

Lloyd's Register energy services

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

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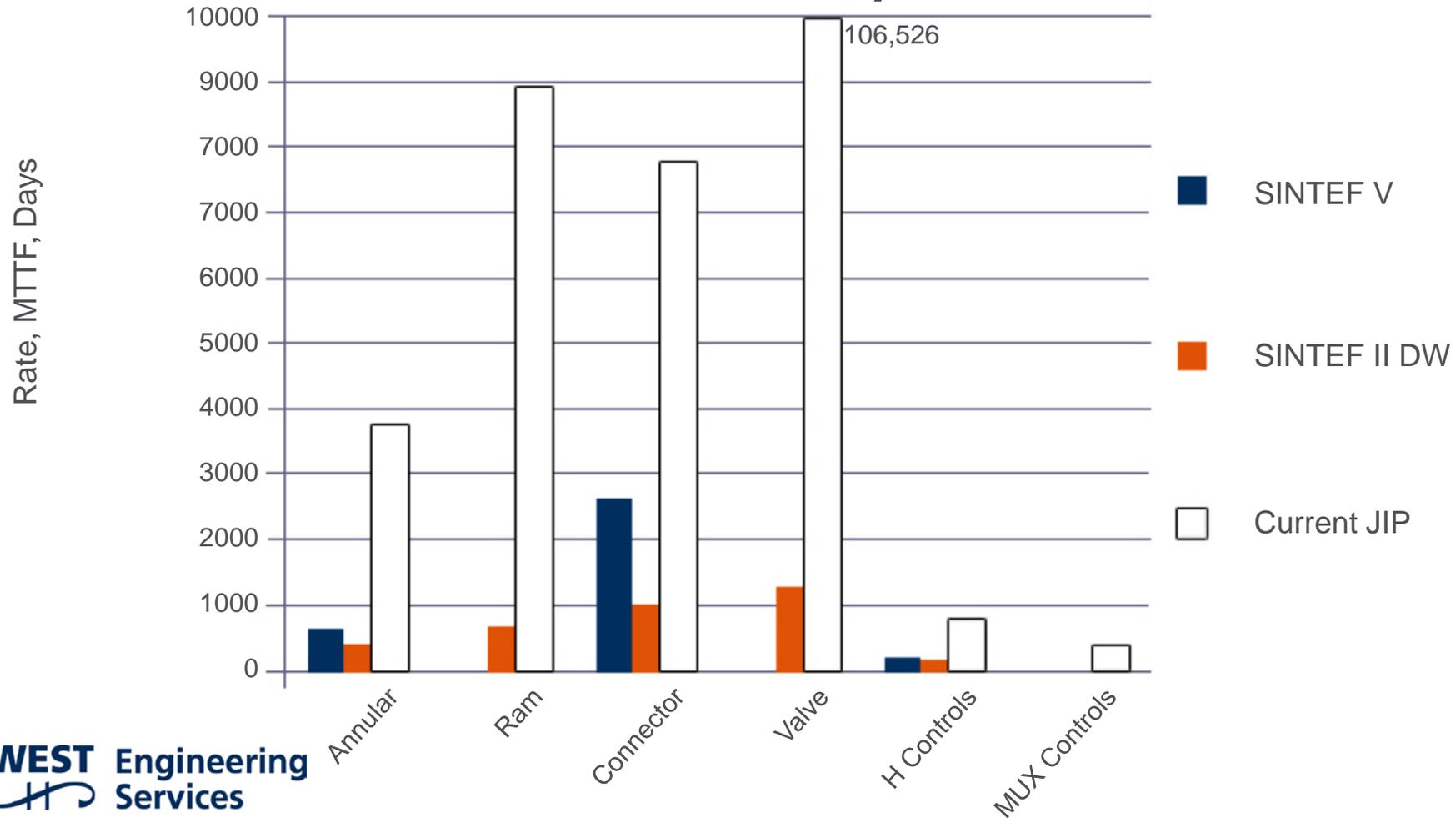


# Manufacturing, Test, Maintenance, and Certification Requirements

- Current Status
- Issues

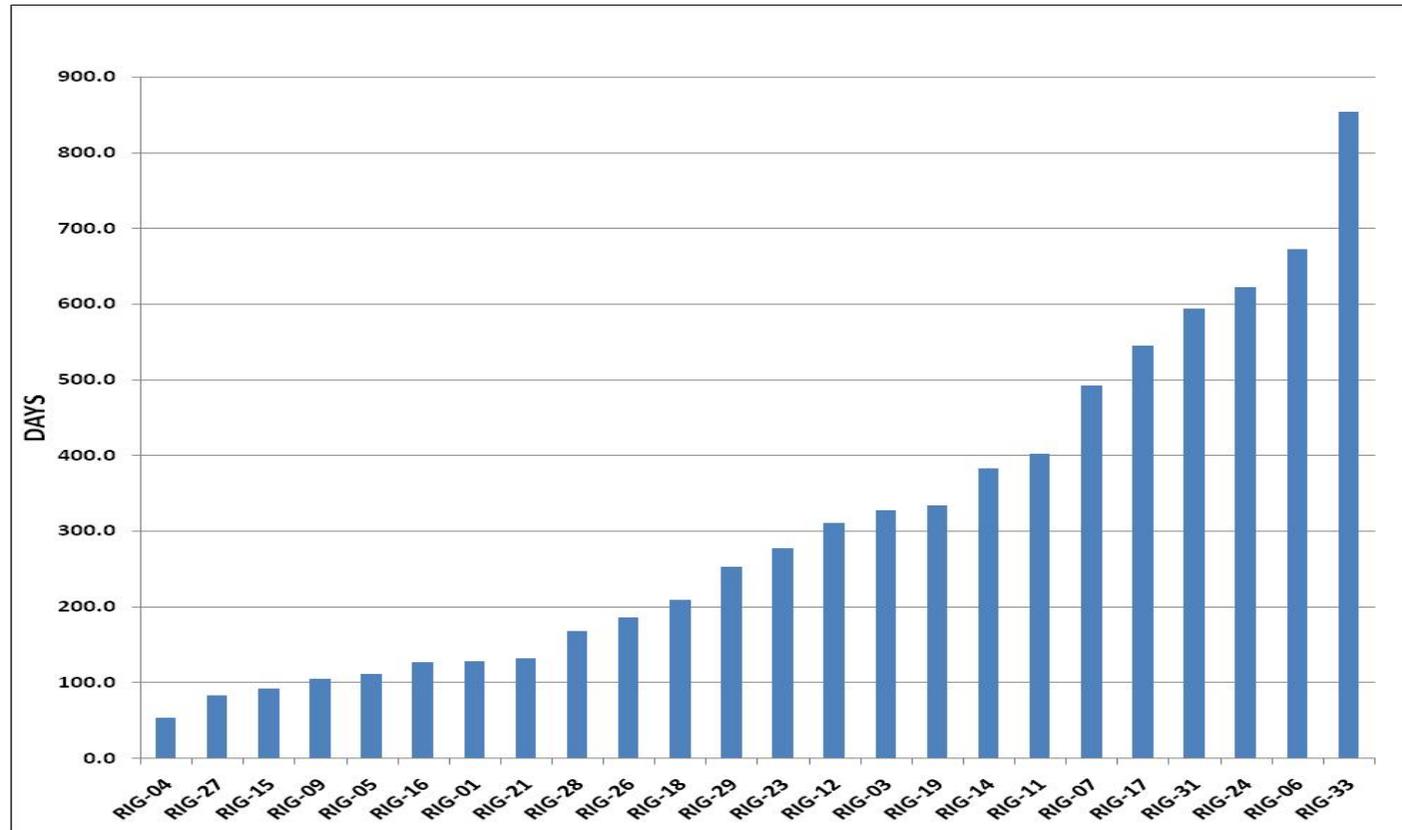
# Current Status

- Subsea failure rate comparison



# 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?

# Repair

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

# Wrap-up

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

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