

UNLOCKING THE ORGANIZATION: ACTION RESEARCH AS A MEANS OF IMPROVING ORGANIZATIONAL SAFETY¹

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Abstract: Most companies involved in hazardous operations are required to have some sort of safety management system. The most frequently used approaches to safety management are largely bureaucratic ones, which rely heavily on top-down perspectives on organizations, and on extensive systems of rules and regulations. We argue that these approaches can lead organizations into lock-in situations, where they get “stuck” in certain ways of thinking and acting with regard to safety. We show how a holistic cultural approach based on principles of action research can contribute to the unlocking of organizations. By serving as a medium for bottom-up information and stimulating the safety managers to see alternative ways of managing safety, action research is a highly suitable means for achieving a more interactive relationship between the organisation’s safety legislators and its employees. Such an interactive relationship must be considered an important prerequisite of Reason’s (1997) concept of an informed culture, which in many ways constitutes the ideal of all safety management systems. The argument is based on empirical work carried out in a Norwegian oil company over a period of five years.

INTRODUCTION

In the past decades the issues of safety and reliability have moved to the centre of both scientific and managerial interest. This is probably connected to an increasing interest in the broader concept of risk which has become a central theme in contemporary social science through the works of Ulrich Beck (1992) and Anthony Giddens (1990). While accidents were traditionally seen as “engineering failure” or “human error”, more recent approaches also emphasize the *organizational* conditions which determine the safety of organizations. This applies to individual workplace accidents as well as to major industrial disasters. Organizational conditions have been shown to constitute important root causes of major accidents, such as the Chernobyl, Bhopal and Challenger disasters.

The reason for the increased interest in organizational factors is, of course, the prospect of building organizations that are able to *control* the hazards associated with industrial activity in a satisfactory manner. The literature on safety management specifies a number of strategies which are meant to improve or maintain high levels of organizational safety. However, organizations are sometimes unable to move beyond specific ways of seeing and doing things. This rigidity may also manifest itself in organizations’ approaches to safety management. The factors behind such lock-in processes are highly interesting in themselves. Nevertheless, from a more practical point of view, the pivotal (though not unrelated) question is not primarily “how did we get into this situation?” but rather “how do we get out of it?”

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In this article we argue that traditional strategies, which manage safety through a top-down perspective, can lead to lock-in situations. We describe the “unlocking” of the safety management processes in a distributed offshore logistics activity. The terms “lock-in” and “unlocking” first appeared (to our knowledge) in the title of the 21st colloquium of the European Group for Organizational Studies (EGOS) in Berlin 2005: “Unlocking Organizations”. We regard these concepts as rather useful in describing processes of organizational learning, which lie at the core of all safety management systems.

We draw upon research which has demonstrated that organizational actions seeking to foster employee commitment have positive effects on key organizational qualities such as employee turnover, effectiveness and productivity. We believe that the same logic can be applied to organizational safety. With this as our starting point, we discuss the practice of action research as a means of unlocking the organization’s safety management approach, and thereby improving organizational safety.

An action research group associated with the Norwegian University of Science and Technology has collaborated closely with a Norwegian oil company from year 2000 onwards. The goal was to improve the safety of the supply services which provide the transport and emergency preparedness necessary to operate the offshore installations. The long term nature of the collaboration, as well as the closeness of the relationship involved, has provided the researchers with very good access to the organization. In addition to conducting three surveys and about 40 interviews, the research group has participated in numerous meetings at different levels in the company. Our argument draws upon all these sources of data.

The article consists of three sections. First we give a short introduction to safety management and organizational safety. Second, we give a brief account of what we believe to be a lock-in situation in the organization. In the third section we describe and discuss the measures initiated by the action research group with the aim of unlocking the organization.

DIFFERENT APPROACHES TO MANAGING ORGANIZATIONAL SAFETY

The report *Organising for Safety* by the Advisory Committee on the Safety of Nuclear Installations (ACSNI 1993) is the first comprehensive review of the literature on organizational safety (Hale & Hovden 1998). This report divides the history of attempts to regulate organisational safety into three phases:

The first phase is largely a **punishment-based approach**, as it is characterized by what can be described as a “scapegoat mentality”. When incidents occur, the main focus is to find someone responsible and have them punished. This approach tends to see accidents as results of unsafe individual acts, and pays little attention to whether the unsafe act has anything to do with systemic conditions. The approach is based on classical behaviourist psychology.

The second phase is characterized by what is labelled “prescribing in advance” (ACSNI 1993:3), and may be called a **bureaucratic approach**. Detailed rules and work procedures are the main regulating devices in this approach, which is thus a firmly structural one. Safety is seen as a management responsibility, and as something which can and should be directed and controlled by management. The principles underlying this approach can be traced back to Heinrich (1931), but general management theories from the 1960s and 1970s also comprise a heavy influence (Haukelid 1999). The bureaucratic approach represents a development compared to the first phase, as it recognises the impact of organizational conditions on safety. It relies quite heavily on control-oriented actions, as it aims at achieving control through compliance-oriented measures and policies (DeJoy 2005).

The third phase may be labelled the **cultural approach**, as it is characterized by an interest in the relationship between organizational culture and safety (commonly described as “safety culture”). This approach is conceived as a way of thinking that is fundamentally different to the previous phases: By moving beyond the setting of externally imposed criteria in the form of rules and regulations, emphasis is instead to be placed upon the more informal parts of the organization, such as the climate or culture in work groups (ibid.). Glendon and Stanton (2000) introduce a useful distinction as they propose a further division of the cultural approach into two sub-categories: functionalist, top-down approaches; and interpretative, bottom-up approaches. Their distinction is an important one, because only the interpretative approach represents a fundamental break with the traditional approaches to safety management.

The top-down perspectives see culture as something readily assessed and modified by managers. These perspectives continue the heavy emphasis on strong leadership inherent in the punishment-based and bureaucratic approaches to safety management. A great deal of the existing research on safety culture rests on such top-down perspectives.

However, in recent years the research on safety culture has adopted a more bottom-up oriented perspective by drawing upon more advanced theories of organizational culture (e.g. Guldenmund 2000; Gherardi & Nicolini 2000; Richter & Koch 2004). The bottom-up perspective does not exclude the role of managers in influencing cultures; it does imply, however, that safety cultures cannot be as easily changed as functionalist-oriented researchers and managers may wish.

Research within this framework is characterized by a more descriptive, rather than normative stance towards the study of culture. We agree with Waring and Glendon (1998) that this approach is more appropriate than the top-down, functionalist approach for understanding organizational safety, as well as other aspects of organizational life.

This approach is highly compatible with practice-based methods such as action research. Nevertheless, surprisingly few attempts have been made to study organizational safety through action research. Richter (2003) and Richter and Koch (2004) are honourable exceptions, as they adopt principles of action research in their studies of safety culture. Although these studies are useful, they fail to address a question of vital importance: *In what ways are the principles of action research useful for improving organizational safety?* This is the primary research question to be addressed in this article.

Although the above-mentioned approaches to safety are described as phases, it must be stressed that all three approaches can, to varying degrees, be found in organizations. In fact, it can be asserted that the bureaucratic approach is still the managerial method most frequently applied in order to improve or maintain organizations' safety levels (Barling & Hutchinson 2000). As we will demonstrate, the bureaucratic approach comprised a significant part of the lock-in situation in the organization which provides the empirical basis for this article.

THE STORY OF SAFETY DEVELOPMENT IN A DISTRIBUTED OFFSHORE LOGISTICS ACTIVITY

This case is based on empirical work conducted by several researchers over a period of 4-5 years. We provide a brief presentation in this section. The case story documents a project aimed at improving safety among the service vessels in the maritime operations of a Norwegian oil company. Oil and gas operations are a key industry in Norway, representing 15 per cent of the GDP, and the company in question has a dominant position in the Norwegian oil industry.

The offshore oil industry in the North Sea is mainly serviced by three types of vessel: Supply vessels are used by the supply services to transport goods to the oil and gas installations, specially equipped vessels operate anchor-handling activities, and stand-by vessels take care of the emergency preparedness.

The supply services conduct the lion's share of the activity, which can be regarded as a value chain (Porter 1985) or a logistics chain. This chain describes the physical and sequential flow of products or goods through different parts of the organization, or transversing different organizations. The logistics chain of the supply vessels is complex, and several organizations and actors are involved: the shipowners' offices, the ships' crews, the oil company with its different departments, and the installation crew. However, the activity in the logistics chain is to a great extent controlled and coordinated by the oil company. In addition to communicating directly with the oil company in their daily operations, the vessels are subject to a rather extensive set of rules and regulations. Also, the charters of the contract between the shipowners and the oil company grant the latter considerable influence over the shipowners' safety management system.

The logistics chain represents a highly complex system. This complexity poses major challenges for safety management. The next section describes the way safety was initially attended to in the logistics chain.

The lock-in situation

The work on the service vessels has been associated with considerable risk from the very start of the oil industry in Norway in the 1970s. However, from the mid 1990s, the oil company's figures for lost time injuries (LTIs) showed a significant increase: From 1996 to 2001 the number LTIs nearly tripled. In addition, the number of collisions between service vessels and the oil company's installations doubled every year: While there was one collision in 1997, the number rose to three in 1998, six in 1999 and twelve in 2000. These collisions represented an increased risk of personnel injuries, in addition to severe property damage and potential shut-downs in the production of oil and gas on the installations. Thus, the actual and potential financial losses associated with vessel-installation collisions were considerable.

The responses to this development were firmly rooted within a bureaucratic approach: Investigations carried out after injuries and serious incidents often revealed failure to comply with the existing rules and procedures. Instead of seeking to shed light on the underlying reasons as to *why* the rules were ignored, a common response was to propose yet more rules and procedures. Thus, new or modified work procedures became a largely “standard” management response to injuries and incidents. This approach can be characterized as a rationalistic one, in that to a large extent, the efficiency of the organization is based on the principle that work can be standardized and pre-programmed. Standard operating procedures are then adjusted to cover each specific situation, as it arises. Such a prescriptive safety control mode is shown in figure 1.

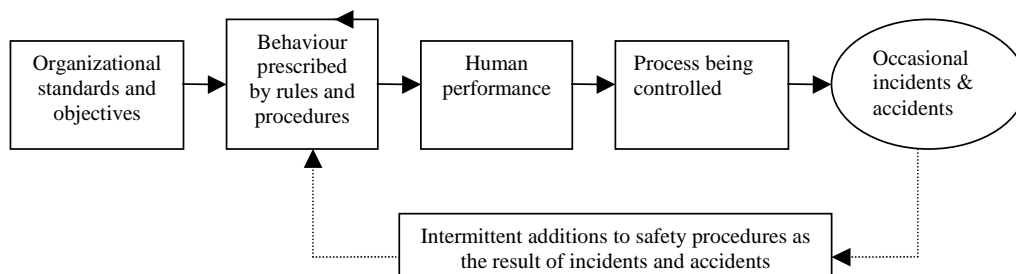


Figure 1: A feed forward process control, based on procedures with intermittent additions (Reason 1997).

Reason (1997) argues that the result of this approach is that the body of safety procedures increases in an additive fashion, thus reducing the scope of action required to perform tasks effectively. Problems occur when the scope of permitted actions shrinks to such an extent that violation of procedures becomes routine practice. Another problem is that procedures to ensure safe work operations suffer from a lack of requisite variety. In virtually all hazardous operations, the variety of possible unsafe behaviours is much greater than the variety of required productive behaviours. Thus, the requisite variety of the procedures necessary to govern safe behaviour will always be smaller than the possible variety of unsafe situations. The third problem is that the procedures are developed by experts who are not involved at the operational level. Morgan (1986) argues that one of the most far-reaching consequences of the rational approach is that planning and pre-programming are separated from the people performing the work.

Such separation between planners and operators was found in relation to the service vessels, where the procedures were developed without any real participation from the workers. The relationship between legislators and workers was thus to a great extent based on linear, top-down communication. This is characteristic of the bureaucratic approach to safety, as it tends to treat safety as extraneous to work practice (Gherardi & Nicolini 2000).

This one-way situation can be described by a very simple model, commonly used to describe a linear communication process (figure 2):



Figure 2: Linear model of communication. Adapted from Adler et al. (1983)

Note that the model does not include any form of feedback, so that the sender knows very little about the recipient’s interpretation and use of the message.

The organizations involved found themselves in a situation with a complex and growing body of work procedures. At the same time, the number of collisions and injuries continued to increase. Thus, it became obvious that the traditional response of achieving safety through increased standardization was no longer satisfactory. This caused both concern and frustration among the managers of the logistics chain.

In hindsight, the safety managers related their problems to the one-directional mode of communication which was inherent in their approach to safety management. One of the managers summed up the situation like this:

We had no arenas where we could meet the captains and address their views, where they were alone and not dependent upon others. We had a previous arena called the "safety forum" which included captains, platform managers, personnel, safety representatives, lots of people. But the only thing that came out of it was bickering, and it was the same issues being discussed over and over again. (...) we needed to change tactics to foster enthusiasm, and not be pointing fingers like we used to.

The negative development of accident and incident rates, in combination with a feeling of lacking the perspective and methods to turn the situation around, constitute the essence of what we denote the lock-in situation. This situation led the managers of the maritime operations department to bring in external expertise in the form of our research group at Studio Apertura at the Norwegian University of Science and Technology. Some of the members of the group had previously been involved in other research projects in the organization, which was probably an important factor in the oil company's choice of collaborator.

In the next section, we describe the action research activities which contributed to new collective practices and improved safety in the organization.

Unlocking the organization

The action research approach

In order to get an overview of possible causes and measures, the oil company carried out a survey in cooperation with our research group in 2000. 434 persons from the service vessels' crews (response rate 76) constituted the sample for the survey. The main conclusion from the survey was that an efficiency improvement project in the logistics chain that started in 1997 had led to increased physical strain on the crews, causing attention problems. In addition, the crews experienced pressure from other parts of the logistics chain. Especially the supply vessel crews reported that they felt pressurized into docking the platforms irrespective of the weather conditions. The vessel crews commonly saw themselves as the "underdogs" of the logistics chain, who could be pushed around to satisfy the whims of the platform crews.

In 2001, the oil company asked our research group to carry out a development program, where the ultimate goal was to increase the safety and improve the safety results of their maritime operations involving the service vessels. Our research group had previous experience with practise-based methods in organizational development. An important assumption in the development program was that safety could be improved in a more fundamental and lasting manner by involving the community of practice whose safety was at stake. In our view, stakeholder involvement could improve motivation, encourage development of more effective solutions and measures, and also foster a more holistic view among the stakeholders of the safety challenges they were experiencing. The main stakeholders in our case were the crews on the service vessels, but other personnel groups in the logistics chain became more important as the programme developed.

Action research (Greenwood & Levin 1998) was considered an approach that met the basic assumption of stakeholder involvement. As a tool for accomplishing democratic social change, action research (AR) involves three basic elements: research, action and participation. The action research process is described in the following manner:

"AR is social research carried out by a team encompassing a professional action researcher and members of an organization or community seeking to improve their situation. [...] Together, the professional researcher and the stakeholders define the problems to be examined, cogenerate relevant knowledge about them, learn and execute social research techniques, take actions, and interpret the results of actions based on what they have learned." (ibid: 4)

The captains on the vessels were considered key personnel and important stakeholders in safety questions, since they carried the overall responsibility for the activity on board. We therefore established an arena – "Captain's Forum" – where the action research process took place. We arranged regular search conferences, where safety questions were addressed. A search conference is a methodology where planning, creative problem solving and concrete action are integrated activities (Greenwood & Levin 1998). The first search conferences were devoted to reflections upon

why accidents happened, and what could be done to reach the vision of zero accidents. Later search conferences focused on how different actors in the logistics chain could cooperate in order to improve the safety results. Hence, personnel from the onshore supply services and offshore oil and gas installations also became important participants in the search conferences.

Our research group carried out different research activities as input to the search conferences. We analyzed historical data and earlier accidents involving the service vessels that were registered in a database. We also carried out new surveys and interviews involving the crews. The results from these activities were presented to and jointly interpreted by the stakeholders and the research group. These discussions resulted in a list of concrete preventative actions. In later search conferences, these actions were jointly evaluated. This circle of establishing and evaluating concrete measures is still active.

In addition to search conferences, 15 other measures aimed at improving the situation were put into effect by the oil company. These included individual, physical, organizational and communicational measures (Hansson et al. 2004). Several of these measures originated in the discussions in the "Captain's Forum". The search conferences thus served both as arenas for assessment and definition of problem areas with regard to safety; as well as arenas for brainstorming and discussion about solutions to these problems. As shown in the next section, the action research approach appears to have been effective.

Effects of the measures

The safety level of the service vessels has increased significantly after the interventions. Since 2001 the annual collision frequency has been between 0 and 1, which is a dramatic improvement on the 12 collisions in 2000 (figure 3).

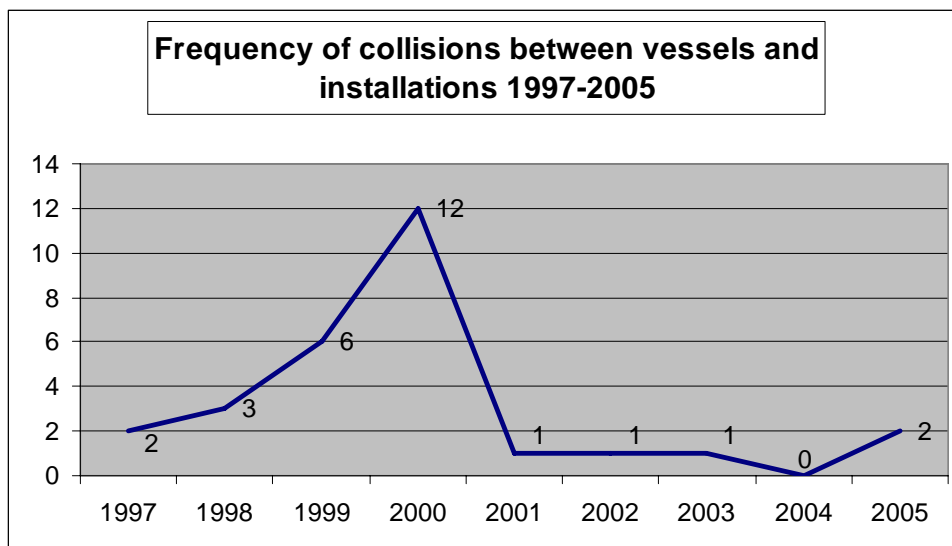


Figure 3: Development in the frequency of collisions between service vessels and installations in the period from 1997 to 2005.

In addition, the frequency of personnel injuries per million working hours decreased from 13.8 in 2001 to 2.6 in 2005 (figure 4):

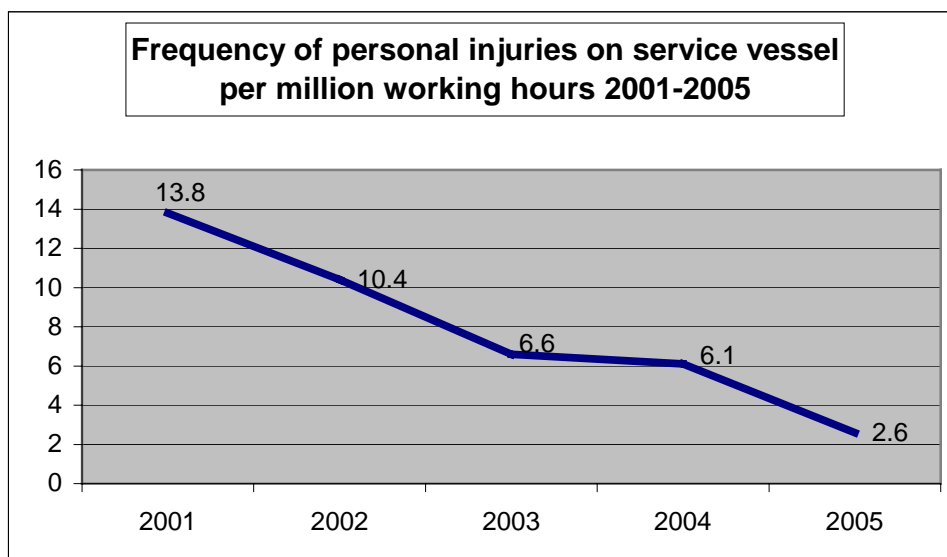


Figure 4: Development in the frequency of personnel injuries on service vessels per million working hours in the period from 2001 to 2005.

It is extremely difficult to establish with certainty that these improvements are due to the safety development programme. However, an evaluation of the programme concluded that there are few alternative explanations (Hansson et al. 2004). Although the oil company has contracted a small number of newly built ships, the technological standard of the remaining fleet is still largely the same. Technological improvements are thus unlikely to explain more than a limited proportion of the improvements. The improvements are also far too radical to be attributable to coincidence.

The crews on the vessels seemed to agree that things had changed considerably in terms of the way safety was managed in the logistics chain:

I have to hand it to them [the oil company], they have changed in recent years. It seems obvious that someone has pushed them a bit too, over the last few years. They have gained a better understanding of the work that we do.

It is worth noting that the informant traces the changes back to an increased managerial understanding of the work on shop floor level, which is one of the major purposes of action research. Another informant expresses a similar argument, emphasising that there has been a shift away from what bears strong resemblance to a “punishment” approach:

(...) I think that it [communication] has changed a bit from what was before. If an accident or incident does happen, they sometimes jump at us. I think that has been taken more calmly, it is no longer that harsh reaction, but at the same time they take things seriously and try to do something about it.

This can be seen as a shift away from a blame-oriented stance towards a more learning-oriented approach to accidents and incidents.

The crew members’ rating of the oil company also showed significant improvement after the safety development programme was introduced. Respondents to the survey assessments in 2000 and 2002 were asked to state their level of agreement with the following statement: “Compared to others, this oil company is a good employer”. The mean values rose from 3.89 in 2000 to 4.46 in 2002. Although one should take care not to overestimate the relevance of such general indicators to the organization’s safety level, they nevertheless serve as an important index of the perceived changes in the oil company’s safety management approach.

The role of action research

The lock-in situation was characterised by a considerable distance, both physically and psychologically, between those who designed and maintained the safety management system and the employees who were supposed to work in accordance with the regulations built into this system. As a consequence of the bureaucratic approach to safety management, the safety management system took on a life of its own: The focus on designing

and maintaining the system had become so all-consuming that the question of whether it was working as intended was completely ignored. This failure is no doubt associated with the general tendency among various regulatory authorities to perform system revisions that aim to assess which safety systems exist, rather than whether these systems are actually working as intended.

The action research helped to break up this pattern in a number of ways:

1. Increased worker participation and involvement is instrumental in enhancing employees' trust in management, and their commitment to safety (Barling & Hutchinson 2000). Search conference methodology strongly emphasizes worker involvement. The action research approach increases the workers' ownership over the definition of and possible solutions to safety challenges. This is fundamentally different to the control-oriented approach, as it accepts the fact that the "official" way of doing things is not necessarily the safest way to perform risky activities.

2. A more unified approach to safety in the logistics chain. The bureaucratic approach focuses mainly on procedures and organizational structures. It pays little attention to organizational culture. When the vessel crews perceived themselves as "underdogs" who were under pressure to compromise safety in order to comply with the platform crews' requests, this hints at the existence of subcultures in the logistics chain. The main goal of the logistics chain is to ensure that the oil and gas production can proceed as smoothly as possible, a fact which singles out the platforms as the most important parts of the logistics chain. However, this emphasis has cultural implications, as it creates differences in status between platform and vessel employees, differences which then contribute to the perceived efficiency pressure. What is important here is that these kinds of culturally induced risks are extremely difficult, if not impossible, to assess through traditional safety management methods, such as formal incident reporting. The assessment of such risks demands an approach which involves all relevant stakeholders, and which is thus both unified and practice based.

3. A more two-way form of communication. As one-way communication was a major part of the lock-in situation, two-way communication is a major part of the unlocking-process. This form of communication introduces the concept of feedback into the linear model (figure 5).

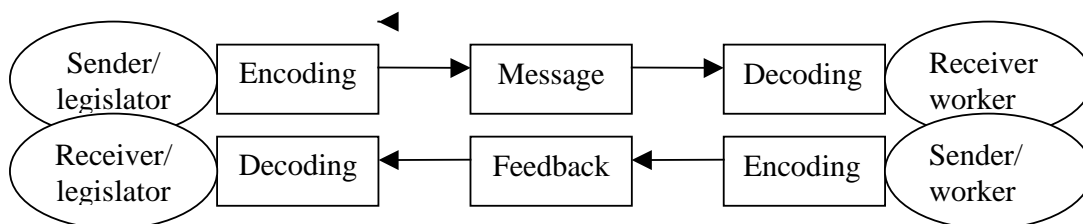


Figure 5: Interactive model of communication. Adapted from Adler et al. (1983)

The search conferences were designed as forums for collective learning, collective reflection on practice, and collective inquiry, and they provided crucial arenas for such two-way communication. As already indicated, the search conferences led to a variety of new safety measures. Since to a large extent these measures are based on practical experiences from operative work, they are likely to be better adapted to practical work tasks, and are also perceived as more legitimate by the workers.

The fact that the workers' feedback is quickly translated into action serves both a manifest and symbolic purpose. It has a manifest purpose in that it can provide safety improvement/learning *without* having to wait for incidents or accidents to happen. In addition, it sends an important message to the participants that safety is important, and that everyone has a role to play in safety improvement. Such symbolic functions should not be underestimated within the field of safety improvement.

Although we argue against the traditional strategies of safety management, we acknowledge that work procedures are not irrelevant to safety. The pivotal question, however, is whose expertise provides the basis for these procedures? Procedures without a firm basis in local safety knowledge are likely to be perceived as constraints rather than opportunities. Our argument is thus aimed at the top-down oriented bureaucratic approach to the production of procedures, rather than at the procedures as such.

In addition to the manifest safety improvements, the oil company also attributes improved efficiency to the safety development programme. Reportedly, the work with safety improvement has given the different units in the logistics chain a better understanding of each other's work responsibilities and challenges. This in turn has been said to improve the overall cooperation and communication, and thereby the efficiency in the logistics chain. The relation is a difficult one to prove empirically, but we assert that a unified cultural approach to safety improvement is likely to have effects beyond improved safety, because it targets communication and mutual understanding as central aspects of the improvement processes. These are general organizational aspects that affect the performance of complex organizations in ways that are not restricted to the area of safety, suggesting that the traditional view of an antagonistic relationship between production and safety may not be as self-evident as previously thought.

In sum, we believe that the action research approach has been instrumental in providing the means for unlocking the organization. However, an important question remains: Is the organization now fully unlocked?

Is the organization unlocked?

In establishing the search conferences as recurring arenas for safety communication and learning, action research can stimulate the organization towards a more interactive form of communication. However, there are few "quick fixes" when it comes to organizational development. This is also the case in this organization. In 2004 we conducted a survey and 20 interviews to assess safety culture in the logistics chain. Our results show that some of the problems, especially with regard to work procedures, were still present. The oil company's way of managing safety was still the object of a certain amount of confusion and frustration. For example, many still called for increased worker participation in the managing of safety. Nearly 17 per cent of the respondents in the survey disagreed that they had sufficient influence on the development of procedures and regulations.

This was also reflected in the qualitative material. The following quotation from a first officer is a good illustration that the oil company still has work to do in terms of incorporating local knowledge into their safety management approach:

I am highly critical to the stressing of procedures and checklists. (...) But that doesn't mean that I don't take safety issues seriously. (...) Focusing on safety, putting it on the agenda, and focusing on the use of protective equipment, among other things, that is very important. But going from that to controlling every detail, telling workers how they should behave and work in every situation, that's too excessive in my opinion.

Although some of the problems relating to a bureaucratic safety management approach are still present in the organization, the management now knows about and appreciates the workers' frustration to a greater extent. Organizational change is a complex process, and one cannot expect immediate transformation. However, the managers of the logistics chain show a growing willingness to abandon the control-oriented perspective. For instance, the oil company has agreed to let the shipping companies take over much of the investigation after incidents and accidents.

This brief account of the current situation indicates that action research can provide the necessary, but not the sufficient conditions for unlocking an organization. Action research provides the tools for local development processes, but it takes continuous and goal-oriented efforts for these processes to really "take hold" in the organization.

CONCLUSIONS

In this article, we have shown how an action research approach can contribute to the unlocking of the safety management system in a distributed offshore logistics activity. We have shown that the organization was to a large extent trapped in a bureaucratic approach to safety management. By serving as a medium for bottom-up information, and stimulating the safety managers to see alternative ways of managing safety, action research is a highly suitable means for achieving a more interactive relationship between the organisation's safety legislators and its employees. Such an interactive relationship must be considered an important prerequisite of Reason's (1997) concept of an informed culture, which in many ways constitutes the ideal of all safety management systems.

With its emphasis upon worker participation, dialogue and learning, action research can represent a powerful approach to the unlocking of organizations. However, old habits die hard. Our research shows that one cannot expect any quick fixes in unlocking organizations. Nevertheless, by facilitating feedback communication and dialogue, action research can help create the conditions necessary to unlock the organization. This is achieved

by stimulating new ways of thinking and seeing the different realities of the organization. However, the actual unlocking must be conducted by the organization itself.

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