

Tore Mellem

Mechanical Engineer, M.Sc. NTH & THD
Business Title: Principal engineer

Education

1969: Master of Science, NTH, Norwegian Institute of Technology
(Mechanical Engineering)

1965: Other Education:, THD, Technische Hochschule, Darmstadt,
Germany (Mechanical Engineering)

**Summary**

Technical: Subsea, Production and Facilities, Maritime:

Broad technical knowledge. In depth knowledge for: Deep water pipeline repair to 2500 m water depth, Pipeline engineering, Well completion, Subsea production, Workover, Offshore operation of subsea items in rough sea, Hyperbaric diving, ROV operations, Umbilical, Submersibles, Analyses/Calculations of: forces, stress & deflections; dynamics & responses, reliability, Qualification of new technology.

Management:

As section manager and manager of interdisciplinary projects for subsea systems of size up to 12000 man-hours.

Working experience**2007 - MELTOR****1970 to 2007 - Det Norske Veritas**

Project manager for:

Tasks: Subsea Production System, Pipelines, Well Completion Systems, Topside Facilities, Qualification:

- Pipeline Subsea Repair JIP, Project manager (2005-2006)
- Qualification of sand retention system for the Ormen Lange gas wells, (2004-2005).
- Qualification of deep water, subsea pipeline repair system for the Green Stream and Blue stream pipelines, (2003-2005).
- Qualification of downhole safety valves for Ormen Lange, related in particular to new aspects of the deep setting (1600 m), large bore (7" and 9 5/8") and deep subsea (900 m) application. (2002-2003)
- Study - New technology qualification for subsea water/oil separation systems (Troll Pilot) and downhole gravity separation (HSEP) (2001-2002)
- Study of gripping capacity between a pipeline recovery head teeth and a pipeline with high material hardness (2002).
- Certification of pipeline recovery head for the 2000 m deep 24" trans Black Sea pipeline (Blue Stream) (2001)
- Qualification Procedure for New Technology – a DEMO 2000 & JIP project funded by Oil-companies, Norwegian authorities, other companies and DNV (2001).
- Erika Cargo Neutralisation Project - feasibility assessment of the subsea operations for removal of the oil from the sunken tanker offshore France (2000)
- Remote operated mechanical pipeline couplings and repair clamps: JIP Development of Recommended Practice RPF104 for Mechanical Pipeline Couplings, functional requirements, Verification of PD coupling, Morgrip 42" coupling, Repair system for Draugen, Assessments of repair scenario on Draupner, Study and verification of 42" repair clamps.
- Balder subsea, "Risk Based" inspection planning (RBI)
- Remotely Operated Pipeline Isolation Plugs, verification and follow up for PSI and PII Tecnomarine

- BOP malfunction and remedy assessments, Njord, Visund
- Subsea well consequences from falling objects- horizontal/conventional X-mas trees, TOGP, Njord
- HAZOP leader for: Pipeline plug isolation/Riser valve modification Troll A, B11, H7; Operations of receiving isolation train at B11; TOGP subsea separator level sensor replacement.
- Reciprocating Hydrocarbon Compressor Package verification coordination, Varg
- Rotating Hydrocarbon Compressor damage assessments, Vigdis
- Diesel engine, high temperature manifold damage assessments, Ruston.
- Subsea X-mas tree thermal internal expansion, Troll
- Subsea template verification, TOGP (Troll), Lufeng, Snorre B
- 40" and 32" pipeline remotely operated isolation plugs verification/Certification
- Pipeline valve/actuator: Response and Closure time calculations, Replacement tool assessments, Internal deflection & seal assessments.
- Åsagard transport: concept uncertainty evaluations (MDPT), verification of subsea valves and connectors
- Well tubing installations; Analysis of resultant torque.
- Coiled tubing; Dynamic measurements and analysis to determine operational limits for operation from floaters.
- Development of analytical methods to determine the effects from impacts between trawl boards and pipelines.
- Verification of deep water pipeline repair system for: the Oman-India pipeline project (3500 m water depth) and Blue Stream (Black Sea 2500 m water depth).
- Russian gas transmission system: Assessments of valve and compressor stations.
- Tungsten carbide friction tests
- Mudline hanger failure investigations
- Well tubing/casing telemetry system, assessments related to function and safety.
- Bending stiffener fixation devices on production vessels, verification.
- Subsea choke valve; damage investigations by tests and analysis.
- Well casing strength during side tracking.
- High Pressure High Temperature drilling equipment
- Vøringsplatået: Feasibility assessment of applying high strength casing for risers for slim hole drilling.
- Frøy: Effects on trawl board hooking of pipeline
- ROV development and operation for 300 +m depth
- Sleipner Vest: Valve qualification, HIPPS system evaluation
- Europipe, Zeepipe, NorFra, Troll and: Valve verification.
- Kårstø: Compressor evaluations
- Troll Olje (Phase II): Safety and Availability assessments, HAZOP. Detailed design export pipelines (Lead engineer). Choke valve leak study. Pollution verification study. Pipeline protection, Interface co-ordination.
- Gullfaks: 7" Downhole Completion Equipment - Review. Flare study.
- Heidrun: Well-Template Interaction Assessments
- Statfjord Satellites: Diving Risk Assessments
- Tordis: Hydrate removal study
- Snorre: Verification of tie-back wellhead systems, design and tests and ROMV deployment system, Bilge and ballast system review, Work-over riser dispute assessments, Leak testing of damaged flanges/new gaskets
- Blow-out. Emergency Procedures for drilling vessels
- Sand monitoring systems - methodology for qualification and improvements
- Troll: Feasibility study: electrical heating of flowline
- TOGI: Subsea template and completion component design review
- Veslefrikk: Establish limitations for the Tie-back system, Wellhead equipment design review.
- Sleipner A: Piping flexibility program verification, valves up-rating and pre-qualification verification, explosion loads on piping systems.
- Oseberg 2: Main piping flexibility calculations.
- Piping connection systems. A comparative study.
- Flexibility analysis of a formaldehyde process plant.
- Tommeliten: Subsea development project, technical calculations, design verification, trouble shooting, fabrication following-up.
- Oseberg Subsea Satellite wells control system FMEA
- East Frigg subsea production system, design verification
- TOGI Oseberg B, piping flexibility calculations
- SKU: Relief valve vibration calculations

**DET NORSKE VERITAS 1981 - 1987**

Industry and Offshore Division (IOD) Principal Engineer, Dept. for Drilling, Production and Materials.
Head of Section for Subsea Production Systems.

Tasks: Subsea Production Systems and Well Completion Systems.

Project Manager of projects dealing with:

- Oseberg B, x-mas tree system verification
- East Frigg subsea production system, design verification
- Petrojarl/Oseberg subsea production systems, verification
- Tecnomare, 1000 m deep subsea processing system, concept verification
- SSC-1 Bombay High, subsea production system, certification
- North East Frigg, Subsea Production System, certification consultancies
- Gullfaks A, platform wellhead equipment, verification
- ALGA Subsea Production System - conceptual engineering assessments
- Subsea Atmospheric System, (Statoil, Kværner, Mobil) - engineering assessments
- Troll subsea developments, Risk assessment
- Balmoral - Subsea System - Certificate of Compliance
- Gullfaks A - Subsea Production Systems and flexible riser in "J" tube - Assessments
- Development of Rules for Certification of Subsea Production Systems
- Statfjord B - Platform wellhead and downhole equipment, verification and fabrication follow up
- Group Leader for the "Subsea Production System" Advisory Group with participants from oil companies.
- The division's research projects for 1983 related to "New platform technology for deep waters and environment".
- Methodology for life and reliability assessment and qualification components in subsea production systems.

This period includes mainly work in Oslo, but also USA, UK, Netherlands, Italy and Singapore.

DET NORSKE VERITAS 1978 - 1981

Ship Division Deputy Head of Section

Project Manager, Section for underwater systems, with responsibility for:

- Diving systems, submersibles, remote operated vehicles
- Development of calculations methodology for forces during handling submerged items in rough sea such as welding habitats, dry subsea production systems, diving bells and submersibles.
- Full scale measurements during handling objects from vessels in rough sea (submersibles, diving bells)
- Full scale measurements of forces in umbilicals during bell handling from vessel with heave compensator systems used in rough sea.

This period also includes work offshore on vessels, drilling rigs and fixed production platforms.

DET NORSKE VERITAS 1976 - 1978

Research Division Project Manager

Section for underwater systems, responsible for research projects related to submersibles, diving systems, dry subsea production systems, handling of submersibles and diving bells from vessels in rough sea.

Machinery Section 1972 - 1976

- Finite element computer calculations
- Project Manger for projects related to troubleshooting of machinery and development of methods for early warning of incipient failures, in particular by aid of acoustic monitoring and signal condition in the frequency range 10Hz to 30kHz.

This period also includes work onboard ships in Spain.



DET NORSKE VERITAS 1970 - 1972

Internal company job rotation programme for recently employed mechanical engineers.

Machinery Department

- Calculation of dynamic behaviour of shaft systems
- Reduction gear calculations
- Approval of machinery design

Ship In-Service Department

- Evaluation of ship damages and wreckage

Research Division, Machinery Department

- Finite element computer calculations of diesel engines, transmission gears and stern of ships
- Development of a wear sensor for large bore Diesel engines cylinder liners.

Survey Station, Malmø, Sweden (Permanent with family for 6 months)

- Survey of mechanical equipment during fabrication and upon completion at manufacturers
- Survey of ship, new buildings and in-service.

OTHER COMPANIES/EXPERIENCE

Norwegian Institute of Technology, NTH, 1983 - 1988

External Examiner for: the Division of Marine System Design, Specialised Vessels and Equipment for Underwater Operations.

Military Service 1963 - 1964

Rank: Sergeant in the Air Defence.

Industrial Apprentice-ship 1962 - 1969

14 months industrial apprentice-ship at various companies in Norway, Germany, France, Yugoslavia and onboard a US marine biological research ship, prior to and during study.

The industry types were:

- Electrical power distribution
 - Mechanical industry, manufacturing of power plants, printing machines, tools and railway locomotives
 - Foundries for iron, steel and stainless steel
- Position onboard a ship as: Chief engineer and diver during operation in Norway, Shetland and Orknies.

Language

Language	Native	Proficiency
German	No	medium
English	No	high
French	No	low
Norwegian	Yes	high

**List of papers/publications**

Published Papers:

- "Surface Handling of Diving Bells and Submersibles in Rough Sea", Paper: OTC 3530, 1979.
- "Rules for Certification of Diving Systems", Paper: NIF-1980
- "Rule Proposal for Certification of Subsea Production Systems", Paper: NIF-2-1983.
- "Subsea Venting", Paper: NIF, I Chem E - 1987.10 Subsea Separation & Transport.
- "Rørskjøter", Paper: NIF 1991.09 - Konstruksjon, drift og vedlikehold, rør og rørsystem.
- "Trawl Board Impacts on Pipelines" Paper OMAE 96-1017 presented Firenze 1996.
- "Effect of Relative Motion Between Reel/Gooseneck for a Coiled Tubing Rig-Up on a Floating Unit", Paper: ICoTA 96038, European Coiled Tubing Roundtable, Aberdeen, 96.06.19
- "DNV'96, Acceptance Criteria for Interaction between Trawl Gear and Pipelines", Paper: ASME International, Book No. HO 1084-1997, The 16th International Conference on Offshore Mechanics and Arctic Engineering, Yokohama 1997.
- "Mechanical Pipeline Repair Couplings" DNV Recommended Practice RP-F104, issued 1999
- "A method to obtain high reliability for mechanical pipeline couplings" Paper: ISOPE conference Seattle 2000.6.31
- "Wet buckle repair system" Paper: DOT conference Rio de Janeiro 2001.10.19
- "A systematic approach to reduce subsea equipment failures" Paper: SACADA 2002, Conference Paris 2002.06.14
- "A qualification approach to reduce subsea equipemnt failures" Paper: ISOPE 2003-JSC-140, Conference Honolulu 2003.06.
- "Qualification of Ormen Lange down-hole safety valves for high reliability" Paper. DOT conference Vitoria, Brasil, 2005.11.08
- "Pipeline Subsea Repair" Paper: OMAE2007-29274, Conference San Diego, California 2007.06.12

Courses

- 2004: Risk Management-Understanding (Internal)
- 2002: Relational Skills (Internal)
- 2001: Train the Trainer (External)
- 2000: SHE-for employees, DNV Norway (Internal)
- 2000: SHE-for employees, DNV Norway (Internal)
- 1999: Subsea Pipeline Technology (Internal)
- 1998: Quality Assurance III (Internal)
- 1998: Classification Concept (Internal)
- 1998: Dnv Classification Systematics (Internal)
- 1985: Subsea production (External)
- 1985: Mid-Management (Internal)
- 1984: Top Side Technology (Internal)
- 1983: Well completion (External)
- 1982: Hydrocarbon production (External)

More information

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