JOURNEY INTO UNCHARTED TERRITORIES

How are owners, contractors and suppliers adapting to successfully execute projects and reposition their businesses in the ever evolving project environment?

REPOSITIONING THE PROJECTS BUSINESS IN A WORLD WITH CHANGING BOUNDARIES

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Gorgon LNG Project – The New Paradigm

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JOURNEY INTO UNCHARTED TERRITORIES
GENERAL SESSION

REPOSITIONING THE PROJECTS BUSINESS IN A WORLD WITH CHANGING BOUNDARIES
Extinction: The challenge of our time

- 5 historical extinctions and we are witnessing the 6th
- Estimated 27,000 species lost per year
- At this rate, 20% of all known species will be extinct by 2022
- An estimated 7000x the background rate
Australia’s threatened species

**Threatened Species:**
- 1,324 species (2nd to the US)
- 38 reptiles (1st in the world)
- 35 amphibians (1st in the world)
- 74 fish (3rd to Mexico and China)
- 20% of all mammals

**Rare species:**
- 612 plants
- 47 birds
- 39 mammals
- 16 frogs
- 16 reptiles
- 19 fish
Barrow Island – Class A Nature Reserve

- 2nd largest Island off West Australia
- Separated for 8000 years
- Proclaimed in 1910 as a Class A Nature Reserve
- Oil discovered in 1964
  - 475 producing wells today
  - 313 million barrel’s of oil to date
Gorgon Project Overview

Joint Venture Participants
- Chevron (~47%)
- ExxonMobil (25%)
- Shell (25%)
- Osaka Gas (1.25%)
- Tokyo Gas (1%)
- Chubu Electric Power (0.417%)

Project Development Plan
- 3 x 5 MTPA LNG trains
- A domestic gas plant with capacity of 300 terajoules per day
- LNG shipping facilities to transport products to international markets
- Challenging environmental approval process
- World’s largest CO₂ injection project
## Gorgon Project Facts

<table>
<thead>
<tr>
<th>Category</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>FID / Total Investment</td>
<td>Sept 2009, $A43bn</td>
</tr>
<tr>
<td>First Gas</td>
<td>2014</td>
</tr>
<tr>
<td>Employment</td>
<td>&gt;20,000 people</td>
</tr>
<tr>
<td>Total Freight Tonnage</td>
<td>&gt;3.5 Million freight tonnes</td>
</tr>
<tr>
<td>Total number of vessels</td>
<td>&gt;180 barges, tugs, supports</td>
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<tr>
<td>Modularised steel tonnage</td>
<td>&gt;260,000 tonnes</td>
</tr>
<tr>
<td>Rock for pipe line stabilisation</td>
<td>1.5 million tonnes</td>
</tr>
<tr>
<td>Dredging total</td>
<td>~6 million cubic metres</td>
</tr>
<tr>
<td>Fuel</td>
<td>&gt;300 million liters of diesel</td>
</tr>
<tr>
<td>Passengers</td>
<td>~275,000 (FID to first gas)</td>
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<tr>
<td>Meals</td>
<td>~15 million meals (FID to first gas)</td>
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<tr>
<td>Contribute to Australian GDP</td>
<td>A$60bn</td>
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</tbody>
</table>
Gorgon – Progress to Date

Horizontal Directional Drilling Site

Gorgon LNG Plant Site

Temp Facilities and Utilities

Construction Accommodation ~ 4,000 people

Marine Offloading Facility
Challenging Regulatory Approval

• EPA Report 1101 (2003) advised that if Gorgon was approved:
  – Develop Set of standards for acceptable risks
  – Involve independent technical experts
  – Include a high level of community input
  – Set new benchmarks and go ‘beyond best practice’

• EPA Report 1323 (Sept 2009) stated:
  ‘… likely to be world’s best practice and therefore it is unlikely to be possible to recommend additional practical controls beyond that system.’
Quarantine Management System (QMS)

- Infection Modes & Effect Analysis (IMEA)
- Preliminary Barrier Analysis (PBA)
- HAZID Process (QHAZ)

• No tools existed to undertake a risk assessment in conservation values
• Risk assessment process for QMS was derived from engineering “tools”
Structure of the QMS

Management review
Assessments, audits, monitoring and expert advice

Corrective action
Improvements to specifications, procedures and guidelines

Monitoring and audits
Environmental & Procedural Monitoring and 3-Tier auditing

Identify issues
Risk assessment i.e. IMEs, PBAs, QHAZ

Identification of issues

Management measures
Procedures, specifications checklists and plans

Improvement program

Roles and responsibilities
Culture, work force participation and delegation framework

Communication
Internal, external and management of change

Policy

Performance commitments

Objectives, strategy & actions

Capacity Building
Education, awareness and training

Eliminate NIS
Inspect

Custody
Detect

Monitor and eradicate
Protect

QMS Focus

COST

Effort
Quarantine Continuum

Quarantine is addressed as a continuum of activities occurring:
- Pre-border (before goods and personnel reach the island)
- Border (on arrival at Barrow Island) and
- Post-border (outside of the development)
Quarantine Design and Treatment Solutions

- Facilities Design, e.g.
  - Kitchen
  - Supply base
  - Wash-bays
  - Airport departure lounge
  - BWI Clearance facility

- Wrapping
- Fumigation
- Residual insecticides
- Herbicides
- Anti-fouling
Quarantine and Logistics Assurance

- Quarantine Management Plans
- Quarantine Advice Report
- Quarantine Inspection Protocol
- Quarantine Compliance Verification
- Quarantine Non-conformance Report

- Quarantine Audit Report
- Quarantine Corrective Action
- Opportunity for Improvement
- Competency Training
- Quarantine Awareness
Quarantine Science

- Substantial field collection
- Most comprehensive baselines
- Remote diagnostic capacity
- New benchmark in surveillance
- Species action plans
- Incursion response protocol

Quarantine Marine Pest Alert

Asian green mussels

Classification: Threat

Asian green mussels are species with the potential to become a threat to the natural marine environment. They grow in shallow waters and can quickly become a significant threat to local marine populations by competing for space and food. They can displace native marine species and may contribute significantly to the degradation of marine ecosystems.

Distribution

The Asian green mussel originates from the northwest Indian Ocean and western Pacific Ocean. It is found from the Horn of Africa to the Philippines and from the East China Sea in the north to Indonesia. It has been accidentally introduced along the California coast, Hawaii, and South America. Since then, it has spread extensively along the coast, reaching as far south as Peru.

Economy

The Asian green mussel is a valuable food source and is used in various traditional and modern cuisines. It is also used in the production of seafood products, such as fish bait and marine feed. The species is also used in the production of natural food supplements and other seafood products.

History

Asian green mussels are known to have been in the region for a long time. They are found in various parts of the world and are known for their ability to adapt to different environments. They are also known for their resistance to pollution and other environmental stressors.

Barnacles

Classification: Threat

Barnacles are a type of crustacean that generally attach themselves to rocks or other hard surfaces. World wide, there are around 1000 different species of barnacles. There are two major groups of barnacles, barnacles that attach to rocks or other hard surfaces and barnacles that attach to soft surfaces such as coral reefs or seagrass beds. The barnacles that attach to rocks or other hard surfaces are known as bed barnacles, while the barnacles that attach to soft surfaces are known as suspension feeding barnacles.

Distribution

The barnacle is native to the Antarctic and has been recorded in the subpolar and polar zones of South America, Africa, and the Middle East. The barnacle is also native to the Atlantic coast of North America, but in the warmer regions, it is less common. In Europe, the barnacle is found along the Mediterranean coast and in the Baltic Sea.

Economy

Barnacles are a valuable food source and are used in traditional and modern cuisines. They are also used in the production of seafood products, such as fish bait and marine feed. The species is also used in the production of natural food supplements and other seafood products.

History

Barnacles have been in the region for a long time and have been used as a food source and a source of oil for centuries. They are also known for their ability to adapt to different environments and their resistance to pollution and other environmental stressors.
## Quarantine Statistics

### Seed Sources
- BWI Incident Level 3
- BWI Incident Level 2
- BWI Incident Level 1
- BWI Intercept Level 3
- BWI Intercept Level 2
- BWI Intercept Level 1

### Invertebrate Sources
- Hymenoptera (Wasp, Ant, Bee)
- Carabidae (Ground Beetle)
- Lepidoptera (Moth)
- Araneae (Spider)
- Blattodea (Cockroach)
- Neuroptera (Common Lacewing)
- Coleoptera (Ladybird)

### Plant Sources
- Bulrush
- Pampas Grass
- Fleabane
- Sowthistle
- Smooth Catsear
- Buffel Grass
Quarantine Performance

Awards:
- APPEA Environment Award 2010
- CRC Excellence in Innovation Award 2011

Statistics:
- More than 500,000 tonnes shipped to Barrow Island [this includes all rock shipped]
- Served more than 1.7 million quarantine compliant meals
- More than 99,000 passengers screened at airports in Perth and Karratha
- 148 fully compliant vessels have been mobilised
- 87 audits completed
- Delivered almost 19,000 Quarantine training sessions to more than 12,500 contractors

All this activity without a single introduction of a non-indigenous species
Repositioning Our Business

**Gorgon and Australia Benefits:**
- Positive impacts in construction
- Disciplined quarantine bestowed unforeseen benefits in execution
- Built a strong conservation culture – “Sense of pride”
- Benefit to the greater Australian Community

**Industry benefits:**
- Exploration and execution of projects in sensitive remote areas
- Greater global awareness around environmental and conservation issues, putting greater demands on projects
- Competitive advantage
- The “New Paradigm”
Questions