

Valve Aftermarket - Subsea

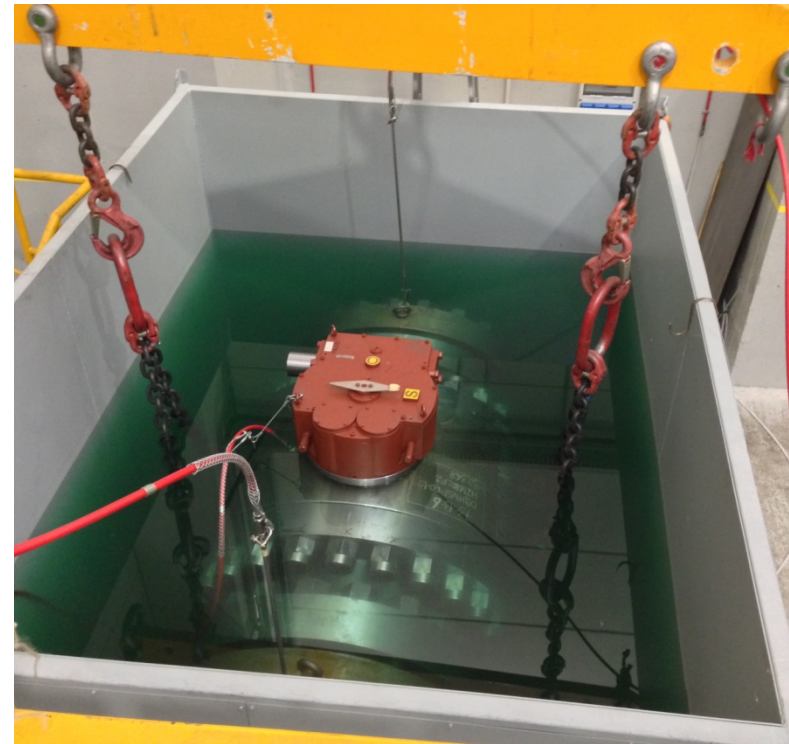
Are Halvorsen

Nordic Valve Services AS



Valve Aftermarket - Subsea

- Challenges for the valve maker - Qualification
- Challenges for the aftermarket -entrepreneurs
- Local workshop solution



A valve makers challenge

- Qualify first then RFQ
 - Endurance testing
 - PR2 testing (various temps...API17D/API6A + end users spec)
 - Hyperbaric testing
- Willingness from entrepreneur
 - Man-hours, technical support follow up and inspection
 - Huge risk - experience vs technical and commercial capabilities
 - Under capacity

A valve makers challenge



Aftermarket challenge

- Subsea Production System Entrepreneur
 - 3rd Party Valves
 - Presence of local valve care from OEM
 - Lack of local independent valve aftermarket specialist
- Independent after market company
 - Experience with simpler / larger structures
 - More and more xmt's, BOP's, pump modules = 3rd party valves
 - Lack of local independent valve aftermarket specialist

Local workshop solution

- Facilities
 - Capable of handling larger structures
 - Located on the supply base
 - Customer integrated systems
- Technology
 - Welding
 - Hard-facing
 - NDT
 - Machining
 - Testing
 - Surface treatment



Local workshop solution - Welding

International Welding Services:

- Qualification according to ISO 3834-2



Local workshop solution – Hard facing

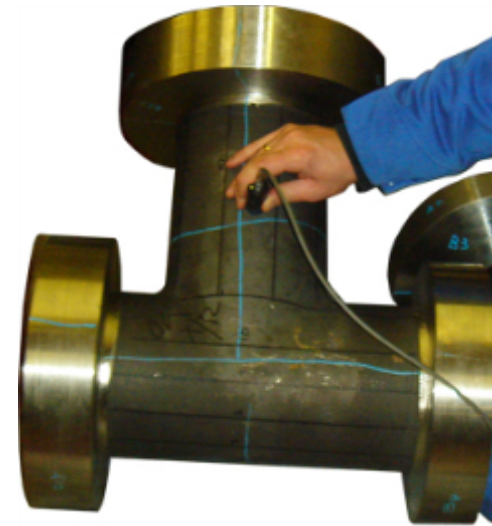
- Norsok
 - NHF1, Stellite 6
 - NHF2, TCC
- TR2000
 - ZH201



Local workshop solution – NDT

NDT services available with the following methods used:

- Visual inspection
- MT, PT, ET, RT, UT, PMI & HT
- Short mobilization time



Local workshop solution – Machining

- Local machining
 - Quick turnaround
 - Document control
 - Tolerance control
 - Modification supervisor

Local workshop solution – Testing

- Onsite testing facilities:
 - Testpits
 - Test chambers



Local workshop solution – Surface treatment

- Industrial surface treatment according to NORSOK M-501 and TR0042 Industry specific standards onshore and offshore
- Inspection and consulting (FROSIO)
- Metalizing



Local workshop solution - Conclusion

- Independent vendor
 - NDA with OEM and vendors
 - ISO 9001-08 / 3834-2
 - "One stop shop"
- Close proximity to intermodal infrastructure and the largest offshore port in Europe.

