
**SAFETY AND ENVIRONMENTAL
MANAGEMENT SYSTEMS ACCIDENT
INVESTIGATION REPORT**

**PART 2 – RECOMMENDATIONS AND
CORRECTIVE ACTION**

IN RE:

**South Timbalier Block 220, Well #A003ST01BP03
Walter Oil & Gas Corporation Blowout involving
Hercules Offshore Incorporated Rig 265**

**Prepared by
Walter Oil & Gas Corporation**

November 18, 2014

PREFACE

Report Part 1 – Root Cause Investigation Results, previously submitted, describes findings that are based on the evidence examined to date and reflects the investigators' current understanding of events leading to the blowout. The investigation has focused on the nature of the incident and the factors that contributed to initiation of the incident and its escalation to a loss of control.

This report, *Report Part 2 – Recommendations and Corrective Action*, complies with the reporting requirements found in Subpart S-Safety and Environmental Management Systems (SEMS) of 30 CFR Chapter II, Section 250.1919 (a)(3), (b)(1)-(3). This report presents recommendations identified as a result of the investigation and plans for implementation of a corrective action program.

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OVERVIEW

1. Incident Summary

On July 23, 2013 at approximately 8:45 am, Walter Oil & Gas Corporation (“Walter”) experienced a well control incident at ST Block 220. Well #A003ST01BP03 was being recompleted to the 8800 ft sand with the Hercules Offshore, Inc. Jack-Up Rig 265. Well control was lost while pulling the drillstring back to surface after perforating. All personnel on the rig were successfully evacuated without any loss of life or injury. The resulting pollution was limited because the produced fluid was primarily natural gas with just a small amount of associated liquid condensate and because the blowout ignited about 13 hours after control was lost. A large amount of formation sand was being produced along with the formation fluids and the well bridged-off naturally within a few days.

2. Incident Root Cause(s)

Upon completion of the investigation detailed in the previous report, *Report Part 1 – Root Cause Investigation Results*, it was concluded that three primary root causes were responsible for the event:

1. Higher than estimated pore pressure in the 8800 ft sand, resulting in a smaller than expected trip margin;
2. An ineffective response to well control complications with both kick detection and well shut-in procedures;
3. The inability to close choke line HCR valve due to accumulator pressure depletion resulting from interflow caused by incomplete selector valve actuation.

3. Recommendations and Action Items

Walter recommends and will timely initiate the following action items which will be described in detail in this report:

1. Implement tripping procedures that require designated stoppage points to monitor the well for flow, require trip sheets to be maintained by the driller, and verify that the fill-up required be posted at the rig floor;
2. Implement tripping procedures that require a cross-over sub to fit the drill pipe being pulled be placed on the top drive when using a tapered string;
3. Perform training for all operations personnel on findings of the investigation;
4. Implement BOP acceptance procedures that require Hydraulic Operating Chamber testing to be performed prior to initial deployment of BOP;
5. Develop and implement BOP shut-in procedures for completion operations that require hard shut-in as the standard procedure;

6. Include hazards of gas migration with fluid loss during completion operations with completion fluids in all completion and work-over SEMS hazards communications.

The 'Incident Root Cause(s)' described in #2 above and the 'Action Items' detailed in #3 above are lifted from that certain '*Incident Investigation – Action Item(s)*' report ("AI Report") previously submitted by Walter to BSEE (a copy of which is attached hereto as Attachment 1).

RECOMMENDATIONS AND RESPONSE TO FINDINGS

1. Changes In Tripping Procedures

1.1 Recommended Corrective Measures and Response to Finding

(a) Walter recommends implementing and intends to implement tripping procedures that require designated stoppage points to monitor the well for flow, require trip sheets to be maintained by the driller, and verify that the fill-up required be posted at the rig floor.

By being more specific with the tripping requirements Walter will be addressing both the pore pressure estimation and kick recognition. Pore pressure should always be considered as estimated when tripping. Focusing on improving the recognition of kick indicators and setting company-defined stopping points is the best approach to address accuracy of pore pressure estimates.

This corrective action addresses the root cause opinions found in Paragraphs 9.1.2, 9.1.3(a-c), 9.1.4, and 9.1.5(a) of the SEMS Accident Investigation Report Part 1 – Root Cause Investigation Results.

(b) Walter recommends implementing and intends to implement tripping procedures that require a cross-over sub to fit the drill pipe being pulled be placed on the top drive when using a tapered string.

Requiring the top drive lower connection be compatible with the string being tripped will improve the safety of the rig crew and allow flow from the well to be addressed more quickly. The weight of the top drive and the mechanical advantage of the motor to torque the drillstring will increase the range of pressure and flow through the drill pipe where successful shut in of the well can be achieved.

This corrective action item addresses the root cause opinions found in Paragraphs 9.1.5(b & c) of the SEMS Accident Investigation Report Part 1 – Root Cause Investigation Results.

1.2 Status of Implementation of Recommended Corrective Measure

REDACTED

2. Training For All Operations Personnel

2.1 Recommended Corrective Measures and Response to Finding

Walter recommends performing training and intends to perform training for all operations personnel on findings of the investigation.

Training will focus on the differences between tripping operations with drilling mud and tripping operations with completion fluid, and training will focus on the likelihood and recognition of gas migration while losing fluid. Training will also focus on the importance of investigating any variations in expected fill-up (high or low). Training will stress the importance of having set procedures for tripping that have established parameters for the drillers to follow when tripping out of the hole.

This corrective action item addresses the root cause opinions found in Paragraphs 9.1.1, 9.1.3 (b-d), 9.1.5 (a-c), 9.1.6, and 9.1.7 of the SEMS Accident Investigation Report Part 1 – Root Cause Investigation Results.

2.2 Status of Implementation of Recommended Corrective Measure

REDACTED

3. Modification to BOP Acceptance Procedures

3.1 Recommended Corrective Measures and Response to Finding

(a) Walter recommends implementing and intends to implement BOP acceptance procedures that require Hydraulic Operating Chamber testing to be performed prior to initial deployment of BOP.

The Hydraulic Chamber test will verify that the BOP control system is tested and leak-free prior to operations starting. The test as described by API Standard 53 confirms (i) the WP integrity of the control system from valve to BOP, (ii) the complete actuation of the control valves and (iii) no interflow from the valve.

This corrective action item addresses the root cause opinions found in Paragraph 9.1.6 of the SEMS Accident Investigation Report Part 1 – Root Cause Investigation Results.

(b) Walter recommends implementing and intends to implement additional function test procedures for remote push button actuators.

Walter will add to its function test procedures a specific verification that remote push button actuators provide sufficient signal to fully function the primary valve at the main hydraulic

control unit. Walter will require signage at all remote stations stipulating the minimum time to hold the push button actuator closed to achieve complete function of the main valve.

This corrective action item addresses the root cause opinions found in Paragraphs 9.1.6 and 9.1.7 of the SEMS Accident Investigation Report Part 1 – Root Cause Investigation Results

3.2 Status of Implementation of Recommended Corrective Measure

REDACTED

4. BOP Shut-In Procedures Requiring Hard Shut-In

4.1 Recommended Corrective Measures and Response to Finding

Walter recommends developing and implementing, and intends to develop and implement, BOP shut-in procedures for completion operations that require hard shut-in as the standard procedure.

Switching to a hard shut-in procedure for completions requires that the choke manifold alignment be kept in a “closed choke” condition for all completion operations and ensures the fastest response to a well flow condition.

This corrective action item addresses the root cause opinions found in Paragraphs 9.1.5 (c), 9.1.6 and 9.1.7 of the SEMS Accident Investigation Report Part 1 – Root Cause Investigation Results.

4.2 Status of Implementation of Recommended Corrective Measure

REDACTED

5. Hazards Communications

5.1 Recommended Corrective Measures and Response to Finding

Walter recommends including and intends to include hazards of gas migration with fluid loss during completion operations with completion fluids in all completion and work-over SEMS hazards communications.

Walter will include as part of its future hazards communications to appropriate personnel for completion operations an overview of gas migration in clear fluids and the effect of high flow potential sands on shut-in time. The speed at which well flow can increase with completion fluids and open perforations will be discussed, as will the use of tripping and well monitoring to mitigate those factors.

This corrective action item addresses the root cause opinions found in Paragraphs 9.1.4 and 9.1.5 of the SEMS Accident Investigation Report Part 1 – Root Cause Investigation Results.

5.2 Status of Implementation of Recommended Corrective Measure

REDACTED

DISTRIBUTION OF CONCLUSION TO FACILITIES AND PERSONNEL

REDACTED