

Deepwater Technology: Technical Assessment



[Click to see video.](#)



[Click to see video.](#)

Mike Conner

Minerals Management Service



[Click to see video.](#)



[Click to see video.](#)

What Is New Technology?

New technology – procedure(s) or component(s) that

- Have not been used in the GOM before
- Are an integral part of the hydrocarbon recovery plan or operation
- If found to be malfunctioning, may severely affect human safety, the environment, or energy conservation

Examples of New Technology

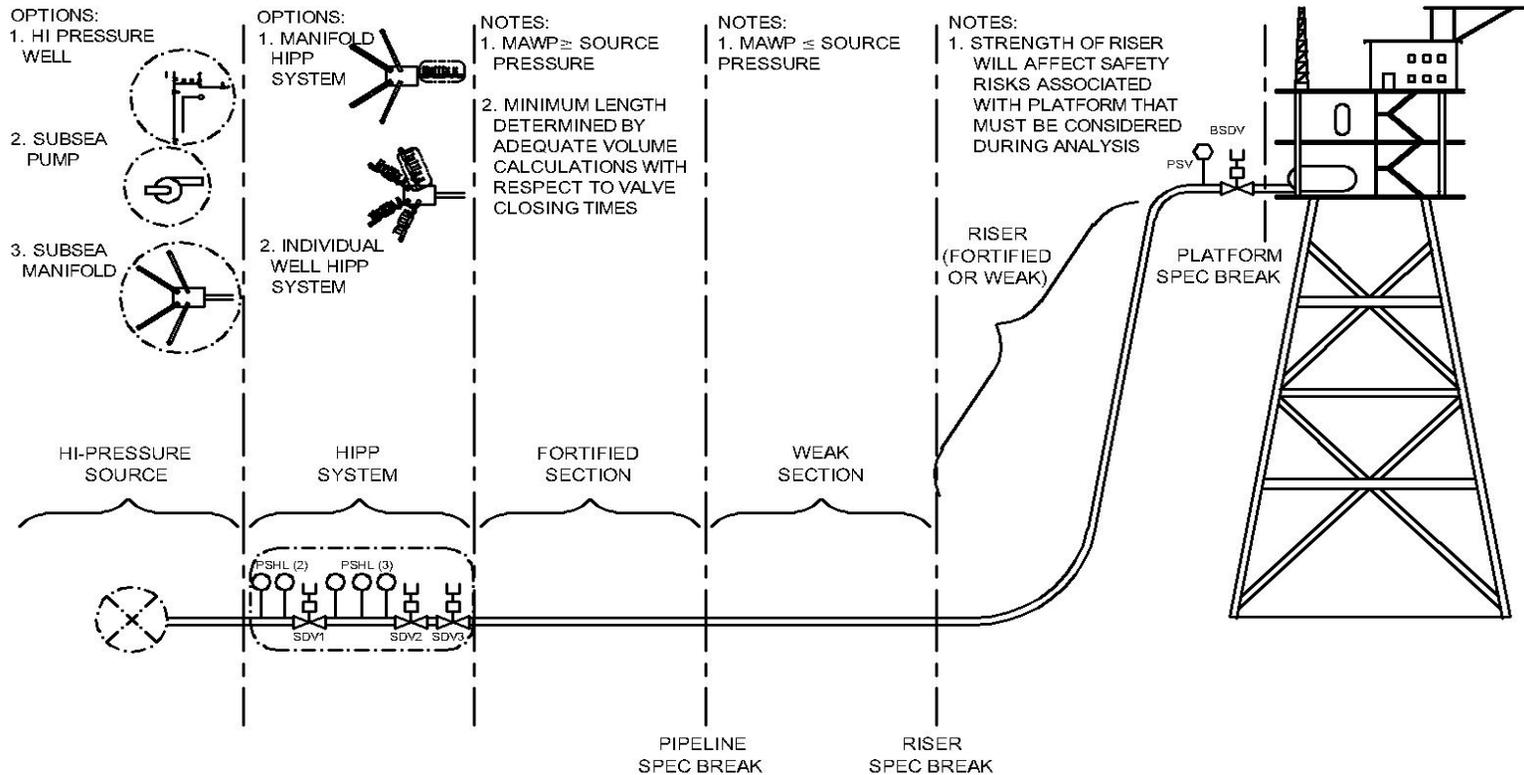
- FPSOs with disconnectable turrets
- Vertical production risers
- HIPPs
- Subsea separation – subsea pressure boosting
- Greater than 15,000 psi/350 degrees Fahrenheit
Subsea Completion Systems
- Managed pressure drilling/underbalanced drilling
- Casing drilling (drill liner)

How Does MMS Approach the Implementation of New Technology?

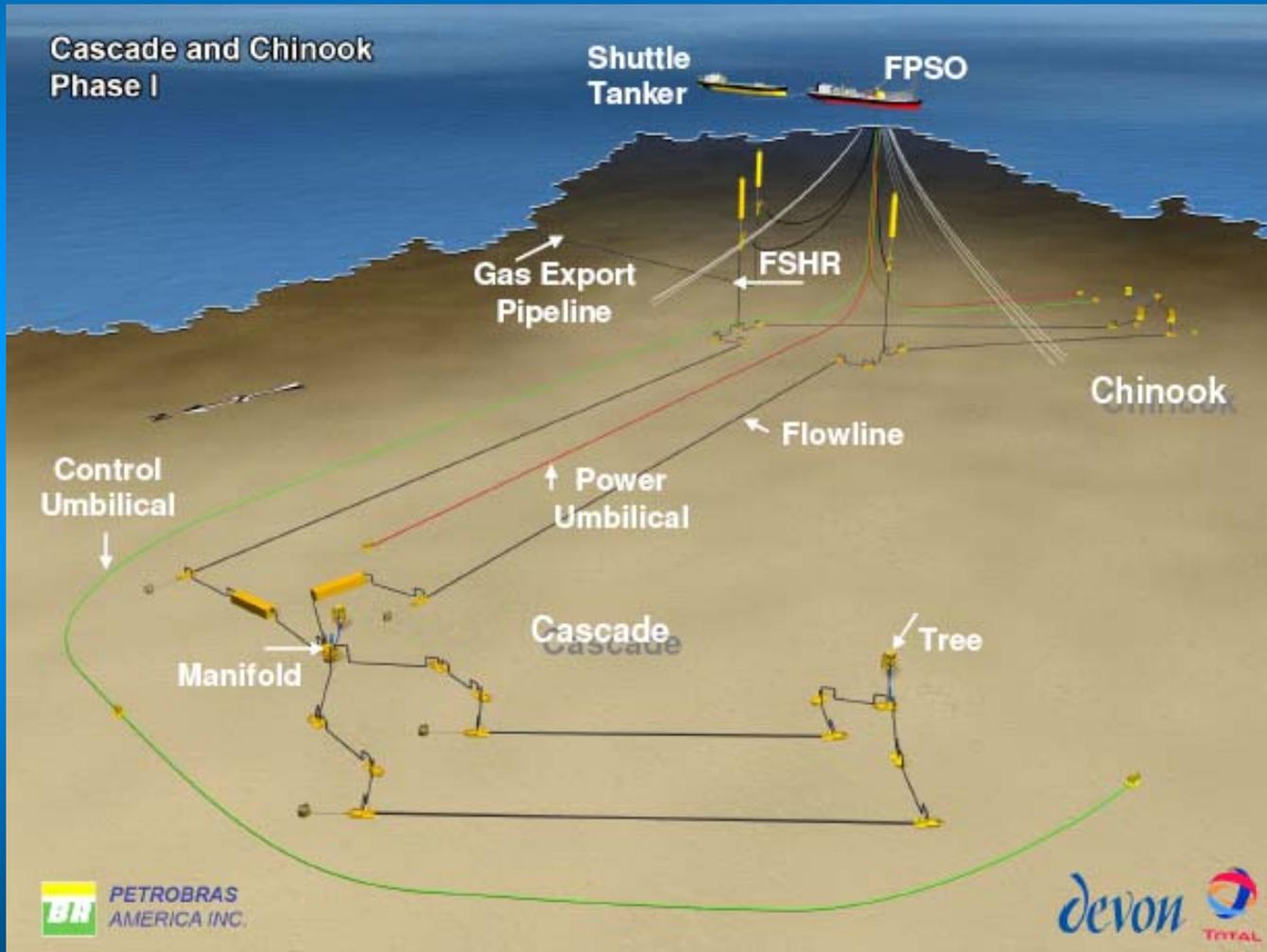
- Presently, new technology is reviewed on a case by case basis. MMS may:
 - Set a “line” that industry cannot venture
 - Work with the standards organizations to address new technology “fit for purpose” acceptance and verification
 - Require a third party evaluation
 - Require a risk assessment
 - Deny approval

THE GOOD

High Integrity Pressure Protection System (HIPPS)



Floating Production, Storage, and Offloading System (FPSO)



Courtesy of Aker Engineering

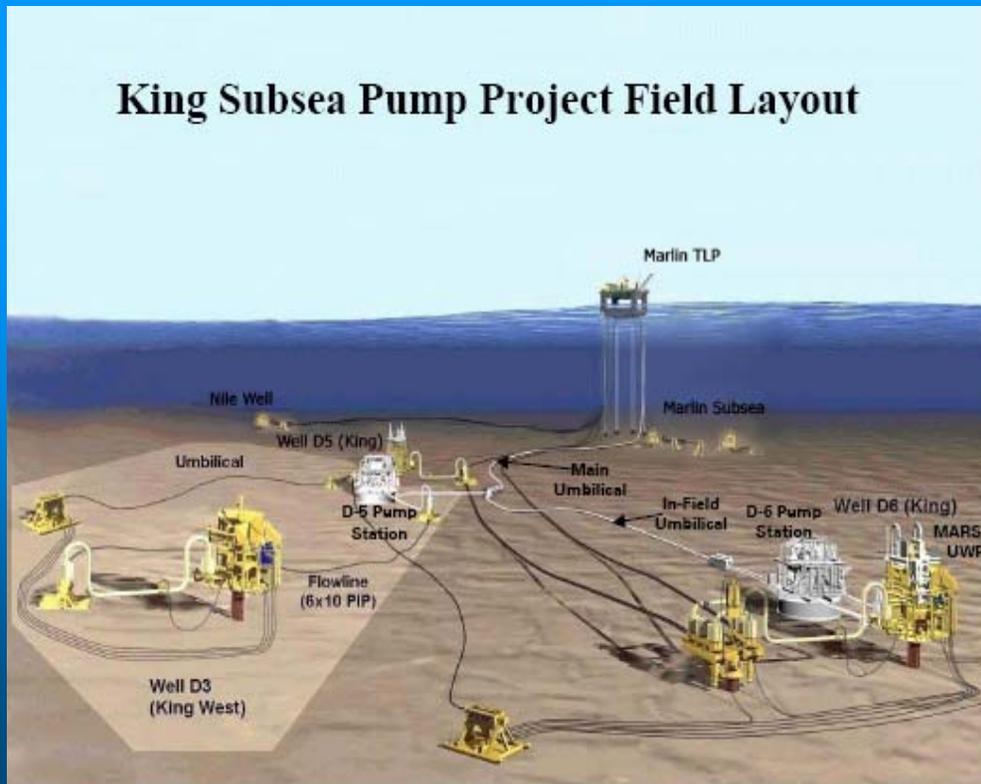
Subsea Boosting Systems

Shell Perdido

Petrobras Chinook/Cascade

BP Multiphase Subsea Pump

King Subsea Pump Project Field Layout



APPROVED:

2 - conceptual

1 - site specific

Verticle Riser Systems

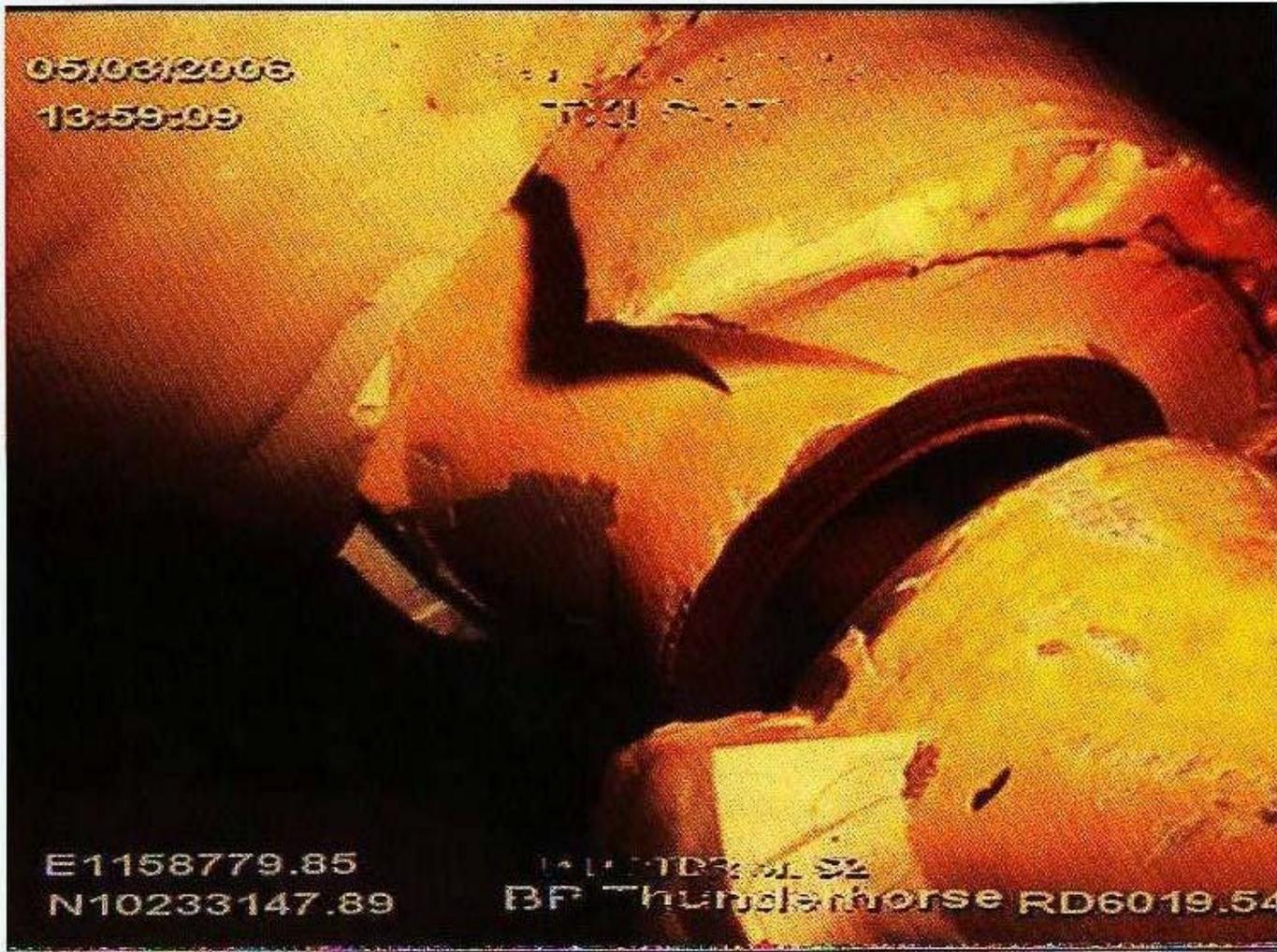
- Shell Perdido
- Petrobras Cascade/Chinook
- Others ...

Improving Guidelines Concerning

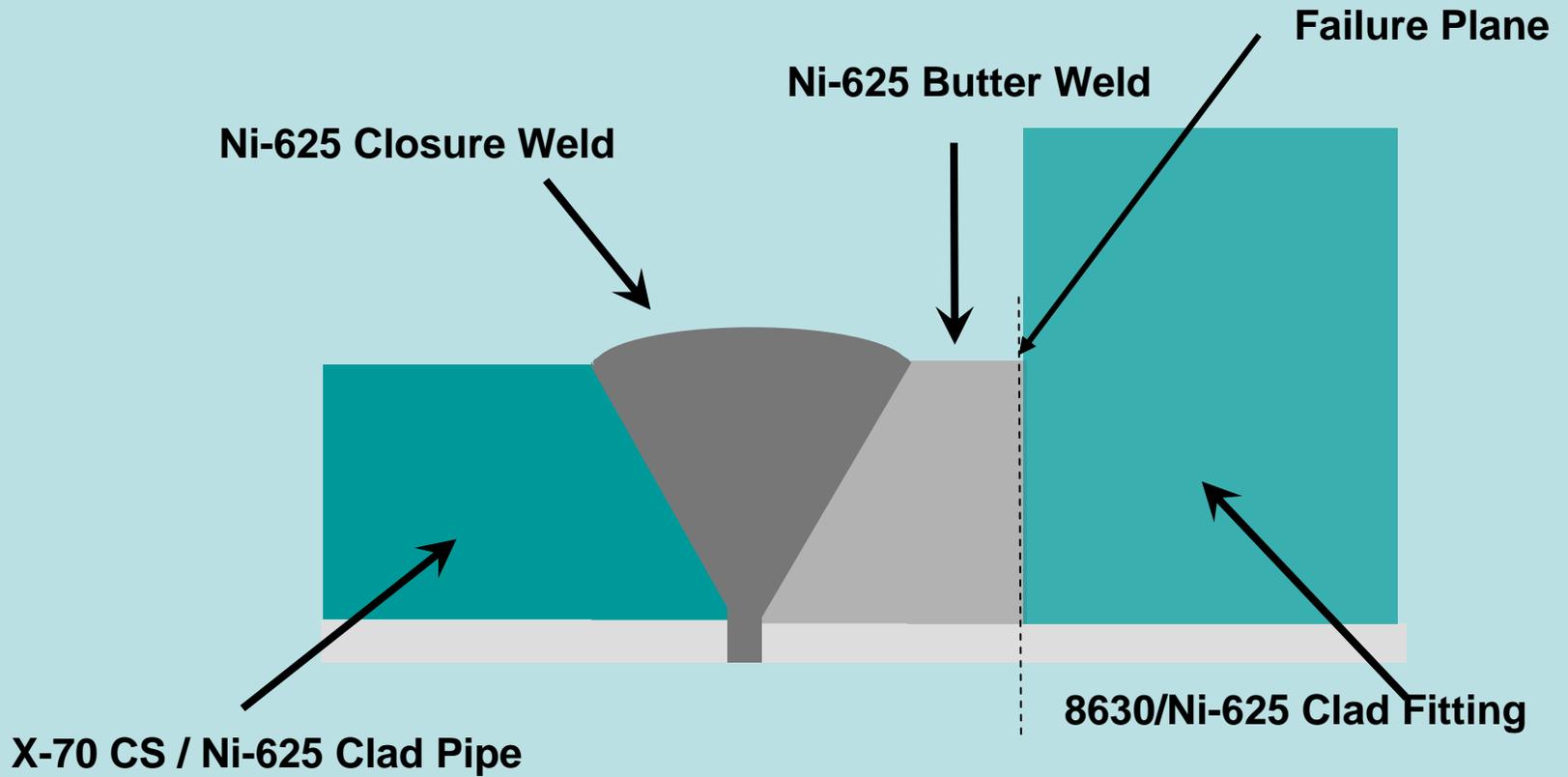
- Managed pressure drilling/ underbalanced drilling
- Polyester moorings use, testing, maintenance, and replacement
- Metocean criteria determination
- Surface BOPs on a floating vessels
- Coil tubing on floating vessels

THE BAD

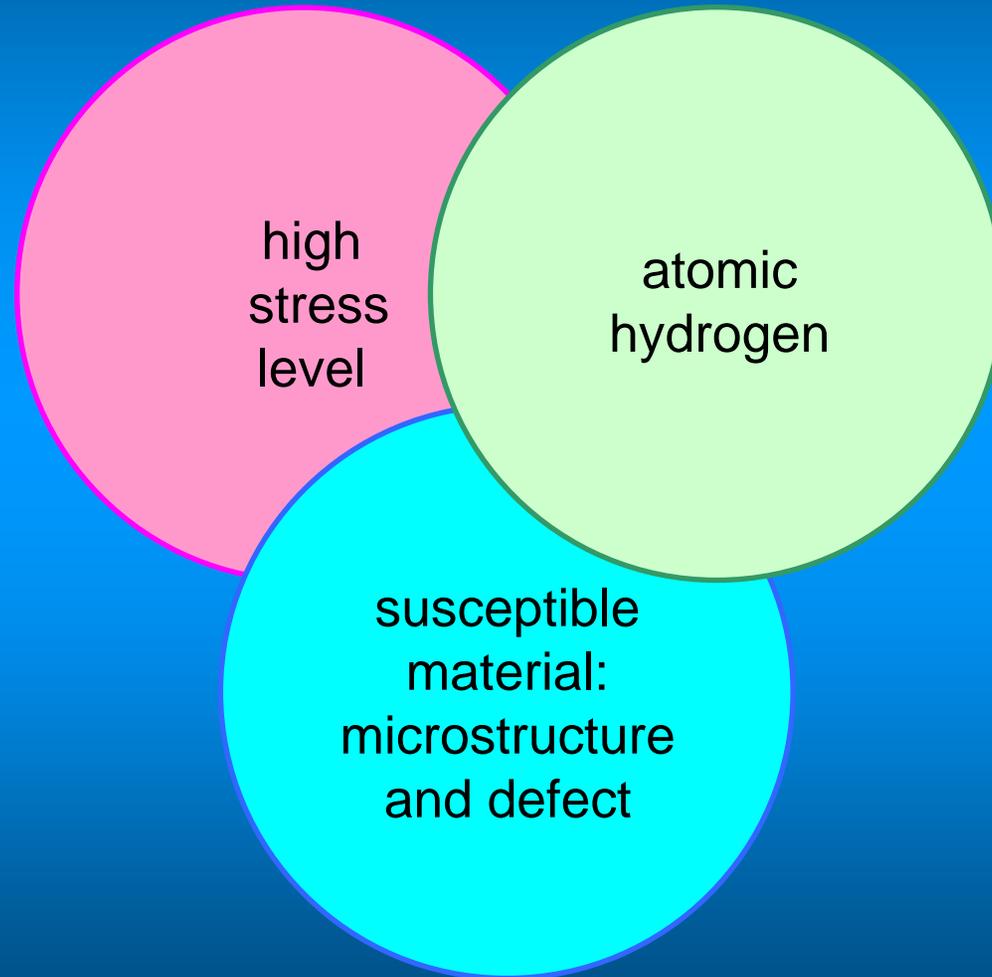
Thunder Horse Project Subsea Manifold Leak



Typical Layout

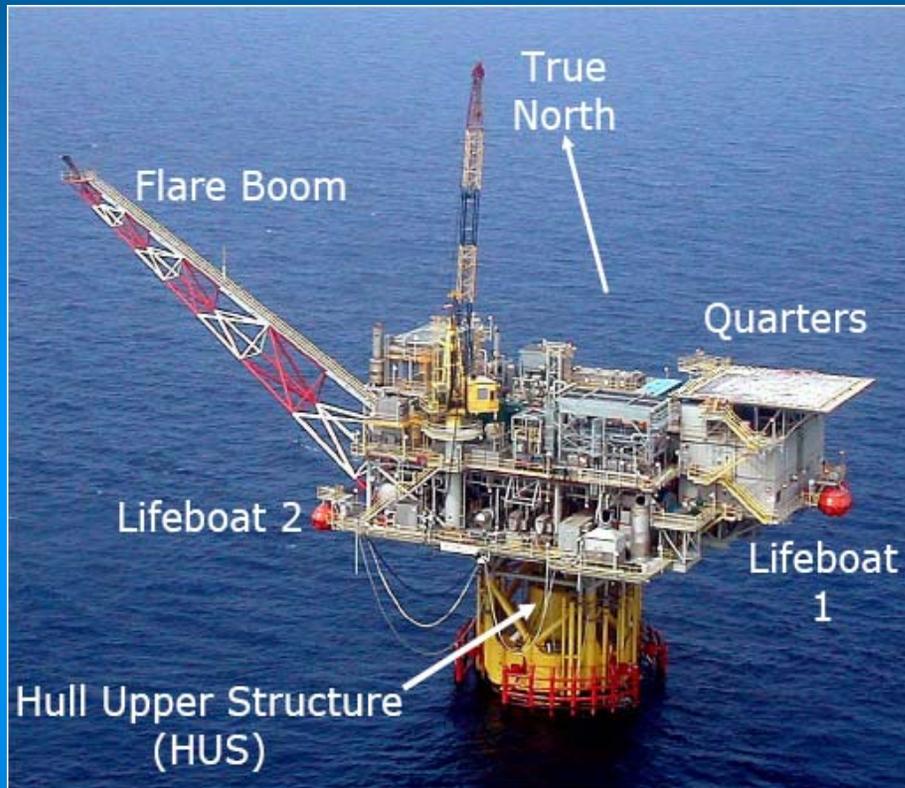


Hydrogen Induced Cracking

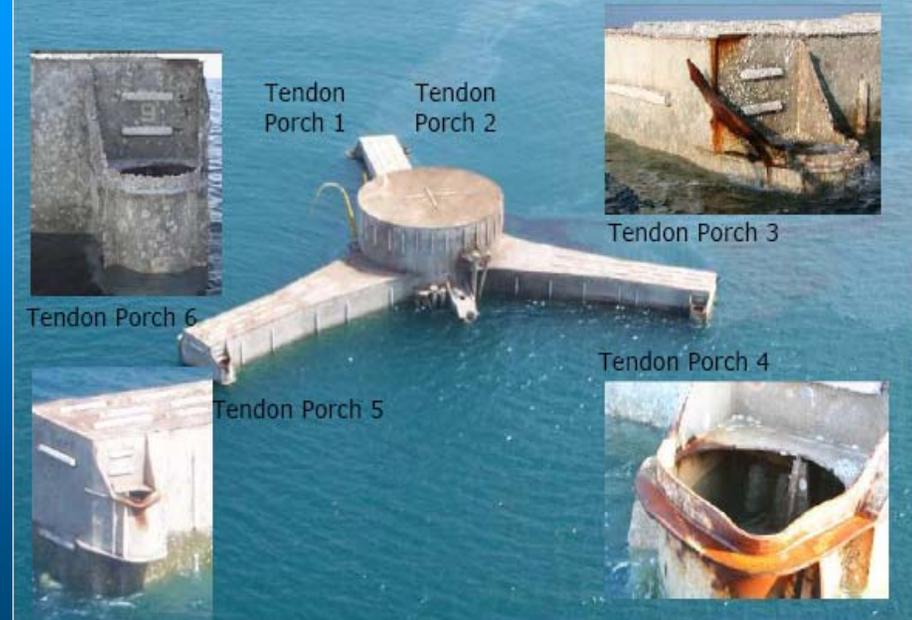


THE NOT SO GOOD

Typhoon



Major Damage on Tendon Porches 3, 4, 5 & 6



The Prize

Name	WD (ft)	Date	Additional Info
Exxon Guyed Tower (Lena)	1000	1983	1st guyed tower
Conoco Joliet TLP	1760	1989	1st TLP
Shell Cognac	1023	1978	Fixed platform
Shell Bullwinkle	1353	1988	Fixed platform
Placid Penrod 72	1540	1988	Decommissioned in 1989
Shell MARS TLP	2933	1996	TLP with greatest production
Onyx Neptune Spar	1930	1996	1st Spar
Independence Hub	8000	Not installed	Deepest Production Facility (semi)
Petronius	1754	2000	Deepest Compliant Tower
Mensa	5400	1998	Longest SS Tie-back (68+ miles)
Shell Perdido	8500	Not installed	Deepest Spar

The Prize

Other Records				MD (ft)	TVD (ft)
Deepest Well Drilled:	Nexon	GC 512	Knotty Head Prospect	34,189	34,067
Longest Well Drilled:	Nexon	GC 512	Knotty Head Prospect	34,189	34,067
Longest Extended Well Test:	Chevron	WR 758	Jack Prospect	7250 wd	
Current Longest Producing Well:	Chevron	VK 786 (into block 830)	Petronius field	31,020	11,628
Future Production in Deepest Water:	Anadarko		Independence Hub	9200 wd	

THE DW PRIZE

- At the end of November, Shell surpassed 1,000,000,000 boe in subsea production from the Gulf of Mexico (for you fine print lovers, and you know who you are, this is Total Gross production from Shell operated GOM deepwater subsea properties). This has been 12 years in the making, starting with the first Tahoe well back in 1994. Subsea wells were, at the time, a huge technological step. Since then, they have been the means of opening up entire fields throughout the deepwater Gulf to cost-effective development. In those 12 years since 1994 Shell has produced from 20 subsea developments and 56 subsea wells. In the first half of 2006, subsea production accounted for almost 50% of Gulf of Mexico production.

[Click to see video.](#)

[Click to see video.](#)



© KURT JONES 2003