

# Deepwater Well Intervention Vessel



**HOUSTON**

2007



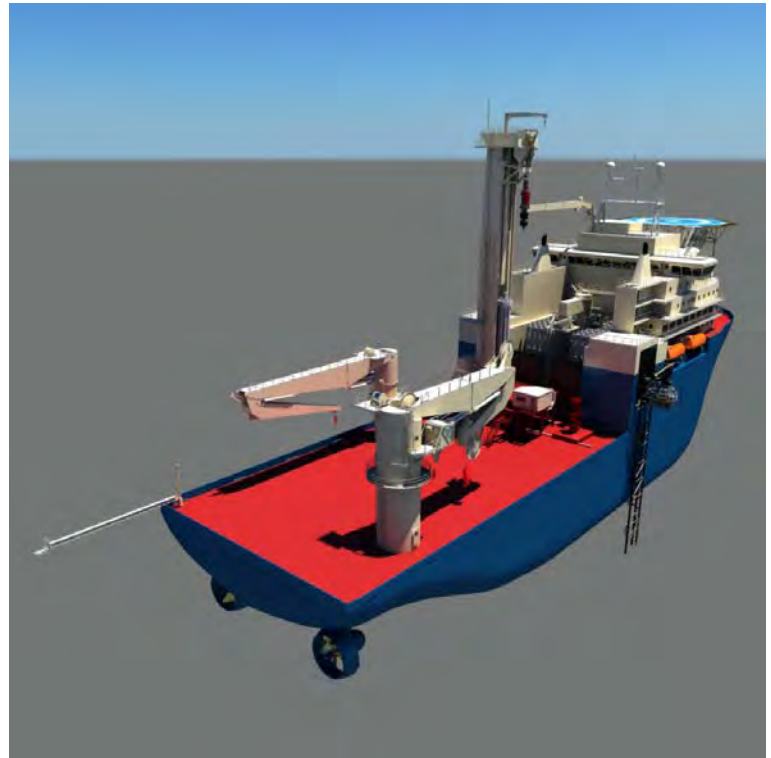
NAUTILUS CONTRIBUTION: Designer

OBJECTIVE:

Provide drilling equipment and functionality expertise to design a minimal space deepwater, 7,500 foot capable, well intervention vessel.

PROJECT:

Nautilus provided the expertise to assist IntecSea design a deepwater, minimal space well intervention vessel. Nautilus was provided a basic ship shape, capability requirements and size constraints and ask to specify and arrange the drilling components. Various vendors were engaged to find creative ways to minimize space. Drillfloor and moon pool logistics were thought out and creatively managed into the total design.



DELIVERABLES:

● **Phase I: Define the Scope of Work and Functional Design**

- Review Basis of Design.
- Define the area required for drilling equipment.
- Assist marine engineers with allocating ship space and drilling areas.

● **Phase II: Select and specify drilling components**

- Specify drilling equipment to meet the required specified capabilities.
- Determine total weights and sizes for space on the vessel.
- Engage equipment providers to integrate their systems into the vessel.

● **Phase III: Finalize Design.**

- Work with marine and riser engineers to finalize positions of equipment.
- Finalize riser and moon pool arrangements and activity plans.
- Complete integration of drilling equipment with vessel.

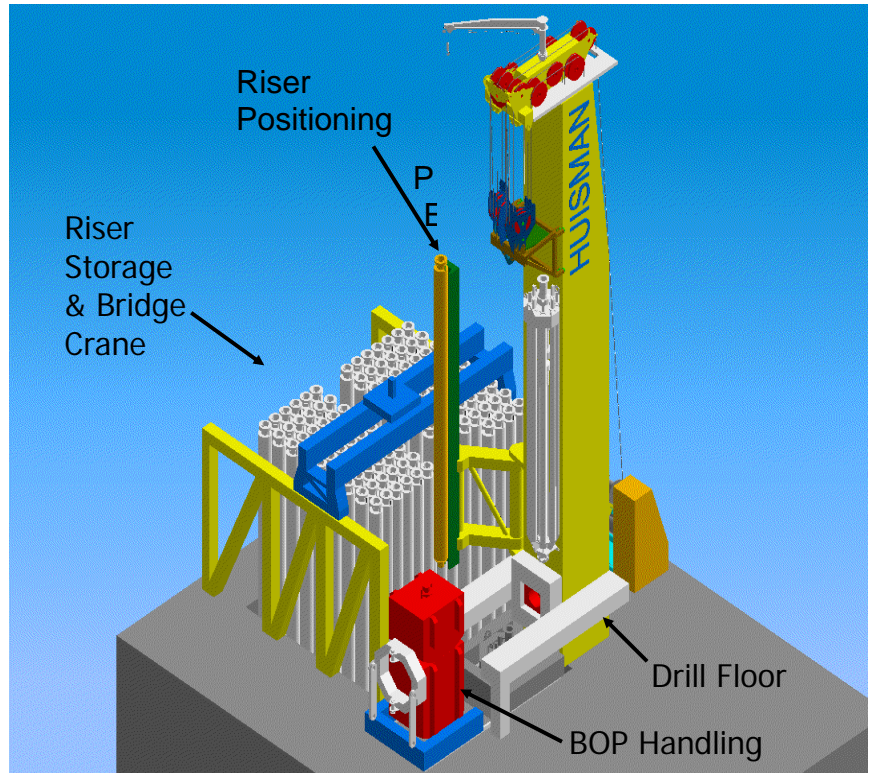
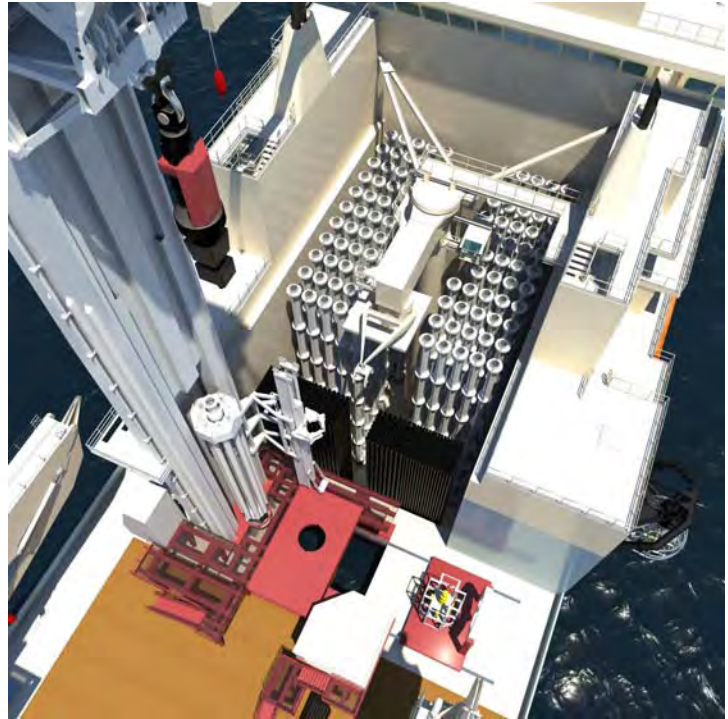
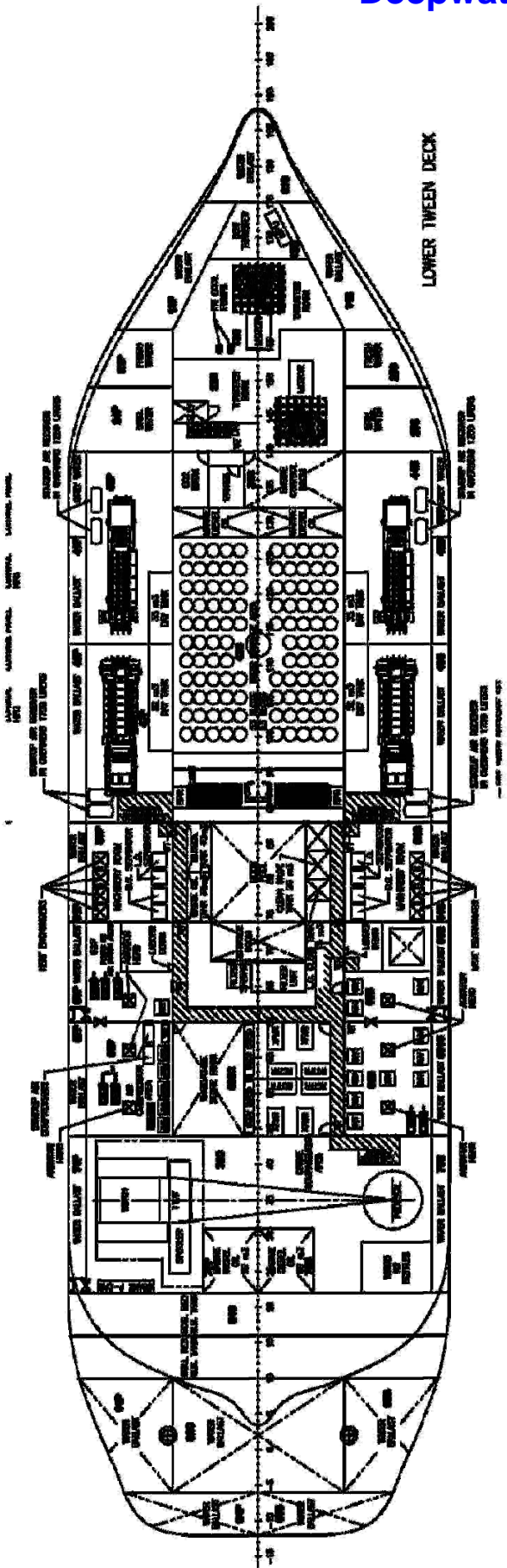
RESULTS:

A highly effective minimal space well intervention vessel was conceptualized and designed. IntecSea provided Mearsk with a final package, which was internalized by Mearsk to market to the industry.

CONTACT REFERENCE:

Bill Greiner, Project Manager, IntecSea: Houston, Texas (281) 579-9700.

# Deepwater Well Intervention Vessel



# Load Reduction Analysis



*Broussard, Louisiana  
October, 2002*

**NAUTILUS CONTRIBUTION:** Project Manager / Developer (Feb, 2002 to October, 2002)

## **OBJECTIVE:**

Develop rig enhancements to save space and reduce payloads on jack-up fleet upgrades with the intended goal of enabling greater competitive marketing advantages.

## **PROJECT:**

Nautilus was commissioned to develop an upgrade study for Ensco Jack-up rigs related to space savings and payload reduction. The study was performed in four phases to create innovative ways in maximizing space and identify fixed and variable loads that can be reduced, combined or eliminated. This was to allow greater working capacities on Ensco's existing fleet of jack-ups and potentially target deep gas in shallow GoM waters.

## **DELIVERABLES:**

### **④ Phase I: Define the Scope of Work.**

- Identify the ideal ENSCO Jack-up unit to make a base case study.
- Categorize, define and label each area (space) on base Jack-up.
- Categorize and determine an inventory of fixed and variable loads using the base case Jack-up.

### **④ Phase II: Identify potential SPACE SAVINGS.**

- Develop a working matrix comparing space used that may be combined, reduced, or eliminated vs. potential costs. Develop a scale of ranking.
- Identify and rank space according to greatest savings vs. least estimated capital expenditure using the scale of ranking.

### **④ Phase III: Identify potential LOAD REDUCTIONS**

- Develop a working matrix comparing loads that may be moved, reduced, combined, or eliminated vs. potential costs. Develop a scale of ranking.
- Identify and rank loads according to greatest reduction vs. least estimated capital expenditure using the scale of ranking.

### **④ Phase IV: Report findings.**

- Assemble a comprehensive report to identify all findings. The report will include:

## **RESULTS:**

Ensco implemented many of the load reduction and space saving findings. Raw water towers are being replaced with new water delivery systems, drill line spool relocation considered, mud house weight reduction implemented, docking plugs installed in preload tanks, composite product replacement on many rig elements considered. Various other weight reduction projects to be considered in rig refurbishment AFEs.

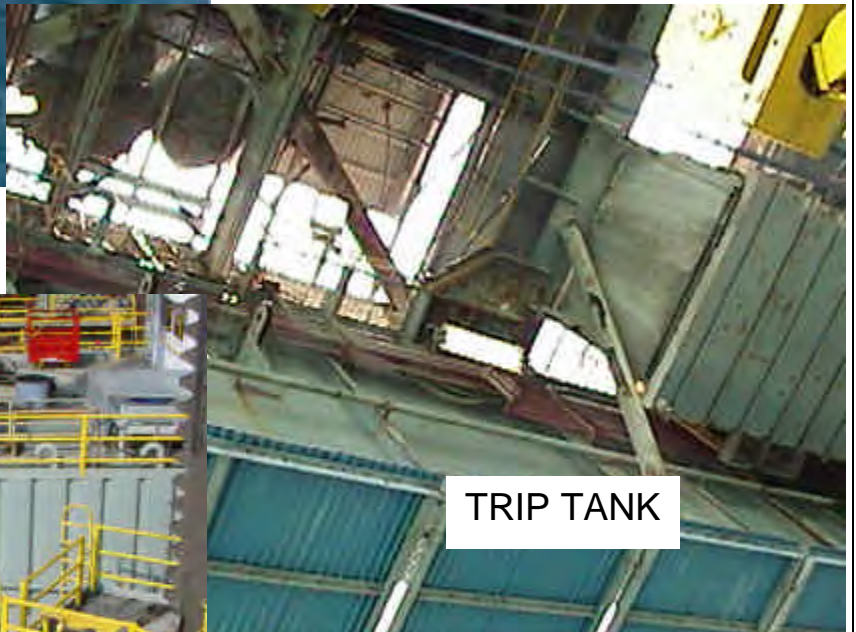
## **CONTACT REFERENCE:**

Mike Kelly, ENSCO Rig Manger, Broussard, Louisiana.  
(now VP Operations for TODCO, Houston (713) 278-6024)

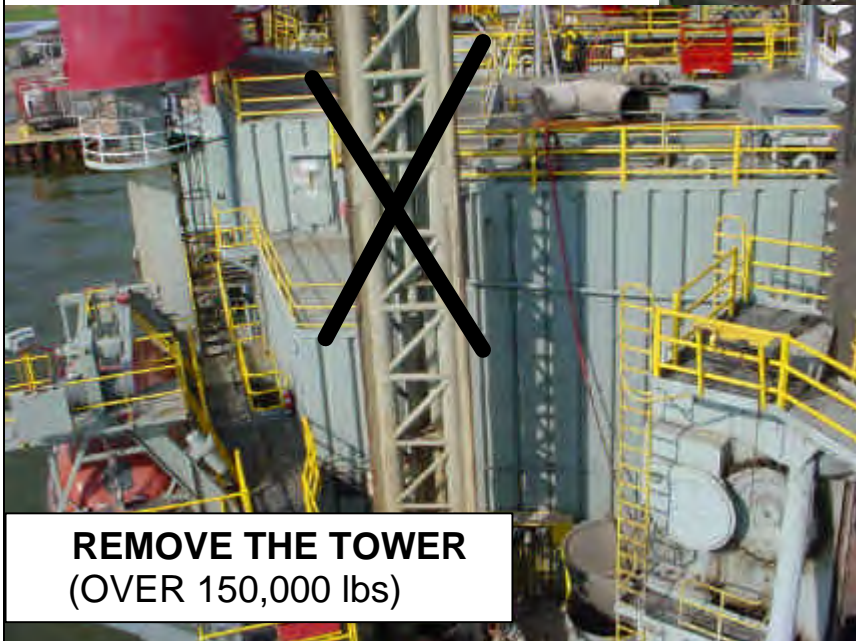


DRILL LINE SPOOL

## EXAMPLES OF LOAD REDUCTION PROJECTS



TRIP TANK



**REMOVE THE TOWER**  
(OVER 150,000 lbs)

# Rig Alignment Study



Trinidad  
October, 2004



**NAUTILUS CONTRIBUTION:** Project Manager and Coordinator (July 2004 to October 2004)

## **OBJECTIVE:**

The Objective of this study was to align the BP's Trinidadian Division's Rig Strategy with its 2004 – 2012 Long Term Drilling Plan (LTP).

## **PROJECT:**

Nautilus was commissioned to develop a comprehensive study for BP Trinidad (bpTT) to align their rig strategy with their long term drilling program through the year 2012. This "Rig Strategy Alignment with bpTT's Long Term Plan 2004- 2012" study consisted of reviewing existing and planned well characteristics, classify well types, determining rig types to drill each well class and planning an optimum rig schedule to drill the roughly 108 wells. Platform access, HSE criteria, platform related construction projects and rig equipment specifications were integrated into the scheduling process to optimum rig solutions. Economic cost savings for various rig options were analyzed to determine the most economical rig solutions and deployment timing. These rig solutions and associated rig schedule were presented to BP for implementation consideration.

## **DELIVERABLES:**

- ① **Well Montages**.....Review and build well summary montages for planned wells.
- ② **Drilling Rig Specifications**.....Specify rig types for bpTT's long term drilling program.
- ③ **Maintenance Specifications**.....Integrate bpTT construction works with LTP.
- ④ **HSE Rig Selection Criteria**...Identify & incorporate HSE issues relating to rig selection.
- ⑤ **Rig Evaluation Matrix**.....Summarizing bpTT's potential rig solutions / options.
- ⑥ **Rig Strategy**.....Integrate bpTT's wells, production, and construction needs with LTP.
- ⑦ **Rig Schedule**.....Build a rig schedule that supports the long term strategy.
- ⑧ **Rig Schedule Economics**.....Support rig schedule with economic cost savings.
- ⑨ **Management Presentation**.....Two stage gate presentations: Assess and Select.

## **RESULTS:**

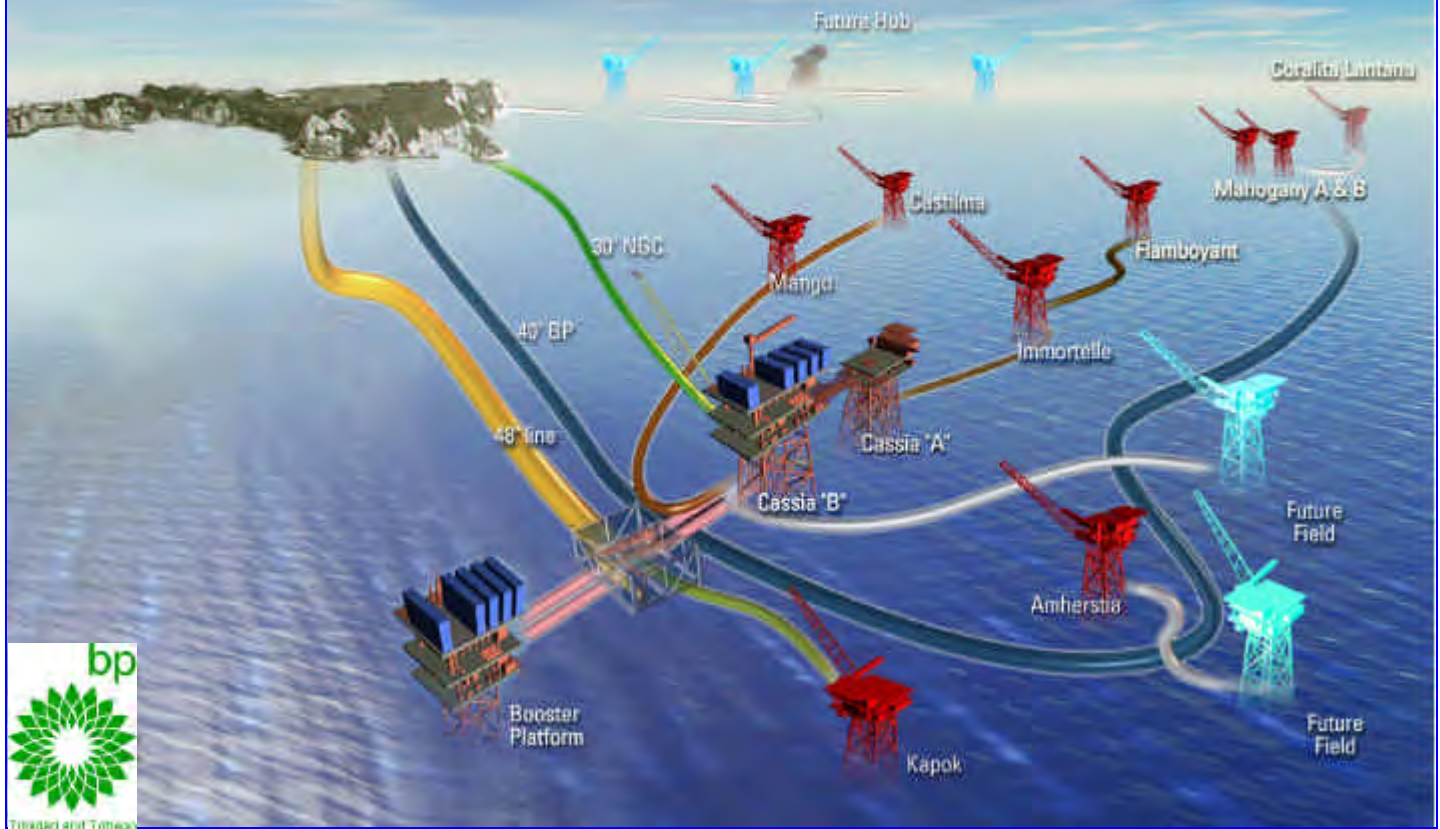
BpTT is currently reviewing the Decision Support Package along with BP's London Corporate office to decide on the rig schedule and FEED study for the Multi-Purpose Unit proposed. The decision going forward could potentially reduce bpTT's drilling costs by \$169 MM over the next eight years.

## **CONTACT REFERENCE:**

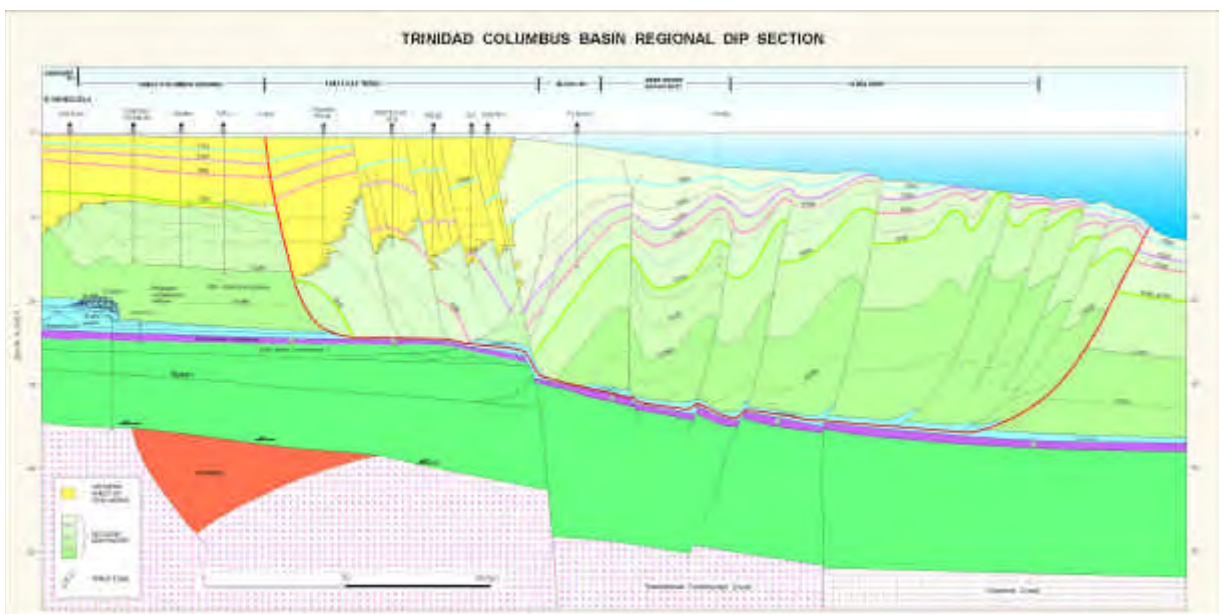
Jeremy Hill, Senior Drilling Engineer ( bpTT Rig Alignment Manger), Trinidad, Queen's Park Plaza  
(868) 623-2862 (ext 5647)

**OFFSHORE CAPACITY 4+ bcfd**

**- 2007**



**ALIGN DRILLING RIG SCHEDULE  
WITH  
BP TRINIDAD'S WELL DRILLING PROGRAM**



**DECISION SUPPORT PACKAGE**