Contributions to maintenance management/production assurance:
Handling of uncertainty.

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The phd-work will be a part of the research project; “Regularity and uncertainty analysis and management for the Norwegian gas processing and transportation system (RAMONA)”. The main objective of the RAMONA-project is to develop new theory as well as new methods and tools to optimize regularity and capacity utilization in systems for production, processing and transport of natural gas.

Present methods for regularity-analysis and –management for offshore gas transport systems are primarily developed to support decisions about configuration and arrangement in the planning phase. There is need for research to develop theses further in order to take into account uncertainty to a larger degree, and to extend them to the operation phase and incorporate aspects like ageing and maintenance.

A Bayesian approach offers a consistent treatment of information and uncertainty. A practical implementation of such a Bayesian analysis is not ready and demands research and development.

The phd-work will be in the point of intersection between regularity and maintenance, with risk management as a frame for handling uncertainty. Decision making is also an important part of the background context. So far the following research tasks are identified:

1) Literature review of Bayesian theory, methods and models within maintenance optimisation

2) Development of methods and models for
   ▪ maintenance optimisation
   ▪ ageing effects, maintenance and other operational aspects on delivery and cost-effectiveness
   ▪ handling of uncertainty in system planning
   ▪ decision support in production- and transport systems

The aspect of risk management will be based on a knowledge- and decision-oriented Bayesian framework developed at UIS the last 10 years.