

# Delta House Project

## OCSAB Workshop



Rick Fowler – LLOG Exploration  
February 3, 2016



# Overview of LLOG

- Founded in 1977
- Privately funded
- Largest US private oil producer
- 5<sup>th</sup> most active deepwater GOM driller
- 8<sup>th</sup> largest deepwater GOM producer
- 70% Exploration success rate
- 21 operated deepwater developments to date
- 43 operated subsea wells brought on production
- Who Dat FPS with 10 wells on production
- Delta House FPS with 8 wells on production



This is to Certify that  
LLOG Exploration  
was awarded the  
**Safe Operations  
and Accurate Reporting  
(SOAR) Award**



# LLOG's Business Plan vs. Southwest Airlines



## Operating Area

Originally – Dallas, Houston, San Antonio.  
Currently - North America Only,

GOM Only. Mostly Mississippi Canyon focused.

Midway vs. O'Hare; Love vs. DFW; Hobby vs. Bush.

Some smaller projects (<20MMB) that large companies won't pursue.

## Standardization

Every Southwest plane is the same – Boeing 737.

Same development plans – Use same FPS, manifolds, trees, casing.

All the parts are the same.

Most prospects are amplitudes and structures near other wells.

Fits same number of passengers so can switch planes in and out.

## Cycle Time

Goal to keep a plane at the gate for twenty minutes between flights.

FPS projects in 3-4 years, subsea projects in 12-18 mos.

## Costs

Low fares. Give passengers peanuts.

Low cost projects. Employees eat peanuts.

## Flexibility

No cancellation fees. No checked bag fees.

Delta House financing, develop other's leases just before they expire.

## Fun

Comedy safety briefing, singing flight attendants.

Project video, movie, halloween, parties.

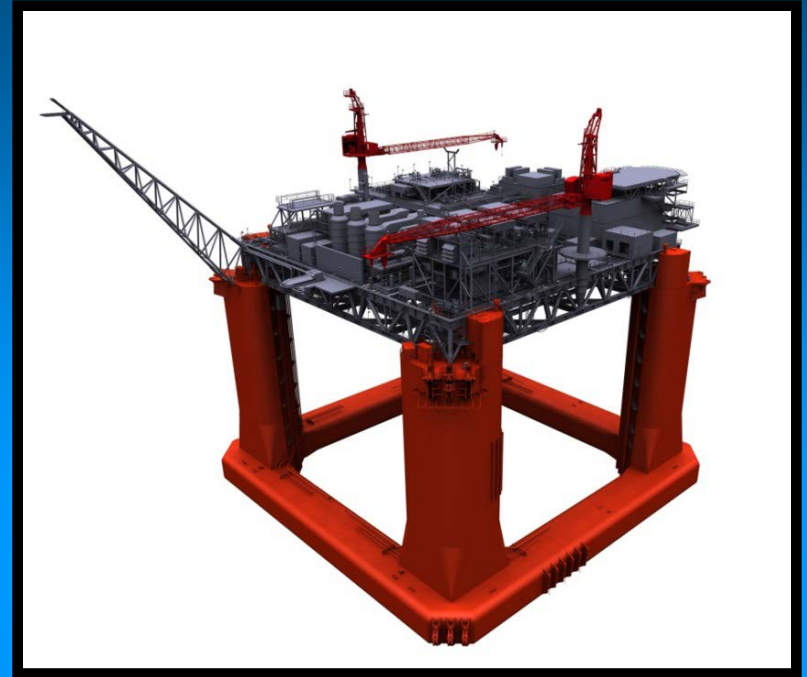


# Delta House Project



# Delta House Floating Production System

- New four column semisubmersible
- First production April 16, 2015
- Total project cost ~\$2B
- Peaking capacity
  - 100 MBOPD
  - 240 MMCFD
  - 40 MBWPD
- Process production from five fields
- Currently producing over 80 MBOPD, 99% Uptime
- In the gulf of Mexico 130 miles southeast of New Orleans
- Located in water about a mile deep
- Designed to survive hurricanes





# Delta House - Unique Aspects

- Designed to be first of many
- Engineering began prior to any discoveries
- Yard bidding prior to any discoveries
- Private equity to own FPS and Exports
- Sanctioned project with only two wells drilled
- About three years from discovery to first production



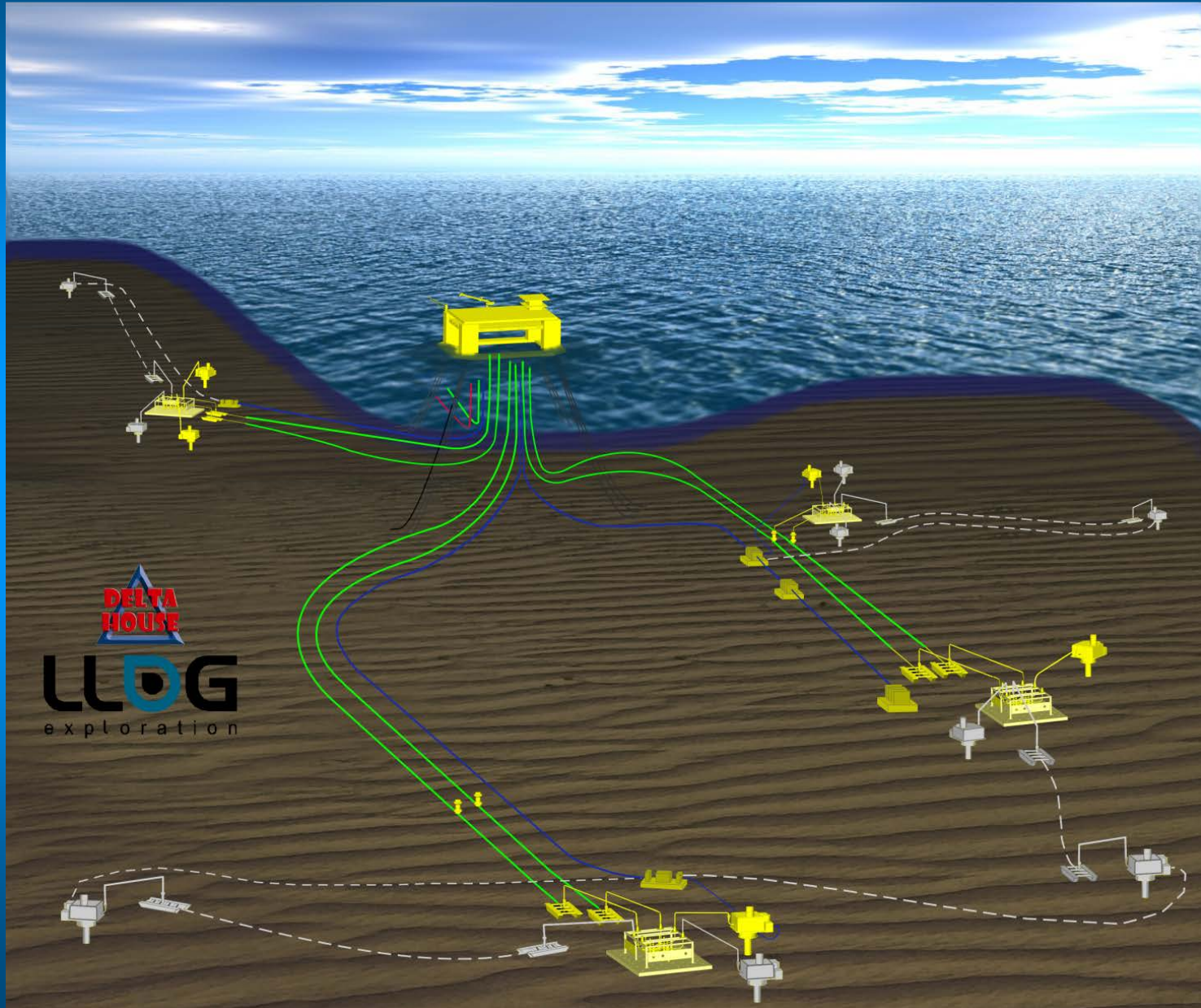
# Delta House by the Numbers

- 39,000 Tons Displacement
- 15 MW power generation
- 15000 HP compression
- 9000 HP pumps
- Over 12,000 people involved
- Over 170 companies involved
- At its peak, enough oil to make 1.5MM gallons of gasoline per day



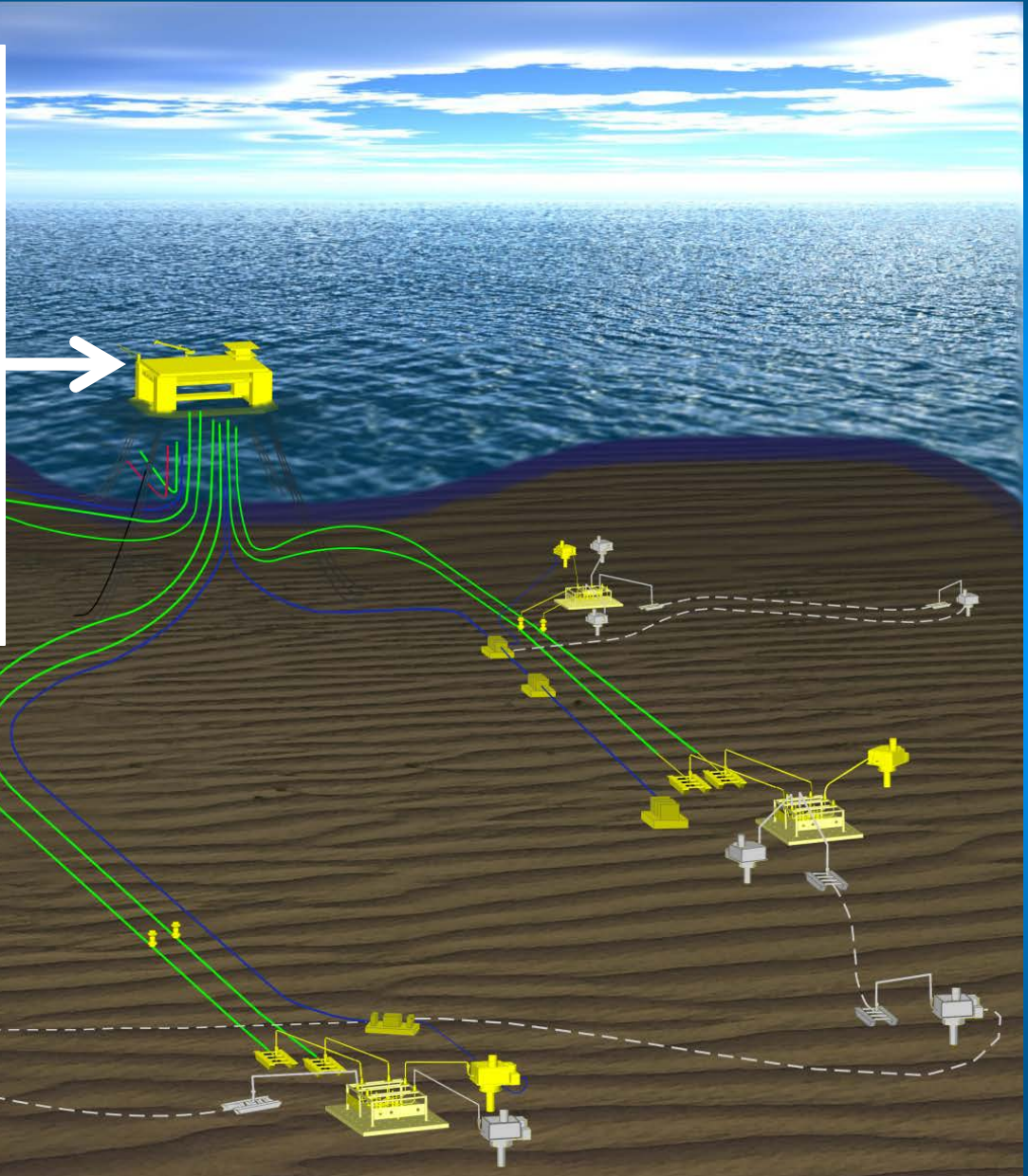
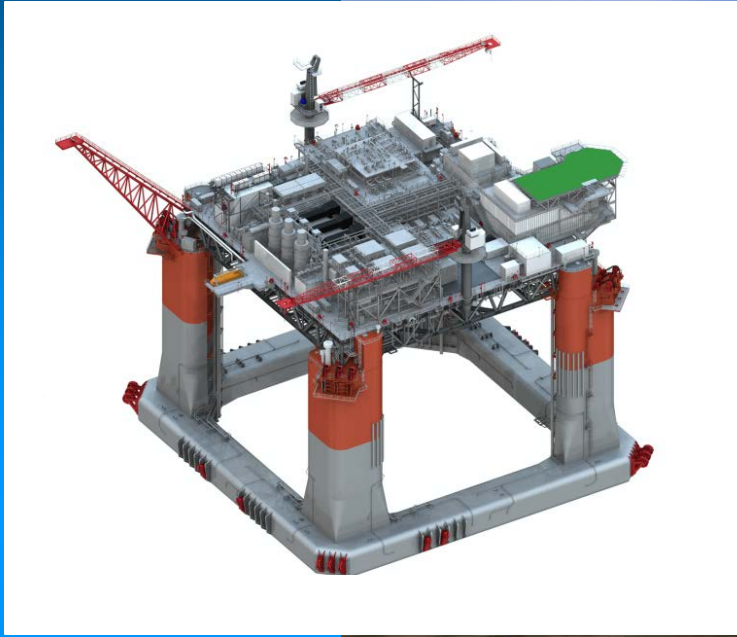


# Delta House Project Scope



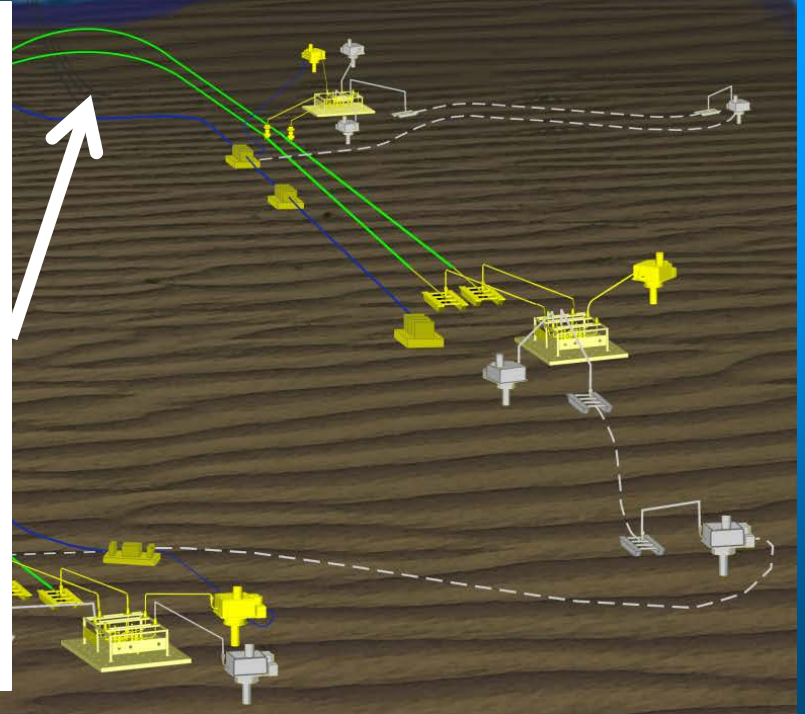
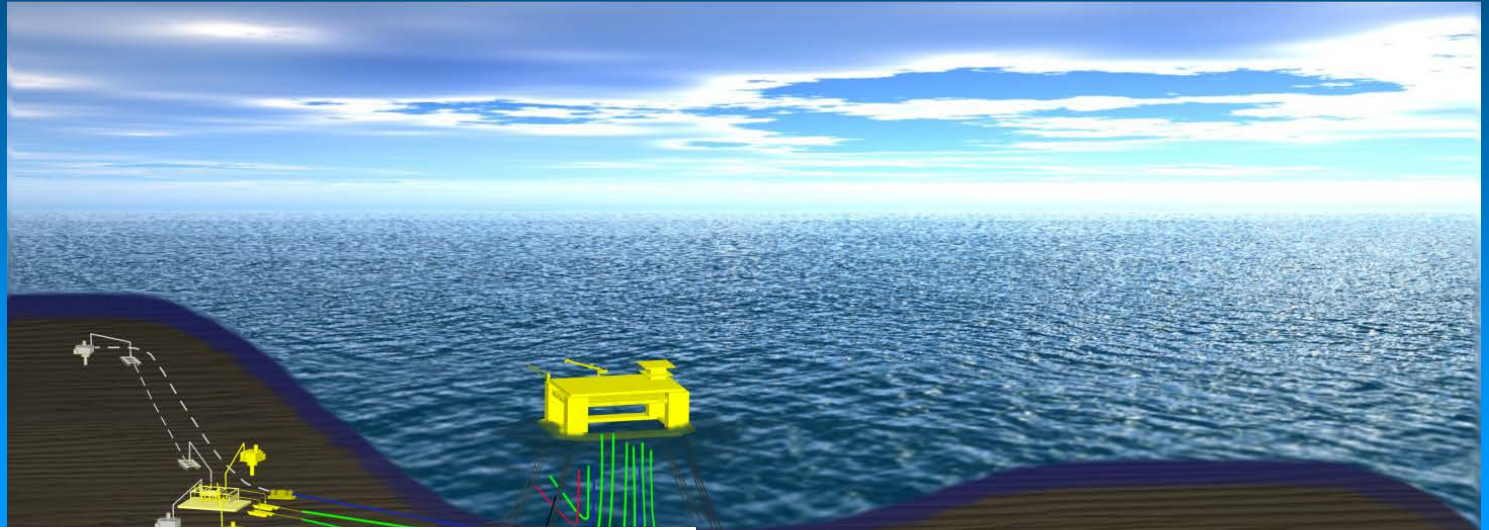


# Delta House Project Scope





# Delta House Suction Pile







# Delta House Mooring Chain



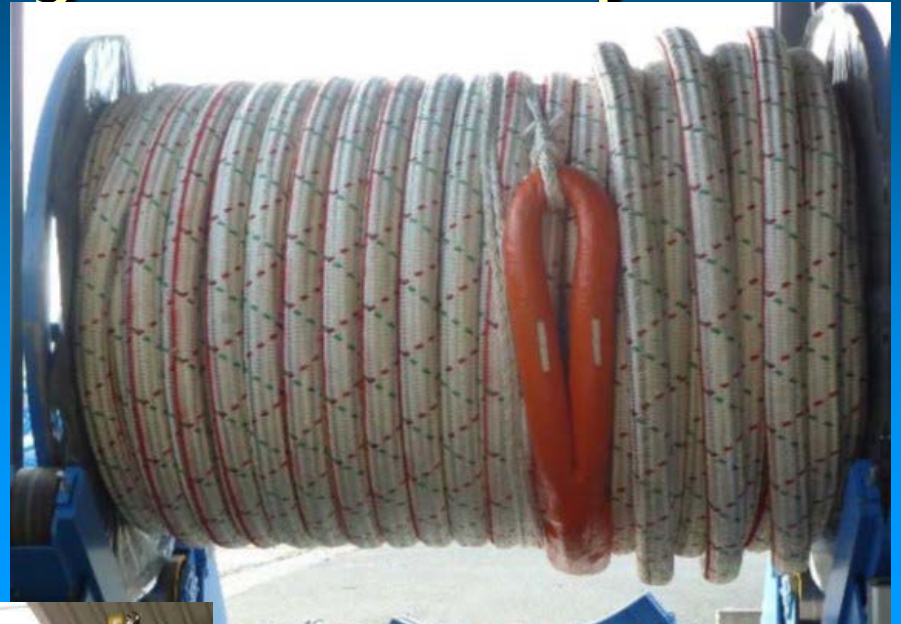


# Delta House Project



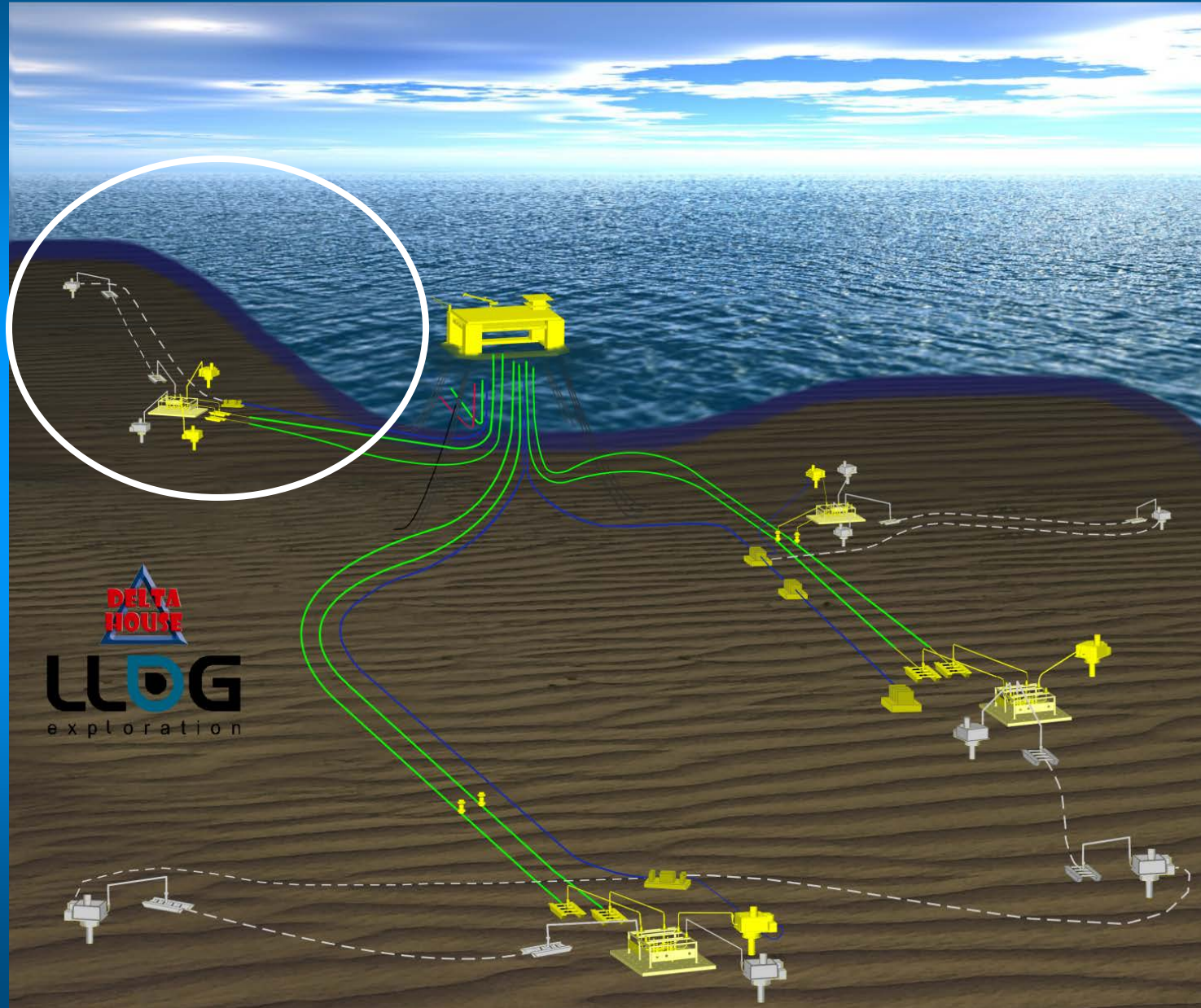


# Mooring Polyester Rope

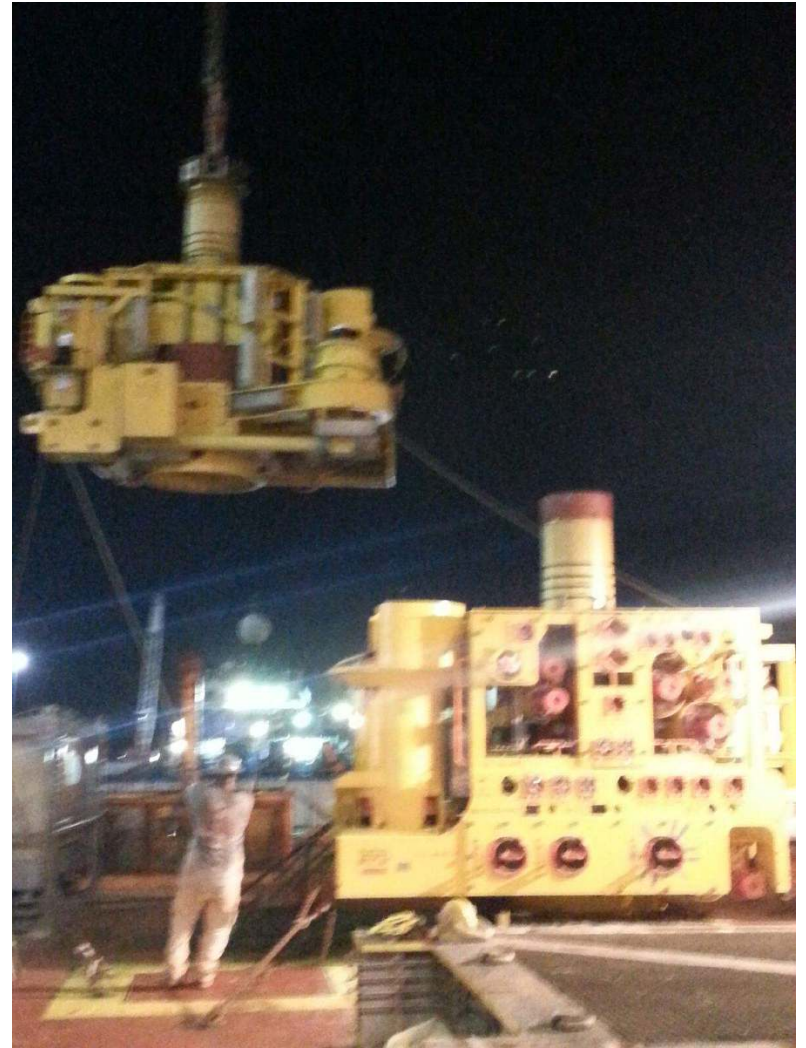
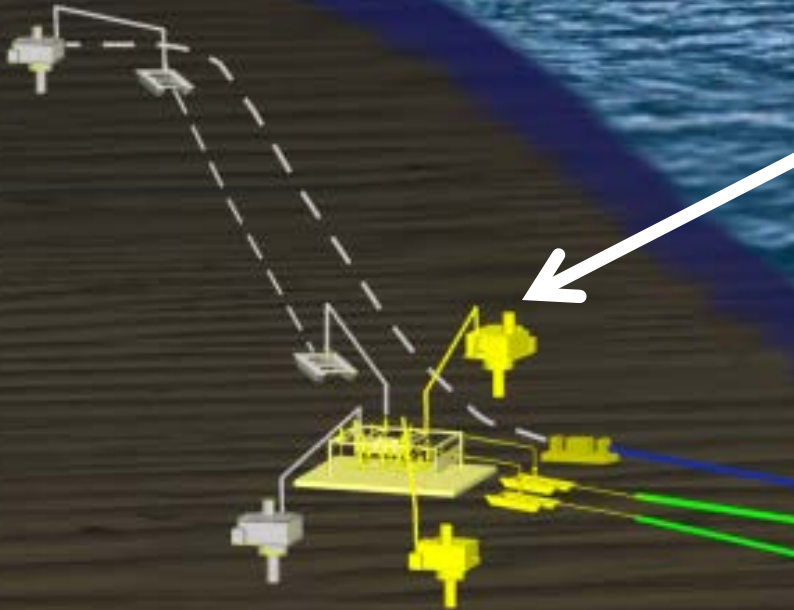




# Delta House Project Scope

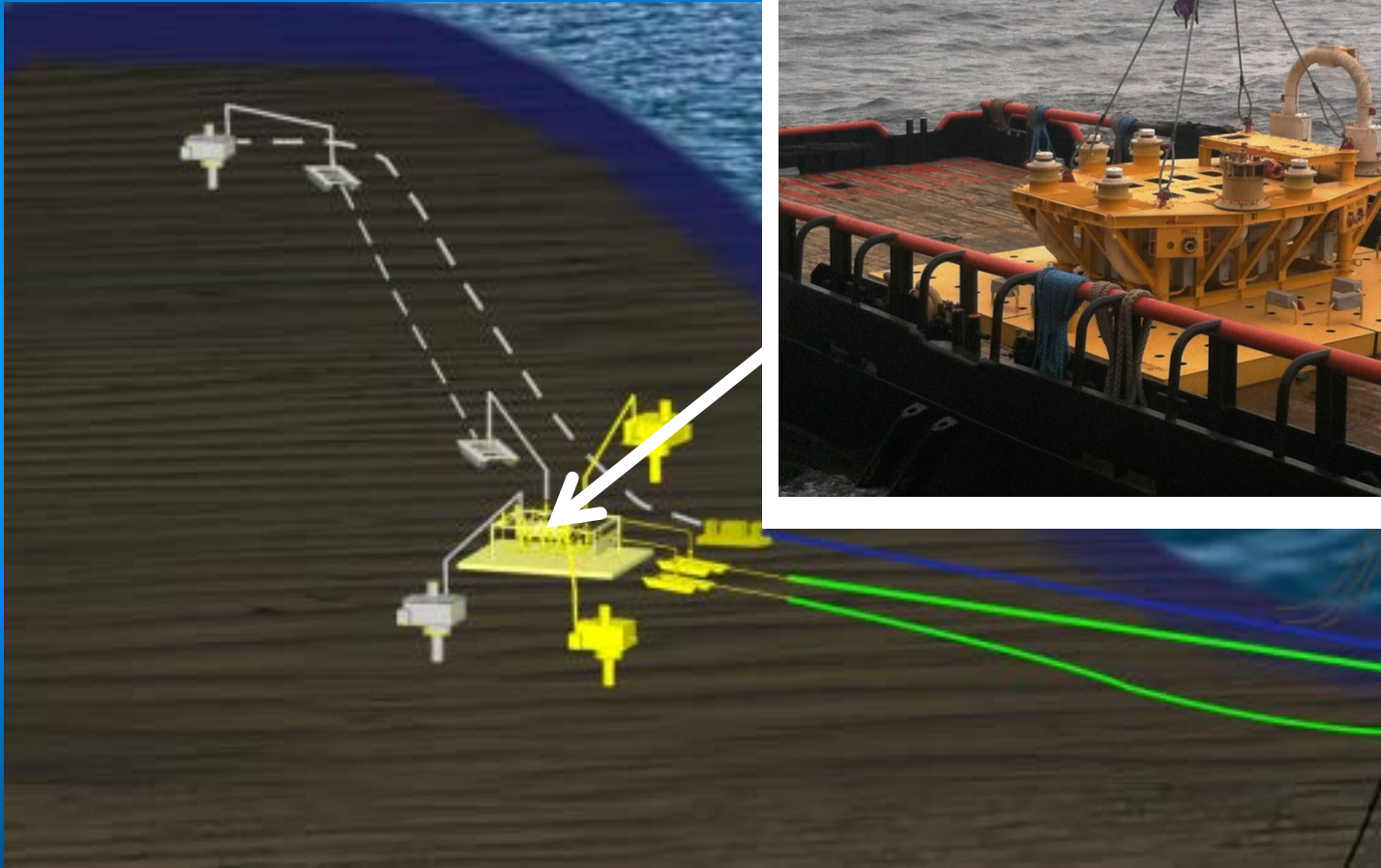


# Subsea Tree

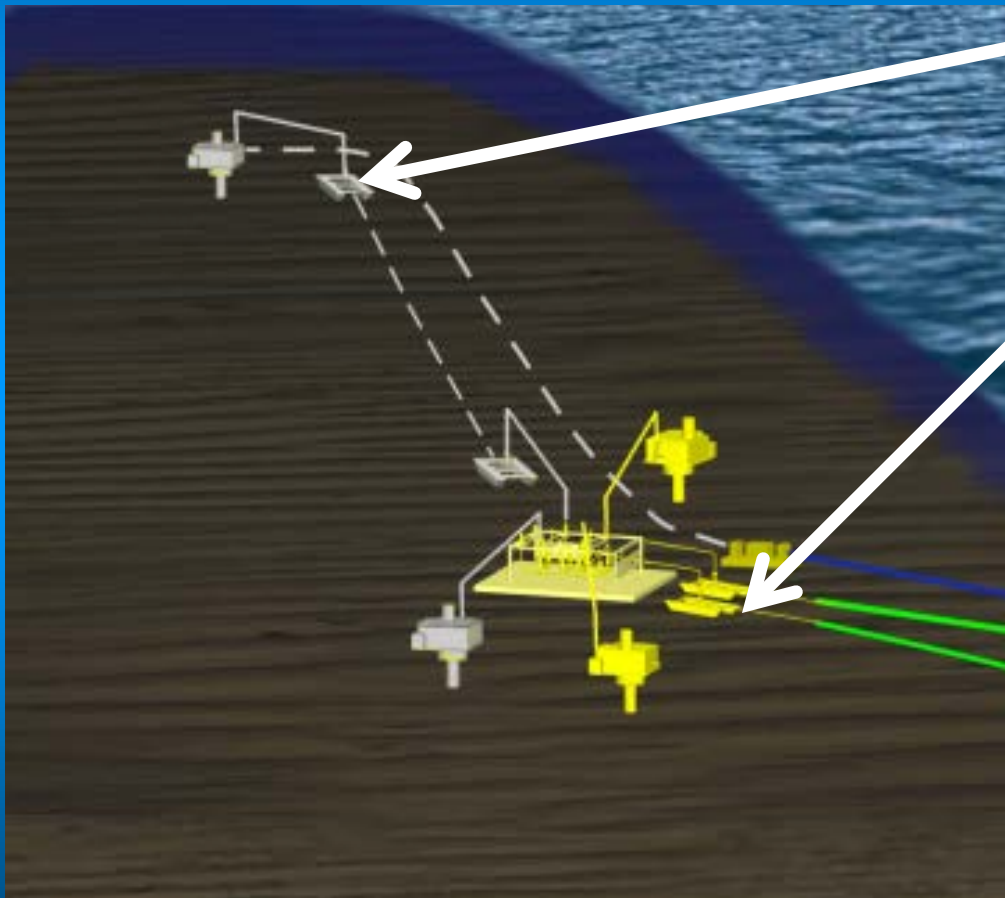




# Subsea Manifold

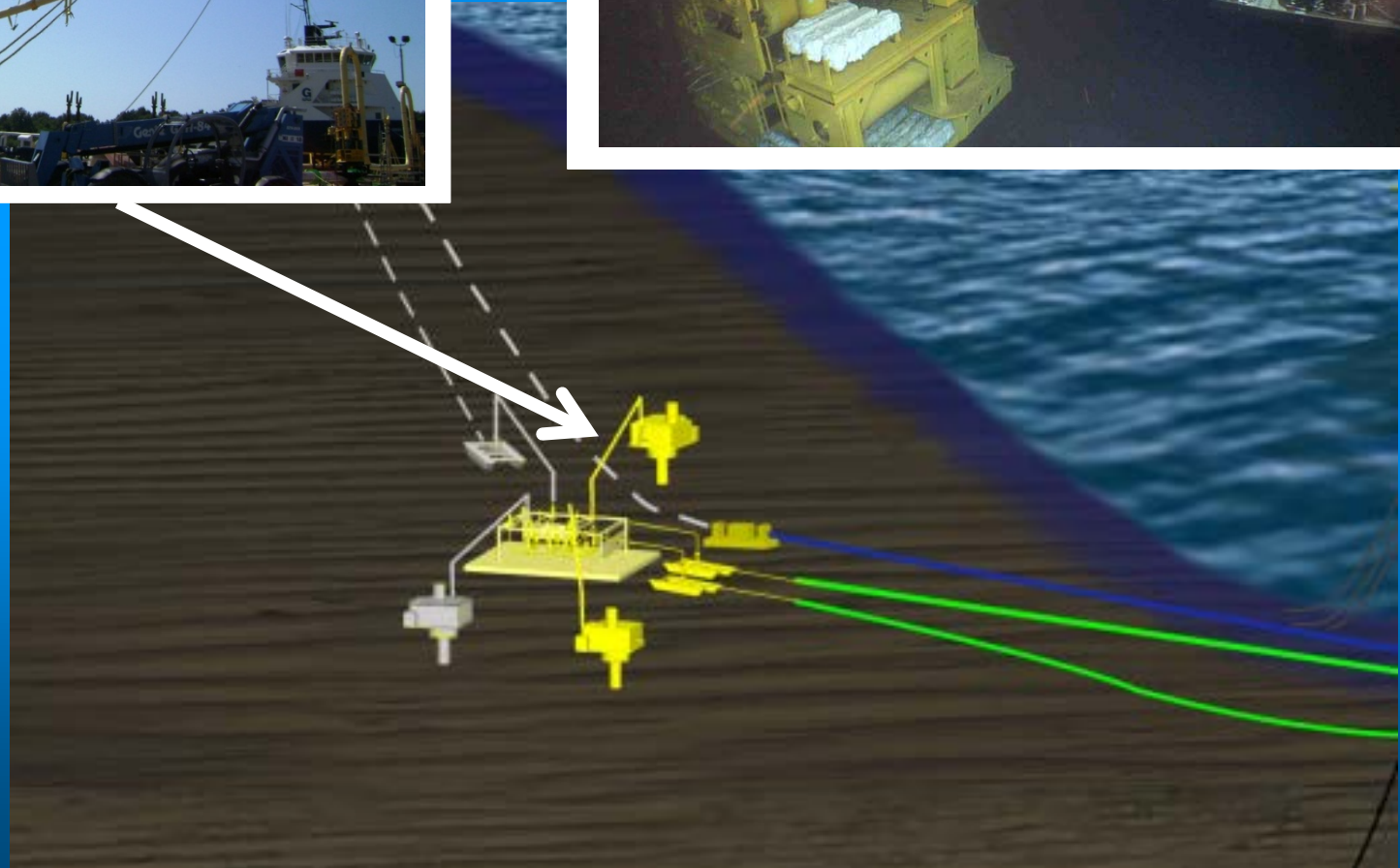


# Flowline End Termination

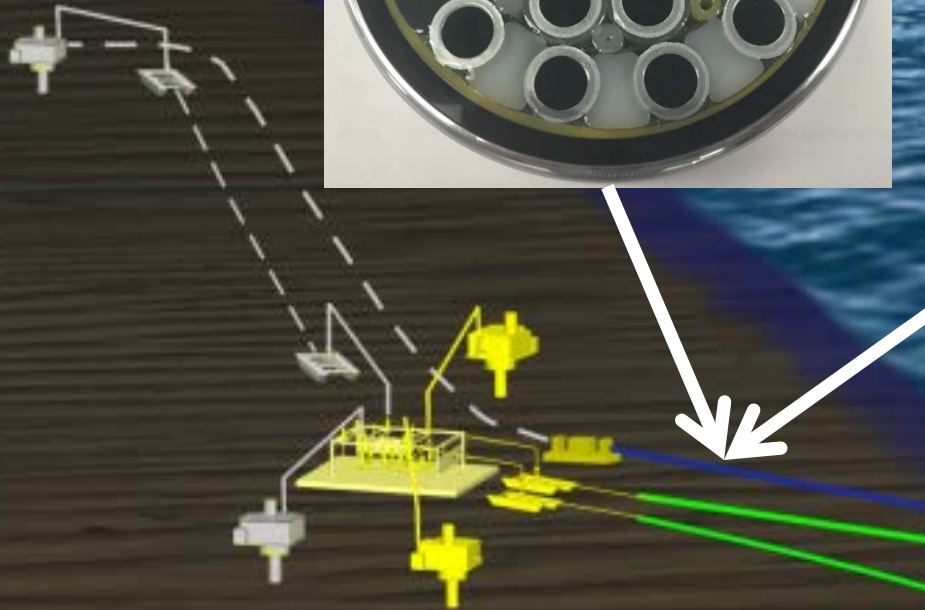




# Flowline Jumper

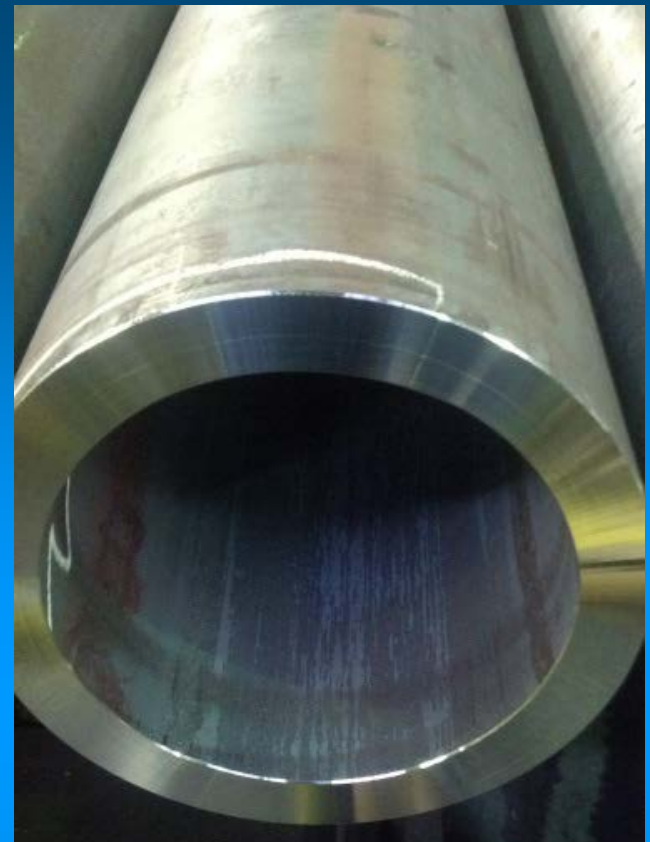


# Umbilical





# Pipelines



# Riser Installation



Heeled: 0.00 °  
Trimmed: 0.00 °



# Riser Installation



# Delta House Hull

July 13, 2013



December 9, 2013



December 19, 2013



January 2, 2014





# Delta House Hull



# Delta House Topsides





# Delta House Topsides



# Integration

## Delta House FPS

Integration Time Lapse Video



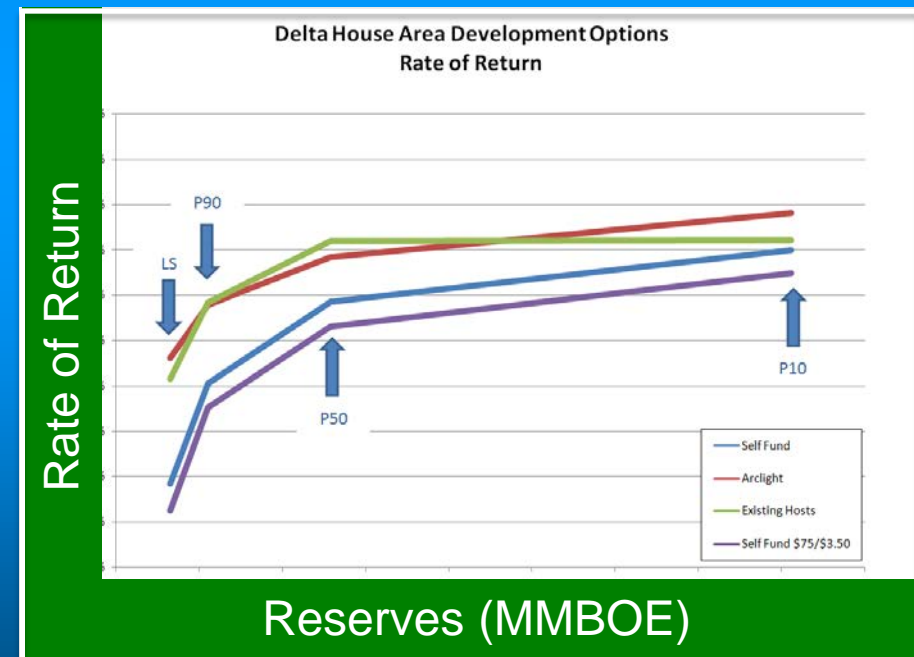
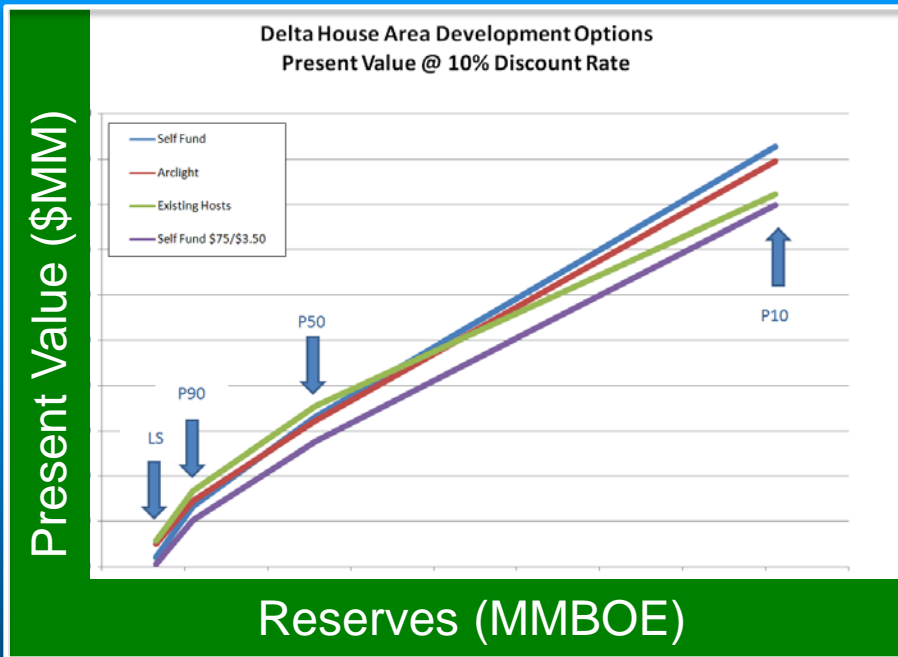
# Wet Tow



Photo courtesy Tim Burdick of Crowley Maritime

# Delta House – Infrastructure Financing

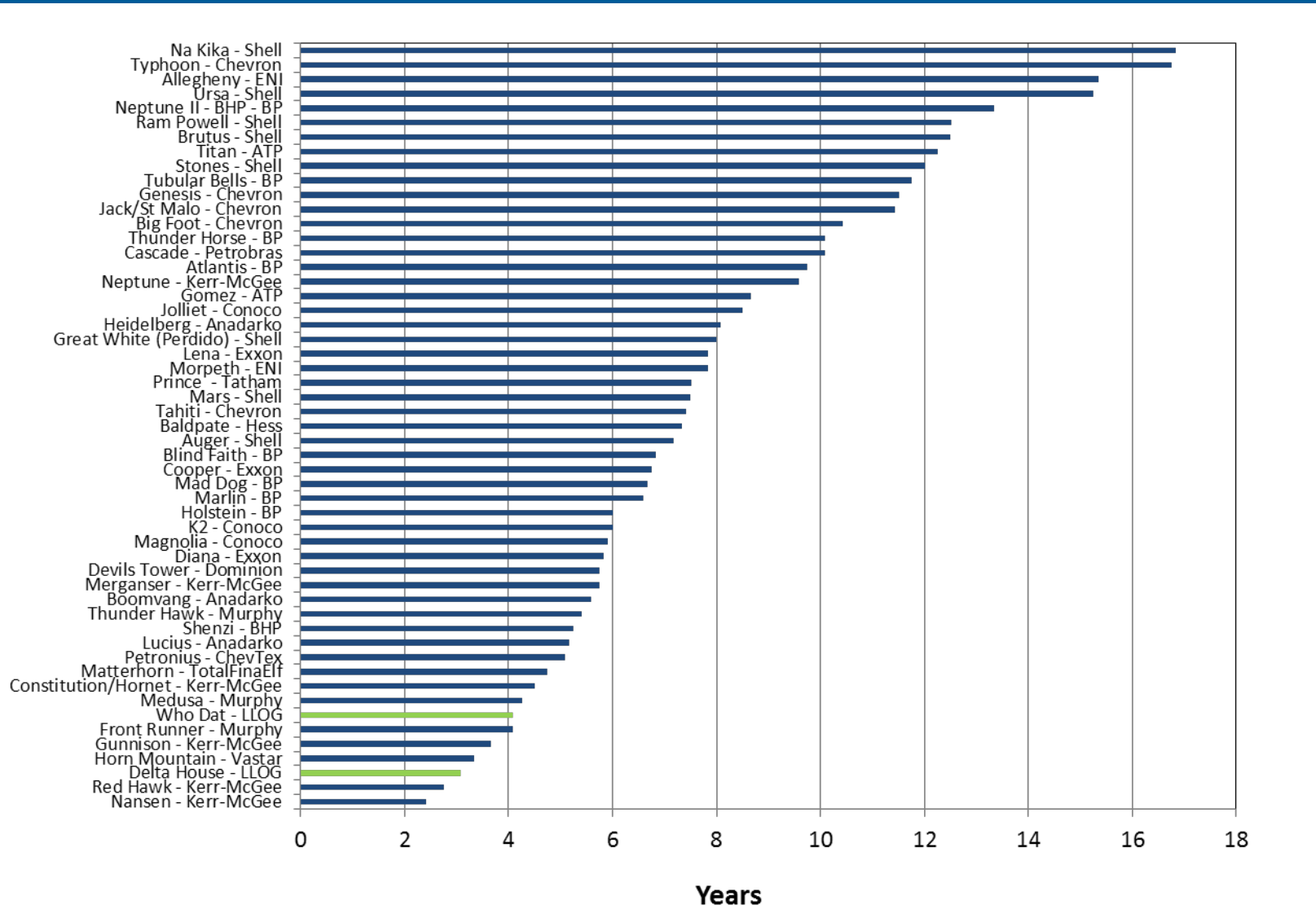
- Capital for FPS and export lines provided by private equity
- Reduced capital required by producers
- Reduced threshold which allowed earlier sanctioning
- No mortgage on the fields which allowed producers to have other debt





# GOM New FPS Projects

## Time from Discovery to First Production



# How can LLOG do it?

Safe, Low Cost, On Time, On Budget, High Quality

## Typical Industry

### Late Decision of Wet vs. Dry Trees

- Expendable wells

### Each FPS custom

- Design after discovery/appraisal

### Vendors chosen late

- Bid after design
- How much to build this?

### High Cost=High Threshold=Late Sanction

- Need many wells to sanction

### Decisions by Large Teams

- Weeks response typical

## LLOG

### All Wet Trees

- No expendable wells

### Design one, build many

- DH designed before discovery

### Early Vendor Involvement

- DH bid before discovery
- How can we adjust the design so you can build it faster/easier/lower cost

### Low Cost=Low Threshold=Early Sanction

- DH sanctioned with 2 wells
- Infrastructure financing reduced threshold

### On Site Project Manager with High Authority

- Hours response typical



# Future Plans

- LLOG has begun engineering for the next FPS
- Optimization work to increase available payload
- Additional Capabilities (increased export pressure, water injection)
- Drill exploration wells



# Contact Information

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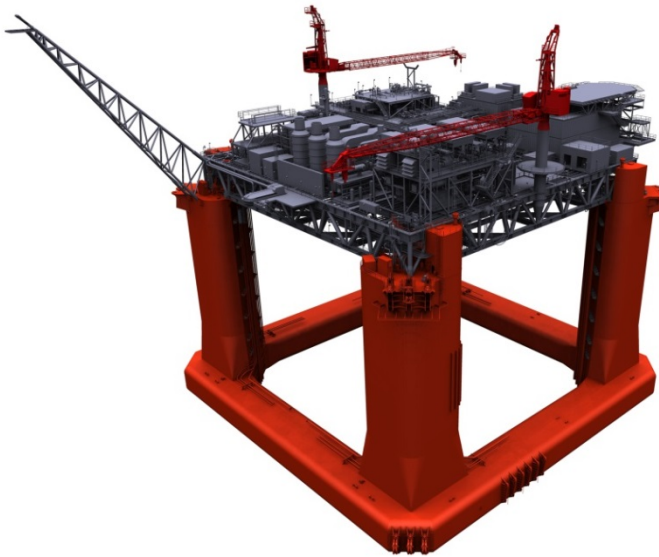


Backup

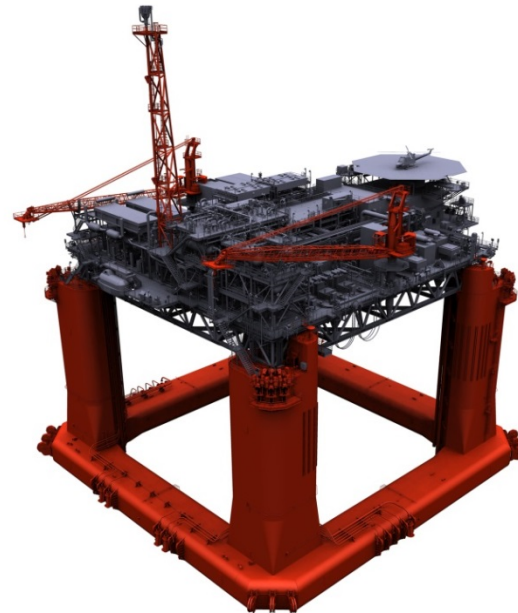
# Delta House – Why the Opti-ex design?

- Wet trees – separate drilling and production
- Similar to recently executed Who Dat project
- Flexible to 10,000' water depth
- Robust design for metocean conditions
- Quayside integration
- Single deck reduces schedule risk
- Reduced steel/easier to fabricate

Delta House



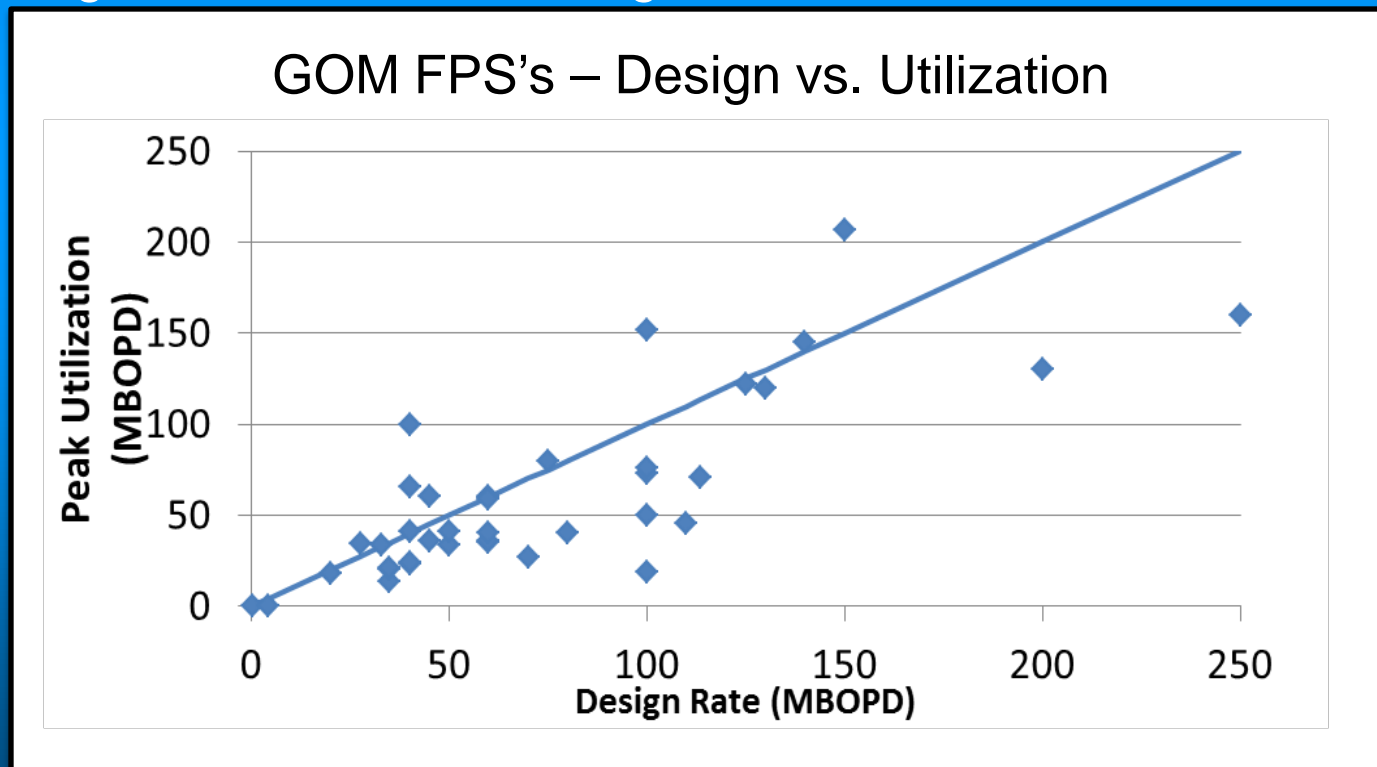
Who Dat





# Delta House – One Size Fits Most

- LLOG expected to build 10 units
- Capture learnings of each project
- Faster schedule
- Small incremental cost for bigger size
- Value of unused capacity
- Potential for expansion if capacity is too low
- Can design to handle a wide range of fluids



“And don't forget to have some fun!”





# Delta House Timeline

