

# TA4 - Safe and Clean Hydrocarbons

Dr. Frank Børre Pedersen – DNV GL

# The “easy” oil & gas resources have been developed; now we are aiming for less accessible reserves

Social license to operate: Both real and perceived risk has to come down

Major accidents have not shown the same improvements as occupational accidents

New EU regulations – Increased focus on major accident hazards for safety and environment



## Deeper waters

- Dynamic and remote operations
- Challenging oil flow conditions
- Challenging drill string - and well borehole stability



## Going Arctic

- Untouched ecosystems
- Remoteness
- Low temperature and ice
- Darkness



## Near/on shore O&G fields

- Environmental sensitive areas
- Shale gas
- Water usage/contamination



## Enhanced oil recovery & life time extension:

- More and faster drilling operations
- Ageing facilities
- Ageing workforce
- Decommissioning

# Some key challenges and needs

## 1. Maintaining acceptable risk level from design – execution – operation

- Managing both production critical, safety critical and environmental critical elements

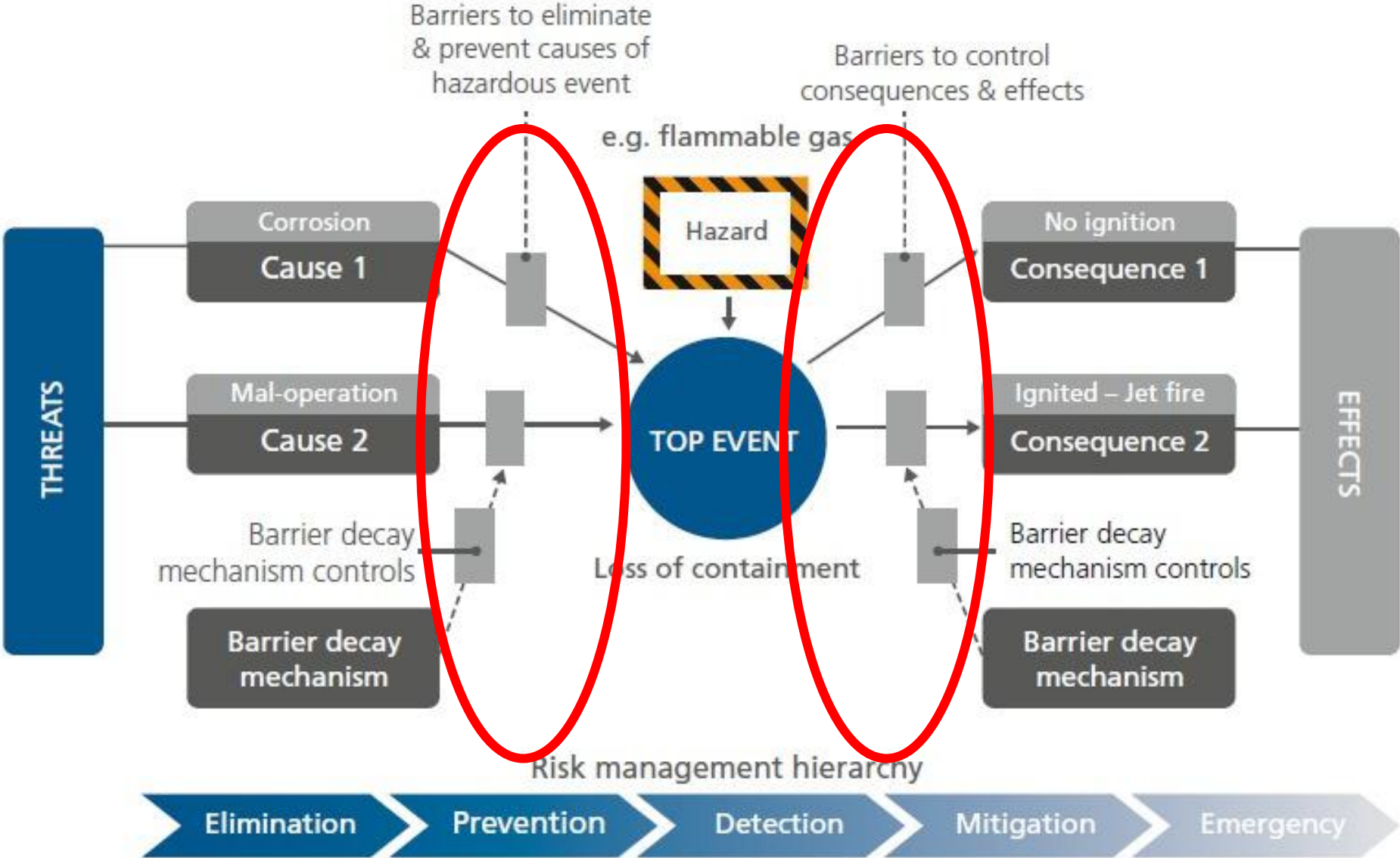
## 2. Do we have a realistic and relevant approach towards analysis of risk?

- Major accident root causes are known – so why do the models not get it right?

## 3. Continuous improvement – Counteracting erosion of risk management

- 6 levers for a enhancement offshore safety and environmental performance

# Barrier Management : Maintaining acceptable risk level from design – execution – operation



## Risk Assessments: Do we have a realistic and relevant approach towards analysis of risk?

- Major accident root causes are known – so why do the models not get it right?
- Our knowledge (or lack thereof) must be reflected:
  - ISO 31000: Risk = Effect of uncertainty on objectives
  - PSA: The risk associated with an activity means the combination of possible future incidents and their consequences, and associated uncertainty
- For actual performance to improve, we must ensure that our risk assessment are realistic, relevant and reproducible (validated and verifiable)

# From risk analysis to risk management: Six critical performance levers to enhance offshore safety and environmental performance

