Fatigue is a concern for subsea equipment

Vessel motion

VIV

Larger, heavier BOPs

Extended field operations

Decommissioning
Subsea Project Execution
~700 standards
4200 pages of detailed requirements
12 weeks for compliance assessment

Subsea Wellhead Execution
33 different raw material specs
30 different high pressure housings

Standardisation Drivers

Quality
- API Q1
- ISO 9001
- AWS QC-1
- ISO 17025
- ASNT SNT-TC-1A
- ISO9712
- ACCP-CP-1
- API 5L
- BS EN 10204
- API 20B
- DNV GL-RP-0034

Design
- API 6A
- API 17D
- ASME BPVC
- AWS D1.1
- NACE MR0175
- API 5C3

Fatigue
- DNV-RP-C203
- NORSOK U001
- DNVGL-RP-0005
- DNVGL-RP-0142

Supply Model Optimisation Opportunities

Order/Design
Raw Material
Manufacturing
Delivery & Installation

Bespoke Cycle Times
A Standardised Fatigue-Resistant Subsea Wellhead System

Holistic system solution
Harmonized specifications from global operator

Operator benefits could cover the wellhead system cost and more through:

Global application for any condition provides inventory minimization & optimization

Longer fatigue life leads to more uptime on the well for drilling and work over

Reduction in lead time with increased predictability and less schedule risk
Order and Design

- Quality/Gap assessment
- System Design
- Fatigue Analysis

**Impact: 12 weeks saved**
Raw Materials

Quality: DNVGL-RP-0034 and API 20B

Performance: A707 and F22

Certification: BS EN 10204:2004, section 3.2

Impact: 20 weeks saved
Manufacturing

- Inspection Test Plans (ITPs) carried out by an independent 3rd party
- Modular configuration
- Automated & highly controlled fabrication
- More stringent tolerances and controls to facilitate fit-up & alignment
- PWHT after girth welds eliminated

**Impact: 8 weeks saved**
Delivery & Installation

Existing tool fleet and system interfaces

No new field service training required

Global manufacturing capability and service support

Order/Design

Raw Material

Manufacturing

Delivery & Installation

Bespoke Cycle Times

MS-800 SFX Cycle Time
A Simpler, Faster, Stronger Solution

- **STANDARDISATION**: Maximize efficiency and flexibility with complete solutions
- **COLLABORATION**: Work together to solve industry challenges
- **COST REDUCTION**: Lower operating costs with greater efficiencies
- **VERSATILITY**: Increase the number of days of safe operation
- **VERSATILITY**: Increase the number of days of safe operation
- **SIMPLIFICATION**: Increase production for market advancement
- **SPEED**: Reduce lead time and complexity
- **PERFORMANCE**: Increased fatigue resistance with resonant testing
- **RISK MITIGATION**: Increase the number of days of safe operation
- **RELIABILITY**: Increase availability and longer asset life
- **QUALITY**: Consistently meet expectations

Up to 16 times fatigue improvement
50% reduction in lead time
Operator productivity and savings can cover wellhead system cost