The Blowout Contingency Plan: Contingency and Response Planning

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Monday, 19 October 2015
What Is A Blowout?

The most catastrophic occurrence during wellsite operations is a blowout.

A blowout is an uncontrolled flow of reservoir fluids from the wellbore to the Earth’s surface.
When Can A Blowout Occur?
Documented facts show that over 80% of major catastrophes involve a chain of 7-11 separate contributing factors (or warning signs) before a catastrophe occurs.

Blowouts Are NO Different!
Offshore drilling operations in deepwater are generally safe operations – when working with a trained, experienced crew.
During the drilling operation, control of the well is lost unexpectedly resulting in hydrocarbons igniting at the rig floor.

The rig is safely evacuated.

What happens next?
What happens next?

• Operator declares an Emergency and immediately activates the company’s Blowout Contingency Plan.

• The Blowout Contingency Plan is an emergency response document, pre-authorized at the Corporate level, that provides an integrated and systematic approach to well control incident management. It is designed to provide guidance to the Company’s response efforts.

• The Blowout Contingency Plan is crucial to an effective and efficient response during a well control incident.
The Blowout Contingency Plan

The Blowout Contingency Plan (BCP)

•Defines and establishes an Incident Command Structure (ICS)
•Assigns responsibilities and duties
•Outlines the Well Control Incident Action Plan
•Identifies resources that may be required for an effective response
•Integrates with other information
Benefits of having a BCP in place include:

- Reduces risks to personnel, property and population
- Designates the response structure
- Minimizes or eliminates costly time delays
- Provides a written reference in times of indecisiveness
- Enhances communication
- Minimizes environmental impact
- Projects a proactive position to the public
The Incident Command Structure is designated by the BCP to manage the emergency response.

The Incident Command Structure
- Clearly identifies the decision makers
- Assigns tasks and responsibilities
- Gives structure to the response effort
- Enhances the efficiency for the emergency response
The Incident Command Structure

Typical ICS found in Blowout Contingency Plans
The Operations Section

- Operations Section Chief
  - Deputy Operations Section Chief
    - Deputy Operations Section Chief
      - Oil Spill Response
      - Protection Group
      - On-Water Recovery Group
      - Shore-Side Recovery Group
      - Disposal Group
      - Decontamination Group
      - On-Water Dispersants
      - Source Control Branch
        - Subsea Containment Group
        - Surface Containment Group
        - Relief Well Group
        - SIMOPS Group
        - Engineering Support
Operationally, the ICS is focused on:

- Oil Spill Response
- Source Control

While both Oil Spill Response and Source Control are equally important, Source Control efforts are viewed as being proactive – seeking to eliminate pollution by halting the uncontrolled flow of hydrocarbons.
High Level Source Control

On Scene Commander

Source Control Branch Director

Deputy Source Control Branch Director

Relief Well Group
Vessel SIMOPS Group
Subsea Well Containment Group
Surface Well Containment Group
Flow Control Group
Focused on:

Controlling the source at the wellhead
   » May be subsea or surface

Operationally, Source Control is the priority. Until it is successful in its efforts, the Oil Spill Response will continue.

This priority requires resources dedicated solely to Source Control efforts.
Well Control Incident Plan

Outlines the Actions for:

• Debris Clearing
• Dispersant Injection
• Well Capping
• Well Containment
• Relief Well Efforts
Resource Requirements

- Vessels
- ROVs
- Air Support
- Dispersant Injection Equipment
- Debris Clearing Equipment
- Well Intervention (Capping Stack) Equipment
- Drilling Rig for Relief Well
- Engineering Support
Vessel Specifications

All Vessels
» DP 2/3
» Deck Space: 1,500 – 2,000 sq ft
» 2 x ROV

Debris
» 150T crane

Dispersant
» 100T crane

Capping Stack
» 200T crane
» Tower
» Drilling Rig?
Under Source Control Operations, you will have the following Simultaneous Operations (SimOps):

- **Oil Spill Response**
- **Source Control Response**
  - Completing assessment
  - Commencing debris clearing
  - Commencing dispersant injection
  - Identifying well intervention (well capping) assets and mobilizing same to wellsite
  - Planning for relief well
Example of SimOps during Subsea Source Control efforts

- Surface and subsea SimOps
- ROV survey and assessment
- Secondary function/troubleshooting of ‘failed’ BOP
- Subsea debris removal (gain access to wellbore)
- Capping stack install/operation
- Subsea dispersant application
- Relief well drilling/intercept/well kill
- Controlled flowback to surface for capture/disposal
SOURCE CONTROL
Response
Methodology
Response Overview – Source Control

Within the first hour of the event happening, Operator’s Well Control provider is contacted and response put into effect based on Operator’s Blowout Contingency Plan …

- Well Control Engineers mobilized to Operator’s offices
- Well Control Specialists mobilized to wellsite
- Well Control Response Specialists begin mobilization process for capping equipment, debris clearing tools and dispersant injection equipment
- Relief Well Engineers mobilized to Operator’s office to commence Relief Well Planning
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 – To be Commenced Immediately
Scenario 3

Rig Sinks At Distance From BOPs and Wellhead

Commence Subsea Intervention and Relief Well Simultaneously
Initial Assessment

- Determine the status of the wellhead
- Identify flow paths
- Determine status of flowlines
- Determine status of riser assembly
- Identify location of rig if sank
- Determine/identify hazards around wellhead
- Determine/identify hazards on surface
- Assess condition/status of seabed around wellhead
- Identify viable well intervention options
Debris Clearing

If assessment identifies rig components/debris around wellhead or other critical components of the wellhead, clearing around the wellhead must be done before well intervention activities can commence. Debris clearing shears or diamond wire cutters are deployed to depth and used to remove any debris.

Resources required

- Large hydraulic subsea shears
- Hydraulic power packs and hydraulic hose reels
- Hydraulically operated Diamond Wire Cutters
- ROVs, Work Class
- Dedicated vessel as a work platform
Debris Clearing Illustration

Up to 35-in. Diameter
Shear Force 5,000psi
Dispersant Injection

If it is determined that dispersant injected at the initial flow path is possible, then efforts should be made to get the dispersant injection equipment deployed as quickly as possible.

Resources required

- Injection Equipment – multiple wands, subsea hoses
- Coiled Tubing unit for conveying dispersant to subsea injection equipment
- Dispersant
- ROVs, Work Class
- Dedicated vessel as a work platform
Dispersant Injection Illustration
If the assessment determines that Well Intervention is possible, the Capping Stack is mobilized to the nearest docks, assembled and tested, then mobilized to the well site. The Well Control company will oversee the deployment of the capping stack. When successful, the well is shut in or diverted to the surface for capturing.

Well Intervention Assets Required

Resources required

• Well Intervention Equipment – Capping Stack
• Subsea Hydraulic Power Unit
• Flow to Surface Equipment
• ROVs, Work Class
• Dedicated vessel as a work platform
Well Intervention Assets – Capping Stack

Front View
Well Intervention Assets – Subsea Hydraulic Power Unit

Subsea HPU General Specifications

- Rated to 10,000 fsw
- Built on existing technology (millennium Class ROV)
- Allows for rapid closure/function of the capping stack
- Supplies adequate power for all subsea tooling
- 17H high-flow hot stab
Regardless of the blowout scenario, Relief Well Planning is automatically initiated. Working simultaneously with Well Intervention efforts, but operating autonomously, the Relief Well Team begins:

- Collecting well data of the target well
- Commence dynamic kill modeling
- Commence casing/well design of the relief well
- Identifying the best location/site for relief well
- Identifying potential rigs for relief well efforts
Within the Blowout Contingency Plan are many other Plans, each equally important, that will enhance the overall effectiveness and efficiency of the response.

The Blowout Contingency Plan also includes –

• Dynamic Kill Plans
• Broaching Analysis
• Gas Dispersion Analysis
• Shallow Water Capping Deployment Procedures
• Company Specific Technical Checklists that are Position Specific for Source Control Emergency Response positions
• Customized Subsea Well Containment Equipment Deployment Plans
• Logistical Deployment Plans
Training, Drills and Exercises
Training, Drills and Exercises

- It is important that the Blowout Contingency plan is followed to minimize disruptions and unnecessary delays. It is most important that the ICS personnel and First Responders are trained in their response.
- It is critical that drills and exercises be performed to ensure a response will be completed in a consistent, effective and efficient manner.

Training, drills and exercises are critical to the success of an emergency response.
CONCERNS
Mobilization Concerns for Source Control Resources

Where will the Source Control Resources come from:

» Debris clearing tools?
» Dispersant injection tools?
» Well intervention (capping stack) equipment?
» Relief well rig?
» Vessels?

Where will the Dispersant come from?

What is the Quantity of Dispersant needed? Is it approved?
If the Operator does not own his own Well Intervention / Capping Stack, then the Operator must have contractual access to OSRL or Wild Well subsea capping equipment.
Wild Well’s Subsea Capping Stack

Internal diameter: 18 3/4 in.
Pressure rating: 15,000psi
Temp. range: -20 to 250°F
Weight: +/- 110s/t
Height: 23 ft

Interfaces:
- **Primary bore:**
  - Upper interface: 18 3/4 in. 15M HC Hub/mandrel
  - Lower interface: 18 ¾ in. 15M HC, H4 or Drillquip DX-15 connector
- **Wing:**
  - (4x) Vector Optima mechanical connector mandrels
- **ROV functions:**
  - Manifolds: 17H high flow
  - Chokes: Class IV torque tool
  - Vector connectors: Class V torque tool
<table>
<thead>
<tr>
<th>Step</th>
<th>Time (hrs)</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Move From Staging Point to Freight Forwarder</td>
<td>36 - 48 hrs</td>
<td>Dependent on Plane Availability</td>
</tr>
<tr>
<td>Air Charter – Prestwick to Cuba / US</td>
<td>34 - 38 hrs</td>
<td>Based on Antonov 10 - 12 hrs</td>
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<tr>
<td></td>
<td></td>
<td>Based on 747s</td>
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<tr>
<td>Airport to Port of Mariel</td>
<td>4 - 6 hrs</td>
<td>Includes Loading and Unloading</td>
</tr>
<tr>
<td>Assembly / Testing at Dock</td>
<td>24 - 48 hrs</td>
<td></td>
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<tr>
<td>Seafastening</td>
<td>24 - 48 hrs</td>
<td></td>
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<tr>
<td>Transit to Wellsite</td>
<td>8 - 10 hrs</td>
<td></td>
</tr>
<tr>
<td>Total Time to Wellsite</td>
<td>130 - 198 hrs</td>
<td>Assuming no delays</td>
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**Estimated Timing for Mobilization of Well Intervention (Well Capping) Assets**

Estimated 5.4 – 8.3 days to move Subsea Well Capping Assets from Staging Point to Well Site.
What Are The Concerns for a Multinational Emergency Response

• Cuban authorization for the mobilization and importation of response personnel and equipment.
• Cuban authorization for response personnel to be deployed offshore.
• US Authorization for deployment of equipment and personnel to assist.
• Approval of well intervention plans and procedures by Cuban government/regulatory agencies.
• Validation/vetting of support equipment/services to be provided from local resources.
• Granting of immunity for emergency responders
• Lack of multinational training, drills and exercises
• Introduction/insertion of Unified Command
Unified Command (UC)

The UC may be used whenever multiple jurisdictions are involved in a response effort. These jurisdictions could be represented by:

- Geographic boundaries
- Governmental levels
- Functional responsibilities
- Statutory responsibilities
- Some combination of the above
A Joint Contingency Plan between Mexico and the United States regarding pollution of the marine environment by discharges.

Establishes cooperative processes that promotes joint utilization of transboundary reservoirs and establishes guidelines for transboundary developments.

Could be model of Joint Contingency Plan between Cuba and the United States.
The Gulf Loop Current
Well Control Specialists Must Be Allowed to Do Their Job
For Cuba

- Pre-authorization for the temporary importation of emergency response equipment to Cuba in the event of an emergency.
- Pre-approved work visas for travel by emergency response personnel to Cuba.
- Develop policies for the indemnification and protection of emergency response personnel.
- Holding of joint US-Cuba exercises to develop plans and procedures in order to have an effective and efficient response (Not just Oil Spill Drills, but also Emergency Well Intervention Drills).
- Permit transfer of technology / information that will enhance an effective response.
- Encourage joint meetings of each country’s regulatory bodies to confirm the availability of mutual aid should it be needed in a response.
What Would be Our Recommendations

For the US

- Pre-approve licenses for the temporary export of emergency response equipment to Cuba in the event of an emergency.
- Pre-approve licenses for the travel by emergency response personnel to Cuba.
- Holding of joint US-Cuba exercises to develop plans and procedures in order to have an effective and efficient response.
- Permit transfer of technology / information that will enhance an effective response.
- Encourage joint meetings of each country’s regulatory bodies to confirm the availability of mutual aid should it be needed in a response.
What Would be Our Recommendations

For the COMPANY

BE PREPARED for a Well Control Emergency

» Develop a comprehensive Blowout Contingency Plan with the help of the Company’s designated Well Control Company.

PRACTICE - Conduct Drills / Exercises for the Rig Crew and Office Personnel, using the BCP as a guideline. Annually or sooner.

MAINTAIN RELATIONSHIPS with all regulatory agencies, well control company, other Operators as to the requirements and expectations of them in the event of a well control incident.
Questions?
THANK YOU!

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