Risk Reduction in Offshore Decommissioning
Chevron’s Success in the Gulf of Mexico

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Key Messages

- Focusing on Risk Reduction in Decommissioning works:
  - Use technology to move humans to a safer location
  - Larger lifts: Reduce rigging, lifting and offshore exposure
  - Reduction in Diving Risk
  - Tank Cleaning: Confined Space Risk

- Contractor Collaboration & Partnership key to facilitate technology development and deployment
Path to Zero: Historical Safety Performance
Chevron Hurricane Restoration Team (HRT)

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Larger Lifts – Reduce Lifting, Rigging, Cutting and Time
Larger Lifts – Green Canyon 6A
2,667 tons
Larger Lifts – Mississippi Canyon 63B
3,600 ton lift, 27 mile tow

DP system & lifting hooks minimize personnel exposure when rigging
Larger Lifts Using The Claw – 5 Decks – September 2011

Claw lifting deck to cradle

Cradle lifted to surface

Cradle transferred to barge for transport
Reducing Diving Risk – The Claw
2011 Case Study from 5 lifts

Deck prep without the claw
- Obstruction clearance
- Cut hook holes in deck
- Install Hooks

Deck prep with the claw
- Jetting for claw access
- Install beacons & buoys

<table>
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<tr>
<th>5 deck lifts</th>
<th>Without Claw</th>
<th>With Claw (Actual)</th>
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<tbody>
<tr>
<td>Dive Hrs Saved</td>
<td>1359</td>
<td>121</td>
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92% Reduction (~57 Days)
Target - Reduction in Diving Risk
Solution - Develop the “Claw”
The Claw at Work: Zero Diver Exposure
Toppled Platform Deck Recovered with the Claw

Minimal Diver Exposure!

Claw marks
Reducing Diving Risk - Specialty Tools

Large Hydraulic Shear:
• Eliminate all diver exposure to:
  • burning
  • stored energy in members

Large Dredging Pump:
• Minimized diver exposure:
  • Excavation cave-in
  • Reduced time “on bottom”
• Significantly more cost effective

Diamond Wire Saws:
• Eliminates all diver exposure to burning and moving debris
Reducing Diver Risk – Technology:
Internal Spear for removing conductors

1. Lowering spear through top conductor guide
2. Lowering spear through conductor guide
3. Spear entering well conductor
4. Conductor lifted through conductor guide
5. Conductor lifted to the surface
6. Laying conductor down on cargo barge
Reducing Diver Risk – Increased usage with ROVs

ROV – Arm Holding Intake

New Dual Pump Dredge

ROV Performing Excavation

Sonar view - ROV working zero visibility

ROV advances Risk Reduction:
- diving surveillance, “tool caddy”
- ROV-Mounted Imaging Systems
- understand diver situation
- dive planning with 3D modeling
- remove diver for high risk steps
ROV cutting and rigging jacket legs, debris
Reduce high risk confined space entry time when cleaning tanks.

"Think outside the tank"

Results
- Cost savings
- Project complete IFO
- Knowledge share

3 Fold Reduction Of Risk
LRAD – Long Range Acoustic Device
Communicate and deter vessel encroachment

History of vessel encroachment on dive ops; Broadcast: warning tone, live and recorded voice communication. Success: used nearly a dozen times.
Contractor Collaboration & Partnership:
Critical to Risk Reducing Technology Development and Launch

- Strategic collaboration, innovative business arrangements
  - New technology for heavy lifts (VB-10,000 & the Claw)
  - New & improved cutting technology
  - Improved ROV Capabilities and applications
  - Communication technology to reduce vessel incursions on dive operations – LRAD

- Routine meetings with dive contractors
  - Reduce risk by sharing incidents and lessons learned
  - Accelerate adoption of new technology
Step change in safety won’t come from “doing it the same way” - requires a completely new approach to work.

We can’t go forward “the way it’s always been done” and expect better results.
Questions ?
Backup Material

This material might be used in answering questions.
Photos of Additional specialty tools used in Chevron’s Decommissioning Operations that help us to reduce risks.

- 13 slides of additional photos
Purpose built saturation diving/ROV support vessel with “paired cranes”.
Large Hydraulic Shear
Self Clamping Diamond Wire Saw
Dredging Pump
Hand held shear
Linear or Rail Mill
Internal
Grit
Cutter
Grit Cutter Deck
Use
Footprint