Outline

- Proposed Project
- Development Evolution
- VE Alternatives Evaluated
- Details of POLA 100% Design
- Component Details
- Details of Scenario #1
- Results and Comparisons
- Next Steps
Proposed Project
Rendering of Marine Terminal
Range of Ships Accommodated

- VLCC
- AFRAMAX
- PANAMAX
- SUEZMAX
# Vessel Particulars

<table>
<thead>
<tr>
<th>Item</th>
<th>Parameters</th>
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<tr>
<td>Ballast draft (ft)</td>
<td>23</td>
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Development Evolution
Development Evolution

• *Started as a traditional MOT development within the POLA*
  - POLA designs, procures, and constructs the marine and related civil & structural landside facilities for the proposed tenant
  - Tenant (PLAMT) designs, procures, and constructs the mechanical and electrical facilities
  - At the end of 2009, POLA was at 100% completion on the marine facilities design and PLAMT was at about 60% completion on the design of the M&E facilities
The economy slowdown brought changes to this delivery model in early 2010

- PLAMT will now be responsible for the design and construction of all aspects of the MOT development, including the marine facilities traditionally done by POLA
- POLA will have review & approval responsibilities throughout the development of the project
Development Evolution (Cont’d)

- PLAMT stepped back and assessed how to move forward with the development. This raised some questions:
  - Should PLAMT just take over where POLA left off on the marine design?
  - Are there construction risks that should be evaluated further? POLA identified construction risks associated with driving thru rock lenses known to exist at this site.
  - Are there opportunities to reduce costs as the lead in the design of the marine structures?
PLAMT made a decision to address these questions and authorized a Value Engineering (VE) Study to be done for the marine structures. The VE Study was to accomplish the following:

- Concepts must address the potential impacts to the approved EIR, which was based on the POLA 100% Design
- The risk of driving through the rock lenses must be quantified
- The base case would be POLA’s 100% Design Submittal
- Those structures to be evaluated included the following:
VE Study Basis
Alternatives Evaluated

- Components of POLA 100% Submittal
  - Major structures supported on vertical, large-dia. steel pipe piles (54” Dia.), with cast-in-place concrete decks for structures and trestles
  - Short spans on trestles and walkways
Concrete Surface

Steel Grating Surface

Cast-in-Place (CIP) concrete decks for the major components
Typical Section thru ULP & NT
ULP with 12 - 54" Dia. Vertical Steel Piles & Cast-in-Place Concrete Deck
BD with 4 – 54” Dia. Vertical Steel Pipe Piles and CIP Concrete Deck
MD with 4 – 54” Dia. Vertical Steel Pipe Piles and CIP Concrete Deck
NT - CIP Concrete Deck Supported by Concrete Girders on 2-Pile Bents

(48” Dia. Steel Piles) Spanning 40 Ft  ST Similar
AMPP CIP Concrete Deck Supported by Concrete Girders on 2-Pile Bent

(14 - 48-inch Steel Piles) Spanning 40 Ft
Walkways Supported on Intermediate Pile Bents

Note: Every “X” indicates the location of a 24” Octagonal Prestressed Pile to Support the WWs
Total No. of Piles Utilized = 44
VE Alternatives Studied

- Components of POLA 100% Submittal

- Components of Alternatives Evaluated
  - Similar use of vertical, large-dia. steel pipe piles (54” Dia.), but with steel decks for structures and trestles. Unloading platform (ULP) and trestles topped with precast concrete deck
  - Jacketed structures similar to offshore platforms (ULP, BDs, & MDs)
VE Alternatives Studied (Cont’d)

- Monopiles for the BDs & MDs and vertical piles for ULP
- Trestles (NT & ST) and AMP Platform (AMPP) components with precast concrete surfaces supported on steel girders at larger spans, resulting in reduced no. of piles
- Walkways capable of spanning from structure to structure, without intermediate piles
Typical Jacketed Structures
Partial Height and Battered Legs
Typical Monopile Structure

BD Monopile with Steel Deck
120” OD
Pile Wgt. – 314 ST
Pile Length – 208 Ft
Max. WT = 2.875”
Scenario Results

- Components of POLA 100% Submittal
- Components of Alternatives Evaluated
- Alternative Results
  - Scenario #1 - Vertical pile system with steel deck framing cost competitive and similar to POLA 100% Design
  - Scenario #2 - Jacketed structures also cost competitive, with large differences from POLA 100% Design
    - Jacket fabrication & installation not common on West coast
    - Differences may require re-evaluation of the approved EIR
Scenario Results (Cont’d)

- Scenario #3 - Monopile BDs & MDs very cost competitive, but even larger differences from POLA 100% Design
  - Monopile fabrication & installation not common on West coast
  - Differences may require re-evaluation of the approved EIR
Scenario Results (Cont’d)

- Components of POLA 100% Submittal
- Components of Alternatives Evaluated
- Scenario Results

<table>
<thead>
<tr>
<th>Scenario No.</th>
<th>Est. Total Const. Cost (% Base Case)</th>
<th>Comparison to Base Case</th>
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<tbody>
<tr>
<td>POLA 100% Design - Base Case</td>
<td>100%</td>
<td></td>
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<tr>
<td>Scenario #1</td>
<td>91%</td>
<td>Similar</td>
</tr>
<tr>
<td>Scenario #2</td>
<td>91%</td>
<td>Large configuration differences below deck (Jacket Fab. &amp; Installation)</td>
</tr>
<tr>
<td>Scenario #3</td>
<td>88%</td>
<td>Very large configuration differences below deck (Monopile fab. &amp; installation)</td>
</tr>
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</table>
Scenario Results (Cont’d)

- Components of POLA 100% Submittal
- Components of Alternatives Evaluated
- Scenario Results

**Move forward with detailed comparisons of POLA 100% Design and Scenario #1 for the following reasons:**

- Potential savings in construction cost
- Reduction in the no. of piles and minimal CIP concrete
  - Minimize risk issues with driving through rock lenses
  - Reduced construction time in the field
Details of Scenario #1
The size of the deck areas in plan are identical to the POLA 100% Design Configuration. Precast concrete structures.
ULP Deck Framing Plan

5" deep H.D. open grid grating, ASinsn throughout, except at reinforced concrete drainage area.

- 6" deep reinforced concrete drainage area; curbs all around; diaphragm action required.
- Bunker barge fender.

Plan at +20.00' MLLW.
Breasting Dolphin

[Diagram of Breasting Dolphin with dimensions and notes]

DOLPHIN DECK PLAN

DOLPHIN FRAMING PLAN

NOTES:
1. ALL PRIMARY STEEL A36.
2. ALL NUTS, BOLTS AND WASHERS.
3. DOLPHIN FENCE UNLESS NOTED.
4. ALT. A X 44" X 31" DOLPHIN L/B.
5. AL. B X 12" X 35" DOLPHIN L/B.
Mooring Dolphin
Section thru North Trestle
South Trestle Similar
Section thru AMP Platform
Walways Spanning from Dolphin to Dolphin Utilizing Large Dia. Pipe

Note: No intermediate piles supporting the walkways. Total No. of Piles Eliminated = 44
Results and Comparisons
## Concept Comparisons

<table>
<thead>
<tr>
<th>Construction Component</th>
<th>POLA 100% Design</th>
<th>Scenario #1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Steel Piles (48” &amp; 54” Dia.)</td>
<td>86</td>
<td>61</td>
</tr>
<tr>
<td>Concrete Piles (24” Oct. PCP)</td>
<td>75</td>
<td>31</td>
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<tr>
<td>Decks – ULP; BDs; &amp; MDs</td>
<td>Cast-in-Place (CIP) Concrete</td>
<td>ULP – Steel Deck with precast concrete Panels; BDs &amp; MDs – Steel Deck with Grated Surfaces</td>
</tr>
</tbody>
</table>
| Decks – Trestles (NT; ST; & AMP Platform) | Pile Caps – CIP Concrete  
Beams – Precast Box Girders  
Deck – CIP Concrete | Pile Caps – CIP Concrete  
Beams – Steel Fabricated Beams  
Deck – Precast Concrete Panels |
| Life Cycle Maintenance Cost            | Lower than Scenario #1 | Higher than POLA 100% Design                    |
| Utility Boat Dock; Firewater Pump & Spill Boom Plat. | Presently, Scenario #1 will be identical to the POLA 100% Design |
### Schedule Comparisons

#### BERTH 408 SCHEDULE COMPARISON

<table>
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<tr>
<th>ACTIVITY DESCRIPTION</th>
<th>Months</th>
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<tbody>
<tr>
<td>DESIGN</td>
<td>8 months</td>
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<tr>
<td>BID &amp; AWARD</td>
<td>4 mos</td>
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<tr>
<td>MARINE PROCUREMENT (e.g. PILES)</td>
<td>10 months</td>
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<tr>
<td>MARINE CONSTRUCTION (excl topsides)</td>
<td>11 mos</td>
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**Legend**
- M&N Redesign (Scenario #1)
- POLA Current Schedule

- Scenario #1 requires more time for re-design
- POLA 100% Design concept requires more field time (more piles and more CIP concrete)
- Presently, the marine construction package is not on the critical path for the start-up of the facility
- At this time, there are no strong drivers to select one concept over the other, based on schedule
Pile Driving Risk Identified by POLA
Pile Driving Risk Identified by POLA

Longitudinal Section A – A’
## Risk Mitigation Strategy

<table>
<thead>
<tr>
<th>Risk Mitigation</th>
<th>Purpose/Benefit</th>
<th>POLA 100% Design</th>
<th>Scenario #1</th>
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<tbody>
<tr>
<td>Design Stiffer Steel Piles</td>
<td>Deliver energy to pile tip to penetrate rock lens (min. WT = 1.50”)</td>
<td>✓</td>
<td>✓</td>
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<td>Reduce the No. of Steel Piles Driven</td>
<td>Simply reduces the no. of opportunities to hit rock lenses</td>
<td>86</td>
<td>61 Reduction</td>
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<tr>
<td>Reduce the No. of Prestressed Concrete Piles Driven</td>
<td>Simply reduces the no. of opportunities to hit rock lenses</td>
<td>75</td>
<td>31 Reduction</td>
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</table>
Next Steps
Next Steps

- PLAMT in negotiations with POLA for long-term lease
- PLAMT in negotiations with their customers to lock in the business drivers for this capital investment
- **If and when those 2 hurdles are cleared, the final design and construction phases will move forward**
Questions?