Forum on next-generation BOP and control systems technology, management, and regulations

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Manufacturing, Test, Maintenance, and Certification Requirements

• Current Status
• Issues
Current Status

- Subsea failure rate comparison

![Graph showing subsea failure rate comparison between SINTEF V, SINTEF II DW, and Current JIP for various components such as Annular, Ram, Connector, Valve, H Controls, MUX Controls. The rate is measured in MTTF (Mean Time To Failure) days, with SINTEF V showing the highest rate at 106,526 days.](image-url)
Current Status

- MTTF by Rig (Subsea)

13 (35%) of rigs had no associated failures
Current Status

- Existing standards
  - Class
  - API
    - Specifications (design and manufacture)
    - Recommended Practices (operations and maintenance)
  - Private
- Regulatory
- Generally considered minimums
Compliance to Standards

• Who verifies compliance?
• What are competence requirements?
• How often?
WEST Verification Standard

- Procedure developed over 26 years
- Job specific
  - Regulations, standards, best industry practices
- Decide what is mandatory
- Includes controls (hydraulic and electronic)
Unintended Consequences?

- Consideration of reduced redundancy
- Increased wellbore pressure testing
- Increased focus on repair work (non-floaters)
Issues

• Focus on asking questions
• Considerations
• And the answer is . . . . . ?
Manufacturing Standards

• Base (minimum) requirements
• Compromises inevitable
• Consistent between manufacturers
• Gaps
• Technology advances
Maintenance Systems

• Centralized or decentralized?
  • Control vs optimization
  • _____ BEST ways to maintain?
• Is more better?
Repair

• No API standard
• Remanufacturers
  • Can OEM (Original Equipment Manufacturer) change?
  • What are criteria?
Lloyd’s Register energy services

Repair

• Parts
  • RP 53 – “equal or better”
  • Mix and match
  • Buy out equipment
  • Upgrade (may not be available from OEM)
  • Discontinued
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Wrap-up

• Offered many questions
• Answers will vary by providers
• What is minimum standard?
  • and are we happy with minimum?
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