A Framework for Risk Analysis to Support Operational Planning

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Introduction

- Planning for future situations involve uncertainty
  - Not possible to eliminate all uncertainty

- Planning assumptions are necessary
  - Are the assumptions realistic?
  - Are they vulnerable?
  - What if assumptions fails?

- Uncertainty and assumptions give rise to risks

- We propose a framework for risk analysis
  - Input to risk management
  - Overview of critical capabilities and vulnerabilities

  - ➢ Support development of robust and adaptable plans
  - ➢ Gives guidance on how risks assessments can be performed to support the OPP
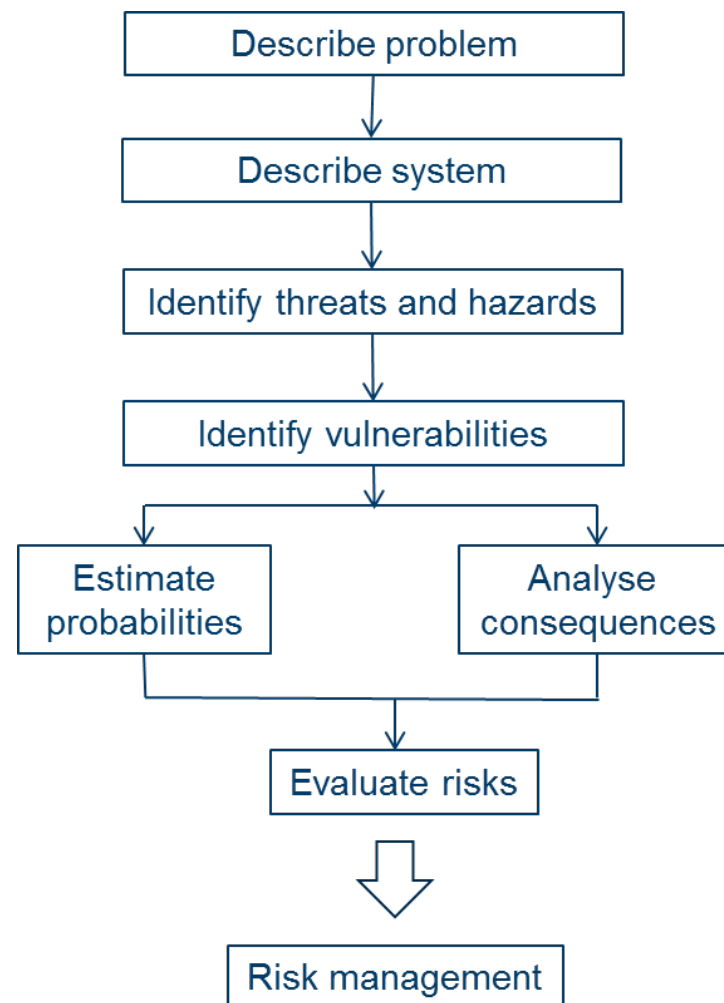
Risk

- Risks are negative consequences of uncertainty
    - What can go wrong?
    - How likely is it?
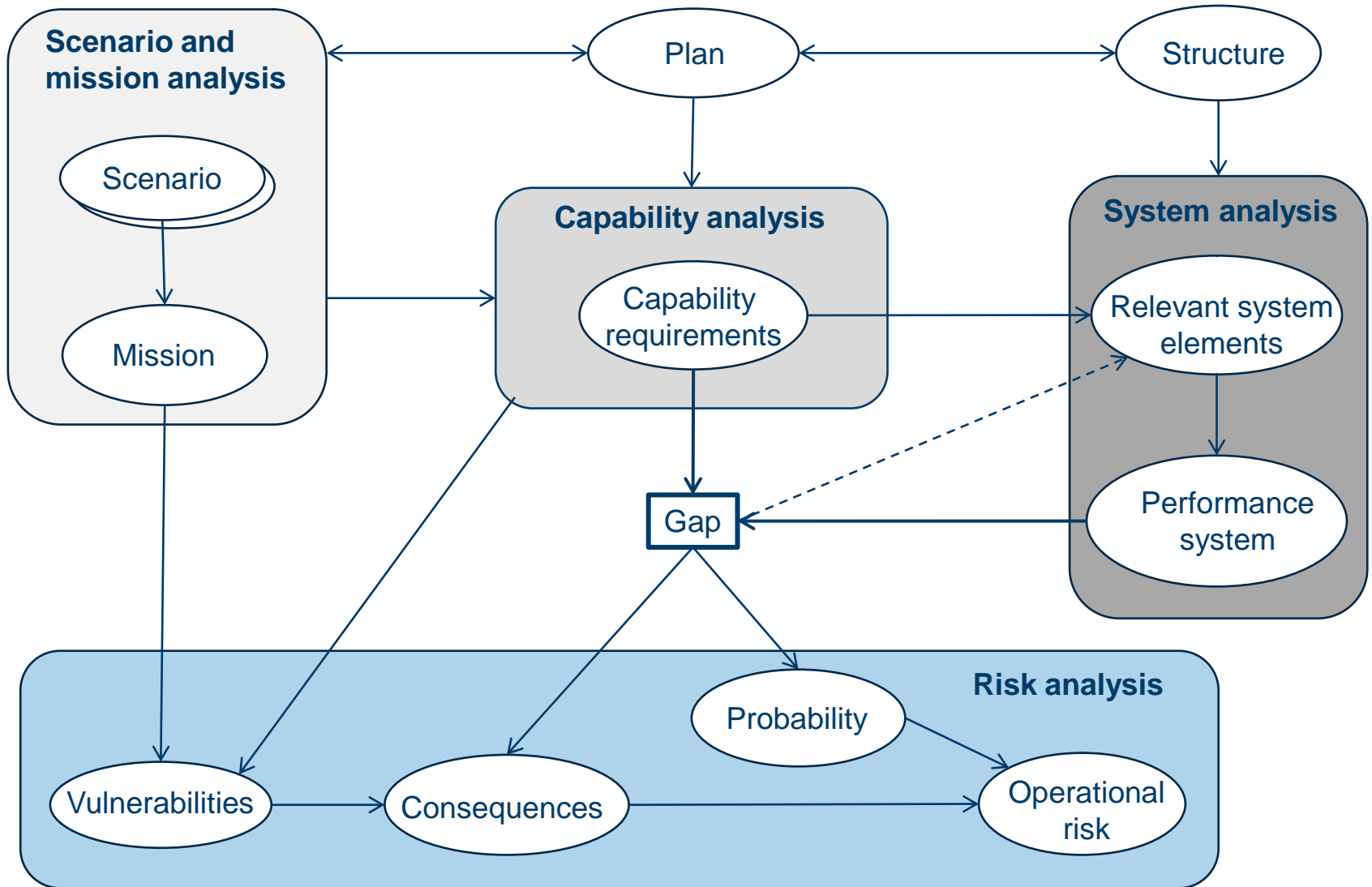   - What are the consequences?

    Kaplan & Garrick, 1981

- Operational risks:
  «..*risks to the achievement of operational objectives or risk to the force that result from the operational environment or the capabilities and actions of the main actors in the JOA.*»

    COPD V2.0

Framework for Risk Analysis

Scenario and Mission Analysis

- Which scenarios can challenge planning assumptions?
  - Intentional threats, large accidents and natural disasters
  - Combined, hybrid threats
  - Events requiring military preparedness beyond routine missions
  - Potentially large consequences for the operation

- Example:
  - Resource conflict in the Barents Sea

- Develop objectives, effects and a CoA for handling the scenario
 - Plan: Objectives, assumptions and constraints
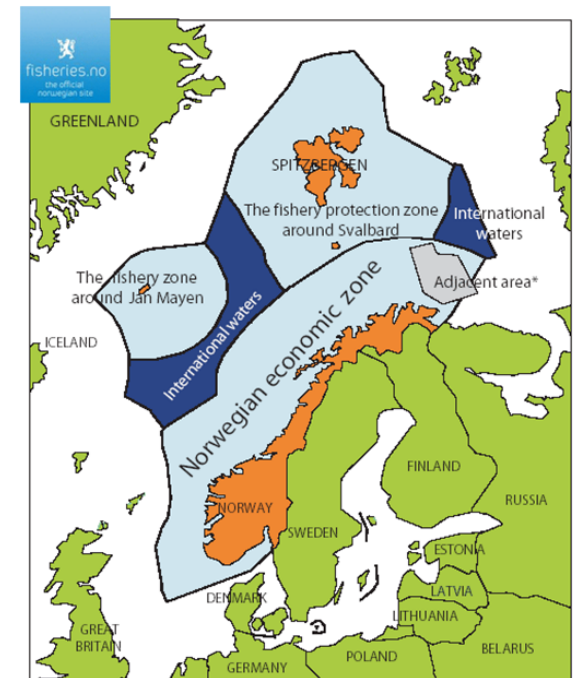
Capability analysis

- What are the capability requirements for the mission and chosen CoA
  - Examples: ISR maritime, ISR joint, C2

- Plan assumes availability of relevant capabilities and resources

- Capability requirements are expressed by the parameters:
  - *Capacity*, *reaction time*, *sustainment* and *interoperability*

- Example capability requirement: ISR maritime

Capability	Capacity	Availability/ reaction time	Sustainability	Interoperability
ISR-maritime	Surveillance of AOI with all-weather sensors Video documentation	Enhanced ISR ASAP after incident reported	Continuous during mission	Data and information exchange between actors. Contribute to common operational picture.

Vulnerability Analysis

- What are the vulnerabilities and how can these be "exploited"?
  - Vulnerabilities:
    - Cause capability gaps
    - Affect operational effectiveness
  - DOTMLPFI
 - Which vulnerabilities are critical for the success of the operation?
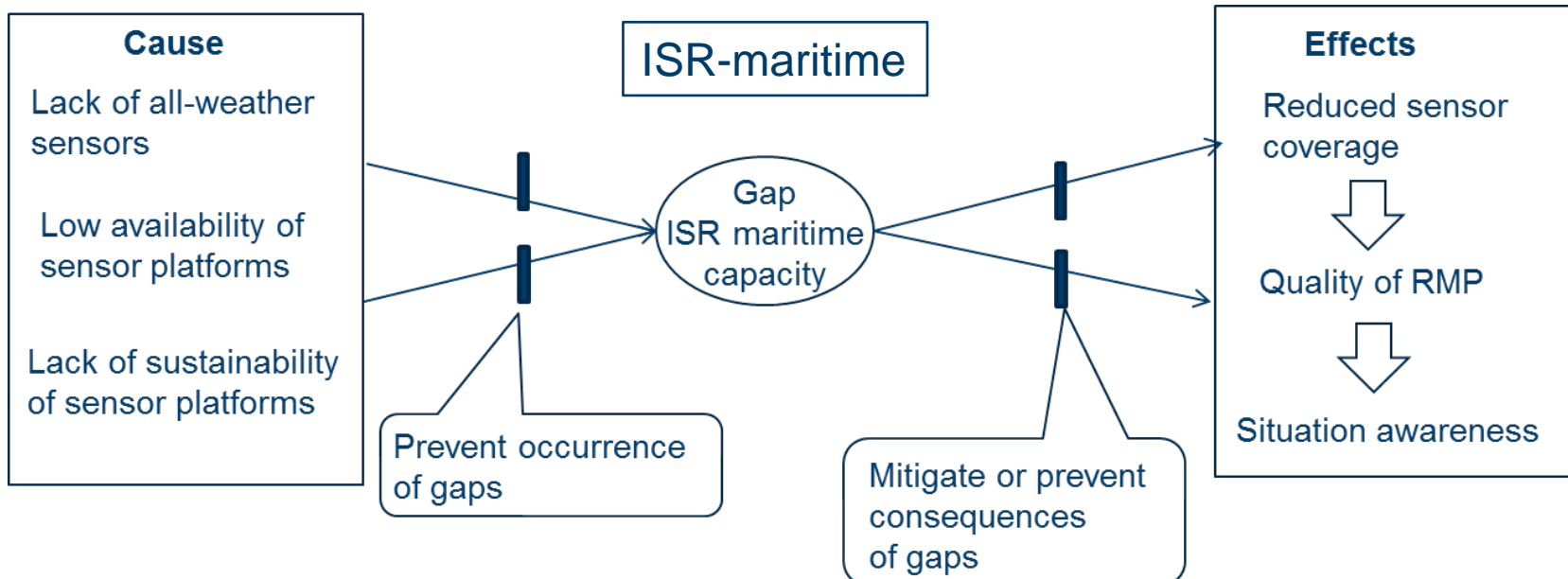
System Analysis and Performance

- Which available system elements (SE) and system solutions can fulfil capability requirements
  - Use SEs from current force structure
  - Which SEs are critical?

- Examples of SEs that may fulfil the ISR-maritime capability requirement:
  - SE (Air): Maritime patrol aircraft (MPA), helicopter,…
  - SE (Sea): Coast Guard vessel, frigate
  - SE (Space): Satellite

- What is the performance of SEs and system solutions measured by:
  - *Capacity*, *availability/reaction*, *sustainability* and *interoperability?*

Capability Gaps

- How well are the SEs/ system solutions performing relative to the capability requirements => degree of capability fulfilment?
  - How large are the gaps?

- Are gaps related to identified vulnerabilities?
  - Critical capabilities and vulnerabilities

- Probability of gaps?
  - P(g) = H, M, L
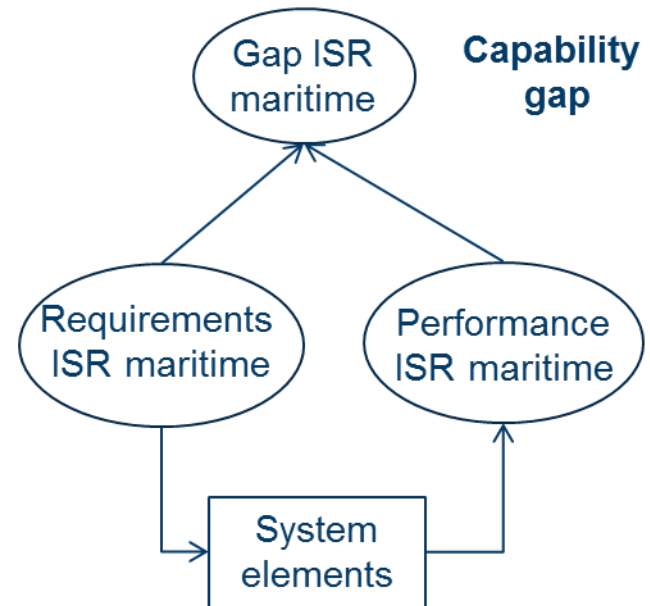
Risk Analysis: Consequences

- Gap => exploit vulnerabilities => consequences output => consequences outcome

- Consequences for output
  - Capability performance

- Consequences for outcome
  - Plan: Objectives, DCs and effects

- Necessary to define meaningful scales

Consequence model

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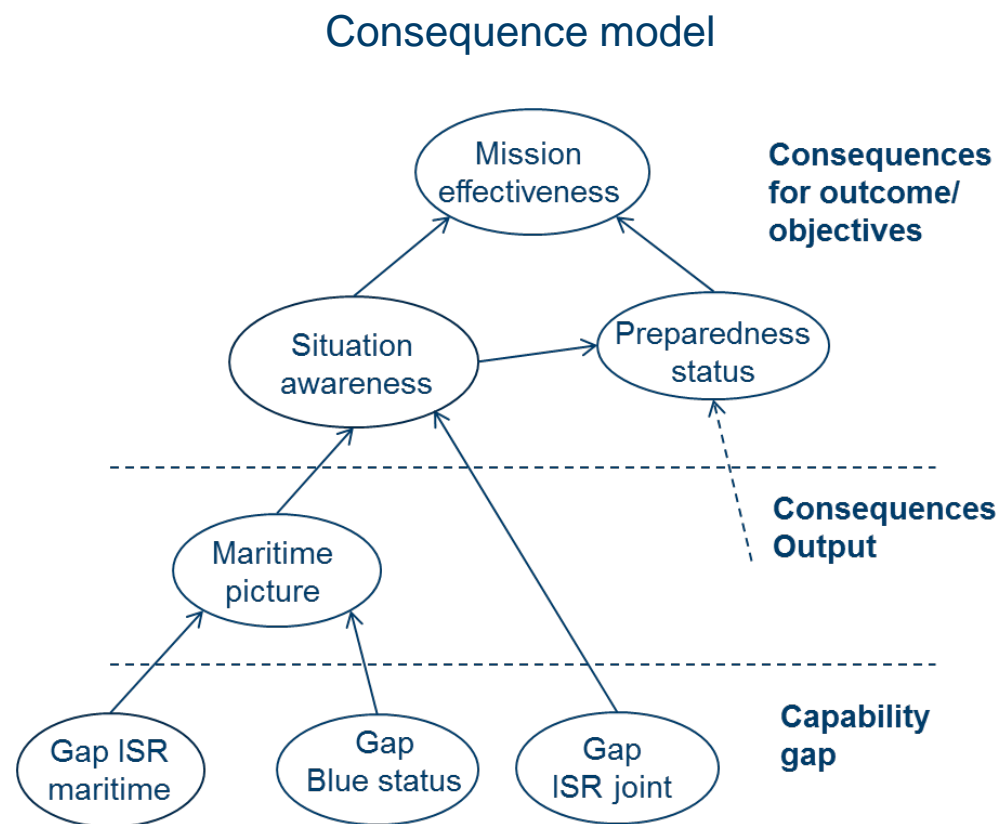
Operational Risks

- Combine probability of gaps with operational consequences (outcome)

- Probability of gap (H, M, L)

- Assessment of operational consequences (EH, M, H, L)

- Examples of risks:
  1. Insufficient situation awareness
     - Lack of ISR maritime resources
  2. Lack of preparedness
     - Lack of civilian-military interoprability

Consequence:
L = Low
M = Moderate
H = High
EH = Extremely H

Probability:
L = Low
M = Medium
H = High
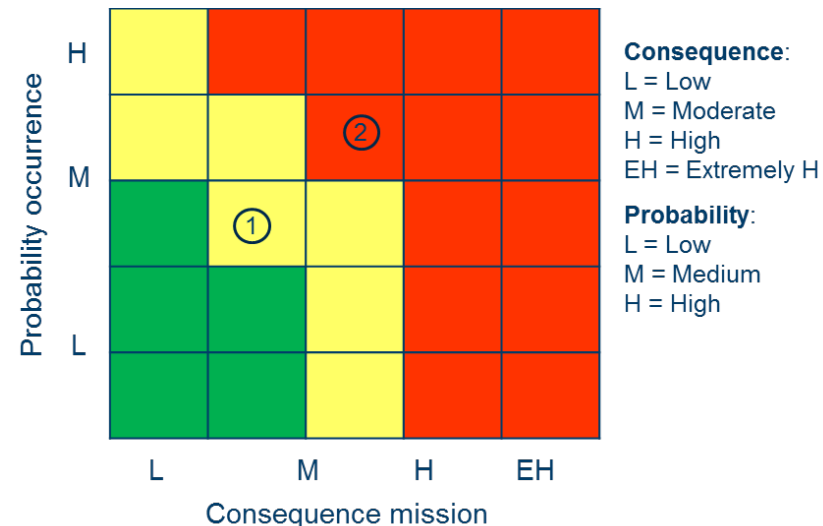
Summary and Conclusions

- We propose a framework for risk assessment to support operational planning
  - Systematic approach to identify operational risks
  - Assessment of planning assumptions
  - Treatment of uncertainty

- Framework combines scenario and capability analysis with risk analysis
  - Flexible (adaptable to user requirements)
  - Multi-method (allow for different combinations of methods)

- The risk analysis framework:
  - Gives an overview of vulnerabilities and risks that can impact mission success
  - Supports risk management
    - Acceptable vs. not acceptable gaps
    - Identify and prioritize mitigating actions
  - Provides input to revision of plans

- ➤ Supports the development of more robust and adaptable plans
- ➤ Gives guidance on how risks assessments can be performed to support the OPP