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The Ichthys LNG Project  
Major subsea installation phase

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INPEX



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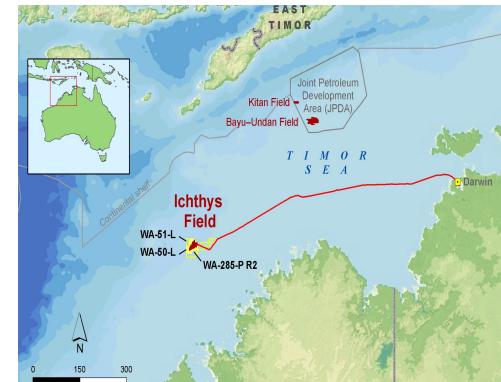
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The Ichthys LNG Project is a Joint Venture between INPEX group companies (the Operator), major partner Total, CPC Corporation Taiwan, and the Australian subsidiaries of Tokyo Gas, Osaka Gas, Kansai Electric Power, Chubu Electric Power and Toho Gas.

# The Ichthys LNG Project

- Reservoirs situated in Timor Sea ~ 200 kilometres off the West Australian coast
- Reserves, proven and probable (2P) of around 12TCF of gas and 500 million barrels of condensate
- Comprised of three mega projects – offshore facilities, gas export pipeline, onshore LNG facilities
- Includes some of the world's biggest and most advanced offshore floating units, onshore liquefaction plant near Darwin, and an 889 kilometre pipeline between them
- 8.4 mtpa LNG, 1.6 mtpa LPG, 100,000 barrels condensate per day at peak
- Challenge of a conventional development in difficult, remote and often extreme environments
- Operational life of at least 40 years
- CAPEX estimated at US\$34 billion.



# Remote Project location

- Remote offshore location – more than 2 hours flight time to nearest capital city (Darwin)
  - Major offshore installation campaign
- Western Australia is big – 2.5 million square kilometres – France would easily fit inside WA nearly five times
- Perth – world's most isolated continental capital city
- Onshore site near Darwin
  - Small population and shortage of skilled labour
  - required modular construction
  - global fabrication yards.



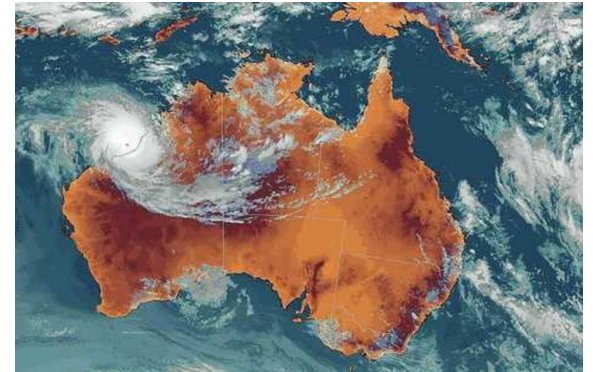
# HSE challenges

- Wide geographic spread over many international yards
  - Korea, Thailand, China, Philippines, Indonesia, Singapore, Malaysia
- Significant number of work hours – more than 162 million as of January 2015
- Two-rig drilling campaign – Jack Bates and ENSCO 5006
- Numerous pipe handling and lifting operations for 889 km gas export pipeline
  - 74,000 pipe joints, 1 million movements
- Challenging environments
  - Cyclones (offshore and onshore)
  - Environmental commitments
  - Darwin wet season and Darwin tidal variance
- Two-year major offshore installation campaign
  - Major subsea campaign
  - Logistics: large number of offshore vessels, significant amount of helicopter travel, large distances
- Large multicultural workforce
- Numerous onshore subcontractors.



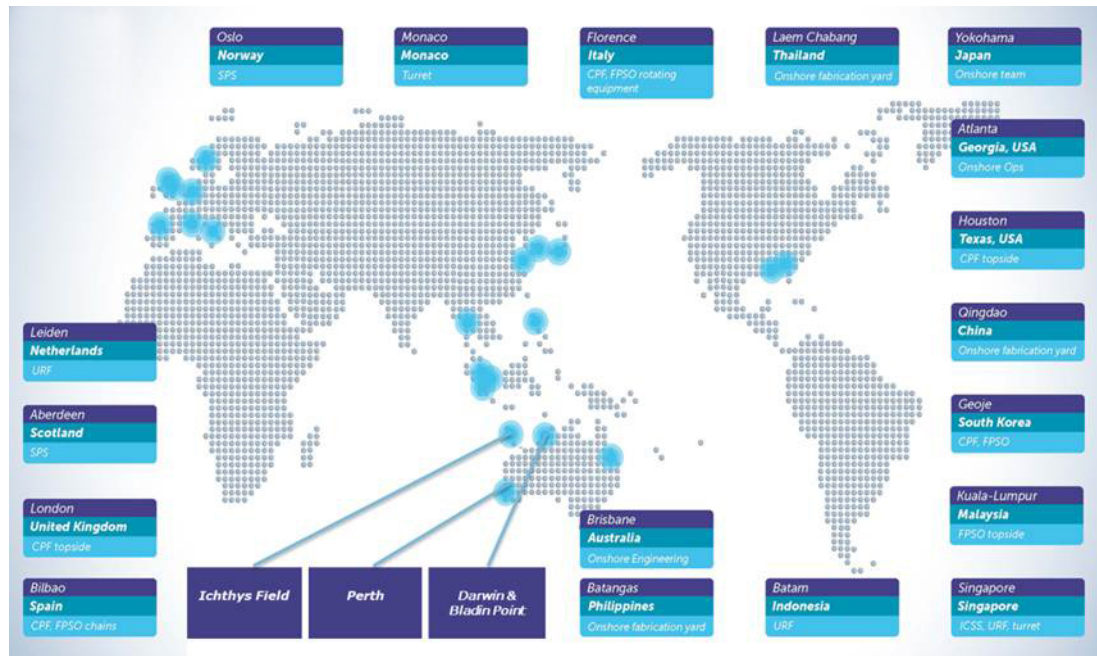
# Designed for decades in extreme conditions

- Challenge: design facilities for 40 years of continuous operations in a remote area often subject to extreme weather conditions
- CPF and FPSO: 40 years on site without dry dock
- Browse Basin is very well known for cyclones
- CPF and FPSO designed to withstand 10,000 year return conditions and to be operable in 200 year return conditions



# Large global spread

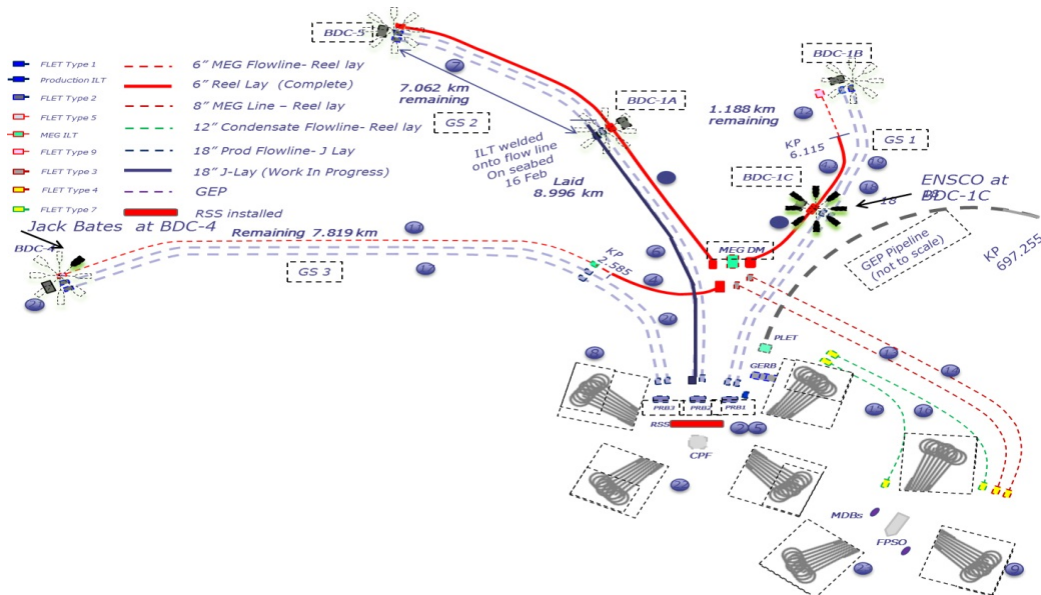
- Selected world renowned contractors resulting in a large supply chain
- Global spread is reducing as the Project progresses
- Perth, the Ichthys Field and Darwin will remain when construction is complete.



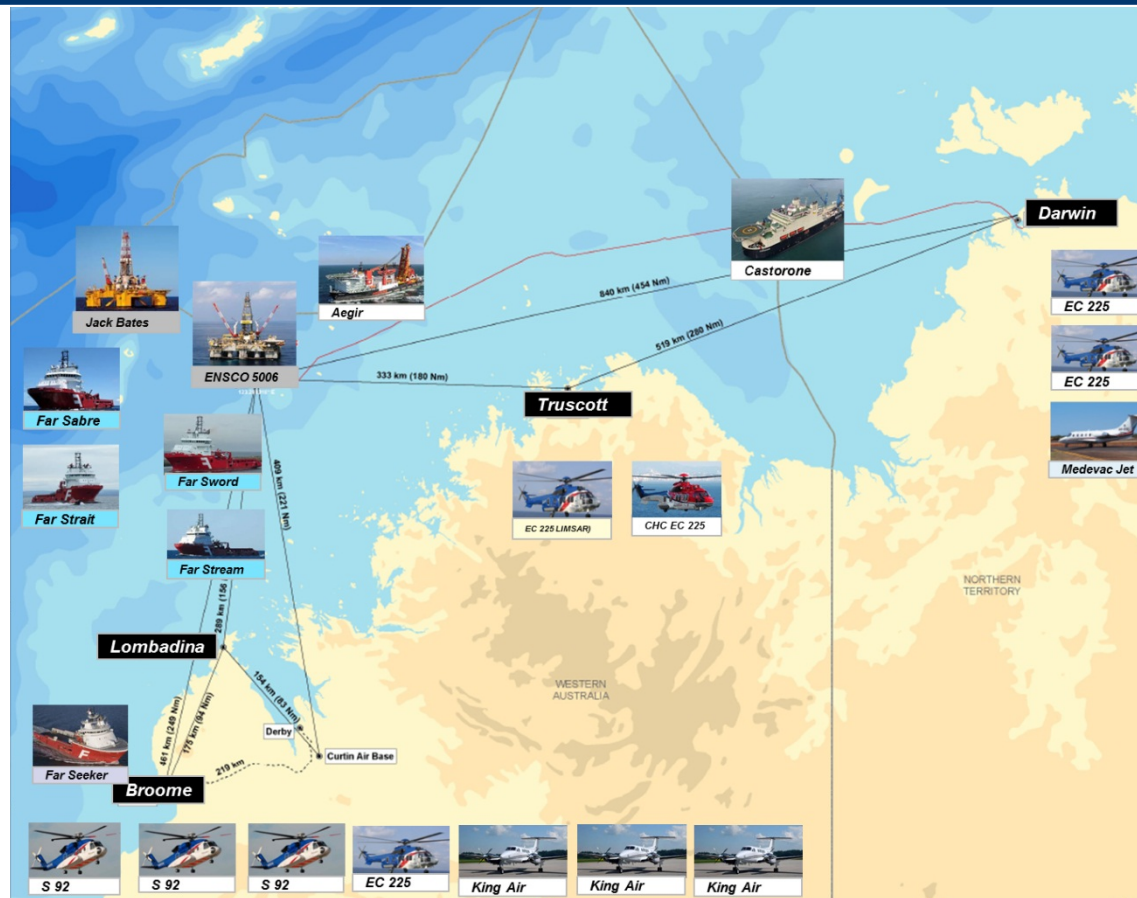


# Offshore installation – major subsea campaign

- **Umbilicals, risers and flowlines work:**
  - Fabrication, installation and pre-commissioning of subsea umbilicals, risers and flowlines, support structures and control systems
  - The connection of these systems to other offshore components
  - Installation and connection of the moorings for the CPF and FPSO
  - Major subsea campaign currently underway – at peak 2000 people offshore and 25 vessels.



# Logistics



# Technical and social infrastructure

- Remote natured Project required good technical and social infrastructure
- INPEX and Shell joint investment to build subsea optical fibre cable system
- High-speed data and voice communication services
- Initially for Ichthys Project and Shell's Prelude FLNG project
- Essential for effective and efficient operations at future offshore facilities
- Offshore workers: reliable link with friends and family

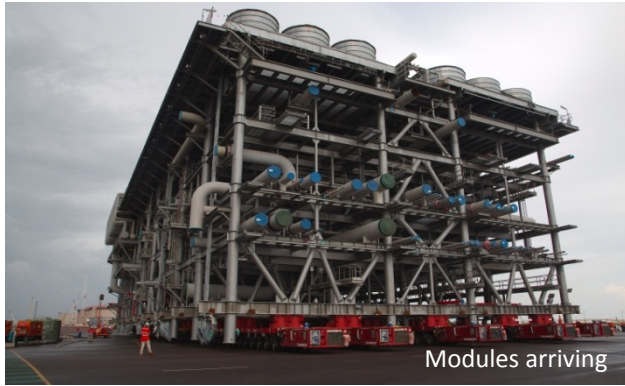


# Onshore LNG facilities

- Modular construction
  - Darwin population 120,000, despite land mass three times that of France
  - Limited skilled labour
  - Reduces onsite construction work-hours and trims peak manning levels
- Global fabrication yards: Thailand, China, Philippines, Malaysia
  - More than 200 modules
  - Total module shipping distance nearly 1,073,000 kilometres
- Challenging conditions
  - Darwin 'wet season', cyclones, major tidal variance (up to 8 metres)



# Results



# Thank you

