Barossa FPSO FEED Competition Project

Australian Industry Participation
TechnipFMC Snapshot
Business Overview

- **Subsea**
  - Optimizing subsea fields from concept to project delivery and beyond
  - 6 IEPCI™ awards in under 12 months
  - Subsea 2.0 implementation

- **Onshore/Offshore**
  - Delivering unrivaled technology and project capabilities
  - Delivered 142 modules for three LNG trains, Yamal
  - 600,000-tonnes Prelude FLNG largest ever floating facility

- **Surface Technologies**
  - Combining field-proven equipment, services & integrated solutions
  - $1m savings per well
  - 1 acquisition of Plexus wellhead exploration and services business

**Key facts**

- 37,000+ employees
- 126 nationalities
- 48 countries we operate in
- 2 stock exchange listings
- 20 vessels including two under construction*
- 1 global HQ (London) two operational HQs (Paris and Houston)

*As of March 31, 2018
TechnipFMC Australia

Office Facilities & Services - Perth

- Projects and Engineering office headcount ~ **500** (700 peak)
- *Genesis* headcount ~ **35**
- Delivering projects in Australia since 1995
- Concept Select, Pre-FEED, FEED, Project Management, Engineering, EPCM, EPCI capability
- Onshore, Offshore and Subsea

Office Facilities & Services - Henderson

- Henderson Facility headcount ~ **90**
- Delivering projects in Australia since 2010
- Subsea Ops and Project Management, Engineering Support, Asset Management, Maintenance, Refurbishment and Repair of Equipment, Provision of Rental Tools
- 20,000m² footprint
- 1,750m² High Bay
- 1,200m² Low Bay and Warehouse (500m²)
Projects
Flagship Australian Projects – Locally Delivered

- **Kupe** – longest HDD (world record)
- **Wheatstone** – FEED and Detailed Design
- **Macedon** – Gas Plant EPCM
- **Gorgon Upstream**
- **Wheatstone Subsea Installation EPCI**
Flagship Australian Projects – Locally Supported

Prelude FLNG EPC

INPEX Ichthys

Flexible riser supply
Detailed design FPSO topsides
Scope Summary

Contract covers project management, design, engineering, procurement, installation and pre-commissioning (EPCI) of:

- 80 km of carbon steel production flowline, carbon steel water injection flowline, flexible risers and flowlines
- 39 km umbilicals
- Subsea structures and valves
- Multi-phase pump system T&I
Major Subsea Supply Projects

Legacy FMC

- Chevron Wheatstone
- Shell Prelude
- ConocoPhillips Bayu-Undan
- Woodside Greater Western Flank 1 & 2
- Woodside Persephone
SHI Snapshot
Business Update

Business area

SHIP at a Glance (as of Dec. 2017)

<table>
<thead>
<tr>
<th>Category</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Establishment</td>
<td>1974</td>
</tr>
<tr>
<td>Asset</td>
<td>13.2 Billion USD</td>
</tr>
<tr>
<td>Revenue</td>
<td>7.5 Billion USD</td>
</tr>
<tr>
<td>Employees</td>
<td>10,662</td>
</tr>
</tbody>
</table>

Order Backlog: 18.5 B$ (as of July. 2018)

<table>
<thead>
<tr>
<th>Category</th>
<th>Value (B$)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Shipbuilding &amp; Drilling</td>
<td>No. 69</td>
</tr>
<tr>
<td></td>
<td>No. 5</td>
</tr>
<tr>
<td></td>
<td>Amt. 9.7</td>
</tr>
<tr>
<td></td>
<td>Amt. 8.8</td>
</tr>
<tr>
<td>Offshore</td>
<td></td>
</tr>
<tr>
<td></td>
<td>No. 5</td>
</tr>
<tr>
<td></td>
<td>FSO (1)</td>
</tr>
<tr>
<td></td>
<td>FLNG (2)</td>
</tr>
<tr>
<td></td>
<td>Platform (1)</td>
</tr>
<tr>
<td></td>
<td>FPU (1)</td>
</tr>
</tbody>
</table>

Barossa FPSO FEED Project
SHI Geoje Shipyard

<table>
<thead>
<tr>
<th>Production Site</th>
<th>4.0 million m²</th>
</tr>
</thead>
<tbody>
<tr>
<td>Quay Wall Length</td>
<td>7.9 km</td>
</tr>
<tr>
<td>Quay Wall Berthing Capacity</td>
<td>24 vessels</td>
</tr>
<tr>
<td>Shipbuilding Capacity</td>
<td>70 vessels / year</td>
</tr>
<tr>
<td>Offshore Capacity</td>
<td>250,000 MT / year</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Dock</th>
<th>Length x width</th>
<th>Major Products</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Dock</td>
<td>283 x 46</td>
<td>Tanker, LNGC, Drillship</td>
</tr>
<tr>
<td>2 Dock</td>
<td>390 x 65</td>
<td>LNGC, Drillship</td>
</tr>
<tr>
<td>3 Dock</td>
<td>640 x 98</td>
<td>Container ship, FLNG, VLCC</td>
</tr>
<tr>
<td>G1 Dock</td>
<td>270 x 52</td>
<td>Tanker, Drillship, FPSO</td>
</tr>
<tr>
<td>G2 Dock</td>
<td>400 x 55</td>
<td>Tanker, LNGC</td>
</tr>
<tr>
<td>G3 Dock</td>
<td>400 x 70</td>
<td>Container ship, VLCC, FLNG</td>
</tr>
<tr>
<td>G4 Dock</td>
<td>420 x 70</td>
<td>Container ship, VLCC, FLNG</td>
</tr>
<tr>
<td>OFD</td>
<td>157 x 131</td>
<td>Offshore facilities only</td>
</tr>
</tbody>
</table>
### Australia Experience

#### INPEX Ichthys CPF (2017)
**World’s Biggest FPU**

- **Scope of Work**
  - Engineering work: Hull (SHI), Topside (SHI+WGM)
- **Weight**
  - Hull: 42,000 MT
  - Topside: 60,000 MT
- **Production Capacity**
  - Oil: 125,500 bopd
  - Gas: 1,657 mmmscfd

#### Shell Prelude FLNG (2017)
**World’s First and Largest FLNG**

- **Scope of Work**
  - Engineering work: Hull (SHI), Topside (Technip)
- **Weight**
  - Hull: 135,000 MT
  - Topside: 74,000 MT
- **LNG Production**
  - 3.6 MTPA
- **Storage Capacity**
  - LNG: 220,000 m³
  - LPG: 90,000 m³

**Legend**
- Australian gas reserves
- Delivered floaters by SHI
Barossa Project Overview
Project Overview

- Consortium between TechnipFMC & SHI
- Hull at SHI, Pangyo & Geoje and Topsides engineering at TechnipFMC, Kuala Lumpur
- Production capacities:
  - Export gas rate fixed by DLNG (3.7 MTPA backfill)
  - 800 MMscfd raw gas capacity
  - ~8,000 bpd condensate / 700,000 bbl storage
  - ~20,000 bspd prod water
- Main Processing requirements:
  - Removal of bulk CO2
  - Oil in Water: 30mg/L avg
  - Export pressure ~190 bar
  - HP & LP compression
FEED Execution Plan

- Main Subcontracts: Turret and Mooring Systems (TMS)
- Overall engineering split TechnipFMC / SHI:
**Topsides Layout**

**Topsides Dry Weight**  32,513 MT

**Topsides Operating Weight**  34,298 MT

**Hull Design Basis**  41,153 MT

**L x B x D (m)**  304 x 60 x 30

**Topside modules (excl. Piperacks)**  16

<table>
<thead>
<tr>
<th>Module</th>
<th>Module Dry Wt (MT)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Electrical Building/Shop</td>
<td>2,652</td>
</tr>
<tr>
<td>P4 - HP Separation</td>
<td>2,800</td>
</tr>
<tr>
<td>P6 - CO2 Removal</td>
<td>2,843</td>
</tr>
<tr>
<td>S6 - Gas Dehyd/Dew Pointing</td>
<td>5,269</td>
</tr>
<tr>
<td>P7 - HP Compression</td>
<td>3,677</td>
</tr>
<tr>
<td>S7 - HP Compression</td>
<td>2,100</td>
</tr>
</tbody>
</table>
Turret and Mooring System

Typical Internal Turret
## Major Mechanical Packages

<table>
<thead>
<tr>
<th>HULL</th>
<th>TOPSIDES</th>
</tr>
</thead>
</table>
|      | • Essential Generator set  
|      | • Engine driven fire water pump package  
|      | • Slop water treatment package  
|      | • Fire fighting equipment package  
|      | • Condensate/ballast pump package  
|      | • Valves remote control system package  
|      | • Inert gas generator package  
|      | • Hull HVAC package  
|      | • Tandem offloading system  
|      | • Life boats and safety equipment  
|      | • MEG regeneration  
|      | • Turbo-Expander Package  
|      | • Tertiary Water Treatment Package  
|      | • CO2 Removal Package  
|      | • Power Generation  
|      | • Export Compressor  
|      | • CO2 Compressor  
|      | • Flash Gas Compressor  
|      | • Thick walled cladded Pressure Vessels  
|      | • Cold Box  
|      | • Mercury Removal Unit  
|      | • Demin Water Generation Skid  
|      | • Sales Gas Metering Skid  
|      | • Export Gas Cooler  
|      | • Subsea Chemical Injection Skid  
|      | • Pedestal Cranes  
|      | • Thermal Oxidizer Package  
|      | • Instrument Air  
|      | • Nitrogen Generator  
|      | • Transformers / Switchgears / UPS  
|      | • ICSS / F&G systems / ESD Systems / Telecom  
|      | • Mooring System and Anchors  

- For major equipment potentially awarded elsewhere, AIP contractual requirements will be cascaded to the vendors.
- For FEED phase, enquires to be posted on ICN from Q3 18.
- For EPCIC phase, enquiries expected to be posted from Q4 19 to Q3 20.
List of Systems in Topsides

Nitrogen System
Sea Water and Cooling Medium System
Hypochlorite Generation System
Heating Medium System
Chemical Injection System
Demineralized Water System
Utility Turret Connection
Main Power Generation System
Inlet Separation
Gas Mercury Removal
Hydrocarbon Dew-pointing
CO2 Removal
Export Gas Compression and Metering
MEG recovery
Condensate Treating
Condensate Stabilization
Flash Gas Compression
Produced Water Treating
Fuel Gas System
MEG Regeneration
Flare and Vent System
Closed Drain System
Open Drain System
# List of Systems in Hull

- Diesel oil system
- Lubricating oil system
- Cooling water system
- Compressed air system
- Potable & fresh water system
- Grey and black water system
- Bilge system
- Exhaust gas system
- Firefighting system for LQ and M/S
- Valve remote control system
- Gas sampling system
- Heli-fuel system
- Remote sounding system
- Air vent & sounding system
- Condensate system
- Slop water system
- Inert gas system
- Ballast system
- Hull HVAC System
- Tandem Offloading system
- Automation system
- Telecommunication system
- Mooring System
Offshore Packages

- Offshore Installation Package / Supply of Marine Spreads
- FPSO Towing
- FPSO Hook-Up
- Offshore Commissioning
- Onshore Logistic Support
- Waste Removal
- Provision of Accommodation Support Vessel
**Australian Industry Participation**

TechnipFMC actively supports AIP and is committed to working constructively with Australia industry to ensure “Full, Fair and Reasonable” opportunity is provided to participate in this project in accordance to TFMC’s AIP Plan via the following processes:

- Publication of information through ICN Gateway (via ICNNT)
- All Work Packages shall be given no less than 4 weeks period for suppliers to garner EOI
- TSC will evaluate and shortlist potential suppliers for tender
- Bid evaluation will be conducted for all submitted quotations
- Selected supplier will be qualified per TechnipFMC Supplier qualification process and included into the Qualified Supplier List
Key Contacts

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QUESTIONS?