

WtE preliminary project in Iceland

Assessing and dealing with different facets of risk

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Introduction

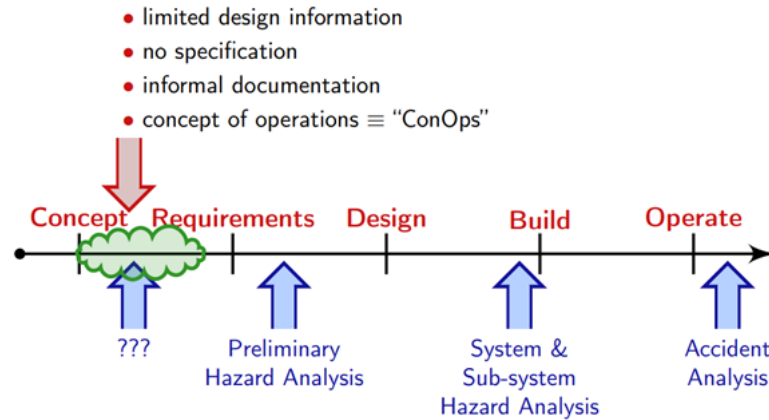
- Based on a previous preliminary project from Dec. 2021
- Review of recent scientific articles on WtE projects
- Review of reports from other experts in this preliminary project with regard to risk
- Risk analysis method based on systems theory (STAMP, STPA, STECA), stakeholder theory and Safe-by-Design engineering concept
- A scientific article was published on this WtE case study in December 2023:

Title: [Aligning Stakeholders and Actors: A New Safety and Security-Based Design Approach for Major National Infrastructures](https://www.mdpi.com/2071-1050/16/1/328)

<https://www.mdpi.com/2071-1050/16/1/328>

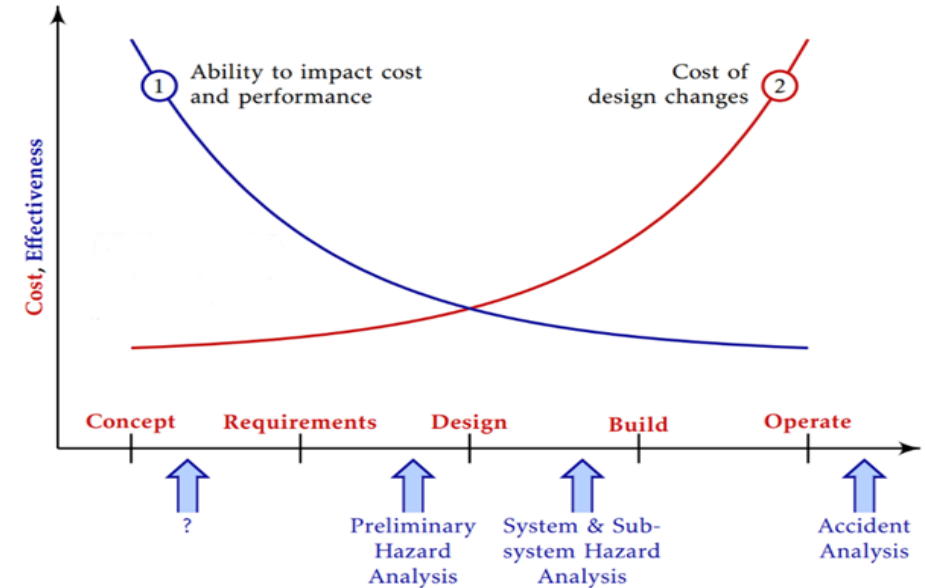


Why is risk assessment important?



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<https://psas.scripts.mit.edu/home/wp-content/uploads/2015/03/2015-STECA-Tutorial.pdf>



- The figures demonstrate the problem we often face in major infrastructure projects
- It takes time to gather sufficient information at the beginning, e.g. to carry out a detailed risk analysis
- A project is launched without enough information and people are tempted to make decisions regarding the design and implementation of the project with insufficient information at hand
- This not only leads to the project exceeding the budget, but also creates risks regarding the outcome of the project, i.e. that the project is not properly designed and that it may prove difficult to manage risks when it is transferred to operation



The importance of risk analysis and assessment

- A detailed and continuously revised analysis and assessment of risk is needed for an infrastructure project of this type is to be successful
- By basing decisions on the results of a thorough risk analysis from the start, we can:
 - Achieve a safe and secure design (Safe-by-Design engineering concept)
 - Design safety and security into all aspects of the project
 - Thereby ensure a successful outcome



What does science say about risk in WtE projects?

- Many stakeholders are involved in these types of infrastructure projects – split of risk is often unclear
- People's fear of environmental pollution causes opposition and bad image
- Inadequate communication and lack of communication with the public creates risk
- Risk is related to the financing of the project
- Deposition of energy and heat
- The role of the government and shortcomings in the legal and regulatory system
- Risk analysis and risk assessment are important



Risk related to preparation, design and implementation

- Many risk factors associated with NOT having a WtE incineration plant in the country and being dependent on other nations, oil prices, etc.
- Municipalities cannot handle the project alone and need help from private sector and government
- Risk is related to the ownership arrangement, both during the project time and later in operation
- Risk is associated with site selection, e.g. negative public opinion and transport of waste to the WtE incineration plant
- Risk is related to the requirements analysis and design



Risk associated with preparation, design and construction phase

- Risk is related to environmental impact and people's health during the project
- Risk due to technological development and changes in environmental legislation and regulations during the project time
- Sloppy project management creates many types of risks, e.g. risk of accidents, project delays and increased cost.
- Risk is associated with the failure to carry out a comprehensive risk assessment covering the preparation, design, implementation and operation of the incineration plant - to support decision-making at all stages



Risks related to operation of the WtE plant

- Risk is related to sufficient amount of waste and correct incineration value
- Risk due to environmental pollution, in the worst case it could lead to a complete stop of operations
- Risk is related to people's health
- There is a risk in the unplanned suspension of operations and the renewal of the operational license
- Risk is inherent in operating losses, e.g. due to uncertainty regarding sale of products
- Risk due to changes in environmental law and regulations
- Risk due to technological developments, e.g. during carbon capture



Risks associated with building **two** WtE plants

- Increased risk regarding the financing of two separate WtE projects
- Risk regarding the amount of waste to each one – there will be competition for waste
- Both are small, but both must meet strict requirements regarding incineration and cleaning mechanism
- A WtE plant in the southwest makes another smaller WtE plant elsewhere in the country even more risky
- Risk regarding operational efficiency – relatively high cost of both and higher gate fees



Thank you for your attention

Further information:

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References:

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