QA/QC Processes Well integrity and the Deepwater drilling worldwide group



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- **1.** Repsol's HSE Principles and Risk Management
- 2. E&P Quality Assurance & Quality Control process
- 3. Well construction Process: Roles & Responsibilities
- 4. Repsol's Well Containment Global Strategy

Repsol's HSE Principles and Risk Management HSE Commitment and Principles



Repsol's Health, Safety and Environmental policy sets out the commitment and the principles on health, safety and environmental matters which help to deploy the Vision and the Values of the company.

- Leadership and integrated management:
 - Integrated safety and environmental management. The chain of command must integrate safety and environmental matters into the business management and the business cycle.
- Compliance with local regulations and application of industry best practices
- **Continuous improvement**: Repsol systematically establishes goals and objectives for continuous improvement in health, safety and environmental protection.
- Communication and community relations: Transparent report of performance and knowledge sharing with the community and interest groups

Repsol's HSE Principles and Risk Management Major Accident Hazards



- The Hazard Management strategy for Repsol E&P assets and projects has been improved to ensure:
 - Alignment with safety management recommendations developed after the Macondo accident
 - Compliance with recently approved European Safety Offshore directive
- All E&P production assets and projects will have a comprehensive "Safety Case" in place before the end of 2015, to prove that all Major Accident Hazards have been identified and controlled to an ALARP (As low as reasonable practicable) level.

Repsol's HSE Principles and Risk Management Management of Major Accident Hazards





E&P Quality Assurance & Quality Control process QA & QC Concept



Since 2006 Repsol E&P has implemented the Quality Assurance and Quality Control processes, making them an integral part of the investment approval pre-requisites.

Main benefits of these processes:

- Integrated view of the project, showing interdependences of the different elements/disciplines
- Common metric for all projects, making them comparable under a common view and taking lessons learned
- Rising "red flags" with time enough to fulfill gaps and reduce risks of the project before investment decision

Subject Matter Experts



Well construction Process: Roles & Responsibilities Repsol Global Drilling Group

Repsol has created an expert **Global Drilling Group** under DE Technical Development, based in Houston:

- GDC is accountable to set the well construction process & manual, guidelines and best practices to be applied in Repsol; helps on identification and assignment of drilling human resources; and provides technical support for complex wells.
- GDC examines the Basis of Design of offshore and other complex wells, independent of the immediate line management of the well operations involved. The main objective of the review is to assure that the well is properly designed, the risks are identified and are as low as is reasonably practicable and the well integrity is fully assessed in each step of the design process. GDC also sanctions significant design changes to complex wells.

REPSOL



Repsol's Well Containment Global Strategy



- Well Containment is a generic term for all activities related to the **direct intervention** of a blow out at source point (wellbore) in an effort to halt or control the release of hydrocarbons to the environment.
- Internally, Repsol Upstream has confirmed the necessity to have a Global Well Capping and Containment response based on:
 - Standardized Model is developed and tested
 - Up to 30 operators use this model
 - Service companies are trained on this model
 - Allows standardized training and documentation globally



Repsol's Well Containment Global Strategy Equipment



The Global Well Containment Strategy confirms the use of the following equipment:



- The capping stack is an equipment that allows to control the release of hydrocarbons in case of a blowout.
- Repsol has signed a Master Contract with Wild Well Control Inc (WWC), one of the most recognized companies of well control. WWC is to provided all the equipment related to the Well Containment Response.

Repsol's Well Containment Global Strategy Equipment



The contract with Wild Well Control Inc (WWC) describes:

Equipment	WWC					
Capping Stack	Two capping stacks: • 2 ea. 15K (18 ³ / ₄ " bore)					
Capping Availability	 1st system available in Aberdeen 2nd system available in Singapore 					
Ancillary Equipment	Subsea HPU Data Acquisition Unit					
Subsea Dispersant Application	CT Manifold Routing Hoses Subsea Manifold ROV Wands					
Subsea Debris Clearing	Shears Model 2500 Shears Model 660					
Overall Support	Mature support capability and procedures					
Other equipment (e.g. CT, pumping, vessels, ROVs, relief well services) to be contracted by the Project						

Repsol's Well Containment Global Strategy Core Blowout Team



- Repsol contracted Deep Sea Development Services Inc (DSDS), which supported BP in the capping of the Macondo well.
- DSDS has been a key player in the establishment and development of well containment plans, conducting training, and supporting drill response activities to members of Helix and MWCC.

The **strategy** confirms that due to Repsol's size, a **Core Blowout Team** - integrated by several professionals among all Business Units – has to be formed. This approach allows personnel from **different regions** to meld into a common management structure.



Repsol's Well Containment Global Strategy Well Containment Response Plan



- To assure that the preparation of Well Containment Response Plans are accurate, operational procedures were identified:
 - Site Assessment and Initial Response
 - Debris Removal and Recovery
 - Well Capping & Shut-in Operation
 - Run Intervention Riser System

- Well Kill Operations
- Abandon Well
- Subsea Dispersant Plan
- Capping Stack Systems
- Phase 2 corresponds to the deployment of the Global Well Containment Response Strategy to identified deepwater operated drilling projects:
 - Efficient **implementation** tied to consistent use of a response **organization structure**, training and documentation program.
 - Supplementation of existing operations' Emergency Management and Response Plans (e.g. Blow Out Contingency Plan, Oil Spill Response Plan, Medevac, etc).
 - Integration with existing Repsol programs under the general category of global emergency response.

Repsol's Well Containment Global Strategy Well Containment Response Plan - Logistics



- The country specific Logistic Plan:
 - a) describes effectively and outlay the **mobilization** of the Capping equipment (Source Control Equipment) into the **project country**, from point of entry (Project International Airport) through end delivery point (Logistic Base or Project Port).
 - b) provides guidance for the embarkation and debarkation of WWC equipment from the storage facility in Peterhead, Scotland through export process via Air Charter Operations, importation and local delivery to the stack-up location quayside at Project Port.
 - c) highlights the **Roles and Responsibilities** of different groups (e.g.):
 - Wild Well Control
 - Crane Worldwide (CWW) (Scottish Logistic Company)
 - Score and Oceaneering UK (Cargo Company)
 - Ground Carrier
 - Air Carrier
 - Repsol Project Team

Repsol's Well Containment Global Strategy Well Containment Response Plan - Logistics



 As an example, the specific logistic plan describes the detailed ground logistics / point of origin requirements (Peterhead / Aberdeen / Prestwick)



WWC Equipment in Deployable Ready State for Emergency Load Out



WWC Destination Route Map

Repsol's Well Containment Global Strategy Well Containment Response Plan - Logistics





Antonov Cargo Plane

Aircraft	Feet Required				
747-400	Min. 10,400 feet				
Antonov IL124	Min. 9,842 feet				



Boeing 747 Freighter



Main Deck Loader

Offloading Equipment Required

20T High Loader (Scissor Lift)

100 MT Crane

Conclusions



- A thorough QA&QC process oriented to ensure quality requirements, support management decisions and detect value improvement.
- A well construction process carefully designed and carried out with numerous peer and technical reviews and gatekeepers to guarantee well integrity.
- A Global Well Containment Response Strategy internally approved which comprises access to the most advanced equipment, a trained personnel (core blowout response team), and detailed operational procedures established to provide a standardized response for any offshore well containment situation.
- Contracts signed with the most recognized well-control companies: Wild Well Control Inc (WWC) for supply of required equipment and services and Deep Sea Development Services Inc (DSDS) to conduct training and establish well containment plans.
- Dedicated meetings (WWC, DSDS and GDC) held with DW Drilling Managers in order to analyze the different activities project by project.



"no more and no less, at the right time"



GLOBAL CRITICAL EMERGENCY MANAGEMENT



Safety & Environment

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1. Background

- 2. Implementation Plan
 - Critical Management
 Program
 - Path forward



Background

Why is it necessary?



	Risk	1			Impacts			
	Operational	Geographic		Social		Economic		Reputatio nal
•	Deepwater Drilling, HP/HT, Helicopter Ops, Extreme Environments	 36 wells Offshore (3 exploratory and 33 development) 711 wells Onshore (8 exploratory and 703* development) E&P Activity in 32 countries (operator in 25) 	•	Environmental Impact Impact on communities	•	Sanctions Legal settlements Containment and remediation costs	•	Exxon Valdez, Piper Alpha, BP Macondo, Chevron Brazil, Repsol Alaska



Implementation Plan

GCEM Framework









The Global Critical Emergency Management system:

the prevention, preparedness, response and recovery services that mitigate the impact of a Major Accident Hazard

(MAH) realized on Repsol E&P's global operations

System & Boundaries





GCEM Objectives Breakdown





E&P Global Critical Management Program

Standardized Program of Best PracticesAlign Organizations & Calibrate Processes



Doctors (E&P Global Critical Management Group)

Experts in Preparedness, Response and Recovery (6-9)
Technical experts in oil spills, response safety, business continuity (3)



Dream Team (E&P Global Critical Response Group)

Regional & BU Personnel trained for modular responses
Capable for quick activation to support other Regions/BUs



Response Assets

- •Critical Management Centres
- Situation Rooms
- •Located in Madrid, Houston, Port of Spain, Lima and Rio de Janeiro

In coordination with Technical Development, HSE, and Corporate functions





To implement a **Global Critical Emergency Management system**, which is supported by response personnel and assets that mitigate the impact of a Critical or Major Accident Hazard.

The GCEM shall;

- 1. Meet **industry standards** as a minimum
- 2. Have competent and trained **response personnel**
- 3. Have suitable and audited **response assets**

Procedure Structure





E&P Global Critical Management Program

Standardized Program of Best PracticesAlign Organizations & Calibrate Processes







GCEM Organization





Doctores (E&P Global Critical Management Group)

• Experts in Preparedness, Response and Recovery (6-9)

•Technical experts in oil spills, response safety, business continuity (3)



Repsol's Three Level Response





Dream Team (E&P Global Critical Response Group)

•Regional & BU Personnel trained for modular responses

•Capable for quick activation to support other Regions/BUs





Response Assets





Response Assets

Critical Management Centres

Situation Rooms

•Located in Madrid, Houston, Port of Spain, Lima and Rio de Janeiro



GCEM KEY 2014 DATES



ACTIVITY	JAN	FEB	MAR	APR	MAY	JUN	JULY	AUG	SEPT	ост	NOV	DEC
E&P GCEM Review												
On site oil spill & ER Tech Support												
Industry Meetings												
Training EAA												
Training USA												
Training Brazil												
Training Caribbean												
Training Pacific								_	_	_		
Exercise EAA												
Exercise USA												
Exercise Brazil												
Exercise Caribbean												
Exercise Pacific												

Questions?





Regulatory Framework



Gulf of Mexico

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AGENDA

- 1. Regulatory Framework
- 2. New Mandates
- 3. Workplace Safety Rule
- 4. US Adaptation
- 5. Going Forward

Regulatory Structure Re-Organization



On October 1, 2011, the <u>Bureau of Ocean Energy Management, Regulation</u> <u>and Enforcement (BOEMRE)</u>, formerly the Minerals Management Service (MMS), was replaced by the Bureau of Ocean Energy Management (BOEM) and the Bureau of Safety and Environmental Enforcement (BSEE) as part of a major reorganization.

BOEM is responsible for managing environmentally and economically responsible development of the nation's offshore resources.

BSEE is responsible for safety and environmental oversight of offshore oil and gas operations, including permitting and inspections, of offshore oil and gas operations

2. New Mandates

Enhanced Drilling Safety

- Operators must demonstrate that they are prepared to deal with the potential for a blowout and worst-case discharge per NTL-06.
- Permit applications for drilling projects must meet new design standards and be independently certified by a professional engineer per the new Drilling Safety Rule.
- New guidance, through NTL-10, requires a corporate compliance statement and review of subsea blowout containment resources for deepwater drilling, a key lesson of the *Deepwater Horizon* oil spill.
- The bureau announced that they will begin to use multiple-person inspection teams for offshore oil and gas inspections.





2. New Mandates

Enhanced Workplace Safety



BSEE imposed, for the first time, requirements that offshore operators maintain comprehensive safety and environmental programs.

- Performance-based standards for offshore drilling and production operations, including equipment, safety practices, environmental safeguards, and management oversight of operations and contractors.
- Companies now have to develop and maintain a Safety and Environmental Management System (SEMS) per the new Workplace Safety Rule.



3. Workplace Safety Rule

Safety & Environmental Management System



- The Workplace Safety Rule became effective on November 15, 2010.
- SEMS must be implemented by Nov. 15, 2013
- Additional **SEMS II Rule** went into effect on June 4, 2013.
- Operators have until June 4, 2014 to comply with the provisions of the SEMS II Rule, except for the auditing requirements.
- All SEMS audits must be in compliance with the SEMS II Rule by June 4, 2015.



3. Workplace Safety Rule SEMS I – Original Elements



- 1. General provisions
- 2. Safety and environmental information
- 3. Hazards analysis
- 4. Management of change
- 5. Operating procedures
- 6. Safe work practices
- 7. Training
- 8. Mechanical integrity
- 9. Pre-startup review
- 10. Emergency response and control
- 11. Investigation of Incidents
- 12. Audits
- 13. Records and documentation



3. Workplace Safety Rule SEMS II - Additional Elements



- 1. Developing and implementing a **STOP WORK AUTHORITY**
- 2. Developing and implementing an **ULTIMATE WORK AUTHORITY**
- 3. Requiring an **EMPLOYEE PARTICIPATION PLAN**
- 4. Establishing guidelines for **REPORTING UNSAFE WORKING CONDITIONS**
- 5. Establishing additional requirements for CONDUCTING A JOB SAFETY ANALYSIS
- 6. Requiring that the team lead for an audit be independent and represent an ACCREDITED AUDIT SERVICE PROVIDER

4. US BU Adaptation

Integrated Management System



In the 1st qtr 2011, the US BU launched an initiative to develop a **formalized** Integrated Management System.

- Disciplinary Based
- Incorporates PLAN-DO-CHECK-ACT Principle
- Compliant with ISO and OSHAS standards
- Incorporates SEMS I & II Elements
- Incorporates and supports Corporate and Upstream Standards
- Bolstered by a robust Critical Response Management Sytem

4. US Business Unit Adaptation

Integrated Management System



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4. US BU Adaptation Repsol SEMS Development



Post Macondo

- SEMS became the top priority
- Leading up to the deadline set by BSEE, in August 2012 the US Business Unit had a 3rd party GAP audit completed to help identify any gaps in it's SEMS
- In November 2012 a final verification audit was carried out by a 3rd party and Repsol's US Business Unit was determined to have a fully Compliant SEMS



5. Contractor Integration Bridging Process



Bridging SEMS with Contractors

- Repsol as the operator is responsible for ensuring SEMS is fully implemented throughout the operation regardless what type of program is being executed, i.e. drilling, work over, production, etc.
- Outside of production operations, the asset is not typically owned nor maintained by the operator, thus a bridging process must be completed to clearly identify which elements of each respective company's SEMS will be utilized.
- Once the SEMS Bridging Document is complete, it must be approved by both companies and serves as an official agreement between the companies to formally manage SEMS within the operation

5. Contractor Integration Additional Elements



Training & Competency Verifications

All personnel that travels to the vessel must have a comprehensive training review completed.

SEMS Compliance Audits

To fully demonstrate SEMS compliance, as an operator we carry out 3rd party compliance audits on applicable contractors to ensure they have a functional SEMS



5. Going ForwardOn Going Efforts



- Final SEMS II elements are currently being incorporated where needed and an Audit shall be carried out prior to the June 4th deadline to demonstrate full SEMS compliance with BSEE's mandate
- We are planning to carry out a full SEMS audit on our current GOM Deepwater project within the year to ensure compliance as well to measure its effectiveness
- We are working to enhance our contractor management processes to further support SEMS implementation within our other operations within the US (not just GOM)
- Work continues to advance the other systems within the Integrated Management System





