Asset and Integrity Management
Extending the Horizon

Presented by: Ankur Barua
Group Oil and Gas Manager

Presentation to Australasian Oil & Gas Conference 2015
Subsea Stream: Inspection, Maintenance & Repair- Best Practice
Orontide Overview

- Focused on life cycle plant maintenance; repair, replacement and maintenance for subsea and offshore/onshore equipment
- Over $82 million turnover in FY14
- Engineering and Industrial Services Divisions with specialized equipment
- Combined total of over 20,000 square metres of workshop space across Western Australia

Leading WA owned Engineering Maintenance and Preservation services business for over 35 years.
Orontide Overview

- Sites located in Henderson, Port Hedland and Bunbury
- Combined total of over 20,000 sq.m of workshop space across WA
- Quadruple Accreditation by Bureau Veritas
- Safety milestone achieved in October 2014
- 1,000,000 hours worked across the group without a Lost Time Incident.
Presentation Overview

- Elements of a qualitative partnering model and advantages to asset owners and international suppliers to have high quality local support
- Orontide initiatives in support of the model
- Asset Owner and supplier challenges and the solutions to overcome them
- Examples of Orontide’s successful project delivery
Learning Outcomes

1. Application of existing expertise to treatment of new asset demands including learnings from industry in Europe and the US.

2. Overall asset lifecycle cost and how this can be minimised using industry leading practices.

3. Risk minimisation and opportunity identification within the supply chain in terms of delivery and quality.
The Macro View

- Approx. $200bn has been committed and invested locally on new energy assets.
- Since 2007 our productivity has been declining 1.2 to 1.3% i.e. $13m for every $1bn spent/year.
- Annual maintenance cost (proportional to investment cost & age of plant) at 4% => approx. $8 billion+ per year.
Competitiveness of Industry

Oil, Gas and Resources identified as an area where Australia has a competitive advantage by Department of Industry, but we rank:

- Poorly in regards to overall competitiveness
- 23rd out of 26 OECD countries for businesses collaborating on innovation
- Last out of 30 OECD nations for business – research collaborations; 81 out of 143 countries on how effectively we get returns from research
Why Think About It?

Having a suitable model allows for:

- Benefits of the local support industry to come to the fore
- A lower cost base to be developed upon which the industry can flourish
- Quicker turnaround that leads to increased production and in turn asset utilization / sales
- Key criteria =>\( f \{R,C,T,O\}\)

*Robust; Competitive; withstands the test of Time; contains asset owner/supplier Obligations*
Elements of a Qualitative Model

Other criteria includes:

- Is it current, quantitative with a shared understanding of supply chain?
- Consideration of design, life cycle management
- A common vision of how to collaborate to create value jointly
- Reward sharing, not just risk; co-operation and efficiency

What is required:

- Need parties that understand these philosophies and cycles
- Relationship Orientation as opposed to a Transaction Orientation

“Want your brainpower, not your margins” - Robert Lutz
Typical Supplier Challenges

- The distant supplier: remoteness makes it difficult for supplier to meet needs of asset owners
- Only link is finished product/financial flows
- Fragmented approach from asset owners
- Scheduling one-offs, small batches and high volume products on the same shop floor
- Arm’s length relationships; no collaboration or insight into needs and expenses of buyers
Typical Supplier Challenges

- Manufacturing a part they have not designed
- Other Issues in dealings:
  - Poor planning
  - Logistical delays
  - Internal red tape
- Competitive and contractual relationships
- Cultural and historical relations sometimes do not matter in the face of cost competition or distance
Solution-Service Delivery Model

- High level of Supply Chain Integration
- Rapid, co-operative innovation
- Co-investment programs
- Development of improved production methods and manufacturing techniques
- An adapted *Keiretsu* system suitable for Australia?
Solution-Service Delivery Model

- Relationship ensures greater involvement in:
  - Product/ Asset development
  - Improvement of production processes
- Incentive for more innovative products
- Faster development/ process improvement
- Lower cost in development and procurement
Orontide Initiatives

- Lean processes - currently participating in SCIP program (Supply Chain for 21st century)
- Simplify assembly process and reduce labour input
- Optimise customer value across whole chain; what can we do to add value?
- Information sharing with clients to improve manufacturing processes
Orontide Initiatives

- Harness technical capabilities group wide to offer high degree of product customisation
- Value add elsewhere in the chain; assist prime E&C Contractors
- Condition monitoring and information flows
- Future direction: Telematics - real time sharing of data
Benefits

- Improved relationship with customer*
- Lower manufacture/refurbishment (development) time*
- Improved cost competitiveness
- Lower quality surveillance and control costs
- Sustainable supplier base that can be relied upon; cost base impacted by lower utilisation
- Focus on shared cost base instead of margins; work towards making the ‘pie bigger’

* indicates evidence based on other industries
Example 1

Manufacture of Bend Restrictors

- Design for manufacturing, innovative fast track manufacturing and integration of group wide capability to deliver a timely, quality compliant outcome to meet end client requirements in a subsea environment;

- Orontide manufactured two 8” Steel Bend Restrictor Assemblies (including spares) for installation on a flexible flow line to be used off the coast of New Zealand.
Steel Bend Restrictors

Challenges
- Extensive material testing & qualification
- Accuracy of bend radius
- Machining of components using 5 Axis CNC Integrex Machine centres
- Locking Radius Verification testing
- Surface treatment to NORSOK M-501
- Electrical Continuity Testing
- 10 week time frame given by client
Steel Bend Restrictors

**Integrated Supply:** Components sent to Orontide’s Industrial Services Henderson workshop for application of specialised surface treatment before final inspection, packaging and delivery to the client.

**Outcome**
Scope of work successfully completed within timeframe.

- Safety - No incidents
- Quality - Met quality requirements
- What we learnt - we can turn around packages with tight deadlines using our project delivery approach.
Example 2

Preservation Capabilities Offshore

- Adapting to a dynamic offshore environment to deliver services on a production asset
- Orontide assisted with a significant refurbishment project on the Riser Turret Mooring of Okha FPSO; possibly the first full refurbishment of its kind in WA
- Vessel free to weathervane around the turret which is fixed via a number of anchor lines to the seabed
Riser Turret Mooring Preservation

Challenges

- Work environment located above water and at height; rope access required and all equipment, including 40kg UHP pumps on board the FPSO.

- Risk of ropes and cables becoming tangled, snagged or broken or compromise in safety in any way.

Outcome

Scope of work successfully completed with no safety or quality issues

- What we learnt - we can safely do works locally, without precedent using our existing systems.
Adaptation of materials and technology to meet relevant global standards whilst offering the requisite technical assurance.

Orontide engaged to manufacture a series of buckle initiator structures for the Gorgon Project; included 11 Permanent Restraint Tools (PRT), 2 Displacement Tools, Deployment Frames and Transport Skids.
Pipeline Buckle Initiator

Worked closely with DOF Subsea to ensure timely completion of all project requirements:

- Fabrication to AWS D1.1
- Machining using 5 axis CNC Mazak Machine centres
- NATA approved NDT and Load Testing
- Surface treatment to extend asset life up to 40 years on the seabed
- FAT (Final Assembly & Test) and SIT (Site Integration Testing)
Pipeline Buckle Initiator

**Outcome**
Scope of work successfully completed within timeframe with no incidents and met quality requirements.

**What we learnt**
We can be part of mega projects like Chevron’s Gorgon project and have the systems, tools and resources to deliver successfully when collaborating and working well with others in the supply chain.
A project for GE Oil showcased Orontide’s specialised machining capabilities and ability to introduce a level of innovation not usually seen.

- Manufacture and machining of the subsea wellhead PAD-PRT (Pressure Assisted Drill Pipe Running Tool) body

- Challenge: Quick turnaround with assurance that accuracy of machining be maintained during manufacturing on long lead material available from Europe
Manufacturing for Subsea Applications

Manufactured from a single piece of Grade 8630 forged bar using Orontide’s 5 axis CNC Mazak Integrex machine centre.

Outcome
Scope of work successfully completed within timeframe with required accuracy.

- What we learnt – building prototypes in development allowed us to retain accountability on delivery
- Effective, flawless solutions can be developed with the right approach that meets cost, quality and schedule criteria.
Conclusion

Orontide has managed to successfully deliver a range of projects to the Oil and Gas industry incorporating both manufacturing and preservation of assets.

- Combination of the following used:
  - design for manufacturing expertise; innovative manufacturing
  - application of proven systems for new challenges
  - alignment of project processes between us the supplier and client.

- Opportunities exist for close collaboration leading to successful delivery; customisation of these processes and methods can only lead to technically superior solutions that are commercially viable.
References and Bibliography

- D Flath, Distribution Keiretsu, FDI and Import penetration in Japan, Sept. 2005
- Europe’s Solution Factories-S Chick, A Huchzermeier, S Netessine, HBR April 2014 Issue
- How Chrysler Created an American Keiretsu- Jeffrey H Dyer, HBR July 1996 Issue
Engineering + Maintenance + Preservation

- Project Coordination
- Engineering & Design Solutions
- CNC Machining and Fitting
- Maintenance & Refurbishment
- Fabrication (Structural, Mechanical, Piping)
- Coatings Removal & Application
- Corrosion Prevention & Control

**Contact:** Ankur Barua—Group Oil and Gas Manager  
Ph: +61 (0)8 9236 2555    Email: ankur.barua@orontide.com.au  