**What is marine operation and maintenance engineering?**

Marine operation and maintenance engineering covers important activities needed to ensure a well-functioning, safe and environment-friendly system. We focus on marine systems, such as ships, offshore installations, marine renewable energy production systems, fisheries and aquaculture.

Operation of a ship, an offshore wind farm, or an oil/gas installation requires extensive knowledge of the production processes and technical systems, including reliability, safety, maintenance, and operation management.

Planning and optimization of maintenance involves the development and use of mathematical models and operations research, but also the analysis of human and organizational factors.

Safety and reliability include the assessment of technical, human, environmental and organizational factors, which makes it very exciting to work in this area.

**Master’s Degree Programme**

Master courses:
- TMR 4260  Safe operation and maintenance
- TMR 4555  Operation and maintenance engineering - specialization course

PhD course:
System safety engineering and management

See http://www.ntnu.edu/ross/courses for more relevant courses.

See http://www.ntnu.edu/studies for more information about studying in Trondheim.

See http://www.ntnu.edu/ivt/phd for short information about PhD opportunities.

**Contact information:**

Professor Ingrid Bouwer Utne
Telephone: (+47) 73 59 55 01
Fax: (+47) 73 59 56 97
E-mail: ingrid.b.utne@ntnu.no

Postal / visiting address:
Department of Marine Technology
Marinteknisk Senter
O. Nielsens vei 10, Tyholt
NO 7491 Trondheim, Norway
In the oil and gas industry, there are exciting work related to operation, maintenance, and modifications of offshore and onshore facilities. The consequences of insufficient maintenance and safety can be catastrophic, both in terms of loss of human lives, environmental impact, and damage to assets; the Deepwater Horizon accident is one example.

Many oil and gas installations on the Norwegian continental shelf are aging; increasing the need for maintenance. It is a challenge to analyze and determine the need for maintenance to ensure safety.

As the oil and gas industry is moving into deeper water, subsea solutions are becoming more common. Important equipment placed on the seabed makes great demands on the operation, in terms of maintenance of the equipment and ensuring control over the technical condition. Use of intervention vessels is very expensive and it is very complicated to perform maintenance when the water depth is, for example, 1000 meters or more.

Consultancy services request candidates with technical background. As a consultant, you get a broad experience from a variety of businesses and industries. Typical tasks for a consultant include RCM analysis, availability analysis, risk analysis, and assistance in strategic planning and performance management.

Ships are operated in either “Ship Management” companies which are specialized in the operation of ships, or as an integral part of a shipping company. Typical work in this context is within the technical department or as an inspector. The inspector is usually responsible for 3-4 ships, visiting the ships regularly and making technical management plans with focus on safety, economy, and efficiency.

See http://www.rederi.no for more information on the Norwegian maritime industry.