



Leadership in Offshore Facilities and Construction Engineering in Houston

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- One aspect of leadership is anticipating trends
 - Client changes
 - Project changes
 - Technology changes
 - History of Projects and Engineering Company Evaluation
 - What Can We Expect for Future Projects
 - What Technology Changes Might Impact Engineering Companies
 - Conclusions



1970s – 1980s Offshore Projects

- Many Small Projects. A few larger projects
- Much of the work centered on Gulf of Mexico
- Overseas projects also designed in Houston. Many fabricated on Gulf Coast as well.

1970s – 1980s Engineering Companies

- Many Small Companies
 - 50 to 100 with size range of 50-200 people
- Several Large International Companies
 - Staff of 1000+
 - BR, McDermott/Hudson, Lummus Crest, Fluor Ocean Services, Bechtel



Recent Trends - Offshore Projects

- Fewer Small Projects
- Subsea tie-backs – small scope for F&C Engineering Companies
- The few Gulf of Mexico Large Projects are Much Larger than they Used to Be
- International Projects are Larger, Slower to Develop, and Require More Front End Planning
 - Involvement of NOC
 - Many Operators Need to Approve
 - Worldwide Tenders
 - Large Scope of Work Within Single Tenders



Recent Trends – Engineering Companies

- Disappearance of Many Small Companies
- Absorption by Larger Entities
- Consolidation with Larger Entities
- Some Large Companies Leave the Houston Offshore Engineering Market
- Other Small Companies Enter the Field



Recent Trends – Engineering Companies (Continued)

- Net result is fewer Independent Companies and Those Remaining Tend to Be Smaller in size and Technical Capability
- About the same number of large companies, but shift from U.S. based to European based parents – Technip, Wood Group, Aker Kvaerner, AMEC
- Overriding Concern: Aging Workforce



Future of Offshore Projects

- Few small jobs in GOM
 - Base load for detail engineering and training
- Even fewer large GOM jobs
 - Some large project detail engineering
- Large overseas jobs structured towards EPC contracts
 - Need for conceptual studies and FEEDs in Houston
 - Low cost centers for detail engineering
- Push for host country content



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- What Does All This Mean for the Future of Offshore F&C Engineering in Houston?
 - To Understand We Need to Talk First About Project Management Technology



Past Technology Changes

- 1980s
 - Engineering Computation
 - AutoCAD – 2D

- 1990s
 - Automating Project Controls
 - Development of Estimating Tools and Databases
 - Data Base Modeling – 3D



Project Management Technology Today

- Integration of Work Processes In Linked Data Bases:
 - Engineering Work Processes
 - Procurement and Material Control
 - Project Progress, Scheduling and Cost Controls

- Enables
 - More efficient design and construction
 - Manage Change
 - Share Work Globally
 - Take advantage of knowledge where it is located
 - Increase host country content
 - Utilize low cost engineering centers



What Does This Mean to the Future of Offshore Engineering in Houston

- More detail and site specific work being done in host country
- More detail work being done in low cost centers
- Houston companies focus on high value added activities
 - Conceptual Studies and FEEDs
 - Special Expertise
 - U.S. Supply and Logistics Support
 - QA/QC of Detail Design
 - Operations Support
- Utilize electronic work processes to enable this to happen
- Aid in replacing an aging U.S. based work force



Conclusions

- Engineering Leadership Challenged to Prepare for this Changing World
- There will always be a need for detail engineering for smaller projects, brownfield work, and GOM projects and training
- Need to Justify Our Salaries by Focusing on High Value Added Engineering
- Use Technology to Share Work via Internet with Host Country and Low Cost Centers
- Leadership Challenge:
 - Adopt Work Processes & Technology
 - Train Staff
- Education Challenges