

# ***LNG TERMINAL ENGINEERING AND MAINTENANCE STANDARDS (LNGTEMS)***

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# Presentation Preview

- Project Background
- Project Status
- Key Issues
- Path Forward

# Project Background

- Numerous projects proposed in California
- Lempert-Keene-Seastrand Oil Spill Prevention Act gives CSLC jurisdiction
- Project Commencement – 2006
- Halcrow – Prime
  - Aker Kvaerner (LNG systems)
  - Energo Engineering (fixed platforms)

# Project Scope

- 4 Configurations
- Conventional Pier/Wharf



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- Deep Water Port



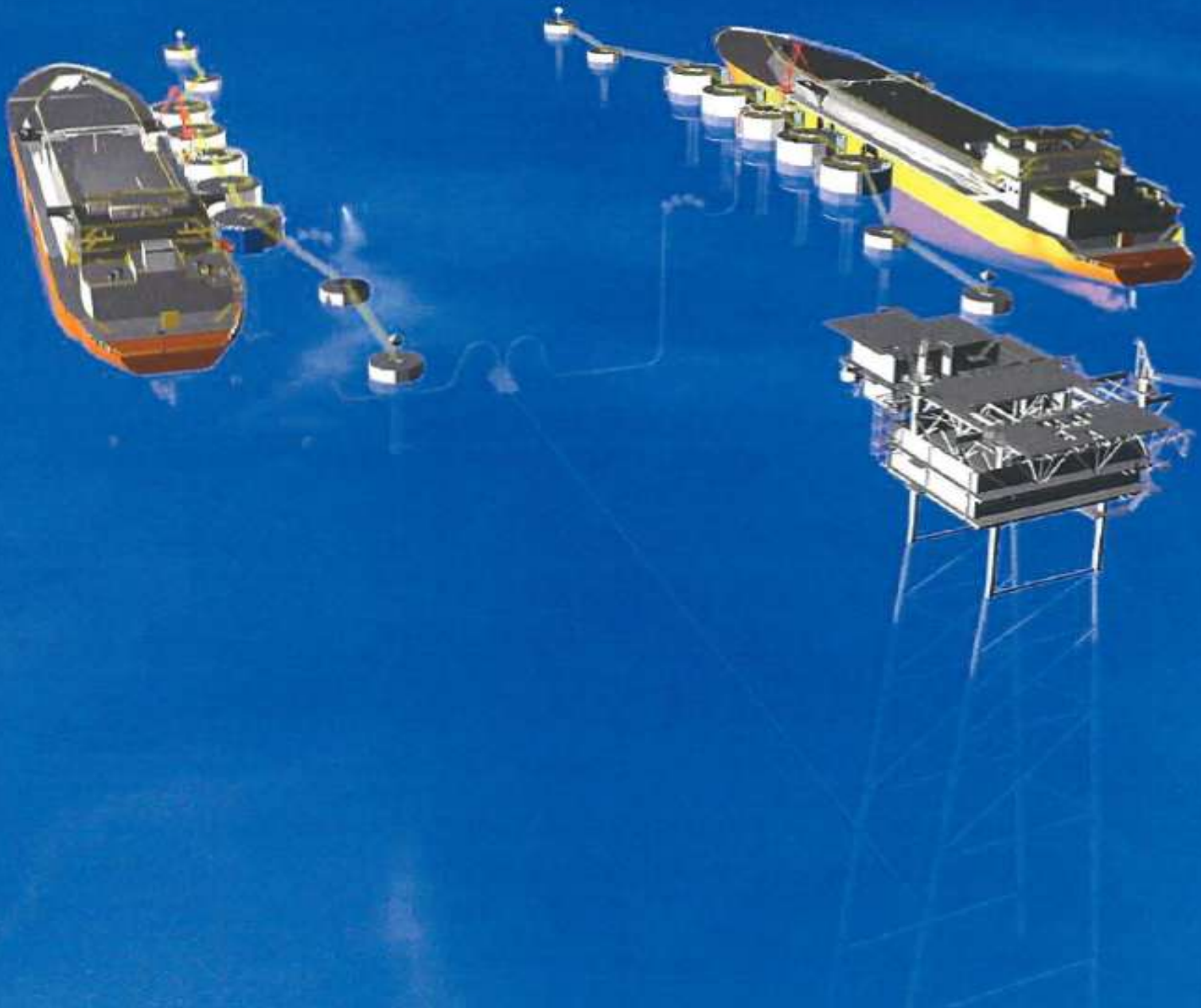






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- 4 Configurations
- Conventional Pier/Wharf
- Deep Water Port
- LNG Vessel Adjacent to Existing Platform



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- 4 Configurations
- Conventional Pier/Wharf
- Deep Water Port
- LNG Vessel Adjacent to Existing Platform
- Gravity Based Structure (GBS)



# Not Covered

- Vessels
  - FSRUs
  - LNG Tank Vessels
  - Tugs
- Siting

# Topics

- Similar to MOTEMS
  - Structural Loading, Analysis, Performance
  - Mooring and Berthing
  - Geotechnical Hazards
  - Component Structural Analysis and Design
  - Fire Prevention, Detection, Suppression
  - Piping and Pipelines
  - Mechanical / Electrical
  - Audits and Inspections
- Focus on LNG Specific Design Issues
- Extra Emphasis on Hazards and Risk Analyses



# Key References

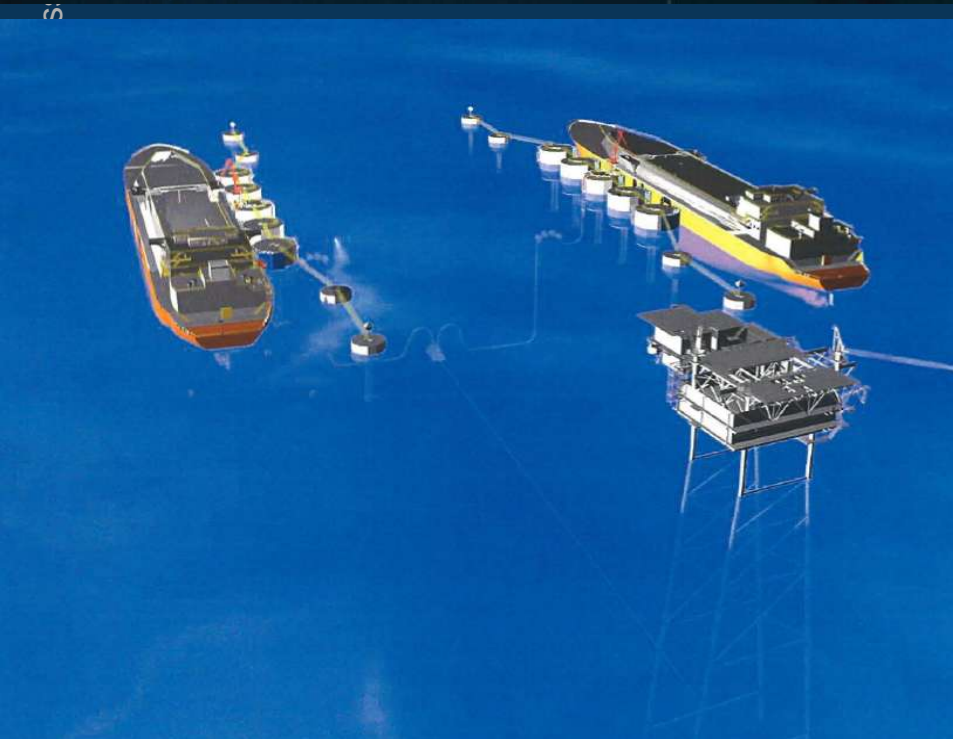
- MOTEMS
- NFPA 59A
- API RP 2A
- Mexican LNG Code
- Sandia Guidance Document
- DnV
- ABS

# Project Status

- Mechanical systems complete
- Fixed platform configuration complete
- GBS remaining
- Workshops to take place

# Key Issues

- Varying Levels of CSLC Jurisdiction



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- Varying Levels of CSLC Jurisdiction
- Nearshore vs. Offshore Design
- **Seismic Design Standards**
  - ISO 19901-2
  - API RP 2EQ
  - 1/2500 P(f) for SSE
  - Some Europeans pushing for 10,000 year RP

# Key Issues

- Varying Levels of CSLC Jurisdiction
- Nearshore vs. Offshore Design
- Seismic Design Standards
- **New Technologies**



# Key Issues

- Varying Levels of CSLC Jurisdiction
- Nearshore vs. Offshore Design
- Seismic Design Standards
- New Technologies
- **Risk Perception**

# LNG Risk

- Perceived by many to be comparable to nuclear power plants



# LNG Risk

- Perceived by many to be comparable to nuclear power plants
- Attempting to capture “best practice”
- Need to accept that we can’t eliminate risk completely





# Path Forward

- Draft within next 6 months
- Workshop in Houston
- Workshop in California

And that's all I have to say about that ...

