When Things go Wrong

Human Factors, Accidents and Learning

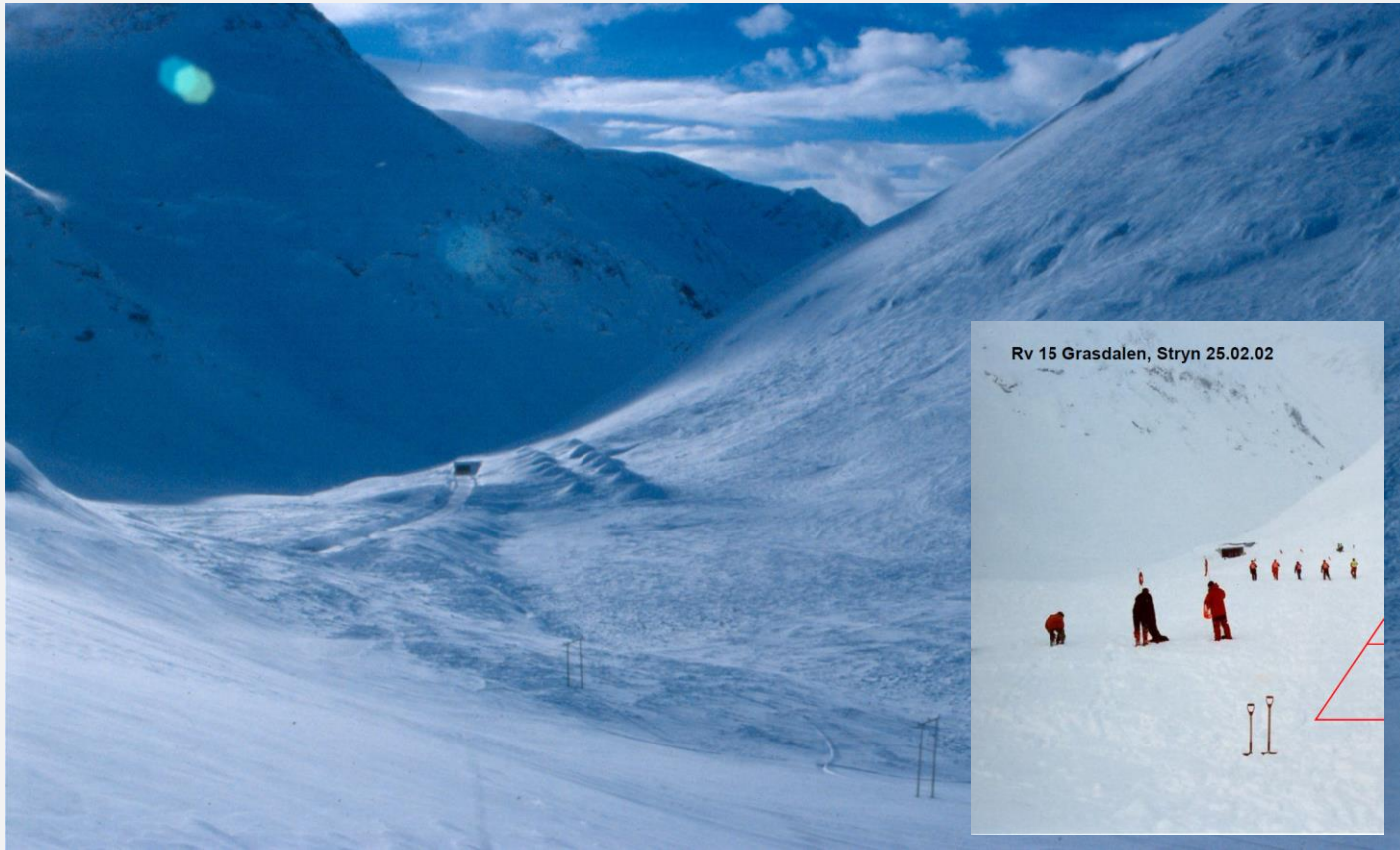
Who investigates?

- Police *(Prosecution Authority)*
  - Why: Uncover crimes or criminal neglect
  - Result: Establish blame and liability

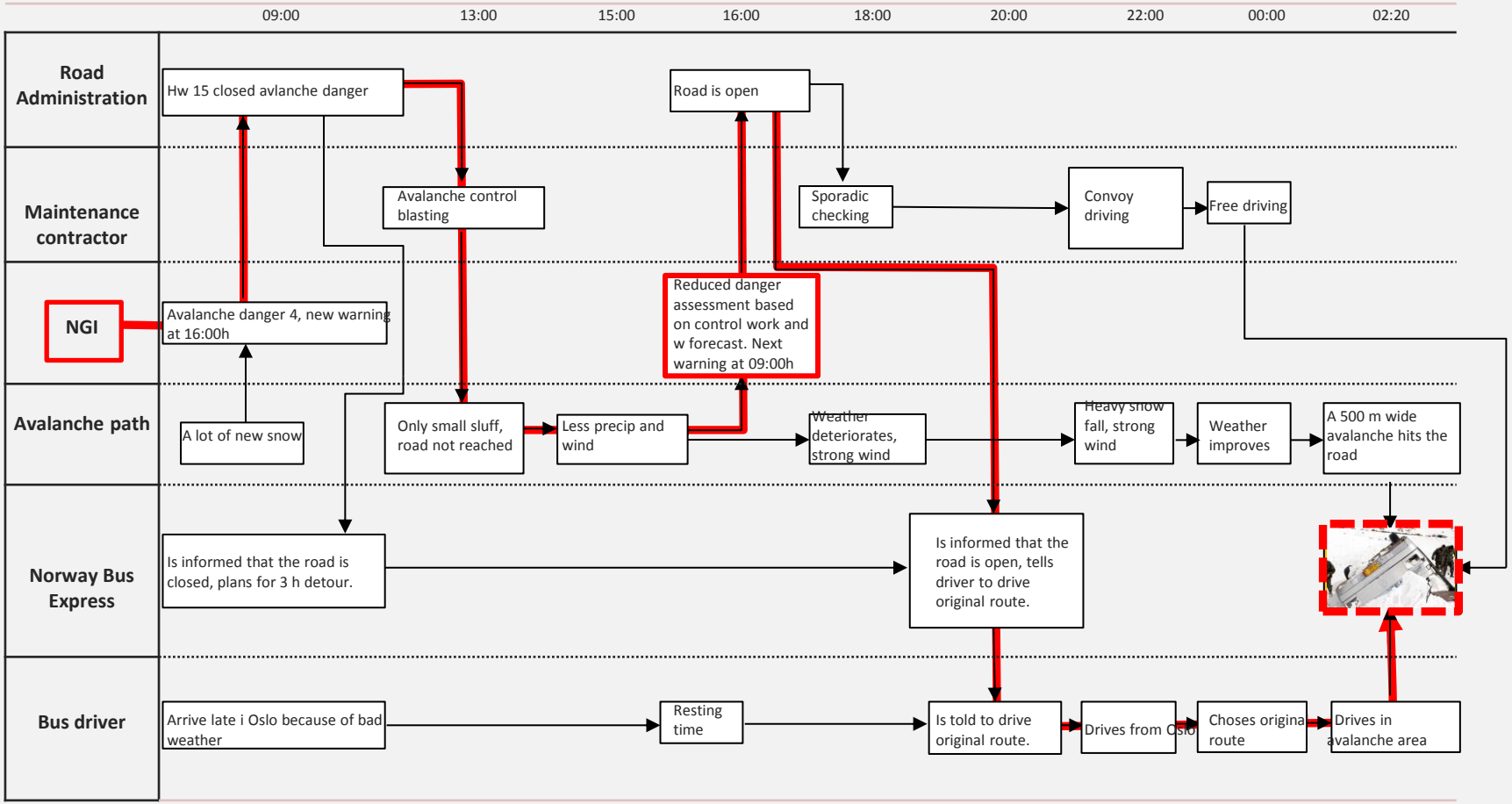
- Organizations, Regulators *(private or government investigative agencies)*
  - Why: Identify safety problems. Give advice for improvement
  - Result: Learning, and change (hopefully)

Example

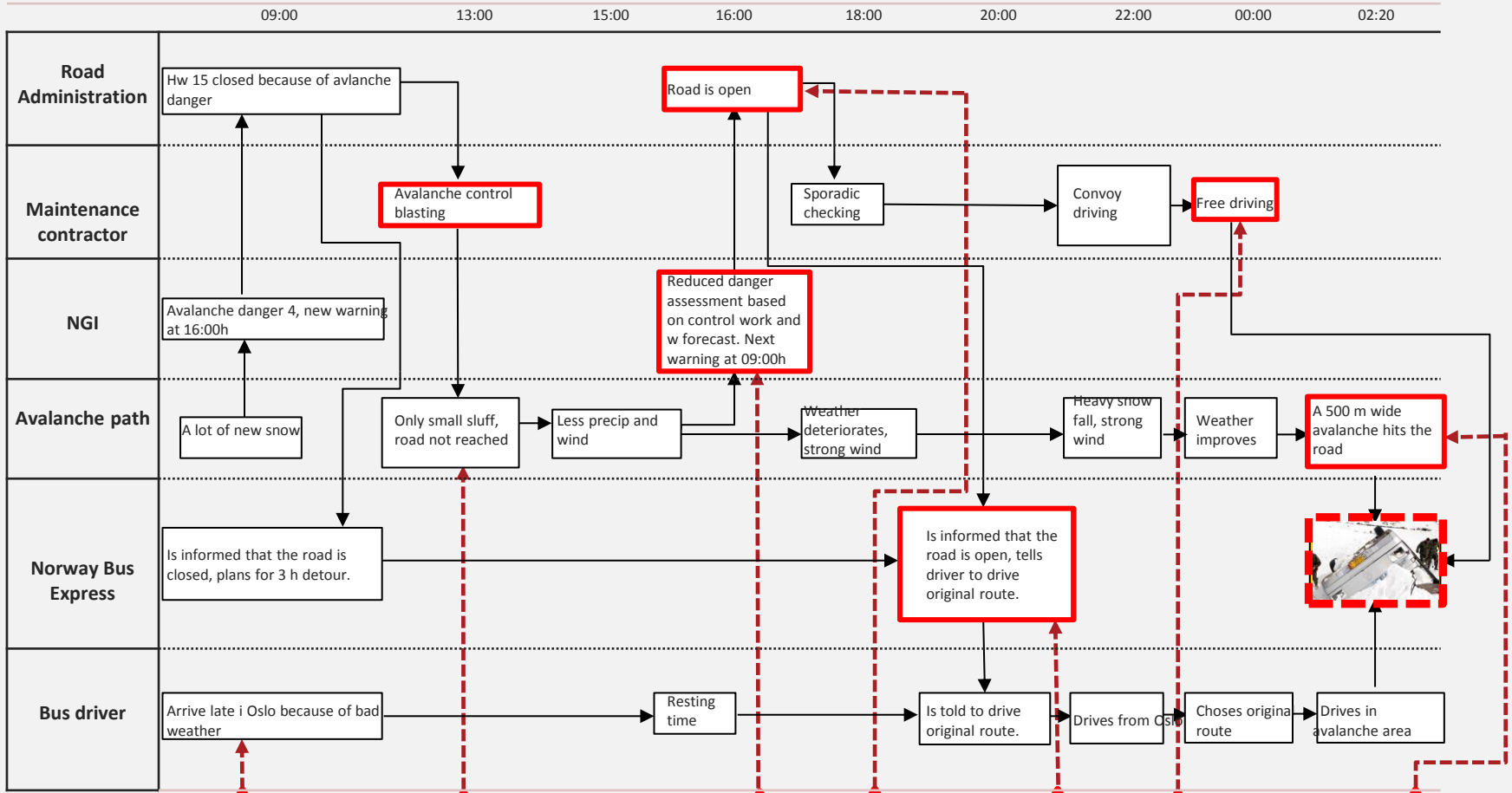
Oslo-Stryn night express bus buried by avalanche



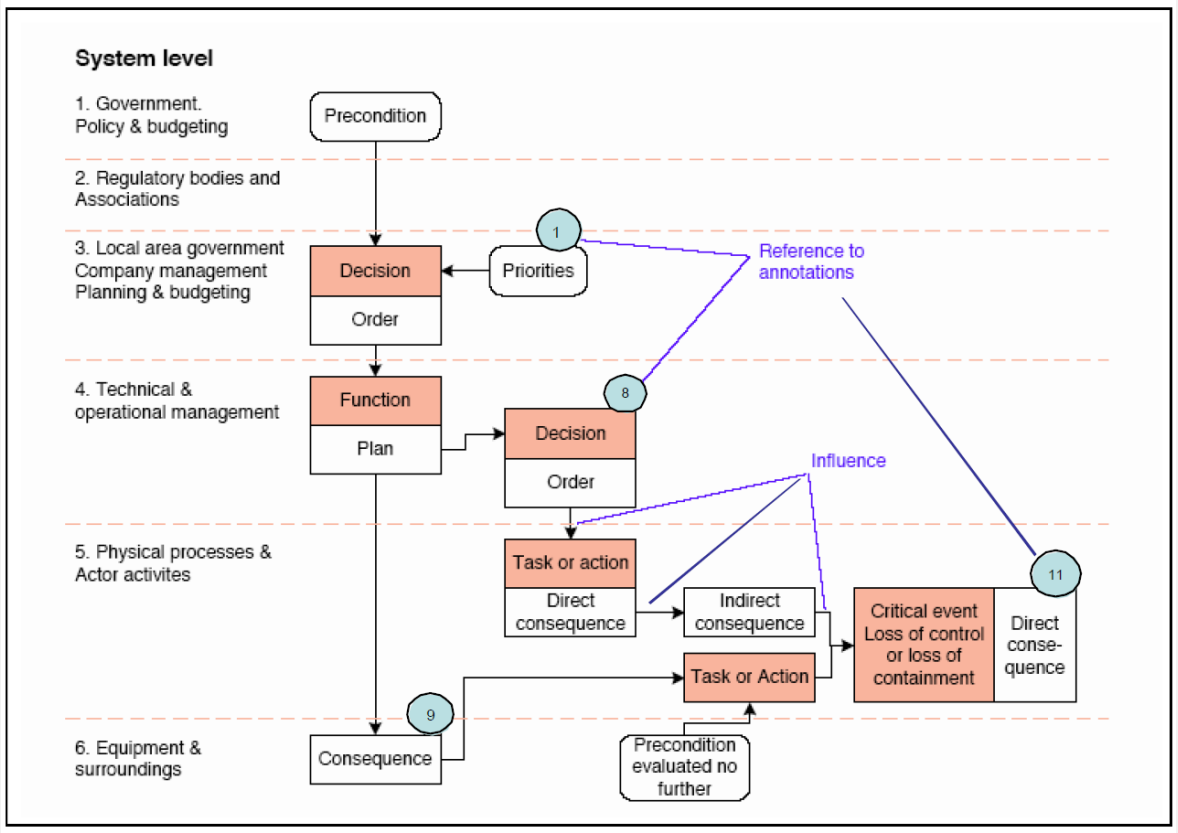
STEP sequence analysis



STEP sequence analysis

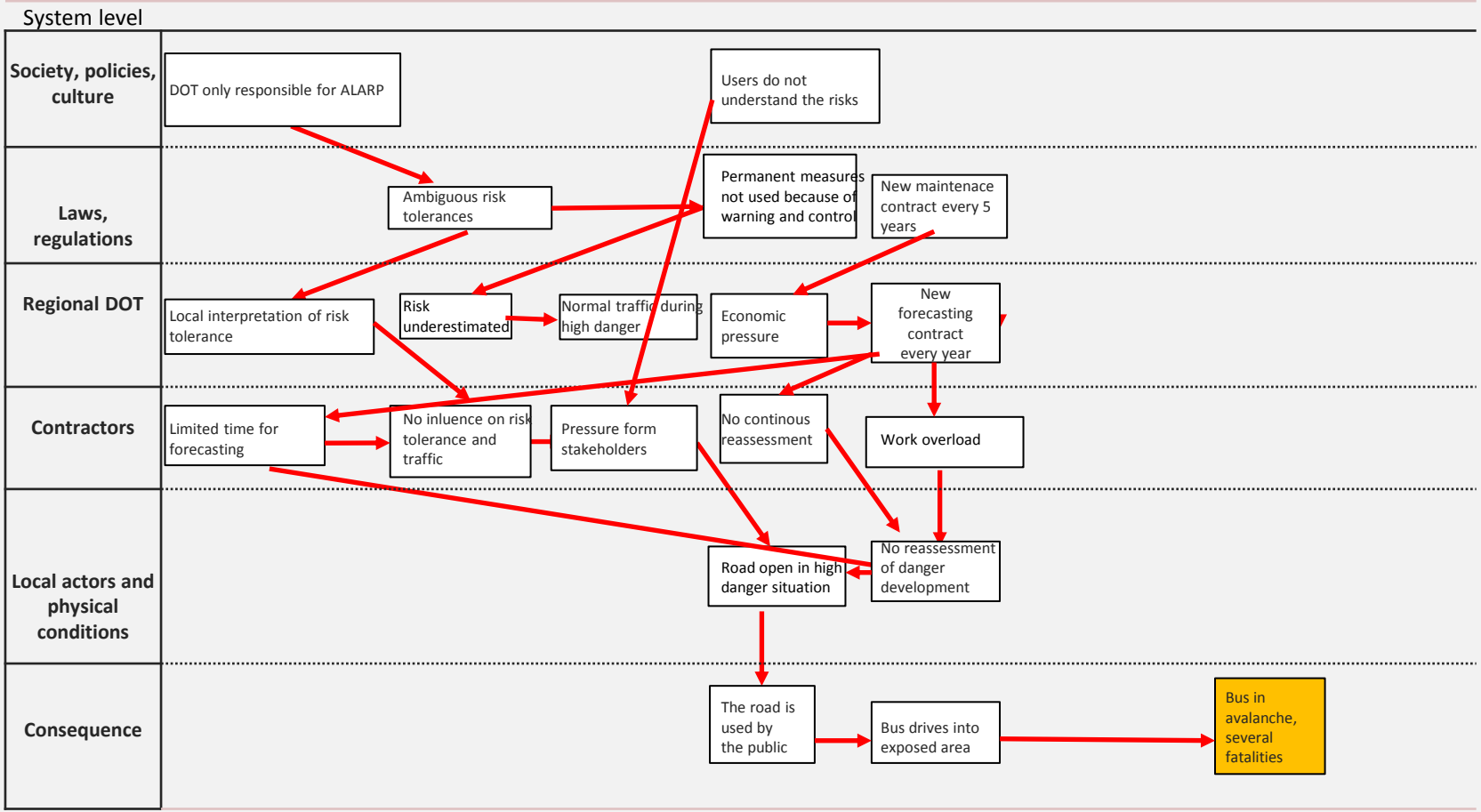


Hierarchic influenceanalysis (AcciMap)

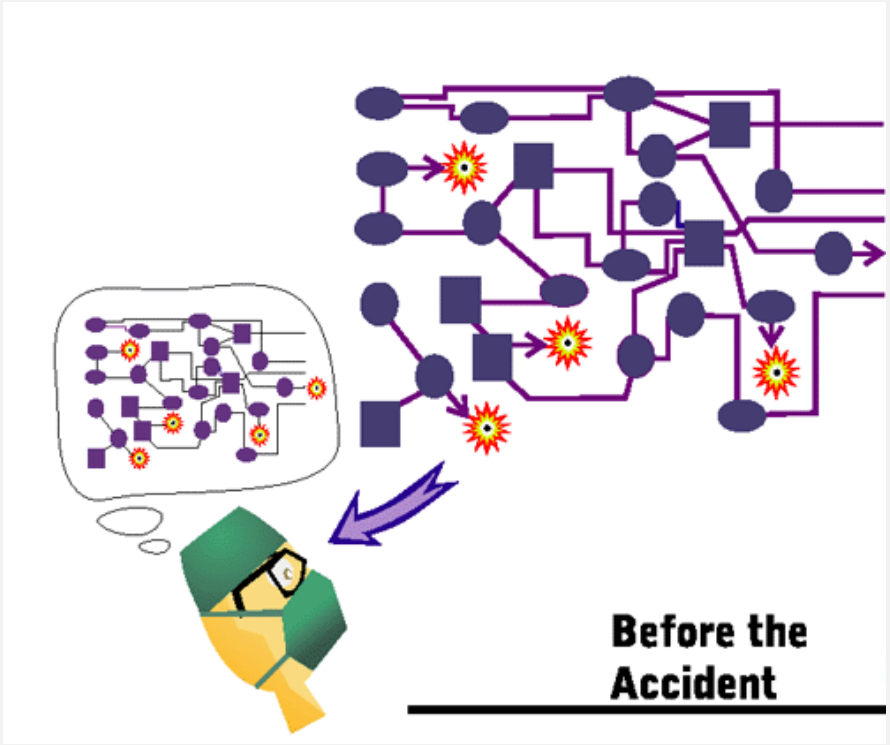


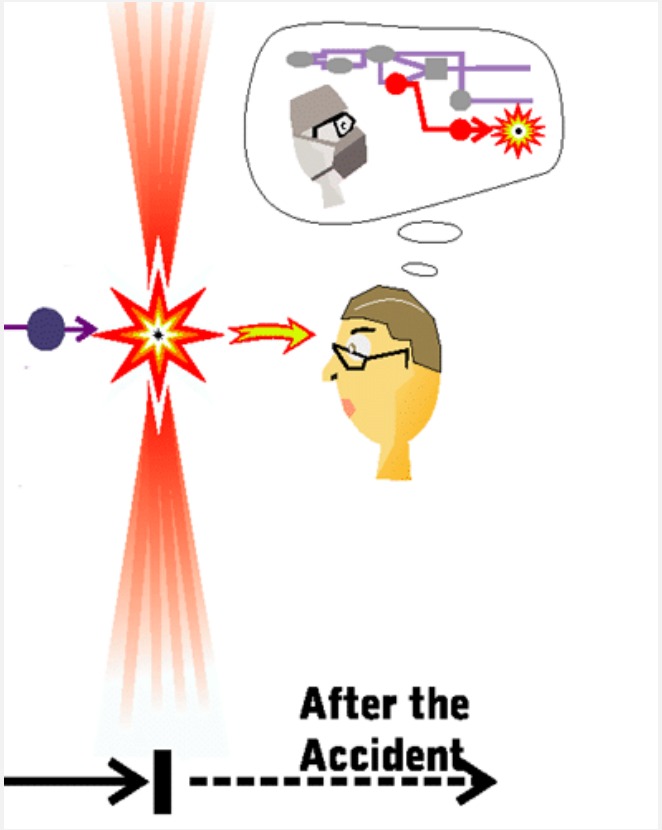
AcciMap diagram format (adapted from Svedung and Rasmussen (2002)

AcciMap influensanalyse



Hindsight bias





Cook, 1997

Old view

People make mistakes because of:

- Stupidity
- Carelessness
- Complacency
- Incompetence
- Defective

How to fix it:

- Make rules
- Enforce rules, make people fearful
- Punish violators
  - Fire them
  - Suspend them
  - Retrain them
  - Counsel them

NGI

If you follow the rules, you cannot have an accident!

Old view works because..

- The organization saves face
- Just a temporary glitch, no big changes necessary
- One bad apple only – easily removed

Cheap and easy!

Why the old view fails

Basic Attribution Error:

- Attribute behaviour to the quality of the person
- Underestimate the influence of the situation.

Ignores local rationality:

- Actions were perfectly reasonable, given their point of view and focus of attention; their knowledge of the situation

The new view

"Underneath every simple, obvious story about error, there is a deeper, more complex story…"

"Take your pick: Blame human error or try to learn from failure…"

(Dekker, 2006)

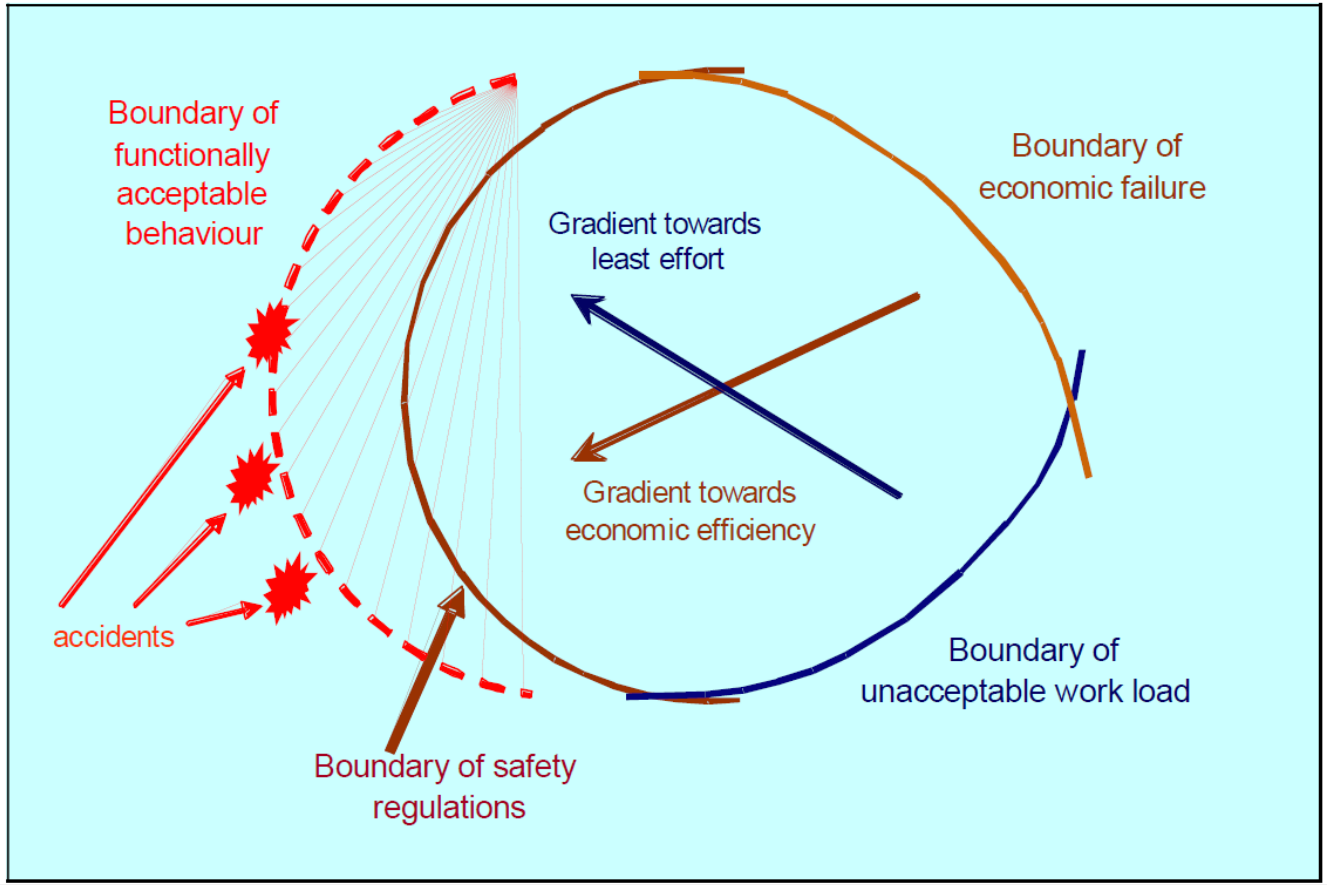
NGI

The new view

- Human Error is a symptom of trouble deeper inside a system
- To explain failure, do not try to find where people went wrong
- Instead, find out how people's assessments and actions made sense at the time given the circumstances that surrounded them

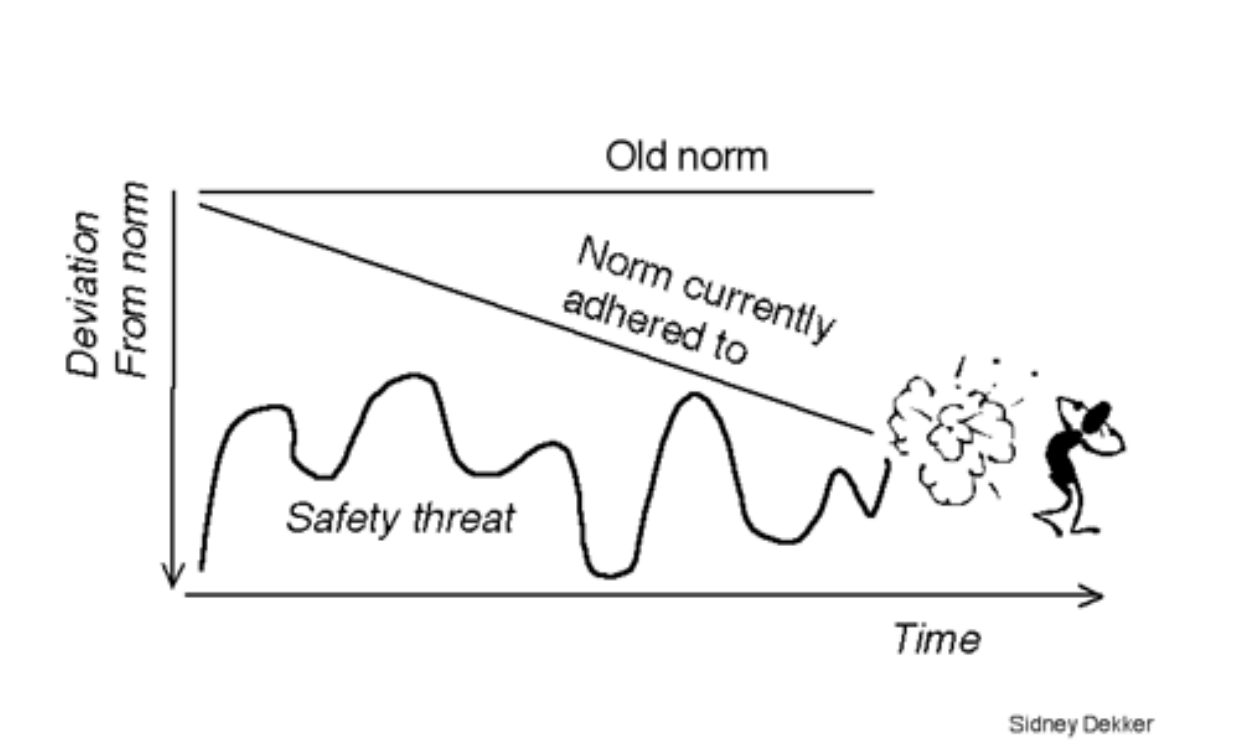
NGI

Drift into failure



Rasmussen (1997)

Drift into failure



Just culture

- An atmosphere of trust
- People are encouraged (rewarded) for providing safety related information
- It is clear where the line is drawn between acceptable and unacceptable behaviour
- It is clear who draws this line
- The organization is willing to learn and reform

Accident investigation problem

- split second operational decisions get evaluated, turned over, examined, picked apart and analyzed for months
- by people who were not there when the decision was taken, and whose daily work does not even involve such decisions.

@infoNGI

NORGES GEOTEKNISKE INSTITUTT
NGI.NO