

UNITED STATES DEPARTMENT OF THE INTERIOR
MINERALS MANAGEMENT SERVICE
GULF OF MEXICO REGION

ACCIDENT INVESTIGATION REPORT

1. OCCURRED

DATE: 14-NOV-2009 TIME: 2350 HOURS

2. OPERATOR: BHP Billiton Petroleum (GOM) Inc.
REPRESENTATIVE: Susan Wilson
TELEPHONE: (713) 599-6349
CONTRACTOR: Transocean Offshore
REPRESENTATIVE: George Schneider
TELEPHONE: (832) 587-6940

- STRUCTURAL DAMAGE
- CRANE
- OTHER LIFTING DEVICE
- DAMAGED/DISABLED SAFETY SYS.
- INCIDENT >\$25K
- H2S/15MIN./20PPM
- REQUIRED MUSTER
- SHUTDOWN FROM GAS RELEASE
- OTHER

3. OPERATOR/CONTRACTOR REPRESENTATIVE/SUPERVISOR
ON SITE AT TIME OF INCIDENT:

6. OPERATION:

4. LEASE: G08038
AREA: AT LATITUDE:
BLOCK: 618 LONGITUDE:

- PRODUCTION
- DRILLING
- WORKOVER
- COMPLETION
- HELICOPTER
- MOTOR VESSEL
- PIPELINE SEGMENT NO.
- OTHER

5. PLATFORM:
RIG NAME: GSF C.R. LUIGS

6. ACTIVITY: EXPLORATION (POE)
 DEVELOPMENT/PRODUCTION
(DOCD/POD)

8. CAUSE:

7. TYPE:

- HISTORIC INJURY
 - REQUIRED EVACUATION
 - LTA (1-3 days)
 - LTA (>3 days)
 - RW/JT (1-3 days)
 - RW/JT (>3 days)
 - Other Injury

- EQUIPMENT FAILURE
- HUMAN ERROR
- EXTERNAL DAMAGE
- SLIP/TRIP/FALL
- WEATHER RELATED
- LEAK
- UPSET H2O TREATING
- OVERBOARD DRILLING FLUID
- OTHER _____

- FATALITY
- POLLUTION
- FIRE
- EXPLOSION

9. WATER DEPTH: 6266 FT.

- LWC HISTORIC BLOWOUT
- UNDERGROUND
- SURFACE
- DEVERTER
- SURFACE EQUIPMENT FAILURE OR PROCEDURES

10. DISTANCE FROM SHORE: 107 MI.

11. WIND DIRECTION: SSE
SPEED: 6 M.P.H.

12. CURRENT DIRECTION: SSE
SPEED: 0 M.P.H.

COLLISION HISTORIC >\$25K <=\$25K

13. SEA STATE: 0 FT.

17. INVESTIGATION FINDINGS:

On 14 November 2009 at approximately 2350 hours, while attempting to open the boost line gate valve at the Lower Marine Riser Package (LMRP) via the ROV, the boost line valve began leaking at the flanged connection between the actuator and mud boost line valve. Approximately 67 bbls of Synthetic Oil Based Mud (SBM), containing 56% Accolade, was released to the sea floor.

An investigation was conducted by the operator and a third party contractor to determine the following:

- * Normal operating pressure of 1500 psi was applied multiple times to open the valve with no success.
- * A hydraulic jack was positioned at the lower valve stem (indicator rod) using the ROV in an unsuccessful attempt to force the valve open.
- * In addition to using the hydraulic jack, internal pressure was also applied to the boost line in an attempt to equalize the pressure differential between the boost line and the wellbore when the external mud leak between the bonnet flange and valve body connection was observed.
- * A complete valve disassembly, with visual and physical inspection of the failed boost valve was performed to determine three failures as follows:
 - (a) The valves's retainer plate could not return to the open position as a result of a gate retention pin that became loose and wedged on the retainer plate.
 - (b) The actuator rod failed at the gate connection during the attempt to hydraulically open the valve.
 - (c) The actuator by valve body flange washed-out as a result of having two gaskets installed.

Additional contributing factors discovered during the investigation included:

- * The bonnet was assembled with two ring gaskets at the operator bonnet flange. These ring gaskets previously held 5000 psi test pressure, but normal assembly requires that only one gasket is installed.
- * The gate valve became stuck in the closed position due to the indicator rod connecting pin falling in front of the lower seal seat retaining plate with the plates being held in place by the operator bonnet flange and indicator rod flange. Little to no horizontal movement between the plates prevented the gate from returning to the fail safe open position.
- * In addition to the applied opening pressure, there was additional opening force applied when attempts to force the valve open with the hydraulic jack was used. This excessive force could have flexed the flange enough to allow a leak path between the two ring gaskets.

18. LIST THE PROBABLE CAUSE(S) OF ACCIDENT:

Equipment Failure:

The boost line valve began leaking at the flanged connection between the actuator and mud boost line valve as a result of:

- (a) The valves's retainer plate could not return to the open position as a result of a gate retention pin that became loose and wedged on the retainer plate.
- (b) The actuator rod failed at the gate connection during the attempt to hydraulically

open the valve.

(c) The actuator by valve body flange washed-out as a result of having two gaskets installed.

19. LIST THE CONTRIBUTING CAUSE(S) OF ACCIDENT:

- * Although the bonnet was assembled and tested successfully with two ring gaskets, normal assembly requires only one ring gasket being installed.
- * Little to no movement between the seal seat retaining plates could have prevented the gate from returning to the fail safe open position.
- * The additional hydraulic jack force used in an attempt to open the valve may have flexed the flange enough to allow a leak path between the two ring gaskets.

20. LIST THE ADDITIONAL INFORMATION:

The incident was reported to National Response Center (NRC) at 00:30 hours on 17 November 2009 (NRC # 923599).

21. PROPERTY DAMAGED:

Loss of 67 bbl of SBM.

NATURE OF DAMAGE:

Released into Gulf Waters

ESTIMATED AMOUNT (TOTAL): \$10,050

22. RECOMMENDATIONS TO PREVENT RECURRENCE NARRATIVE:

The MMS New Orleans District makes no recommendations to the MMS Regional Office of Safety Management (OSM).

23. POSSIBLE OCS VIOLATIONS RELATED TO ACCIDENT: YES

24. SPECIFY VIOLATIONS DIRECTLY OR INDIRECTLY CONTRIBUTING. NARRATIVE:

E-100 issued for failure to prevent an unauthorized discharge of pollutants into offshore waters.

25. DATE OF ONSITE INVESTIGATION:

17-NOV-2009

26. ONSITE TEAM MEMBERS:

29. ACCIDENT INVESTIGATION
PANEL FORMED:

Tom Meyer / Darryl Williams /
Kevin Sterling /

OCS REPORT: NO

30. DISTRICT SUPERVISOR:

Trocquet, David

APPROVED

DATE: 02-APR-2010

