Operational and Organizational Challenges for New Energy Technologies – Implications for the MTO perspective and social aspects

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About

- Pioneer of the MTO perspective in the nuclear sector
- Introduced and expanded the MTO perspective across multiple industries
- MTO expert on several IAEA missions
- International lecturer and advisor
- Member of RSN
- CEO, Kecklund Advisors AB

Declining Share of Nuclear Power – Why?

- → Around 2000: Nuclear accounted for **17%** of global electricity generation
- → By 2024: Nuclear accounted for **10%** of the global power mix
- → Influencing factors: economics, competition, regulatory complexity, public acceptance and nuclear accidents

Key MTO-Related Safety Concerns – Design & Operation

- Conventional PWR and BWR technology
- Multi-module risk interactions
  - Common-cause failures
- Increased automation reduces human oversight and interactions
  - Lower staffing levels

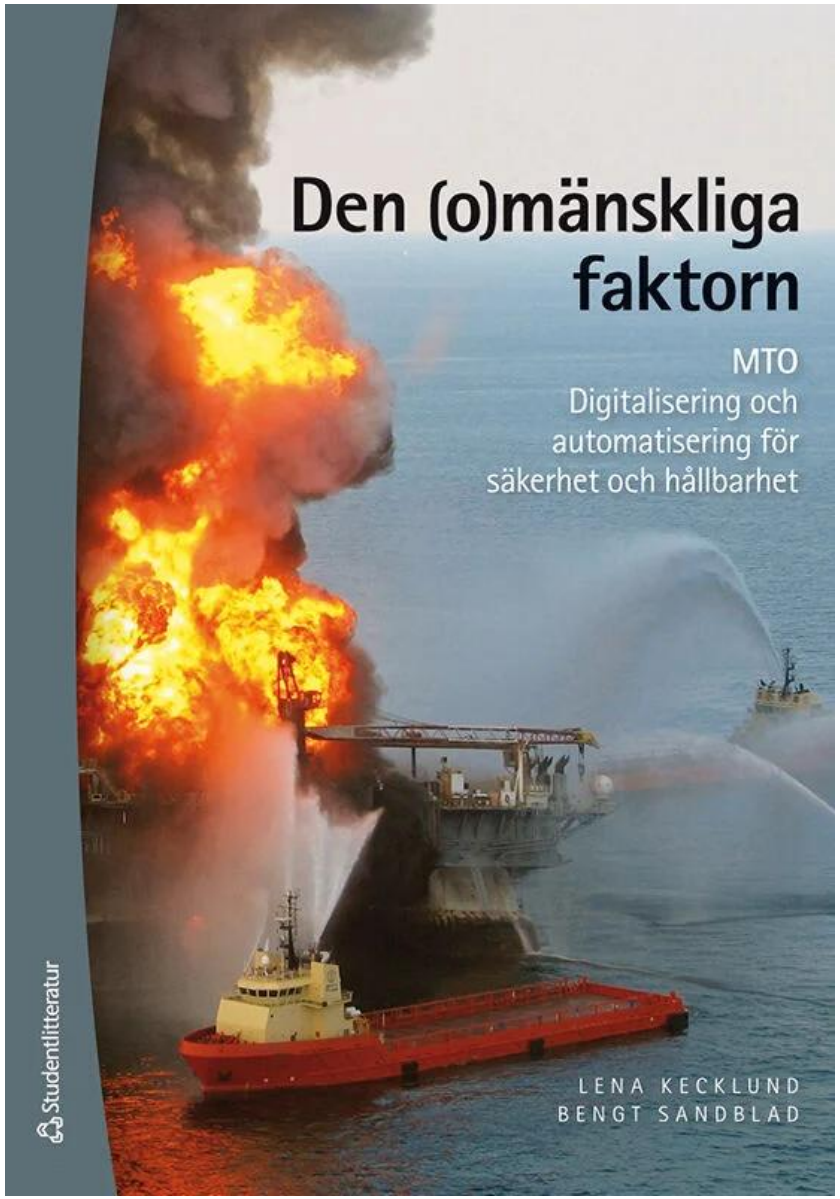
Key MTO-Related Safety Concerns – Operation, Management & Governance

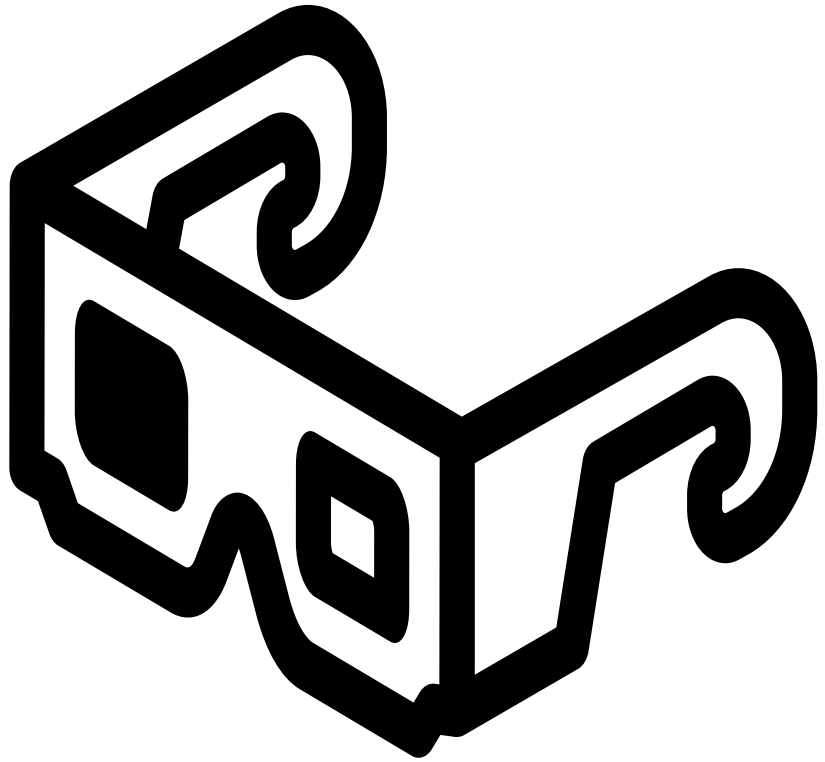
- Global upscaling
  - Shortage of trained and experienced personnel
- Governance, culture and safety awareness among investors, boards and senior management
  - Start-up culture may not address safety
  - Lack of knowledge on nuclear safety
  - Knowledge and experience from previous nuclear programs is not used
- Use of AI in nuclear applications – EU AI act does not cover
- Regulatory requirements and the licensing process to be further refined

Recommendations

- Safety assessment of new interactions – MTO perspective
  - Governance
  - New design features
- Competence - on all levels
- Utilize knowledge from previous nuclear programs
- Nuclear safety training for executives and boards
- Integrate safety culture in new business models
- Licensing models and regulatory requirements
- Requirements for use of AI

- Public acceptance





Suggested reading

Thank you!
Questions?