

Evaluation of Experience –

the development of a generic procedure for the
assessment of THE CAUSES failures and
malfunctions

Jochen Köhler

Outline

- Background
- Unsafe, Safe and too Safe Structures – where do we look at ?
- What is the Information, and how do we update our experience domain ?
- How can we provide a framework that allows for different levels of detail ?
- How can we cooperate with other research communities ? – TG COST TU0601

Background

- Load bearing structures are designed and constructed to **fulfil certain requirements**
- Requirements related to **reliability**, **serviceability** and **cost efficiency**
- It is assumed that the performance can be **predicted and controlled**
- This requires that **best practice is efficient**
- And that best practice is **not violated**

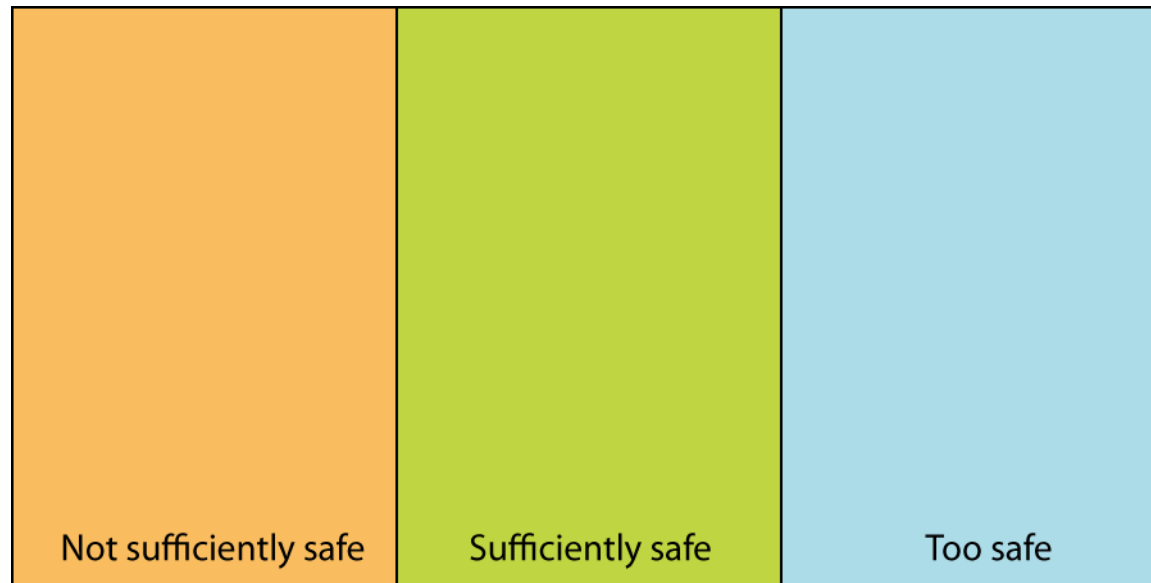
Background - Past Experience

- Several studies assessed the performance of structures – it is **focus on bad performance** (failures and malfunctions)
- The analysis of failures and malfunctions delivers an important **insight to the efficiency of current best practice** and how often a **violation of best practice** is leading to failure.

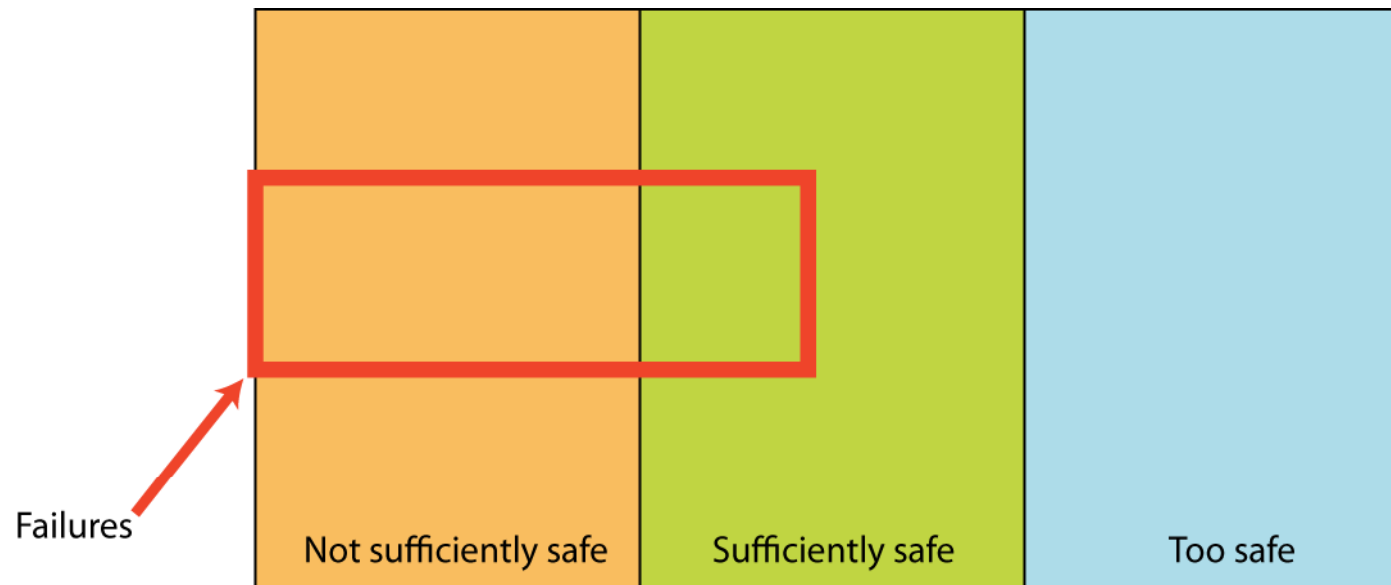
Background - Past Experience

- These evaluations are **hard to compare** – different classification schemes are used
- The findings are rather consistent:
The vast majority of failures had been caused by **violations of best practice**.
- This was found for **different types** of structures build with **different building materials**.

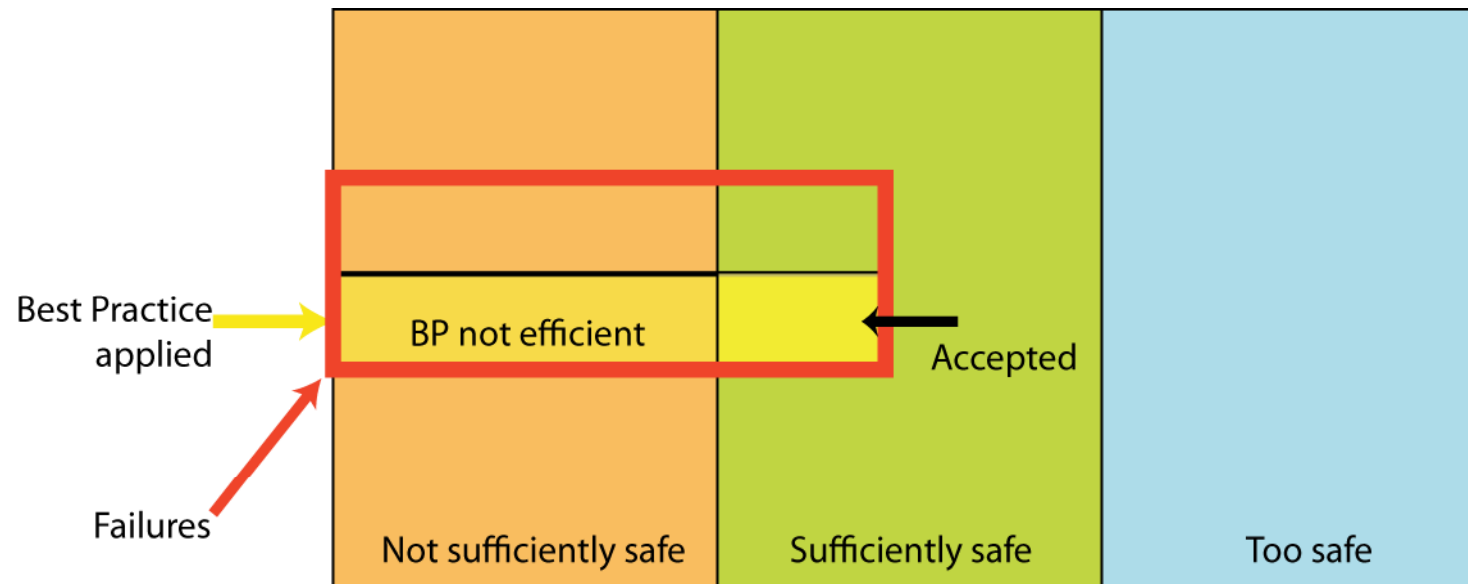
Where do we look at ?



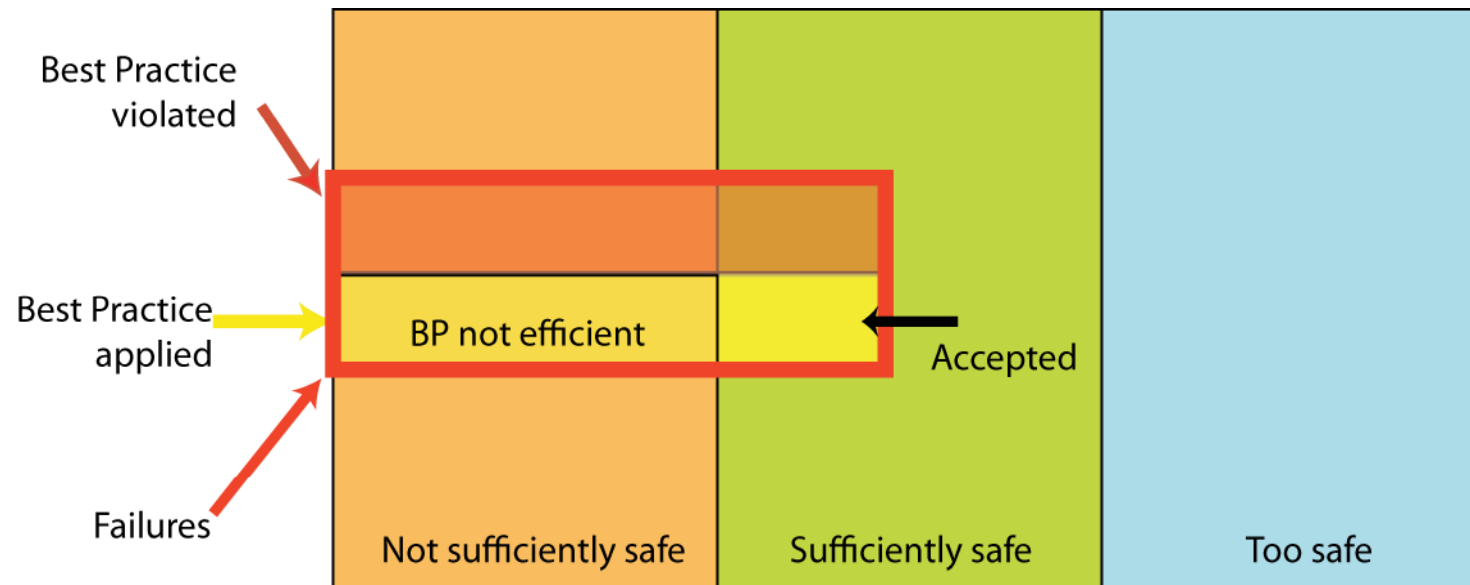
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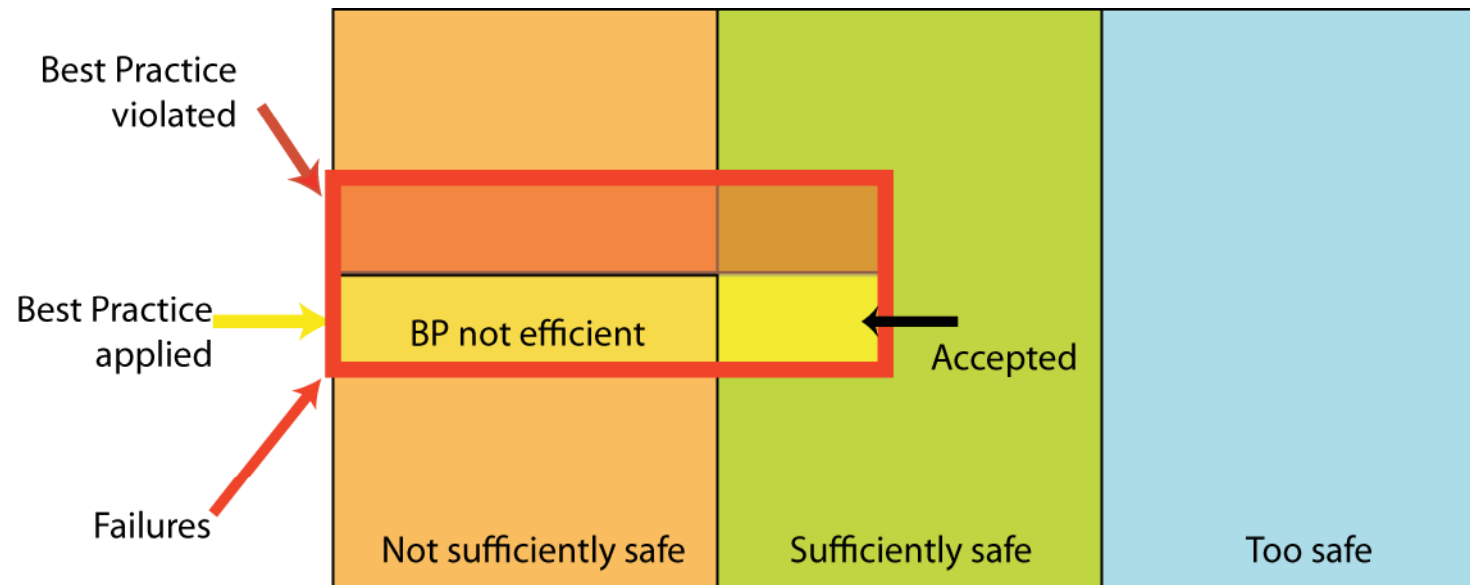
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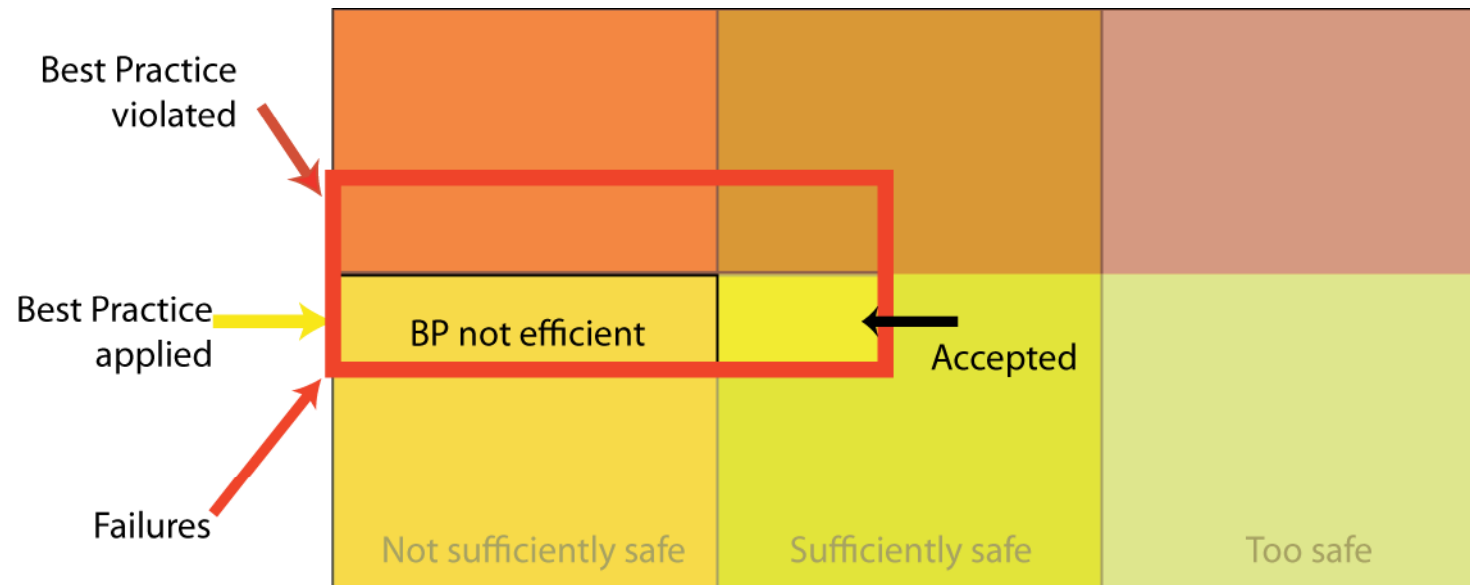
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What is the information about ?

- Description of the structural system:

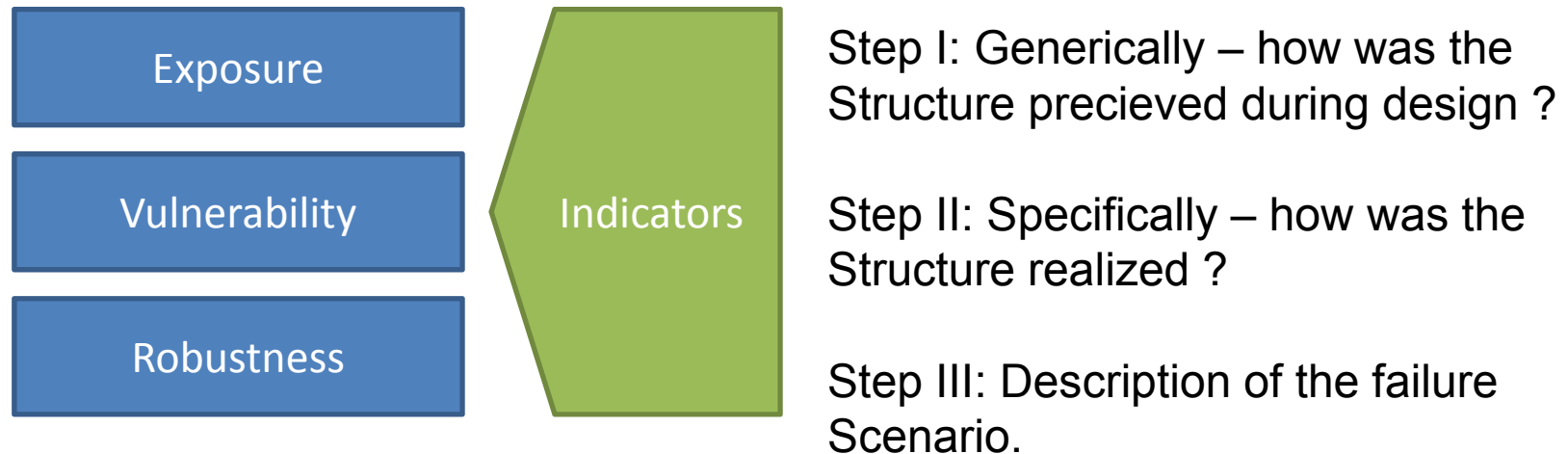
Exposure

Vulnerability

Robustness

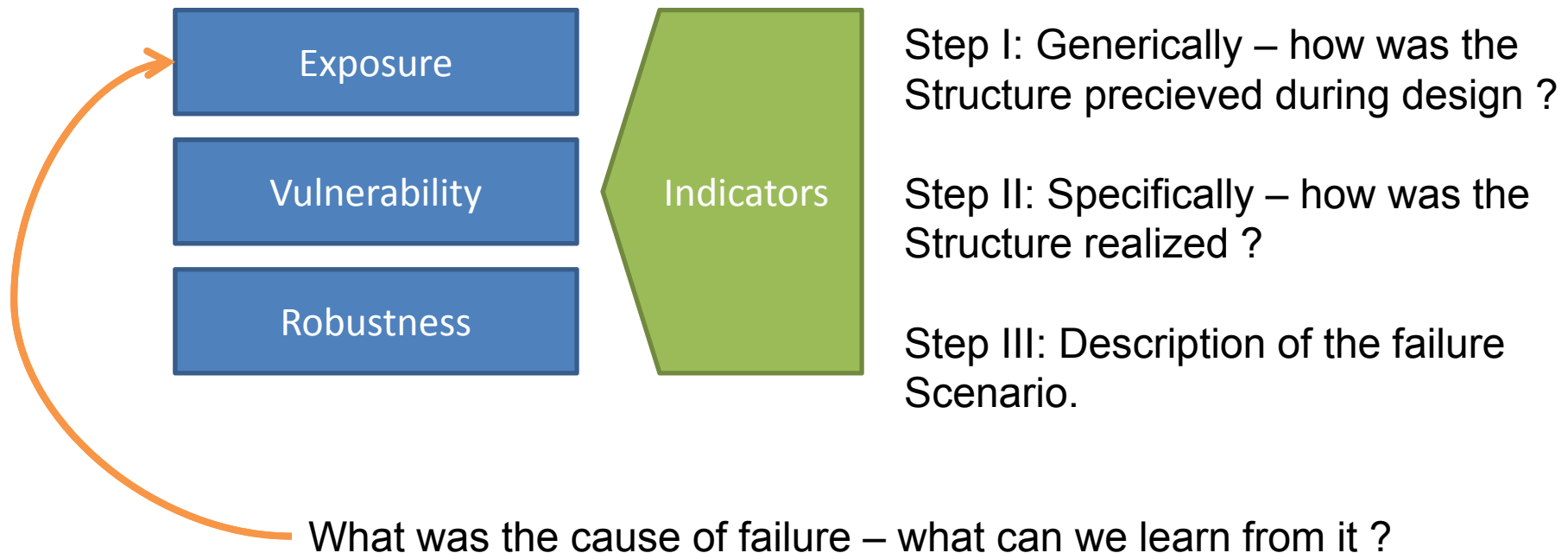
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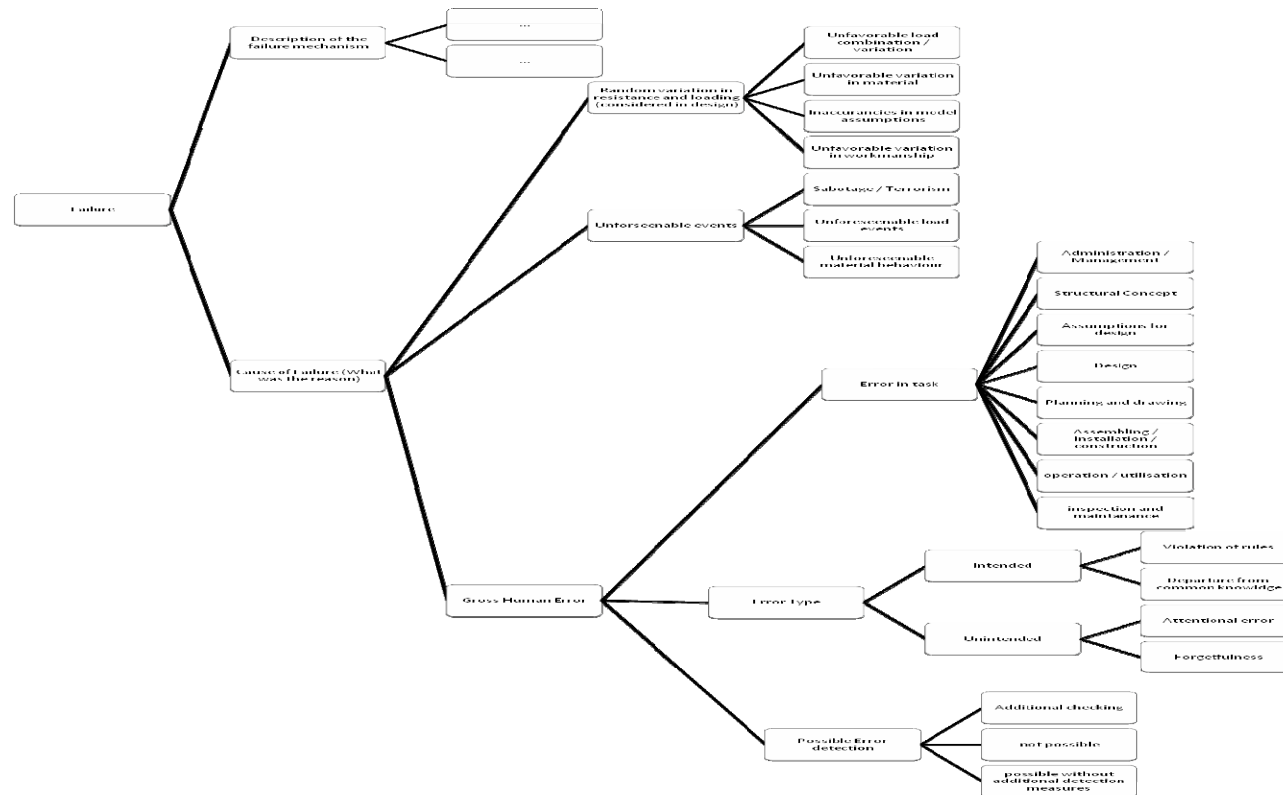
The description of the cause of the failure should earn proper attention

Accepted, Best Practice not efficient or Error !

Possible classification of 'error':

- According to when in the design process it took place.
(Design concept, Design Analysis, Construction, Inspection, Use)
- According to the effect on the Limit State.
(Failure mode similar to the one against it was designed or failure mode against it was not designed)
- According to the consequences caused by the failure
- According to those responsible for causing / not detecting the failure

How to focus on relevant information per case?



Synergies with other projects?

- Assessment of failures task group within COST TU0601 'Robustness of Structures'.
- Considerations for all building materials.
- Synergies should be used not only for information merge – but also to discuss the possibility of a homogeneous approach for structural engineering.