



Shell Oil Products Company
Mormon Island Marine Terminal
Berths 168 & 169
Port of Los Angeles



AGENDA

- Facility Description
- Near Term Programs
 - MOTEMS Audit
 - Berthing Upgrade Projects
 - Piping Upgrades
- Possible Future Upgrade Projects
- Upgrade Status
- Closing



FACILITY DESCRIPTION

- Two Berth Unloading Facility 168 & 169
- 1920's Vintage Timber Wharf
- MOTEMS Medium Risk Classification



FACILITY DESCRIPTION



Shell Mormon Island Oil Terminal

DMJM HARRIS | AECOM

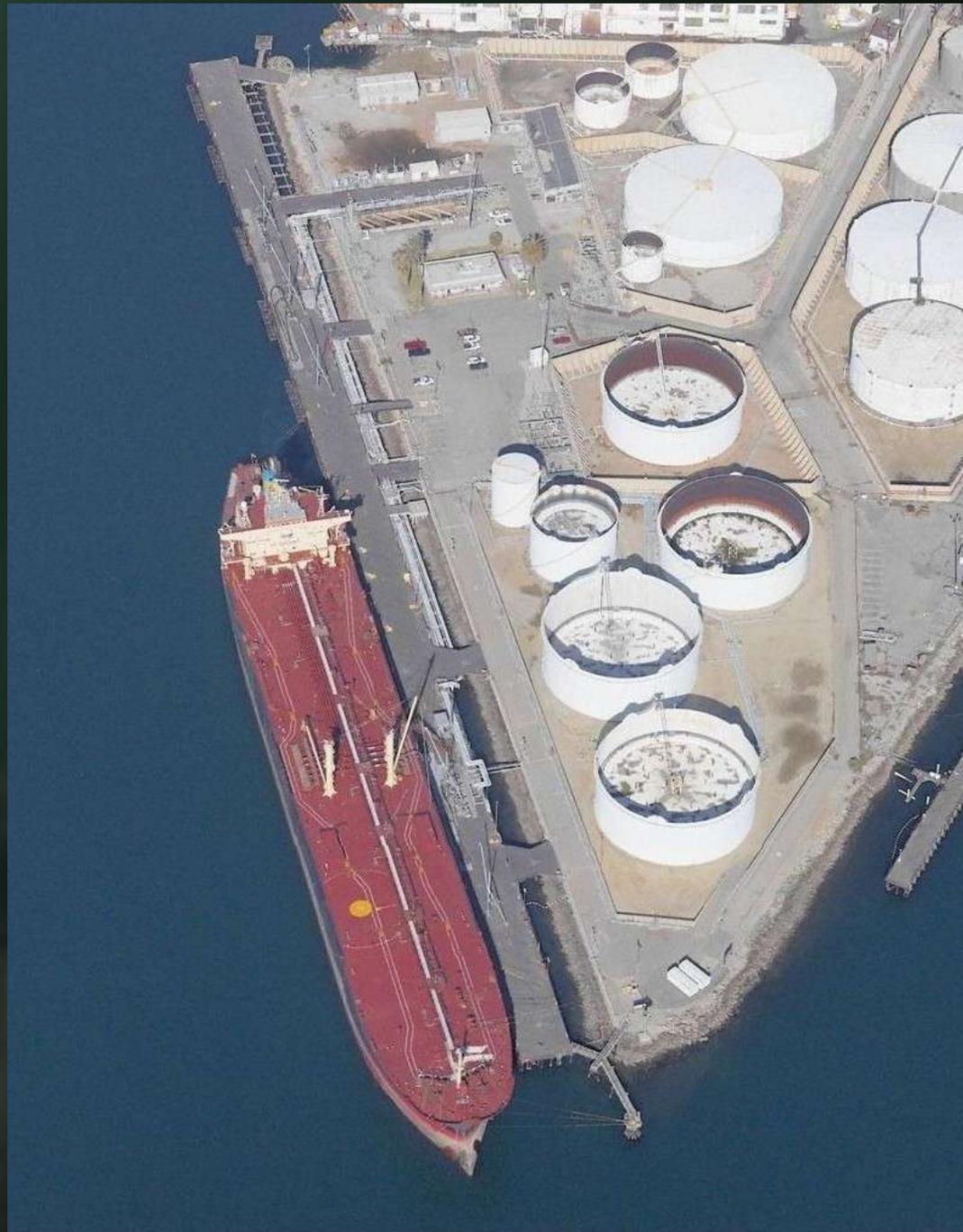
FACILITY DESCRIPTION

- *DECK*
- *PILES*
- *TIMBER FENDER SYSTEM*



FACILITY DESCRIPTION

- *CAMELS*
- *LOADING MASTS*
- *PIPING*



FACILITY DESCRIPTION



EXISTING TIMBER DECK



EXISTING PILES & FENDER SYSTEM



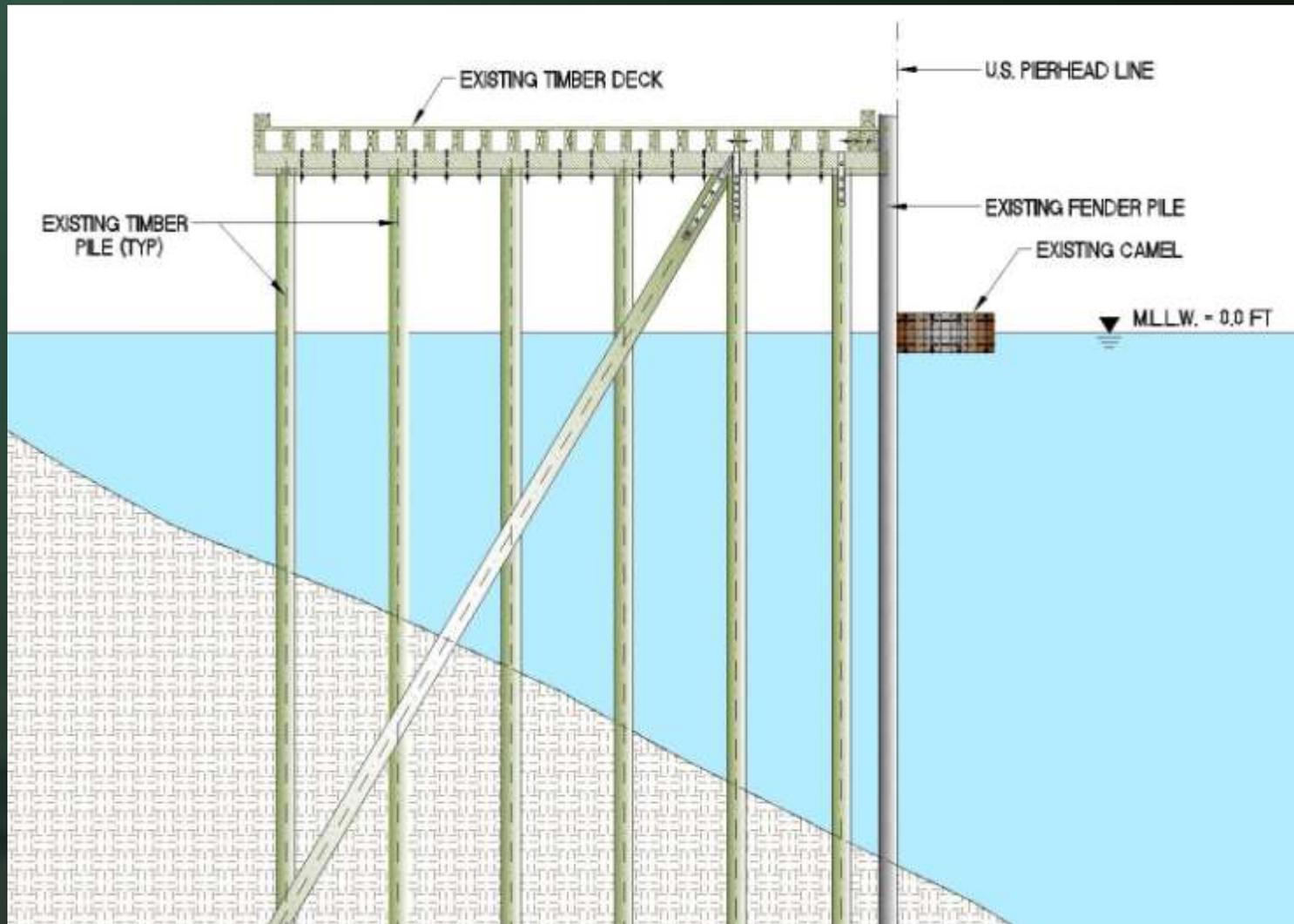
EXISTING PILES & STRAPS



EXISTING PIPING SYSTEMS



FACILITY DESCRIPTION

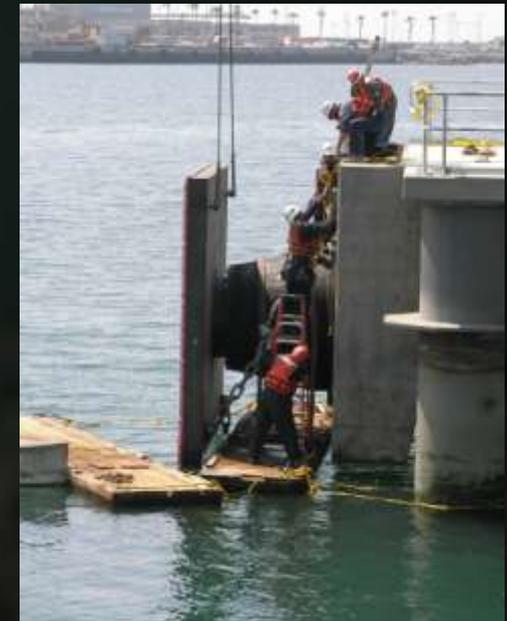


Existing Typical Wharf Section



NEAR TERM PROGRAMS

- MOTEMS Initial Audit
- Berthing Improvement Project
- Piping Improvement Project



MOTEMS INITIAL AUDIT

- Field Investigations
- Mooring
- Berthing
- Structural Analysis
- Geotechnical Analysis
- Piping / Mechanical / Electrical
- Fire Protection



MOTEMS INITIAL AUDIT

- Field Investigations
 - Geotechnical Landside and Waterside
 - Diving Inspection
 - Structural Field Inspection Top Sides & Below Deck
 - Mechanical, Electrical and FF



MOTEMS INITIAL AUDIT

- Timber fender system
- Agreed with POLA/
CSLC to install
Composite Camels
 - installed in 2007
 - interim measure
- Pursue Design of New
Berthing Dolphins



MOTEMS INITIAL AUDIT

- Preliminary Mooring Analysis
 - Coordination with Pilots
 - Dynamic Mooring Analysis (TERMSIM)
 - Load Conditions:
 - Wind Speed
 - Passing Vessel



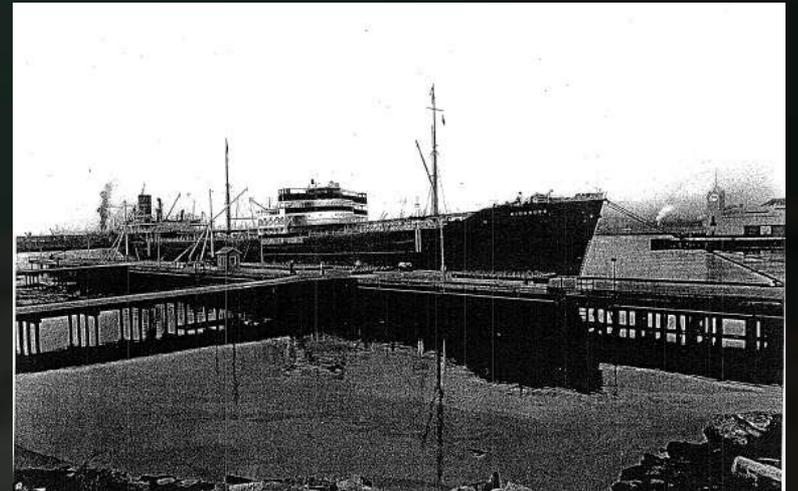
SEISMIC & STRUCTURAL EVALUATION

- Analyzed Deck, Bridges and Existing Mooring Points against MOTEMS
- Non-linear Dynamic Analysis (SAP2000)
 - To account for batter piles
- POLA Seismic Criteria



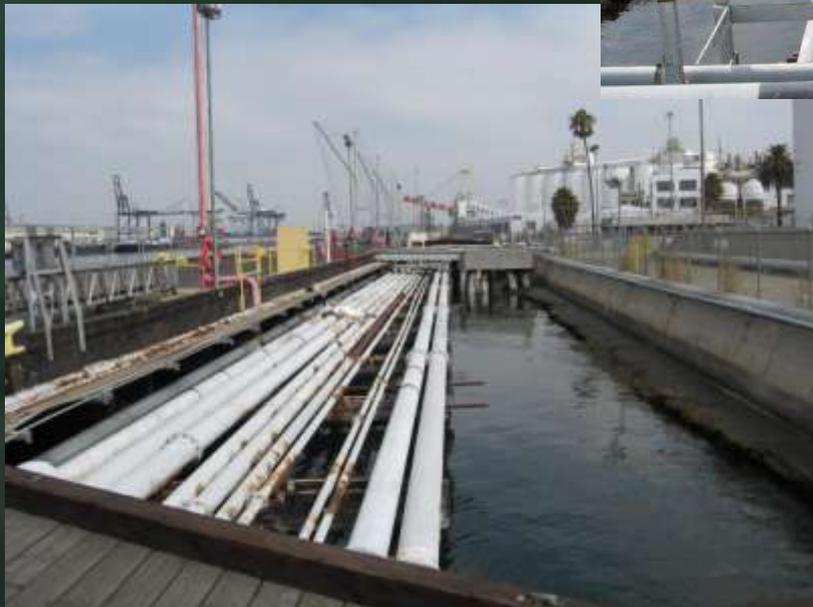
MOTEMS INITIAL AUDIT

- Geotechnical Findings



MOTEMS INITIAL AUDIT

- Piping / Mechanical
- Electrical
- Fire



BERTHING UPGRADE PROJECT

- Interim with Existing Timber Piles and Composite Camels
- New Berthing System:
 - Isolate berthing loads from timber wharf



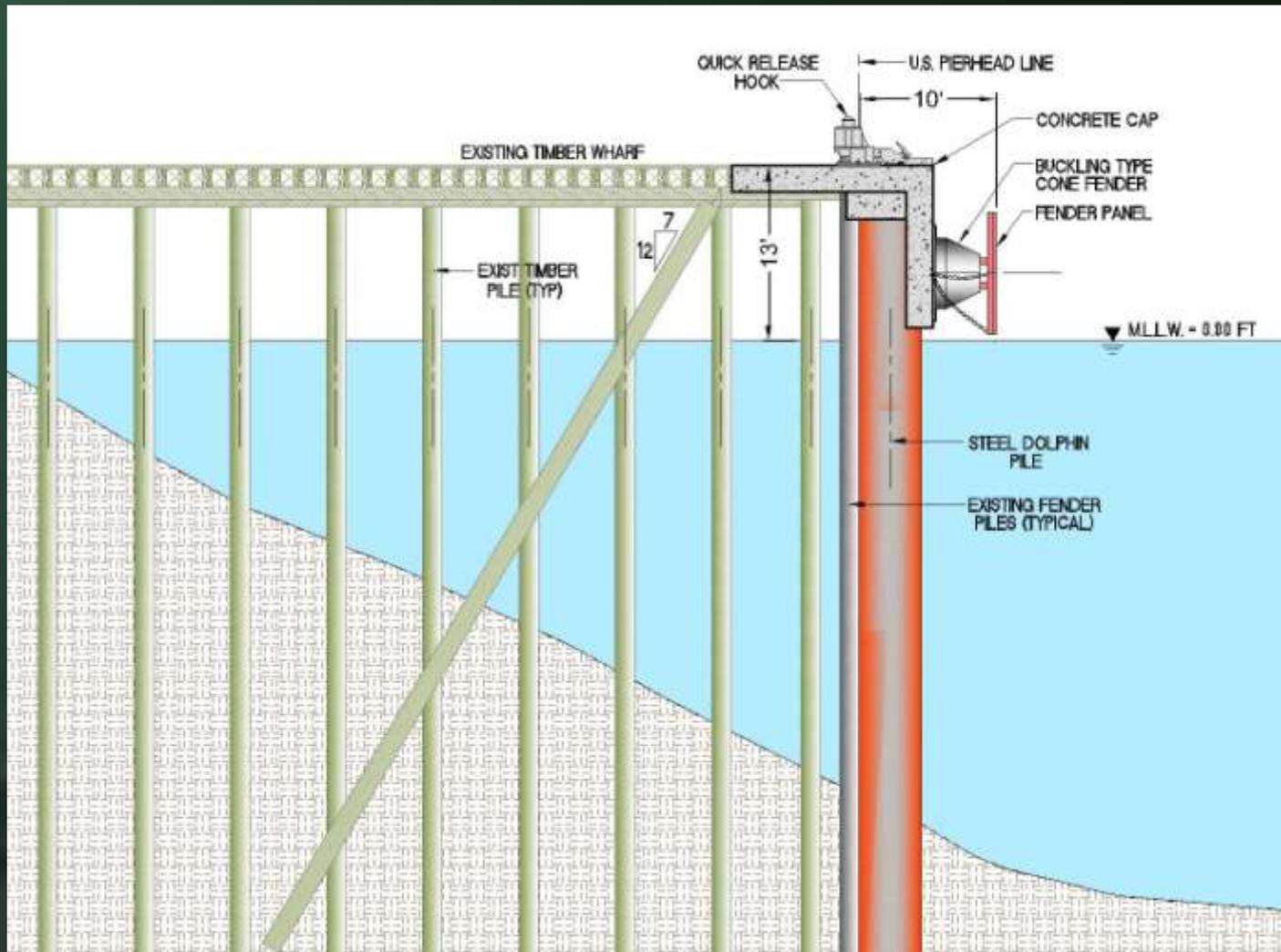
BERTHING UPGRADE PROJECT



PROPOSED WHARF IMPROVEMENTS



BERTHING UPGRADE PROJECT



PROPOSED WHARF SECTION



BERTHING UPGRADE PROJECT

- *Project Staging*



Phase I Construction



Phase II Construction

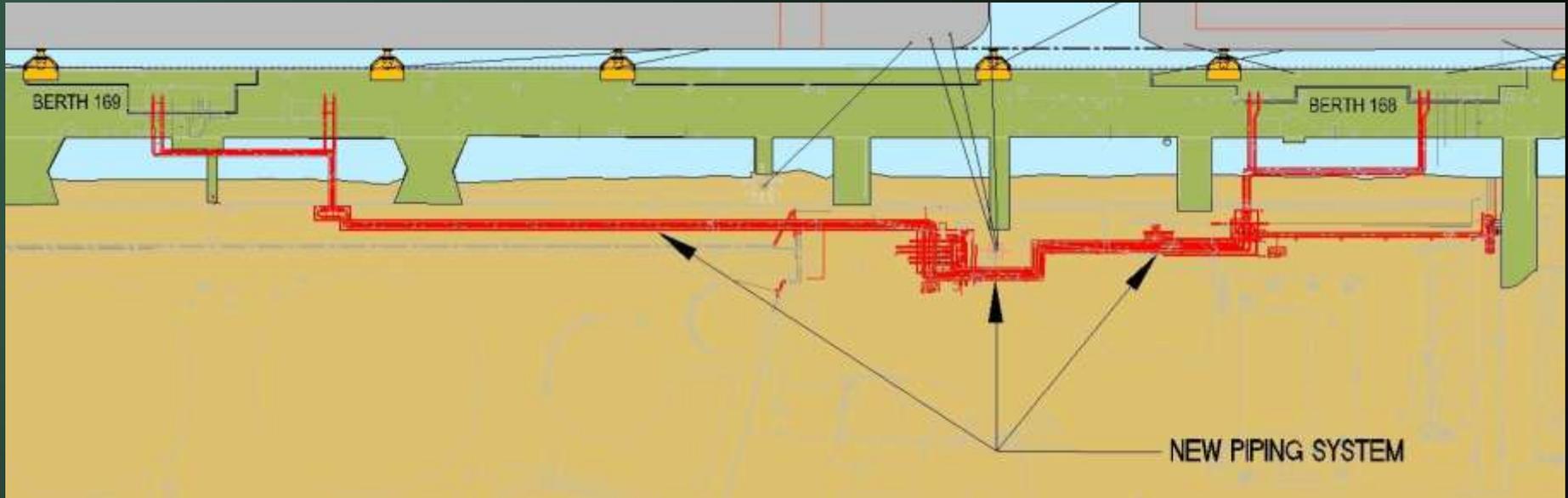


PIPING UPGRADE PROGRAM

- Replace Product Piping
 - Bring Most Piping on Land
 - Reduce Over Water Piping
- Isolate Piping from Timber Wharf



PIPING UPGRADE PROGRAM



PROPOSED PIPING SYSTEM



POSSIBLE FUTURE UPGRADE PROJECTS

- Mooring Upgrades
- Embankment / Ground Improvements
- Unloading Platform



UPGRADE STATUS

- Evaluating Operating Parameters
- Berthing / Piping Upgrade Projects
 - Contract documents
 - Bid process (Contractors pre-qualified)
- MOTEMS RAP's Initiated
- Future Upgrades
 - Shell / POLA conceptual design study implemented



CLOSING

- Medium Facility – Audit due 2010
- Proactive
- Implementing Programs and Measures

QUESTIONS

