Gaining Benefits in the Era of Offshore Digitalization

Ken Richardson
Agenda

- Data Enabled Asset
- Asset Integrity and Performance
- Leveraging Experience and Lessons Learned
- The Digital Twin
- Class Perspective
The Data-Enabled Asset

Real-time connection

Onshore Support and Confirmation and Communication with Class

Hull and Structural Monitoring

Class Use of Asset Data

Client Use of Asset Data

SMART Asset Data

Dependent on system design, software and data quality, timeliness, and integrity

Operations

Machinery and System Health and Condition Monitoring
Asset Integrity and Performance

• Operations/Safety
  - Performance prediction
  - Energy/Efficiency management
  - Autonomous capabilities

• Machinery and System Health
  - Condition and performance monitoring

• Hull and Structural Monitoring
  - Strength and fatigue monitoring
  - Condition assessment and life extension support
Leveraging Experience and Lessons Learned

- **Direct Operational Feedback**
  - Optimized operations
  - Improved uptime

- **Inform Subsequent Generations of Design**
  - Reliability in Design

---

**Main Assumptions and Variables:**
- Operations and maintenance objectives
- Reliability/Risk assessment

---

**Operations and Maintenance Planning**
- Optimized operation
- Maintenance tasks selection
- Maintenance intervals

---

**Performance and Results**
- Operational and maintenance metrics
- Machinery health
- Structural health

---

Adapted from Argyris and Schon (1974)
The Digital Twin

• Analytics on sensor data
  - Feedback to operations and maintenance
  - Track and trend condition over time

• Modeling and predictions for more proactive decision-making
Class Perspective

- Leverage Data-centric Programs for Survey credit

- Minimally disruptive Survey via PMP crediting
  - PM – Chief engineer’s overhauls via planned maintenance
  - CM – Condition monitoring results
  - Smart functionality and real-time monitoring providing objective information for survey crediting
Summary

• Is your asset data-ready?
• Data-centric decision points to support asset integrity and performance improvements
• Direct feedback on operations and maintenance, plus inform subsequent generations of design
• The Digital Twin – mirror operational asset with analytics and simulation capabilities
• Supports alternative crediting of class requirements