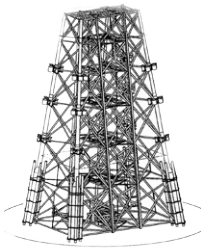
Comparative Risk Assessment of North West Hutton removal options

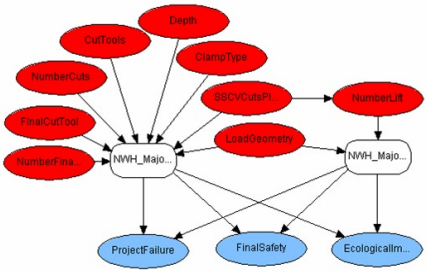
North West Hutton

Facts about the North West Hutton platform

- **Installed 1983 North East of Shetland Isles**
- **Production ceased 2003**
- **Water depth 144 m**
- **Steel jacket of approx. 17,300 tons**
- **Approx. 30,000 tons of drill cuttings**



Jacket and footings



Object Oriented Bayesian Network

Client benefits

- **Objective evaluation of risks associated with removal options**
- **Create focus on key questions to be dealt with as part of the cessation process**
- **Substantiate and form basis for firm decision making**

At the end of a platform's productive life, decisions regarding its decommissioning shall be taken. The owner of the platform faces a difficult choice between various removal options influenced by uncertain technical, environmental and safety aspects.

To facilitate BP's choice of a removal option for the North West Hutton steel jacket and cuttings pile, COWI A/S carried out a quantitative comparative risk assessment of various removal options. These included complete removal of jacket, footing, template and drill cuttings as well as a number of partial removal options.

The methodology of the study comprised of breaking down the method statement of each removal option into 20-25 sequential activities. For each activity the main hazards were identified and their probability of occurrence was assessed from detailed technical background documentation and in expert workshop sessions. On this basis a risk model was established using Object Oriented Bayesian Networks, which is a class of probabilistic models well suited for handling interdependent variables. Using this model, the removal options were compared with respect to technical and personnel risk as well as environmental impact.

The technical feasibility of the removal activities included quantification of major accident probabilities and schedule/cost problems. These problems could be caused by tool failure or structural condition uncertainty. Personnel safety was evaluated in terms of fatality risk during e.g. diving, cutting or lifting operations.

The main output of the project was a well documented quantitative basis for selection of the optimal removal option. The study provides high-level decision support based on detailed background technical documentation prepared for the decommissioning project. It included sensitivity analyses and identification of main risk contributors. The study is expected to form an important part of the basis for the public consultation process.

Decommissioning Services

- **Decision support for selection of optimal removal option with respect to**
  - **technical project feasibility**
  - **personnel safety**
  - **environmental impact**
- **Sensitivity assessments evaluating the impact of changes in the removal method**
- **Documentation to support the public consultation process**

Project period: 2003-2004

Client: BP Exploration Operations Company Limited

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COWI