Avoiding major accidents in the offshore industry

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My PhD

• Relationship started with Project and Master Thesis in 1984
• PhD: 1988-1991
• Title of dissertation: Probabilistic evaluation of frequency of collision between ships and offshore platforms
  – A model for calculating how often merchant vessels would collide with offshore platforms
  – How uncertain would the calculated results be – quantitative uncertainty analysis
COLLIDE

• Model was developed into a software tool that has been applied widely in the Norwegian and UK offshore industry after that – still in use, more than 20 years later
• New PhD has just started work on ”redeveloping” the model
• The uncertainty analysis has probably never been used for anything!
What have I been up to?

• Started working for risk consultants Safetec in 1985
• PhD was done on leave from Safetec
• Moved to Aberdeen to set up Safetec office in 1991
• Managing Director of Safetec 1993-1999
• R&D manager Safetec 1999-2010
• Adjunct Professor (Prof II) at NTNU 2000-2010
• Professor since 2010
  – Technical safety, Risk analysis
From Risk Assessment to Accident Prevention

• Working mainly with major accidents
  – Consulting
  – Research
  – Education
• Starting with risk analysis (like the collision model)
• Building detailed quantitative models to support a safe design
• More interested in the numbers than the reality behind?
• Focus on technical systems
Expanding the view

• The objective is to prevent accidents from occurring, not analysing what the risk is!
• Why do accidents occur?
  – Understanding why we experience severe accidents again and again
• How do people influence major accident risk?
• 80% of accidents are caused by human error
  – Is any technological accident not caused by human error?!?
  – Is it realistic to ”improve” peoples behavior to avoid errors?
Making safe decisions

• According to one source (an engineer!), there were 27 "bad" decisions that caused the Macondo blowout
  – Would anyone on purpose make a decision that would lead to a blowout?
  – Are all decisions that did not have a blowout at the end "good"?
  – How could all (or at least some) have been changed into "good" decisions instead?

• Expectations and requirements for an accident-free world are increasing
MIRMAP

• What are the types of decisions where support is required?
  – Understanding the context of the decision

• What decision support is required and helpful?
  – Providing a (usually very small) probability is not necessarily helpful
  – How do people interpret the information, what do we act upon, how do we act upon it?

• How can we provide that support?
  – Analysis tools – ”live” decision support
Online decision support for safer operations in oil and gas

- RISCOPS aims to reduce the number of incidents with major hazard potential on the Norwegian Continental Shelf (NCS) with 20%