or Potentially Investigated				Base
		Occurred but not Recorded		Recorded but not Investigated		Record only if it Occurred		Has Occured and Was Investigated		Would Investigate if it Occurred		Yes		No		No
		No	%	No	%	No	%	No	%	No	%	No	%	No	%	
Agriculture	Under 10	1	5%					4	19%	16	76%	20	95%	1	5%	21
	Oct-49			3	18%			9	53%	5	29%	14	82%	3	18%	17
	50-200							17	77%	5	23%	22	100%			22
	Over 200							3	60%	2	40%	5	100%			5
Construction	Under 10							3	19%	13	81%	16	100%			16
	Oct-49			3	12%			16	62%	7	27%	23	88%	3	12%	26
	50-200							11	50%	11	50%	22	100%			22
	Over 200			3	13%			20	83%	1	4%	21	88%	3	13%	24
Ext./Util./Trans	Oct-49			1	3%			11	30%	25	68%	36	97%	1	3%	37
	50-200			2	3%			55	72%	19	25%	74	97%	2	3%	76
	Over 200			1	3%			26	74%	8	23%	34	97%	1	3%	35
Manufacturing	Oct-49	1	1%	5	3%			71	49%	67	47%	138	96%	6	4%	144
	50-200	2	1%	26	10%	3	1%	170	67%	54	21%	224	88%	31	12%	255
	Over 200			2	1%			131	80%	30	18%	161	99%	2	1%	163
Services	Under 10			2	3%	1	1%	6	8%	63	88%	69	96%	3	4%	72
	Oct-49	1	1%	5	4%	1	1%	28	21%	98	74%	126	95%	7	5%	133
	50-200	2	2%	6	5%			62	47%	62	47%	124	94%	8	6%	132
	Over 200			1	1%			95	73%	34	26%	129	99%	1	1%	130
Higher Risk	Under 10	1	3%					7	19%	29	78%	36	97%	1	3%	37
	Oct-49	1	0%	12	5%			107	48%	104	46%	211	94%	13	6%	224
	50-200	2	1%	28	7%	3	1%	253	67%	89	24%	342	91%	33	9%	375
	Over 200			6	3%			180	79%	41	18%	221	97%	6	3%	227
Lower Risk	Under 10			2	3%	1	1%	6	8%	63	88%	69	96%	3	4%	72
	Oct-49	1	1%	5	4%	1	1%	28	21%	98	74%	126	95%	7	5%	133
	50-200	2	2%	6	5%			62	47%	62	47%	124	94%	8	6%	132
	Over 200			1	1%			95	73%	34	26%	129	99%	1	1%	130
Base		7	1%	60	5%	5	0%	738	55%	520	39%	1258	95%	72	5%	1330

Source : Metra Martech - 27/10/00

TABLE 4C-1 : RECORDING AND INVESTIGATION OF INCIDENTS OF WORK RELATED ILL HEALTH

		Response to Incidents of Work Related Ill Health										Actually or Potentially Investigated				Base
		Occurred but not Recorded		Recorded but not Investigated		Record only if it Occurred		Has Occured and Was Investigated		Would Investigate if it Occurred		Yes		No		No
		No	%	No	%	No	%	No	%	No	%	No	%	No	%	
Risk	Higher	5	1%	23	3%	5	1%	147	18%	635	78%	782	96%	33	4%	815
	Lower	1	0%	16	3%	3	1%	71	15%	374	80%	445	96%	20	4%	465
Employees	Under 10	1	1%	3	3%	1	1%	5	5%	91	90%	96	95%	5	5%	101
	Oct-49	1	0%	10	3%	2	1%	21	6%	307	90%	328	96%	13	4%	341
	50-200	2	0%	19	4%	5	1%	73	16%	365	79%	438	94%	26	6%	464
	Over 200	2	1%	7	2%			119	32%	246	66%	365	98%	9	2%	374
Sector	Agriculture			2	3%	1	2%	10	17%	45	78%	55	95%	3	5%	58
	Construction	1	1%					5	6%	80	93%	85	99%	1	1%	86
	Mining			1	4%			4	15%	21	81%	25	96%	1	4%	26
	Transport			2	2%			10	11%	80	87%	90	98%	2	2%	92
	Utilities	1	4%	3	13%			10	42%	10	42%	20	83%	4	17%	24
	Pet. & Chem.							27	23%	91	77%	118	100%			118
	Metals etc			9	11%			21	26%	52	63%	73	89%	9	11%	82
	Food							20	23%	66	77%	86	100%			86
	Textiles etc	1	1%	2	2%			25	23%	79	74%	104	97%	3	3%	107
	Machinery etc	2	2%	4	3%	4	3%	13	10%	101	81%	114	92%	10	8%	124
	Repair							2	17%	10	83%	12	100%			12
	Wholsale			2	2%	1	1%	15	16%	75	81%	90	97%	3	3%	93
	Retail			3	3%			15	17%	68	79%	83	97%	3	3%	86
	Hotels etc			1	2%	1	2%	4	6%	59	91%	63	97%	2	3%	65
	Finance etc	1	1%	8	11%			15	21%	49	67%	64	88%	9	12%	73
	Services			2	3%			8	11%	63	86%	71	97%	2	3%	73
	Health etc					1	1%	14	19%	60	80%	74	99%	1	1%	75
Group	Agriculture			2	3%	1	2%	10	17%	45	78%	55	95%	3	5%	58
	Construction	1	1%					5	6%	80	93%	85	99%	1	1%	86
	Ext./Util./Trans	1	1%	6	4%			24	17%	111	78%	135	95%	7	5%	142
	Manufacturing	3	1%	15	3%	4	1%	108	20%	399	75%	507	96%	22	4%	529
	Services	1	0%	16	3%	3	1%	71	15%	374	80%	445	96%	20	4%	465
Base		6	0%	39	3%	8	1%	218	17%	1009	79%	1227	96%	53	4%	1280

Source : Metra Martech - 27/10/00

TABLE 4C-2 : RECORDING AND INVESTIGATION OF INCIDENTS OF WORK RELATED ILL HEALTH BY SIZE

		Response to Incidents of Work Related Ill Health										Actually or Potentially Investigated				Base
		Occurred but not Recorded		Recorded but not Investigated		Record only if it Occurred		Has Occured and Was Investigated		Would Investigate if it Occurred		Yes		No		No
		No	%	No	%	No	%	No	%	No	%	No	%	No	%	
Agriculture	Under 10							2	11%	17	89%	19	100%			19
	Oct-49			2	13%	1	7%	2	13%	10	67%	12	80%	3	20%	15
	50-200							5	25%	15	75%	20	100%			20
	Over 200							1	25%	3	75%	4	100%			4
Construction	Under 10	1	5%							18	95%	18	95%	1	5%	19
	Oct-49							1	4%	23	96%	24	100%			24
	50-200							1	5%	20	95%	21	100%			21
	Over 200							3	14%	19	86%	22	100%			22
Ext./Util./Trans	Oct-49			1	3%			3	9%	31	89%	34	97%	1	3%	35
	50-200	1	1%	3	4%			9	12%	60	82%	69	95%	4	5%	73
	Over 200			2	6%			12	35%	20	59%	32	94%	2	6%	34
Manufacturing	Oct-49	1	1%	5	3%			7	5%	135	91%	142	96%	6	4%	148
	50-200	1	0%	9	4%	4	2%	49	22%	162	72%	211	94%	14	6%	225
	Over 200	1	1%	1	1%			52	33%	102	65%	154	99%	2	1%	156
Services	Under 10			3	4%	1	1%	3	4%	68	91%	71	95%	4	5%	75
	Oct-49			5	4%	1	1%	11	8%	122	88%	133	96%	6	4%	139
	50-200	1	1%	4	3%	1	1%	19	15%	98	80%	117	95%	6	5%	123
	Over 200			4	3%			38	30%	86	67%	124	97%	4	3%	128
Higher Risk	Under 10	1	3%					2	5%	35	92%	37	97%	1	3%	38
	Oct-49	1	0%	8	4%	1	0%	13	6%	199	90%	212	95%	10	5%	222
	50-200	2	1%	12	4%	4	1%	64	19%	257	76%	321	95%	18	5%	339
	Over 200	1	0%	3	1%			68	31%	144	67%	212	98%	4	2%	216
Lower Risk	Under 10			3	4%	1	1%	3	4%	68	91%	71	95%	4	5%	75
	Oct-49			5	4%	1	1%	11	8%	122	88%	133	96%	6	4%	139
	50-200	1	1%	4	3%	1	1%	19	15%	98	80%	117	95%	6	5%	123
	Over 200			4	3%			38	30%	86	67%	124	97%	4	3%	128
Base		6	0%	39	3%	8	1%	218	17%	1009	79%	1227	96%	53	4%	1280

Source : Metra Martech - 27/10/00

TABLE 4D-1 : RECORDING AND INVESTIGATION OF VERY SERIOUS OR FATAL ACCIDENTS

		Response to Very Serious or Fatal Accidents										Actually or Potentially Investigated				Base
		Occurred but not Recorded		Recorded but not Investigated		Record only if it Occurred		Has Occured and Was Investigated		Would Investigate if it Occurred		Yes		No		No
		No	%	No	%	No	%	No	%	No	%	No	%	No	%	
Risk	Higher	1	0%	22	3%	4	0%	105	13%	695	84%	800	97%	27	3%	827
	Lower	1	0%	10	2%	1	0%	58	12%	415	86%	473	98%	12	2%	485
Employees	Under 10			4	3%	1	1%	3	2%	113	93%	116	96%	5	4%	121
	Oct-49			9	3%			19	5%	326	92%	345	97%	9	3%	354
	50-200	1	0%	18	4%	4	1%	44	9%	400	86%	444	95%	23	5%	467
	Over 200	1	0%	1	0%			97	26%	271	73%	368	99%	2	1%	370
Sector	Agriculture			5	9%			7	12%	45	79%	52	91%	5	9%	57
	Construction			1	1%			4	4%	91	95%	95	99%	1	1%	96
	Mining			1	4%			6	22%	20	74%	26	96%	1	4%	27
	Transport			1	1%			9	9%	85	89%	94	99%	1	1%	95
	Utilities							8	44%	10	56%	18	100%			18
	Pet. & Chem.							25	21%	95	79%	120	100%			120
	Metals etc			9	11%			14	17%	60	72%	74	89%	9	11%	83
	Food									88	100%	88	100%			88
	Textiles etc			2	2%			16	15%	90	83%	106	98%	2	2%	108
	Machinery etc	1	1%	3	2%	4	3%	15	12%	101	81%	116	94%	8	6%	124
	Repair							1	9%	10	91%	11	100%			11
	Wholsale			2	2%	1	1%	15	16%	74	80%	89	97%	3	3%	92
	Retail			1	1%			6	6%	97	93%	103	99%	1	1%	104
	Hotels etc			1	2%			3	5%	60	94%	63	98%	1	2%	64
	Finance etc	1	1%	5	7%			21	28%	47	64%	68	92%	6	8%	74
	Services			1	1%			11	14%	64	84%	75	99%	1	1%	76
	Health etc							2	3%	73	97%	75	100%			75
Group	Agriculture			5	9%			7	12%	45	79%	52	91%	5	9%	57
	Construction			1	1%			4	4%	91	95%	95	99%	1	1%	96
	Ext./Util./Trans			2	1%			23	16%	115	82%	138	99%	2	1%	140
	Manufacturing	1	0%	14	3%	4	1%	71	13%	444	83%	515	96%	19	4%	534
	Services	1	0%	10	2%	1	0%	58	12%	415	86%	473	98%	12	2%	485
Base		2	0%	32	2%	5	0%	163	12%	1110	85%	1273	97%	39	3%	1312

Source : Metra Martech - 27/10/00

TABLE 4D-2 : RECORDING AND INVESTIGATION OF VERY SERIOUS OR FATAL ACCIDENTS BY SIZE

		Response to Very Serious or Fatal Accidents										Actually or Potentially Investigated				Base
		Occurred but not Recorded		Recorded but not Investigated		Record only if it Occurred		Has Occured and Was Investigated		Would Investigate if it Occurred		Yes		No		No
		No	%	No	%	No	%	No	%	No	%	No	%	No	%	
Agriculture	Under 10							2	11%	17	89%	19	100%			19
	Oct-49			4	27%			2	13%	9	60%	11	73%	4	27%	15
	50-200			1	6%			2	11%	15	83%	17	94%	1	6%	18
	Over 200							1	20%	4	80%	5	100%			5
Construction	Under 10			1	4%			1	4%	24	92%	25	96%	1	4%	26
	Oct-49									28	100%	28	100%			28
	50-200									20	100%	20	100%			20
	Over 200							3	14%	19	86%	22	100%			22
Ext./Util./Trans	Oct-49			1	3%			3	8%	34	89%	37	97%	1	3%	38
	50-200			1	1%			9	13%	60	86%	69	99%	1	1%	70
	Over 200							11	34%	21	66%	32	100%			32
Manufacturing	Oct-49			3	2%			14	9%	133	89%	147	98%	3	2%	150
	50-200	1	0%	11	5%	4	2%	23	10%	189	83%	212	93%	16	7%	228
	Over 200							34	22%	122	78%	156	100%			156
Services	Under 10			3	3%	1	1%			86	96%	86	96%	4	4%	90
	Oct-49			3	2%			3	2%	137	96%	140	98%	3	2%	143
	50-200	1	1%	3	2%			13	11%	106	86%	119	97%	4	3%	123
	Over 200			1	1%			42	33%	86	67%	128	99%	1	1%	129
Higher Risk	Under 10			1	2%			3	7%	41	91%	44	98%	1	2%	45
	Oct-49			8	3%			19	8%	204	88%	223	97%	8	3%	231
	50-200	1	0%	13	4%	4	1%	34	10%	284	85%	318	95%	18	5%	336
	Over 200							49	23%	166	77%	215	100%			215
Lower Risk	Under 10			3	3%	1	1%			86	96%	86	96%	4	4%	90
	Oct-49			3	2%			3	2%	137	96%	140	98%	3	2%	143
	50-200	1	1%	3	2%			13	11%	106	86%	119	97%	4	3%	123
	Over 200			1	1%			42	33%	86	67%	128	99%	1	1%	129
Base		2	0%	32	2%	5	0%	163	12%	1110	85%	1273	97%	39	3%	1312

Source : Metra Martech - 27/10/00

TABLE 4E-1 : RECORDING AND INVESTIGATION OF ACCIDENTS TO CONTRACTORS' EMPLOYEES

		Response to Accidents to Contractors' Employees										Actually or Potentially Investigated				Base
		Occurred but not Recorded		Recorded but not Investigated		Record only if it Occurred		Has Occured and Was Investigated		Would Investigate if it Occurred		Yes		No		No
		No	%	No	%	No	%	No	%	No	%	No	%	No	%	
Risk	Higher	1	0%	28	4%	4	1%	155	20%	572	75%	727	96%	33	4%	760
	Lower			15	3%	8	2%	80	18%	334	76%	414	95%	23	5%	437
Employees	Under 10			4	5%	2	2%	1	1%	81	92%	82	93%	6	7%	88
	Oct-49			13	4%	5	2%	21	7%	268	87%	289	94%	18	6%	307
	50-200	1	0%	18	4%	5	1%	65	15%	354	80%	419	95%	24	5%	443
	Over 200			8	2%			148	41%	203	57%	351	98%	8	2%	359
Sector	Agriculture			4	7%			11	20%	40	73%	51	93%	4	7%	55
	Construction							8	10%	74	90%	82	100%			82
	Mining			4	14%			11	39%	13	46%	24	86%	4	14%	28
	Transport							14	17%	70	83%	84	100%			84
	Utilities			2	9%			14	64%	6	27%	20	91%	2	9%	22
	Pet. & Chem.							45	38%	75	63%	120	100%			120
	Metals etc	1	1%	9	11%			18	21%	56	67%	74	88%	10	12%	84
	Food									47	100%	47	100%			47
	Textiles etc			4	4%			17	16%	83	80%	100	96%	4	4%	104
	Machinery etc			5	4%	4	3%	17	14%	97	79%	114	93%	9	7%	123
	Repair									11	100%	11	100%			11
	Wholsale			1	1%	1	1%	22	24%	67	74%	89	98%	2	2%	91
	Retail			2	3%	1	1%	12	15%	65	81%	77	96%	3	4%	80
	Hotels etc			5	9%	6	10%	6	10%	41	71%	47	81%	11	19%	58
	Finance etc			7	10%			26	37%	37	53%	63	90%	7	10%	70
	Services							10	14%	59	86%	69	100%			69
	Health etc							4	6%	65	94%	69	100%			69
Group	Agriculture			4	7%			11	20%	40	73%	51	93%	4	7%	55
	Construction							8	10%	74	90%	82	100%			82
	Ext./Util./Trans			6	4%			39	29%	89	66%	128	96%	6	4%	134
	Manufacturing	1	0%	18	4%	4	1%	97	20%	369	75%	466	95%	23	5%	489
	Services			15	3%	8	2%	80	18%	334	76%	414	95%	23	5%	437
Base		1	0%	43	4%	12	1%	235	20%	906	76%	1141	95%	56	5%	1197

Source : Metra Martech - 27/10/00

TABLE 4E-2 : RECORDING AND INVESTIGATION OF ACCIDENTS TO CONTRACTORS' EMPLOYEES BY SIZE

		Response to Accidents to Contractors' Employees										Actually or Potentially Investigated				Base
		Occurred but not Recorded		Recorded but not Investigated		Record only if it Occurred		Has Occured and Was Investigated		Would Investigate if it Occurred		Yes		No		No
		No	%	No	%	No	%	No	%	No	%	No	%	No	%	
Agriculture	Under 10							1	5%	18	95%	19	100%			19
	Oct-49			3	21%			1	7%	10	71%	11	79%	3	21%	14
	50-200			1	6%			6	38%	9	56%	15	94%	1	6%	16
	Over 200							3	50%	3	50%	6	100%			6
Construction	Under 10									16	100%	16	100%			16
	Oct-49							5	21%	19	79%	24	100%			24
	50-200							1	5%	19	95%	20	100%			20
	Over 200							2	9%	20	91%	22	100%			22
Ext./Util./Trans	Oct-49			1	3%			3	9%	28	88%	31	97%	1	3%	32
	50-200			3	4%			17	24%	51	72%	68	96%	3	4%	71
	Over 200			2	6%			19	61%	10	32%	29	94%	2	6%	31
Manufacturing	Oct-49			9	7%			6	5%	116	89%	122	93%	9	7%	131
	50-200	1	0%	9	4%	4	2%	33	15%	169	78%	202	94%	14	6%	216
	Over 200							58	41%	84	59%	142	100%			142
Services	Under 10			4	6%	2	3%			59	91%	59	91%	6	9%	65
	Oct-49			3	2%	5	4%	9	7%	108	86%	117	94%	8	6%	125
	50-200			5	4%	1	1%	15	13%	97	82%	112	95%	6	5%	118
	Over 200			3	2%			56	43%	70	54%	126	98%	3	2%	129
Higher Risk	Under 10							1	3%	34	97%	35	100%			35
	Oct-49			13	6%			15	7%	173	86%	188	94%	13	6%	201
	50-200	1	0%	13	4%	4	1%	57	18%	248	77%	305	94%	18	6%	323
	Over 200			2	1%			82	41%	117	58%	199	99%	2	1%	201
Lower Risk	Under 10			4	6%	2	3%			59	91%	59	91%	6	9%	65
	Oct-49			3	2%	5	4%	9	7%	108	86%	117	94%	8	6%	125
	50-200			5	4%	1	1%	15	13%	97	82%	112	95%	6	5%	118
	Over 200			3	2%			56	43%	70	54%	126	98%	3	2%	129
Base		1	0%	43	4%	12	1%	235	20%	906	76%	1141	95%	56	5%	1197

Source : Metra Martech - 27/10/00

TABLE 4F-1 : RECORDING AND INVESTIGATION OF ACCIDENTS TO MEMBERS OF THE PUBLIC

		Response to Accidents to Members of the Public										Actually or Potentially Investigated				Base
		Occurred but not Recorded		Recorded but not Investigated		Record only if it Occurred		Has Occured and Was Investigated		Would Investigate if it Occurred		Yes		No		No
		No	%	No	%	No	%	No	%	No	%	No	%	No	%	
Risk	Higher	1	0%	27	4%	5	1%	54	8%	612	88%	666	95%	33	5%	699
	Lower			14	3%	4	1%	79	17%	364	79%	443	96%	18	4%	461
Employees	Under 10			3	3%	2	2%	2	2%	94	93%	96	95%	5	5%	101
	Oct-49			10	3%			21	7%	266	90%	287	97%	10	3%	297
	50-200			19	4%	5	1%	37	9%	371	86%	408	94%	24	6%	432
	Over 200	1	0%	9	3%	2	1%	73	22%	245	74%	318	96%	12	4%	330
Sector	Agriculture			4	7%			8	14%	44	79%	52	93%	4	7%	56
	Construction	1	1%	1	1%			2	3%	64	94%	66	97%	2	3%	68
	Mining			3	12%	1	4%	6	23%	16	62%	22	85%	4	15%	26
	Transport							8	10%	75	90%	83	100%			83
	Utilities			4	17%			13	57%	6	26%	19	83%	4	17%	23
	Pet. & Chem.							1	1%	118	99%	119	100%			119
	Metals etc			6	8%			5	6%	69	86%	74	93%	6	8%	80
	Food									16	100%	16	100%			16
	Textiles etc			2	2%			7	7%	90	91%	97	98%	2	2%	99
	Machinery etc			7	6%	4	3%	2	2%	104	89%	106	91%	11	9%	117
	Repair							2	17%	10	83%	12	100%			12
	Wholsale			2	2%	1	1%	9	10%	76	86%	85	97%	3	3%	88
	Retail			1	1%	1	1%	21	24%	66	74%	87	98%	2	2%	89
	Hotels etc			1	2%	2	3%	10	16%	51	80%	61	95%	3	5%	64
	Finance etc			8	11%			16	23%	47	66%	63	89%	8	11%	71
	Services			1	1%			9	12%	64	86%	73	99%	1	1%	74
	Health etc			1	1%			14	19%	60	80%	74	99%	1	1%	75
Group	Agriculture			4	7%			8	14%	44	79%	52	93%	4	7%	56
	Construction	1	1%	1	1%			2	3%	64	94%	66	97%	2	3%	68
	Ext./Util./Trans			7	5%	1	1%	27	20%	97	73%	124	94%	8	6%	132
	Manufacturing			15	3%	4	1%	17	4%	407	92%	424	96%	19	4%	443
	Services			14	3%	4	1%	79	17%	364	79%	443	96%	18	4%	461
Base		1	0%	41	4%	9	1%	133	11%	976	84%	1109	96%	51	4%	1160

Source : Metra Martech - 27/10/00

TABLE 4F-2 : RECORDING AND INVESTIGATION OF ACCIDENTS TO MEMBERS OF THE PUBLIC BY SIZE

		Response to Accidents to Members of the Public										Actually or Potentially Investigated				Base
		Occurred but not Recorded		Recorded but not Investigated		Record only if it Occurred		Has Occured and Was Investigated		Would Investigate if it Occurred		Yes		No		No
		No	%	No	%	No	%	No	%	No	%	No	%	No	%	
Agriculture	Under 10							1	5%	18	95%	19	100%			19
	Oct-49			3	21%			2	14%	9	64%	11	79%	3	21%	14
	50-200			1	6%			4	22%	13	72%	17	94%	1	6%	18
	Over 200							1	20%	4	80%	5	100%			5
Construction	Under 10									14	100%	14	100%			14
	Oct-49			1	6%					15	94%	15	94%	1	6%	16
	50-200							1	6%	16	94%	17	100%			17
	Over 200	1	5%					1	5%	19	90%	20	95%	1	5%	21
Ext./Util./Trans	Oct-49			1	3%			1	3%	29	94%	30	97%	1	3%	31
	50-200			3	4%			16	23%	52	73%	68	96%	3	4%	71
	Over 200			3	10%	1	3%	10	33%	16	53%	26	87%	4	13%	30
Manufacturing	Oct-49			6	5%			6	5%	113	90%	119	95%	6	5%	125
	50-200			7	4%	4	2%	4	2%	180	92%	184	94%	11	6%	195
	Over 200			2	2%			7	6%	114	93%	121	98%	2	2%	123
Services	Under 10			3	4%	2	3%	1	1%	74	93%	75	94%	5	6%	80
	Oct-49			2	2%			16	12%	112	86%	128	98%	2	2%	130
	50-200			6	5%	1	1%	19	15%	98	79%	117	94%	7	6%	124
	Over 200			3	2%	1	1%	43	34%	80	63%	123	97%	4	3%	127
Higher Risk	Under 10							1	3%	32	97%	33	100%			33
	Oct-49			11	6%			9	5%	166	89%	175	94%	11	6%	186
	50-200			11	4%	4	1%	25	8%	261	87%	286	95%	15	5%	301
	Over 200	1	1%	5	3%	1	1%	19	11%	153	85%	172	96%	7	4%	179
Lower Risk	Under 10			3	4%	2	3%	1	1%	74	93%	75	94%	5	6%	80
	Oct-49			2	2%			16	12%	112	86%	128	98%	2	2%	130
	50-200			6	5%	1	1%	19	15%	98	79%	117	94%	7	6%	124
	Over 200			3	2%	1	1%	43	34%	80	63%	123	97%	4	3%	127
Base		1	0%	41	4%	9	1%	133	11%	976	84%	1109	96%	51	4%	1160

Source : Metra Martech - 27/10/00

TABLE 4G-1 : RECORDING AND INVESTIGATION OF INCIDENTS OF VIOLENCE TO EMPLOYEES

		Response to Incidents of Violence to Employees								Actually or Potentially Investigated				Base
		Recorded but not Investigated		Record only if it Occurred		Has Occured and Was Investigated		Would Investigate if it Occurred		Yes		No		No
		No	%	No	%	No	%	No	%	No	%	No	%	
Risk	**Higher**	22	3%	4	1%	53	8%	610	89%	663	96%	26	4%	689
	Lower	14	3%	1	0%	54	13%	350	84%	404	96%	15	4%	419
Employees	**Under 10**	3	3%	1	1%	2	2%	90	94%	92	96%	4	4%	96
	Oct-49	10	4%			21	8%	249	89%	270	96%	10	4%	280
	50-200	20	5%	4	1%	20	5%	371	89%	391	94%	24	6%	415
	Over 200	3	1%			64	20%	250	79%	314	99%	3	1%	317
Sector	**Agriculture**	4	7%			3	5%	50	88%	53	93%	4	7%	57
	Construction	1	2%					64	98%	64	98%	1	2%	65
	Mining	1	4%			2	8%	23	88%	25	96%	1	4%	26
	Transport					8	10%	74	90%	82	100%			82
	Utilities	2	9%			13	59%	7	32%	20	91%	2	9%	22
	Pet. & Chem.					6	5%	113	95%	119	100%			119
	Metals etc	6	8%			7	9%	67	84%	74	93%	6	8%	80
	Food							15	100%	15	100%			15
	Textiles etc	2	2%			10	10%	87	88%	97	98%	2	2%	99
	Machinery etc	6	5%	4	3%	4	3%	102	88%	106	91%	10	9%	116
	Repair							8	100%	8	100%			8
	Wholsale	3	6%	1	2%	4	7%	46	85%	50	93%	4	7%	54
	Retail	2	2%			16	19%	66	79%	82	98%	2	2%	84
	Hotels etc	1	2%			6	9%	57	89%	63	98%	1	2%	64
	Finance etc	7	10%			11	16%	51	74%	62	90%	7	10%	69
	Services					6	8%	69	92%	75	100%			75
	Health etc	1	1%			11	15%	61	84%	72	99%	1	1%	73
Group	**Agriculture**	4	7%			3	5%	50	88%	53	93%	4	7%	57
	Construction	1	2%					64	98%	64	98%	1	2%	65
	Ext./Util./Trans	3	2%			23	18%	104	80%	127	98%	3	2%	130
	Manufacturing	14	3%	4	1%	27	6%	392	90%	419	96%	18	4%	437
	Services	14	3%	1	0%	54	13%	350	84%	404	96%	15	4%	419
Base		36	3%	5	0%	107	10%	960	87%	1067	96%	41	4%	1108

Source : Metra Martech - 27/10/00

TABLE 4G-2 : RECORDING AND INVESTIGATION OF INCIDENTS OF VIOLENCE TO EMPLOYEES BY SIZE

		Response to Incidents of Violence to Employees								Actually or Potentially Investigated				Base
		Recorded but not Investigated		Record only if it Occurred		Has Occured and Was Investigated		Would Investigate if it Occurred		Yes		No		No
		No	%	No	%	No	%	No	%	No	%	No	%	
Agriculture	Under 10					1	5%	18	95%	19	100%			19
	Oct-49	3	21%					11	79%	11	79%	3	21%	14
	50-200	1	6%			1	6%	16	89%	17	94%	1	6%	18
	Over 200					1	17%	5	83%	6	100%			6
Construction	Under 10							14	100%	14	100%			14
	Oct-49	1	7%					14	93%	14	93%	1	7%	15
	50-200							17	100%	17	100%			17
	Over 200							19	100%	19	100%			19
Ext./Util./Trans	Oct-49	1	3%			2	7%	27	90%	29	97%	1	3%	30
	50-200	1	1%			13	18%	58	81%	71	99%	1	1%	72
	Over 200	1	4%			8	29%	19	68%	27	96%	1	4%	28
Manufacturing	Oct-49	7	6%			7	6%	107	88%	114	94%	7	6%	121
	50-200	6	3%	4	2%	8	4%	176	91%	184	95%	10	5%	194
	Over 200	1	1%			12	10%	109	89%	121	99%	1	1%	122
Services	Under 10	3	4%	1	1%	3	4%	68	91%	71	95%	4	5%	75
	Oct-49	2	2%			12	10%	105	88%	117	98%	2	2%	119
	50-200	8	8%			5	5%	92	88%	97	92%	8	8%	105
	Over 200	1	1%			34	28%	85	71%	119	99%	1	1%	120
Higher Risk	Under 10					1	3%	32	97%	33	100%			33
	Oct-49	12	7%			9	5%	159	88%	168	93%	12	7%	180
	50-200	8	3%	4	1%	22	7%	267	89%	289	96%	12	4%	301
	Over 200	2	1%			21	12%	152	87%	173	99%	2	1%	175
Lower Risk	Under 10	3	4%	1	1%	3	4%	68	91%	71	95%	4	5%	75
	Oct-49	2	2%			12	10%	105	88%	117	98%	2	2%	119
	50-200	8	8%			5	5%	92	88%	97	92%	8	8%	105
	Over 200	1	1%			34	28%	85	71%	119	99%	1	1%	120
Base		36	3%	5	0%	107	10%	960	87%	1067	96%	41	4%	1108

Source : Metra Martech - 27/10/00

TABLE 4H-1 : RECORDING AND INVESTIGATION OF NEAR MISSES INVOLVING NO INJURY

		Response to Near Misses Involving No Injury										Actually or Potentially Investigated				Base
		Occurred but not Recorded		Recorded but not Investigated		Record only if it Occurred		Has Occured and Was Investigated		Would Investigate if it Occurred		Yes		No		No
		No	%	No	%	No	%	No	%	No	%	No	%	No	%	
Risk	Higher	17	2%	37	5%	6	1%	254	34%	433	58%	687	92%	60	8%	747
	Lower	23	5%	13	3%	10	2%	112	25%	285	64%	397	90%	46	10%	443
Employees	Under 10	13	13%	5	5%			5	5%	74	76%	79	81%	18	19%	97
	Oct-49	9	3%	14	5%	7	2%	41	14%	228	76%	269	90%	30	10%	299
	50-200	8	2%	21	5%	6	1%	132	30%	279	63%	411	92%	35	8%	446
	Over 200	10	3%	10	3%	3	1%	188	54%	137	39%	325	93%	23	7%	348
Sector	Agriculture			3	5%	1	2%	17	29%	37	64%	54	93%	4	7%	58
	Construction	5	8%	5	8%			15	23%	40	62%	55	85%	10	15%	65
	Mining			1	4%			14	52%	12	44%	26	96%	1	4%	27
	Transport	7	7%	1	1%			24	25%	63	66%	87	92%	8	8%	95
	Utilities			2	9%			13	59%	7	32%	20	91%	2	9%	22
	Pet. & Chem.			2	2%			55	45%	64	53%	119	98%	2	2%	121
	Metals etc	1	1%	10	11%			44	48%	36	40%	80	88%	11	12%	91
	Food	2	10%	5	25%			7	35%	6	30%	13	65%	7	35%	20
	Textiles etc	1	1%	5	5%			30	27%	75	68%	105	95%	6	5%	111
	Machinery etc	1	1%	2	2%	5	4%	30	25%	83	69%	113	93%	8	7%	121
	Repair			1	6%			5	31%	10	63%	15	94%	1	6%	16
	Wholsale	10	12%	4	5%			32	38%	38	45%	70	83%	14	17%	84
	Retail	2	3%	2	3%	2	3%	17	24%	49	68%	66	92%	6	8%	72
	Hotels etc	2	3%	1	2%	8	12%	5	8%	49	75%	54	83%	11	17%	65
	Finance etc	5	7%	6	8%			27	38%	33	46%	60	85%	11	15%	71
	Services	4	5%					16	21%	55	73%	71	95%	4	5%	75
	Health etc							15	20%	61	80%	76	100%			76
Group	Agriculture			3	5%	1	2%	17	29%	37	64%	54	93%	4	7%	58
	Construction	5	8%	5	8%			15	23%	40	62%	55	85%	10	15%	65
	Ext./Util./Trans	7	5%	4	3%			51	35%	82	57%	133	92%	11	8%	144
	Manufacturing	5	1%	25	5%	5	1%	171	36%	274	57%	445	93%	35	7%	480
	Services	23	5%	13	3%	10	2%	112	25%	285	64%	397	90%	46	10%	443
Base		40	3%	50	4%	16	1%	366	31%	718	60%	1084	91%	106	9%	1190

Source : Metra Martech - 27/10/00

TABLE 4H-2 : RECORDING AND INVESTIGATION OF NEAR MISSES INVOLVING NO INJURY BY SIZE

		Response to Near Misses Involving No Injury										Actually or Potentially Investigated				Base
		Occurred but not Recorded		Recorded but not Investigated		Record only if it Occurred		Has Occured and Was Investigated		Would Investigate if it Occurred		Yes		No		No
		No	%	No	%	No	%	No	%	No	%	No	%	No	%	
Agriculture	Under 10							3	17%	15	83%	18	100%			18
	Oct-49			3	20%	1	7%	3	20%	8	53%	11	73%	4	27%	15
	50-200							9	47%	10	53%	19	100%			19
	Over 200							2	33%	4	67%	6	100%			6
Construction	Under 10	3	18%	1	6%					13	76%	13	76%	4	24%	17
	Oct-49	1	6%	3	18%			1	6%	12	71%	13	76%	4	24%	17
	50-200	1	11%					1	11%	7	78%	8	89%	1	11%	9
	Over 200			1	5%			13	59%	8	36%	21	95%	1	5%	22
Ext./Util./Trans	Oct-49	3	8%	2	5%			7	19%	25	68%	32	86%	5	14%	37
	50-200	1	1%	1	1%			25	34%	46	63%	71	97%	2	3%	73
	Over 200	3	9%	1	3%			19	56%	11	32%	30	88%	4	12%	34
Manufacturing	Under 10			1	50%			1	50%			1	50%	1	50%	2
	Oct-49			4	3%			25	19%	101	78%	126	97%	4	3%	130
	50-200	3	1%	16	8%	4	2%	68	32%	122	57%	190	89%	23	11%	213
	Over 200	2	1%	4	3%	1	1%	77	57%	51	38%	128	95%	7	5%	135
Services	Under 10	12	17%	4	6%			1	1%	55	76%	56	78%	16	22%	72
	Oct-49	3	2%	3	2%	6	5%	16	13%	94	77%	110	90%	12	10%	122
	50-200	4	3%	4	3%	2	2%	31	25%	82	67%	113	92%	10	8%	123
	Over 200	4	3%	2	2%	2	2%	64	51%	54	43%	118	94%	8	6%	126
Higher Risk	Under 10	3	8%	2	5%			4	11%	28	76%	32	86%	5	14%	37
	Oct-49	4	2%	12	6%	1	1%	36	18%	146	73%	182	91%	17	9%	199
	50-200	5	2%	17	5%	4	1%	103	33%	185	59%	288	92%	26	8%	314
	Over 200	5	3%	6	3%	1	1%	111	56%	74	38%	185	94%	12	6%	197
Lower Risk	Under 10	12	17%	4	6%			1	1%	55	76%	56	78%	16	22%	72
	Oct-49	3	2%	3	2%	6	5%	16	13%	94	77%	110	90%	12	10%	122
	50-200	4	3%	4	3%	2	2%	31	25%	82	67%	113	92%	10	8%	123
	Over 200	4	3%	2	2%	2	2%	64	51%	54	43%	118	94%	8	6%	126
Base		40	3%	50	4%	16	1%	366	31%	718	60%	1084	91%	106	9%	1190

Source : Metra Martech - 27/10/00

TABLE 5 : THE OVERALL COMPOSITION OF THE INVESTIGATING TEAM FOR EACH TYPE OF INCIDENT

	Line Management		Senior Management		HSO		Safety Rep or Committee		External Experts		Medical Experts		Other		Base
	No	%	No	%	No	%	No	%	No	%	No	%	No	%	
Minor Accidents	635	67%	401	42%	436	46%	241	25%	63	7%	98	10%	93	10%	949
Lost Time Accidents	860	68%	803	64%	661	53%	362	29%	173	14%	246	20%	182	14%	1258
Incidents of Work Related Ill Health	784	64%	815	66%	611	50%	341	28%	247	20%	402	33%	218	18%	1227
Very Serious or Fatal Accidents	801	63%	1,000	79%	697	55%	393	31%	502	39%	558	44%	390	31%	1273
Accidents to Contractors' Employees	710	62%	731	64%	582	51%	317	28%	210	18%	178	16%	241	21%	1141
Accidents to Members of the Public	665	60%	764	69%	543	49%	307	28%	213	19%	218	20%	211	19%	1109
Incidents of Violence to Employees	660	62%	756	71%	497	47%	269	25%	241	23%	163	15%	283	27%	1067
Near Misses Involving No Injury	703	65%	695	64%	532	49%	278	26%	190	18%	90	8%	128	12%	1084
Source : Metra Martech - 27/10/00															

TABLE 5A-1 : MEMBERS OF INVESTIGATING TEAM FOR MINOR ACCIDENTS

		Line Management		Senior Management		HSO		Safety Rep or Committee		External Experts		Medical Experts		Other		Base
Risk	**Higher**	424	72%	232	39%	288	49%	164	28%	42	7%	64	11%	61	10%	593
	Lower	211	59%	169	47%	148	42%	77	22%	21	6%	34	10%	32	9%	356
Employees	**Under 10**	10	17%	53	88%	10	17%	1	2%	1	2%	4	7%	2	3%	60
	Oct-49	119	51%	132	56%	94	40%	46	20%	21	9%	21	9%	17	7%	235
	50-200	259	72%	139	39%	176	49%	96	27%	25	7%	31	9%	34	9%	358
	Over 200	247	83%	77	26%	156	53%	98	33%	16	5%	42	14%	40	14%	296
Sector	**Agriculture**	22	56%	12	31%	18	46%	3	8%			4	10%	3	8%	39
	Construction	29	64%	19	42%	29	64%	5	11%	3	7%			3	7%	45
	Mining	19	95%	2	10%	7	35%	4	20%	1	5%	4	20%			20
	Transport	47	70%	26	39%	21	31%	15	22%	3	4%	1	1%	6	9%	67
	Utilities	16	73%	7	32%	13	59%	2	9%			4	18%			22
	Pet. & Chem.	92	86%	40	37%	44	41%	37	35%	3	3%	6	6%	23	21%	107
	Metals etc	45	60%	33	44%	38	51%	36	48%	14	19%	14	19%	1	1%	75
	Food	22	96%	8	35%	20	87%	10	43%					4	17%	23
	Textiles etc	65	71%	38	41%	46	50%	26	28%	5	5%	14	15%	6	7%	92
	Machinery etc	59	67%	37	42%	49	56%	25	28%	12	14%	16	18%	14	16%	88
	Repair	8	53%	10	67%	3	20%	1	7%	1	7%	1	7%	1	7%	15
	Wholsale	39	54%	35	49%	40	56%	32	44%	4	6%	12	17%	4	6%	72
	Retail	42	82%	19	37%	24	47%	6	12%	2	4%	2	4%	5	10%	51
	Hotels etc	22	47%	34	72%	13	28%	6	13%	4	9%	6	13%	4	9%	47
	Finance etc	37	63%	19	32%	17	29%	22	37%	6	10%	6	10%	5	8%	59
	Services	34	61%	26	46%	26	46%	8	14%	5	9%	2	4%	8	14%	56
	Health etc	37	52%	36	51%	28	39%	3	4%			6	8%	6	8%	71
Group	**Agriculture**	22	56%	12	31%	18	46%	3	8%			4	10%	3	8%	39
	Construction	29	64%	19	42%	29	64%	5	11%	3	7%			3	7%	45
	Ext./Util./Trans	82	75%	35	32%	41	38%	21	19%	4	4%	9	8%	6	6%	109
	Manufacturing	291	73%	166	42%	200	50%	135	34%	35	9%	51	13%	49	12%	400
	Services	211	59%	169	47%	148	42%	77	22%	21	6%	34	10%	32	9%	356
Base		635	67%	401	42%	436	46%	241	25%	63	7%	98	10%	93	10%	949

Source : Metra Martech - 27/10/00

TABLE 5A-2 : MEMBERS OF INVESTIGATING TEAM FOR MINOR ACCIDENTS BY SIZE

		Line Management		Senior Management		HSO		Safety Rep or Committee		External Experts		Medical Experts		Other		Base
Agriculture	**Under 10**	1	14%	4	57%	1	14%					1	14%			7
	Oct-49	6	55%	2	18%	8	73%	1	9%			2	18%	2	18%	11
	50-200	10	67%	6	40%	6	40%	1	7%			1	7%			15
	Over 200	5	83%			3	50%	1	17%					1	17%	6
Construction	**Under 10**	2	22%	8	89%					1	11%			1	11%	9
	Oct-49	8	50%	6	38%	13	81%	1	6%	2	13%			1	6%	16
	50-200	5	83%	2	33%	6	100%	3	50%							6
	Over 200	14	100%	3	21%	10	71%	1	7%					1	7%	14
Ext./Util./Trans	**Oct-49**	12	48%	15	60%	9	36%	5	20%	1	4%			2	8%	25
	50-200	45	76%	19	32%	21	36%	10	17%	1	2%	6	10%	3	5%	59
	Over 200	25	100%	1	4%	11	44%	6	24%	2	8%	3	12%	1	4%	25
Manufacturing	**Under 10**	1	17%	5	83%									1	17%	6
	Oct-49	61	59%	52	50%	45	44%	28	27%	13	13%	13	13%	8	8%	103
	50-200	130	74%	74	42%	94	54%	55	31%	17	10%	22	13%	21	12%	175
	Over 200	99	85%	35	30%	61	53%	52	45%	5	4%	16	14%	19	16%	116
Services	**Under 10**	9	18%	43	88%	11	22%	3	6%	1	2%	3	6%			49
	Oct-49	44	48%	57	63%	30	33%	14	15%	4	4%	6	7%	5	5%	91
	50-200	71	68%	39	37%	49	47%	28	27%	8	8%	8	8%	12	11%	105
	Over 200	87	78%	30	27%	58	52%	32	29%	8	7%	17	15%	15	14%	111
Higher Risk	**Under 10**	4	18%	17	77%	1	5%			1	5%	1	5%	2	9%	22
	Oct-49	87	56%	75	48%	75	48%	35	23%	16	10%	15	10%	13	8%	155
	50-200	190	75%	101	40%	127	50%	69	27%	18	7%	29	11%	24	9%	255
	Over 200	143	89%	39	24%	85	53%	60	37%	7	4%	19	12%	22	14%	161
Lower Risk	**Under 10**	9	18%	43	88%	11	22%	3	6%	1	2%	3	6%			49
	Oct-49	44	48%	57	63%	30	33%	14	15%	4	4%	6	7%	5	5%	91
	50-200	71	68%	39	37%	49	47%	28	27%	8	8%	8	8%	12	11%	105
	Over 200	87	78%	30	27%	58	52%	32	29%	8	7%	17	15%	15	14%	111
Base		635	67%	401	42%	436	46%	241	25%	63	7%	98	10%	93	10%	949

Source : Metra Martech - 27/10/00

TABLE 5B-1 : MEMBERS OF INVESTIGATING TEAM FOR LOST TIME ACCIDENTS

		Line Management		Senior Management		HSO		Safety Rep or Committee		External Experts		Medical Experts		Other		Base
Risk	**Higher**	586	72%	498	61%	470	58%	252	31%	123	15%	153	19%	126	16%	810
	Lower	274	61%	305	68%	191	43%	110	25%	50	11%	93	21%	56	13%	448
Employees	**Under 10**	14	15%	87	94%	12	13%	3	3%	11	12%	19	20%	5	5%	93
	Oct-49	164	52%	239	76%	123	39%	65	21%	49	16%	55	17%	36	11%	315
	50-200	355	75%	299	63%	267	56%	148	31%	70	15%	82	17%	61	13%	473
	Over 200	327	87%	178	47%	259	69%	146	39%	43	11%	90	24%	80	21%	377
Sector	**Agriculture**	31	51%	38	62%	29	48%	7	11%			6	10%	6	10%	61
	Construction	50	61%	63	77%	55	67%	18	22%	14	17%	13	16%	17	21%	82
	Mining	21	78%	13	48%	17	63%	8	30%	5	19%	7	26%	3	11%	27
	Transport	68	72%	65	69%	45	48%	27	29%	19	20%	18	19%	15	16%	94
	Utilities	16	70%	10	43%	15	65%	3	13%	1	4%	3	13%	1	4%	23
	Pet. & Chem.	107	88%	84	69%	69	57%	50	41%	15	12%	24	20%	26	21%	122
	Metals etc	51	61%	34	41%	42	51%	37	45%	19	23%	16	19%			83
	Food	65	88%	30	41%	65	88%	28	38%	10	14%	6	8%	31	42%	74
	Textiles etc	81	73%	69	62%	53	48%	30	27%	10	9%	24	22%	8	7%	111
	Machinery etc	86	72%	84	70%	78	65%	43	36%	27	23%	34	28%	19	16%	120
	Repair	10	77%	8	62%	2	15%	1	8%	3	23%	2	15%			13
	Wholsale	49	56%	52	60%	49	56%	41	47%	15	17%	23	26%	5	6%	87
	Retail	67	86%	56	72%	36	46%	12	15%	12	15%	10	13%	19	24%	78
	Hotels etc	26	43%	51	85%	17	28%	6	10%	7	12%	21	35%	9	15%	60
	Finance etc	42	58%	35	49%	26	36%	31	43%	6	8%	7	10%	7	10%	72
	Services	49	66%	49	66%	37	50%	11	15%	7	9%	12	16%	10	14%	74
	Health etc	41	53%	62	81%	26	34%	9	12%	3	4%	20	26%	6	8%	77
Group	**Agriculture**	31	51%	38	62%	29	48%	7	11%			6	10%	6	10%	61
	Construction	50	61%	63	77%	55	67%	18	22%	14	17%	13	16%	17	21%	82
	Ext./Util./Trans	105	73%	88	61%	77	53%	38	26%	25	17%	28	19%	19	13%	144
	Manufacturing	400	76%	309	59%	309	59%	189	36%	84	16%	106	20%	84	16%	523
	Services	274	61%	305	68%	191	43%	110	25%	50	11%	93	21%	56	13%	448
Base		860	68%	803	64%	661	53%	362	29%	173	14%	246	20%	182	14%	1,258

Source : Metra Martech - 27/10/00

TABLE 5B-2 : MEMBERS OF INVESTIGATING TEAM FOR LOST TIME ACCIDENTS BY SIZE

		Line Management		Senior Management		HSO		Safety Rep or Committee		External Experts		Medical Experts		Other		Base
Agriculture	**Under 10**	1	5%	17	85%	2	10%					1	5%	2	10%	20
	Oct-49	10	71%	8	57%	12	86%	1	7%			2	14%	2	14%	14
	50-200	16	73%	12	55%	12	55%	4	18%			3	14%	2	9%	22
	Over 200	4	80%	1	20%	3	60%	2	40%							5
Construction	**Under 10**	3	19%	16	100%	1	6%			6	38%	2	13%	2	13%	16
	Oct-49	14	61%	17	74%	20	87%	3	13%	5	22%	1	4%	7	30%	23
	50-200	13	59%	11	50%	14	64%	11	50%	1	5%			4	18%	22
	Over 200	20	95%	19	90%	20	95%	4	19%	2	10%	10	48%	4	19%	21
Ext./Util./Trans	**Oct-49**	16	44%	27	75%	12	33%	5	14%	5	14%	3	8%	7	19%	36
	50-200	56	76%	48	65%	42	57%	18	24%	15	20%	18	24%	9	12%	74
	Over 200	33	97%	13	38%	23	68%	15	44%	5	15%	7	21%	3	9%	34
Manufacturing	**Oct-49**	81	59%	94	68%	55	40%	40	29%	29	21%	25	18%	12	9%	138
	50-200	178	79%	142	63%	139	62%	78	35%	36	16%	46	21%	30	13%	224
	Over 200	141	88%	73	45%	115	71%	71	44%	19	12%	35	22%	42	26%	161
Services	**Under 10**	14	20%	63	91%	12	17%	5	7%	6	9%	18	26%	2	3%	69
	Oct-49	64	51%	103	82%	37	29%	20	16%	13	10%	24	19%	12	10%	126
	50-200	85	69%	79	64%	65	52%	40	32%	18	15%	20	16%	16	13%	124
	Over 200	111	86%	60	47%	77	60%	45	35%	13	10%	31	24%	26	20%	129
Higher Risk	**Under 10**	4	11%	33	92%	3	8%			6	17%	3	8%	4	11%	36
	Oct-49	121	57%	146	69%	99	47%	49	23%	39	18%	31	15%	28	13%	211
	50-200	263	77%	213	62%	207	61%	111	32%	52	15%	67	20%	45	13%	342
	Over 200	198	90%	106	48%	161	73%	92	42%	26	12%	52	24%	49	22%	221
Lower Risk	**Under 10**	14	20%	63	91%	12	17%	5	7%	6	9%	18	26%	2	3%	69
	Oct-49	64	51%	103	82%	37	29%	20	16%	13	10%	24	19%	12	10%	126
	50-200	85	69%	79	64%	65	52%	40	32%	18	15%	20	16%	16	13%	124
	Over 200	111	86%	60	47%	77	60%	45	35%	13	10%	31	24%	26	20%	129
Base		860	68%	803	64%	661	53%	362	29%	173	14%	246	20%	182	14%	1,258

Source : Metra Martech - 27/10/00

TABLE 5C-1 : MEMBERS OF INVESTIGATING TEAM FOR INCIDENTS ON WORK RELATED ILL HEALTH

		Line Management		Senior Management		HSO		Safety Rep or Committee		External Experts		Medical Experts		Other		Base
Risk	**Higher**	531	68%	496	63%	434	55%	237	30%	156	20%	241	31%	141	18%	782
	Lower	253	57%	319	72%	177	40%	104	23%	91	20%	161	36%	77	17%	445
Employees	**Under 10**	13	14%	91	95%	12	13%	2	2%	14	15%	30	31%	10	10%	96
	Oct-49	161	49%	254	77%	116	35%	68	21%	83	25%	105	32%	55	17%	328
	50-200	309	71%	285	65%	233	53%	130	30%	89	20%	127	29%	67	15%	438
	Over 200	301	82%	185	51%	250	68%	141	39%	61	17%	140	38%	86	24%	365
Sector	**Agriculture**	21	38%	35	64%	22	40%	3	5%			17	31%	6	11%	55
	Construction	48	56%	67	79%	49	58%	21	25%	24	28%	27	32%	23	27%	85
	Mining	18	72%	16	64%	22	88%	9	36%	7	28%	9	36%	5	20%	25
	Transport	61	68%	61	68%	38	42%	22	24%	23	26%	20	22%	14	16%	90
	Utilities	8	40%	6	30%	10	50%	2	10%			10	50%	4	20%	20
	Pet. & Chem.	101	86%	78	66%	68	58%	47	40%	14	12%	46	39%	21	18%	118
	Metals etc	43	59%	31	42%	35	48%	34	47%	17	23%	14	19%			73
	Food	71	83%	42	49%	70	81%	30	35%	21	24%	25	29%	40	47%	86
	Textiles etc	70	67%	71	68%	45	43%	25	24%	14	13%	34	33%	9	9%	104
	Machinery etc	81	71%	81	71%	73	64%	43	38%	34	30%	36	32%	19	17%	114
	Repair	9	75%	8	67%	2	17%	1	8%	2	17%	3	25%			12
	Wholsale	45	50%	54	60%	51	57%	43	48%	30	33%	51	57%	5	6%	90
	Retail	64	77%	66	80%	34	41%	11	13%	17	20%	22	27%	26	31%	83
	Hotels etc	28	44%	54	86%	18	29%	4	6%	7	11%	29	46%	15	24%	63
	Finance etc	35	55%	39	61%	21	33%	25	39%	11	17%	11	17%	10	16%	64
	Services	40	56%	49	69%	31	44%	13	18%	13	18%	18	25%	11	15%	71
	Health etc	41	55%	57	77%	22	30%	8	11%	13	18%	30	41%	10	14%	74
Group	**Agriculture**	21	38%	35	64%	22	40%	3	5%			17	31%	6	11%	55
	Construction	48	56%	67	79%	49	58%	21	25%	24	28%	27	32%	23	27%	85
	Ext./Util./Trans	87	64%	83	61%	70	52%	33	24%	30	22%	39	29%	23	17%	135
	Manufacturing	375	74%	311	61%	293	58%	180	36%	102	20%	158	31%	89	18%	507
	Services	253	57%	319	72%	177	40%	104	23%	91	20%	161	36%	77	17%	445
Base		784	64%	815	66%	611	50%	341	28%	247	20%	402	33%	218	18%	1,227

Source : Metra Martech - 27/10/00

TABLE 5C-2 : MEMBERS OF INVESTIGATING TEAM FOR INCIDENTS ON WORK RELATED ILL HEALTH BY SIZE

		Line Management		Senior Management		HSO		Safety Rep or Committee		External Experts		Medical Experts		Other		Base
Agriculture	**Under 10**			17	89%	2	11%					2	11%	2	11%	19
	Oct-49	7	58%	6	50%	10	83%					6	50%	1	8%	12
	50-200	10	50%	10	50%	7	35%	3	15%			7	35%	3	15%	20
	Over 200	4	100%	2	50%	3	75%					2	50%			4
Construction	**Under 10**	3	17%	18	100%					7	39%	6	33%	2	11%	18
	Oct-49	12	50%	18	75%	16	67%	4	17%	10	42%	5	21%	11	46%	24
	50-200	12	57%	11	52%	12	57%	11	52%	2	10%	3	14%	4	19%	21
	Over 200	21	95%	20	91%	21	95%	6	27%	5	23%	13	59%	6	27%	22
Ext./Util./Trans	**Oct-49**	15	44%	25	74%	12	35%	6	18%	6	18%	5	15%	9	26%	34
	50-200	46	67%	43	62%	35	51%	13	19%	16	23%	21	30%	9	13%	69
	Over 200	26	81%	15	47%	23	72%	14	44%	8	25%	13	41%	5	16%	32
Manufacturing	**Oct-49**	78	55%	103	73%	50	35%	39	27%	39	27%	45	32%	17	12%	142
	50-200	161	76%	140	66%	132	63%	71	34%	41	19%	60	28%	33	16%	211
	Over 200	136	88%	68	44%	111	72%	70	45%	22	14%	53	34%	39	25%	154
Services	**Under 10**	12	17%	64	90%	12	17%	4	6%	10	14%	23	32%	7	10%	71
	Oct-49	66	50%	111	83%	39	29%	22	17%	32	24%	52	39%	20	15%	133
	50-200	81	69%	78	67%	55	47%	37	32%	29	25%	40	34%	21	18%	117
	Over 200	94	76%	66	53%	71	57%	41	33%	20	16%	46	37%	29	23%	124
Higher Risk	**Under 10**	3	8%	35	95%	2	5%			7	19%	8	22%	4	11%	37
	Oct-49	112	53%	152	72%	88	42%	49	23%	55	26%	61	29%	38	18%	212
	50-200	229	71%	204	64%	186	58%	98	31%	59	18%	91	28%	49	15%	321
	Over 200	187	88%	105	50%	158	75%	90	42%	35	17%	81	38%	50	24%	212
Lower Risk	**Under 10**	12	17%	64	90%	12	17%	4	6%	10	14%	23	32%	7	10%	71
	Oct-49	66	50%	111	83%	39	29%	22	17%	32	24%	52	39%	20	15%	133
	50-200	81	69%	78	67%	55	47%	37	32%	29	25%	40	34%	21	18%	117
	Over 200	94	76%	66	53%	71	57%	41	33%	20	16%	46	37%	29	23%	124
Base		784	64%	815	66%	611	50%	341	28%	247	20%	402	33%	218	18%	1,227

Source : Metra Martech - 27/10/00

TABLE 5D-1 : MEMBERS OF INVESTIGATING TEAM FOR VERY SERIOUS OR FATAL ACCIDENTS

		Line Management		Senior Management		HSO		Safety Rep or Committee		External Experts		Medical Experts		Other		Base
Risk	**Higher**	546	68%	604	76%	487	61%	271	34%	288	36%	316	40%	242	30%	800
	Lower	255	54%	396	84%	210	44%	122	26%	214	45%	242	51%	148	31%	473
Employees	**Under 10**	12	10%	108	93%	12	10%	3	3%	38	33%	50	43%	34	29%	116
	Oct-49	171	50%	293	85%	132	38%	72	21%	168	49%	172	50%	108	31%	345
	50-200	317	71%	351	79%	272	61%	152	34%	169	38%	169	38%	127	29%	444
	Over 200	301	82%	248	67%	281	76%	166	45%	127	35%	167	45%	121	33%	368
Sector	**Agriculture**	22	42%	44	85%	27	52%	4	8%	10	19%	16	31%	20	38%	52
	Construction	52	55%	84	88%	52	55%	27	28%	35	37%	50	53%	37	39%	95
	Mining	18	69%	19	73%	24	92%	10	38%	12	46%	12	46%	10	38%	26
	Transport	63	67%	77	82%	45	48%	29	31%	39	41%	29	31%	32	34%	94
	Utilities	9	50%	14	78%	14	78%	4	22%	3	17%	6	33%	4	22%	18
	Pet. & Chem.	106	88%	104	87%	79	66%	56	47%	47	39%	61	51%	45	38%	120
	Metals etc	43	58%	32	43%	38	51%	35	47%	17	23%	14	19%			74
	Food	73	83%	48	55%	70	80%	30	34%	30	34%	31	35%	44	50%	88
	Textiles etc	71	67%	80	75%	60	57%	29	27%	40	38%	52	49%	16	15%	106
	Machinery etc	82	71%	93	80%	75	65%	45	39%	48	41%	39	34%	34	29%	116
	Repair	7	64%	9	82%	3	27%	2	18%	7	64%	6	55%			11
	Wholsale	43	48%	61	69%	52	58%	44	49%	36	40%	55	62%	6	7%	89
	Retail	69	67%	91	88%	42	41%	14	14%	41	40%	40	39%	42	41%	103
	Hotels etc	29	46%	60	95%	24	38%	10	16%	43	68%	50	79%	32	51%	63
	Finance etc	33	49%	52	76%	25	37%	28	41%	23	34%	11	16%	17	25%	68
	Services	39	52%	62	83%	35	47%	12	16%	24	32%	29	39%	24	32%	75
	Health etc	42	56%	70	93%	32	43%	14	19%	47	63%	57	76%	27	36%	75
Group	**Agriculture**	22	42%	44	85%	27	52%	4	8%	10	19%	16	31%	20	38%	52
	Construction	52	55%	84	88%	52	55%	27	28%	35	37%	50	53%	37	39%	95
	Ext./Util./Trans	90	65%	110	80%	83	60%	43	31%	54	39%	47	34%	46	33%	138
	Manufacturing	382	74%	366	71%	325	63%	197	38%	189	37%	203	39%	139	27%	515
	Services	255	54%	396	84%	210	44%	122	26%	214	45%	242	51%	148	31%	473
Base		801	63%	1,000	79%	697	55%	393	31%	502	39%	558	44%	390	31%	1,273

Source : Metra Martech - 27/10/00

TABLE 5D-2 : MEMBERS OF INVESTIGATING TEAM FOR VERY SERIOUS OR FATAL ACCIDENTS BY SIZE

		Line Management		Senior Management		HSO		Safety Rep or Committee		External Experts		Medical Experts		Other		Base
Agriculture	**Under 10**			16	84%	2	11%	1	5%			2	11%	6	32%	19
	Oct-49	8	73%	10	91%	10	91%	1	9%	3	27%	5	45%	5	45%	11
	50-200	9	53%	15	88%	11	65%	2	12%	5	29%	7	41%	8	47%	17
	Over 200	5	100%	3	60%	4	80%			2	40%	2	40%	1	20%	5
Construction	**Under 10**	3	12%	25	100%	2	8%			10	40%	13	52%	7	28%	25
	Oct-49	15	54%	25	89%	17	61%	6	21%	14	50%	13	46%	15	54%	28
	50-200	13	65%	13	65%	12	60%	12	60%	2	10%	7	35%	7	35%	20
	Over 200	21	95%	21	95%	21	95%	9	41%	9	41%	17	77%	8	36%	22
Ext./Util./Trans	**Oct-49**	16	43%	31	84%	13	35%	6	16%	8	22%	7	19%	14	38%	37
	50-200	46	67%	58	84%	45	65%	21	30%	33	48%	26	38%	20	29%	69
	Over 200	28	88%	21	66%	25	78%	16	50%	13	41%	14	44%	12	38%	32
Manufacturing	**Oct-49**	84	57%	114	78%	59	40%	39	27%	71	48%	67	46%	31	21%	147
	50-200	161	76%	162	76%	148	70%	83	39%	79	37%	78	37%	53	25%	212
	Over 200	137	88%	90	58%	118	76%	75	48%	39	25%	58	37%	55	35%	156
Services	**Under 10**	11	13%	78	91%	12	14%	4	5%	38	44%	43	50%	25	29%	86
	Oct-49	69	49%	126	90%	45	32%	26	19%	72	51%	82	59%	48	34%	140
	50-200	80	67%	96	81%	62	52%	38	32%	50	42%	53	45%	35	29%	119
	Over 200	95	74%	96	75%	91	71%	54	42%	54	42%	64	50%	40	31%	128
Higher Risk	**Under 10**	3	7%	41	93%	4	9%	1	2%	10	23%	15	34%	13	30%	44
	Oct-49	123	55%	180	81%	99	44%	52	23%	96	43%	92	41%	65	29%	223
	50-200	229	72%	248	78%	216	68%	118	37%	119	37%	118	37%	88	28%	318
	Over 200	191	89%	135	63%	168	78%	100	47%	63	29%	91	42%	76	35%	215
Lower Risk	**Under 10**	11	13%	78	91%	12	14%	4	5%	38	44%	43	50%	25	29%	86
	Oct-49	69	49%	126	90%	45	32%	26	19%	72	51%	82	59%	48	34%	140
	50-200	80	67%	96	81%	62	52%	38	32%	50	42%	53	45%	35	29%	119
	Over 200	95	74%	96	75%	91	71%	54	42%	54	42%	64	50%	40	31%	128
Base		801	63%	1,000	79%	697	55%	393	31%	502	39%	558	44%	390	31%	1,273

Source : Metra Martech - 27/10/00

TABLE 5E-1 : MEMBERS OF INVESTIGATING TEAM FOR ACCIDENTS TO CONTRACTORS' EMPLOYEES

		Line Management		Senior Management		HSO		Safety Rep or Committee		External Experts		Medical Experts		Other		Base
Risk	**Higher**	493	68%	442	61%	408	56%	224	31%	114	16%	89	12%	164	23%	727
	Lower	217	52%	289	70%	174	42%	93	22%	96	23%	89	21%	77	19%	414
Employees	**Under 10**	9	11%	78	95%	11	13%	4	5%	10	12%	16	20%	10	12%	82
	Oct-49	131	45%	208	72%	106	37%	60	21%	72	25%	47	16%	45	16%	289
	50-200	287	68%	272	65%	227	54%	119	28%	66	16%	52	12%	84	20%	419
	Over 200	283	81%	173	49%	238	68%	134	38%	62	18%	63	18%	102	29%	351
Sector	**Agriculture**	22	43%	35	69%	23	45%	4	8%	3	6%	3	6%	10	20%	51
	Construction	50	61%	68	83%	47	57%	20	24%	19	23%	9	11%	28	34%	82
	Mining	16	67%	12	50%	18	75%	9	38%	5	21%	5	21%	5	21%	24
	Transport	57	68%	56	67%	34	40%	21	25%	17	20%	10	12%	12	14%	84
	Utilities	12	60%	7	35%	12	60%	2	10%			3	15%	11	55%	20
	Pet. & Chem.	105	88%	69	58%	68	57%	48	40%	7	6%	12	10%	32	27%	120
	Metals etc	44	59%	32	43%	38	51%	35	47%	17	23%	14	19%			74
	Food	44	94%	22	47%	43	91%	23	49%	10	21%	1	2%	22	47%	47
	Textiles etc	62	62%	62	62%	50	50%	24	24%	9	9%	15	15%	14	14%	100
	Machinery etc	75	66%	70	61%	72	63%	38	33%	25	22%	17	15%	30	26%	114
	Repair	6	55%	9	82%	3	27%			2	18%					11
	Wholsale	44	49%	55	62%	51	57%	43	48%	46	52%	43	48%	10	11%	89
	Retail	58	75%	59	77%	32	42%	6	8%	13	17%	3	4%	21	27%	77
	Hotels etc	22	47%	37	79%	16	34%	3	6%	8	17%	14	30%	3	6%	47
	Finance etc	25	40%	37	59%	22	35%	29	46%	13	21%	5	8%	17	27%	63
	Services	38	55%	46	67%	34	49%	7	10%	10	14%	10	14%	18	26%	69
	Health etc	30	43%	55	80%	19	28%	5	7%	6	9%	14	20%	8	12%	69
Group	**Agriculture**	22	43%	35	69%	23	45%	4	8%	3	6%	3	6%	10	20%	51
	Construction	50	61%	68	83%	47	57%	20	24%	19	23%	9	11%	28	34%	82
	Ext./Util./Trans	85	66%	75	59%	64	50%	32	25%	22	17%	18	14%	28	22%	128
	Manufacturing	336	72%	264	57%	274	59%	168	36%	70	15%	59	13%	98	21%	466
	Services	217	52%	289	70%	174	42%	93	22%	96	23%	89	21%	77	19%	414
Base		710	62%	731	64%	582	51%	317	28%	210	18%	178	16%	241	21%	1,141

Source : Metra Martech - 27/10/00

TABLE 5E-2 : MEMBERS OF INVESTIGATING TEAM FOR ACCIDENTS TO CONTRACTORS' EMPLOYEES BY SIZE

		Line Management		Senior Management		HSO		Safety Rep or Committee		External Experts		Medical Experts		Other		Base
Agriculture	Under 10			18	95%	2	11%	1	5%					3	16%	19
	Oct-49	8	73%	7	64%	10	91%	1	9%			1	9%	1	9%	11
	50-200	8	53%	8	53%	8	53%	1	7%	1	7%	1	7%	5	33%	15
	Over 200	6	100%	2	33%	3	50%	1	17%	2	33%	1	17%	1	17%	6
Construction	Under 10	3	19%	16	100%					3	19%			3	19%	16
	Oct-49	13	54%	21	88%	15	63%	4	17%	10	42%			12	50%	24
	50-200	13	65%	12	60%	11	55%	11	55%			1	5%	5	25%	20
	Over 200	21	95%	19	86%	21	95%	5	23%	6	27%	8	36%	8	36%	22
Ext./Util./Trans	Oct-49	12	39%	21	68%	9	29%	4	13%	5	16%	2	6%	6	19%	31
	50-200	48	71%	41	60%	36	53%	15	22%	12	18%	9	13%	17	25%	68
	Over 200	25	86%	13	45%	19	66%	13	45%	5	17%	7	24%	5	17%	29
Manufacturing	Oct-49	61	50%	75	61%	49	40%	33	27%	26	21%	14	11%	14	11%	122
	50-200	150	74%	130	64%	126	62%	67	33%	29	14%	24	12%	46	23%	202
	Over 200	125	88%	59	42%	99	70%	68	48%	15	11%	21	15%	38	27%	142
Services	Under 10	8	14%	52	88%	11	19%	5	8%	11	19%	17	29%	6	10%	59
	Oct-49	50	43%	91	78%	35	30%	21	18%	32	27%	30	26%	13	11%	117
	50-200	70	63%	79	71%	54	48%	30	27%	26	23%	24	21%	19	17%	112
	Over 200	89	71%	67	53%	74	59%	37	29%	27	21%	18	14%	39	31%	126
Higher Risk	Under 10	3	9%	34	97%	2	6%	1	3%	3	9%			6	17%	35
	Oct-49	94	50%	124	66%	83	44%	42	22%	41	22%	17	9%	33	18%	188
	50-200	219	72%	191	63%	181	59%	94	31%	42	14%	35	11%	73	24%	305
	Over 200	177	89%	93	47%	142	71%	87	44%	28	14%	37	19%	52	26%	199
Lower Risk	Under 10	8	14%	52	88%	11	19%	5	8%	11	19%	17	29%	6	10%	59
	Oct-49	50	43%	91	78%	35	30%	21	18%	32	27%	30	26%	13	11%	117
	50-200	70	63%	79	71%	54	48%	30	27%	26	23%	24	21%	19	17%	112
	Over 200	89	71%	67	53%	74	59%	37	29%	27	21%	18	14%	39	31%	126
Base		710	62%	731	64%	582	51%	317	28%	210	18%	178	16%	241	21%	1,141

Source : Metra Martech - 27/10/00

TABLE 5F-1 : MEMBERS OF INVESTIGATING TEAM FOR ACCIDENTS TO MEMBERS OF THE PUBLIC

		Line Management		Senior Management		HSO		Safety Rep or Committee		External Experts		Medical Experts		Other		Base
Risk	**Higher**	432	65%	430	65%	363	55%	207	31%	99	15%	103	15%	129	19%	666
	Lower	233	53%	334	75%	180	41%	100	23%	114	26%	115	26%	82	19%	443
Employees	**Under 10**	10	10%	90	94%	12	13%	4	4%	17	18%	22	23%	20	21%	96
	Oct-49	126	44%	225	78%	103	36%	57	20%	65	23%	63	22%	44	15%	287
	50-200	270	66%	279	68%	215	53%	121	30%	69	17%	64	16%	83	20%	408
	Over 200	259	81%	170	53%	213	67%	125	39%	62	19%	69	22%	64	20%	318
Sector	**Agriculture**	18	35%	38	73%	23	44%	4	8%	3	6%	5	10%	13	25%	52
	Construction	41	62%	57	86%	40	61%	16	24%	11	17%	11	17%	19	29%	66
	Mining	15	68%	14	64%	19	86%	9	41%	5	23%	6	27%	3	14%	22
	Transport	55	66%	59	71%	35	42%	23	28%	21	25%	11	13%	16	19%	83
	Utilities	12	63%	8	42%	14	74%	3	16%			4	21%	3	16%	19
	Pet. & Chem.	103	87%	72	61%	67	56%	47	39%	10	8%	13	11%	31	26%	119
	Metals etc	44	59%	33	45%	38	51%	36	49%	18	24%	15	20%			74
	Food	15	94%	11	69%	14	88%	11	69%	1	6%			6	38%	16
	Textiles etc	53	55%	64	66%	45	46%	22	23%	8	8%	20	21%	14	14%	97
	Machinery etc	69	65%	65	61%	66	62%	34	32%	20	19%	18	17%	24	23%	106
	Repair	7	58%	9	75%	2	17%	2	17%	2	17%					12
	Wholsale	43	51%	54	64%	47	55%	39	46%	36	42%	39	46%	6	7%	85
	Retail	63	72%	69	79%	37	43%	6	7%	23	26%	8	9%	26	30%	87
	Hotels etc	27	44%	56	92%	18	30%	6	10%	18	30%	30	49%	16	26%	61
	Finance etc	28	44%	39	62%	21	33%	31	49%	16	25%	5	8%	6	10%	63
	Services	36	49%	52	71%	33	45%	8	11%	16	22%	13	18%	19	26%	73
	Health etc	36	49%	64	86%	24	32%	10	14%	5	7%	20	27%	9	12%	74
Group	**Agriculture**	18	35%	38	73%	23	44%	4	8%	3	6%	5	10%	13	25%	52
	Construction	41	62%	57	86%	40	61%	16	24%	11	17%	11	17%	19	29%	66
	Ext./Util./Trans	82	66%	81	65%	68	55%	35	28%	26	21%	21	17%	22	18%	124
	Manufacturing	291	69%	254	60%	232	55%	152	36%	59	14%	66	16%	75	18%	424
	Services	233	53%	334	75%	180	41%	100	23%	114	26%	115	26%	82	19%	443
Base		665	60%	764	69%	543	49%	307	28%	213	19%	218	20%	211	19%	1,109

Source : Metra Martech - 27/10/00

TABLE 5F-2 : MEMBERS OF INVESTIGATING TEAM FOR ACCIDENTS TO MEMBERS OF THE PUBLIC BY SIZE

		Line Management		Senior Management		HSO		Safety Rep or Committee		External Experts		Medical Experts		Other		Base
Agriculture	**Under 10**			18	95%	3	16%	1	5%					4	21%	19
	Oct-49	7	64%	9	82%	8	73%	1	9%	1	9%	1	9%	4	36%	11
	50-200	8	47%	9	53%	8	47%	2	12%	1	6%	4	24%	5	29%	17
	Over 200	3	60%	2	40%	4	80%			1	20%					5
Construction	**Under 10**	3	21%	14	100%					2	14%			3	21%	14
	Oct-49	8	53%	13	87%	12	80%	3	20%	5	33%	2	13%	6	40%	15
	50-200	11	65%	11	65%	9	53%	9	53%			1	6%	4	24%	17
	Over 200	19	95%	19	95%	19	95%	4	20%	4	20%	8	40%	6	30%	20
Ext./Util./Trans	**Oct-49**	11	37%	21	70%	9	30%	4	13%	5	17%	2	7%	4	13%	30
	50-200	47	69%	47	69%	41	60%	17	25%	16	24%	12	18%	15	22%	68
	Over 200	24	92%	13	50%	18	69%	14	54%	5	19%	7	27%	3	12%	26
Manufacturing	**Oct-49**	56	47%	79	66%	49	41%	34	29%	22	18%	20	17%	11	9%	119
	50-200	128	70%	122	66%	105	57%	61	33%	23	13%	24	13%	38	21%	184
	Over 200	107	88%	53	44%	78	64%	57	47%	14	12%	22	18%	26	21%	121
Services	**Under 10**	9	12%	67	89%	11	15%	5	7%	19	25%	23	31%	16	21%	75
	Oct-49	58	45%	111	87%	37	29%	19	15%	34	27%	39	30%	21	16%	128
	50-200	73	62%	86	74%	57	49%	34	29%	29	25%	30	26%	21	18%	117
	Over 200	93	76%	70	57%	75	61%	42	34%	32	26%	23	19%	24	20%	123
Higher Risk	**Under 10**	3	9%	32	97%	3	9%	1	3%	2	6%			7	21%	33
	Oct-49	82	47%	122	70%	78	45%	42	24%	33	19%	25	14%	25	14%	175
	50-200	194	68%	189	66%	163	57%	89	31%	40	14%	41	14%	62	22%	286
	Over 200	153	89%	87	51%	119	69%	75	44%	24	14%	37	22%	35	20%	172
Lower Risk	**Under 10**	9	12%	67	89%	11	15%	5	7%	19	25%	23	31%	16	21%	75
	Oct-49	58	45%	111	87%	37	29%	19	15%	34	27%	39	30%	21	16%	128
	50-200	73	62%	86	74%	57	49%	34	29%	29	25%	30	26%	21	18%	117
	Over 200	93	76%	70	57%	75	61%	42	34%	32	26%	23	19%	24	20%	123
Base		665	60%	764	69%	543	49%	307	28%	213	19%	218	20%	211	19%	1,109

Source : Metra Martech - 27/10/00

TABLE 5G-1 : MEMBERS OF INVESTIGATING TEAM FOR INCIDENTS OF VIOLENCE TO EMPLOYEES

		Line Management		Senior Management		HSO		Safety Rep or Committee		External Experts		Medical Experts		Other		Base
Risk	**Higher**	435	66%	438	66%	349	53%	193	29%	121	18%	94	14%	146	22%	663
	Lower	225	56%	318	79%	148	37%	76	19%	120	30%	69	17%	137	34%	404
Employees	**Under 10**	10	11%	86	93%	10	11%	2	2%	24	26%	17	18%	25	27%	92
	Oct-49	127	47%	213	79%	95	35%	49	18%	74	27%	44	16%	66	24%	270
	50-200	271	69%	279	71%	192	49%	102	26%	72	18%	44	11%	109	28%	391
	Over 200	252	80%	178	57%	200	64%	116	37%	71	23%	58	18%	83	26%	314
Sector	**Agriculture**	20	38%	39	74%	22	42%	2	4%	2	4%	4	8%	19	36%	53
	Construction	37	58%	55	86%	39	61%	15	23%	9	14%	8	13%	15	23%	64
	Mining	18	72%	17	68%	18	72%	6	24%	5	20%	6	24%	5	20%	25
	Transport	54	66%	58	71%	31	38%	22	27%	20	24%	11	13%	14	17%	82
	Utilities	12	60%	8	40%	15	75%	3	15%	1	5%	4	20%	9	45%	20
	Pet. & Chem.	103	87%	74	62%	63	53%	45	38%	13	11%	10	8%	38	32%	119
	Metals etc	44	59%	32	43%	38	51%	35	47%	17	23%	14	19%			74
	Food	14	93%	10	67%	14	93%	11	73%	1	7%			6	40%	15
	Textiles etc	57	59%	67	69%	46	47%	21	22%	26	27%	21	22%	17	18%	97
	Machinery etc	71	67%	71	67%	61	58%	33	31%	22	21%	16	15%	23	22%	106
	Repair	5	63%	7	88%	2	25%			5	63%					8
	Wholsale	27	54%	28	56%	28	56%	20	40%	3	6%	4	8%	8	16%	50
	Retail	61	74%	66	80%	32	39%	7	9%	28	34%	4	5%	28	34%	82
	Hotels etc	30	48%	57	90%	20	32%	8	13%	26	41%	33	52%	31	49%	63
	Finance etc	29	47%	41	66%	17	27%	27	44%	15	24%	6	10%	12	19%	62
	Services	40	53%	59	79%	32	43%	7	9%	8	11%	9	12%	36	48%	75
	Health etc	38	53%	67	93%	19	26%	7	10%	40	56%	13	18%	22	31%	72
Group	**Agriculture**	20	38%	39	74%	22	42%	2	4%	2	4%	4	8%	19	36%	53
	Construction	37	58%	55	86%	39	61%	15	23%	9	14%	8	13%	15	23%	64
	Ext./Util./Trans	84	66%	83	65%	64	50%	31	24%	26	20%	21	17%	28	22%	127
	Manufacturing	294	70%	261	62%	224	53%	145	35%	84	20%	61	15%	84	20%	419
	Services	225	56%	318	79%	148	37%	76	19%	120	30%	69	17%	137	34%	404
Base		660	62%	756	71%	497	47%	269	25%	241	23%	163	15%	283	27%	1,067

Source : Metra Martech - 27/10/00

TABLE 5G-2 : MEMBERS OF INVESTIGATING TEAM FOR INCIDENTS OF VIOLENCE TO EMPLOYEES BY SIZE

		Line Management		Senior Management		HSO		Safety Rep or Committee		External Experts		Medical Experts		Other		Base
Agriculture	**Under 10**			17	89%	1	5%			1	5%			5	26%	19
	Oct-49	7	64%	9	82%	9	82%					1	9%	5	45%	11
	50-200	9	53%	11	65%	8	47%	1	6%	1	6%	2	12%	9	53%	17
	Over 200	4	67%	2	33%	4	67%	1	17%			1	17%			6
Construction	**Under 10**	3	21%	14	100%	1	7%			2	14%			3	21%	14
	Oct-49	6	43%	12	86%	11	79%	3	21%	4	29%			4	29%	14
	50-200	10	59%	12	71%	9	53%	9	53%			1	6%	4	24%	17
	Over 200	18	95%	17	89%	18	95%	3	16%	3	16%	7	37%	4	21%	19
Ext./Util./Trans	**Oct-49**	11	38%	21	72%	10	34%	4	14%	6	21%	2	7%	6	21%	29
	50-200	48	68%	46	65%	36	51%	14	20%	14	20%	12	17%	17	24%	71
	Over 200	25	93%	16	59%	18	67%	13	48%	6	22%	7	26%	5	19%	27
Manufacturing	**Oct-49**	57	50%	81	71%	44	39%	31	27%	32	28%	16	14%	10	9%	114
	50-200	132	72%	125	68%	103	56%	58	32%	36	20%	26	14%	47	26%	184
	Over 200	105	87%	55	45%	77	64%	56	46%	16	13%	19	16%	27	22%	121
Services	**Under 10**	9	13%	63	89%	11	15%	4	6%	24	34%	18	25%	21	30%	71
	Oct-49	59	50%	101	86%	29	25%	13	11%	33	28%	24	21%	46	39%	117
	50-200	70	72%	76	78%	43	44%	21	22%	23	24%	9	9%	33	34%	97
	Over 200	87	73%	78	66%	65	55%	38	32%	40	34%	18	15%	37	31%	119
Higher Risk	**Under 10**	3	9%	31	94%	2	6%			3	9%			8	24%	33
	Oct-49	81	48%	123	73%	74	44%	38	23%	42	25%	19	11%	25	15%	168
	50-200	199	69%	194	67%	156	54%	82	28%	51	18%	41	14%	77	27%	289
	Over 200	152	88%	90	52%	117	68%	73	42%	25	14%	34	20%	36	21%	173
Lower Risk	**Under 10**	9	13%	63	89%	11	15%	4	6%	24	34%	18	25%	21	30%	71
	Oct-49	59	50%	101	86%	29	25%	13	11%	33	28%	24	21%	46	39%	117
	50-200	70	72%	76	78%	43	44%	21	22%	23	24%	9	9%	33	34%	97
	Over 200	87	73%	78	66%	65	55%	38	32%	40	34%	18	15%	37	31%	119
Base		660	62%	756	71%	497	47%	269	25%	241	23%	163	15%	283	27%	1,067

Source : Metra Martech - 27/10/00

TABLE 5H-1 : MEMBERS OF INVESTIGATING TEAM FOR NEAR MISSES WITH NO INJURY

		Line Management		Senior Management		HSO		Safety Rep or Committee		External Experts		Medical Experts		Other		Base
Risk	**Higher**	473	69%	401	58%	369	54%	191	28%	95	14%	55	8%	81	12%	687
	Lower	230	58%	294	74%	163	41%	87	22%	95	24%	35	9%	47	12%	397
Employees	**Under 10**	9	11%	74	94%	9	11%	1	1%	18	23%	11	14%	7	9%	79
	Oct-49	131	49%	204	76%	100	37%	46	17%	67	25%	21	8%	27	10%	269
	50-200	291	71%	265	64%	211	51%	110	27%	63	15%	23	6%	43	10%	411
	Over 200	272	84%	152	47%	212	65%	121	37%	42	13%	35	11%	51	16%	325
Sector	**Agriculture**	23	43%	34	63%	23	43%	4	7%	1	2%	2	4%	4	7%	54
	Construction	37	67%	46	84%	37	67%	6	11%	4	7%			4	7%	55
	Mining	18	69%	12	46%	19	73%	6	23%	4	15%	3	12%	4	15%	26
	Transport	57	66%	51	59%	33	38%	19	22%	10	11%	2	2%	12	14%	87
	Utilities	12	60%	8	40%	14	70%	4	20%	1	5%	1	5%	3	15%	20
	Pet. & Chem.	104	87%	69	58%	65	55%	49	41%	10	8%	11	9%	25	21%	119
	Metals etc	48	60%	35	44%	43	54%	38	48%	17	21%	12	15%			80
	Food	10	77%	2	15%	12	92%	4	31%					1	8%	13
	Textiles etc	74	70%	68	65%	51	49%	26	25%	23	22%	9	9%	7	7%	105
	Machinery etc	81	72%	64	57%	69	61%	34	30%	22	19%	13	12%	21	19%	113
	Repair	9	60%	12	80%	3	20%	1	7%	3	20%	2	13%			15
	Wholsale	43	61%	44	63%	42	60%	30	43%	17	24%	10	14%	3	4%	70
	Retail	54	82%	51	77%	30	45%	7	11%	12	18%	3	5%	11	17%	66
	Hotels etc	24	44%	47	87%	15	28%	5	9%	24	44%	8	15%	7	13%	54
	Finance etc	27	45%	40	67%	19	32%	26	43%	8	13%	2	3%	6	10%	60
	Services	41	58%	47	66%	34	48%	11	15%	8	11%	6	8%	9	13%	71
	Health etc	41	54%	65	86%	23	30%	8	11%	26	34%	6	8%	11	14%	76
Group	**Agriculture**	23	43%	34	63%	23	43%	4	7%	1	2%	2	4%	4	7%	54
	Construction	37	67%	46	84%	37	67%	6	11%	4	7%			4	7%	55
	Ext./Util./Trans	87	65%	71	53%	66	50%	29	22%	15	11%	6	5%	19	14%	133
	Manufacturing	326	73%	250	56%	243	55%	152	34%	75	17%	47	11%	54	12%	445
	Services	230	58%	294	74%	163	41%	87	22%	95	24%	35	9%	47	12%	397
Base		703	65%	695	64%	532	49%	278	26%	190	18%	90	8%	128	12%	1,084

Source : Metra Martech - 27/10/00

TABLE 5H-2 : MEMBERS OF INVESTIGATING TEAM FOR NEAR MISSES WITH NO INJURY BY SIZE

		Line Management		Senior Management		HSO		Safety Rep or Committee		External Experts		Medical Experts		Other		Base
Agriculture	**Under 10**			16	89%	1	6%					1	6%	3	17%	18
	Oct-49	6	55%	5	45%	10	91%	1	9%			1	9%			11
	50-200	11	58%	11	58%	10	53%	2	11%					1	5%	19
	Over 200	6	100%	2	33%	2	33%	1	17%	1	17%					6
Construction	**Under 10**	3	23%	13	100%	1	8%			3	23%			1	8%	13
	Oct-49	7	54%	9	69%	11	85%	1	8%	1	8%			1	8%	13
	50-200	7	88%	8	100%	5	63%	3	38%							8
	Over 200	20	95%	16	76%	20	95%	2	10%					2	10%	21
Ext./Util./Trans	**Oct-49**	12	38%	21	66%	12	38%	4	13%	6	19%	2	6%	7	22%	32
	50-200	47	66%	43	61%	39	55%	14	20%	6	8%	2	3%	9	13%	71
	Over 200	28	93%	7	23%	15	50%	11	37%	3	10%	2	7%	3	10%	30
Manufacturing	**Under 10**			1	100%											1
	Oct-49	69	55%	83	66%	53	42%	32	25%	30	24%	9	7%	9	7%	126
	50-200	143	75%	113	59%	107	56%	61	32%	32	17%	19	10%	25	13%	190
	Over 200	114	89%	53	41%	83	65%	59	46%	13	10%	19	15%	20	16%	128
Services	**Under 10**	7	13%	53	95%	9	16%	1	2%	18	32%	11	20%	4	7%	56
	Oct-49	56	51%	94	85%	28	25%	14	13%	32	29%	8	7%	12	11%	110
	50-200	76	67%	84	74%	53	47%	32	28%	24	21%	6	5%	12	11%	113
	Over 200	91	77%	63	53%	73	62%	40	34%	21	18%	10	8%	19	16%	118
Higher Risk	**Under 10**	3	9%	30	94%	2	6%			3	9%	1	3%	4	13%	32
	Oct-49	94	52%	118	65%	86	47%	38	21%	37	20%	12	7%	17	9%	182
	50-200	208	72%	175	61%	161	56%	80	28%	38	13%	21	7%	35	12%	288
	Over 200	168	91%	78	42%	120	65%	73	39%	17	9%	21	11%	25	14%	185
Lower Risk	**Under 10**	7	13%	53	95%	9	16%	1	2%	18	32%	11	20%	4	7%	56
	Oct-49	56	51%	94	85%	28	25%	14	13%	32	29%	8	7%	12	11%	110
	50-200	76	67%	84	74%	53	47%	32	28%	24	21%	6	5%	12	11%	113
	Over 200	91	77%	63	53%	73	62%	40	34%	21	18%	10	8%	19	16%	118
Base		703	65%	695	64%	532	49%	278	26%	190	18%	90	8%	128	12%	1,084

Source : Metra Martech - 27/10/00

TABLE 6 : THE OVERALL USE OF OTHER SOURCES OF INFORMATION FOR EACH TYPE OF INCIDENT

	Injured Party		Co-Workers		Witnesses		Union/Staff Reps		Medical Experts		Other		Base
	No	%	No	%	No	%	No	%	No	%	No	%	
Minor Accidents	819	94%	467	54%	493	57%	120	14%	123	14%	19	2%	949
Lost Time Accidents	1,112	94%	733	62%	760	64%	156	13%	204	17%	66	6%	1258
Incidents of Work Related Ill Health	1,056	93%	707	62%	679	60%	146	13%	272	24%	103	9%	1227
Very Serious or Fatal Accidents	1,085	90%	808	67%	895	74%	208	17%	416	34%	192	16%	1273
Accidents to Contractors' Employees	948	91%	638	61%	757	73%	139	13%	173	17%	103	10%	1141
Accidents to Members of the Public	932	90%	594	58%	788	77%	137	13%	177	17%	81	8%	1109
Incidents of Violence to Employees	871	88%	618	63%	759	77%	136	14%	140	14%	103	10%	1067
Near Misses Involving No Injury	516	53%	660	68%	709	73%	135	14%	97	10%	34	4%	1084

Source : Metra Martech - 27/10/00

TABLE 6A-1 : OTHER SOURCES OF INFORMATION ON MINOR ACCIDENTS

		Injured Party		Co-Workers		Witnesses		Union/Staff Reps		Medical Experts		Other		Base
Risk	**Higher**	517	95%	311	57%	288	53%	96	18%	88	16%	12	2%	545
	Lower	302	93%	156	48%	205	63%	24	7%	35	11%	7	2%	325
Employees	**Under 10**	42	93%	23	51%	22	49%					1	2%	45
	Oct-49	202	95%	124	58%	128	60%	25	12%	23	11%	7	3%	212
	50-200	313	94%	166	50%	189	57%	45	14%	52	16%	5	2%	333
	Over 200	262	94%	154	55%	154	55%	50	18%	48	17%	6	2%	280
Sector	**Agriculture**	26	74%	16	46%	7	20%			2	6%	3	9%	35
	Construction	34	100%	12	35%	11	32%							34
	Mining	19	95%	9	45%	9	45%	2	10%					20
	Transport	53	88%	32	53%	22	37%	6	10%	1	2%	1	2%	60
	Utilities	18	86%	6	29%	7	33%	2	10%	2	10%			21
	Pet. & Chem.	93	98%	52	55%	48	51%	4	4%	1	1%	1	1%	95
	Metals etc	74	99%	72	96%	73	97%	44	59%	52	69%	1	1%	75
	Food	23	100%	4	17%	6	26%					2	9%	23
	Textiles etc	90	99%	61	67%	55	60%	25	27%	21	23%			91
	Machinery etc	74	96%	41	53%	43	56%	12	16%	8	10%	4	5%	77
	Repair	13	93%	6	43%	7	50%	1	7%	1	7%			14
	Wholsale	68	97%	24	34%	47	67%	9	13%	7	10%			70
	Retail	45	92%	25	51%	28	57%	7	14%	2	4%	2	4%	49
	Hotels etc	39	95%	32	78%	31	76%	5	12%	7	17%	2	5%	41
	Finance etc	42	79%	23	43%	30	57%	2	4%	11	21%	1	2%	53
	Services	44	96%	7	15%	23	50%			6	13%	1	2%	46
	Health etc	64	97%	45	68%	46	70%	1	2%	2	3%	1	2%	66
Group	**Agriculture**	26	74%	16	46%	7	20%			2	6%	3	9%	35
	Construction	34	100%	12	35%	11	32%							34
	Ext./Util./Trans	90	89%	47	47%	38	38%	10	10%	3	3%	1	1%	101
	Manufacturing	367	98%	236	63%	232	62%	86	23%	83	22%	8	2%	375
	Services	302	93%	156	48%	205	63%	24	7%	35	11%	7	2%	325
Base		819	94%	467	54%	493	57%	120	14%	123	14%	19	2%	870

Source : Metra Martech - 27/10/00

TABLE 6A-2 : OTHER SOURCES OF INFORMATION ON MINOR ACCIDENTS BY SIZE

		Injured Party		Co-Workers		Witnesses		Union/Staff Reps		Medical Experts		Other		Base
Agriculture	**Under 10**	5	71%	1	14%	1	14%					1	14%	7
	Oct-49	8	89%	4	44%	3	33%					1	11%	9
	50-200	8	62%	7	54%	1	8%			2	15%	1	8%	13
	Over 200	5	83%	4	67%	2	33%							6
Construction	**Under 10**	6	100%	5	83%	2	33%							6
	Oct-49	12	100%	1	8%	3	25%							12
	50-200	5	100%	2	40%	2	40%							5
	Over 200	11	100%	4	36%	4	36%							11
Ext./Util./Trans	**Oct-49**	21	91%	12	52%	5	22%	1	4%					23
	50-200	49	91%	24	44%	22	41%	3	6%	1	2%	1	2%	54
	Over 200	20	83%	11	46%	11	46%	6	25%	2	8%			24
Manufacturing	**Under 10**	5	100%	1	20%									5
	Oct-49	92	96%	63	66%	68	71%	19	20%	22	23%	5	5%	96
	50-200	163	99%	97	59%	102	62%	36	22%	39	24%	1	1%	164
	Over 200	107	97%	75	68%	62	56%	31	28%	22	20%	2	2%	110
Services	**Under 10**	35	97%	20	56%	25	69%							36
	Oct-49	78	95%	49	60%	50	61%	7	9%	3	4%	1	1%	82
	50-200	91	91%	36	36%	63	63%	7	7%	10	10%	2	2%	100
	Over 200	98	92%	51	48%	67	63%	10	9%	22	21%	4	4%	107
Higher Risk	**Under 10**	16	89%	7	39%	3	17%					1	6%	18
	Oct-49	133	95%	80	57%	79	56%	20	14%	22	16%	6	4%	140
	50-200	225	95%	130	55%	127	54%	39	17%	42	18%	3	1%	236
	Over 200	143	95%	94	62%	79	52%	37	25%	24	16%	2	1%	151
Lower Risk	**Under 10**	35	97%	20	56%	25	69%							36
	Oct-49	78	95%	49	60%	50	61%	7	9%	3	4%	1	1%	82
	50-200	91	91%	36	36%	63	63%	7	7%	10	10%	2	2%	100
	Over 200	98	92%	51	48%	67	63%	10	9%	22	21%	4	4%	107
Under 10		51	94%	27	50%	28	52%					1	2%	54
Oct-49		211	95%	129	58%	129	58%	27	12%	25	11%	7	3%	222
50-200		316	94%	166	49%	190	57%	46	14%	52	15%	5	1%	336
Over 200		241	93%	145	56%	146	57%	47	18%	46	18%	6	2%	258
Base		819	94%	467	54%	493	57%	120	14%	123	14%	19	2%	870

Source : Metra Martech - 27/10/00

TABLE 6B-1 : OTHER SOURCES OF INFORMATION ON LOST TIME ACCIDENTS

		Injured Party		Co-Workers		Witnesses		Union/Staff Reps		Medical Experts		Other		Base
Risk	**Higher**	732	95%	496	64%	468	61%	128	17%	135	18%	53	7%	770
	Lower	380	91%	237	57%	292	70%	28	7%	69	17%	13	3%	416
Employees	**Under 10**	66	92%	41	57%	43	60%			6	8%	1	1%	72
	Oct-49	287	96%	206	69%	198	66%	32	11%	40	13%	24	8%	300
	50-200	418	94%	263	59%	290	65%	55	12%	90	20%	16	4%	444
	Over 200	341	92%	223	60%	229	62%	69	19%	68	18%	25	7%	370
Sector	**Agriculture**	47	82%	31	54%	25	44%	1	2%	9	16%	6	11%	57
	Construction	75	100%	55	73%	61	81%	3	4%	3	4%	3	4%	75
	Mining	25	96%	17	65%	19	73%	5	19%	2	8%	2	8%	26
	Transport	84	92%	55	60%	48	53%	12	13%	8	9%	5	5%	91
	Utilities	14	67%	8	38%	6	29%	6	29%	6	29%	2	10%	21
	Pet. & Chem.	116	96%	73	60%	62	51%	7	6%	3	2%	1	1%	121
	Metals etc	81	99%	80	98%	79	96%	49	60%	55	67%	1	1%	82
	Food	74	100%	25	34%	24	32%			5	7%	21	28%	74
	Textiles etc	108	98%	84	76%	80	73%	28	25%	28	25%	1	1%	110
	Machinery etc	96	96%	61	61%	54	54%	16	16%	15	15%	10	10%	100
	Repair	12	92%	7	54%	10	77%	1	8%	1	8%	1	8%	13
	Wholsale	86	99%	39	45%	71	82%	12	14%	20	23%			87
	Retail	71	95%	46	61%	51	68%	6	8%	6	8%	5	7%	75
	Hotels etc	48	92%	41	79%	41	79%	6	12%	13	25%	2	4%	52
	Finance etc	49	78%	27	43%	42	67%	3	5%	13	21%	3	5%	63
	Services	52	83%	25	40%	34	54%	1	2%	11	17%	2	3%	63
	Health etc	74	97%	59	78%	53	70%			6	8%	1	1%	76
Group	**Agriculture**	47	82%	31	54%	25	44%	1	2%	9	16%	6	11%	57
	Construction	75	100%	55	73%	61	81%	3	4%	3	4%	3	4%	75
	Ext./Util./Trans	123	89%	80	58%	73	53%	23	17%	16	12%	9	7%	138
	Manufacturing	487	97%	330	66%	309	62%	101	20%	107	21%	35	7%	500
	Services	380	91%	237	57%	292	70%	28	7%	69	17%	13	3%	416
Base		1,112	94%	733	62%	760	64%	156	13%	204	17%	66	6%	1,186

Source : Metra Martech - 27/10/00

TABLE 6B-2 : OTHER SOURCES OF INFORMATION ON LOST TIME ACCIDENTS BY SIZE

		Injured Party		Co-Workers		Witnesses		Union/Staff Reps		Medical Experts		Other		Base
Agriculture	**Under 10**	14	78%	8	44%	6	33%			2	11%	1	6%	18
	Oct-49	12	92%	7	54%	7	54%					1	8%	13
	50-200	16	76%	14	67%	10	48%	1	5%	6	29%	1	5%	21
	Over 200	5	100%	2	40%	2	40%			1	20%	3	60%	5
Construction	**Under 10**	13	100%	8	62%	12	92%							13
	Oct-49	19	100%	15	79%	18	95%	1	5%			2	11%	19
	50-200	22	100%	12	55%	12	55%			2	9%	1	5%	22
	Over 200	21	100%	20	95%	19	90%	2	10%	1	5%			21
Ext./Util./Trans	**Oct-49**	31	89%	19	54%	9	26%	2	6%	1	3%	3	9%	35
	50-200	63	91%	40	58%	46	67%	11	16%	11	16%	5	7%	69
	Over 200	29	85%	21	62%	18	53%	10	29%	4	12%	1	3%	34
Manufacturing	**Oct-49**	126	95%	99	74%	97	73%	23	17%	29	22%	14	11%	133
	50-200	205	98%	130	62%	130	62%	40	19%	52	25%	8	4%	209
	Over 200	156	99%	101	64%	82	52%	38	24%	26	16%	13	8%	158
Services	**Under 10**	49	96%	30	59%	33	65%			4	8%			51
	Oct-49	117	98%	83	69%	81	68%	9	8%	16	13%	4	3%	120
	50-200	107	90%	59	50%	86	72%	6	5%	19	16%	2	2%	119
	Over 200	107	85%	65	52%	92	73%	13	10%	30	24%	7	6%	126
Higher Risk	**Under 10**	27	87%	16	52%	18	58%			2	6%	1	3%	31
	Oct-49	188	94%	140	70%	131	66%	26	13%	30	15%	20	10%	200
	50-200	306	95%	196	61%	198	62%	52	16%	71	22%	15	5%	321
	Over 200	211	97%	144	66%	121	56%	50	23%	32	15%	17	8%	218
Lower Risk	**Under 10**	49	96%	30	59%	33	65%			4	8%			51
	Oct-49	117	98%	83	69%	81	68%	9	8%	16	13%	4	3%	120
	50-200	107	90%	59	50%	86	72%	6	5%	19	16%	2	2%	119
	Over 200	107	85%	65	52%	92	73%	13	10%	30	24%	7	6%	126
Base		1,112	94%	733	62%	760	64%	156	13%	204	17%	66	6%	1,186

Source : Metra Martech - 27/10/00

TABLE 6C-1 : OTHER SOURCES OF INFORMATION ON INCIDENTS OF WORK RELATED ILL HEALTH

		Injured Party		Co-Workers		Witnesses		Union/Staff Reps		Medical Experts		Other		Base
Risk	**Higher**	688	94%	457	62%	409	56%	116	16%	168	23%	68	9%	734
	Lower	368	92%	250	63%	270	68%	30	8%	104	26%	35	9%	400
Employees	**Under 10**	70	92%	41	54%	43	57%			8	11%	7	9%	76
	Oct-49	297	97%	224	73%	212	69%	34	11%	74	24%	39	13%	306
	50-200	373	92%	235	58%	231	57%	47	12%	96	24%	24	6%	405
	Over 200	316	91%	207	60%	193	56%	65	19%	94	27%	33	10%	347
Sector	**Agriculture**	37	76%	25	51%	16	33%	2	4%	10	20%	3	6%	49
	Construction	77	99%	50	64%	45	58%	3	4%	11	14%	12	15%	78
	Mining	23	96%	15	63%	17	71%	7	29%	6	25%	2	8%	24
	Transport	76	86%	49	56%	40	45%	8	9%	10	11%	3	3%	88
	Utilities	6	35%	2	12%	2	12%	3	18%	12	71%	1	6%	17
	Pet. & Chem.	111	98%	61	54%	53	47%	7	6%	3	3%	1	1%	113
	Metals etc	72	99%	71	97%	70	96%	45	62%	50	68%	1	1%	73
	Food	86	100%	36	42%	33	38%			21	24%	30	35%	86
	Textiles etc	98	96%	84	82%	71	70%	25	25%	27	26%	2	2%	102
	Machinery etc	91	98%	56	60%	53	57%	16	17%	14	15%	12	13%	93
	Repair	11	100%	8	73%	9	82%			4	36%	1	9%	11
	Wholsale	89	99%	47	52%	74	82%	14	16%	46	51%	3	3%	90
	Retail	75	94%	49	61%	46	58%	5	6%	6	8%	12	15%	80
	Hotels etc	49	92%	45	85%	44	83%	5	9%	18	34%	5	9%	53
	Finance etc	36	75%	17	35%	25	52%	3	6%	14	29%	5	10%	48
	Services	52	87%	31	52%	27	45%	2	3%	11	18%	3	5%	60
	Health etc	67	97%	61	88%	54	78%	1	1%	9	13%	7	10%	69
Group	**Agriculture**	37	76%	25	51%	16	33%	2	4%	10	20%	3	6%	49
	Construction	77	99%	50	64%	45	58%	3	4%	11	14%	12	15%	78
	Ext./Util./Trans	105	81%	66	51%	59	46%	18	14%	28	22%	6	5%	129
	Manufacturing	469	98%	316	66%	289	60%	93	19%	119	25%	47	10%	478
	Services	368	92%	250	63%	270	68%	30	8%	104	26%	35	9%	400
Base		1,056	93%	707	62%	679	60%	146	13%	272	24%	103	9%	1,134

Source : Metra Martech - 27/10/00

TABLE 6C-2 : OTHER SOURCES OF INFORMATION ON INCIDENTS OF WORK RELATED ILL HEALTH BY SIZE

		Injured Party		Co-Workers		Witnesses		Union/Staff Reps		Medical Experts		Other		Base
Agriculture	**Under 10**	13	72%	6	33%	5	28%			3	17%	2	11%	18
	Oct-49	11	92%	8	67%	3	25%			1	8%			12
	50-200	10	67%	9	60%	6	40%	1	7%	5	33%	1	7%	15
	Over 200	3	75%	2	50%	2	50%	1	25%	1	25%			4
Construction	**Under 10**	14	100%	8	57%	13	93%					1	7%	14
	Oct-49	21	100%	12	57%	14	67%			4	19%	6	29%	21
	50-200	20	95%	9	43%	6	29%			2	10%	2	10%	21
	Over 200	22	100%	21	95%	12	55%	3	14%	5	23%	3	14%	22
Ext./Util./Trans	**Oct-49**	28	88%	19	59%	8	25%	1	3%	3	9%	2	6%	32
	50-200	54	83%	32	49%	36	55%	7	11%	14	22%	2	3%	65
	Over 200	23	72%	15	47%	15	47%	10	31%	11	34%	2	6%	32
Manufacturing	**Oct-49**	131	98%	103	77%	106	79%	22	16%	44	33%	19	14%	134
	50-200	189	97%	118	61%	105	54%	35	18%	48	25%	14	7%	194
	Over 200	149	99%	95	63%	78	52%	36	24%	27	18%	14	9%	150
Services	**Under 10**	52	98%	32	60%	32	60%			7	13%	6	11%	53
	Oct-49	120	98%	96	78%	90	73%	14	11%	28	23%	11	9%	123
	50-200	98	88%	62	56%	77	69%	7	6%	29	26%	6	5%	111
	Over 200	98	87%	60	53%	71	63%	9	8%	40	35%	12	11%	113
Higher Risk	**Under 10**	27	84%	14	44%	18	56%			3	9%	3	9%	32
	Oct-49	191	96%	142	71%	131	66%	23	12%	52	26%	27	14%	199
	50-200	273	93%	168	57%	153	52%	43	15%	69	23%	19	6%	295
	Over 200	197	95%	133	64%	107	51%	50	24%	44	21%	19	9%	208
Lower Risk	**Under 10**	52	98%	32	60%	32	60%			7	13%	6	11%	53
	Oct-49	120	98%	96	78%	90	73%	14	11%	28	23%	11	9%	123
	50-200	98	88%	62	56%	77	69%	7	6%	29	26%	6	5%	111
	Over 200	98	87%	60	53%	71	63%	9	8%	40	35%	12	11%	113
Base		1,056	93%	707	62%	679	60%	146	13%	272	24%	103	9%	1,134

Source : Metra Martech - 27/10/00

TABLE 6D-1 : OTHER SOURCES OF INFORMATION ON VERY SERIOUS OR FATAL ACCIDENTS

		Injured Party		Co-Workers		Witnesses		Union/Staff Reps		Medical Experts		Other		Base
Risk	**Higher**	708	93%	518	68%	537	70%	154	20%	220	29%	114	15%	763
	Lower	377	84%	290	65%	358	80%	54	12%	196	44%	78	17%	447
Employees	**Under 10**	83	87%	48	51%	62	65%	2	2%	29	31%	23	24%	95
	Oct-49	307	92%	245	73%	266	80%	43	13%	152	46%	63	19%	334
	50-200	389	92%	275	65%	317	75%	72	17%	124	29%	45	11%	422
	Over 200	306	85%	240	67%	250	70%	91	25%	111	31%	61	17%	359
Sector	**Agriculture**	32	65%	31	63%	31	63%	3	6%	14	29%	7	14%	49
	Construction	89	99%	57	63%	78	87%	10	11%	25	28%	27	30%	90
	Mining	23	92%	20	80%	21	84%	12	48%	8	32%	8	32%	25
	Transport	83	90%	58	63%	54	59%	13	14%	11	12%	8	9%	92
	Utilities	5	31%	7	44%	8	50%	5	31%	5	31%	7	44%	16
	Pet. & Chem.	114	96%	80	67%	65	55%	9	8%	3	3%	1	1%	119
	Metals etc	72	97%	72	97%	72	97%	46	62%	50	68%	1	1%	74
	Food	88	100%	38	43%	50	57%			24	27%	34	39%	88
	Textiles etc	101	97%	85	82%	89	86%	33	32%	59	57%	7	7%	104
	Machinery etc	92	97%	61	64%	58	61%	22	23%	15	16%	13	14%	95
	Repair	9	82%	9	82%	11	100%	1	9%	6	55%	1	9%	11
	Wholsale	85	96%	50	56%	78	88%	13	15%	53	60%	7	8%	89
	Retail	88	86%	59	58%	72	71%	16	16%	28	27%	18	18%	102
	Hotels etc	51	89%	51	89%	53	93%	12	21%	45	79%	22	39%	57
	Finance etc	37	62%	28	47%	44	73%	7	12%	18	30%	7	12%	60
	Services	47	73%	32	50%	43	67%	1	2%	9	14%	12	19%	64
	Health etc	69	92%	70	93%	68	91%	5	7%	43	57%	12	16%	75
Group	**Agriculture**	32	65%	31	63%	31	63%	3	6%	14	29%	7	14%	49
	Construction	89	99%	57	63%	78	87%	10	11%	25	28%	27	30%	90
	Ext./Util./Trans	111	83%	85	64%	83	62%	30	23%	24	18%	23	17%	133
	Manufacturing	476	97%	345	70%	345	70%	111	23%	157	32%	57	12%	491
	Services	377	84%	290	65%	358	80%	54	12%	196	44%	78	17%	447
Base		1,085	90%	808	67%	895	74%	208	17%	416	34%	192	16%	1,210

Source : Metra Martech - 27/10/00

TABLE 6D-2 : OTHER SOURCES OF INFORMATION ON VERY SERIOUS OR FATAL ACCIDENTS BY SIZE

		Injured Party		Co-Workers		Witnesses		Union/Staff Reps		Medical Experts		Other		Base
Agriculture	**Under 10**	10	59%	6	35%	8	47%	1	6%	4	24%	5	29%	17
	Oct-49	8	73%	9	82%	9	82%			3	27%			11
	50-200	12	75%	12	75%	11	69%	1	6%	5	31%	1	6%	16
	Over 200	2	40%	4	80%	3	60%	1	20%	2	40%	1	20%	5
Construction	**Under 10**	22	100%	10	45%	19	86%			5	23%	7	32%	22
	Oct-49	26	100%	14	54%	24	92%	1	4%	10	38%	10	38%	26
	50-200	20	100%	11	55%	13	65%	2	10%	3	15%	3	15%	20
	Over 200	21	95%	22	100%	22	100%	7	32%	7	32%	7	32%	22
Ext./Util./Trans	**Oct-49**	29	83%	22	63%	12	34%	2	6%	2	6%	6	17%	35
	50-200	58	87%	45	67%	50	75%	14	21%	15	22%	12	18%	67
	Over 200	24	77%	18	58%	21	68%	14	45%	7	23%	5	16%	31
Manufacturing	**Oct-49**	136	96%	111	78%	119	84%	26	18%	73	51%	28	20%	142
	50-200	193	98%	129	65%	139	71%	46	23%	59	30%	15	8%	197
	Over 200	147	97%	105	69%	87	57%	39	26%	25	16%	14	9%	152
Services	**Under 10**	62	91%	37	54%	45	66%	1	1%	25	37%	15	22%	68
	Oct-49	122	88%	110	80%	119	86%	17	12%	72	52%	17	12%	138
	50-200	102	87%	67	57%	95	81%	11	9%	37	32%	15	13%	117
	Over 200	91	73%	76	61%	99	80%	25	20%	62	50%	31	25%	124
Higher Risk	**Under 10**	32	82%	16	41%	27	69%	1	3%	9	23%	12	31%	39
	Oct-49	199	93%	156	73%	164	77%	29	14%	88	41%	44	21%	214
	50-200	283	94%	197	66%	213	71%	63	21%	82	27%	31	10%	300
	Over 200	194	92%	149	71%	133	63%	61	29%	41	20%	27	13%	210
Lower Risk	**Under 10**	62	91%	37	54%	45	66%	1	1%	25	37%	15	22%	68
	Oct-49	122	88%	110	80%	119	86%	17	12%	72	52%	17	12%	138
	50-200	102	87%	67	57%	95	81%	11	9%	37	32%	15	13%	117
	Over 200	91	73%	76	61%	99	80%	25	20%	62	50%	31	25%	124
Base		1,085	90%	808	67%	895	74%	208	17%	416	34%	192	16%	1,210

Source : Metra Martech - 27/10/00

TABLE 6E-1 : OTHER SOURCES OF INFORMATION ON ACCIDENTS INVOLVING CONTRACTORS' EMPLOYEES

		Injured Party		Co-Workers		Witnesses		Union/Staff Reps		Medical Experts		Other		Base
Risk	**Higher**	474	93%	339	67%	360	71%	107	21%	101	20%	39	8%	509
	Lower	247	86%	156	54%	229	80%	21	7%	52	18%	31	11%	288
Employees	**Under 10**	27	82%	16	48%	23	70%			3	9%	5	15%	33
	Oct-49	178	95%	127	68%	146	78%	26	14%	35	19%	12	6%	187
	50-200	285	92%	179	58%	237	77%	48	16%	65	21%	22	7%	309
	Over 200	231	86%	173	65%	183	68%	54	20%	50	19%	31	12%	268
Sector	**Agriculture**	15	56%	14	52%	11	41%	1	4%	4	15%	10	37%	27
	Construction	37	100%	33	89%	36	97%	4	11%	1	3%			37
	Mining	18	95%	14	74%	17	89%	6	32%	5	26%	1	5%	19
	Transport	52	88%	36	61%	36	61%	4	7%	6	10%	7	12%	59
	Utilities	6	40%	6	40%	8	53%	2	13%	2	13%	7	47%	15
	Pet. & Chem.	101	98%	57	55%	56	54%	5	5%	1	1%	1	1%	103
	Metals etc	70	99%	69	97%	69	97%	44	62%	51	72%	1	1%	71
	Food	14	100%	4	29%	5	36%					1	7%	14
	Textiles etc	85	97%	65	74%	73	83%	26	30%	19	22%	3	3%	88
	Machinery etc	69	100%	39	57%	44	64%	15	22%	11	16%	8	12%	69
	Repair	7	100%	2	29%	5	71%			1	14%			7
	Wholsale	62	95%	37	57%	56	86%	11	17%	32	49%	8	12%	65
	Retail	40	89%	21	47%	33	73%	5	11%	3	7%	2	4%	45
	Hotels etc	31	94%	29	88%	29	88%	2	6%	6	18%	3	9%	33
	Finance etc	25	66%	15	39%	25	66%	2	5%	7	18%	6	16%	38
	Services	32	71%	17	38%	31	69%			2	4%	9	20%	45
	Health etc	57	92%	37	60%	55	89%	1	2%	2	3%	3	5%	62
Group	**Agriculture**	15	56%	14	52%	11	41%	1	4%	4	15%	10	37%	27
	Construction	37	100%	33	89%	36	97%	4	11%	1	3%			37
	Ext./Util./Trans	76	82%	56	60%	61	66%	12	13%	13	14%	15	16%	93
	Manufacturing	346	98%	236	67%	252	72%	90	26%	83	24%	14	4%	352
	Services	247	86%	156	54%	229	80%	21	7%	52	18%	31	11%	288
Base		721	90%	495	62%	589	74%	128	16%	153	19%	70	9%	797

Source : Metra Martech - 27/10/00

TABLE 6E-2 : OTHER SOURCES OF INFORMATION ON ACCIDENTS INVOLVING CONTRACTORS' EMPLOYEES BY SIZE

		Injured Party		Co-Workers		Witnesses		Union/Staff Reps		Medical Experts		Other		Base
Agriculture	**Under 10**	3	50%	1	17%	2	33%					3	50%	6
	Oct-49	5	83%	4	67%	2	33%					1	17%	6
	50-200	3	33%	5	56%	4	44%	1	11%	3	33%	3	33%	9
	Over 200	4	67%	4	67%	3	50%			1	17%	3	50%	6
Construction	**Under 10**	6	100%	5	83%	6	100%							6
	Oct-49	13	100%	11	85%	13	100%	1	8%	1	8%			13
	50-200	4	100%	3	75%	3	75%							4
	Over 200	14	100%	14	100%	14	100%	3	21%					14
Ext./Util./Trans	**Oct-49**	15	88%	11	65%	7	41%			1	6%	2	12%	17
	50-200	45	83%	31	57%	40	74%	3	6%	7	13%	10	19%	54
	Over 200	16	73%	14	64%	14	64%	9	41%	5	23%	3	14%	22
Manufacturing	**Under 10**	2	100%											2
	Oct-49	82	98%	60	71%	68	81%	21	25%	21	25%	6	7%	84
	50-200	154	98%	98	62%	119	76%	37	24%	38	24%	6	4%	157
	Over 200	108	99%	78	72%	65	60%	32	29%	24	22%	2	2%	109
Services	**Under 10**	24	89%	15	56%	23	85%			6	22%	5	19%	27
	Oct-49	74	94%	53	67%	65	82%	9	11%	15	19%	2	3%	79
	50-200	75	89%	38	45%	68	81%	6	7%	15	18%	3	4%	84
	Over 200	74	76%	50	51%	73	74%	6	6%	16	16%	21	21%	98
Higher Risk	**Under 10**	11	79%	6	43%	8	57%					3	21%	14
	Oct-49	115	96%	86	72%	90	75%	22	18%	23	19%	9	8%	120
	50-200	206	92%	137	61%	166	74%	41	18%	48	21%	19	8%	224
	Over 200	142	94%	110	73%	96	64%	44	29%	30	20%	8	5%	151
Lower Risk	**Under 10**	24	89%	15	56%	23	85%			6	22%	5	19%	27
	Oct-49	74	94%	53	67%	65	82%	9	11%	15	19%	2	3%	79
	50-200	75	89%	38	45%	68	81%	6	7%	15	18%	3	4%	84
	Over 200	74	76%	50	51%	73	74%	6	6%	16	16%	21	21%	98
Base		721	90%	495	62%	589	74%	128	16%	153	19%	70	9%	797

Source : Metra Martech - 27/10/00

TABLE 6F-1 : OTHER SOURCES OF INFORMATION ON ACCIDENTS TO MEMBERS OF THE PUBLIC

		Injured Party		Co-Workers		Witnesses		Union/Staff Reps		Medical Experts		Other		Base
Risk	**Higher**	568	92%	383	62%	440	71%	111	18%	100	16%	51	8%	616
	Lower	364	88%	211	51%	348	84%	26	6%	77	19%	30	7%	414
Employees	**Under 10**	68	89%	35	46%	55	72%			9	12%	10	13%	76
	Oct-49	253	94%	173	64%	217	80%	28	10%	49	18%	16	6%	270
	50-200	342	90%	201	53%	288	76%	50	13%	66	17%	28	7%	378
	Over 200	269	88%	185	60%	228	75%	59	19%	53	17%	27	9%	306
Sector	**Agriculture**	35	71%	26	53%	31	63%	1	2%	6	12%	10	20%	49
	Construction	58	100%	44	76%	54	93%	2	3%			4	7%	58
	Mining	20	95%	10	48%	16	76%	7	33%	3	14%	5	24%	21
	Transport	67	86%	43	55%	49	63%	8	10%	9	12%	5	6%	78
	Utilities	11	69%	4	25%	9	56%	4	25%	3	19%	6	38%	16
	Pet. & Chem.	111	97%	66	57%	63	55%	5	4%	2	2%	1	1%	115
	Metals etc	73	99%	72	97%	72	97%	47	64%	50	68%	2	3%	74
	Food	15	100%	5	33%	8	53%					3	20%	15
	Textiles etc	83	89%	67	72%	82	88%	25	27%	20	22%	7	8%	93
	Machinery etc	83	98%	42	49%	44	52%	11	13%	7	8%	8	9%	85
	Repair	12	100%	4	33%	12	100%	1	8%					12
	Wholsale	82	98%	38	45%	76	90%	11	13%	39	46%	6	7%	84
	Retail	77	92%	42	50%	64	76%	4	5%	3	4%	8	10%	84
	Hotels etc	50	91%	45	82%	53	96%	5	9%	17	31%	5	9%	55
	Finance etc	38	70%	19	35%	41	76%	3	6%	12	22%	3	6%	54
	Services	46	73%	20	32%	45	71%	1	2%	2	3%	8	13%	63
	Health etc	71	96%	47	64%	69	93%	2	3%	4	5%			74
Group	**Agriculture**	35	71%	26	53%	31	63%	1	2%	6	12%	10	20%	49
	Construction	58	100%	44	76%	54	93%	2	3%			4	7%	58
	Ext./Util./Trans	98	85%	57	50%	74	64%	19	17%	15	13%	16	14%	115
	Manufacturing	377	96%	256	65%	281	71%	89	23%	79	20%	21	5%	394
	Services	364	88%	211	51%	348	84%	26	6%	77	19%	30	7%	414
Base		932	90%	594	58%	788	77%	137	13%	177	17%	81	8%	1,030

Source : Metra Martech - 27/10/00

TABLE 6F-2 : OTHER SOURCES OF INFORMATION ON ACCIDENTS TO MEMBERS OF THE PUBLIC BY SIZE

		Injured Party		Co-Workers		Witnesses		Union/Staff Reps		Medical Experts		Other		Base
Agriculture	**Under 10**	12	71%	6	35%	9	53%			2	12%	4	24%	17
	Oct-49	9	82%	7	64%	9	82%			2	18%	1	9%	11
	50-200	10	63%	9	56%	10	63%	1	6%	1	6%	5	31%	16
	Over 200	4	80%	4	80%	3	60%			1	20%			5
Construction	**Under 10**	9	100%	6	67%	8	89%							9
	Oct-49	14	100%	10	71%	14	100%					1	7%	14
	50-200	15	100%	8	53%	12	80%					1	7%	15
	Over 200	20	100%	20	100%	20	100%	2	10%			2	10%	20
Ext./Util./Trans	**Oct-49**	23	88%	14	54%	11	42%			1	4%	4	15%	26
	50-200	55	86%	32	50%	45	70%	9	14%	10	16%	9	14%	64
	Over 200	20	80%	11	44%	18	72%	10	40%	4	16%	3	12%	25
Manufacturing	**Oct-49**	106	96%	77	70%	89	81%	22	20%	26	24%	7	6%	110
	50-200	155	93%	93	56%	121	73%	34	20%	31	19%	11	7%	166
	Over 200	116	98%	86	73%	71	60%	33	28%	22	19%	3	3%	118
Services	**Under 10**	55	92%	26	43%	47	78%			9	15%	8	13%	60
	Oct-49	118	94%	80	64%	108	86%	10	8%	24	19%	3	2%	125
	50-200	99	88%	51	46%	92	82%	8	7%	22	20%	5	4%	112
	Over 200	92	79%	54	46%	101	86%	8	7%	22	19%	14	12%	117
Higher Risk	**Under 10**	21	81%	12	46%	17	65%			2	8%	4	15%	26
	Oct-49	152	94%	108	67%	123	76%	22	14%	29	18%	13	8%	161
	50-200	235	90%	142	54%	188	72%	44	17%	42	16%	26	10%	261
	Over 200	160	95%	121	72%	112	67%	45	27%	27	16%	8	5%	168
Lower Risk	**Under 10**	55	92%	26	43%	47	78%			9	15%	8	13%	60
	Oct-49	118	94%	80	64%	108	86%	10	8%	24	19%	3	2%	125
	50-200	99	88%	51	46%	92	82%	8	7%	22	20%	5	4%	112
	Over 200	92	79%	54	46%	101	86%	8	7%	22	19%	14	12%	117
Base		932	90%	594	58%	788	77%	137	13%	177	17%	81	8%	1,030

Source : Metra Martech - 27/10/00

TABLE 6G-1 : OTHER SOURCES OF INFORMATION ON INCIDENTS OF VIOLENCE TO EMPLOYEES

		Injured Party		Co-Workers		Witnesses		Union/Staff Reps		Medical Experts		Other		Base
Risk	**Higher**	560	91%	402	65%	441	72%	115	19%	95	15%	59	10%	614
	Lower	311	84%	216	58%	318	85%	21	6%	45	12%	44	12%	372
Employees	**Under 10**	63	88%	41	57%	50	69%			5	7%	11	15%	72
	Oct-49	236	94%	174	69%	206	82%	25	10%	34	13%	20	8%	252
	50-200	317	88%	213	59%	278	77%	49	14%	57	16%	33	9%	360
	Over 200	255	84%	190	63%	225	75%	62	21%	44	15%	39	13%	302
Sector	**Agriculture**	36	71%	27	53%	32	63%	1	2%	4	8%	14	27%	51
	Construction	56	100%	44	79%	51	91%	2	4%	1	2%	3	5%	56
	Mining	21	95%	16	73%	18	82%	7	32%	2	9%	6	27%	22
	Transport	66	87%	46	61%	47	62%	11	14%	8	11%	7	9%	76
	Utilities	9	53%	6	35%	12	71%	5	29%	2	12%	8	47%	17
	Pet. & Chem.	111	96%	66	57%	63	54%	6	5%	3	3%	1	1%	116
	Metals etc	72	97%	72	97%	72	97%	47	64%	49	66%	2	3%	74
	Food	15	100%	5	33%	8	53%					3	20%	15
	Textiles etc	83	88%	71	76%	87	93%	24	26%	20	21%	6	6%	94
	Machinery etc	83	98%	44	52%	43	51%	12	14%	6	7%	9	11%	85
	Repair	8	100%	5	63%	8	100%							8
	Wholsale	46	94%	22	45%	42	86%	5	10%	8	16%	3	6%	49
	Retail	68	87%	41	53%	62	79%	4	5%	5	6%	9	12%	78
	Hotels etc	51	91%	48	86%	53	95%	7	13%	17	30%	13	23%	56
	Finance etc	37	67%	25	45%	43	78%	4	7%	11	20%	3	5%	55
	Services	44	70%	26	41%	53	84%					13	21%	63
	Health etc	65	92%	54	76%	65	92%	1	1%	4	6%	3	4%	71
Group	**Agriculture**	36	71%	27	53%	32	63%	1	2%	4	8%	14	27%	51
	Construction	56	100%	44	79%	51	91%	2	4%	1	2%	3	5%	56
	Ext./Util./Trans	96	83%	68	59%	77	67%	23	20%	12	10%	21	18%	115
	Manufacturing	372	95%	263	67%	281	72%	89	23%	78	20%	21	5%	392
	Services	311	84%	216	58%	318	85%	21	6%	45	12%	44	12%	372
Base		871	88%	618	63%	759	77%	136	14%	140	14%	103	10%	986

Source : Metra Martech - 27/10/00

TABLE 6G-2 : OTHER SOURCES OF INFORMATION ON INCIDENTS OF VIOLENCE TO EMPLOYEES BY SIZE

		Injured Party		Co-Workers		Witnesses		Union/Staff Reps		Medical Experts		Other		Base
Agriculture	**Under 10**	11	65%	6	35%	8	47%			1	6%	6	35%	17
	Oct-49	10	91%	7	64%	10	91%			1	9%	1	9%	11
	50-200	11	65%	10	59%	10	59%	1	6%	1	6%	5	29%	17
	Over 200	4	67%	4	67%	4	67%			1	17%	2	33%	6
Construction	**Under 10**	10	100%	6	60%	9	90%							10
	Oct-49	11	100%	10	91%	11	100%			1	9%	1	9%	11
	50-200	16	100%	9	56%	12	75%					1	6%	16
	Over 200	19	100%	19	100%	19	100%	2	11%			1	5%	19
Ext./Util./Trans	**Oct-49**	22	92%	14	58%	11	46%			1	4%	2	8%	24
	50-200	54	83%	38	58%	47	72%	12	18%	8	12%	13	20%	65
	Over 200	20	77%	16	62%	19	73%	11	42%	3	12%	6	23%	26
Manufacturing	**Oct-49**	104	96%	79	73%	85	79%	21	19%	25	23%	8	7%	108
	50-200	152	92%	100	60%	125	75%	36	22%	31	19%	10	6%	166
	Over 200	116	98%	84	71%	71	60%	32	27%	22	19%	3	3%	118
Services	**Under 10**	52	93%	30	54%	42	75%			6	11%	6	11%	56
	Oct-49	103	91%	82	73%	103	91%	7	6%	9	8%	8	7%	113
	50-200	75	83%	49	54%	75	83%	5	6%	14	16%	8	9%	90
	Over 200	81	72%	55	49%	98	87%	9	8%	16	14%	22	19%	113
Higher Risk	**Under 10**	21	78%	12	44%	17	63%			1	4%	6	22%	27
	Oct-49	147	95%	110	71%	117	76%	21	14%	28	18%	12	8%	154
	50-200	233	88%	157	59%	194	73%	49	19%	40	15%	29	11%	264
	Over 200	159	94%	123	73%	113	67%	45	27%	26	15%	12	7%	169
Lower Risk	**Under 10**	52	93%	30	54%	42	75%			6	11%	6	11%	56
	Oct-49	103	91%	82	73%	103	91%	7	6%	9	8%	8	7%	113
	50-200	75	83%	49	54%	75	83%	5	6%	14	16%	8	9%	90
	Over 200	81	72%	55	49%	98	87%	9	8%	16	14%	22	19%	113
Base		871	88%	618	63%	759	77%	136	14%	140	14%	103	10%	986

Source : Metra Martech - 27/10/00

TABLE 6H-1 : OTHER SOURCES OF INFORMATION ON NEAR MISSES WITH NO INJURY

		Injured Party		Co-Workers		Witnesses		Union/Staff Reps		Medical Experts		Other		Base
Risk	**Higher**	353	57%	431	69%	420	68%	112	18%	74	12%	25	4%	621
	Lower	163	47%	229	66%	289	83%	23	7%	23	7%	9	3%	347
Employees	**Under 10**	17	29%	41	71%	38	66%	1	2%	1	2%	6	10%	58
	Oct-49	123	51%	175	73%	182	76%	25	10%	21	9%	8	3%	241
	50-200	202	55%	237	65%	268	73%	49	13%	39	11%	7	2%	366
	Over 200	174	57%	207	68%	221	73%	60	20%	36	12%	13	4%	303
Sector	**Agriculture**	18	38%	29	60%	27	56%	2	4%	3	6%	8	17%	48
	Construction	10	21%	42	89%	42	89%	3	6%					47
	Mining	21	91%	15	65%	17	74%	6	26%	3	13%	1	4%	23
	Transport	48	65%	44	59%	40	54%	5	7%	1	1%	2	3%	74
	Utilities	4	25%	6	38%	11	69%	3	19%	3	19%	3	19%	16
	Pet. & Chem.	111	95%	74	63%	63	54%	5	4%	2	2%	1	1%	117
	Metals etc	21	27%	76	96%	77	97%	50	63%	35	44%	2	3%	79
	Food	10	91%	2	18%	1	9%					1	9%	11
	Textiles etc	13	13%	89	89%	85	85%	25	25%	20	20%	1	1%	100
	Machinery etc	88	97%	45	49%	45	49%	13	14%	6	7%	5	5%	91
	Repair	9	60%	9	60%	12	80%			1	7%	1	7%	15
	Wholsale	56	84%	37	55%	57	85%	9	13%	11	16%			67
	Retail	26	46%	39	68%	46	81%	3	5%	1	2%			57
	Hotels etc	7	15%	39	83%	44	94%	7	15%	3	6%	3	6%	47
	Finance etc	25	53%	19	40%	34	72%	3	6%	6	13%	2	4%	47
	Services	28	49%	31	54%	41	72%			1	2%	3	5%	57
	Health etc	21	29%	64	89%	67	93%	1	1%	1	1%	1	1%	72
Group	**Agriculture**	18	38%	29	60%	27	56%	2	4%	3	6%	8	17%	48
	Construction	10	21%	42	89%	42	89%	3	6%					47
	Ext./Util./Trans	73	65%	65	58%	68	60%	14	12%	7	6%	6	5%	113
	Manufacturing	252	61%	295	71%	283	69%	93	23%	64	15%	11	3%	413
	Services	163	47%	229	66%	289	83%	23	7%	23	7%	9	3%	347
Base		516	53%	660	68%	709	73%	135	14%	97	10%	34	4%	968

Source : Metra Martech - 27/10/00

TABLE 6H-2 : OTHER SOURCES OF INFORMATION ON NEAR MISSES WITH NO INJURY BY SIZE

		Injured Party		Co-Workers		Witnesses		Union/Staff Reps		Medical Experts		Other		Base
Agriculture	**Under 10**	4	25%	7	44%	6	38%	1	6%	1	6%	5	31%	16
	Oct-49	4	36%	7	64%	6	55%			1	9%	1	9%	11
	50-200	5	33%	10	67%	11	73%	1	7%	1	7%	1	7%	15
	Over 200	5	83%	5	83%	4	67%					1	17%	6
Construction	**Under 10**	4	44%	6	67%	8	89%							9
	Oct-49	1	10%	9	90%	10	100%	1	10%					10
	50-200			8	100%	5	63%							8
	Over 200	5	25%	19	95%	19	95%	2	10%					20
Ext./Util./Trans	**Oct-49**	22	85%	14	54%	8	31%			1	4%			26
	50-200	32	52%	36	59%	41	67%	5	8%	2	3%	4	7%	61
	Over 200	19	73%	15	58%	19	73%	9	35%	4	15%	2	8%	26
Manufacturing	**Under 10**	1	100%									1	100%	1
	Oct-49	71	61%	84	72%	91	78%	21	18%	18	16%	6	5%	116
	50-200	88	51%	122	71%	122	71%	39	23%	27	16%	2	1%	173
	Over 200	92	75%	89	72%	70	57%	33	27%	19	15%	2	2%	123
Services	**Under 10**	9	23%	33	83%	31	78%							40
	Oct-49	43	43%	76	77%	84	85%	7	7%	4	4%	1	1%	99
	50-200	67	67%	54	54%	81	81%	6	6%	9	9%	1	1%	100
	Over 200	44	41%	66	61%	93	86%	10	9%	10	9%	7	6%	108
Higher Risk	**Under 10**	9	35%	13	50%	14	54%	1	4%	1	4%	6	23%	26
	Oct-49	98	60%	114	70%	115	71%	22	13%	20	12%	7	4%	163
	50-200	125	49%	176	68%	179	70%	45	18%	30	12%	7	3%	257
	Over 200	121	69%	128	73%	112	64%	44	25%	23	13%	5	3%	175
Lower Risk	**Under 10**	9	23%	33	83%	31	78%							40
	Oct-49	43	43%	76	77%	84	85%	7	7%	4	4%	1	1%	99
	50-200	67	67%	54	54%	81	81%	6	6%	9	9%	1	1%	100
	Over 200	44	41%	66	61%	93	86%	10	9%	10	9%	7	6%	108
Base		516	53%	660	68%	709	73%	135	14%	97	10%	34	4%	968

Source : Metra Martech - 27/10/00

TABLE 7 : OVERALL PERSON HOURS SPENT ON INVESTIGATION OF INCIDENTS

	Under 1h		1-2h		02-May		5-10h		10-20h		Over 20h		Same as Own Employees		Less than Own Employees		More than Own Employees		Base	
	No	%	No	%	No	%	No	%	No	%	No	%	No	%	No	%	No	%	No	%
Minor Accidents	567	71%	137	17%	63	8%	17	2%	4	1%	11	1%							799	100%
Lost Time Accidents	163	18%	217	24%	253	28%	135	15%	41	5%	82	9%							891	100%
Incidents of Work Related Ill Health	65	8%	118	15%	202	26%	148	19%	100	13%	132	17%							765	100%
Very Serious or Fatal Accidents	8	1%	9	1%	19	3%	29	5%	51	8%	523	82%							639	100%
Accidents to Contractors' Employees	34	4%	36	5%	56	7%	49	6%	18	2%	44	6%	420	54%	49	6%	76	10%	782	100%
Accidents to Members of the Public	33	4%	37	5%	66	9%	49	7%	24	3%	51	7%	357	48%	19	3%	102	14%	738	100%
Incidents of Violence to Employees	8	1%	89	16%	179	32%	140	25%	57	10%	84	15%							557	100%
Near Misses Involving No Injury	88	15%	110	19%	157	27%	104	18%	58	10%	67	11%							584	100%

Source : Metra Martech - 27/10/00

TABLE 8A-1 : PERSON HOURS SPENT ON INVESTIGATION OF MINOR ACCIDENTS

		Minor Accidents												Base
		Under 1h		1-2h		02-May		5-10h		10-20h		Over 20h		
Risk	Higher	341	68%	103	20%	40	8%	12	2%	2	0%	7	1%	505
	Lower	226	77%	34	12%	23	8%	5	2%	2	1%	4	1%	294
Employees	Under 10	41	91%	2	4%	2	4%							45
	Oct-49	158	80%	28	14%	9	5%	2	1%	1	1%			198
	50-200	211	69%	58	19%	25	8%	7	2%	2	1%	5	2%	308
	Over 200	157	63%	49	20%	27	11%	8	3%	1	0%	6	2%	248
Sector	Agriculture	19	58%	9	27%	5	15%							33
	Construction	30	73%	9	22%	2	5%							41
	Mining	11	73%	3	20%	1	7%							15
	Transport	37	62%	15	25%	5	8%	2	3%			1	2%	60
	Utilities	14	64%	4	18%	1	5%	1	5%	1	5%	1	5%	22
	Pet. & Chem.	55	56%	28	28%	13	13%	3	3%					99
	Metals etc	42	82%	6	12%	1	2%	1	2%			1	2%	51
	Food	5	22%	4	17%	8	35%	4	17%			2	9%	23
	Textiles etc	63	81%	13	17%	1	1%					1	1%	78
	Machinery etc	57	78%	11	15%	2	3%	1	1%	1	1%	1	1%	73
	Repair	8	80%	1	10%	1	10%							10
	Wholsale	46	77%	8	13%	3	5%					3	5%	60
	Retail	37	82%	4	9%	4	9%							45
	Hotels etc	34	89%	4	11%									38
	Finance etc	22	55%	8	20%	5	13%	4	10%	1	3%			40
	Services	32	65%	6	12%	9	18%	1	2%			1	2%	49
	Health etc	55	89%	4	6%	2	3%			1	2%			62
Group	Agriculture	19	58%	9	27%	5	15%							33
	Construction	30	73%	9	22%	2	5%							41
	Ext./Util./Trans	62	64%	22	23%	7	7%	3	3%	1	1%	2	2%	97
	Manufacturing	230	69%	63	19%	26	8%	9	3%	1	0%	5	1%	334
	Services	226	77%	34	12%	23	8%	5	2%	2	1%	4	1%	294
Base		567	71%	137	17%	63	8%	17	2%	4	1%	11	1%	799

Source : Metra Martech

TABLE 8A-2 : PERSON HOURS SPENT ON INVESTIGATION OF MINOR ACCIDENTS BY SIZE

		Minor Accidents												Base
		Under 1h		1-2h		02-May		5-10h		10-20h		Over 20h		
Agriculture	**Under 10**	4	67%	1	17%	1	17%							6
	Oct-49	8	80%	1	10%	1	10%							10
	50-200	5	36%	7	50%	2	14%							14
	Over 200	2	67%			1	33%							3
Construction	**Under 10**	7	88%	1	13%									8
	Oct-49	10	67%	4	27%	1	7%							15
	50-200	2	50%	2	50%									4
	Over 200	11	79%	2	14%	1	7%							14
Ext./Util./Trans	**Oct-49**	11	48%	8	35%	4	17%							23
	50-200	38	72%	10	19%			3	6%			2	4%	53
	Over 200	13	62%	4	19%	3	14%			1	5%			21
Manufacturing	**Under 10**	2	67%			1	33%							3
	Oct-49	66	80%	11	13%	3	4%	2	2%	1	1%			83
	50-200	108	71%	28	18%	11	7%	2	1%			3	2%	152
	Over 200	54	56%	24	25%	11	11%	5	5%			2	2%	96
Services	**Under 10**	34	94%	2	6%									36
	Oct-49	73	91%	3	4%	3	4%	1	1%					80
	50-200	56	67%	13	15%	12	14%	1	1%	2	2%			84
	Over 200	63	67%	16	17%	8	9%	3	3%			4	4%	94
Higher Risk	**Under 10**	13	76%	2	12%	2	12%							17
	Oct-49	95	73%	24	18%	9	7%	2	2%	1	1%			131
	50-200	153	69%	47	21%	13	6%	5	2%			5	2%	223
	Over 200	80	60%	30	22%	16	12%	5	4%	1	1%	2	1%	134
Lower Risk	**Under 10**	34	94%	2	6%									36
	Oct-49	73	91%	3	4%	3	4%	1	1%					80
	50-200	56	67%	13	15%	12	14%	1	1%	2	2%			84
	Over 200	63	67%	16	17%	8	9%	3	3%			4	4%	94
Base		567	71%	137	17%	63	8%	17	2%	4	1%	11	1%	799

Source : Metra Martech

TABLE 8B-1 : PERSON HOURS SPENT ON INVESTIGATION OF LOST TIME ACCIDENTS

		Lost Time Accidents												Base
		Under 1h		1-2h		02-May		5-10h		10-20h		Over 20h		
Risk	**Higher**	83	14%	137	24%	169	29%	99	17%	29	5%	64	11%	581
	Lower	80	26%	80	26%	84	27%	36	12%	12	4%	18	6%	310
Employees	**Under 10**	27	61%	10	23%	4	9%	2	5%	1	2%			44
	Oct-49	59	28%	71	34%	46	22%	23	11%	2	1%	10	5%	211
	50-200	51	15%	73	21%	109	31%	57	16%	20	6%	37	11%	347
	Over 200	26	9%	63	22%	94	33%	53	18%	18	6%	35	12%	289
Sector	**Agriculture**	15	38%	11	28%	9	23%	2	5%	1	3%	2	5%	40
	Construction	8	16%	12	24%	16	31%	7	14%	5	10%	3	6%	51
	Mining	5	25%	6	30%	5	25%	1	5%			3	15%	20
	Transport	5	7%	16	21%	25	33%	16	21%	5	7%	8	11%	75
	Utilities	5	23%	6	27%	5	23%	3	14%	1	5%	2	9%	22
	Pet. & Chem.	6	6%	28	26%	32	29%	27	25%	9	8%	7	6%	109
	Metals etc	2	13%	3	20%	5	33%			1	7%	4	27%	15
	Food	2	3%	4	6%	30	43%	18	26%	3	4%	12	17%	69
	Textiles etc	11	15%	20	27%	18	24%	14	19%	3	4%	8	11%	74
	Machinery etc	22	23%	26	28%	20	21%	10	11%	1	1%	15	16%	94
	Repair	2	17%	5	42%	4	33%	1	8%					12
	Wholsale	6	8%	19	24%	36	46%	15	19%			2	3%	78
	Retail	11	21%	9	17%	18	34%	7	13%	2	4%	6	11%	53
	Hotels etc	19	44%	12	28%	5	12%	7	16%					43
	Finance etc	9	23%	8	21%	7	18%	4	10%	5	13%	6	15%	39
	Services	15	35%	10	23%	10	23%	3	7%	3	7%	2	5%	43
	Health etc	20	37%	22	41%	8	15%			2	4%	2	4%	54
Group	**Agriculture**	15	38%	11	28%	9	23%	2	5%	1	3%	2	5%	40
	Construction	8	16%	12	24%	16	31%	7	14%	5	10%	3	6%	51
	Ext./Util./Trans	15	13%	28	24%	35	30%	20	17%	6	5%	13	11%	117
	Manufacturing	45	12%	86	23%	109	29%	70	19%	17	5%	46	12%	373
	Services	80	26%	80	26%	84	27%	36	12%	12	4%	18	6%	310
Base		163	18%	217	24%	253	28%	135	15%	41	5%	82	9%	891

Source : Metra Martech - 27/10/00

TABLE 8B-2 : PERSON HOURS SPENT ON INVESTIGATION OF LOST TIME ACCIDENTS BY SIZE

		Lost Time Accidents												Base
		Under 1h		1-2h		02-May		5-10h		10-20h		Over 20h		
Agriculture	Under 10	3	33%	2	22%	3	33%			1	11%			9
	Oct-49	5	56%	2	22%	1	11%	1	11%					9
	50-200	7	37%	6	32%	4	21%					2	11%	19
	Over 200			1	33%	1	33%	1	33%					3
Construction	Under 10	2	33%	2	33%	1	17%	1	17%					6
	Oct-49	2	15%	5	38%	4	31%	2	15%					13
	50-200			3	21%	7	50%	2	14%	1	7%	1	7%	14
	Over 200	4	22%	2	11%	4	22%	2	11%	4	22%	2	11%	18
Ext./Util./Trans	Oct-49	5	18%	11	39%	6	21%	4	14%	1	4%	1	4%	28
	50-200	8	13%	12	20%	17	28%	11	18%	3	5%	10	16%	61
	Over 200	2	7%	5	18%	12	43%	5	18%	2	7%	2	7%	28
Manufacturing	Oct-49	21	24%	32	36%	19	22%	7	8%	1	1%	8	9%	88
	50-200	20	12%	31	18%	51	30%	37	22%	11	6%	20	12%	170
	Over 200	4	3%	23	20%	39	34%	26	23%	5	4%	18	16%	115
Services	Under 10	24	65%	8	22%	3	8%	2	5%					37
	Oct-49	27	32%	26	31%	19	22%	11	13%	1	1%	1	1%	85
	50-200	16	19%	17	20%	30	36%	7	8%	6	7%	8	10%	84
	Over 200	13	13%	29	28%	32	31%	16	15%	5	5%	9	9%	104
Higher Risk	Under 10	5	33%	4	27%	4	27%	1	7%	1	7%			15
	Oct-49	33	24%	50	36%	30	22%	14	10%	2	1%	9	7%	138
	50-200	35	13%	52	20%	79	30%	50	19%	15	6%	33	13%	264
	Over 200	10	6%	31	19%	56	34%	34	21%	11	7%	22	13%	164
Lower Risk	Under 10	24	65%	8	22%	3	8%	2	5%					37
	Oct-49	27	32%	26	31%	19	22%	11	13%	1	1%	1	1%	85
	50-200	16	19%	17	20%	30	36%	7	8%	6	7%	8	10%	84
	Over 200	13	13%	29	28%	32	31%	16	15%	5	5%	9	9%	104
Base		163	18%	217	24%	253	28%	135	15%	41	5%	82	9%	891

Source : Metra Martech - 27/10/00

TABLE 8C-1 : PERSON HOURS SPENT ON INVESTIGATION OF WORK RELATED ILL HEALTH

		Incidents of Work Related Ill Health												Base
		Under 1h		1-2h		02-May		5-10h		10-20h		Over 20h		
Risk	**Higher**	30	6%	70	14%	134	28%	101	21%	54	11%	94	19%	483
	Lower	35	12%	48	17%	68	24%	47	17%	46	16%	38	13%	282
Employees	**Under 10**	19	42%	6	13%	11	24%	2	4%	1	2%	6	13%	45
	Oct-49	20	10%	40	20%	55	27%	35	17%	24	12%	28	14%	202
	50-200	20	7%	36	13%	74	27%	55	20%	40	15%	45	17%	270
	Over 200	6	2%	36	15%	62	25%	56	23%	35	14%	53	21%	248
Sector	**Agriculture**	7	29%	9	38%	4	17%			2	8%	2	8%	24
	Construction	4	11%	6	17%	9	26%	10	29%			6	17%	35
	Mining	1	6%	4	22%	3	17%	1	6%	1	6%	8	44%	18
	Transport	3	5%	5	8%	20	33%	10	17%	9	15%	13	22%	60
	Utilities	1	5%	7	37%	4	21%	1	5%	1	5%	5	26%	19
	Pet. & Chem.	1	1%	10	10%	31	31%	26	26%	16	16%	15	15%	99
	Metals etc			1	25%	1	25%			1	25%	1	25%	4
	Food			2	2%	21	26%	26	32%	9	11%	23	28%	81
	Textiles etc	3	5%	12	20%	19	32%	13	22%	6	10%	7	12%	60
	Machinery etc	9	12%	13	18%	20	27%	12	16%	6	8%	14	19%	74
	Repair	1	11%	1	11%	2	22%	2	22%	3	33%			9
	Wholsale	1	1%	3	4%	9	11%	23	29%	33	41%	11	14%	80
	Retail	6	11%	5	9%	18	33%	8	15%	2	4%	16	29%	55
	Hotels etc	7	16%	18	42%	10	23%	3	7%	4	9%	1	2%	43
	Finance etc	3	13%	2	8%	6	25%	7	29%	1	4%	5	21%	24
	Services	7	21%	10	29%	10	29%	3	9%	3	9%	1	3%	34
	Health etc	11	24%	10	22%	15	33%	3	7%	3	7%	4	9%	46
Group	**Agriculture**	7	29%	9	38%	4	17%			2	8%	2	8%	24
	Construction	4	11%	6	17%	9	26%	10	29%			6	17%	35
	Ext./Util./Trans	5	5%	16	16%	27	28%	12	12%	11	11%	26	27%	97
	Manufacturing	14	4%	39	12%	94	29%	79	24%	41	13%	60	18%	327
	Services	35	12%	48	17%	68	24%	47	17%	46	16%	38	13%	282
Base		65	8%	118	15%	202	26%	148	19%	100	13%	132	17%	765

Source : Metra Martech - 27/10/00

TABLE 8C-2 : PERSON HOURS SPENT ON INVESTIGATION OF WORK RELATED ILL HEALTH BY SIZE

		Incidents of Work Related Ill Health												Base
		Under 1h		1-2h		02-May		5-10h		10-20h		Over 20h		
Agriculture	Under 10	3	43%			3	43%					1	14%	7
	Oct-49	1	33%	1	33%					1	33%			3
	50-200	3	25%	7	58%	1	8%					1	8%	12
	Over 200			1	50%					1	50%			2
Construction	Under 10	2	29%	1	14%	1	14%	1	14%			2	29%	7
	Oct-49			2	15%	3	23%	6	46%			2	15%	13
	50-200			1	13%	4	50%	2	25%			1	13%	8
	Over 200	2	29%	2	29%	1	14%	1	14%			1	14%	7
Ext./Util./Trans	Oct-49	3	12%	7	28%	7	28%	3	12%	2	8%	3	12%	25
	50-200	2	5%	6	14%	12	27%	6	14%	4	9%	14	32%	44
	Over 200			3	11%	8	29%	3	11%	5	18%	9	32%	28
Manufacturing	Oct-49	8	10%	13	16%	25	31%	8	10%	11	14%	15	19%	80
	50-200	6	4%	17	12%	39	27%	37	26%	19	13%	26	18%	144
	Over 200			9	9%	30	29%	34	33%	11	11%	19	18%	103
Services	Under 10	16	42%	6	16%	9	24%	1	3%	2	5%	4	11%	38
	Oct-49	7	8%	17	20%	22	26%	20	23%	12	14%	8	9%	86
	50-200	9	13%	7	10%	17	24%	13	18%	16	22%	10	14%	72
	Over 200	3	3%	18	21%	20	23%	13	15%	16	19%	16	19%	86
Higher Risk	Under 10	5	36%	1	7%	4	29%	1	7%			3	21%	14
	Oct-49	12	10%	23	19%	35	29%	17	14%	14	12%	20	17%	121
	50-200	11	5%	31	15%	56	27%	45	22%	23	11%	42	20%	208
	Over 200	2	1%	15	11%	39	28%	38	27%	17	12%	29	21%	140
Lower Risk	Under 10	16	42%	6	16%	9	24%	1	3%	2	5%	4	11%	38
	Oct-49	7	8%	17	20%	22	26%	20	23%	12	14%	8	9%	86
	50-200	9	13%	7	10%	17	24%	13	18%	16	22%	10	14%	72
	Over 200	3	3%	18	21%	20	23%	13	15%	16	19%	16	19%	86
Base		65	8%	118	15%	202	26%	148	19%	100	13%	132	17%	765

Source : Metra Martech - 27/10/00

TABLE 8D-1 : PERSON HOURS SPENT ON INVESTIGATION OF VERY SERIOUS OR FATAL ACCIDENTS

		Very Serious or Fatal Accidents												Base
		Under 1h		1-2h		02-May		5-10h		10-20h		Over 20h		
Risk	**Higher**	3	1%	5	1%	11	3%	16	4%	27	7%	331	84%	393
	Lower	5	2%	4	2%	8	3%	13	5%	24	10%	192	78%	246
Employees	**Under 10**	3	8%			4	11%	3	8%			28	74%	38
	Oct-49	1	1%	4	3%	2	1%	10	7%	14	9%	121	80%	152
	50-200	3	1%	2	1%	9	4%	8	3%	19	8%	193	82%	234
	Over 200	1	0%	3	1%	4	2%	8	4%	18	8%	181	84%	215
Sector	**Agriculture**	1	5%	1	5%	3	14%	4	18%			13	59%	22
	Construction							2	11%	1	6%	15	83%	18
	Mining	1	6%					1	6%	1	6%	15	83%	18
	Transport									2	3%	61	97%	63
	Utilities							1	7%	3	20%	11	73%	15
	Pet. & Chem.			1	1%	3	3%	2	2%	10	9%	90	85%	106
	Metals etc					1	33%					2	67%	3
	Food									3	21%	11	79%	14
	Textiles etc					3	5%	1	2%	6	10%	49	83%	59
	Machinery etc	1	1%	3	4%	1	1%	2	3%	1	1%	60	88%	68
	Repair							3	43%			4	57%	7
	Wholsale			2	5%	1	3%			8	20%	29	73%	40
	Retail	2	4%			3	6%	3	6%	3	6%	41	79%	52
	Hotels etc			1	2%					2	5%	41	93%	44
	Finance etc	1	3%			3	10%	5	16%	4	13%	18	58%	31
	Services	2	6%			1	3%	4	12%	3	9%	23	70%	33
	Health etc			1	2%			1	2%	4	9%	40	87%	46
Group	**Agriculture**	1	5%	1	5%	3	14%	4	18%			13	59%	22
	Construction							2	11%	1	6%	15	83%	18
	Ext./Util./Trans	1	1%					2	2%	6	6%	87	91%	96
	Manufacturing	1	0%	4	2%	8	3%	8	3%	20	8%	216	84%	257
	Services	5	2%	4	2%	8	3%	13	5%	24	10%	192	78%	246
Base		8	1%	9	1%	19	3%	29	5%	51	8%	523	82%	639

Source : Metra Martech - 27/10/00

TABLE 8D-2 : PERSON HOURS SPENT ON INVESTIGATION OF VERY SERIOUS OR FATAL ACCIDENTS BY SIZE

		Very Serious or Fatal Accidents												Base
		Under 1h		1-2h		02-May		5-10h		10-20h		Over 20h		
Agriculture	Under 10	1	14%			3	43%	2	29%			1	14%	7
	Oct-49			1	33%							2	67%	3
	50-200							1	10%			9	90%	10
	Over 200							1	50%			1	50%	2
Construction	Under 10											3	100%	3
	Oct-49							2	50%			2	50%	4
	50-200									1	17%	5	83%	6
	Over 200											5	100%	5
Ext./Util./Trans	Oct-49							2	8%	2	8%	20	83%	24
	50-200	1	2%							1	2%	47	96%	49
	Over 200									3	13%	20	87%	23
Manufacturing	Oct-49	1	2%	3	5%	2	3%	6	10%	4	7%	44	73%	60
	50-200					5	4%	2	2%	13	11%	99	83%	119
	Over 200			1	1%	1	1%			3	4%	73	94%	78
Services	Under 10	2	6%			1	3%	2	6%			30	86%	35
	Oct-49					2	3%			9	14%	53	83%	64
	50-200	2	4%	2	4%	2	4%	4	8%	4	8%	39	74%	53
	Over 200	1	1%	2	2%	3	3%	7	7%	11	12%	70	74%	94
Higher Risk	Under 10	1	10%			3	30%	2	20%			4	40%	10
	Oct-49	1	1%	4	4%	2	2%	10	11%	6	7%	68	75%	91
	50-200	1	1%			5	3%	3	2%	15	8%	160	87%	184
	Over 200			1	1%	1	1%	1	1%	6	6%	99	92%	108
Lower Risk	Under 10	2	6%			1	3%	2	6%			30	86%	35
	Oct-49					2	3%			9	14%	53	83%	64
	50-200	2	4%	2	4%	2	4%	4	8%	4	8%	39	74%	53
	Over 200	1	1%	2	2%	3	3%	7	7%	11	12%	70	74%	94
Base		8	1%	9	1%	19	3%	29	5%	51	8%	523	82%	639

Source : Metra Martech - 27/10/00

TABLE 8E-1 : PERSON HOURS SPENT ON INVESTIGATION OF ACCIDENTS TO CONTRACTORS' EMPLOYEES

		Accidents to Contractors' Employees																		Base
		Under 1h		1-2h		02-May		5-10h		10-20h		Over 20h		Same as Own Employees		Less than Own Employees		More than Own Employees		
Risk	**Higher**	16	3%	27	6%	37	8%	32	7%	10	2%	36	8%	233	50%	21	4%	56	12%	468
	Lower	18	6%	9	3%	19	6%	17	5%	8	3%	8	3%	187	60%	28	9%	20	6%	314
Employees	**Under 10**	5	11%	5	11%	4	9%	2	5%			3	7%	22	50%	3	7%			44
	Oct-49	9	5%	11	6%	16	8%	13	7%	5	3%	11	6%	96	50%	12	6%	20	10%	193
	50-200	7	2%	11	4%	17	6%	15	5%	4	1%	17	6%	163	57%	19	7%	33	12%	286
	Over 200	13	5%	9	3%	19	7%	19	7%	9	3%	13	5%	139	54%	15	6%	23	9%	259
Sector	**Agriculture**	3	12%	2	8%	4	15%	1	4%	1	4%	3	12%	9	35%	2	8%	1	4%	26
	Construction	3	9%	7	22%	7	22%	8	25%			3	9%	4	13%					32
	Mining	3	21%	3	21%	1	7%	1	7%	1	7%	5	36%							14
	Transport			2	3%	1	1%	2	3%	2	3%	2	3%	46	65%	5	7%	11	15%	71
	Utilities			2	11%	3	16%	2	11%	1	5%			7	37%	2	11%	2	11%	19
	Pet. & Chem.			2	2%			1	1%					83	78%	5	5%	16	15%	107
	Metals etc	1	33%			1	33%							1	33%					3
	Food			3	7%	13	30%	15	34%	4	9%	9	20%							44
	Textiles etc	1	2%	2	3%							1	2%	41	68%	3	5%	12	20%	60
	Machinery etc	5	6%	4	5%	7	9%	1	1%	1	1%	13	16%	35	43%	2	2%	14	17%	82
	Repair							1	10%					7	70%	2	20%			10
	Wholsale					2	3%	2	3%	3	4%			65	84%	3	4%	2	3%	77
	Retail	4	8%	3	6%	4	8%	4	8%	1	2%	3	6%	22	42%	5	9%	7	13%	53
	Hotels etc	8	25%	4	13%	6	19%	3	9%	1	3%			9	28%	1	3%			32
	Finance etc	3	7%	1	2%	2	5%	3	7%	2	5%	3	7%	24	55%	5	11%	1	2%	44
	Services	1	2%	1	2%	3	6%	4	8%	1	2%	2	4%	31	58%	7	13%	3	6%	53
	Health etc	2	4%			2	4%	1	2%					36	65%	7	13%	7	13%	55
Group	**Agriculture**	3	12%	2	8%	4	15%	1	4%	1	4%	3	12%	9	35%	2	8%	1	4%	26
	Construction	3	9%	7	22%	7	22%	8	25%			3	9%	4	13%					32
	Ext./Util./Trans	3	3%	7	7%	5	5%	5	5%	4	4%	7	7%	53	51%	7	7%	13	13%	104
	Manufacturing	7	2%	11	4%	21	7%	18	6%	5	2%	23	8%	167	55%	12	4%	42	14%	306
	Services	18	6%	9	3%	19	6%	17	5%	8	3%	8	3%	187	60%	28	9%	20	6%	314
Base		34	4%	36	5%	56	7%	49	6%	18	2%	44	6%	420	54%	49	6%	76	10%	782

Source : Metra Martech - 27/10/00

TABLE 8E-2 : PERSON HOURS SPENT ON INVESTIGATION OF ACCIDENTS TO CONTRACTORS' EMPLOYEES BY SIZE

		Accidents to Contractors' Employees																		Base
		Under 1h		1-2h		02-May		5-10h		10-20h		Over 20h		Same as Own Employees		Less than Own Employees		More than Own Employees		
Agriculture	Under 10	2	29%	1	14%	2	29%					1	14%			1	14%			7
	Oct-49			1	20%	1	20%							3	60%					5
	50-200	1	9%					1	9%			2	18%	5	45%	1	9%	1	9%	11
	Over 200					1	33%			1	33%			1	33%					3
Construction	Under 10	1	17%	1	17%			1	17%					3	50%					6
	Oct-49			4	36%	2	18%	4	36%					1	9%					11
	50-200					5	63%	2	25%			1	13%							8
	Over 200	2	29%	2	29%			1	14%			2	29%							7
Ext./Util./Trans	Oct-49			3	11%			2	7%			1	4%	16	57%			6	21%	28
	50-200	2	4%	4	8%			1	2%	1	2%	4	8%	29	57%	6	12%	4	8%	51
	Over 200	1	4%			5	20%	2	8%	3	12%	2	8%	8	32%	1	4%	3	12%	25
Manufacturing	Oct-49	5	7%	4	6%	7	10%	2	3%	1	1%	9	13%	26	38%	5	7%	9	13%	68
	50-200	1	1%	4	3%	5	3%	9	6%	1	1%	10	7%	87	61%	3	2%	23	16%	143
	Over 200	1	1%	3	3%	9	9%	7	7%	3	3%	4	4%	54	57%	4	4%	10	11%	95
Services	Under 10	3	7%	3	7%	2	5%	2	5%			3	7%	26	63%	2	5%			41
	Oct-49	3	3%	1	1%	8	9%	5	6%	4	5%			49	57%	9	10%	7	8%	86
	50-200	4	5%	3	4%	5	6%	4	5%	2	3%	4	5%	45	56%	8	10%	5	6%	80
	Over 200	8	7%	2	2%	4	4%	6	6%	2	2%	1	1%	67	63%	9	8%	8	7%	107
Higher Risk	Under 10	3	23%	2	15%	2	15%	1	8%			1	8%	3	23%	1	8%			13
	Oct-49	5	4%	12	11%	10	9%	8	7%	1	1%	10	9%	46	41%	5	4%	15	13%	112
	50-200	4	2%	8	4%	10	5%	13	6%	2	1%	17	8%	121	57%	10	5%	28	13%	213
	Over 200	4	3%	5	4%	15	12%	10	8%	7	5%	8	6%	63	48%	5	4%	13	10%	130
Lower Risk	Under 10	3	7%	3	7%	2	5%	2	5%			3	7%	26	63%	2	5%			41
	Oct-49	3	3%	1	1%	8	9%	5	6%	4	5%			49	57%	9	10%	7	8%	86
	50-200	4	5%	3	4%	5	6%	4	5%	2	3%	4	5%	45	56%	8	10%	5	6%	80
	Over 200	8	7%	2	2%	4	4%	6	6%	2	2%	1	1%	67	63%	9	8%	8	7%	107
Base		34	4%	36	5%	56	7%	49	6%	18	2%	44	6%	420	54%	49	6%	76	10%	782

Source : Metra Martech - 27/10/00

TABLE 8F-1 : PERSON HOURS SPENT ON INVESTIGATION OF ACCIDENTS TO MEMBERS OF THE PUBLIC

		Accidents to Members of the Public																		Base
		Under 1h		1-2h		02-May		5-10h		10-20h		Over 20h		Same as Own Employees		Less than Own Employees		More than Own Employees		
Risk	Higher	14	3%	19	5%	35	9%	26	6%	11	3%	28	7%	190	46%	13	3%	74	18%	410
	Lower	19	6%	18	5%	31	9%	23	7%	13	4%	23	7%	167	51%	6	2%	28	9%	328
Employees	Under 10	2	4%	5	10%	8	16%	3	6%	2	4%	6	12%	21	42%	1	2%	2	4%	50
	Oct-49	11	6%	16	9%	26	15%	13	7%	7	4%	13	7%	69	39%	3	2%	19	11%	177
	50-200	8	3%	10	3%	19	7%	18	6%	8	3%	22	8%	153	53%	11	4%	37	13%	286
	Over 200	12	5%	6	3%	13	6%	15	7%	7	3%	10	4%	114	51%	4	2%	44	20%	225
Sector	Agriculture	2	8%	3	12%	3	12%	3	12%	3	12%	2	8%	8	31%	2	8%			26
	Construction	4	19%	6	29%	6	29%	1	5%					4	19%					21
	Mining	1	9%	1	9%	1	9%	2	18%	1	9%	5	45%							11
	Transport			1	1%			2	3%	2	3%	3	4%	47	66%	2	3%	14	20%	71
	Utilities	1	6%	1	6%	3	17%	2	11%			1	6%	4	22%			6	33%	18
	Pet. & Chem.			2	2%	1	1%							72	70%	4	4%	24	23%	103
	Metals etc					3	100%													3
	Food					4	27%	7	47%	2	13%	2	13%							15
	Textiles etc	1	2%	2	4%	7	13%	5	9%	2	4%	1	2%	22	42%	1	2%	12	23%	53
	Machinery etc	4	5%	2	3%	7	9%	2	3%	1	1%	12	15%	30	38%	2	3%	18	23%	78
	Repair	1	9%	1	9%			2	18%			2	18%	3	27%	2	18%			11
	Wholsale			1	1%	3	4%	2	3%	1	1%	1	1%	62	83%	2	3%	3	4%	75
	Retail	6	10%	4	6%	5	8%	8	13%	4	6%	11	17%	17	27%	1	2%	7	11%	63
	Hotels etc	6	15%	7	17%	10	24%	5	12%	5	12%	3	7%	3	7%	1	2%	1	2%	41
	Finance etc	3	7%			2	5%	1	2%	2	5%	4	10%	25	61%	1	2%	3	7%	41
	Services			1	2%	1	2%	5	9%	1	2%	2	4%	32	60%	1	2%	10	19%	53
	Health etc	4	7%	5	9%	10	18%	2	4%			2	4%	28	51%			4	7%	55
Group	Agriculture	2	8%	3	12%	3	12%	3	12%	3	12%	2	8%	8	31%	2	8%			26
	Construction	4	19%	6	29%	6	29%	1	5%					4	19%					21
	Ext./Util./Trans	2	2%	3	3%	4	4%	6	6%	3	3%	9	9%	51	51%	2	2%	20	20%	100
	Manufacturing	6	2%	7	3%	22	8%	16	6%	5	2%	17	6%	127	48%	9	3%	54	21%	263
	Services	19	6%	18	5%	31	9%	23	7%	13	4%	23	7%	167	51%	6	2%	28	9%	328
Base		33	4%	37	5%	66	9%	49	7%	24	3%	51	7%	357	48%	19	3%	102	14%	738

Source : Metra Martech - 27/10/00

TABLE 8F-2 : PERSON HOURS SPENT ON INVESTIGATION OF ACCIDENTS TO MEMBERS OF THE PUBLIC BY SIZE

		Accidents to Members of the Public																		Base
		Under 1h		1-2h		02-May		5-10h		10-20h		Over 20h		Same as Own Employees		Less than Own Employees		More than Own Employees		
Agriculture	Under 10	2	29%	1	14%	2	29%			1	14%			1	14%					7
	Oct-49					1	20%	2	40%					2	40%					5
	50-200			2	17%			1	8%	1	8%	2	17%	5	42%	1	8%			12
	Over 200									1	50%					1	50%			2
Construction	Under 10			1	25%									3	75%					4
	Oct-49			3	75%									1	25%					4
	50-200					6	86%	1	14%											7
	Over 200	4	67%	2	33%															6
Ext./Util./Trans	Oct-49			1	4%	1	4%	2	7%	1	4%			14	52%			8	30%	27
	50-200	2	4%	1	2%	1	2%	1	2%	1	2%	8	15%	31	58%	2	4%	6	11%	53
	Over 200			1	5%	2	10%	3	15%	1	5%	1	5%	6	30%			6	30%	20
Manufacturing	Oct-49	5	9%	5	9%	11	19%	4	7%	1	2%	8	14%	15	26%	3	5%	6	10%	58
	50-200	1	1%	2	2%	7	5%	8	6%	3	2%	7	5%	68	53%	4	3%	28	22%	128
	Over 200					4	5%	4	5%	1	1%	2	3%	44	57%	2	3%	20	26%	77
Services	Under 10			4	9%	8	17%	4	9%	1	2%	7	15%	19	40%	1	2%	3	6%	47
	Oct-49	7	8%	9	10%	13	14%	5	5%	5	5%	6	7%	41	45%	1	1%	5	5%	92
	50-200	5	6%	3	3%	4	5%	7	8%	3	3%	6	7%	51	59%	3	3%	4	5%	86
	Over 200	7	7%	2	2%	6	6%	7	7%	4	4%	4	4%	56	54%	1	1%	16	16%	103
Higher Risk	Under 10	2	18%	2	18%	2	18%			1	9%			4	36%					11
	Oct-49	5	5%	9	10%	13	14%	8	9%	2	2%	8	9%	32	34%	3	3%	14	15%	94
	50-200	3	2%	5	3%	14	7%	11	6%	5	3%	17	9%	104	52%	7	4%	34	17%	200
	Over 200	4	4%	3	3%	6	6%	7	7%	3	3%	3	3%	50	48%	3	3%	26	25%	105
Lower Risk	Under 10			4	9%	8	17%	4	9%	1	2%	7	15%	19	40%	1	2%	3	6%	47
	Oct-49	7	8%	9	10%	13	14%	5	5%	5	5%	6	7%	41	45%	1	1%	5	5%	92
	50-200	5	6%	3	3%	4	5%	7	8%	3	3%	6	7%	51	59%	3	3%	4	5%	86
	Over 200	7	7%	2	2%	6	6%	7	7%	4	4%	4	4%	56	54%	1	1%	16	16%	103
Base		33	4%	37	5%	66	9%	49	7%	24	3%	51	7%	357	48%	19	3%	102	14%	738

Source : Metra Martech - 27/10/00

TABLE 8G-1 : PERSON HOURS SPENT ON INVESTIGATION OF INCIDENTS OF VIOLENCE TO EMPLOYEES

		Incidents of Violence to Employees												Base
		Under 1h		1-2h		02-May		5-10h		10-20h		Over 20h		
Risk	**Higher**	3	1%	37	11%	120	35%	94	28%	32	9%	53	16%	339
	Lower	5	3%	39	20%	55	28%	42	21%	24	12%	31	16%	196
Employees	**Under 10**	1	3%	4	14%	9	31%	7	24%	2	7%	6	21%	29
	Oct-49	2	2%	25	21%	47	40%	24	21%	4	3%	15	13%	117
	50-200	1	0%	19	9%	63	30%	59	28%	25	12%	43	20%	210
	Over 200	4	2%	28	16%	56	31%	46	26%	25	14%	20	11%	179
Sector	**Agriculture**			2	11%	5	26%	4	21%	3	16%	5	26%	19
	Construction	2	13%	5	33%	6	40%	2	13%					15
	Mining			4	33%			2	17%	2	17%	4	33%	12
	Transport			3	5%	23	42%	11	20%	5	9%	13	24%	55
	Utilities			1	6%	6	33%	4	22%	1	6%	6	33%	18
	Pet. & Chem.			16	16%	32	33%	37	38%	7	7%	6	6%	98
	Metals etc	1	50%			1	50%							2
	Food					4	27%	7	47%	2	13%	2	13%	15
	Textiles etc			3	6%	15	32%	14	30%	8	17%	7	15%	47
	Machinery etc			3	5%	26	47%	12	22%	4	7%	10	18%	55
	Repair					2	67%	1	33%					3
	Wholsale			16	57%	6	21%	3	11%	1	4%	2	7%	28
	Retail			6	14%	13	30%	8	18%	8	18%	9	20%	44
	Hotels etc	4	10%	7	17%	9	22%	10	24%	6	15%	5	12%	41
	Finance etc	1	5%	1	5%	4	20%	7	35%	3	15%	4	20%	20
	Services			5	18%	8	29%	6	21%	4	14%	5	18%	28
	Health etc			4	11%	15	43%	8	23%	2	6%	6	17%	35
Group	**Agriculture**			2	11%	5	26%	4	21%	3	16%	5	26%	19
	Construction	2	13%	5	33%	6	40%	2	13%					15
	Ext./Util./Trans			8	9%	29	34%	17	20%	8	9%	23	27%	85
	Manufacturing	1	0%	22	10%	80	36%	71	32%	21	10%	25	11%	220
	Services	5	3%	39	20%	55	28%	42	21%	24	12%	31	16%	196
Base		8	1%	76	14%	175	33%	136	25%	56	10%	84	16%	535
Source : Metra Martech - 27/10/00														

TABLE 8G-2 : PERSON HOURS SPENT ON INVESTIGATION OF INCIDENTS OF VIOLENCE TO EMPLOYEES BY SIZE

		Incidents of Violence to Employees												Base
		Under 1h		1-2h		02-May		5-10h		10-20h		Over 20h		
Agriculture	Under 10			1	20%	2	40%	1	20%	1	20%			5
	Oct-49							2	100%					2
	50-200			1	11%	1	11%	1	11%	1	11%	5	56%	9
	Over 200					2	67%			1	33%			3
Construction	Under 10			1	33%	1	33%	1	33%					3
	Oct-49			2	100%									2
	50-200					5	83%	1	17%					6
	Over 200	2	50%	2	50%									4
Ext./Util./Trans	Oct-49			5	26%	6	32%	4	21%	1	5%	3	16%	19
	50-200			3	7%	12	27%	9	20%	5	11%	16	36%	45
	Over 200					11	52%	4	19%	2	10%	4	19%	21
Manufacturing	Oct-49			8	20%	20	49%	8	20%			5	12%	41
	50-200			6	5%	35	32%	38	34%	16	14%	16	14%	111
	Over 200	1	1%	8	12%	25	37%	25	37%	5	7%	4	6%	68
Services	Under 10	1	4%	2	7%	10	36%	7	25%	1	4%	7	25%	28
	Oct-49	2	4%	13	23%	19	34%	10	18%	3	5%	9	16%	56
	50-200	1	2%	6	15%	10	24%	9	22%	8	20%	7	17%	41
	Over 200	1	1%	18	25%	16	23%	16	23%	12	17%	8	11%	71
Higher Risk	Under 10			2	25%	3	38%	2	25%	1	13%			8
	Oct-49			15	23%	26	41%	14	22%	1	2%	8	13%	64
	50-200			10	6%	53	31%	49	29%	22	13%	37	22%	171
	Over 200	3	3%	10	10%	38	40%	29	30%	8	8%	8	8%	96
Lower Risk	Under 10	1	4%	2	7%	10	36%	7	25%	1	4%	7	25%	28
	Oct-49	2	4%	13	23%	19	34%	10	18%	3	5%	9	16%	56
	50-200	1	2%	6	15%	10	24%	9	22%	8	20%	7	17%	41
	Over 200	1	1%	18	25%	16	23%	16	23%	12	17%	8	11%	71
Base		8	1%	76	14%	175	33%	136	25%	56	10%	84	16%	535

Source : Metra Martech - 27/10/00

TABLE 8H-1 : PERSON HOURS SPENT ON INVESTIGATION OF NEAR MISSES WITH NO INJURY

		Near Misses Involving No Injury												Base
		Under 1h		1-2h		02-May		5-10h		10-20h		Over 20h		
Risk	**Higher**	54	15%	67	18%	97	26%	73	20%	31	8%	47	13%	369
	Lower	30	15%	41	20%	59	29%	27	13%	27	13%	19	9%	203
Employees	**Under 10**	6	25%	6	25%	7	29%	4	17%			1	4%	24
	Oct-49	23	20%	26	23%	42	37%	12	11%	4	4%	6	5%	113
	50-200	31	15%	37	17%	45	21%	43	20%	26	12%	31	15%	213
	Over 200	24	11%	39	18%	62	28%	41	18%	28	13%	28	13%	222
Sector	**Agriculture**	6	24%	3	12%	5	20%	3	12%	2	8%	6	24%	25
	Construction	4	22%	5	28%	3	17%	4	22%	1	6%	1	6%	18
	Mining	3	19%	2	13%	4	25%	2	13%	1	6%	4	25%	16
	Transport	8	15%	11	20%	13	24%	12	22%	5	9%	6	11%	55
	Utilities			4	24%	7	41%	1	6%	3	18%	2	12%	17
	Pet. & Chem.	12	12%	14	14%	29	28%	27	26%	9	9%	11	11%	102
	Metals etc	1	50%									1	50%	2
	Food	3	33%	3	33%	1	11%	1	11%			1	11%	9
	Textiles etc	2	4%	7	15%	14	30%	10	21%	7	15%	7	15%	47
	Machinery etc	13	19%	15	22%	18	26%	12	18%	3	4%	7	10%	68
	Repair	2	20%	3	30%	3	30%	1	10%			1	10%	10
	Wholsale	4	8%	16	33%	17	35%	7	15%	3	6%	1	2%	48
	Retail	6	17%	5	14%	8	22%	4	11%	7	19%	6	17%	36
	Hotels etc	2	7%	7	26%	11	41%	3	11%	3	11%	1	4%	27
	Finance etc	8	29%	1	4%	5	18%	6	21%	3	11%	5	18%	28
	Services	3	9%	6	19%	9	28%	3	9%	7	22%	4	13%	32
	Health etc	7	22%	6	19%	9	28%	4	13%	4	13%	2	6%	32
Group	**Agriculture**	6	24%	3	12%	5	20%	3	12%	2	8%	6	24%	25
	Construction	4	22%	5	28%	3	17%	4	22%	1	6%	1	6%	18
	Ext./Util./Trans	11	13%	17	19%	24	27%	15	17%	9	10%	12	14%	88
	Manufacturing	33	14%	42	18%	65	27%	51	21%	19	8%	28	12%	238
	Services	30	15%	41	20%	59	29%	27	13%	27	13%	19	9%	203
Base		84	15%	108	19%	156	27%	100	17%	58	10%	66	12%	572

Source : Metra Martech - 27/10/00

TABLE 8H-2 : PERSON HOURS SPENT ON INVESTIGATION OF NEAR MISSES WITH NO INJURY BY SIZE

		Near Misses Involving No Injury												Base
		Under 1h		1-2h		02-May		5-10h		10-20h		Over 20h		
Agriculture	**Under 10**	2	29%	1	14%	2	29%	1	14%			1	14%	7
	Oct-49			1	25%	1	25%	1	25%	1	25%			4
	50-200	4	36%	1	9%			1	9%			5	45%	11
	Over 200					2	67%			1	33%			3
Construction	**Under 10**					1	50%	1	50%					2
	Oct-49			1	100%									1
	50-200					1	100%							1
	Over 200	4	29%	4	29%	1	7%	3	21%	1	7%	1	7%	14
Ext./Util./Trans	**Oct-49**	3	14%	6	29%	6	29%	3	14%	2	10%	1	5%	21
	50-200	7	16%	10	23%	7	16%	7	16%	5	11%	8	18%	44
	Over 200	1	4%	1	4%	11	48%	5	22%	2	9%	3	13%	23
Manufacturing	**Under 10**			1	100%									1
	Oct-49	13	26%	12	24%	19	38%	3	6%			3	6%	50
	50-200	11	10%	19	18%	26	24%	25	23%	11	10%	15	14%	107
	Over 200	9	11%	10	13%	20	25%	23	29%	8	10%	10	13%	80
Services	**Under 10**	5	28%	4	22%	6	33%	2	11%	1	6%			18
	Oct-49	10	23%	8	19%	15	35%	7	16%			3	7%	43
	50-200	6	11%	8	15%	13	24%	8	15%	14	26%	5	9%	54
	Over 200	9	10%	21	24%	25	28%	10	11%	12	14%	11	13%	88
Higher Risk	**Under 10**	2	20%	2	20%	3	30%	2	20%			1	10%	10
	Oct-49	16	21%	20	26%	26	34%	7	9%	3	4%	4	5%	76
	50-200	22	13%	30	18%	34	21%	33	20%	16	10%	28	17%	163
	Over 200	14	12%	15	13%	34	28%	31	26%	12	10%	14	12%	120
Lower Risk	**Under 10**	5	28%	4	22%	6	33%	2	11%	1	6%			18
	Oct-49	10	23%	8	19%	15	35%	7	16%			3	7%	43
	50-200	6	11%	8	15%	13	24%	8	15%	14	26%	5	9%	54
	Over 200	9	10%	21	24%	25	28%	10	11%	12	14%	11	13%	88
Base		84	15%	108	19%	156	27%	100	17%	58	10%	66	12%	572

Source : Metra Martech - 27/10/00

TABLE 9A-1 : WHAT ARE THE STANDARD RULES FOR INVESTIGATIONS OF INCIDENTS?

		Standard rules for investigation team?			Standard rules for others involved?			Standard questions to address?			Base
		Yes	No	DK	Yes	No	DK	Yes	No	DK	
Risk	Higher	77%	21%	2%	67%	29%	4%	57%	38%	4%	949
	Lower	69%	25%	5%	55%	38%	6%	48%	45%	7%	555
Employees	Under 10	41%	44%	15%	27%	57%	16%	18%	62%	20%	168
	Oct-49	67%	30%	3%	53%	43%	4%	44%	52%	4%	384
	50-200	78%	20%	2%	67%	30%	3%	58%	39%	3%	553
	Over 200	89%	9%	2%	82%	16%	3%	73%	24%	3%	399
Sector	Agriculture	61%	32%	7%	52%	38%	10%	23%	61%	16%	69
	Construction	80%	18%	2%	71%	25%	4%	63%	31%	6%	111
	Mining	79%	21%		64%	36%		68%	32%		28
	Transport	73%	27%		66%	34%		62%	36%	2%	102
	Utilities	85%	15%		81%	19%		62%	35%	4%	26
	Pet. & Chem.	78%	22%	1%	70%	28%	2%	60%	39%	1%	125
	Metals etc	87%	8%	5%	81%	14%	5%	61%	34%	5%	111
	Food	78%	20%	2%	69%	28%	2%	75%	23%	2%	95
	Textiles etc	84%	11%	5%	68%	25%	7%	48%	44%	7%	124
	Machinery etc	71%	27%	2%	58%	39%	3%	56%	42%	2%	131
	Repair	59%	41%		44%	56%		48%	52%		27
	Wholsale	81%	17%	2%	65%	33%	2%	54%	45%	1%	109
	Retail	58%	29%	14%	44%	41%	14%	41%	42%	17%	111
	Hotels etc	57%	41%	1%	41%	56%	3%	36%	56%	8%	75
	Finance etc	74%	17%	9%	61%	27%	12%	59%	31%	10%	93
	Services	65%	31%	4%	54%	43%	4%	37%	58%	5%	84
	Health etc	80%	19%	1%	66%	34%		61%	39%		83
Group	Agriculture	61%	32%	7%	52%	38%	10%	1%	3%	1%	69
	Construction	80%	18%	2%	71%	25%	4%	5%	2%	0%	111
	Ext./Util./Trans	76%	24%		68%	32%		7%	4%	0%	156
	Manufacturing	78%	19%	3%	68%	29%	4%	24%	15%	1%	613
	Services	69%	25%	5%	55%	38%	6%	18%	16%	3%	555
Total		74%	22%	4%	63%	33%	5%	54%	41%	5%	1504

Source : Metra Martech - 27/10/00

TABLE 9A-2 : WHAT ARE THE STANDARD RULES FOR INVESTIGATIONS OF INCIDENTS? BY SIZE

		Standard rules for investigation team?			Standard rules for others involved?			Standard questions to address?			Base
		Yes	No	DK	Yes	No	DK	Yes	No	DK	
Agriculture	Under 10	50%	33%	17%	38%	38%	25%	13%	58%	29%	24
	Oct-49	53%	47%		47%	53%		18%	71%	12%	17
	50-200	77%	23%		68%	32%		32%	64%	5%	22
	Over 200	67%	17%	17%	67%	17%	17%	50%	33%	17%	6
Construction	Under 10	50%	43%	7%	30%	60%	10%	13%	63%	23%	30
	Oct-49	89%	11%		83%	17%		71%	29%		35
	50-200	95%	5%		86%	9%	5%	95%	5%		22
	Over 200	92%	8%		92%	8%		83%	17%		24
Ext./Util./Trans	Oct-49	60%	40%		50%	50%		57%	40%	2%	42
	50-200	77%	23%		68%	32%		59%	38%	3%	79
	Over 200	91%	9%		89%	11%		77%	23%		35
Manufacturing	Under 10	36%	64%		9%	91%		27%	73%		11
	Oct-49	68%	28%	4%	52%	42%	5%	43%	53%	4%	165
	50-200	78%	19%	3%	67%	29%	4%	57%	40%	3%	272
	Over 200	92%	7%	1%	88%	10%	2%	80%	18%	2%	165
Services	Under 10	42%	43%	16%	32%	53%	15%	26%	58%	17%	120
	Oct-49	67%	29%	4%	50%	45%	5%	41%	53%	5%	147
	50-200	80%	19%	1%	64%	34%	2%	60%	38%	3%	154
	Over 200	85%	12%	3%	72%	23%	4%	63%	32%	5%	134
Higher Risk	Under 10	48%	43%	9%	29%	57%	14%	15%	63%	22%	65
	Oct-49	68%	29%	2%	56%	41%	3%	47%	49%	4%	259
	50-200	79%	19%	2%	69%	28%	3%	58%	39%	3%	395
	Over 200	91%	7%	1%	88%	10%	2%	79%	19%	2%	230
Lower Risk	Under 10	42%	43%	16%	32%	53%	15%	26%	58%	17%	120
	Oct-49	67%	29%	4%	50%	45%	5%	41%	53%	5%	147
	50-200	80%	19%	1%	64%	34%	2%	60%	38%	3%	154
	Over 200	85%	12%	3%	72%	23%	4%	63%	32%	5%	134
Total		74%	22%	4%	63%	33%	5%	54%	41%	5%	1504

Source : Metra Martech - 27/10/00

TABLE 9B-1 : WHAT USE IS MADE OF THE RESULTS OF INVESTIGATIONS?

		Results reviewed by senior mgt?			Results reviewed by a safety committee?			Results referred to head office?			Results used in prevention?			Results analysed for trends?			Base
		Yes	No	DK	Yes	No	DK	Yes	No	DK	Yes	No	DK	Yes	No	DK	
Risk	**Higher**	87%	9%	4%	58%	34%	8%	58%	14%	28%	88%	6%	6%	63%	26%	11%	949
	Lower	79%	12%	9%	34%	41%	25%	54%	20%	25%	81%	9%	10%	46%	35%	19%	555
Employees	**Under 10**	54%	27%	20%	9%	60%	31%	25%	48%	27%	64%	18%	17%	16%	52%	32%	168
	Oct-49	83%	13%	4%	34%	47%	20%	51%	21%	29%	82%	11%	7%	41%	41%	18%	384
	50-200	91%	6%	3%	57%	35%	9%	59%	10%	31%	92%	3%	5%	62%	28%	10%	553
	Over 200	88%	6%	6%	71%	18%	11%	73%	9%	19%	89%	3%	8%	80%	11%	9%	399
Sector	**Agriculture**	78%	12%	10%	30%	46%	23%	54%	20%	26%	78%	9%	13%	36%	41%	23%	69
	Construction	77%	14%	8%	48%	39%	14%	71%	14%	15%	76%	13%	12%	56%	25%	19%	111
	Mining	96%	4%		61%	32%	7%	79%	11%	11%	86%	7%	7%	75%	11%	14%	28
	Transport	92%	6%	2%	48%	45%	7%	50%	13%	37%	92%	4%	4%	53%	29%	18%	102
	Utilities	96%	4%		58%	38%	4%	81%	12%	8%	96%	4%		81%	15%	4%	26
	Pet. & Chem.	97%	3%		77%	23%		42%	6%	53%	98%	2%	1%	76%	18%	6%	125
	Metals etc	93%	3%	5%	68%	25%	6%	44%	9%	47%	95%	1%	5%	77%	16%	6%	111
	Food	80%	18%	2%	81%	17%	2%	79%	19%	2%	89%	8%	2%	75%	21%	4%	95
	Textiles etc	91%	3%	6%	54%	34%	12%	74%	6%	19%	92%	2%	6%	60%	31%	9%	124
	Machinery etc	82%	12%	6%	56%	37%	7%	47%	25%	28%	84%	8%	8%	56%	31%	13%	131
	Repair	74%	26%		26%	56%	19%	52%	41%	7%	74%	19%	7%	41%	48%	11%	27
	Wholsale	90%	9%	1%	45%	54%	1%	57%	20%	23%	95%	4%	1%	69%	27%	5%	109
	Retail	73%	12%	15%	30%	41%	29%	54%	17%	29%	77%	9%	14%	38%	37%	25%	111
	Hotels etc	57%	29%	13%	8%	64%	28%	19%	51%	31%	41%	29%	29%	13%	55%	32%	75
	Finance etc	80%	6%	14%	47%	34%	18%	72%	10%	18%	87%	3%	10%	49%	30%	20%	93
	Services	76%	15%	8%	36%	43%	21%	56%	18%	26%	88%	7%	5%	45%	37%	18%	84
	Health etc	93%	5%	2%	31%	7%	61%	63%	12%	25%	88%	5%	7%	53%	31%	16%	83
Group	**Agriculture**	78%	12%	10%	30%	46%	23%	2%	1%	1%	4%	0%	1%	2%	2%	1%	69
	Construction	77%	14%	8%	48%	39%	14%	5%	1%	1%	6%	1%	1%	4%	2%	1%	111
	Ext./Util./Trans	94%	5%	1%	52%	42%	6%	6%	1%	3%	10%	0%	0%	6%	2%	2%	156
	Manufacturing	88%	8%	4%	65%	29%	6%	23%	6%	12%	37%	2%	2%	27%	10%	3%	613
	Services	79%	12%	9%	34%	41%	25%	20%	8%	9%	30%	3%	4%	17%	13%	7%	555
Total		84%	10%	6%	49%	36%	15%	57%	16%	27%	85%	7%	8%	56%	29%	14%	1504

Source : Metra Martech - 27/10/00

TABLE 9B-2 : WHAT USE IS MADE OF THE RESULTS OF INVESTIGATIONS? BY SIZE

		Results reviewed by senior mgt?			Results reviewed by a safety committee?			Results referred to head office?			Results used in prevention?			Results analysed for trends?			Base
		Yes	No	DK	Yes	No	DK	Yes	No	DK	Yes	No	DK	Yes	No	DK	
Agriculture	Under 10	67%	17%	17%	17%	67%	17%	38%	38%	25%	71%	8%	21%	25%	38%	38%	24
	Oct-49	88%	12%		29%	41%	29%	53%	18%	29%	88%	12%		24%	71%	6%	17
	50-200	91%	5%	5%	45%	36%	18%	77%	5%	18%	91%	5%	5%	59%	27%	14%	22
	Over 200	50%	17%	33%	33%	17%	50%	33%	17%	50%	33%	17%	50%	33%	17%	50%	6
Construction	Under 10	47%	33%	20%	10%	67%	23%	33%	30%	37%	53%	27%	20%	17%	47%	37%	30
	Oct-49	91%	9%		57%	37%	6%	89%	9%	3%	86%	9%	6%	63%	26%	11%	35
	50-200	91%	5%	5%	64%	23%	14%	86%	5%	9%	86%	5%	9%	73%	14%	14%	22
	Over 200	83%	8%	8%	67%	21%	13%	79%	8%	13%	79%	8%	13%	79%	8%	13%	24
Ext./Util./Trans	Oct-49	86%	10%	5%	24%	64%	12%	40%	17%	43%	79%	12%	10%	36%	29%	36%	42
	50-200	99%	1%		54%	41%	5%	63%	9%	28%	97%	1%	1%	66%	27%	8%	79
	Over 200	91%	9%		80%	17%	3%	77%	14%	9%	94%	3%	3%	83%	11%	6%	35
Manufacturing	Under 10	55%	45%		9%	82%	9%	18%	82%		64%	36%		18%	82%		11
	Oct-49	84%	12%	4%	45%	43%	12%	53%	18%	30%	84%	10%	7%	45%	39%	16%	165
	50-200	90%	7%	3%	68%	28%	4%	54%	13%	33%	93%	3%	4%	69%	25%	6%	272
	Over 200	91%	5%	4%	82%	14%	4%	65%	8%	27%	96%	1%	4%	90%	7%	4%	165
Services	Under 10	56%	24%	20%	8%	55%	37%	24%	52%	24%	68%	17%	15%	19%	53%	28%	120
	Oct-49	81%	14%	5%	22%	45%	33%	48%	21%	31%	82%	12%	7%	42%	40%	18%	147
	50-200	88%	7%	5%	45%	42%	12%	65%	6%	29%	90%	4%	6%	51%	34%	15%	154
	Over 200	86%	6%	8%	56%	22%	22%	77%	7%	16%	81%	4%	15%	69%	15%	16%	134
Higher Risk	Under 10	55%	29%	15%	12%	69%	18%	32%	42%	26%	62%	22%	17%	20%	49%	31%	65
	Oct-49	85%	11%	3%	42%	46%	12%	56%	16%	28%	83%	10%	7%	44%	37%	18%	259
	50-200	92%	5%	3%	64%	30%	6%	59%	11%	30%	93%	3%	4%	68%	25%	7%	395
	Over 200	89%	6%	5%	79%	15%	6%	68%	9%	23%	92%	2%	6%	86%	8%	6%	230
Lower Risk	Under 10	56%	24%	20%	8%	55%	37%	24%	52%	24%	68%	17%	15%	19%	53%	28%	120
	Oct-49	81%	14%	5%	22%	45%	33%	48%	21%	31%	82%	12%	7%	42%	40%	18%	147
	50-200	88%	7%	5%	45%	42%	12%	65%	6%	29%	90%	4%	6%	51%	34%	15%	154
	Over 200	86%	6%	8%	56%	22%	22%	77%	7%	16%	81%	4%	15%	69%	15%	16%	134
Total		84%	10%	6%	49%	36%	15%	57%	16%	27%	85%	7%	8%	56%	29%	14%	1504

Source : Metra Martech - 27/10/00

TABLE 9C-1 : WHERE ARE RESULTS OF INVESTIGATIONS RECORDED?

		Incident recorded in accident book?			Investigation results recorded in same book?			Investigation (also) recorded in separate file?			'Near Miss' investigations recorded in same			Base
		Yes	No	DK	Yes	No	DK	Yes	No	DK	Yes	No	DK	
Risk	**Higher**	94%	5%	1%	47%	49%	4%	72%	25%	4%	58%	32%	11%	949
	Lower	91%	5%	4%	54%	38%	8%	56%	35%	9%	43%	40%	17%	555
Employees	**Under 10**	63%	27%	11%	51%	36%	13%	22%	60%	18%	20%	55%	25%	168
	Oct-49	95%	4%	2%	56%	38%	5%	61%	34%	5%	39%	41%	20%	384
	50-200	99%	1%	1%	48%	48%	4%	71%	25%	4%	61%	28%	11%	553
	Over 200	96%	3%	1%	44%	53%	3%	82%	15%	3%	66%	29%	5%	399
Sector	**Agriculture**	80%	16%	4%	38%	55%	7%	51%	42%	7%	22%	48%	30%	69
	Construction	86%	12%	3%	50%	47%	4%	71%	22%	7%	50%	37%	14%	111
	Mining	96%	4%		54%	46%		86%	11%	4%	71%	25%	4%	28
	Transport	96%	3%	1%	49%	49%	2%	80%	20%		71%	26%	3%	102
	Utilities	85%	15%		31%	69%		85%	15%		54%	31%	15%	26
	Pet. & Chem.	96%	4%		26%	73%	2%	83%	17%		75%	21%	4%	125
	Metals etc	99%		1%	41%	56%	4%	75%	23%	3%	66%	27%	7%	111
	Food	100%			71%	25%	4%	75%	20%	5%	55%	37%	8%	95
	Textiles etc	98%	1%	1%	53%	42%	5%	70%	25%	5%	56%	27%	16%	124
	Machinery etc	95%	2%	2%	51%	41%	8%	60%	36%	5%	51%	37%	12%	131
	Repair	89%	11%		48%	52%		59%	41%		56%	41%	4%	27
	Wholsale	94%	6%	1%	42%	52%	6%	60%	38%	3%	53%	34%	13%	109
	Retail	86%	4%	11%	46%	39%	15%	58%	23%	19%	45%	34%	21%	111
	Hotels etc	89%	9%	1%	84%	13%	3%	27%	68%	5%	11%	77%	12%	75
	Finance etc	94%	1%	5%	47%	42%	11%	65%	22%	14%	55%	28%	17%	93
	Services	88%	11%	1%	43%	49%	8%	55%	36%	10%	40%	35%	25%	84
	Health etc	96%	4%		72%	28%		65%	31%	4%	45%	41%	14%	83
Group	**Agriculture**	80%	16%	4%	38%	55%	7%	2%	2%	0%	1%	2%	1%	69
	Construction	86%	12%	3%	50%	47%	4%	5%	2%	1%	4%	3%	1%	111
	Ext./Util./Trans	94%	5%	1%	47%	52%	1%	9%	2%	0%	7%	3%	1%	156
	Manufacturing	97%	2%	1%	47%	48%	4%	29%	10%	1%	25%	12%	4%	613
	Services	91%	5%	4%	54%	38%	8%	21%	13%	3%	16%	15%	6%	555
Total		93%	5%	2%	49%	45%	5%	66%	28%	6%	52%	35%	13%	1504
Source : Metra Martech - 27/10/00														

TABLE 9C-2 : WHERE ARE RESULTS OF INVESTIGATIONS RECORDED? BY SIZE

		Incident recorded in accident book?			Investigation results recorded in same book?			Investigation (also) recorded in separate file?			'Near Miss' investigations recorded in same			Base
		Yes	No	DK	Yes	No	DK	Yes	No	DK	Yes	No	DK	
Agriculture	Under 10	42%	46%	13%	33%	50%	17%	29%	58%	13%	17%	42%	42%	24
	Oct-49	100%			47%	47%	6%	65%	35%		29%	47%	24%	17
	50-200	100%			27%	73%		64%	27%	9%	18%	50%	32%	22
	Over 200	100%			67%	33%		50%	50%		33%	67%		6
Construction	Under 10	63%	30%	7%	47%	47%	7%	33%	53%	13%	33%	53%	13%	30
	Oct-49	91%	9%		40%	60%		86%	14%		43%	31%	26%	35
	50-200	100%			77%	18%	5%	86%	9%	5%	64%	32%	5%	22
	Over 200	92%	4%	4%	42%	54%	4%	83%	4%	13%	67%	29%	4%	24
Ext./Util./Trans	Oct-49	90%	7%	2%	64%	36%		74%	24%	2%	62%	26%	12%	42
	50-200	96%	4%		37%	62%	1%	82%	18%		73%	23%	4%	79
	Over 200	94%	6%		49%	49%	3%	91%	9%		63%	37%		35
Manufacturing	Under 10	82%	18%		55%	45%		27%	73%		18%	82%		11
	Oct-49	96%	2%	2%	50%	42%	8%	62%	31%	7%	43%	36%	21%	165
	50-200	99%		1%	47%	49%	4%	69%	28%	3%	62%	30%	8%	272
	Over 200	96%	4%		45%	54%	1%	87%	12%	1%	78%	21%	1%	165
Services	Under 10	68%	21%	11%	56%	31%	13%	22%	59%	19%	19%	56%	25%	120
	Oct-49	97%	2%	1%	65%	28%	7%	56%	37%	7%	40%	42%	18%	147
	50-200	98%	1%	1%	52%	42%	6%	66%	26%	8%	53%	30%	17%	154
	Over 200	97%		3%	43%	52%	5%	73%	22%	5%	55%	35%	10%	134
Higher Risk	Under 10	58%	34%	8%	43%	48%	9%	31%	58%	11%	25%	54%	22%	65
	Oct-49	95%	4%	2%	51%	44%	5%	68%	28%	5%	45%	34%	20%	259
	50-200	99%	1%	1%	46%	51%	3%	73%	25%	3%	62%	30%	8%	395
	Over 200	96%	4%	0%	46%	53%	2%	87%	12%	2%	73%	26%	1%	230
Lower Risk	Under 10	68%	21%	11%	56%	31%	13%	22%	59%	19%	19%	56%	25%	120
	Oct-49	97%	2%	1%	65%	28%	7%	56%	37%	7%	40%	42%	18%	147
	50-200	98%	1%	1%	52%	42%	6%	66%	26%	8%	53%	30%	17%	154
	Over 200	97%		3%	43%	52%	5%	73%	22%	5%	55%	35%	10%	134
Total		93%	5%	2%	49%	45%	5%	66%	28%	6%	52%	35%	13%	1504

Source : Metra Martech - 27/10/00

TABLE 10-1 : HOW MANY PEOPLE HAVE HAD TRAINING IN ACCIDENT INVESTIGATION?

		None	One	02-May	06-Oct	Nov-20	21-100	100+	DK/NA	Base
Risk	**Higher**	45%	12%	17%	7%	6%	6%	2%	5%	949
	Lower	57%	10%	13%	4%	3%	3%	2%	8%	555
Employees	**Under 10**	86%	4%	6%	1%				3%	168
	Oct-49	66%	10%	13%	4%	1%	1%	0%	5%	384
	50-200	47%	15%	19%	7%	4%	1%	0%	7%	553
	Over 200	21%	11%	16%	10%	12%	15%	8%	8%	399
Sector	**Agriculture**	64%	9%	13%	1%		1%	3%	9%	69
	Construction	43%	7%	15%	15%	6%	6%	1%	5%	111
	Mining	43%	11%	11%	4%	11%	4%	11%	7%	28
	Transport	49%	14%	19%	3%	5%	6%	1%	4%	102
	Utilities	19%	4%	15%	4%	15%	12%	8%	23%	26
	Pet. & Chem.	34%	14%	21%	9%	10%	9%	2%	1%	125
	Metals etc	48%	15%	21%	5%	4%	4%	3%	2%	111
	Food	24%	8%	23%	16%	9%	16%	1%	2%	95
	Textiles etc	51%	12%	10%	7%	3%	2%	2%	12%	124
	Machinery etc	51%	17%	14%	5%	3%	2%	3%	6%	131
	Repair	74%	4%	11%	4%	4%	4%			27
	Wholsale	48%	14%	18%	4%	6%	5%	2%	5%	109
	Retail	61%	8%	9%	5%	5%	2%	4%	5%	111
	Hotels etc	73%	11%	7%	4%		1%		4%	75
	Finance etc	35%	8%	18%	3%	3%	3%	3%	26%	93
	Services	50%	18%	15%	1%		5%	1%	10%	84
	Health etc	78%	5%	10%	6%	1%				83
Group	**Agriculture**	64%	9%	13%	1%		1%	3%	9%	69
	Construction	43%	7%	15%	15%	6%	6%	1%	5%	111
	Ext./Util./Trans	43%	12%	17%	3%	8%	6%	4%	8%	156
	Manufacturing	44%	13%	17%	8%	6%	6%	2%	5%	613
	Services	57%	10%	13%	4%	3%	3%	2%	8%	555
Total		49%	11%	15%	6%	5%	5%	2%	7%	1504

Source : Metra Martech - 27/10/00

TABLE 10-2 : HOW MANY PEOPLE HAVE HAD TRAINING IN ACCIDENT INVESTIGATION? BY SIZE

		None	One	02-May	06-Oct	Nov-20	21-100	100+	DK/NA	Base
Agriculture	**Under 10**	88%		4%					8%	24
	Oct-49	65%		24%				6%	6%	17
	50-200	45%	14%	18%	5%			5%	14%	22
	Over 200	33%	50%				17%			6
Construction	**Under 10**	90%		7%	3%					30
	Oct-49	37%	6%	29%	17%	3%	3%		6%	35
	50-200	23%	18%	14%	32%	9%			5%	22
	Over 200	13%	8%	8%	13%	17%	25%	4%	13%	24
Ext./Util./Trans	**Oct-49**	60%	14%	10%	2%	5%	2%		7%	42
	50-200	42%	11%	25%	5%	5%	3%		9%	79
	Over 200	26%	9%	6%		17%	20%	17%	6%	35
Manufacturing	**Under 10**	100%								11
	Oct-49	66%	12%	16%	1%	1%	1%		4%	165
	50-200	42%	17%	19%	8%	5%	2%	1%	7%	272
	Over 200	21%	9%	16%	15%	13%	18%	7%	2%	165
Services	**Under 10**	83%	6%	7%	2%				3%	120
	Oct-49	68%	10%	9%	5%	1%	1%		6%	147
	50-200	54%	14%	19%	1%	1%	2%	1%	8%	154
	Over 200	25%	11%	17%	7%	9%	8%	7%	16%	134
Higher Risk	**Under 10**	91%		5%	2%				3%	65
	Oct-49	61%	11%	17%	3%	2%	2%	0%	5%	259
	50-200	41%	15%	20%	8%	5%	2%	1%	7%	395
	Over 200	21%	10%	13%	12%	13%	19%	8%	4%	230
Lower Risk	**Under 10**	83%	6%	7%	2%				3%	120
	Oct-49	68%	10%	9%	5%	1%	1%		6%	147
	50-200	54%	14%	19%	1%	1%	2%	1%	8%	154
	Over 200	25%	11%	17%	7%	9%	8%	7%	16%	134
Total		49%	11%	15%	6%	5%	5%	2%	7%	1504

Source : Metra Martech - 27/10/00

TABLE 11-1 : WHICH TRAINING PROVIDERS ARE USED FOR TRAINING IN ACCIDENT INVESTIGATION?

		BSC	RoSPA	IOSH	NEBOSH	CITB	DuPont	Kelvin Topset	Taproot	Tripod	SCAT	Local FE	Internal H&S	Internal General	None	Base
Risk	**Higher**	4%	2%	6%	12%	3%	1%	0%	0%		0%	11%	18%	11%	60%	949
	Lower	2%	1%	3%	5%	0%				0%		9%	10%	3%	74%	555
Employees	**Under 10**	1%										5%	1%		94%	168
	Oct-49	2%	1%	1%	4%	2%				0%		6%	9%	8%	79%	384
	50-200	3%	1%	5%	8%	2%	0%					11%	11%	6%	67%	553
	Over 200	6%	3%	9%	20%	2%	1%	0%	0%		0%	15%	33%	13%	35%	399
Sector	**Agriculture**				3%							3%	7%	1%	87%	69
	Construction	6%	1%	4%	12%	14%			1%			10%	21%	20%	56%	111
	Mining			7%	7%	7%							7%	7%	68%	28
	Transport	7%	3%	4%	13%	1%						21%	19%	5%	59%	102
	Utilities	8%	4%	4%									27%		69%	26
	Pet. & Chem.	10%	6%	5%	11%	2%	1%				1%	20%	10%	14%	34%	125
	Metals etc	1%		4%	8%	1%	2%					5%	18%	4%	63%	111
	Food	2%		25%	48%			1%				26%	55%	37%	26%	95
	Textiles etc	2%	2%	4%	5%							6%	11%	4%	74%	124
	Machinery etc	1%	1%	3%	6%	2%	2%					7%	10%	5%	73%	131
	Repair				4%								11%	4%	81%	27
	Wholsale	5%	1%	3%	6%							10%	10%	5%	68%	109
	Retail	1%	1%	7%	7%							9%	14%	5%	73%	111
	Hotels etc	1%			1%	1%						5%	9%	4%	80%	75
	Finance etc	2%	1%	1%	5%							8%	11%	2%	72%	93
	Services	1%	1%	2%	6%							13%	5%		73%	84
	Health etc				5%					1%		7%	7%		80%	83
Group	**Agriculture**				3%							3%	7%	1%	87%	69
	Construction	6%	1%	4%	12%	14%			1%			10%	21%	20%	56%	111
	Ext./Util./Trans	6%	3%	4%	10%	2%						13%	18%	4%	62%	156
	Manufacturing	3%	2%	7%	14%	1%	1%	0%			0%	12%	19%	11%	56%	613
	Services	2%	1%	3%	5%	0%				0%		9%	10%	3%	74%	555
Total		3%	1%	5%	10%	2%	0%	0%	0%	0%	0%	10%	15%	8%	65%	1504

Source : Metra Martech - 27/10/00

TABLE 11-2 : WHICH TRAINING PROVIDERS ARE USED FOR TRAINING IN ACCIDENT INVESTIGATION? BY SIZE

		BSC	RoSPA	IOSH	NEBOSH	CITB	DuPont	Kelvin Topset	Taproot	Tripod	SCAT	Local FE	Internal H&S	Internal General	None	Base
Agriculture	**Under 10**														100%	24
	Oct-49											12%	6%	6%	82%	17
	50-200				5%								14%		82%	22
	Over 200				17%								17%		67%	6
Construction	**Under 10**											3%	3%		93%	30
	Oct-49	9%			11%	20%						6%	29%	31%	49%	35
	50-200			14%	18%	18%						27%	36%	23%	36%	22
	Over 200	17%	4%	4%	21%	17%			4%			8%	17%	25%	38%	24
Ext./Util./Trans	**Oct-49**	2%		2%	12%							12%	12%	5%	79%	42
	50-200	1%	3%	5%	5%	1%						13%	11%	3%	65%	79
	Over 200	20%	6%	6%	17%	6%						17%	40%	9%	37%	35
Manufacturing	**Under 10**														100%	11
	Oct-49	1%	1%	2%	4%	2%						4%	3%	5%	82%	165
	50-200	5%	1%	7%	14%	1%	1%	0%				12%	17%	10%	57%	272
	Over 200	4%	3%	12%	24%		2%				1%	19%	39%	20%	27%	165
Services	**Under 10**	1%			1%							6%	3%	1%	91%	120
	Oct-49	1%		2%	1%					1%		8%	9%	3%	82%	147
	50-200	2%	1%	1%	5%							10%	3%	1%	78%	154
	Over 200	4%	2%	7%	14%	1%						10%	25%	6%	45%	134
Higher Risk	**Under 10**											2%	2%		97%	65
	Oct-49	2%	1%	2%	6%	4%						6%	8%	9%	77%	259
	50-200	4%	2%	7%	12%	2%	1%	0%				12%	16%	9%	59%	395
	Over 200	7%	3%	10%	23%	3%	1%		0%		0%	17%	37%	18%	30%	230
Lower Risk	**Under 10**	1%			1%							6%	3%	1%	91%	120
	Oct-49	1%		2%	1%					1%		8%	9%	3%	82%	147
	50-200	2%	1%	1%	5%							10%	3%	1%	78%	154
	Over 200	4%	2%	7%	14%	1%						10%	25%	6%	45%	134
Total		3%	1%	5%	10%	2%	0%	0%	0%	0%	0%	10%	15%	8%	65%	1504
Source : Metra Martech - 27/10/00																

TABLE 12A-1 : WHAT PRIORITY IS GIVEN TO PARTICULAR FACTORS DURING INVESTIGATIONS?

		Identifying person(s) responsible		Identifying direct contributory factors		Identifying underlying causes		Fulfilling statutory obligations		Avoiding litigation etc		Preventing recurrence	
		Mean	Valid Answers	Mean	Valid Answers	Mean	Valid Answers	Mean	Valid Answers	Mean	Valid Answers	Mean	Valid Answers
Risk	**Higher**	4.12	909	4.65	914	4.61	915	4.52	914	4.19	908	4.84	910
	Lower	4.31	527	4.72	528	4.61	527	4.61	529	4.43	525	4.91	526
Employees	**Under 10**	4.33	147	4.6	146	4.46	145	4.34	146	4.35	142	4.82	143
	Oct-49	4.54	369	4.71	367	4.61	368	4.64	368	4.5	363	4.9	365
	50-200	4.27	534	4.65	537	4.54	538	4.55	538	4.22	536	4.82	537
	Over 200	3.67	386	4.71	392	4.75	391	4.55	391	4.13	392	4.9	391
Sector	**Agriculture**	4.43	67	4.69	67	4.64	67	4.43	67	4.34	65	4.89	65
	Construction	4.14	102	4.7	102	4.69	102	4.44	102	4.16	101	4.92	101
	Mining	4.04	28	4.75	28	4.71	28	4.32	28	4.07	28	4.96	28
	Transport	4.75	100	4.61	100	4.58	100	4.48	100	4.29	100	4.83	99
	Utilities	3.46	26	4.54	26	4.62	26	4.5	26	4.12	26	4.88	26
	Pet. & Chem.	3.52	122	4.61	123	4.71	123	4.62	122	4.06	123	4.83	123
	Metals etc	4.24	106	4.79	110	4.73	110	4.58	110	4.14	108	4.87	110
	Food	3.92	88	4.52	88	4.52	88	4.15	88	4.03	88	4.68	88
	Textiles etc	4.11	120	4.65	121	4.52	122	4.74	122	4.35	120	4.83	121
	Machinery etc	4.13	125	4.63	124	4.48	124	4.59	124	4.21	124	4.81	124
	Repair	4.48	25	4.64	25	4.44	25	4.68	25	4.32	25	4.84	25
	Wholsale	4.27	108	4.68	108	4.53	107	4.66	108	4.39	107	4.87	106
	Retail	4.29	96	4.59	95	4.56	95	4.52	95	4.4	95	4.77	95
	Hotels etc	4.48	75	4.65	75	4.47	75	4.55	75	4.52	73	4.89	75
	Finance etc	3.95	86	5.07	86	4.92	86	4.68	87	4.36	87	5.15	87
	Services	4.27	79	4.63	81	4.56	81	4.44	81	4.36	81	4.88	81
	Health etc	4.63	83	4.73	83	4.63	83	4.78	83	4.61	82	4.91	82
Group	**Agriculture**	4.43	67	4.69	67	4.64	67	4.43	67	4.34	65	4.89	65
	Construction	4.14	102	4.7	102	4.69	102	4.44	102	4.16	101	4.92	101
	Ext./Util./Trans	4.4	154	4.62	154	4.61	154	4.45	154	4.22	154	4.86	153
	Manufacturing	4	586	4.64	591	4.59	592	4.56	591	4.17	588	4.81	591
	Services	4.31	527	4.72	528	4.61	527	4.61	529	4.43	525	4.91	526
Total		4.19	1436	4.68	1442	4.61	1442	4.55	1443	4.28	1433	4.86	1436

Source : Metra Martech - 27/10/00

TABLE 12A-2 : WHAT PRIORITY IS GIVEN TO PARTICULAR FACTORS DURING INVESTIGATIONS? BY SIZE

		Identifying person(s) responsible		Identifying direct contributory factors		Identifying underlying causes		Fulfilling statutory obligations		Avoiding litigation etc		Preventing recurrence	
		Mean	Valid Answers	Mean	Valid Answers	Mean	Valid Answers	Mean	Valid Answers	Mean	Valid Answers	Mean	Valid Answers
Agriculture	**Under 10**	4.73	22	4.68	22	4.68	22	3.86	22	4.33	21	4.85	20
	Oct-49	4.35	17	4.76	17	4.65	17	4.59	17	4.24	17	4.94	17
	50-200	4.14	22	4.55	22	4.5	22	4.77	22	4.43	21	4.95	22
	Over 200	4.67	6	5	6	5	6	4.83	6	4.33	6	4.67	6
Construction	**Under 10**	4.37	27	4.74	27	4.74	27	4.67	27	4.41	27	4.93	27
	Oct-49	4.16	31	4.52	31	4.55	31	4.42	31	4.13	31	4.87	31
	50-200	4.3	20	4.75	20	4.75	20	4.25	20	4.05	19	4.9	20
	Over 200	3.71	24	4.83	24	4.75	24	4.38	24	4	24	5	23
Ext./Util./Trans	**Oct-49**	5.88	40	4.7	40	4.53	40	4.5	40	4.47	40	4.88	40
	50-200	4.16	79	4.66	79	4.61	79	4.46	79	4.13	79	4.91	78
	Over 200	3.26	35	4.46	35	4.71	35	4.4	35	4.14	35	4.74	35
Manufacturing	**Under 10**	4.56	9	4.33	9	4.33	9	4.56	9	4.11	9	4.78	9
	Oct-49	4.54	159	4.77	157	4.63	158	4.73	158	4.56	154	4.87	157
	50-200	3.98	263	4.62	266	4.53	266	4.52	266	4.13	266	4.78	266
	Over 200	3.44	155	4.58	159	4.64	159	4.47	158	3.87	159	4.81	159
Services	**Under 10**	4.24	105	4.58	104	4.4	103	4.35	104	4.42	101	4.8	103
	Oct-49	4.63	144	4.7	143	4.58	144	4.67	144	4.48	143	4.94	142
	50-200	4.31	146	4.68	148	4.51	148	4.63	148	4.43	148	4.82	148
	Over 200	4.02	132	4.91	133	4.92	132	4.71	133	4.41	133	5.06	133
Higher Risk	**Under 10**	4.53	58	4.66	58	4.66	58	4.34	58	4.33	57	4.88	56
	Oct-49	4.7	247	4.73	245	4.61	246	4.64	246	4.47	242	4.88	245
	50-200	4.05	384	4.63	387	4.56	387	4.51	387	4.14	385	4.82	386
	Over 200	3.47	220	4.6	224	4.67	224	4.46	223	3.94	224	4.81	223
Lower Risk	**Under 10**	4.24	105	4.58	104	4.4	103	4.35	104	4.42	101	4.8	103
	Oct-49	4.63	144	4.7	143	4.58	144	4.67	144	4.48	143	4.94	142
	50-200	4.31	146	4.68	148	4.51	148	4.63	148	4.43	148	4.82	148
	Over 200	4.02	132	4.91	133	4.92	132	4.71	133	4.41	133	5.06	133
Total		4.19	1436	4.68	1442	4.61	1442	4.55	1443	4.28	1433	4.86	1436

Source : Metra Martech - 27/10/00

TABLE 12B-1 : WHICH ARE THE TWO MOST IMPORTANT FACTORS WHEN INVESTIGATING ACCIDENTS?

		Identifying person(s) responsible		Identifying direct contributory factors		Identifying underlying causes		Fulfilling statutory obligations		Avoiding litigation etc		Preventing recurrence	
Risk	**Higher**	86	9%	202	21%	429	45%	156	16%	120	13%	669	70%
	Lower	89	16%	142	26%	164	30%	123	22%	84	15%	369	66%
Employees	**Under 10**	33	20%	42	25%	36	21%	23	14%	20	12%	88	52%
	Oct-49	61	16%	93	24%	133	35%	73	19%	49	13%	259	67%
	50-200	59	11%	125	23%	231	42%	99	18%	79	14%	394	71%
	Over 200	22	6%	84	21%	193	48%	84	21%	56	14%	297	74%
Sector	**Agriculture**	6	9%	21	30%	17	25%	5	7%	3	4%	41	59%
	Construction	8	7%	24	22%	51	46%	19	17%	11	10%	71	64%
	Mining	4	14%	5	18%	13	46%	2	7%	4	14%	22	79%
	Transport	9	9%	23	23%	48	47%	10	10%	23	23%	77	75%
	Utilities	1	4%	3	12%	16	62%	5	19%	3	12%	23	88%
	Pet. & Chem.	6	5%	22	18%	81	65%	13	10%	14	11%	106	85%
	Metals etc	12	11%	15	14%	57	51%	12	11%	8	7%	83	75%
	Food	5	5%	29	31%	47	49%	27	28%	12	13%	50	53%
	Textiles etc	12	10%	30	24%	47	38%	27	22%	17	14%	95	77%
	Machinery etc	14	11%	22	17%	45	34%	34	26%	19	15%	85	65%
	Repair	9	33%	8	30%	7	26%	2	7%	6	22%	16	59%
	Wholsale	23	21%	25	23%	19	17%	42	39%	27	25%	78	72%
	Retail	10	9%	28	25%	38	34%	20	18%	18	16%	58	52%
	Hotels etc	20	27%	22	29%	20	27%	12	16%	10	13%	53	71%
	Finance etc	3	3%	26	28%	31	33%	23	25%	12	13%	66	71%
	Services	15	18%	17	20%	26	31%	8	10%	8	10%	58	69%
	Health etc	18	22%	24	29%	30	36%	18	22%	9	11%	56	67%
Group	**Agriculture**	6	9%	21	30%	17	25%	5	7%	3	4%	41	59%
	Construction	8	7%	24	22%	51	46%	19	17%	11	10%	71	64%
	Ext./Util./Trans	14	9%	31	20%	77	49%	17	11%	30	19%	122	78%
	Manufacturing	58	9%	126	21%	284	46%	115	19%	76	12%	435	71%
	Services	89	16%	142	26%	164	30%	123	22%	84	15%	369	66%
Total		175	12%	344	23%	593	39%	279	19%	204	14%	1,038	69%
Source : Metra Martech - 27/10/00													

TABLE 12B-2 : WHICH ARE THE TWO MOST IMPORTANT FACTORS WHEN INVESTIGATING ACCIDENTS? BY SIZE

		Identifying person(s) responsible		Identifying direct contributory factors		Identifying underlying causes		Fulfilling statutory obligations		Avoiding litigation etc		Preventing recurrence	
Agriculture	**Under 10**	1	4%	6	25%	4	17%					9	38%
	Oct-49	2	12%	5	29%	4	24%	1	6%			13	76%
	50-200	3	14%	9	41%	8	36%	4	18%	2	9%	16	73%
	Over 200			1	17%	1	17%			1	17%	3	50%
Construction	**Under 10**	4	13%	7	23%	15	50%	4	13%	2	7%	20	67%
	Oct-49	3	9%	5	14%	10	29%	7	20%	6	17%	21	60%
	50-200	1	5%	6	27%	16	73%	2	9%			11	50%
	Over 200			6	25%	10	42%	6	25%	3	13%	19	79%
Ext./Util./Trans	**Oct-49**	5	12%	8	19%	19	45%	5	12%	10	24%	28	67%
	50-200	7	9%	17	22%	39	49%	9	11%	12	15%	67	85%
	Over 200	2	6%	6	17%	19	54%	3	9%	8	23%	27	77%
Manufacturing	**Under 10**	4	36%	3	27%	4	36%			3	27%	4	36%
	Oct-49	18	11%	30	18%	63	38%	33	20%	23	14%	113	68%
	50-200	29	11%	56	21%	124	46%	52	19%	35	13%	197	72%
	Over 200	7	4%	37	22%	93	56%	30	18%	15	9%	121	73%
Services	**Under 10**	27	23%	29	24%	22	18%	20	17%	17	14%	67	56%
	Oct-49	32	22%	51	35%	46	31%	30	20%	14	10%	97	66%
	50-200	19	12%	38	25%	41	27%	37	24%	30	19%	106	69%
	Over 200	11	8%	24	18%	55	41%	36	27%	23	17%	99	74%
Higher Risk	**Under 10**	9	14%	16	25%	23	35%	4	6%	5	8%	33	51%
	Oct-49	28	11%	48	19%	96	37%	46	18%	39	15%	175	68%
	50-200	40	10%	88	22%	187	47%	67	17%	49	12%	291	74%
	Over 200	9	4%	50	22%	123	53%	39	17%	27	12%	170	74%
Lower Risk	**Under 10**	27	23%	29	24%	22	18%	20	17%	17	14%	67	56%
	Oct-49	32	22%	51	35%	46	31%	30	20%	14	10%	97	66%
	50-200	19	12%	38	25%	41	27%	37	24%	30	19%	106	69%
	Over 200	11	8%	24	18%	55	41%	36	27%	23	17%	99	74%
Total		175	12%	344	23%	593	39%	279	19%	204	14%	1,038	69%

Source : Metra Martech - 27/10/00

TABLE 12C-1 : WHICH ARE THE TWO LEAST IMPORTANT FACTORS WHEN INVESTIGATING ACCIDENTS?

		Identifying person(s) responsible		Identifying direct contributory factors		Identifying underlying causes		Fulfilling statutory obligations		Avoiding litigation etc		Preventing recurrence	
Risk	**Higher**	435	46%	136	14%	120	13%	211	22%	414	44%	14	1%
	Lower	227	41%	98	18%	135	24%	117	21%	219	39%	18	3%
Employees	**Under 10**	43	26%	24	14%	33	20%	40	24%	51	30%	6	4%
	Oct-49	139	36%	60	16%	75	20%	88	23%	153	40%	7	2%
	50-200	233	42%	87	16%	102	18%	128	23%	238	43%	13	2%
	Over 200	247	62%	63	16%	45	11%	72	18%	191	48%	6	2%
Sector	**Agriculture**	22	32%	6	9%	6	9%	14	20%	24	35%	2	3%
	Construction	37	33%	7	6%	6	5%	29	26%	46	41%		
	Mining	13	46%	2	7%	4	14%	7	25%	13	46%		
	Transport	53	52%	23	23%	11	11%	28	27%	40	39%	1	1%
	Utilities	20	77%	3	12%	2	8%	6	23%	16	62%	2	8%
	Pet. & Chem.	88	70%	22	18%	11	9%	30	24%	78	62%	2	2%
	Metals etc	25	23%	7	6%	7	6%	14	13%	37	33%		
	Food	56	59%	19	20%	11	12%	35	37%	44	46%	2	2%
	Textiles etc	57	46%	21	17%	24	19%	17	14%	47	38%	1	1%
	Machinery etc	56	43%	20	15%	28	21%	24	18%	58	44%	3	2%
	Repair	8	30%	6	22%	10	37%	7	26%	11	41%	1	4%
	Wholsale	52	48%	28	26%	49	45%	21	19%	51	47%	7	6%
	Retail	43	39%	22	20%	17	15%	27	24%	40	36%	2	2%
	Hotels etc	14	19%	9	12%	12	16%	16	21%	24	32%	3	4%
	Finance etc	54	58%	12	13%	15	16%	11	12%	36	39%	3	3%
	Services	32	38%	11	13%	18	21%	26	31%	33	39%		
	Health etc	32	39%	16	19%	24	29%	16	19%	35	42%	3	4%
Group	**Agriculture**	22	32%	6	9%	6	9%	14	20%	24	35%	2	3%
	Construction	37	33%	7	6%	6	5%	29	26%	46	41%		
	Ext./Util./Trans	86	55%	28	18%	17	11%	41	26%	69	44%	3	2%
	Manufacturing	290	47%	95	15%	91	15%	127	21%	275	45%	9	1%
	Services	227	41%	98	18%	135	24%	117	21%	219	39%	18	3%
Total		662	44%	234	16%	255	17%	328	22%	633	42%	32	2%

Source : Metra Martech - 27/10/00

TABLE 12C-2 : WHICH ARE THE TWO LEAST IMPORTANT FACTORS WHEN INVESTIGATING ACCIDENTS? BY SIZE

		Identifying		Identifying direct		Identifying		Fulfilling statutory		Avoiding litigation		Preventing	
Agriculture	**Under 10**	5	21%	1	4%	1	4%	6	25%	7	29%		
	Oct-49	3	18%	1	6%	2	12%	3	18%	5	29%		
	50-200	11	50%	4	18%	3	14%	4	18%	9	41%	1	5%
	Over 200	3	50%					1	17%	3	50%	1	17%
Construction	**Under 10**	9	30%	4	13%	2	7%	5	17%	10	33%		
	Oct-49	12	34%	3	9%	3	9%	7	20%	13	37%		
	50-200	6	27%					9	41%	10	45%		
	Over 200	10	42%			1	4%	8	33%	13	54%		
Ext./Util./Trans	**Oct-49**	18	43%	6	14%	8	19%	12	29%	15	36%	3	7%
	50-200	42	53%	13	16%	7	9%	22	28%	40	51%		
	Over 200	26	74%	9	26%	2	6%	7	20%	14	40%		
Manufacturing	**Under 10**	2	18%	3	27%	1	9%	4	36%	4	36%	1	9%
	Oct-49	63	38%	30	18%	30	18%	33	20%	62	38%	1	1%
	50-200	123	45%	42	15%	47	17%	60	22%	115	42%	6	2%
	Over 200	102	62%	20	12%	13	8%	30	18%	94	57%	1	1%
Services	**Under 10**	33	28%	18	15%	31	26%	31	26%	34	28%	5	4%
	Oct-49	49	33%	22	15%	38	26%	33	22%	69	47%	4	3%
	50-200	65	42%	31	20%	43	28%	31	20%	63	41%	5	3%
	Over 200	80	60%	27	20%	23	17%	22	16%	53	40%	4	3%
Higher Risk	**Under 10**	16	25%	8	12%	4	6%	15	23%	21	32%	1	2%
	Oct-49	96	37%	40	15%	43	17%	55	21%	95	37%	4	2%
	50-200	182	46%	59	15%	57	14%	95	24%	174	44%	7	2%
	Over 200	141	61%	29	13%	16	7%	46	20%	124	54%	2	1%
Lower Risk	**Under 10**	33	28%	18	15%	31	26%	31	26%	34	28%	5	4%
	Oct-49	49	33%	22	15%	38	26%	33	22%	69	47%	4	3%
	50-200	65	42%	31	20%	43	28%	31	20%	63	41%	5	3%
	Over 200	80	60%	27	20%	23	17%	22	16%	53	40%	4	3%
Total		662	44%	234	16%	255	17%	328	22%	633	42%	32	2%

Source : Metra Martech - 27/10/00

TABLE 13-1 : HOW WIDELY ARE THE RESULTS OF ACCIDENT INVESTIGATIONS NORMALLY CIRCULATED?

		Team + top mgt		Line mgrs involved		All involved		Widely internally		Internally & externally		DK/NA		Base
Risk	**Higher**	100	11%	71	7%	226	24%	494	52%	27	3%	31	3%	949
	Lower	61	11%	33	6%	126	23%	277	50%	26	5%	32	6%	555
Employees	**Under 10**	36	21%	7	4%	16	10%	77	46%	17	10%	15	9%	168
	Oct-49	32	8%	17	4%	61	16%	239	62%	13	3%	22	6%	384
	50-200	65	12%	48	9%	145	26%	265	48%	13	2%	17	3%	553
	Over 200	28	7%	32	8%	130	33%	190	48%	10	3%	9	2%	399
Sector	**Agriculture**	8	12%	4	6%	15	22%	32	46%	7	10%	3	4%	69
	Construction	12	11%	3	3%	23	21%	63	57%	6	5%	4	4%	111
	Mining	2	7%	3	11%	8	29%	12	43%	2	7%	1	4%	28
	Transport	8	8%	16	16%	23	23%	51	50%	3	3%	1	1%	102
	Utilities	2	8%	1	4%	11	42%	10	38%	2	8%			26
	Pet. & Chem.	15	12%	15	12%	30	24%	64	51%	1	1%			125
	Metals etc	4	4%	3	3%	20	18%	77	69%	1	1%	6	5%	111
	Food	8	8%	11	12%	28	29%	45	47%	3	3%			95
	Textiles etc	15	12%	3	2%	37	30%	61	49%			8	6%	124
	Machinery etc	18	14%	9	7%	29	22%	66	50%	1	1%	8	6%	131
	Repair	8	30%	3	11%	2	7%	13	48%	1	4%			27
	Wholsale	9	8%	1	1%	28	26%	63	58%	6	6%	2	2%	109
	Retail	16	14%	9	8%	30	27%	47	42%	3	3%	6	5%	111
	Hotels etc	8	11%	1	1%	19	25%	34	45%	9	12%	4	5%	75
	Finance etc	11	12%	10	11%	21	23%	32	34%	2	2%	17	18%	93
	Services	11	13%	6	7%	19	23%	41	49%	4	5%	3	4%	84
	Health etc	6	7%	6	7%	9	11%	60	72%	2	2%			83
Group	**Agriculture**	8	12%	4	6%	15	22%	32	46%	7	10%	3	4%	69
	Construction	12	11%	3	3%	23	21%	63	57%	6	5%	4	4%	111
	Ext./Util./Trans	12	8%	20	13%	42	27%	73	47%	7	4%	2	1%	156
	Manufacturing	68	11%	44	7%	146	24%	326	53%	7	1%	22	4%	613
	Services	61	11%	33	6%	126	23%	277	50%	26	5%	32	6%	555
Total		161	11%	104	7%	352	23%	771	51%	53	4%	63	4%	1504

Source : Metra Martech - 27/10/00

TABLE 13-2 : HOW WIDELY ARE THE RESULTS OF ACCIDENT INVESTIGATIONS NORMALLY CIRCULATED? BY SIZE

		Team + top mgt		Line mgrs involved		All involved		Widely internally		Internally & externally		DK/NA		Base
Agriculture	**Under 10**	3	13%			4	17%	12	50%	2	8%	3	13%	24
	Oct-49	2	12%	1	6%	3	18%	7	41%	4	24%			17
	50-200	3	14%	2	9%	7	32%	9	41%	1	5%			22
	Over 200			1	17%	1	17%	4	67%					6
Construction	**Under 10**	8	27%					15	50%	4	13%	3	10%	30
	Oct-49	2	6%	2	6%	9	26%	20	57%	1	3%	1	3%	35
	50-200	2	9%			10	45%	10	45%					22
	Over 200			1	4%	4	17%	18	75%	1	4%			24
Ext./Util./Trans	**Oct-49**	4	10%			7	17%	28	67%	1	2%	2	5%	42
	50-200	6	8%	15	19%	22	28%	31	39%	5	6%			79
	Over 200	2	6%	5	14%	13	37%	14	40%	1	3%			35
Manufacturing	**Under 10**	7	64%	1	9%			3	27%					11
	Oct-49	13	8%	10	6%	21	13%	105	64%	4	2%	12	7%	165
	50-200	39	14%	17	6%	69	25%	137	50%	2	1%	8	3%	272
	Over 200	9	5%	16	10%	56	34%	81	49%	1	1%	2	1%	165
Services	**Under 10**	21	18%	6	5%	12	10%	59	49%	13	11%	9	8%	120
	Oct-49	11	7%	6	4%	25	17%	92	63%	3	2%	10	7%	147
	50-200	15	10%	16	10%	40	26%	67	44%	9	6%	7	5%	154
	Over 200	14	10%	5	4%	49	37%	59	44%	1	1%	6	4%	134
Higher Risk	**Under 10**	18	28%	1	2%	4	6%	30	46%	6	9%	6	9%	65
	Oct-49	21	8%	13	5%	40	15%	160	62%	10	4%	15	6%	259
	50-200	50	13%	34	9%	108	27%	187	47%	8	2%	8	2%	395
	Over 200	11	5%	23	10%	74	32%	117	51%	3	1%	2	1%	230
Lower Risk	**Under 10**	21	18%	6	5%	12	10%	59	49%	13	11%	9	8%	120
	Oct-49	11	7%	6	4%	25	17%	92	63%	3	2%	10	7%	147
	50-200	15	10%	16	10%	40	26%	67	44%	9	6%	7	5%	154
	Over 200	14	10%	5	4%	49	37%	59	44%	1	1%	6	4%	134
Total		161	11%	104	7%	352	23%	771	51%	53	4%	63	4%	1504

Source : Metra Martech - 27/10/00

TABLE 14-1 : THE MAIN BARRIERS TO IMPLEMENTING THE RESULTS OF ACCIDENT INVESTIGATIONS

		Cost/time		Competing initiatives		Lack of skills		Reluctance to change		Union resistance		Blame culture	
Risk	**Higher**	262	28%	83	9%	142	15%	287	30%	22	2%	148	16%
	Lower	140	25%	37	7%	72	13%	99	18%	7	1%	44	8%
Employees	**Under 10**	45	27%	5	3%	10	6%	10	6%	1	1%	4	2%
	Oct-49	89	23%	26	7%	57	15%	76	20%	3	1%	47	12%
	50-200	142	26%	42	8%	88	16%	171	31%	12	2%	78	14%
	Over 200	126	32%	47	12%	59	15%	129	32%	13	3%	63	16%
Sector	**Agriculture**	14	20%	3	4%	5	7%	14	20%			6	9%
	Construction	33	30%	5	5%	7	6%	19	17%	1	1%	3	3%
	Mining	8	29%	7	25%	7	25%	11	39%	1	4%	5	18%
	Transport	32	31%	8	8%	17	17%	37	36%	4	4%	15	15%
	Utilities	7	27%	4	15%	3	12%	14	54%	2	8%	6	23%
	Pet. & Chem.	54	43%	10	8%	22	18%	51	41%	2	2%	14	11%
	Metals etc	21	19%	16	14%	30	27%	54	49%	3	3%	36	32%
	Food	29	31%	9	9%	7	7%	4	4%			16	17%
	Textiles etc	23	19%	8	6%	26	21%	38	31%	6	5%	29	23%
	Machinery etc	34	26%	12	9%	14	11%	38	29%	3	2%	12	9%
	Repair	7	26%	1	4%	4	15%	7	26%			6	22%
	Wholsale	38	35%	6	6%	14	13%	17	16%			10	9%
	Retail	31	28%	12	11%	13	12%	18	16%	2	2%	7	6%
	Hotels etc	12	16%	4	5%	9	12%	9	12%			8	11%
	Finance etc	20	22%	2	2%	7	8%	21	23%	1	1%	2	2%
	Services	16	19%	8	10%	12	14%	18	21%	4	5%	8	10%
	Health etc	23	28%	5	6%	17	20%	16	19%			9	11%
Group	**Agriculture**	14	20%	3	4%	5	7%	14	20%			6	9%
	Construction	33	30%	5	5%	7	6%	19	17%	1	1%	3	3%
	Ext./Util./Trans	47	30%	19	12%	27	17%	62	40%	7	4%	26	17%
	Manufacturing	168	27%	56	9%	103	17%	192	31%	14	2%	113	18%
	Services	140	25%	37	7%	72	13%	99	18%	7	1%	44	8%
Total		402	27%	120	8%	214	14%	386	26%	29	2%	192	13%

Source : Metra Martech - 27/10/00

TABLE 14-1 : THE MAIN BARRIERS TO IMPLEMENTING THE RESULTS OF ACCIDENT INVESTIGATIONS

Lack of Mgt commit-ment		Activity on many sites		Careless- ness		Irrespons- ibility		Conceal- ment of facts		None		DK/NA		Base
81	9%	43	5%	266	28%	111	12%	107	11%	280	30%	39	4%	949
35	6%	26	5%	96	17%	31	6%	24	4%	225	41%	38	7%	555
6	4%	1	1%	16	10%	5	3%	3	2%	86	51%	14	8%	168
22	6%	11	3%	90	23%	28	7%	27	7%	140	36%	22	6%	384
41	7%	23	4%	151	27%	55	10%	63	11%	180	33%	25	5%	553
47	12%	34	9%	105	26%	54	14%	38	10%	99	25%	16	4%	399
4	6%	4	6%	12	17%	5	7%	4	6%	31	45%	2	3%	69
4	4%	6	5%	14	13%	6	5%	9	8%	37	33%	5	5%	111
5	18%	3	11%	8	29%	3	11%	2	7%	8	29%	2	7%	28
11	11%	2	2%	34	33%	13	13%	17	17%	16	16%	4	4%	102
2	8%	7	27%	10	38%	4	15%	1	4%	7	27%			26
8	6%	2	2%	27	22%	3	2%	32	26%	33	26%	1	1%	125
14	13%	10	9%	56	50%	27	24%	16	14%	21	19%	3	3%	111
9	9%	2	2%	24	25%	30	32%	4	4%	29	31%	4	4%	95
15	12%	4	3%	46	37%	13	10%	9	7%	35	28%	7	6%	124
7	5%	1	1%	26	20%	4	3%	12	9%	53	40%	9	7%	131
2	7%	2	7%	9	33%	3	11%	1	4%	10	37%	2	7%	27
5	5%	1	1%	13	12%	5	5%	3	3%	51	47%	2	2%	109
8	7%	10	9%	22	20%	8	7%	7	6%	41	37%	8	7%	111
3	4%			9	12%	6	8%	2	3%	41	55%	1	1%	75
4	4%	5	5%	15	16%	5	5%	2	2%	26	28%	18	19%	93
7	8%	5	6%	15	18%	3	4%	4	5%	35	42%	8	10%	84
8	10%	5	6%	22	27%	4	5%	6	7%	31	37%	1	1%	83
4	6%	4	6%	12	17%	5	7%	4	6%	31	45%	2	3%	69
4	4%	6	5%	14	13%	6	5%	9	8%	37	33%	5	5%	111
18	12%	12	8%	52	33%	20	13%	20	13%	31	20%	6	4%	156
55	9%	21	3%	188	31%	80	13%	74	12%	181	30%	26	4%	613
35	6%	26	5%	96	17%	31	6%	24	4%	225	41%	38	7%	555
116	8%	69	5%	362	24%	142	9%	131	9%	505	34%	77	5%	1504

TABLE 14-2 : THE MAIN BARRIERS TO IMPLEMENTING THE RESULTS OF ACCIDENT INVESTIGATIONS BY SIZE

		Cost/time		Competing initiatives		Lack of skills		Reluctance to change		Union resistance		Blame culture	
Agriculture	**Under 10**	2	8%										
	Oct-49	2	12%	1	6%	1	6%	5	29%			1	6%
	50-200	6	27%	2	9%	4	18%	6	27%			4	18%
	Over 200	4	67%					3	50%			1	17%
Construction	**Under 10**	16	53%	1	3%	2	7%	3	10%				
	Oct-49	12	34%	2	6%	3	9%	8	23%	1	3%	3	9%
	50-200	1	5%	1	5%			2	9%				
	Over 200	4	17%	1	4%	2	8%	6	25%				
Ext./Util./Trans	**Oct-49**	12	29%	5	12%	7	17%	11	26%			4	10%
	50-200	25	32%	10	13%	13	16%	36	46%	4	5%	16	20%
	Over 200	10	29%	4	11%	7	20%	15	43%	3	9%	6	17%
Manufacturing	**Under 10**	3	27%					1	9%			1	9%
	Oct-49	34	21%	11	7%	23	14%	42	25%	2	1%	27	16%
	50-200	78	29%	21	8%	50	18%	91	33%	5	2%	51	19%
	Over 200	53	32%	24	15%	30	18%	58	35%	7	4%	34	21%
Services	**Under 10**	29	24%	4	3%	15	13%	7	6%	1	1%	5	4%
	Oct-49	30	20%	11	7%	23	16%	21	14%	1	1%	15	10%
	50-200	36	23%	7	5%	17	11%	35	23%	2	1%	9	6%
	Over 200	45	34%	15	11%	17	13%	36	27%	3	2%	15	11%
Higher Risk	**Under 10**	21	32%	1	2%	2	3%	4	6%			1	2%
	Oct-49	60	23%	19	7%	34	13%	66	25%	3	1%	35	14%
	50-200	110	28%	34	9%	67	17%	135	34%	9	2%	71	18%
	Over 200	71	31%	29	13%	39	17%	82	36%	10	4%	41	18%
Lower Risk	**Under 10**	29	24%	4	3%	15	13%	7	6%	1	1%	5	4%
	Oct-49	30	20%	11	7%	23	16%	21	14%	1	1%	15	10%
	50-200	36	23%	7	5%	17	11%	35	23%	2	1%	9	6%
	Over 200	45	34%	15	11%	17	13%	36	27%	3	2%	15	11%
Total		402	27%	120	8%	214	14%	386	26%	29	2%	192	13%

Source : Metra Martech - 27/10/00

TABLE 14-2 : THE MAIN BARRIERS TO IMPLEMENTING THE RESULTS OF ACCIDENT INVESTIGATIONS BY SIZE

Lack of Mgt commit- ment		Activity on many sites		Careless- ness		Irrespons- ibility		Conceal- ment of facts		None		DK/NA		Base
				2	8%	2	8%	1	4%	16	67%	2	8%	24
				3	18%			2	12%	8	47%			17
4	18%	4	18%	6	27%	3	14%	1	5%	7	32%			22
				1	17%									6
				3	10%			3	10%	9	30%	2	7%	30
4	11%	4	11%	4	11%	2	6%	3	9%	9	26%	1	3%	35
		2	9%	4	18%	3	14%			12	55%			22
				3	13%	1	4%	3	13%	7	29%	2	8%	24
3	7%	1	2%	10	24%	3	7%	3	7%	12	29%	2	5%	42
11	14%	6	8%	31	39%	12	15%	11	14%	15	19%	2	3%	79
4	11%	5	14%	11	31%	5	14%	6	17%	4	11%	2	6%	35
		1	9%	3	27%					4	36%	1	9%	11
11	7%	4	2%	52	32%	20	12%	15	9%	60	36%	11	7%	165
20	7%	8	3%	87	32%	31	11%	37	14%	76	28%	11	4%	272
24	15%	8	5%	46	28%	29	18%	22	13%	41	25%	3	2%	165
9	8%	1	1%	10	8%	3	3%	2	2%	62	52%	9	8%	120
5	3%	5	3%	25	17%	9	6%	8	5%	58	39%	10	7%	147
8	5%	5	3%	28	18%	7	5%	9	6%	69	45%	11	7%	154
13	10%	15	11%	33	25%	12	9%	5	4%	36	27%	8	6%	134
		1	2%	8	12%	2	3%	4	6%	29	45%	5	8%	65
18	7%	9	3%	69	27%	25	10%	23	9%	89	34%	14	5%	259
35	9%	20	5%	128	32%	49	12%	49	12%	110	28%	13	3%	395
28	12%	13	6%	61	27%	35	15%	31	13%	52	23%	7	3%	230
9	8%	1	1%	10	8%	3	3%	2	2%	62	52%	9	8%	120
5	3%	5	3%	25	17%	9	6%	8	5%	58	39%	10	7%	147
8	5%	5	3%	28	18%	7	5%	9	6%	69	45%	11	7%	154
13	10%	15	11%	33	25%	12	9%	5	4%	36	27%	8	6%	134
116	8%	69	5%	362	24%	142	9%	131	9%	505	34%	77	5%	1504

TABLE 15-1 : HOW DO YOU RATE YOUR EFFECTIVENESS IN IDENTFYING UNDERLYING CAUSES

		Identifying causes		Preventing recurrence	
		Mean	Valid Answers	Mean	Valid Answers
Risk	Higher	4.07	878	4.04	852
	Lower	4.16	485	4.17	479
Employees	Under 10	4.31	131	4.56	121
	Oct-49	4.2	343	4.19	329
	50-200	4.06	506	4.01	508
	Over 200	4	383	3.94	373
Sector	Agriculture	4.19	62	4.23	57
	Construction	4.17	100	4.21	91
	Mining	4.04	24	3.88	24
	Transport	4.11	93	4.1	93
	Utilities	3.96	26	3.69	26
	Pet. & Chem.	3.9	119	3.78	118
	Metals etc	4.11	102	4.05	100
	Food	3.96	92	3.97	92
	Textiles etc	4.11	114	4.11	114
	Machinery etc	4.07	120	4.04	113
	Repair	4.27	26	4.38	24
	Wholsale	4.14	94	4.09	89
	Retail	3.82	89	3.98	87
	Hotels etc	4.57	69	4.57	68
	Finance etc	3.95	75	3.86	80
	Services	4.18	77	4.13	78
	Health etc	4.4	81	4.48	77
Group	Agriculture	4.19	62	4.23	57
	Construction	4.17	100	4.21	91
	Ext./Util./Trans	4.07	143	3.99	143
	Manufacturing	4.04	573	4.01	561
	Services	4.16	485	4.17	479
Total		4.1	1363	4.09	1331
Source : Metra Martech - 27/10/00					

TABLE 15-2 : HOW DO YOU RATE YOUR EFFECTIVENESS IN IDENTFYING UNDERLYING CAUSES

		Identifying causes		Preventing recurrence	
		Mean	Valid Answers	Mean	Valid Answers
Agriculture	**Under 10**	4.37	19	4.78	18
	Oct-49	4	16	3.93	14
	50-200	4.24	21	3.95	22
	Over 200	4	6	4.33	3
Construction	**Under 10**	4.09	22	4.5	18
	Oct-49	4	32	3.91	32
	50-200	4.41	22	4.4	20
	Over 200	4.25	24	4.24	21
Ext./Util./Trans	**Oct-49**	4.14	35	3.94	33
	50-200	4.04	73	4.09	77
	Over 200	4.06	35	3.79	33
Manufacturing	**Under 10**	4.5	10	4.44	9
	Oct-49	4.18	149	4.2	141
	50-200	4.02	255	3.96	254
	Over 200	3.91	159	3.89	157
Services	**Under 10**	4.32	97	4.45	93
	Oct-49	4.25	127	4.27	124
	50-200	4.07	136	4.09	138
	Over 200	4.05	125	3.94	124
Higher Risk	**Under 10**	4.27	51	4.6	45
	Oct-49	4.14	232	4.1	220
	50-200	4.06	371	4.01	373
	Over 200	3.97	224	3.91	214
Lower Risk	**Under 10**	4.32	97	4.45	93
	Oct-49	4.25	127	4.27	124
	50-200	4.07	136	4.09	138
	Over 200	4.05	125	3.94	124
Total		4.1	1363	4.09	1331
Source : Metra Martech - 27/10/00					

TABLE 16-1 : WHAT ARE THE MOST IMPORTANT CHANGES YOU COULD MAKE TO IMPROVE INCIDENT INVESTIGATION AND PREVENTION?

		None needed		More training		Increase awareness		Improve recording and investigation		More people and money		DK/NA		Base
Risk	**Higher**	137	14%	382	40%	348	37%	131	14%	184	19%	2,614	275%	949
	Lower	126	23%	189	34%	171	31%	62	11%	103	19%	1,569	283%	555
Employees	**Under 10**	60	36%	29	17%	40	24%	10	6%	23	14%	510	304%	168
	Oct-49	74	19%	132	34%	114	30%	47	12%	66	17%	1,103	287%	384
	50-200	87	16%	240	43%	210	38%	79	14%	104	19%	1,492	270%	553
	Over 200	42	11%	170	43%	155	39%	57	14%	94	24%	1,078	270%	399
Sector	**Agriculture**	23	33%	12	17%	22	32%	5	7%	9	13%	205	297%	69
	Construction	11	10%	31	28%	40	36%	12	11%	17	15%	333	300%	111
	Mining	4	14%	13	46%	9	32%	5	18%	8	29%	73	261%	28
	Transport	21	21%	46	45%	30	29%	13	13%	20	20%	278	273%	102
	Utilities	2	8%	9	35%	11	42%	1	4%	9	35%	72	277%	26
	Pet. & Chem.	16	13%	69	55%	29	23%	17	14%	36	29%	333	266%	125
	Metals etc	13	12%	57	51%	57	51%	21	19%	24	22%	272	245%	111
	Food	7	7%	44	46%	54	57%	26	27%	17	18%	232	244%	95
	Textiles etc	18	15%	50	40%	58	47%	16	13%	14	11%	340	274%	124
	Machinery etc	16	12%	43	33%	31	24%	11	8%	22	17%	401	306%	131
	Repair	6	22%	8	30%	7	26%	4	15%	8	30%	75	278%	27
	Wholsale	29	27%	50	46%	28	26%	12	11%	32	29%	285	261%	109
	Retail	17	15%	42	38%	38	34%	14	13%	27	24%	306	276%	111
	Hotels etc	24	32%	13	17%	17	23%	2	3%	3	4%	241	321%	75
	Finance etc	16	17%	26	28%	28	30%	11	12%	22	24%	269	289%	93
	Services	26	31%	24	29%	27	32%	14	17%	7	8%	238	283%	84
	Health etc	14	17%	34	41%	33	40%	9	11%	12	14%	230	277%	83
Group	**Agriculture**	23	33%	12	17%	22	32%	5	7%	9	13%	205	297%	69
	Construction	11	10%	31	28%	40	36%	12	11%	17	15%	333	300%	111
	Ext./Util./Trans	27	17%	68	44%	50	32%	19	12%	37	24%	423	271%	156
	Manufacturing	76	12%	271	44%	236	38%	95	15%	121	20%	1,653	270%	613
	Services	126	23%	189	34%	171	31%	62	11%	103	19%	1,569	283%	555
Total		263	17%	571	38%	519	35%	193	13%	287	19%	4,183	278%	1504

Source : Metra Martech - 27/10/00

TABLE 16-2 : WHAT ARE THE MOST IMPORTANT CHANGES YOU COULD MAKE TO IMPROVE INCIDENT INVESTIGATION AND PREVENTION? BY SIZE

		None needed		More training		Increase awareness		Improve recording and investigation		More people and money		DK/NA		Base
Agriculture	**Under 10**	13	54%	1	4%	5	21%			2	8%	75	313%	24
	Oct-49	6	35%	3	18%	6	35%	3	18%	3	18%	47	276%	17
	50-200	3	14%	7	32%	11	50%	2	9%	4	18%	61	277%	22
	Over 200	1	17%	1	17%							22	367%	6
Construction	**Under 10**	3	10%	5	17%	6	20%	1	3%	2	7%	103	343%	30
	Oct-49	1	3%	15	43%	14	40%	6	17%	10	29%	94	269%	35
	50-200	4	18%	5	23%	9	41%	3	14%	3	14%	64	291%	22
	Over 200	3	13%	6	25%	11	46%	2	8%	2	8%	72	300%	24
Ext./Util./Trans	**Oct-49**	12	29%	15	36%	8	19%	5	12%	10	24%	118	281%	42
	50-200	12	15%	38	48%	33	42%	11	14%	16	20%	206	261%	79
	Over 200	3	9%	15	43%	9	26%	3	9%	11	31%	99	283%	35
Manufacturing	**Under 10**	5	45%	1	9%	2	18%			1	9%	35	318%	11
	Oct-49	28	17%	57	35%	49	30%	19	12%	27	16%	480	291%	165
	50-200	28	10%	129	47%	116	43%	48	18%	57	21%	710	261%	272
	Over 200	15	9%	84	51%	69	42%	28	17%	36	22%	428	259%	165
Services	**Under 10**	42	35%	29	24%	32	27%	11	9%	20	17%	346	288%	120
	Oct-49	29	20%	54	37%	47	32%	17	12%	21	14%	420	286%	147
	50-200	40	26%	57	37%	45	29%	15	10%	25	16%	434	282%	154
	Over 200	15	11%	49	37%	47	35%	19	14%	37	28%	369	275%	134
Higher Risk	**Under 10**	21	32%	7	11%	13	20%	1	2%	5	8%	213	328%	65
	Oct-49	47	18%	90	35%	77	30%	33	13%	50	19%	739	285%	259
	50-200	47	12%	179	45%	169	43%	64	16%	80	20%	1,041	264%	395
	Over 200	22	10%	106	46%	89	39%	33	14%	49	21%	621	270%	230
Lower Risk	**Under 10**	42	35%	29	24%	32	27%	11	9%	20	17%	346	288%	120
	Oct-49	29	20%	54	37%	47	32%	17	12%	21	14%	420	286%	147
	50-200	40	26%	57	37%	45	29%	15	10%	25	16%	434	282%	154
	Over 200	15	11%	49	37%	47	35%	19	14%	37	28%	369	275%	134
Total		263	17%	571	38%	519	35%	193	13%	287	19%	4,183	278%	1504

Source : Metra Martech - 27/10/00

TABLE 17-1 : WHAT WOULD BE THE IMPLICATIONS OF BEING REQUIRED TO INVESTIGATE ALL INCIDENTS AND NEAR MISSES?

		None - do it already		No real problem		None - so few incidents		Would comply reluctantly		Additional time & cost		More training		DK/NA		Base
Risk	**Higher**	284	30%	326	34%	109	11%	25	3%	228	24%	47	5%	39	4%	949
	Lower	197	35%	154	28%	88	16%	14	3%	115	21%	30	5%	38	7%	555
Employees	**Under 10**	36	21%	67	40%	42	25%	3	2%	34	20%	2	1%	18	11%	168
	Oct-49	96	25%	133	35%	73	19%	11	3%	77	20%	13	3%	21	5%	384
	50-200	167	30%	180	33%	65	12%	19	3%	119	22%	33	6%	28	5%	553
	Over 200	182	46%	100	25%	17	4%	6	2%	113	28%	29	7%	10	3%	399
Sector	**Agriculture**	23	33%	10	14%	11	16%	1	1%	25	36%	2	3%	5	7%	69
	Construction	19	17%	49	44%	7	6%			41	37%	6	5%	7	6%	111
	Mining	11	39%	4	14%					13	46%	3	11%	2	7%	28
	Transport	27	26%	39	38%	17	17%			23	23%	4	4%	3	3%	102
	Utilities	13	50%	6	23%	3	12%	1	4%	3	12%	3	12%			26
	Pet. & Chem.	57	46%	30	24%	10	8%	8	6%	21	17%			3	2%	125
	Metals etc	36	32%	45	41%	16	14%	4	4%	18	16%	11	10%	1	1%	111
	Food	7	7%	64	67%	7	7%	1	1%	24	25%	6	6%	9	9%	95
	Textiles etc	40	32%	42	34%	16	13%	5	4%	22	18%	8	6%	1	1%	124
	Machinery etc	43	33%	29	22%	16	12%	4	3%	35	27%	3	2%	6	5%	131
	Repair	8	30%	8	30%	6	22%	1	4%	3	11%	1	4%	2	7%	27
	Wholsale	53	49%	23	21%	13	12%	6	6%	21	19%	5	5%	3	3%	109
	Retail	24	22%	46	41%	23	21%	4	4%	23	21%	5	5%	9	8%	111
	Hotels etc	25	33%	22	29%	15	20%	1	1%	17	23%	10	13%	8	11%	75
	Finance etc	35	38%	20	22%	4	4%			25	27%	3	3%	10	11%	93
	Services	33	39%	21	25%	11	13%	2	2%	17	20%	3	4%	6	7%	84
	Health etc	27	33%	22	27%	22	27%	1	1%	12	14%	4	5%	2	2%	83
Group	**Agriculture**	23	33%	10	14%	11	16%	1	1%	25	36%	2	3%	5	7%	69
	Construction	19	17%	49	44%	7	6%			41	37%	6	5%	7	6%	111
	Ext./Util./Trans	51	33%	49	31%	20	13%	1	1%	39	25%	10	6%	5	3%	156
	Manufacturing	191	31%	218	36%	71	12%	23	4%	123	20%	29	5%	22	4%	613
	Services	197	35%	154	28%	88	16%	14	3%	115	21%	30	5%	38	7%	555
Total		481	32%	480	32%	197	13%	39	3%	343	23%	77	5%	77	5%	1,504

Source : Metra Martech - 27/10/00

TABLE 17-2 : WHAT WOULD BE THE IMPLICATIONS OF BEING REQUIRED TO INVESTIGATE ALL INCIDENTS AND NEAR MISSES? BY SIZE

		None - do it already		No real problem		None - so few incidents		Would comply reluctantly		Additional time & cost		More training		DK/NA		Base
Agriculture	**Under 10**	6	25%	4	17%	4	17%			6	25%			4	17%	24
	Oct-49	7	41%	1	6%	5	29%	1	6%	4	24%					17
	50-200	6	27%	5	23%	2	9%			11	50%	1	5%			22
	Over 200	4	67%							4	67%	1	17%	1	17%	6
Construction	**Under 10**	2	7%	13	43%	5	17%			10	33%	1	3%	4	13%	30
	Oct-49	8	23%	17	49%					15	43%	3	9%	1	3%	35
	50-200	2	9%	13	59%	2	9%			6	27%			2	9%	22
	Over 200	7	29%	6	25%					10	42%	2	8%			24
Ext./Util./Trans	**Oct-49**	10	24%	16	38%	7	17%			9	21%	1	2%	3	7%	42
	50-200	24	30%	26	33%	11	14%			19	24%	7	9%	2	3%	79
	Over 200	17	49%	7	20%	2	6%	1	3%	11	31%	2	6%			35
Manufacturing	**Under 10**	3	27%	2	18%	2	18%	1	9%	2	18%			2	18%	11
	Oct-49	35	21%	57	35%	34	21%	7	4%	32	19%	5	3%	8	5%	165
	50-200	77	28%	105	39%	28	10%	12	4%	51	19%	17	6%	10	4%	272
	Over 200	76	46%	54	33%	7	4%	3	2%	38	23%	7	4%	2	1%	165
Services	**Under 10**	25	21%	58	48%	35	29%	2	2%	20	17%	2	2%	9	8%	120
	Oct-49	48	33%	39	27%	29	20%	3	2%	27	18%	6	4%	11	7%	147
	50-200	59	38%	35	23%	17	11%	7	5%	29	19%	9	6%	12	8%	154
	Over 200	65	49%	22	16%	7	5%	2	1%	39	29%	13	10%	6	4%	134
Higher Risk	**Under 10**	11	17%	19	29%	11	17%	1	2%	18	28%	1	2%	10	15%	65
	Oct-49	60	23%	91	35%	46	18%	8	3%	60	23%	9	3%	12	5%	259
	50-200	109	28%	149	38%	43	11%	12	3%	87	22%	25	6%	14	4%	395
	Over 200	104	45%	67	29%	9	4%	4	2%	63	27%	12	5%	3	1%	230
Lower Risk	**Under 10**	25	21%	58	48%	35	29%	2	2%	20	17%	2	2%	9	8%	120
	Oct-49	48	33%	39	27%	29	20%	3	2%	27	18%	6	4%	11	7%	147
	50-200	59	38%	35	23%	17	11%	7	5%	29	19%	9	6%	12	8%	154
	Over 200	65	49%	22	16%	7	5%	2	1%	39	29%	13	10%	6	4%	134
Total		481	32%	480	32%	197	13%	39	3%	343	23%	77	5%	77	5%	1,504

Source : Metra Martech - 27/10/00

TABLE 18-1 : WHAT ARE THE POTENTIAL BENEFITS FROM ACCIDENT INVESTIGATION?

		Improved H&S performance		Improved morale		Better employee relations		Save money		Improved production		Better reputation	
Risk	**Higher**	768	81%	133	14%	50	5%	112	12%	124	13%	43	5%
	Lower	436	79%	93	17%	61	11%	61	11%	66	12%	36	6%
Employees	**Under 10**	122	73%	13	8%	13	8%	7	4%	6	4%	13	8%
	Oct-49	289	75%	42	11%	27	7%	35	9%	49	13%	21	5%
	50-200	470	85%	83	15%	28	5%	61	11%	57	10%	21	4%
	Over 200	323	81%	88	22%	43	11%	70	18%	78	20%	24	6%
Sector	**Agriculture**	61	88%	7	10%	3	4%	5	7%	2	3%	1	1%
	Construction	79	71%	9	8%	4	4%	11	10%	13	12%	6	5%
	Mining	24	86%	4	14%	3	11%	6	21%	3	11%		
	Transport	83	81%	11	11%	6	6%	18	18%	8	8%	4	4%
	Utilities	24	92%	3	12%			5	19%	2	8%	2	8%
	Pet. & Chem.	114	91%	33	26%	7	6%	22	18%	26	21%	6	5%
	Metals etc	100	90%	6	5%	1	1%	7	6%	11	10%	1	1%
	Food	40	42%	13	14%	8	8%	10	11%	18	19%	14	15%
	Textiles etc	109	88%	19	15%	6	5%	7	6%	16	13%	3	2%
	Machinery etc	111	85%	25	19%	11	8%	17	13%	21	16%	4	3%
	Repair	23	85%	3	11%	1	4%	4	15%	4	15%	2	7%
	Wholsale	100	92%	27	25%	17	16%	25	23%	35	32%	13	12%
	Retail	75	68%	12	11%	11	10%	13	12%	13	12%	7	6%
	Hotels etc	50	67%	12	16%	13	17%	3	4%	3	4%	6	8%
	Finance etc	71	76%	15	16%	11	12%	10	11%	11	12%	1	1%
	Services	73	87%	14	17%	3	4%	5	6%	1	1%	8	10%
	Health etc	67	81%	13	16%	6	7%	5	6%	3	4%	1	1%
Group	**Agriculture**	61	88%	7	10%	3	4%	5	7%	2	3%	1	1%
	Construction	79	71%	9	8%	4	4%	11	10%	13	12%	6	5%
	Ext./Util./Trans	131	84%	18	12%	9	6%	29	19%	13	8%	6	4%
	Manufacturing	497	81%	99	16%	34	6%	67	11%	96	16%	30	5%
	Services	436	79%	93	17%	61	11%	61	11%	66	12%	36	6%
Total		1,204	80%	226	15%	111	7%	173	12%	190	13%	79	5%

Source : Metra Martech - 27/10/00

TABLE 18-1 : WHAT ARE THE POTENTIAL BENEFITS FROM ACCIDENT INVESTIGATION?

Better relations with regulators		Avoid litigation		Peace of mind		Encourages general carefulness		None		DK/NA		Base
23	2%	43	5%	57	6%	95	10%	23	2%	48	5%	949
18	3%	16	3%	67	12%	57	10%	18	3%	34	6%	555
6	4%	2	1%	23	14%	11	7%	11	7%	13	8%	168
9	2%	8	2%	23	6%	31	8%	15	4%	30	8%	384
12	2%	23	4%	43	8%	49	9%	13	2%	26	5%	553
14	4%	26	7%	35	9%	61	15%	2	1%	13	3%	399
1	1%	1	1%	2	3%	6	9%	2	3%	4	6%	69
6	5%	4	4%	5	5%	7	6%	7	6%	6	5%	111
1	4%			2	7%	3	11%	1	4%	3	11%	28
1	1%	5	5%	3	3%	8	8%	1	1%	5	5%	102
1	4%	3	12%			4	15%			1	4%	26
2	2%	9	7%	7	6%	10	8%			2	2%	125
		1	1%	1	1%	6	5%	2	2%	6	5%	111
7	7%	4	4%	21	22%	20	21%	5	5%	10	11%	95
		5	4%	3	2%	7	6%	3	2%	5	4%	124
4	3%	9	7%	10	8%	22	17%	2	2%	5	4%	131
		2	7%	3	11%	2	7%			1	4%	27
2	2%	6	6%	28	26%	22	20%	1	1%	1	1%	109
8	7%			6	5%	9	8%	8	7%	7	6%	111
3	4%	3	4%	18	24%	2	3%	4	5%	3	4%	75
1	1%	5	5%	6	6%	12	13%			11	12%	93
2	2%	1	1%	8	10%	12	14%	2	2%	3	4%	84
2	2%	1	1%	1	1%			3	4%	9	11%	83
1	1%	1	1%	2	3%	6	9%	2	3%	4	6%	69
6	5%	4	4%	5	5%	7	6%	7	6%	6	5%	111
3	2%	8	5%	5	3%	15	10%	2	1%	9	6%	156
13	2%	30	5%	45	7%	67	11%	12	2%	29	5%	613
18	3%	16	3%	67	12%	57	10%	18	3%	34	6%	555
41	3%	59	4%	124	8%	152	10%	41	3%	82	5%	1,504

TABLE 18-2 : WHAT ARE THE POTENTIAL BENEFITS FROM ACCIDENT INVESTIGATION? BY SIZE

		Improved H&S performance		Improved morale		Better employee relations		Save money		Improved production		Better reputation	
Agriculture	Under 10	18	75%			1	4%	1	4%				
	Oct-49	16	94%	3	18%	2	12%	1	6%	1	6%		
	50-200	21	95%	3	14%			3	14%	1	5%	1	5%
	Over 200	6	100%	1	17%								
Construction	Under 10	22	73%					2	7%	2	7%		
	Oct-49	27	77%	2	6%	2	6%	5	14%	7	20%	5	14%
	50-200	10	45%	4	18%	1	5%	2	9%	2	9%		
	Over 200	20	83%	3	13%	1	4%	2	8%	2	8%	1	4%
Ext./Util./Trans	Oct-49	27	64%	6	14%	3	7%	5	12%	4	10%	1	2%
	50-200	74	94%	6	8%	3	4%	16	20%	3	4%	2	3%
	Over 200	30	86%	6	17%	3	9%	8	23%	6	17%	3	9%
Manufacturing	Under 10	11	100%							1	9%		
	Oct-49	130	79%	11	7%	5	3%	12	7%	26	16%	6	4%
	50-200	228	84%	47	17%	11	4%	27	10%	31	11%	15	6%
	Over 200	128	78%	41	25%	18	11%	28	17%	38	23%	9	5%
Services	Under 10	84	70%	14	12%	12	10%	5	4%	4	3%	13	11%
	Oct-49	109	74%	26	18%	16	11%	15	10%	12	8%	9	6%
	50-200	136	88%	22	14%	15	10%	16	10%	22	14%	5	3%
	Over 200	107	80%	31	23%	18	13%	25	19%	28	21%	9	7%
Higher Risk	Under 10	51	78%			1	2%	3	5%	3	5%		
	Oct-49	200	77%	22	8%	12	5%	23	9%	38	15%	12	5%
	50-200	333	84%	60	15%	15	4%	48	12%	37	9%	18	5%
	Over 200	184	80%	51	22%	22	10%	38	17%	46	20%	13	6%
Lower Risk	Under 10	84	70%	14	12%	12	10%	5	4%	4	3%	13	11%
	Oct-49	109	74%	26	18%	16	11%	15	10%	12	8%	9	6%
	50-200	136	88%	22	14%	15	10%	16	10%	22	14%	5	3%
	Over 200	107	80%	31	23%	18	13%	25	19%	28	21%	9	7%
Total		1,204	80%	226	15%	111	7%	173	12%	190	13%	79	5%

Source : Metra Martech - 27/10/00

TABLE 18-2 : WHAT ARE THE POTENTIAL BENEFITS FROM ACCIDENT INVESTIGATION? BY SIZE

Better relations with regulators		Avoid litigation		Peace of mind		Encourages general carefulness		None		DK/NA		Base
						1	4%	2	8%	3	13%	24
				1	6%	1	6%					17
1	5%			1	5%	4	18%			1	5%	22
		1	17%									6
1	3%					1	3%	1	3%	3	10%	30
2	6%	4	11%	3	9%	4	11%	2	6%	2	6%	35
2	9%			2	9%	1	5%	4	18%			22
1	4%					1	4%			1	4%	24
1	2%	2	5%	1	2%	2	5%	1	2%	3	7%	42
		1	1%	3	4%	11	14%			5	6%	79
2	6%	5	14%	1	3%	2	6%	1	3%	1	3%	35
				1	9%	1	9%					11
1	1%	2	1%	7	4%	15	9%	8	5%	11	7%	165
7	3%	14	5%	26	10%	27	10%	3	1%	12	4%	272
5	3%	14	8%	11	7%	24	15%	1	1%	6	4%	165
6	5%	2	2%	22	18%	10	8%	9	8%	7	6%	120
4	3%	1	1%	12	8%	10	7%	4	3%	17	12%	147
3	2%	7	5%	16	10%	13	8%	5	3%	5	3%	154
5	4%	6	4%	17	13%	24	18%			5	4%	134
1	2%			1	2%	3	5%	3	5%	6	9%	65
4	2%	8	3%	12	5%	22	8%	11	4%	16	6%	259
10	3%	15	4%	32	8%	43	11%	7	2%	18	5%	395
8	3%	20	9%	12	5%	27	12%	2	1%	8	3%	230
6	5%	2	2%	22	18%	10	8%	9	8%	7	6%	120
4	3%	1	1%	12	8%	10	7%	4	3%	17	12%	147
3	2%	7	5%	16	10%	13	8%	5	3%	5	3%	154
5	4%	6	4%	17	13%	24	18%			5	4%	134
41	3%	59	4%	124	8%	152	10%	41	3%	82	5%	1,504

TABLE 19A-1 : WHEN WAS THE LAST INCIDENT THAT WAS INVESTIGATED?

		When was the last investigated incident?												Base
		Pre '97		1997		1998		1999		2000		DK/NA		
Risk	Higher	20	2%	17	2%	37	4%	81	9%	516	54%	278	29%	949
	Lower	12	2%	8	1%	20	4%	35	6%	252	45%	228	41%	555
Employees	Under 10	8	5%	1	1%	3	2%	5	3%	22	13%	129	77%	168
	Oct-49	13	3%	11	3%	26	7%	26	7%	135	35%	173	45%	384
	50-200	9	2%	10	2%	21	4%	70	13%	303	55%	140	25%	553
	Over 200	2	1%	3	1%	7	2%	15	4%	308	77%	64	16%	399
Sector	Agriculture	6	9%	1	1%	4	6%	10	14%	25	36%	23	33%	69
	Construction	2	2%	1	1%	4	4%	3	3%	49	44%	52	47%	111
	Mining					1	4%	2	7%	19	68%	6	21%	28
	Transport	2	2%	2	2%	2	2%	8	8%	59	58%	29	28%	102
	Utilities					1	4%	1	4%	23	88%	1	4%	26
	Pet. & Chem.	2	2%			3	2%	10	8%	94	75%	16	13%	125
	Metals etc	2	2%	5	5%	7	6%	17	15%	62	56%	18	16%	111
	Food			1	1%	1	1%	2	2%	24	25%	67	71%	95
	Textiles etc	3	2%	2	2%	9	7%	15	12%	63	51%	32	26%	124
	Machinery etc	3	2%	4	3%	5	4%	13	10%	82	63%	24	18%	131
	Repair			1	4%					16	59%	10	37%	27
	Wholsale	4	4%	2	2%	5	5%	4	4%	61	56%	33	30%	109
	Retail			1	1%	1	1%	4	4%	48	43%	57	51%	111
	Hotels etc					3	4%	2	3%	39	52%	31	41%	75
	Finance etc	7	8%	1	1%	3	3%	10	11%	47	51%	25	27%	93
	Services	1	1%	2	2%	3	4%	9	11%	34	40%	35	42%	84
	Health etc			2	2%	5	6%	6	7%	23	28%	47	57%	83
Group	Agriculture	6	9%	1	1%	4	6%	10	14%	25	36%	23	33%	69
	Construction	2	2%	1	1%	4	4%	3	3%	49	44%	52	47%	111
	Ext./Util./Trans	2	1%	2	1%	4	3%	11	7%	101	65%	36	23%	156
	Manufacturing	10	2%	13	2%	25	4%	57	9%	341	56%	167	27%	613
	Services	12	2%	8	1%	20	4%	35	6%	252	45%	228	41%	555
Total		32	2%	25	2%	57	4%	116	8%	768	51%	506	34%	1,504

Source : Metra Martech - 27/10/00

TABLE 19A-2 : WHEN WAS THE LAST INCIDENT THAT WAS INVESTIGATED? BY SIZE

		When was the last investigated incident?												Base
		Pre '97		1997		1998		1999		2000		DK/NA		
Agriculture	Under 10	4	17%					2	8%	1	4%	17	71%	24
	Oct-49	2	12%			2	12%	1	6%	9	53%	3	18%	17
	50-200			1	5%	2	9%	7	32%	10	45%	2	9%	22
	Over 200									5	83%	1	17%	6
Construction	Under 10	1	3%			2	7%	1	3%	6	20%	20	67%	30
	Oct-49	1	3%			1	3%	2	6%	13	37%	18	51%	35
	50-200									10	45%	12	55%	22
	Over 200			1	4%	1	4%			20	83%	2	8%	24
Ext./Util./Trans	Oct-49	1	2%			1	2%	1	2%	19	45%	20	48%	42
	50-200	1	1%	2	3%	2	3%	8	10%	53	67%	13	16%	79
	Over 200					1	3%	2	6%	29	83%	3	9%	35
Manufacturing	Under 10			1	9%					6	55%	4	36%	11
	Oct-49	5	3%	9	5%	12	7%	15	9%	58	35%	66	40%	165
	50-200	4	1%	3	1%	9	3%	39	14%	157	58%	60	22%	272
	Over 200	1	1%			4	2%	3	2%	120	73%	37	22%	165
Services	Under 10	3	3%			2	2%	3	3%	11	9%	101	84%	120
	Oct-49	6	4%	3	2%	10	7%	10	7%	53	36%	65	44%	147
	50-200	2	1%	3	2%	7	5%	13	8%	81	53%	48	31%	154
	Over 200	1	1%	2	1%	1	1%	9	7%	107	80%	14	10%	134
Higher Risk	Under 10	5	8%	1	2%	2	3%	3	5%	13	20%	41	63%	65
	Oct-49	9	3%	9	3%	16	6%	19	7%	99	38%	107	41%	259
	50-200	5	1%	6	2%	13	3%	54	14%	230	58%	87	22%	395
	Over 200	1	0%	1	0%	6	3%	5	2%	174	76%	43	19%	230
Lower Risk	Under 10	3	3%			2	2%	3	3%	11	9%	101	84%	120
	Oct-49	6	4%	3	2%	10	7%	10	7%	53	36%	65	44%	147
	50-200	2	1%	3	2%	7	5%	13	8%	81	53%	48	31%	154
	Over 200	1	1%	2	1%	1	1%	9	7%	107	80%	14	10%	134
Total		32	2%	25	2%	57	4%	116	8%	768	51%	506	34%	1,504

Source : Metra Martech - 27/10/00

TABLE 19B-1 : ARE YOU PREPARED TO DISCUSS THIS INCIDENT ON A FUTURE

		Will you discuss it further?"				Base
		No		Yes		
Risk	**Higher**	271	29%	674	71%	949
	Lower	146	26%	409	74%	555
Employees	**Under 10**	74	44%	94	56%	168
	Oct-49	138	36%	244	64%	384
	50-200	143	26%	409	74%	553
	Over 200	62	16%	336	84%	399
Sector	**Agriculture**	13	19%	56	81%	69
	Construction	36	32%	75	68%	111
	Mining	5	19%	22	81%	28
	Transport	30	29%	72	71%	102
	Utilities	1	4%	25	96%	26
	Pet. & Chem.	37	30%	87	70%	125
	Metals etc	21	19%	89	81%	111
	Food	51	54%	44	46%	95
	Textiles etc	37	30%	87	70%	124
	Machinery etc	30	23%	100	77%	131
	Repair	10	37%	17	63%	27
	Wholsale	25	23%	84	77%	109
	Retail	31	28%	80	72%	111
	Hotels etc	19	25%	56	75%	75
	Finance etc	25	27%	68	73%	93
	Services	20	24%	64	76%	84
	Health etc	26	31%	57	69%	83
Group	**Agriculture**	13	19%	56	81%	69
	Construction	36	32%	75	68%	111
	Ext./Util./Trans	36	23%	119	77%	156
	Manufacturing	186	30%	424	70%	613
	Services	146	26%	409	74%	555
Total		417	28%	1,083	72%	1,504

Source : Metra Martech - 27/10/00

TABLE 19B-2 : ARE YOU PREPARED TO DISCUSS THIS INCIDENT ON A FUTURE

		Will you discuss it further?"				Base
		No		Yes		
Agriculture	Under 10	8	33%	16	67%	24
	Oct-49	2	12%	15	88%	17
	50-200	2	9%	20	91%	22
	Over 200	1	17%	5	83%	6
Construction	Under 10	15	50%	15	50%	30
	Oct-49	8	23%	27	77%	35
	50-200	9	41%	13	59%	22
	Over 200	4	17%	20	83%	24
Ext./Util./Trans	Oct-49	13	32%	28	68%	42
	50-200	19	24%	60	76%	79
	Over 200	4	11%	31	89%	35
Manufacturing	Under 10	5	45%	6	55%	11
	Oct-49	73	45%	90	55%	165
	50-200	73	27%	199	73%	272
	Over 200	35	21%	129	79%	165
Services	Under 10	50	42%	70	58%	120
	Oct-49	47	32%	100	68%	147
	50-200	36	23%	118	77%	154
	Over 200	13	10%	121	90%	134
Higher Risk	Under 10	28	43%	37	57%	65
	Oct-49	96	38%	160	63%	259
	50-200	103	26%	292	74%	395
	Over 200	44	19%	185	81%	230
Lower Risk	Under 10	50	42%	70	58%	120
	Oct-49	47	32%	100	68%	147
	50-200	36	23%	118	77%	154
	Over 200	13	10%	121	90%	134
Total		417	28%	1,083	72%	1,504

Source : Metra Martech - 27/10/00

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