Navigating a MOTEEMS Audit

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Presentation Outline

• Introduction
  • Ben C. Gerwick, Inc
    • Audits Completed for Four High Risk Terminals
    • First two Audits Submitted and Reviewed by CSLC

• The Audit Process
• Lessons Learned
• Summary
• Questions
The Audit Process

- Surveys, Surveys, Surveys
- Operational Capacity and Demand Analyses
- Seismic Capacity and Demand Analyses
- Checklists, Missing Information, and Deficiency Tables
- Executive Summary and Audit Submittal
The Audit Process

- Surveys, Surveys, Surveys, ...
  - Data Collection and Review
  - Above and Below Water Investigations
  - Geotechnical Investigations
  - Hydrographic and Topographic Survey
  - Material Testing
The Audit Process

- Data Collection and Review
  - Existing As-Built Drawings
  - Existing As-Built Specifications
  - Existing Condition Survey(s)
  - Existing Geotechnical Information
  - Existing Hydrographic or Topographic Information
  - Existing Vessel Information and General Arrangements
  - Existing Terminal Operations Manual(s)
  - Available Information from Public Records
The Audit Process

- Above and Below Water Inspections
  - PE Divers and Level of Inspections
  - Coordinate Inspections and Critical Members
  - Compile Inspection Results and Assign Ratings
  - Condition Survey Report (s)
The Audit Process

- Geotechnical Investigations
  - Borings and CPTs
    - Available borings may not meet MOTEMS 100-ft requirement
    - Map both transverse and longitudinal soil profiles
    - Consider potential repairs and upgrades to facilities
  - Seismic Analyses and Hazard Analyses
    - Site Specific Response Spectra
    - Soil Liquefaction and lateral stability
    - P-y and T-z requirements
    - Abutments
The Audit Process

- Operational Capacity and Demand Analyses
  - Operational
    - Dead and Live Loads
    - Berthing
    - Mooring
      - Winds and Currents
      - Passing Vessel Effects
    - Fender Systems
    - Mooring Hardware
The Audit Process

- Seismic Capacity and Demand Analyses
  - Seismic
    - Dead Load and Equipment
    - Inertial and Kinematic Loads
The Audit Process

- Checklists, Missing Information, and Deficiency Tables
- CSLC Draft Audit Manual Checklists
- Missing Information
- Deficiency Tables
The Audit Process

- Executive Summary and Audit Submittal
  - Structural Summaries and CARs
  - Component Summaries and RAPs
  - Path Forward
    - Addresses deficiencies and scheduled repairs
- Audit Submittal
  - Two (2) Copies and CDs to CSLC
    - 7 to 11 Volumes (4-in binders)
    - 1,200 to 3,000 pages
    - 250 - 750 MB of information
Lessons Learned

- Planning and Scheduling
- Immediate Mitigation May be Required
- Testing is knowledge
- MOTEEMS Modifications
- Communication
Lessons Learned

- Planning and Scheduling
- Recommend 12 months from inspection to submittal
Lessons Learned

- Planning and Scheduling (Continued)
  - Start Condition Surveys early
    - Currents, tides, and weather will affect inspection schedules
    - Ship schedules will interrupt inspection schedules
Lessons Learned

- Planning and Scheduling (Continued)
  - Start Geotechnical field investigations early also
    - Site Specific Spectra and soil parameters required for analyses
    - Potential Liquefaction and Lateral Spreading may direct mitigation measures
Lessons Learned

- Planning and Scheduling (Continued)
  - Compile Draft Checklists & Deficiencies
    - Develop repair design plan to eliminate operational deficiencies
    - Plan CSLC walk down after surveys and deficiency direction
  - Review Path Forward with Corporate
    - Local MOTs require input and approval from Corporate
    - CSLC will hold MOTs to Repair Plan Schedules
Lessons Learned

- Mitigations may be required
- Audits are performed on circa 1950 terminals with some improvements
Lessons Learned

- Mitigations may be required (Continued)
- Expect Operational Deficiencies in Older Structures

Damaged Spring Fender Assembly

Relocated Mooring Hook
Lessons Learned

- Mitigations may be required (Continued)
- Events Happen
Lessons Learned

- Testing is knowledge
Lessons Learned

- MOTEMS Audit Modifications
- Executive Summary Table Modifications
- Above and Below Water CARs
- Follow-Up Action Items
Lessons Learned

- MOTEMS Audit Modifications (Continued)
- Deficiency Table Modifications
  - Separate columns for Deficiency and Suggested Mitigation
  - Added Date Completed column
Lessons Learned

- MOTEMS Audit Modifications

- Condition Surveys vs. Assessments
  - A CAR is a Condition Assessment Rating
  - A Condition Survey refers to loss of section

- Underwater vs. Above water
  - MOTEMS states +3-ft MLLW for underwater survey. Above water above +3-ft MLLW
Lessons Learned

- Communication
  - Need a Project Champion at the Terminal
  - Coordination between MOT, Audit Team, and CSLC
    - Include CSLC in schedule and walk through
    - Inform CSLC of known deficiencies and directions
  - Request Clarification from SLC, if needed.
Summary

- Audit Process includes surveys, analyses, and checklists, deficiency tables, summary, and submittal.
- Recommend 12 months to complete Audit
- Expect mitigation requirements for older facilities
- Testing may help for marginal capacities
- MOT needs a Project Manager with good communication skills
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