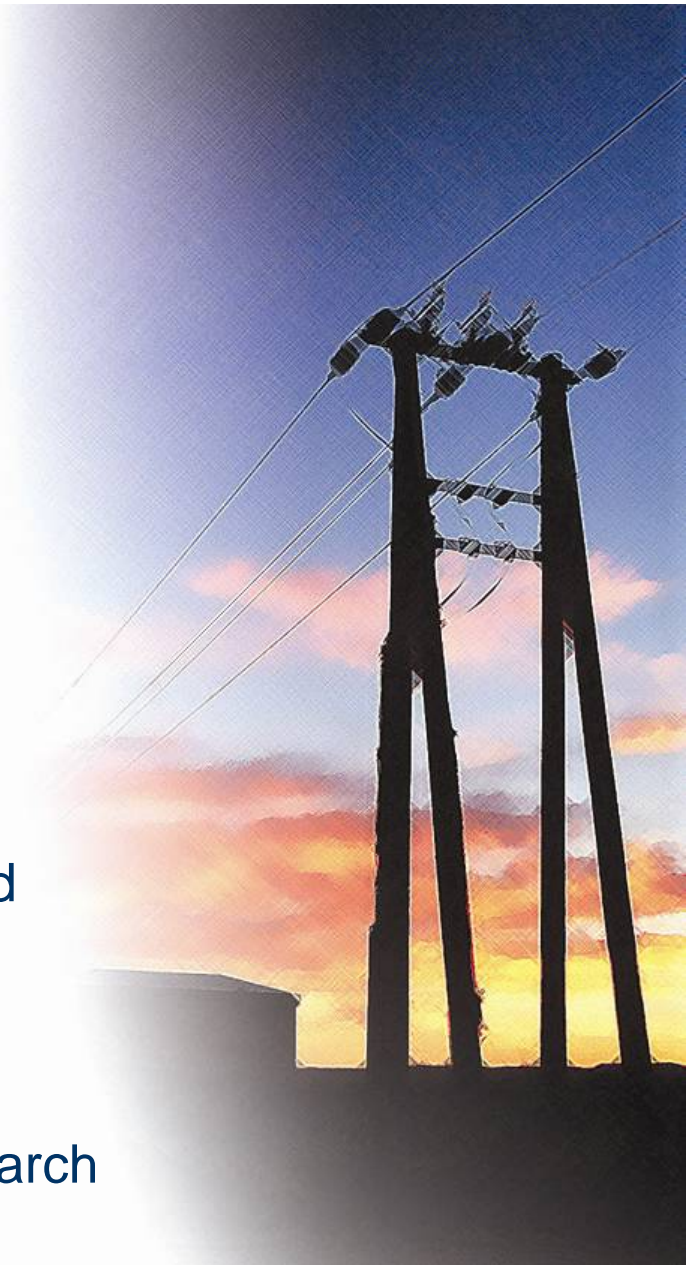


Risk Based Distribution System Asset Management

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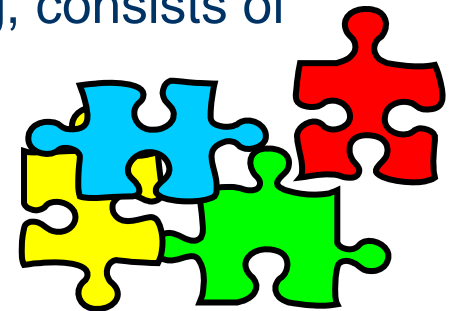


Contents

- Background
- Current risk exposure within distribution companies
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Background

- The deregulation of the electricity sector has led to a significant change in focus and thinking among distribution system operators (DSOs) – with a general emphasis on efficiency improvements and cutting of costs.
- There has however become an increasing awareness concerning whether the DSOs still are performing their business with sufficient risk margins, or whether they are approaching (or exceeding) acceptance limits regarding important risk criteria.
- It is recognized that the total risk the DSOs are facing, consists of several risk criteria

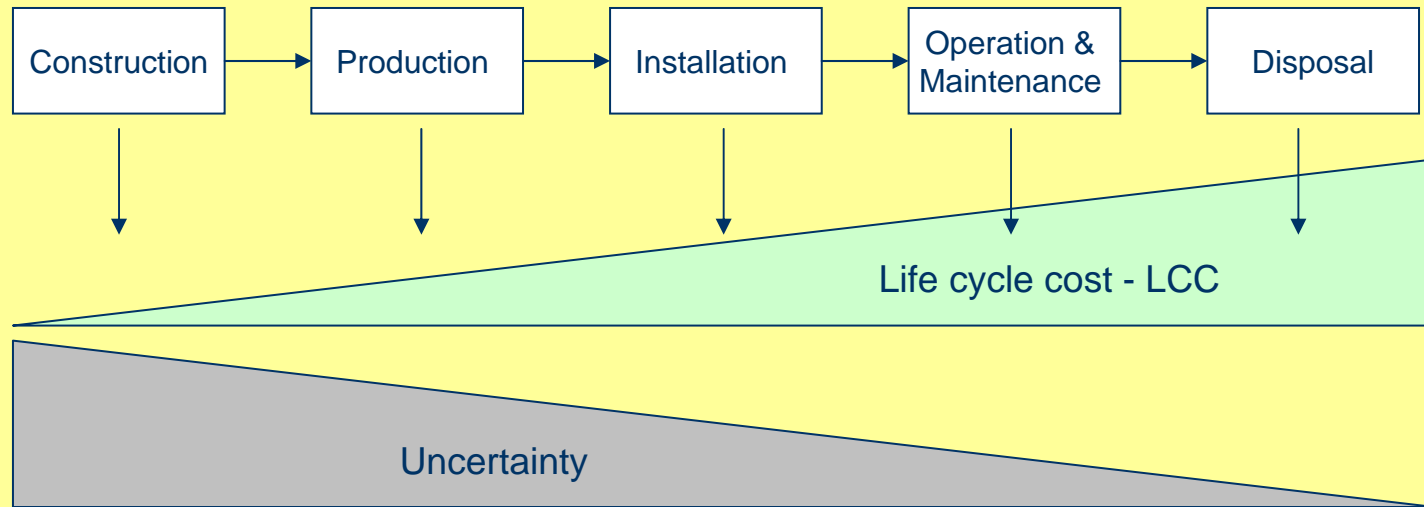


Background

- "Asset management"
 - A buzz word among distribution companies the later years
- What does it mean?
- "The process of managing demand and guiding acquisition, use and disposal of assets to make the most of their service delivery potential, and manage risks and costs over their entire life."
 - *Australian Government - The Department of the Environment and Heritage - <http://www.deh.gov.au/parks/best-practice/reports/asset/glossary.html>*

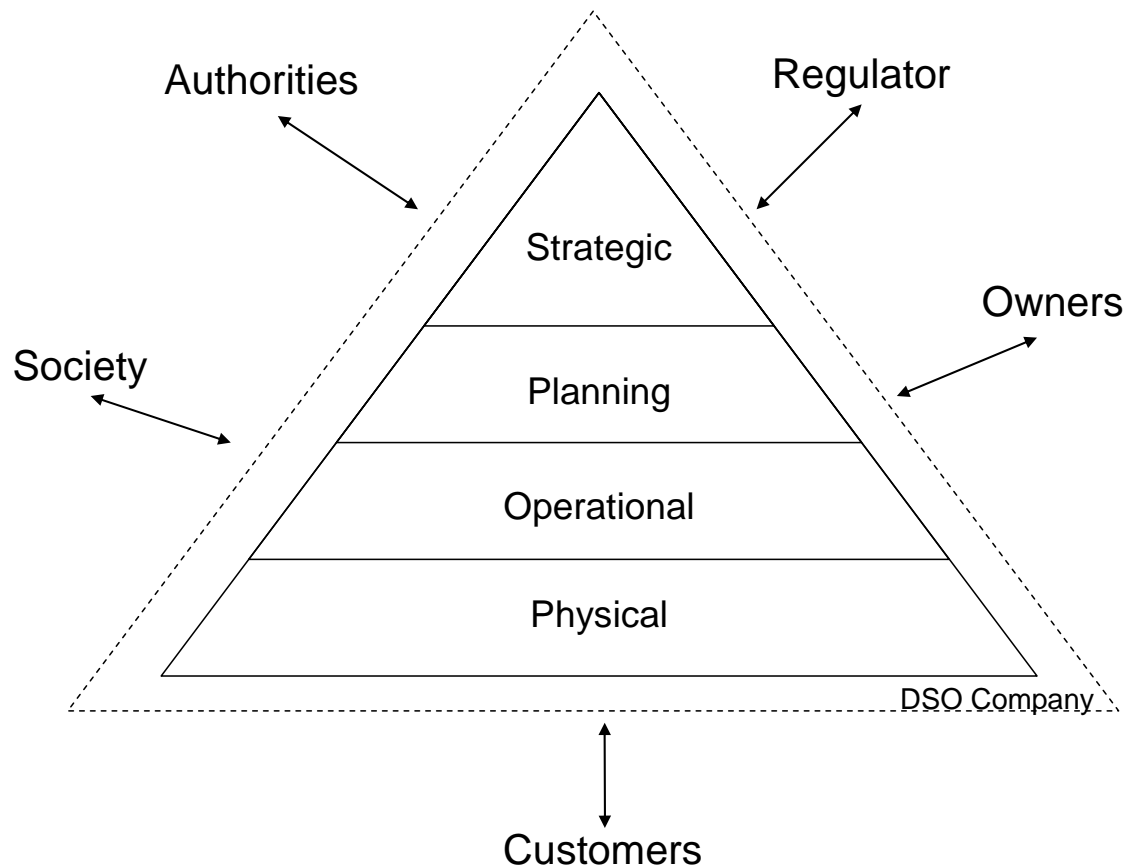
Asset management - Life cycle assessment with acceptable risk

Risk acceptance boundaries



Current Risk Exposure

- Different decision levels and external stakeholders



Current Risk Exposure II

- Some of the key questions being asked by distribution system asset managers are:
 - When is the right time to do the maintenance?
 - Should we reinvest instead of doing maintenance? Is extension of lifetime possible?
 - When is the right time to reinvest?
 - What are the economical and technical aspects?
 - Are the installations safe? How safe?
 - Are the company facing an acceptable risk concerning economic performance, safety and other risk criteria?
- The complex answers to these questions hold the essence of risk based distribution system asset management.

Current Risk Exposure III

- *Risk exposure* is the aggregation of exposure to different *risk criteria*
- An initial survey among the participating companies in the project points out the following risk criteria as being the most relevant:
 - Safety to personnel
 - Environmental risk
 - Reputational risk
 - Economic risk
 - Quality of supply
- The different risk criteria address different sides to the DSO's total risk exposure, and are by their nature somewhat different and may call for different methods for handling.

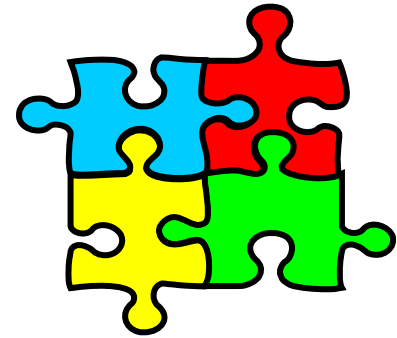
Risk management

- Risk management consists of different aspects, all describing different sides of the whole of risk management. These aspects are:
 - Risk assessment
 - Risk treatment
 - Risk acceptance
 - Risk communication

- Where
 - *risk assessment* being the overall process of risk analysis and risk evaluation,
 - *risk treatment* being the process of selection and implementation of measures to modify risk,
 - *risk acceptance* being the decision to accept a risk, and
 - *risk communication* being exchanging or sharing of information about risk between the decision maker and other stakeholders,
 - *Source: ISO / IEC Guide 73 Risk management – Vocabulary – Guidelines for use in standards*

- All of these aspects are addressed in distribution system asset management.

About the Risk DSAM project



- To meet challenges as stated in the paper a project has been launched.
- The RISK DSAM project is foremost a competence building project with the aim to improve the knowledge of relevant methods and approaches for holistic risk management within distribution companies.
- Project period: 2006-2010
- The project will address several issues related to risk assessment in distribution system companies - including:
 - Measures of quantification of risk exposure on strategic level
 - Identifying maintenance and reinvestment strategies' impact on the risk exposure
 - Quantification of utility value both on project, and project portfolio level



About the Risk DSAM project II

- The Risk DSAM project is funded by the Norwegian Research Council, together with Norwegian and international distribution companies and research partners:
- Project participants
 - Statkraft alliance Network group - BKK Nett, TEV Nett, Agder Energi Nett, Skagerak Nett and Istad Nett (Norway)
 - Hafslund Nett (Norway)
 - Lyse Nett (Norway)
 - Fredrikstad Energiverk/Energi 1 (Norway)
 - EDF R&D (France)
- Reserach partners
 - SINTEF Industrial Management, Dept. of Safety and Reliability (Norway)
 - NTNU, Dept. of Electrical Power Engineering and Dept. of Mathematical Sciences (Norway)
 - SNF – Institute of Research in Economics and Administration (Norway)
 - Lappeenranta University of Technology (Finland)
 - University of Porto/INESC (Portugal)

Concluding remarks

- Distribution system asset management cover many rather different issues – economic, technical and other more qualitative criteria such as safety of personnel.
- There is a need to establish a holistic asset management scheme covering these issues.
- To address these challenges the RISK DSAM project has been launched to build competence and provide solutions.

