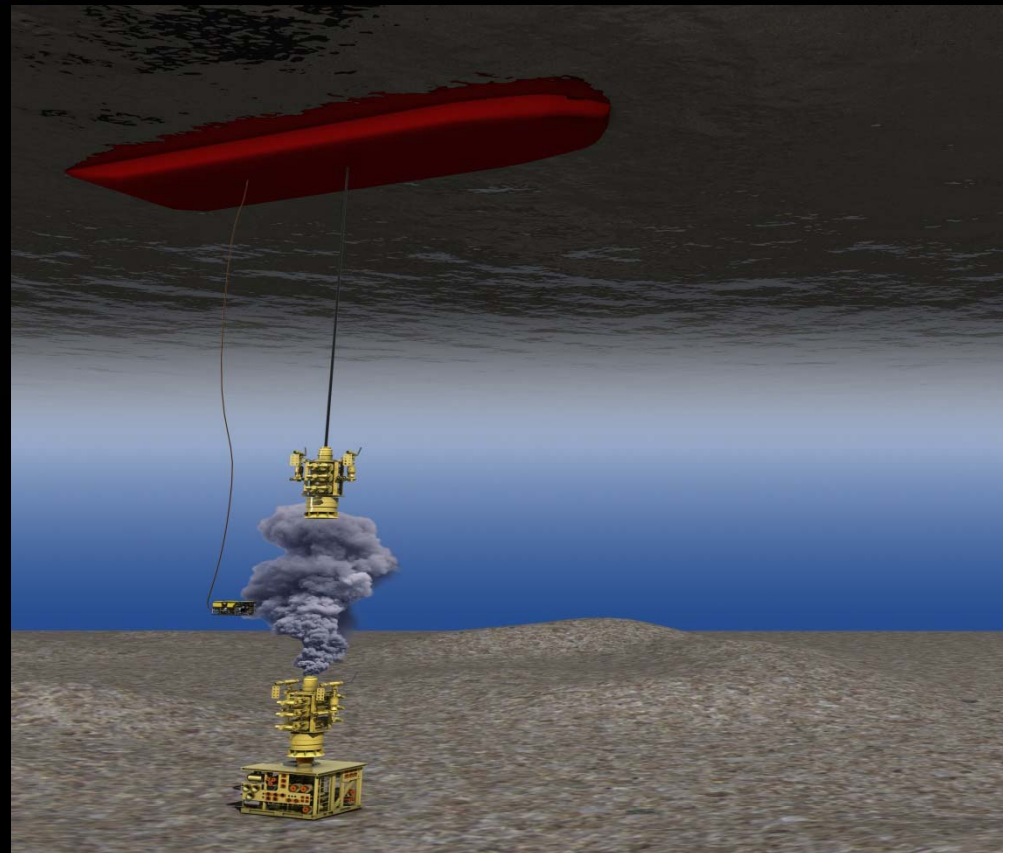


AADE – Houston Chapter Deepwater and Emerging Technologies Group

26 January 2011



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BOEMRE Compliance Guidelines

- Department of Interior's
Increased Safety Measures for Energy Development
on the Outer Continental Shelf, May 27, 2010
- NTL 2010-N05, Superseded by Drilling Safety Rule
- NTL 2010-N06, June 18, 2010
- NTL 2010-N10, November 8, 2010
- BOEMRE's Drilling Safety Rule (Interim Final Rule),

NTL 2010-N05

- NTL 2010-N05

There were many clarifications required after presenting NTL 2010-N05. The Drilling Safety Rules (or Interim Final Rule) followed and provided the necessary clarifications and codified all the relevant points of NTL 2010-N05.

NTL 2010 – N06, dated June 18, 2010

Information Requirements for Exploration plans, Development and Production plans, and Development Operations Coordination Documents on the OCS

- Blowout Scenario – to include
 - Maximum flow rate
 - Worst case discharge
 - Potential to bridge
 - Potential for surface intervention
 - Potential for Relief Well
 - Estimated Time Frame
- Measures that will enhance the Operator's ability to prevent a blowout, reduce the potential of a blowout , and conduct an effective and early intervention

NTL 2010-N10, dated November 8, 2010

Statement of Compliance with Applicable Regulations and Evaluation of Information Demonstrating Adequate Spill Response and Well Containment Resources.

- Operators must submit a statement, signed by a authorized company official, stating that the Operator will conduct all authorized activities in compliance with all applicable regulations. Statement must be submitted with application.
- Operator must demonstrate that Operator has access to and can deploy containment resources that would be adequate to promptly respond to a blowout or other loss of control.

Drilling Safety Plan

Appendix A

Provides additional details regarding –

- Plan (EP or DOCD) Contents
- General Information for Permit
- Waste & Discharge Information
- Oil Spill Information
- Support Vessels and Aircraft information
- Onshore Support Facilities

Drilling Safety Plan

Appendix B

Provides additional clarification of requirements –

- API RP Language – replace “should” with “must”
- Application for Permit to Drill – Requirements for
 - Casing and Cementing
 - Subsea BOP
 - Pressure Testing of Casing
 - BOP Maintenance and Inspection
 - Well Completions. Re-Completions and Workover
 - Permanently Plugging Wells
 - Temporary Plugging Wells

Drilling Safety Plan

Appendix C

Details requirements for -

- Statement of Compliance
- Operator demonstrating that it has access to and can deploy surface and subsea containment resources that would be adequate to promptly respond to a blowout or other loss of well control.
 - Containment Plan should address
 - Debris Removal
 - Subsea Containment
 - Subsea Dispersant Injection Equipment
 - Riser Systems
 - Remotely Operated Vehicles (ROVs)
 - Capture Vessels
 - Support Vessels
 - Storage Facilities

Scenarios To Consider

- What are the scenarios?
 - Rig remains floating.
 - Rig has sunk on top of the wellhead.
 - Rig has sunk off to one side of the wellhead.



Scenario 1

Rig Remains
Floating

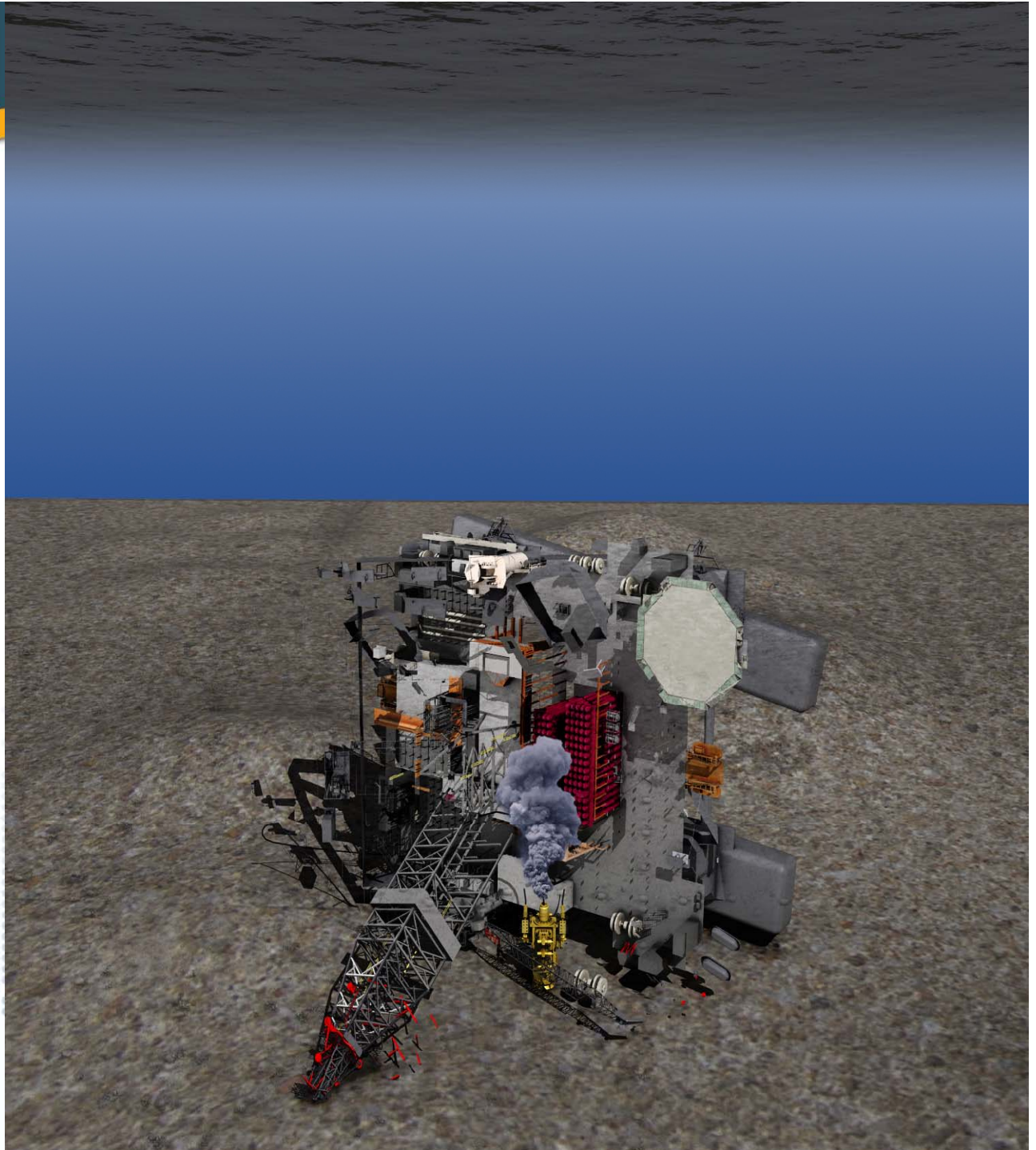
Surface
Intervention
to be Attempted



Scenario 2

Rig Sinks
On Top Of BOPs
and Wellhead

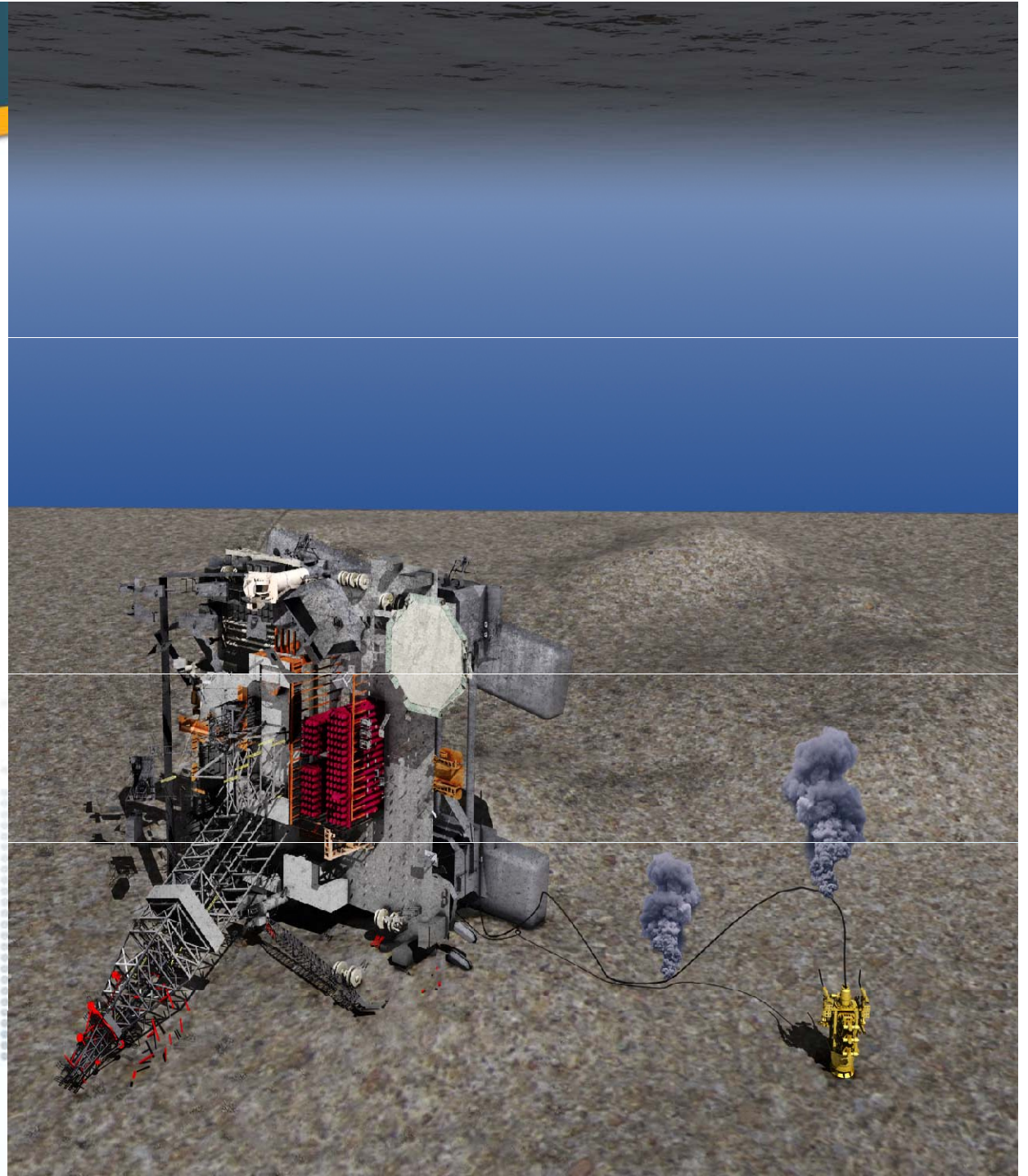
Relief Well
Only Viable
Solution



Scenario 3

Rig Sinks At
Distance From
BOPs and
Wellhead

Commence
Subsea
Intervention
And
Relief Well



Today's Discussion

Focused on Meeting BOEMRE's Requirements For -

- Debris Removal
- Subsea Containment and Capture Equipment
 - Containment Domes
 - Capping Stacks
- Subsea Utility Equipment
 - Hydraulic Power
 - Hydrate Control
 - Dispersant Injection Equipment

Scenario 3 Is Most Likely

- The initial focus in any well control event – onshore or offshore – is to gain access to the wellhead. That is where control of the well will be regained..
- So, the first effort is to remove the debris from the wellhead area and gain access to the BOPs and wellhead. This effort requires special subsea Debris Removal Equipment and Procedures for same.
- To do this, hydraulic shears and diamond wire cutters will be employed to cut marine riser and other debris from the area in order to gain ROV access to the BOPs and wellhead .

Debris Removal Equipment - Hydraulic Shears



Shears

46,000 lbs
18 ft x 9 ft

Up to 35" Diameter
Shear Force 5,000psi

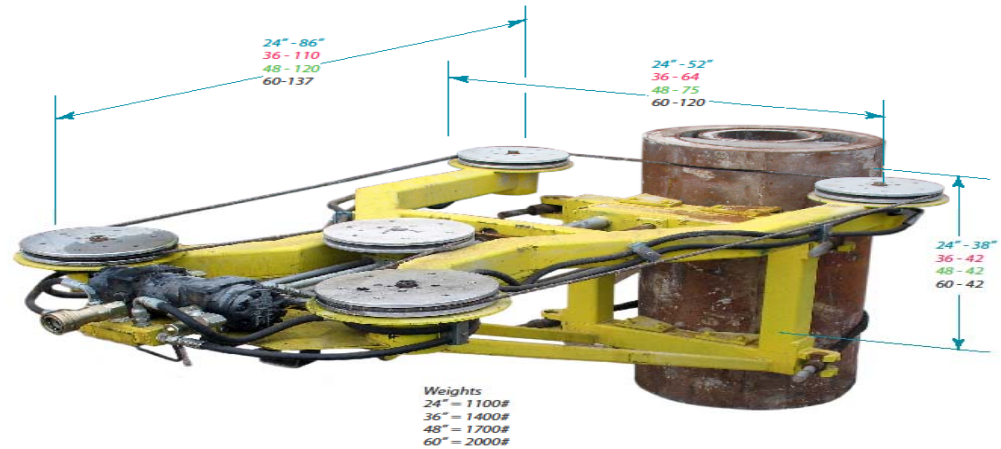


BP, p.l.c.

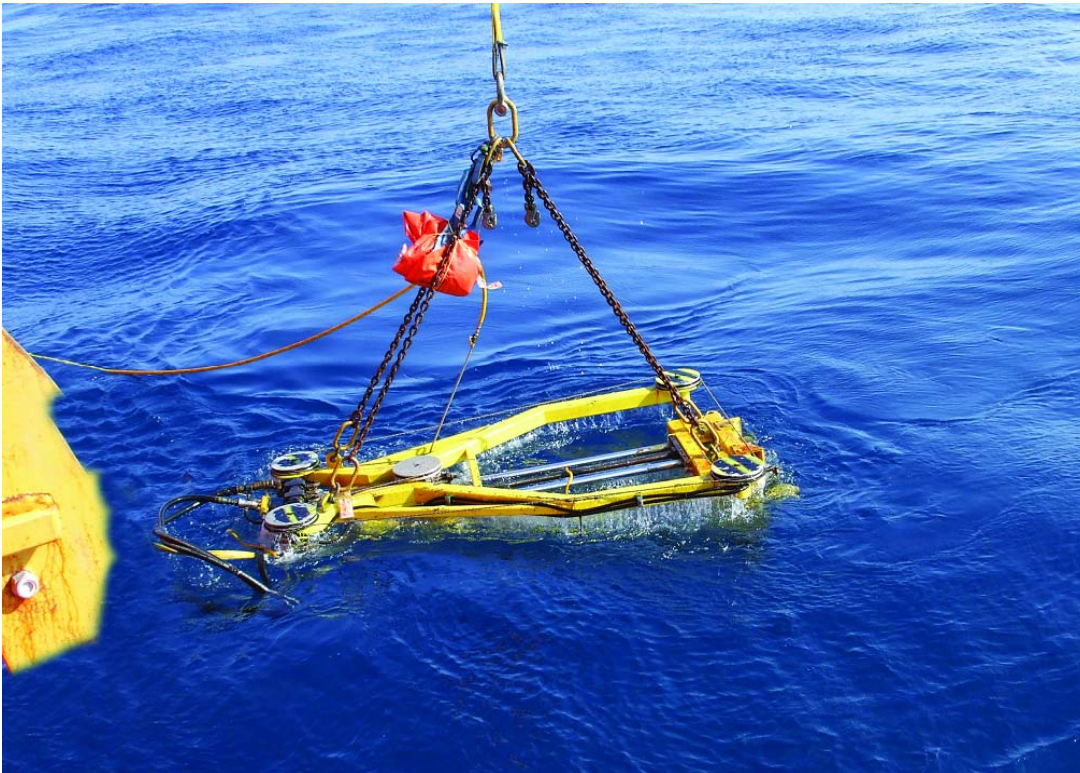


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Debris Removal Equipment – Diamond Wire Cutters



Up to 46" Diameter



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Diversion Cap

- A Diversion Cap (“Top Hat”) may be initially used to temporarily contain and divert the flow to the surface.
- Includes injection ports for dispersant and methanol.



Practical Experience with Capping

Capping Solution = Mathematical Model + Practical Experience

- Mathematical Model
 - Capping subsea wells using capping assembly with smaller ID is mathematically possible.
- Practical Experience
 - The smaller ID poses unnecessary risks and adds to the chances of failing.
 - The use of full bore capping assembly –
 - Allows full access to the wellbore
 - Maximizes visibility.
 - Creates less turbulence.

The industry requires a full suite of capping tools to meet the variety of scenarios.

Capping Concerns

Concerns for capping an uncontrolled flow from 18-3/4" , especially with smaller ID capping assemblies.

- Containing Sonic Flow
- Maintaining Visibility
- Sufficient Snub Force
- Possible Hydrates



Today's Priority

GET PERMIT APPROVED AND GET BACK TO DRILLING!

Our Concerns –

Lack of attention to the detailed BOEMRE requirements.

And BOEMRE's continuous defining and re-defining of these requirements.

Although a growing global issue, focus is on GoM only at this time.

Inability of Operators to align internally on issues.

States –

Operator “...has submitted adequate information demonstrating that it has access to and can deploy surface and subsea containment resources that would be adequate to promptly respond to a blowout or other loss of well control.”

States –

Operator “...has submitted adequate information demonstrating that it has access to and can deploy surface and subsea containment resources that would be adequate to promptly respond to a blowout or other loss of well control.”

What does “has access to” mean?

- Knowing who to call?
- Has MSA with service company?
- Has physical access to most of the resources?, or
- Has a dedicated complete resource for an immediate response?

OPERATOR'S Containment Plan

- Must Incorporate An Integrated Containment System
 - Dedicated Equipment
 - Proven Detailed Procedures
 - Experienced Personnel
- Must Be Dedicated Assets
 - To ensure availability when needed
- Must Be A Long Term Solution
 - Requires Long Term Commitment
- Must Meet All of Operator's Needs
 - Both Domestically and Globally

Wild Well Control's Total Deepwater Solution™

A Totally Integrated Containment System for Subsea Well Control Events

TOTAL DEEPWATER SOLUTION™ Subsea Well Incident Response



GLOBAL EXPERIENCE & RESPONSE

UNMATCHED EXPERIENCE, DEDICATED RESOURCES, AND INTERNATIONAL CAPABILITIES ALLOW WILD WELL CONTROL TO OFFER THE TOTAL DEEPWATER SOLUTION™ PACKAGE TO MEET OPERATORS' EXPECTATIONS AND ALIGN WITH THEIR CONTINGENCY PLANS IN RESPONSE TO A SUBSEA WELL CONTROL EVENT ON A GLOBAL BASIS.

EQUIPMENT IN STATE OF READINESS

- 18 3/4 15K Subsea Capping Stack
- Subsea Dispersant Injection System
- Debris Removal Equipment
- Firefighting / Heat Suppression Equipment

ENGINEERING

- Source Control Management System
- Well Planning & Permitting Support
- Preliminary Relief Well Planning
- Dynamic Kill Modeling

EMERGENCY RESPONSE

- Dedicated Response Center
- Emergency Preparedness Drills
- Logistical Planning
- Experienced Well Control Personnel



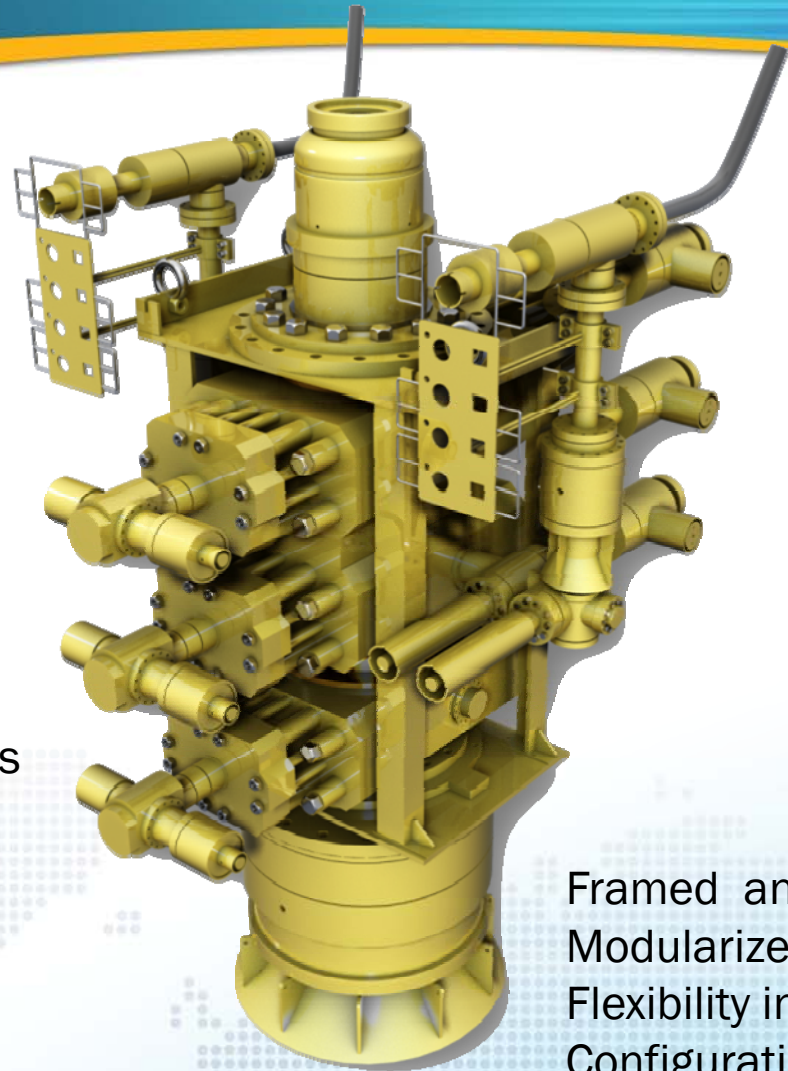
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A SUPERIOR ENERGY SERVICES COMPANY

Dedicated Equipment Listing

- 18.3/4" 15k 3 ram Cameron TL BOP
 - Single Ram with ST Lock
 - Double Ram with ST Lock
- 18.3/4" 15K Drilling Spool with 4 Outlets
 - Double Valves
 - Subsea Choke Assemblies (2)
 - Vertical Connectors (2)
 - Temperature/Pressure Sensors
 - Transducers
 - Hydrate Injection Ports
- Subsea Accumulator
- Control Panel
- Connectors HC (2) and H4 (1)
- Subsea Dispersant System
- Diversion Cap ("Top Hat") System
- Debris Removal Tools
 - Subsea Hydraulic Shears
 - Subsea Diamond Wire Cutters



Framed and
Modularized for
Flexibility in
Configuration
and Air Transport

**Wild
WellControl**

Total Deepwater Solution™

Also Includes -

- Dedicated Emergency Response Center (Houston)
- Ancillary Equipment
- Response Preparedness
 - Emergency Drills
 - Logistical Planning
- Experienced Well Control Personnel
- Incorporation of Wild Well Control's Subsea Containment Management System©
 - Bridging Document into Operators Response System

What Philosophies / Beliefs Confirmed

- Principles of capping a well remain true.
 - Clear debris from wellhead.
 - Assessment of wellhead and BOPs.
 - Cap well using highest probability of success methodology.
- Subsea events are still well events.
 - Utilization of ROV's instead of people.
 - Containment equipment is very large and heavy.
 - Maximum coordination of many sim-ops required.
- Response Plan is an absolute must.
 - Clearly identifies decision makers.
 - Identifies required interfaces.
 - Identifies required resources.

Lessons Learned

- Involves extremely complex sim-ops.
- Decision making roles are continually evolving. Must be decisive and aggressive in decision making.
- This is not a single company's problem, but an industry problem that requires the whole industry for the solution. Must utilize the expertise and experience of multiple disciplines.
- Must plan for a 100 day event. Must continually look forward – with contingencies.
- New media avenues, on global basis, to contend with - having much greater impact.
 - Blogs
 - Twitter
 - Facebook
 - Mainstream News
 - Government Reports



Thank You.

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