
Investment in novel technology Balancing technology and business risk

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Det Norske Veritas - Oil & Gas

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“Master the uncertainties of novel technology in field development”

Basis For Qualification of new Technology

DNV Recommended Practice

RP-A203

**Qualification of
new Technology**



DET NORSKE VERITAS



MANAGING RISK

Procedure for Qualification of new Technology

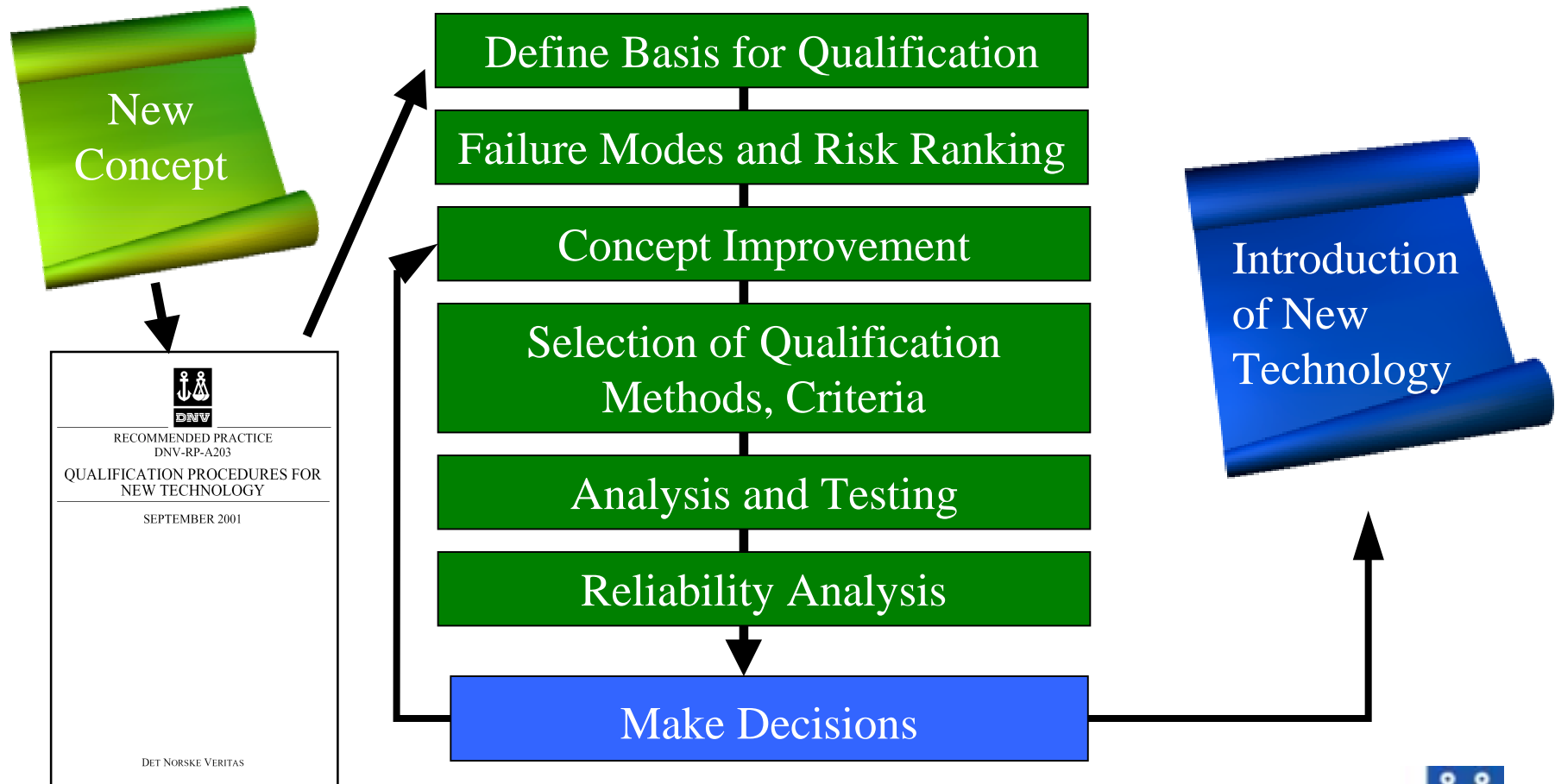
Objective

To provide a systematic approach to the qualification of new technology, ensuring that the technology functions reliably within specified limits

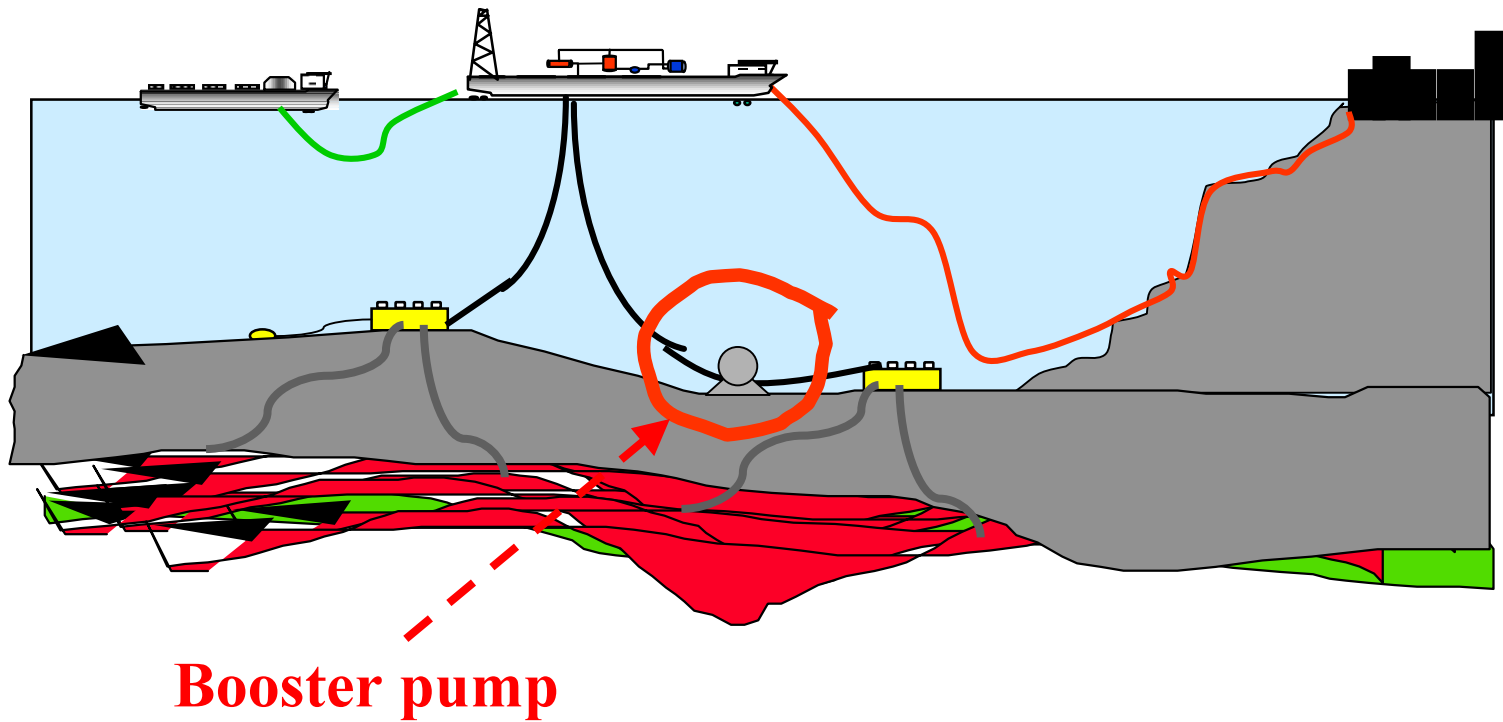
Who benefits from the Procedure ?

- A company offering new technology to the market needs to display proof of “fitness for service”
- A company considering to use new technology needs to evaluate proof of “fitness for service”, as well as optimising benefits of investments through selection between competing technologies

The DNV Qualification Work Process



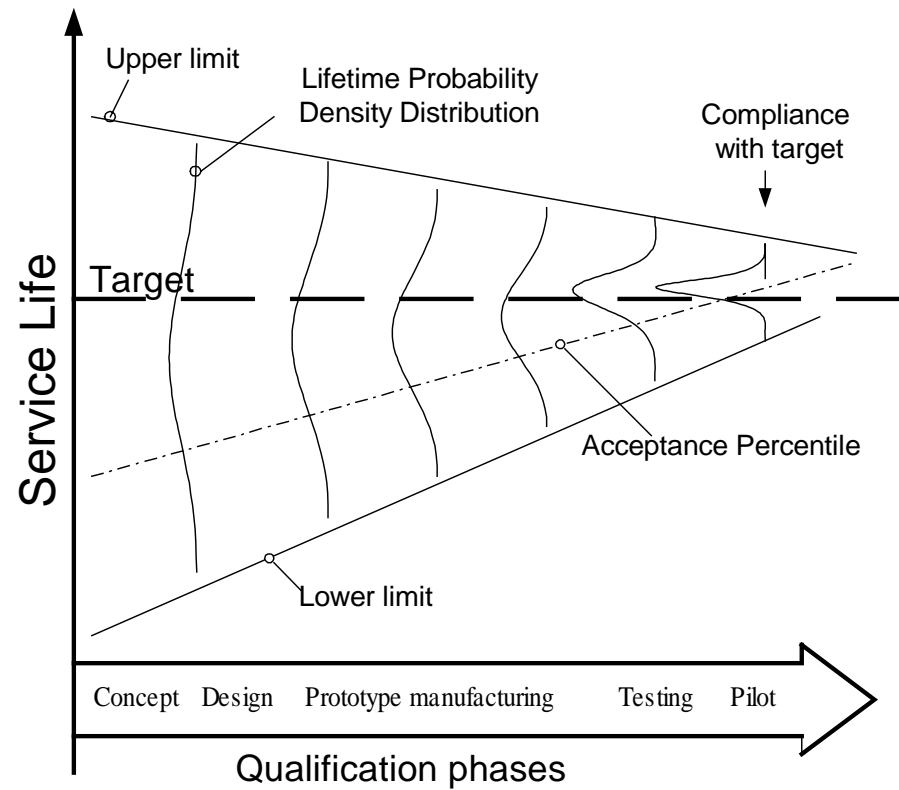
Field development solution



Booster Pump

- The **unproven** booster pump has the following properties
 - Increases In-field flow capacity
 - Increases recovery at end of plateau
 - Gives increased CAPEX
 - Reduces system availability
 - Uncertain specifications (must be Qualified)
- The Backup-up solution is a **proven** booster pump

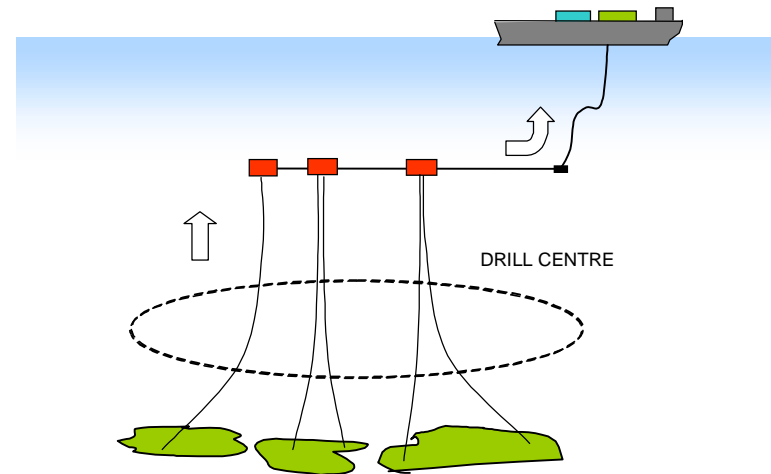
The Qualification Process



Areas of Concern in the Qualification

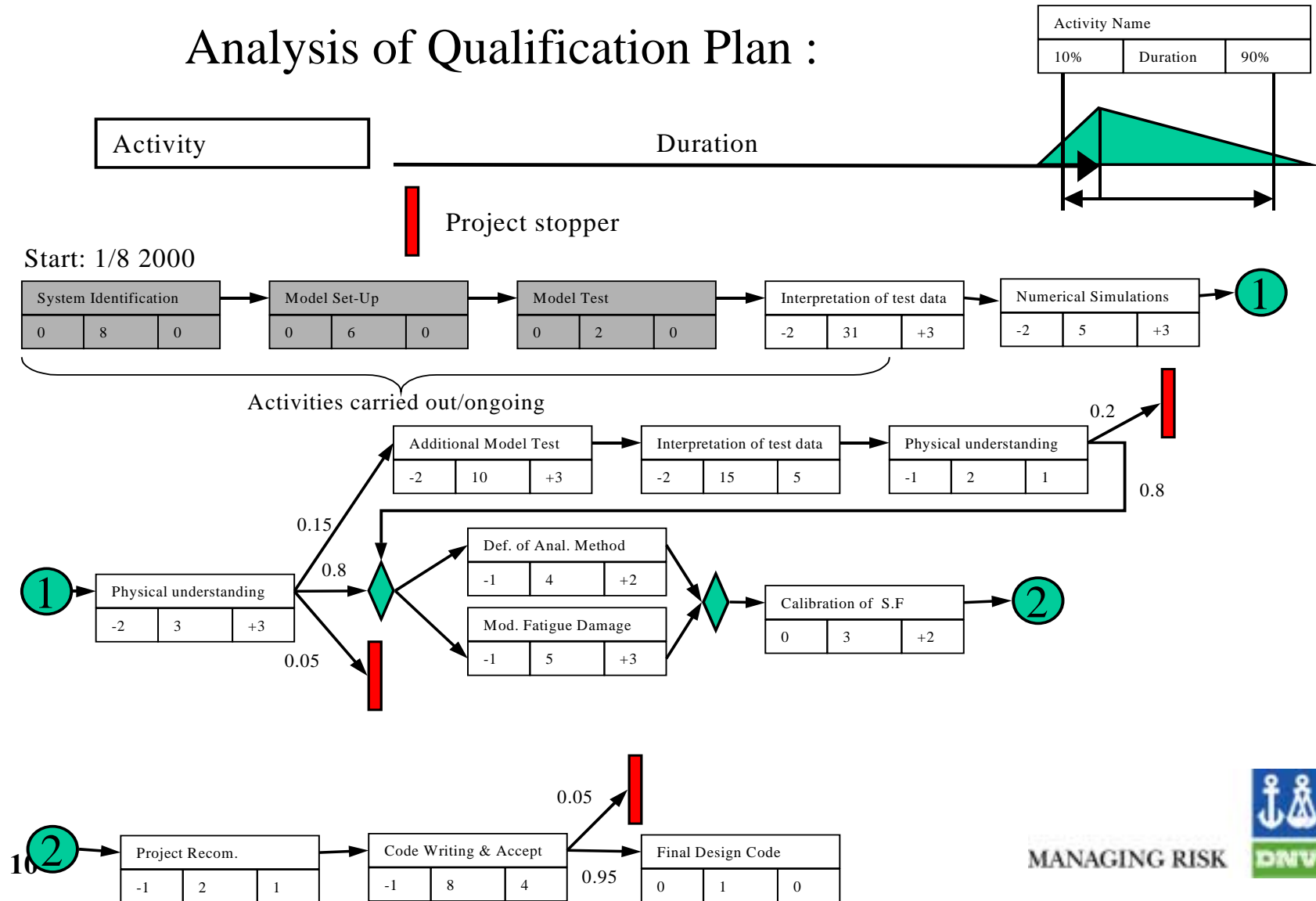
Known versus **New** technology:

- **Which** concepts should I go for?
- **What** is the probability of being able to qualify the product?
- **When** will the product be qualified?
- **When** should I terminate the qualification program?
- **What** are the costs involved?
 - Cost of Qualification program
 - Total Cost (CAPEX, OPEX, ABDEX)



Modelling of the Qualification Program

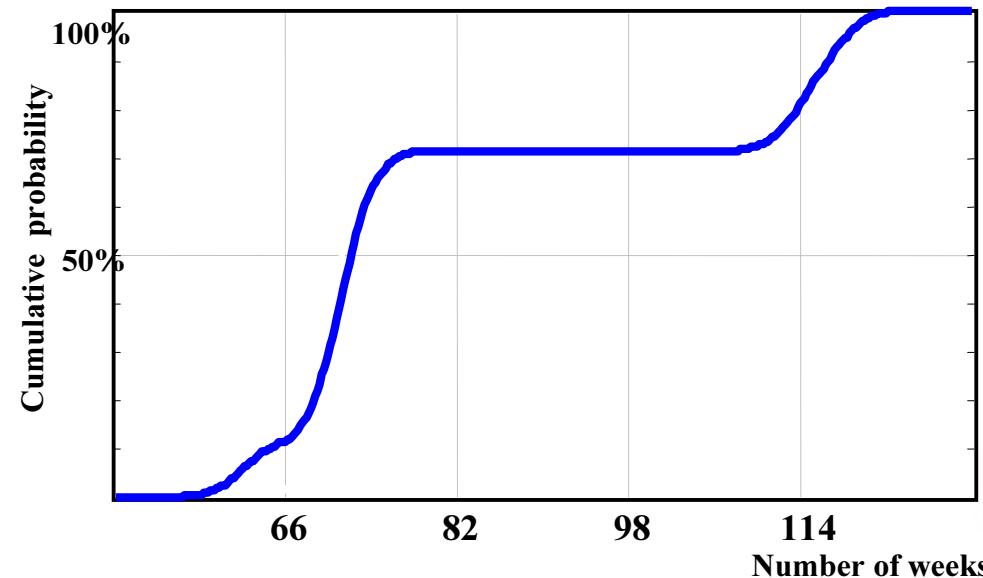
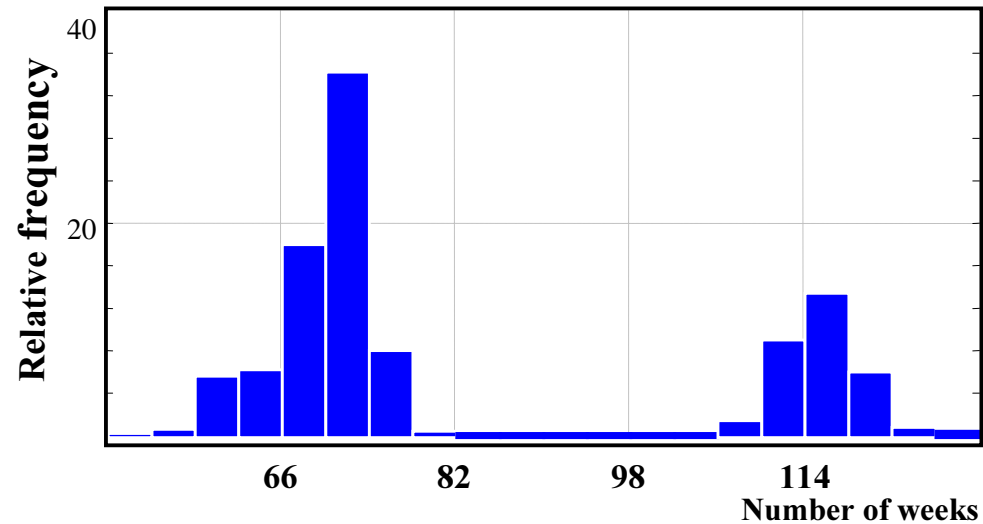
Analysis of Qualification Plan :



Estimated Duration of Qualification Program

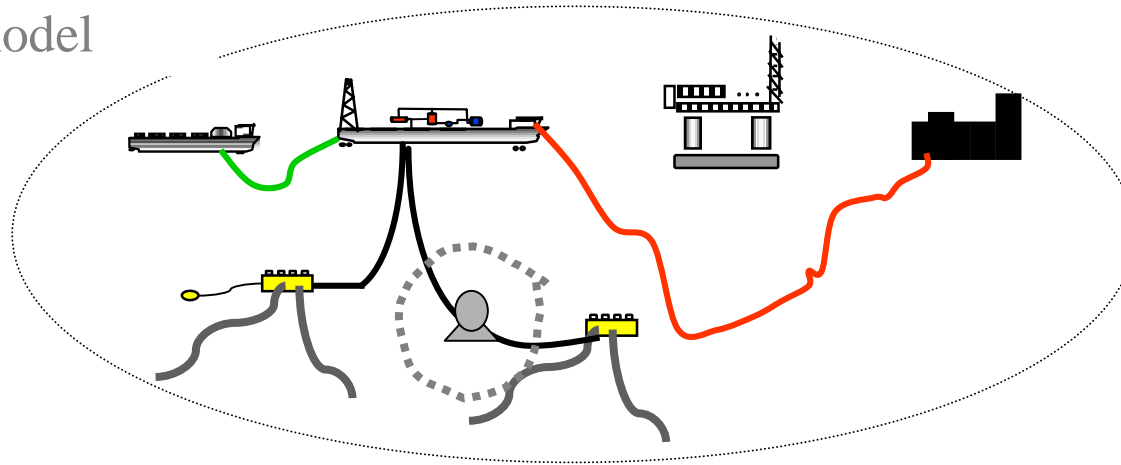
Distribution of duration (weeks) of Qualification program, condition on that qualification is obtained.

Probability of not Qualifying: 28%

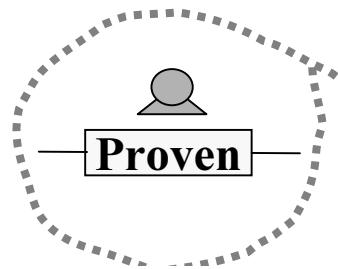


Uncertainty Analysis of Concept

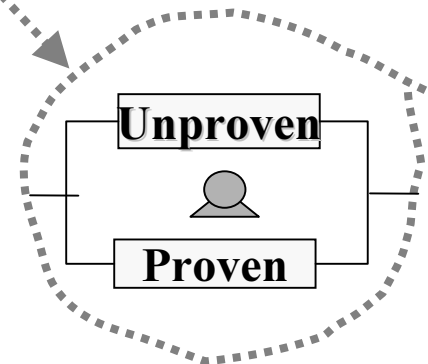
Global model



Local models

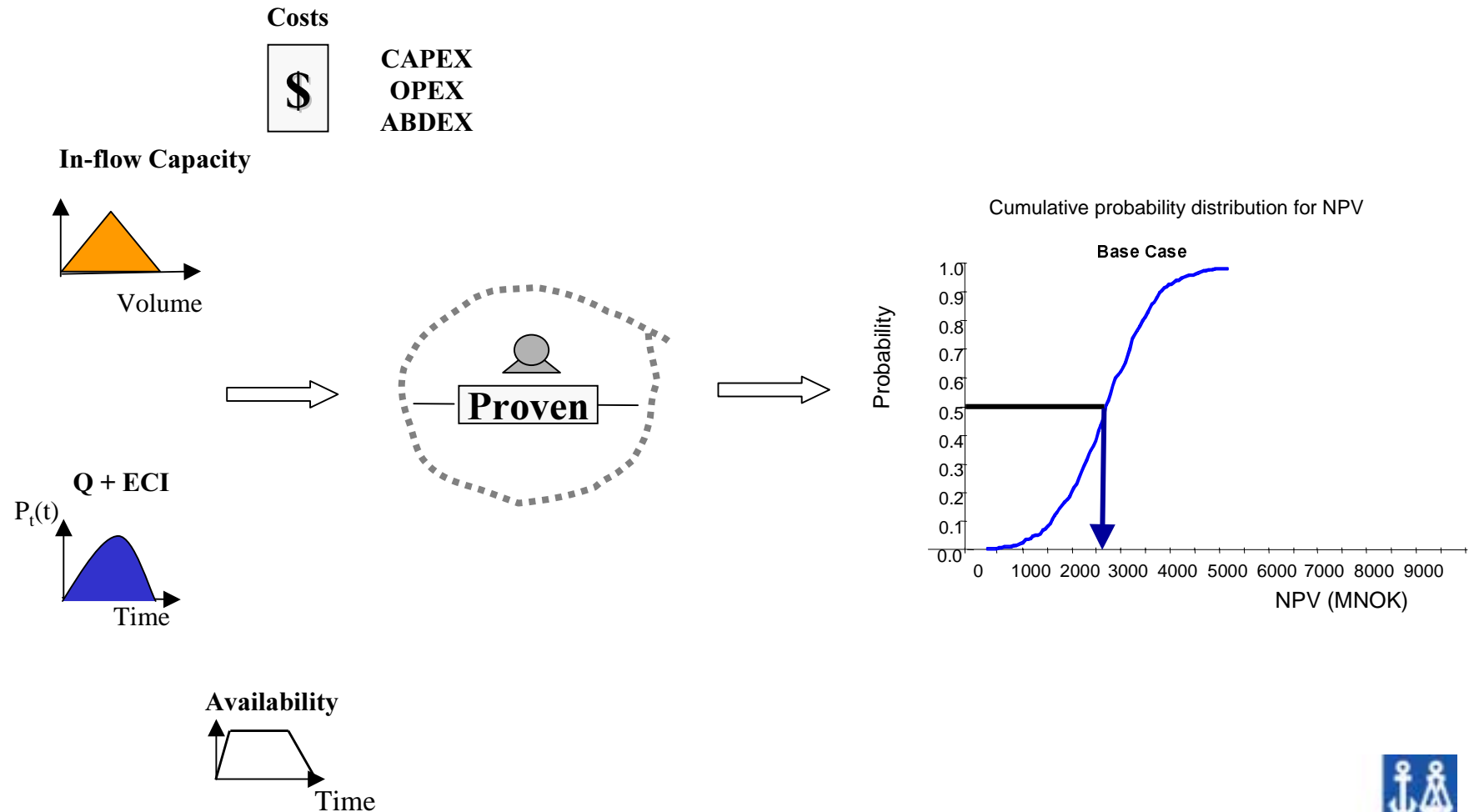


Base Case

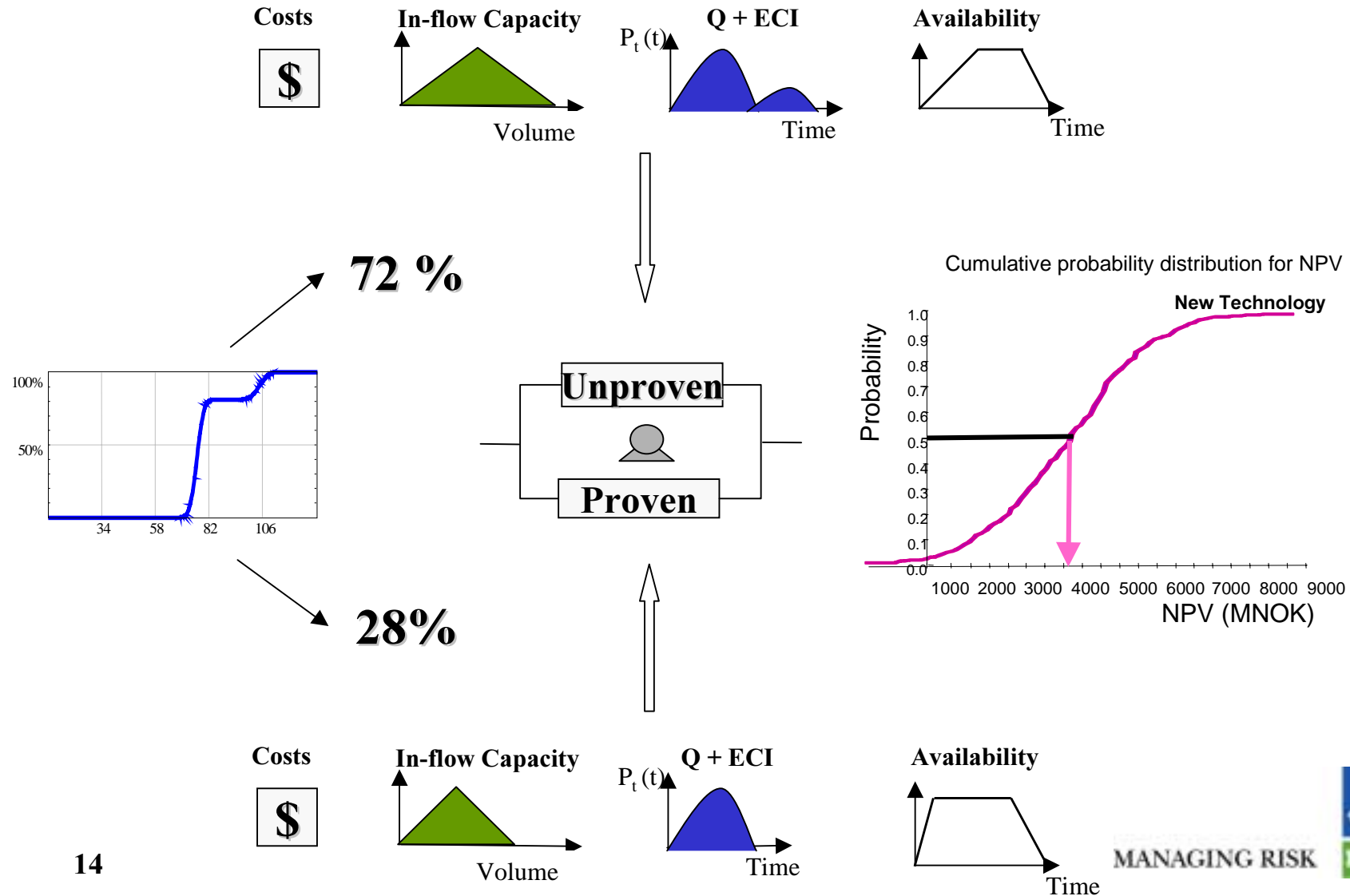


New Technology

Uncertainty analysis - Base Case

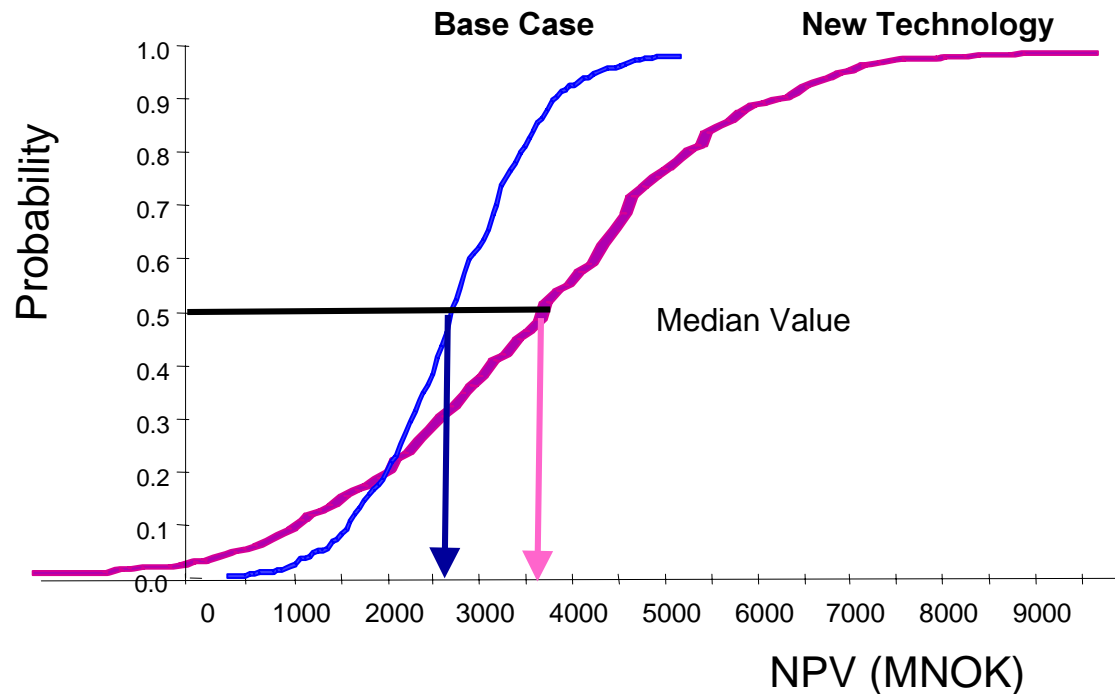


Uncertainty Analysis - New Technology



Comparison of Field Development Solutions

Cumulative probability distribution for Net Present Value



Comparison of Field Development Solutions

Cumulative probability distribution for Schedule

