

2010

From: Serpa, Lina M

Sent: Mon Dec 27 19:57:00 2010

To: Bartholomew, Vincent (TRD); Bezant, Paul; Blome, Greg R.; Christman, Gary E; Cocking, David; Denholm, Morty; Depew, James; Forman, Paul; Little, Ian; O'Neill, John J; Patteson, Mark R; Pruitt, Randal D; Rich, David A; Robinson, Steve W (Alaska); Schofield, Timothy R; Sigurdson, Scott; Zanghi, Mike  
Cc: Lenhoff, Diane A; Tucker, Kenneth E; Therens, Harry H; O'Bryan, Patrick L; MacLean, Evelyn; Lynch, Richard; Higuera, Gabriel; Haden, Steven K; Abbassian, Fereidoun; King, Dave J; Brock, Tony  
Subject: Request to VP Wells- RPU Bly report

Importance: Normal

Attachments: Request\_Update to VP Wells Horizon Incident recommendations v101227.zip

On September 8<sup>th</sup> 2010, 26 recommendations were issued as part of the Deepwater Horizon Incident investigation report. In response to these recommendations, the wells leadership team defined short-term actions aimed to address potential high consequence events from critical Wells activities.

RPUs should focus their efforts on the defined actions described in the document attached,

In a separate email I will send

- Appendix 2 subsea interim guidance and
- the excel input template for global KPIS (leading and lagging indicators)

Please contact me if you need any clarification,

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BP-HZN-2179MDL01483605  
BP-HZN-2179MDL01483605

**Communication to VP Wells - RPU**  
**December 27<sup>th</sup>, 2010**

**Context**

On September 8<sup>th</sup> 2010, 26 recommendations were issued as part of the Deepwater Horizon Incident investigation report. In response to these recommendations, the wells leadership team defined short-term actions aimed to address potential high consequence events from critical Wells activities.

RPU's should focus their efforts on the defined actions described below:

**Actions**

**Action 1:** Conformance with Interim Guidance on Cementing (the final version of the interim guidance document will be sent by Mike Zanghi, technical SPA is Daryl Kellingray).

*The interim guideline establishes engineering criteria to determine what must be reviewed and approved by the cementing technical authority*

For Azerbaijan, Egypt, GoM, North Africa and North Sea, the cementing technical authorities have been identified as follows (see table 1),

Table 1

SPU	RPU TA Cementing January 1
GoM	Erick (interim)
N. Sea	Anderson Bisson / Daryl Kellingray
N. Africa	Paulo Rubenstein
Azerbaijan	Chris Greaves
Egypt	Ian McPherson
MEP	Jochen Pfeiffer
AsiaPac	Daryl Kellingray

For the remaining RPU's that do not have a cementing technical authority, Steve Haden, VP Completions and Interventions, will forward a proposal for an interim cementing technical authority together with start date.

Data required for assurance: For cement jobs identified as critical, the final cementing program shall be approved by the Cementing technical authority, e-mailed to the rig and filed in the well filing system.

**Action 2:** Conformance with the Interim Guidance on Ram Configuration, Emergency System Requirements, Testing, Verification and Shear Ram Requirements (attached document, SPA Scott Sigurdson)

Data required for assurance:

An approved risk assessment (as per the interim guidance) for rigs currently contracted to BP that may not conform to the revised ram configuration and emergency system.

**Action 3:** Conformance with interim guidance for wellbore positive and negative pressure testing (Attached document, SPA Scott Sigurdson)

Data required for assurance:

Wellbore integrity tests documented and approved by the wells team leader.

**Action 4:** Implement leading and lagging indicators for well integrity, well control and rig safety critical equipment (Attached excel data input template, SPA Diane Lenhoff).

By January 1<sup>st</sup>, 2011, begin tracking well integrity, well control and rig safety critical equipment global indicators.

**Key Dates:**

Before January 15<sup>th</sup>, 2011: RPU performance tag training on input template

February 10, 2011: complete and send the INPUT template to Diane Lenhoff.

**Action 5:**

Complete the well start-up check list for identified critical wells and activities. The check list shall be approved by RPU VP Wells prior to initiating operations.

Summary of Critical Wells/Activity (from ELT communication pack sent by Gabriel Higuera on December 12<sup>th</sup>, 2010)

- GoM – All wells
- N. Africa – Libya Offshore and Onshore Exploration
- Brazil – Exploration and appraisal activity
- N. Sea – Devenick, North Uist
- Trinidad – Savonette, Serrette, Immortelle (ST Program)
- Azerbaijan – Shah Deniz, Central Azeri (B-24)
- Egypt – Akhen, Taurt Phase 2
- NAG – Hugoton, Haynesville, Granite Wash
- Angola – PSVM
- Alaska – Gas pad and coastal well activity

Data required for assurance: The well start up checklist approved by RPU VP Wells, emailed to VP Area of wells and filed in the well filing system.

**Action 6:** Execute RAPID chart that specifies accountabilities and delegations for key decisions regarding well design and operations (Attached draft document, SPA Gabriel Higuera)

By day-one of new organization, RPUs shall implement RAPIDs for new well delivery and well intervention.

Exception: Approval for deviations from ETPS.

Note: final RAPIDs to be communicated in January.

Data required for assurance:

**Before day one:** Deviations from ETPs shall be endorsed by RPU VP Wells and approved by Scott Sigurdson (for Western Hemisphere excluding GoM), Mike Zanghi (for GoM) and Steve Haden (for Eastern Hemisphere). Deviations shall be filed in the well filing system.

- By day-one: Communicate and issue updated roles and responsibilities reflecting the changes in RAPIDs. The revised roles and responsibilities shall be documented, communicated and filed as per the organizational MOC.

- By day-one: Documents referenced in the RAPIDs shall be approved as per the RAPID roles.

**Action 7:** Implementation of Interim guidance for rig audit (attached document, SPA Harry Thierens)

Data required for assurance:

- Documented GO/ NO GO decision approved as per the RAPID roles
- Approved audit action plan as per the RAPID roles

Note: *RAPID* R recommend, A agree, P perform, I Input and D decides

**Action 8:** Conformance with interim guidance for Relief Well Requirements. (Attached document, SPA Scott Sigurdson)

Data required for assurance: For planned D&C operations a documented relief well plan.

**Subsea BOPs  
Ram Configuration, Emergency System Requirements, Testing, Verification  
and Shear Ram Requirements  
Interim Guidance**

**Context**

The DWOP, Well Control ETP and the Well Control Manuals are in the process of being revised, and detailed guidance in the area of subsea BOP ram configuration, emergency system requirements, testing, verification and shear ram requirements will be included in the coming releases of those documents. However, in the interim, the following guidance in the area of subsea BOP ram configuration, emergency system requirements, testing, verification and shear ram requirements should be immediately actioned.

It is recognized that the current configuration on rigs currently contracted to BP may not match the revised ram configuration and emergency systems addressed in this interim guidance. Accordingly, it is also recognized that it will take time to modify the equipment and associated software to meet this interim guidance. Where such modifications are required to meet the interim guidelines, and operations are proposed to commence prior to the completion of such modifications, a thorough risk assessment shall be undertaken on a case-by-case basis to identify potential risks that may apply in the interim, as well as mitigations to ensure that such potential risks are properly managed. These risk assessments shall require approval by the RPU VP Wells prior to commencement of the associated operations.

Any loss of BOP redundancy that impacts BOP performance shall be communicated to the RPU VP Wells.

The following terminology applies to this interim guidance:

"Shall" is used where a provision is mandatory.

"Should" is used where a provision is preferred.

"May" is used where alternatives are equally acceptable.

**Interim Subsea BOP Ram Configuration**

The detailed interim guidance is attached as Appendix 1 and is differentiated for moored and DP rigs. The significant points of interim guidance are:

- A casing shear ram shall be required for all subsea BOPs
- DP rigs shall have 2 sets of blind shear rams
- For DP rigs with 5 and 6 ram stacks, blind shear rams shall be in the top cavity and casing shear ram should be installed between the blind shear



rams or directly below them. The final spacing requirements will be resolved and documented as part of the Well Control ETP refresh.

- An invert test ram may be allowed in the bottom ram cavity on 6 ram BOP stacks

These interim subsea BOP ram configurations are based on the following:

- It is possible to have casing across the BOP stack and not have the ability to move it, either due to hole conditions or rig equipment failure. Consequently, the ability to shear casing is desired in all subsea BOP stacks. In addition, the operating philosophy is that in any shearing situation, the casing shear rams would be used first, followed by a blind shear ram. This is intended to provide the best chance of shearing the pipe in the BOPs and sealing the well bore.
- Dynamically positioned (DP) rigs have the potential to have a "drive/drift off" which would include pipe being moved through the stack as that occurred. This could create a scenario where during the emergency disconnect sequence a blind shear ram could have a tool joint across it as it closes, and may not be able to seal the well. In order to mitigate this low probability occurrence and provide the best chance of sealing the well, a second blind shear ram is to be added to all DP rig subsea BOPs.
- Placement of the casing shear rams on DP rig BOPs shall be carefully considered, recognizing the different operations that may occur on the rig (drilling, well testing, completing). Pending more detailed discussion as part of the ETP refresh, the RPU shall determine whether casing shear rams will be placed below all the blind shear rams or in between them.
- An invert test ram may still be used on DP rigs with 6 ram stacks and the decision whether to do shall be made within the RPU. This interim guidance eliminates the use of invert test rams on DP rigs with 5 ram BOPs as all the ram cavities are taken up with the required shear or pipe rams. Since most moored rigs with 5 ram BOPs tend to work in shallower water, the benefit of a test ram was deemed to be insignificant and shall not be used on those rigs.

#### Interim Subsea BOP Emergency Systems

The interim emergency system guidance is differentiated for moored and DP rigs.

- All DP rigs shall contain Deadman and Autoshear systems
- Moored rigs shall have an Autoshear
- Deadman and Autoshear systems shall be set up to activate both the casing shear ram and a blind shear ram above it, in that order
- Emergency disconnect systems shall be set up to activate both the casing shear ram and a blind shear ram above it, in that order. If a moored rig relies on procedures for emergency disconnect (i.e. not automated) then the procedures shall be modified accordingly, including processes to confirm understanding of the revised procedures with the applicable rig crews.
- As a minimum, ROV access shall be required to a blind shear ram, the casing shear ram, and one pipe ram, and shall include the ability to disconnect at the LMRP and the wellhead. In the case of DP rigs, both blind shear rams shall have ROV access.

The emergency system philosophy was built on the recent GoM requirements for DP rigs. It is also recognized that configuring the casing shear rams and a blind shear ram to activate on the Autoshear and Deadman systems may require additional subsea accumulator capacity and other BOP modifications.

#### Interim Subsea BOP Testing

In addition to the standard testing required in the Well Control ETP, the following tests shall be undertaken:

- Deadman systems shall be "live" tested at the surface (i.e. apply hydraulic and electronic power and then cut power and hydraulics off to simulate a system failure).
- The Autoshear shall be "live" tested at surface by having the hydraulic control system at normal operating pressure and disconnecting and picking up the LMRP.
- Emergency Disconnect Systems (EDS) shall be "live" tested at surface with the hydraulic control system at normal operating pressure to ensure the system is working as designed.
- At surface, function test the High Pressure Blind Shear Ram close and the High Pressure Casing Shear Ram close using the BOP's high pressure hydraulic system. After closing the blind shear rams, pressure test the rams to ensure they will seal.
- The ROV system shall be tested at surface with a pump that simulates the rate and pressure of the ROV on the rig
- Once the BOP is installed subsea, the ROV system shall be tested on one ram function each time the BOP is tested. The rig's BOP control fluid should be used for these operations and it is recognized that this may require retrofits to standard ROV systems.

The rationale behind the BOP testing above is as follows:

- Deadman, Autoshear and EDS system testing is to be done "live" at surface to ensure the systems will work as designed. It should be noted that in the GoM it is required to test the Deadman system when the BOP is initially installed on the wellhead. This interim guidance does not require the Deadman to be tested once the BOP stack is installed subsea, as that is seen to import additional risk in the unlikely event the control system does not power back up. (A DP rig would be more or less locked to the wellhead until the system is back up or a ROV can activate a release.)
- The reason to test the high pressure system on the shear rams is to ensure that system will work as designed.
- While it is desirable to test the ROV system at surface with the actual ROV on the rig, it is recognized that this may not be always feasible.

#### Interim Subsea BOP Certification and Between Well Verification

Subsea certification and between well verification shall be incorporated as a work program into the Rig Audit Team protocols (contact Norman Wong or Mike Byrd

for additional details and support - the latest checklist version is attached as Appendix 2). All subsea BOPs shall comply with the following interim guidance:

- A third party (e.g. HOSE, West, etc) shall provide certification attesting that a detailed physical inspection and design review of the BOP has been conducted in accordance with the Original Equipment Manufacturer specifications and that the BOP is operating as designed
- A third party shall confirm that any modifications or upgrades made to the BOP stack have not compromised the design or operation of the BOP
- A third party shall verify that the testing and maintenance of BOPs between wells has been performed in accordance with manufacturer recommendations and API RP-53 (the Rig Audit Team has detailed checklists to assist with this)
- Subsea BOP modifications shall undergo a rigorous Drilling Contractor Management of Change (MoC) process. The completed MoC, which shall include updated drawings and necessary certifications, will be endorsed by the RPU Wells Operations Manager
- Subsea BOPs shall maintain certification by a Class Society (ABS, DNV, etc)

#### Interim Shear Ram Requirements

BOPs shall be capable of shearing drill pipe under the maximum anticipated surface pressures (MASP). For the interim period that these guidelines are applied, the method to calculate MASP for shearing capability shall be one that has been formerly accepted by the BOEM and is based on pore pressure at TD in the section:

- For hole section depths <12,000 ft, using a .1 psi/ft gas gradient, shearing MASP = formation pressure at TD minus a 70% gas, 30% mud column
- For hole section depths between 12,000 and 15,000 ft, using a .15 psi/ft gas gradient, shearing MASP = formation pressure at TD minus a 60% gas, 40% mud column
- For hole section depths greater than 15,000 ft, using a .15 psi/ft gas gradient, shearing MASP = formation pressure at TD minus a 50% gas, 50% mud column
- MASP for shearing should not exceed the working pressure of the annular preventers, as that would be the maximum pressure the blind shear rams would have to close against.



## Appendix 1 - Subsea BOP Interim Guidance Configurations

1. Six (6) Ram DP Rig
  - Annular
  - Annular
  - Shear / Blind
  - Shear / Blind
  - Casing Shear (can also be between the shear/blind rams)
  - Pipe
  - Pipe
  - Option - additional pipe or invert test ram
2. Five (5) Ram DP Rig
  - Annular
  - Annular
  - Shear / Blind
  - Shear / Blind
  - Casing Shear (can also be between the shear/blind rams)
  - Pipe
  - Pipe
3. Five (5) Ram Moored Rig
  - Annular
  - Annular
  - Shear / Blind
  - Casing Shear
  - Pipe
  - Pipe
  - Pipe
4. Four (4) Ram Moored
  - Annular
  - Annular
  - Shear / Blind
  - Casing Shear
  - Pipe
  - Pipe

## **Appendix 2 - Subsea BOP Certification and Between Well Verification Checklist**



API RP-53 BOPE  
Systems Inspect...

## **Wellbore Positive and Negative Pressure Testing Interim Guidance**

### **Context**

The DWOP, the Working with Pressure (GP 10-45) and Breaking Containment (GP 10-36) ETPs and the Well Control Manuals are in the process of being revised, and detailed guidance in the area of wellbore positive and negative pressure testing will be included in the coming releases of those documents. However, in the interim, the following additional guidance shall be immediately actioned.

If an operation is not able to conform to this interim guideline, a thorough risk assessment shall be undertaken on a case-by-case basis to identify potential risks that may apply in the interim, as well as mitigations to ensure that such potential risks are properly managed. These risk assessment mitigations shall require approval by the RPU VP Wells prior to commencement of the associated operations.

The following terminology applies to this interim guidance:

"Shall" is used where a provision is mandatory.

"Should" is used where a provision is preferred.

"May" is used where alternatives are equally acceptable.

### **Wellbore Positive and Negative Pressure Testing Procedures**

All wellbore positive and negative pressure tests shall have detailed procedures that shall include the following as a minimum:

- The purpose of the test
- The definition of barriers to be tested
- Clearly defined success/failure criteria for the test
- Configuration of test lines and valve positions
- Operational steps and decision points
- Identification and evaluation of the estimated consequences of failure
- A contingency plan of action identified in the event that failures occur

### **Negative Differential Testing – Subsea Well Requirement**

A negative differential test shall be performed on all subsea wellbores prior to BOP removal. This test shall include all components below the BOP stack that will be exposed once it is removed - i.e. casing hanger packoff, tubulars, plugs, etc. The test shall confirm that the well has integrity to a negative differential

greater than what is expected once the BOP is removed. When these tests are performed, a successful test result must show that there is no flow or pressure build up on any of the monitoring lines exposed to the wellbore (choke or kill lines, drill pipe, etc).

Integrity Testing Approval

The Wells Team Leader shall approve all wellbore positive and negative pressure tests prior to operations continuing. Any wellbore positive or negative pressure test that is not successful shall be communicated to the RPU VP Wells.

## Global Wells KPI Input Tool – Snapshots Only



- Main Screen
  - Input Form Button
  - Reference Form Button
- Input Form
  - Add Record
  - Delete Record
  - Save
  - Cancel
- Navigation Buttons
- Reference Form
  - Well Control
  - Rig Safety
  - Well Construction
  - Well Integrity





# Global Wells KPI Input Tool – Main Screen

## Instructions:

Click on the Input Form button to input data.  
Click on the 'View Reference' button to view the Global KPI Reference Sheet

Clicking here opens the Form

Input Form

View Reference

## Input Instructions:

1. Open the Input Form
2. Click the "Add" button to add a new record
2. Choose the classification of your input
3. Fill in the Well Name, Rig Name, RESP and Tool
4. Pick the Metric Type and RPU from the drop-down menus.
5. Input the highlighted fields to complete the form.
6. Press "Save" to save your input, or "Cancel" to cancel the changes and clear the form.
7. Press "Close" to close the input form

## Other Instructions:

Data currently in the worksheet can be viewed by navigating with the "First", "Previous", "Next" and "Last" buttons, or by inputting the desired row number in the text box provided.



# Global Wells KPI Input Tool – Input Form

Input Form

Well Name

Rig Name

Responsible Person

Date (MM/DD/YYYY)

Classification

Well Type

Responsible Person Title

Tool

WELL CONTROL

RIG SAFETY CRITICAL EQUIPMENT (SCE)

WELL CONSTRUCTION

WELL INTEGRITY

Metric Description

Comments

General Input Area

(used to provide descriptive information)

Please Fill in Marked Fields

# Well Control Deviations

# Working with pressure Deviations

# Breaching Containment Deviations

# Subsea BOP system events

# BOP Tests

# Failed BOP Tests

# Failed barrier pressure tests

# Well Control Actions

# Overdue Well Control Actions

# WC or BOP activation events

# Assessments Carried Out

# Assessments Below 80%

Events Overdue Maintenance SCE

Days Overdue SCE

Events by type of system overidden

# SCE Failures

# SCE Software Failures

# SCE Actions Overdue

# SCE Actions

Events over the past 12 months

SCE Rigs Agreed List

# Rigs Operating

# Deviations from ETP's

# Deviations from BOD or SOR

# Activation violation events

# Zonal Isolation events

Events exceeding service loads

# Critical Equipment Failures

# Non-Critical Equipment Failures

# Loss of riser integrity

# Number of moving incidents

Events HES Levels above 10 ppm

# Wells Exhibiting SOP

# Total Active Wells

# On-line Wells with failed SSV(DHSV)

# Shut-in Wells with failed SSV(DHSV)

# Wells under deviation

# Number unsecured, shut-in wells

# Events of overdue maintenance

Add Record

Delete Record

Save

Cancel

KPI input Fields

(once general information selected, this area will highlight the input fields to enter information)



# Global Wells KPI Input Tool – Input Form -Actions

Input Form

Well Name

RPU

Responsible Person

Date (MM/DD/YYYY)

Classification

WELL CONTROL  
RIG SAFETY CRITICAL EQUIPMENT (SCE)  
WELL CONSTRUCTION  
WELL INTEGRITY

Metric Type

Tool

Metric Desc

Comments

When initially opened, the form highlights command options for data input

Please Fill in Marked Fields

This command will send the user back to main page

This command will send the user back to the Reference Sheet

# Well Control Deviations

# Events Overdue Maintenance SCE

# Failed BOP Tests

# Failed barrier pressure tests

# Well Control Actions

# SCE Actions Overdue

# SCE Actions

# Events over the next 12 months

# Deviations from ETP's

# Deviations from BOD or SCOR

# Anticollision violation events

# Zonal Isolation events

# Events exceeding service loads

# Critical Equipment Failures

# Non-Critical Equipment Failures

# Loss of riser integrity

# Number of moving incidents

# H2S Levels above 10 ppm

# Wells Existing SOP

# Total Active Wells

# Online Wells with failed SSV/DMSV

# Shut-in Wells with failed SSV/DMSV

# Wells under deviation

# Number unsecured shut-in wells

# Events of overdue maintenance

# Wells Evaluated

# Wells monitored for underpressure

# Wells included in monitoring schedule

Add Record

Delete Record

Save

Cancel

Main Menu

Reference Sheet

Exit

Record 1 of 1

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BP-HZN-2179MDL01483606





# Global Wells KPI Input Tool – Input Form Data Entry

**Input Form**

Well Name \_\_\_\_\_ Rpt Name \_\_\_\_\_ Responsible Person \_\_\_\_\_ Date (MM/DD/YYYY) \_\_\_\_\_

Classification \_\_\_\_\_ Metric Type \_\_\_\_\_ Responsible Person Title \_\_\_\_\_ Tool \_\_\_\_\_

**Well Classifications**  
RIG SAFETY CRITICAL EQUIPMENT (SCE)  
WELL CONSTRUCTION  
WELL INTEGRITY

**Metric Description**  
Deviations from GP 10-10 (Well Control) during well planning & execution.

**Comments**

As data is entered here, the form highlights command options for data input (i.e. in red)

Please Fill in Marked Fields

**When completed, the form highlights Save button for data input (if you hit Cancel or Add Record at this point, no record will be saved)**

Events Overdue Maintenance SCE \_\_\_\_\_ # Deviations from ETP's \_\_\_\_\_

Days Overdue SCE \_\_\_\_\_ # Deviations from BOD or SOR \_\_\_\_\_

Events by type of \_\_\_\_\_

# SC \_\_\_\_\_

# SC \_\_\_\_\_

Events over \_\_\_\_\_

# Working with pressure Deviations \_\_\_\_\_

# Breaching Containment Deviations \_\_\_\_\_

# Subsea BOP system events \_\_\_\_\_

# BOP Tests \_\_\_\_\_

# Failed BOP Tests \_\_\_\_\_

# Failed barrier pressure tests \_\_\_\_\_

# Well Control Actions \_\_\_\_\_

# Overdue Well Control Actions \_\_\_\_\_

# WIC or BOP activation events \_\_\_\_\_

# Assessments Carried Out \_\_\_\_\_

# Assessments Below 80% \_\_\_\_\_

# Wells Exhibiting SCP \_\_\_\_\_

# Total Active Wells \_\_\_\_\_

# Wells Failed SSV/DHSV \_\_\_\_\_

# Wells Failed SSV/DHSV with failed SSV/DHSV \_\_\_\_\_

# Wells under deviation \_\_\_\_\_

# Wells under deviation occurred, shut-in wells \_\_\_\_\_

# Wells under deviation overdue maintenance \_\_\_\_\_

# Wells Evaluated \_\_\_\_\_

# Wells Evaluated for annual pressure monitoring schedule \_\_\_\_\_

Add Record \_\_\_\_\_

Delete Record \_\_\_\_\_

Cancel \_\_\_\_\_

Main Menu \_\_\_\_\_

Reference Sheet \_\_\_\_\_

Edit \_\_\_\_\_

Record 1 of 1



# Global Wells KPI Input Tool – Data Entry cont'd

**Input Fields**

Well Name: \_\_\_\_\_ RPU: \_\_\_\_\_ Date (MM/DD/YYYY): 1/1/2006

Responsible Person: \_\_\_\_\_ Tool: \_\_\_\_\_

Classification: **WELLS CONTROL**  
**RIG SAFETY CRITICAL EQUIPMENT (SCE)**  
**WELL CONSTRUCTION**  
**WELL INTEGRITY**

Metric Type: **Deviations from Well Control related ETP's**

Metric Description  
Deviations from GP 10-10 (Well Control) during well planning & execution.

Comments

Dialogs will confirm  
Actions  
(i.e. Save Changes)

**Save**

Save changes?

# Well Control Deviations	Events Overdue Maintenance SCE	# On-line Wells with failed SSV/DPSV	Delete Record
# Working with pressure Deviations	Days Overdue SCE	# Shut-in Wells with failed SSV/DPSV	Save
# Breaching Containment Deviations	Events by type of system overriden	# Wells under deviation	Cancel
# Subsea BOP system events	# SCE Failures	# Number unsecured, shut-in wells	Main Menu
# BOP Tests	# SCE Software Failures	# Events of overdue maintenance	Reference Sheet
# Failed BOP Tests	# SCE Actions Overdue	# Wells Evaluated	Exit
# Failed barrier pressure tests	# SCE Actions	Wells monitored for annular pressure	
# Well Control Actions	Events over the past 12 months	Wells included in monitoring schedule	
# Overdue Well Control Actions	SCE Rigs Agreed List		
# WPC or BOP activation events	# Rigs Operating		
# Assessments Carried Out			
# Assessments Below 80%			

Record 1 of 1

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# Global Wells KPI Input Tool – Actions/Navigation

Well Name

Rig Name

RPU

Responsible Person

Date (MM/DD/YYYY)

1/1/2006

Tool

Classification

WELL CONTROL

RIS SAFETY CRT

WELL CONSTRUCTION

WELL INTEGRITY

Metric Description

Deviations from

Comments

Once saved, the Save and Cancel buttons gray out.

Note the Navigation buttons appear after record added

Please Fill in Marked Fields

# Well Control Deviations	Events Overdue Maintenance SCE	# Deviations from ETPs	# Wells Exhibiting SGP	Add Record
# Working with pressure Deviations	Days Overdue SCE	# Deviations from BOD or SOR	# Total Active Wells	Delete Record
# Breaching Containment Deviations	Events by type of system overriden	# Anticollision violation events	# On-line Wells with failed SSV/DHSV	Save
# Subsea BOP system events	# SCE Failures	# Zonal Isolation events	# Shut-in Wells with failed SSV/DHSV	Cancel
# BOP Tests	# SCE Software Failures	Events exceeding service loads	# Wells under deviation	Main Menu
# Failed BOP Tests	# SCE Actions Overdue	# Critical Equipment Failures	# Number unsecured, shut-in wells	Reference Sheet
# Failed barrier pressure tests	# SCE Actions	# Non-Critical Equipment Failures	# Events of overdue maintenance	Exit
# Well Control Actions	Events over the past 12 months	# Loss of riser integrity	# Wells Evaluated	
# Overdue Well Control Actions	SCE Rigs Agreed List	# Number of moving incidents	Wells monitored for annular pressure	
# WC or BOP activation events	# Rigs Operating	Events H2S Levels above 10 ppm	Wells included in monitoring schedule	
# Assessments Carried Out				
# Assessments Below 90%				

First

Previous

Next

Last

Record

1

of

1



# Global Wells KPI Input Tool – Record Counter

**Input Form**

Well Name: \_\_\_\_\_ RPU: \_\_\_\_\_ Responsible Person: \_\_\_\_\_ Date (MM/DD/YYYY): \_\_\_\_\_

Classification: **WELL CONTROL** Metric Type: \_\_\_\_\_ Responsible Person Title: \_\_\_\_\_ Tool: \_\_\_\_\_

WELL SAFE  
WELL CO  
WELL INVT

Metric Desc: \_\_\_\_\_

Comments: \_\_\_\_\_

**If user selects continues by selecting Add Record, the record counter increases to inform user which record is being edited**

**ed Fields**

# Well Control Deviations	Events Overdue Maintenance SCE	# Deviations from ETP's	# Wells Exhibiting SCP
# Working with pressure Deviations	Days Overdue SCE	# Deviations from BOD or SCR	# Total Active Wells
# Breaching Containment Deviations	Events by type of system overriden	# Authorization violation events	# On-line Wells with failed SS/PTBY
# Subsea BOP system events	# SCE Failures	# Zone Isolation events	# Shut-in Wells with failed SS/PTBY
# BOP Tests	# SCE Software Failures	Events exceeding service loads	# Wells under deviation
# Failed BOP Tests	# SCE Actions Overdue	# Critical Equipment Failures	# Rubber unmeasured, shut-in wells
# Failed barrier pressure tests	# SCE Actions	# Non-Critical Equipment Failures	# Events of overdue maintenance
# Well Control Actions	Events over the past 12 months	# Loss of riser integrity	# Wells Evaluated
# Overdue Well Control Actions	SCE Rigs Agreed List	# Number of moving incidents	Wells monitored for annular pressure
# WC or BOP activation events	# Rigs Operating	Events HCS Levels above 10 ppm	Wells included in monitoring schedule
# Assessments Carried Out			
# Assessments Below 80%			

Record 2 of 2

Add Record  
Delete Record  
Save  
Cancel  
Main Menu  
Preference Sheet  
Exit





# Global Wells KPI Input Tool – Actions/Navigation

cont'd

Input Form

Well Name

Rig Name

Rig

Alaska

Responsible Person

John Doe

Date (MM/DD/YYYY)

1/1/2010

Tool

TRACTION

Classification

WELL CONTROL

WELL SAFE

WELL CO

WELL INT

Metric Type

SCE not working as intended

Metric Descr

Rig Safety

Comments

To delete a record, User must select which record to clear. (This is done either by changing the record counter box or by scrolling through the records using the navigation buttons.)

Record 2 of 2

First

Previous

Next

Last

Wells Exhibiting SCP

# Wells Exhibiting SCP

# Total Active Wells

# On-line Wells with failed SSV/DHGV

# Shut-in Wells with failed SSV/DHGV

# Wells under deviation

# Number unsecured, shut-in wells

# Events of overdue maintenance

# Wells Evaluated

Wells monitored for annular pressure

Wells included in monitoring schedule

ETP's

# Deviations from BOP or SOR

# Anticollision violation events

# Zonal Isolation events

Events exceeding service loads

# Critical Equipment Failures

# Non-Critical Equipment Failures

# Loss of riser integrity

# Number of moving incidents

Events H2S Levels above 10 ppm

Days Overdue SCE

Events by type of system overriden

# SCE Failures

# SCE Software Failures

# SCE Action/Overdue

# SCE Actions

Events over the past 12 months

SCE Rigs Agreed LUK

# Rigs Operating

# Working with pressure Deviations

# Breaching Containment Deviations

# Subsea BOP system events

# BOP Tests

# Failed BOP Tests

# Failed barrier pressure tests

# Well Control Actions

# Overdue Well Control Actions

# WC or BOP activation events

# Assessments Carried Out

# Assessments Below 80%

Add Record

Delete Record

Cancel

Cancel

Main Menu

Reference Sheet

Exit



# Global Wells KPI Input Tool - Input Form - Deleting

**Input Form**

Well Name:  Well:  RPU:  Alaska

Responsible Person:  John Doe

Date (MM/DD/YYYY):  1/1/2010

Classification:  Metric Type:  Tool:

WELL CONTROL  
WELL CONSTRUCTION  
WELL INTEGRITY

Metric Description:  SCE not working as intended

Comments:

When Delete Record is selected, a dialog box appears to confirm the action.

**Delete Row**

Delete this record?

OK Cancel

Field	Value
# Wells Exhibiting SCP	
# Total Active Wells	
# On-line Wells with failed SSV/DHSP	
# Shut-in Wells with failed SSV/DHSP	
# Wells under deviation	
# Number unrecurred, shut-in wells	
# Events of overtable maintenance	
# Wells Evaluated	
Wells monitored for annular pressure	
Wells included in monitoring schedule	

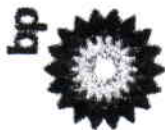
Field	Value
Events Overdue Maintenance SCE	
Days Overdue SCE	
Events by type of system override	
# SCE Failures	
# SCE Software Failures	
# SCE Actions Overdue	
# SCE Actions	
Events over the past 12 months	
SCE Rigs Agreed List	
# Rigs Operating	

Field	Value
# Well Control Deviations	
# Working with pressure Deviations	
# Breaking Containment Deviations	
# Subsea BOP system events	
# BOP Tests	
# Failed BOP Tests	
# Failed barrier pressure tests	
# Well Control Actions	
# Overdue Well Control Actions	
# WIC or BOP activation events	
# Assessments Carried Out	
# Assessments Below 80%	

Buttons: Add Record, Delete Record, Save, Cancel, Main Menu, Reference Sheet, Exit

First Previous Next Last





# Global Wells KPI Input Tool – Deleting Cont'd

**Input Form**

Well Name: \_\_\_\_\_ Rig Name: \_\_\_\_\_ BPU: \_\_\_\_\_ Date (MM/DD/YYYY): 1/1/2006

Classification: **WELLS CONTROL** Metric Type: **Deviations from Well Control related ETP's** Responsible Person: \_\_\_\_\_

Responsible Person Title: \_\_\_\_\_ Tool: \_\_\_\_\_

When Delete Record is confirmed, the result is a reduction in the record counter below

Please Fill in Marked Fields

# Working with pressure Deviations	# Events Overdue Maintenance SCE	# Deviations from ETP's	# Wells Exhibiting SCP	Add Record
# Breaking Containment Deviations	Days Overdue SCE	# Deviations from BOD or SOR	# Total Active Wells	Delete Record
# Subsea BOP system events	Events by type of system override	# Anticollision violation events	# On-line Wells with failed SSVD/DMSV	Save
# BOP Tests	# SCE Failures	# Zonal Isolation events	# Shut-in Wells with failed SSVD/DMSV	Cancel
# Failed BOP Tests	# SCE Software Failures	Events exceeding service loads	# Wells under deviation	Main Menu
# Failed barrier pressure Tests	# SCE Actions Overdue	# Critical Equipment Failures	# Number unsecured, shut-in wells	Reference Sheet
# Well Control Actions	# SCE Actions	# Non-Critical Equipment Failures	# Events of overdue maintenance	Exit
# Overdue Well Control Actions	Events over the past 12 months	# Loss of riser integrity	# Wells Evaluated	
# WIC or BOP activation events	SCE Rigs Agreed List	# Number of moving incidents	Wells monitored for annular pressure	
# Assessments Carried Out	# Rigs Operating	Events H2S levels above 10 ppm	Wells included in monitoring schedule	
# Assessments Below 80%				

First Previous Next Last

Record 1 of 1





# Global Wells KPI Input Tool – Return Main

Input Form

Well Name

Rig Name

Classification

Metric Type

Date (MM/DD/YYYY)

Responsible Person

Responsible Person Title

Tool

WEEL-000-000

Deviations from Well Control related ETP's

1/1/2006

Selecting Main Menu returns user to the Main Input Screen

Selecting Reference Sheet returns user to the Reference Sheet Screen

Marked Fields

# Subsea BOP system events

# BOP Tests

# Failed BOP Tests

# Failed barrier pressure tests

# Well Control Actions

# Overdue Well Control Actions

# WC or BOP activation events

# Assessments Carried Out

# Assessments Below 80%

# SCE Failures

# SCE Software Failures

# SCE Actions Overdue

# SCE Actions

# Events over the past 12 months

# SCE Rigs Agreed List

# Rigs Operating

# Zonal Isolation events

# Events exceeding service loads

# Critical Equipment Failures

# Non-Critical Equipment Failures

# Loss of user integrity

# Number of moving incidents

# Events H2S Levels above 10 ppm

# Wells Exhibiting SCP

# Total Active Wells

# On-line Wells with failed GSV/DHGV

# Shut-in Wells with failed GSV/DHGV

# Wells under deviation

# Number unpermitted shut-in wells

# Events of overdue maintenance

# Wells Evaluated

# Wells monitored for annular pressure

# Wells included in monitoring schedule

Add Record

Delete Record

Print

Cancel

Main Menu

Reference Sheet

Exit

First

Previous

Next

Last

Record 1 of 1



# Global Wells KPI Input Tool – Main (Reference)

## Instructions:

Click on the Input Form button to input data.  
Click on the 'View Reference' button to view the Global KPI Reference Sheet



## Input Instructions:

1. Open the Input Form
2. Click the "Add" button to add a new record.
2. Choose the classification of your input
3. Fill in the Well Name, Rig Name, RESP and Tool.
4. Pick the Metric Type and RPU from the drop-down menus.
5. Input the highlighted fields to complete the form.
6. Press "Save" to save your input, or "Cancel" to cancel the changes and clear the form.
7. Press "Close" to close the input form

## Other Instructions:

Data currently in the worksheet can be viewed by navigating with the "First", "Previous", "Next" and "Last" buttons, or by inputting the desired row number in the text box provided.



[illegible]

Click on "Return to Main Menu" to return to the Input menu. Click "Input Form" to return to the Input Form.

User can peruse through the reference document to get more detailed information (snapshot for illustration purposes only)



## Well Start-up Checklist

Well: \_\_\_\_\_

Rig: \_\_\_\_\_

### (A) - RIG SAFETY CRITICAL EQUIPMENT & SYSTEMS

#### 1. All BOPs

- a. Ram configuration meets the requirements of Well Control ETP.  
(Ref: \_\_\_\_\_)
- b. Drilling contractor has confirmed that all BOP modifications have been disclosed to BP and performed under the drilling contractor's MoC process. ☐  
(Ref: \_\_\_\_\_)
- c. BOP system schematics are up to date, accurate and independently verified. ☐  
(Ref: \_\_\_\_\_)
- d. All well control safety critical equipment (including BOP, choke manifold and related pressure equipment) maintenance and testing is up to date. ☐  
(Ref: \_\_\_\_\_)
- e. If equipped with a shear ram, the BOP is rated to shear the drill pipe under maximum anticipated wellhead pressure. ☐  
(Ref: \_\_\_\_\_)
- f. A documented BP risk assessment is in place to address potential limitations of shearing capability. ☐  
(Ref: \_\_\_\_\_)

#### 2. Additional for Subsea BOPs

- a. Ram configuration meets the requirements of the "Interim Guidance on Subsea BOPs".  
(Ref: \_\_\_\_\_)

- b. Independent third party certification confirming that (i) inspection of the Subsea BOP has been completed in accordance with federal regulations and OEM specification, (ii) that the Subsea BOP is operating as designed and that modifications or upgrades of the Subsea BOP stack have not compromised the design or operation of the BOP. ☐  
(Ref: \_\_\_\_\_)
- c. The emergency systems and the functions they operate have been communicated to both the drilling contractor and BP personnel who are responsible for the operation. Emergency disconnect systems are set up to activate both the casing shear ram and blind shear ram above it, in that order. If a moored rig relies on procedures for emergency disconnect (i.e. not automated) then the procedures have been modified accordingly, including the processes to confirm understanding of the revised procedures with the applicable crews. ☐  
(Ref: \_\_\_\_\_)
- d. A BOP ROV intervention panel is fitted with a minimum capability of closing one set of blind-shear rams, the casing shear ram and one set of pipe rams. ☐  
(Ref: \_\_\_\_\_)
- e. Emergency shut-in system is available in the event that power is lost to the BOP stack or an unplanned disconnect occurs. All DP rigs shall contain Deadman and Autoshear systems. Moored rigs shall have an Autoshear as a minimum. ☐  
(Ref: \_\_\_\_\_)
- f. Testing has been performed in accordance with the requirements in the Well Control ETP and "Interim Guidance on Subsea BOPs. BOP stump test procedures confirmed that all functions including the emergency systems were working as designed. ☐  
(Ref: \_\_\_\_\_)
- g. All well control safety critical equipment (including BOP, choke manifold and related pressure equipment) maintenance and testing is up to date and has been verified by a third party. ☐  
(Ref: \_\_\_\_\_)
- h. A local plan has been defined for ROV intervention - independent of the rig-based ROV. ☐  
(Ref: \_\_\_\_\_)



### 3. Rig Emergency Systems and Critical Maintenance

- a. The drilling contractor has procedures in place such that emergency response drills shall be routinely conducted in accordance with local regulation, contractor and, if applicable, BP requirements. ☐  
(Ref: \_\_\_\_\_)
- b. In the event there is a need to bypass emergency system alarms, procedures are in place to provide adequate control and require that bypassed alarms are reported on the daily drilling report. ☐  
(Ref: \_\_\_\_\_)
- c. All safety critical equipment maintenance is up to date (including hoisting, safety shutdown systems, lifting, etc). Procedures are in place that require the maintenance status of safety critical equipment be provided by the drilling contractor to the BP Wells Team Leader and Wells Operation Manager on a scheduled basis. ☐  
(Ref: \_\_\_\_\_)
- d. Rig and marine audit requirements are in compliance with DWOP and all required actions have been closed. ☐  
(Ref: \_\_\_\_\_)

### 4. Control of Work

- a. A Bridging Document with the Drilling Contractor Safety Management System, is available and up to date to ensure that the Control of Work Standard (GDP 4.5.0001) is adhered to, especially, but not limited to, the areas of Personal and Process Safety. ☐
- b. Continuous Audit Process shall be implemented at the wellsite, as a minimum for the following areas: Well Control, Management of Change, Control of Work, Maintenance Management System, Emergency Equipment, Emergency Response. ☐  
(Ref: \_\_\_\_\_)
- c. All tasks must be risk-assessed, including routine tasks not controlled using PTW, communicated in writing and signed. Routine procedures and associated risk assessments shall be formally recorded and controlled. ☐  
(Ref: \_\_\_\_\_)

## **(B) - WELL CONTROL**

### **5. Well Control**

- a. Valid well control certificates are in place for all drilling contractor personnel involved in drilling operations as required by local regulations and contractor's policy. ☐  
(Ref: \_\_\_\_\_)
- b. Valid well control certificates are in place for all BP personnel as required by local regulations and DWOP. ☐  
(Ref: \_\_\_\_\_)
- c. Well control drills shall be routinely assessed by the BP Well Site Leader and action plans shall be established to close gaps. ☐  
(Ref: \_\_\_\_\_)
- d. Procedures are in place which require monitoring of pit volumes and flow in/out of the well. Compliance with these requirements shall be verified on a scheduled basis by the Well Site Leader and reported on the daily drilling report when verified. ☐  
(Ref: \_\_\_\_\_)
- e. Instructions are in place that describe how independently monitored pit and flow volumes are reconciled for the following activities:
- i. Drilling..... ☐
  - ii. Running tubulars..... ☐
  - iii. Wireline operations..... ☐
  - iv. Wellbore displacements..... ☐
  - v. Pit fluid movement and cleaning activities..... ☐
- (Ref: \_\_\_\_\_)
- f. Relief well contingency requirements are documented and suitable rigs are identified. ☐  
(Ref: \_\_\_\_\_)

## **(C) - WELL DESIGN & INTEGRITY**

### **6. Wellbore Integrity Tests (positive and negative differential)**

- a. Detailed procedures are in place which describe how wellbore integrity tests are to be performed, including but not limited to, barriers to be tested, configuration of the test lines and description of the R&Rs of the personnel involved. The procedures must be approved in writing by an authorized representative of the drilling contractor and the Wells Team Leader.  
(Ref: \_\_\_\_\_) ☐
- b. Pass/Fail criteria is clearly defined and documented, including acceptable pressure variations during a wellbore integrity test and what pressures should be expected/observed when monitoring more than one area.  
(Ref: \_\_\_\_\_) ☐
- c. The process for wellbore integrity test acceptance has been communicated to rig site and office personnel. The acceptance process has been signed by both the Well Site Leader and the authorized Contractor Senior Wellsite personnel.  
(Ref: \_\_\_\_\_) ☐
- d. Procedures are in place which require that all well integrity test results that are outside the defined and documented pass/fail criteria or when anomalies exist, shall be discussed with the Wells Team Leader before operations can proceed.  
(Ref: \_\_\_\_\_) ☐

## 7. Well Design

Procedures are in place which require that:

- a. Segment Guidance document (SG No. 5.1-0002) "Drilling and Completions Statement of Requirements and Basis of Design - Development, Compliance and Deviation Management" is followed.  
(Ref: \_\_\_\_\_) ☐
- b. Deviations to either the BoD or SoR are performed under a formal Management of Change and approved by the SPU VP of Drilling & Completions.  
(Ref: \_\_\_\_\_) ☐
- c. The well design complies with the requirements of ETP GP 10-01 "Casing and Tubing Design" and the "Casing and Tubing Design Manual" and applicable local regulations.  
(Ref: \_\_\_\_\_) ☐

- d. The well design complies with ETP GP 10-60 "Zonal Isolation Requirements during Drilling Operations, Well Abandonment and Suspension" and applicable local regulations. ☐  
(Ref: \_\_\_\_\_)
- e. The cementing services provider's procedures regarding how cement recommendations are to be reviewed and approved prior to submission to BP are in compliance with the provider's internal policies and procedures ☐  
(Ref: \_\_\_\_\_)
- f. Procedures are in place which require slurry testing to be performed in a manner consistent with the cementing services contract, including testing specified in Segment Recommended Practice SRP 4.1-0003. Any additional testing required is defined in the cementing BOD. ☐  
(Ref: \_\_\_\_\_)
- g. Compliance with all other relevant ETPs and STPs has been verified in writing by the RPU Wells VP. ☐  
(Ref: \_\_\_\_\_)







## Rig Audit Process: Draft Plans for Improvements

### Strategy to Strengthen Rig Audit Process

The Rig Audit Process should be enhanced and strengthened.

Responsibilities of the Audit Team should be broadened to better ensure that adequate response and follow up is conducted during the life of a Rig Contract.

The rig audit process will be implemented when the audit team is adequately resourced. This should happen as the team migrates to S&OR.

### Key Drivers

- Perform a pre contract commitment audit
- Major focus on risk management
- Big push on Integrity and Safety Critical Equipment
- Bly report findings
- Regulatory implications and new requirements
- OMS compliance – backbone of our operations
- Strengthen current contracts
- Strengthen Performance by knowing shortfalls and issues
- Better engagement with contractor during all stages
- Develop own workforce competency levels

### Objectives, Drivers, Requirements and Expectations

- Plan to reinforce Rig Audit Process in the following key areas:
- Key focus areas
  - Pre Contract commitment
  - Risk management
  - Integrity management
  - Performance (NPT)
  - Operational capability
  - OMS Compliance
  - Management system/tool (SharePoint) for:
    - Rig Database (Current and historical data)
    - Audit Reports and findings
    - Action Tracking
    - KPI reporting by rig, contractor and SPU

### GO/ NO GO Decision

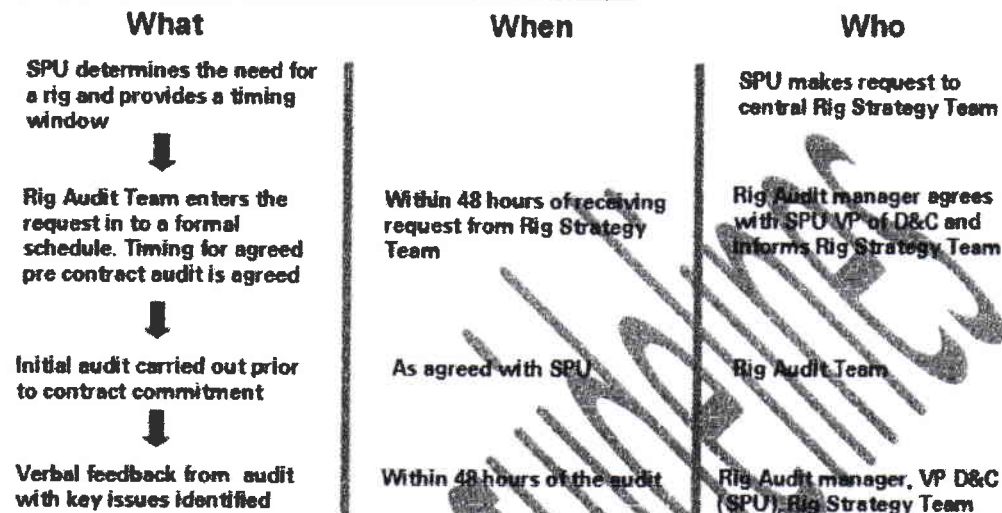
- Risk appreciation should be elevated in the SPU concomitant with Audit findings. A clear process of GO/NO GO to ensure the right business decisions are taken at the right levels in an SPU with the right levels of Wells Functional support.





- Decisions of this nature following Rig Audit Team recommendations will be collectively managed through an approved GO/NO GO involving all interested parties and not just the SPU. All corrective measures following recommendations would be approved by the Rig Audit Team.

#### Pre Rig Contract Commitment Audit (for MODU rigs)



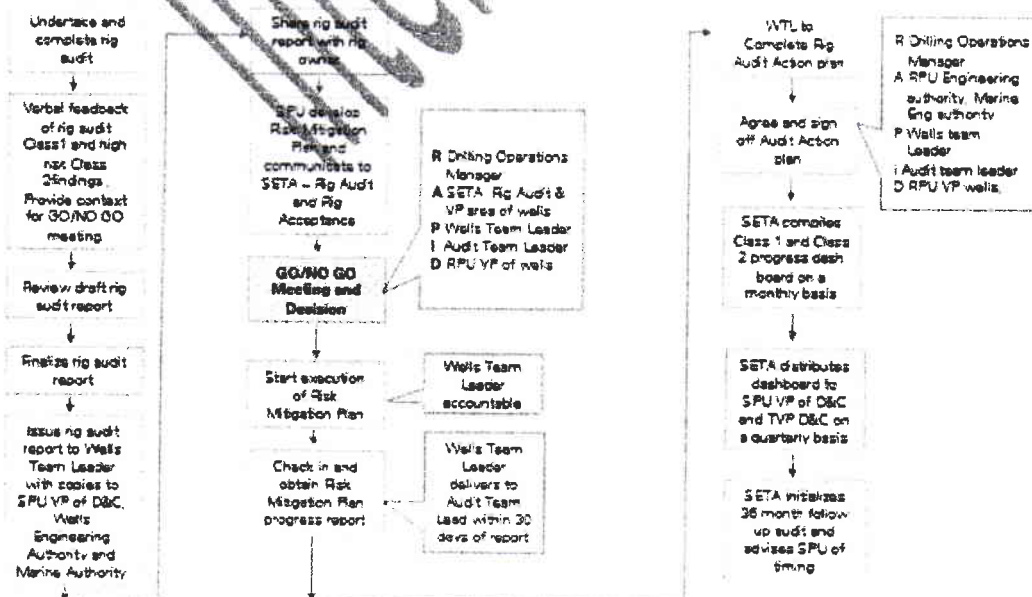
At this time, the initial findings will be split in to three categories:

Rig is acceptable and Contractor meets initial expectations – OK to proceed

Rig does not meet minimum standards but Contractor will commit to improvement before start up – OK to proceed

Rig does not meet minimum standards and Contractor will not commit to improvement before start up – Exit

#### Interim Auditing Sequence



## **Relief Well Requirements Interim Guidance**

### **Context**

The Well Control Manual is in the process of being revised and detailed guidance in the area of relief well planning will be included in the next release. However, in the interim, the following guidance provides clear minimum expectations in the area of relief wells and shall be followed for all D&C drilling operations. If teams require additional detailed design support, Mark Mazella should be contacted for well control issues and Bill Allen for surveying/well positioning support.

The following terminology applies to this interim guidance:

"Shall" is used where a provision is mandatory.

"Should" is used where a provision is preferred.

"May" is used where alternatives are equally acceptable.

### **Planning Expectations**

In conjunction with planned drilling operations a documented relief well plan shall be in place and shall include the following regarding relief wells:

- At least 2 identified relief well surface locations that have been verified for use
  - Offshore this verification may include things like shallow hazard surveys, seabed surveys, and cores to ensure the sites are acceptable
  - For multi-well development sites, consideration should be given regarding whether more than 2 relief well locations are advisable in order to intersect all the planned wells at the site
- Rig availability for use in relief wells shall be identified, recognizing that rig share agreements may be needed in SPUs where a capable rig is not under BP contract
- Identification of required tangible items and confirmation that such items can be made available in the timeframe needed
- High level view of dynamic kill requirements shall include:
  - confirmation that required hydraulic horse power can be made available as needed
  - confirmation that required volumes and weights of kill fluid can be adequately mixed/shipped/stored
- Conceptual relief well design shall include:
  - if specialist equipment (e.g. managed pressure drilling) is to be used, confirmation that adequate equipment can be made available



or that an alternative design can be executed without the specialist equipment

- identification of contingency intersect points (shallow, deep etc.)
- confirmation that the casing design accounts for dynamic kill pressure requirements, including a potential screen-out
- Identification of well control specialist company that will be contacted initially and confirmation that call off contracts are in place
- Identification of a clear process that enables the SPU D&C VP to sign off that the above requirements have been met

The Vice President, Global Wells shall be notified if more than 30 days lead time is anticipated to be required to begin relief well operations.