

UNITED STATES DEPARTMENT OF THE INTERIOR
BUREAU OF SAFETY AND ENVIRONMENTAL ENFORCEMENT
GULF OF MEXICO REGION

ACCIDENT INVESTIGATION REPORT

For Public Release

1. OCCURRED

DATE: 08-AUG-2015 TIME: 1555 HOURS

2. OPERATOR: Anadarko Petroleum Corporation

REPRESENTATIVE:

TELEPHONE:

CONTRACTOR: Diamond Offshore

REPRESENTATIVE:

TELEPHONE:

- 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: G31938

AREA: WR LATITUDE: 26.909699
BLOCK: 51 LONGITUDE: -91.588144

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

5. PLATFORM:

RIG NAME: DIAMOND OCEAN BLACKHAWK

6. ACTIVITY:

- EXPLORATION(POE)
- DEVELOPMENT/PRODUCTION
(DOCD/POD)

8. CAUSE:

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

7. TYPE:

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

- FATALITY
- POLLUTION
- FIRE
- EXPLOSION

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

9. WATER DEPTH: 5876 FT.

10. DISTANCE FROM SHORE: 120 MI.

11. WIND DIRECTION: W
SPEED: 3 M.P.H.

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

13. SEA STATE: 3 FT.

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

While performing drilling operations for Anadarko Petroleum Corporation, the Diamond Ocean Blackhawk experienced two incidents in which small amounts of Synthetic Based Mud (SBM) were inadvertently discharged into the Gulf of Mexico. The rig had been contracted to drill Anadarko's #003 well located in Walker Ridge 51, Lease OCS-G031938. The first incident occurred on July 4, 2015 in which 2.5 barrels of SBM was released, and the second occurred on August 8, 2015 in which 3.3 barrels of SBM was released. Both incidents were related to a malfunction in the rigs software and the rig crew not fully understanding the control system for the Slip Joint Packers.

On July 4, 2015, the time of first incident, the crew had just started running the 16 inch casing into the well when the decision was made to lower the air pressure for the diverter regulator in an attempt to decrease the associated hydraulic pressure settings for the diverter. This was done to prevent the diverter from potentially crushing the 16 inch casing should it have to be activated during an emergency. The instrument air supply and the Slip Joint Packer pressure transducers, for both the Upper and Lower Packers, are tied to one common manifold. The crew had decreased the instrument air supply by approximately 7 psi, dropping both the manifold and packer pressures from 106 psi to 98.7 psi. The crew believed the low pressure alarm set point of the 'Primary' slip joint packer, the Upper Packer, to be set at 89 psi. This means that if pressure to the packer dropped below 89 psi, the system would recognize this as a loss of the packer's ability to seal and automatically engage the secondary packer, in this case the Lower Slip Joint Packer.

Unbeknown to the crew at the time, the software logic for the packer management system will automatically adjust the low alarm set points based on fluctuations in the instrument air over a period of time. As the pressure increases, even by a few pounds, the system will increase the low alarm set points of the packers. However, when the pressure decreases over time, there is no corresponding downward correction of the packer set point. The initial packer set point of 89 psi had increased to 99.1 psi without the crew's knowledge. As the instrument air pressure was dropped from 106 psi to 98.7 psi, the low set point was reached and the system logic took over. The Upper Packer was placed into the 'Vent' mode as the system moved the Lower Packer to the 'Closed' position. Before the crew could shut down the sequence, approximately 2.5 barrels of Synthetic Based Mud had been discharged into the water from the vent line of the packer.

Notification of the incident was reported to BSEE and an investigation between Diamond Offshore and the Software Manufacturer was initiated. By setting the Lower Packer as the 'Primary' packer and with the knowledge of low alarm set point fluctuations the system was allowing, it was believed that a reoccurrence could be avoided until the manufacturer could develop and install an upgrade to the system's logic.

On August 8, 2015, at approximately 15:55, a second incident occurred onboard the rig where an estimated 3.3 barrels of Synthetic Oil Based Mud was released to the Gulf of Mexico. The cause of the second incident was determined to be the same as the first.

The supply pressure for the Lower Slip Joint Packer was allowed to fall below the below the low limit set point. Again, once this set point was reached, the system took over and placed the Lower Packer into the 'Vent' position and closed the Upper Packer. Before the upper packer could obtain an adequate seal, 3.3 barrels had been discharged into the rigs moonpool.

Notification of the incident was reported to all regulatory agencies. Further operations were put on hold until the operator could create and implement a plan of exactly how they were going to be able to prevent yet another discharge from the Slip Joint Packers. Discussions were held between the companies involved and BSEE to determine a safe path forward. An approved plan was established and operations on the rig were allowed to continue.

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

- (1) The Manufacturer's programmed logic allowed the system's 'Low Limit' set point to be automatically adjusted without the crew's knowledge.
- (2) Failure of the rig's personnel to adequately monitor the packer pressure to ensure that they were not nearing their lower set points.

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

- (1) Failure of the rig's personnel to monitor all systems while they attempted to adjust the Diverter Pilot.

20. LIST THE ADDITIONAL INFORMATION:

To prevent this incident from occurring again until the Manufacturer's updates can be installed, the operator has put the following actions into place:

- (1) Both packers will be continuously energized
- (2) Packer pressure is checked once per hour and lower pressure limit is manually adjusted as needed.
- (3) Packer management 'Low Limit Set Points' are being monitored hourly in addition to normal maintenance checks.

21. PROPERTY DAMAGED:

N/A

NATURE OF DAMAGE:

N/A

ESTIMATED AMOUNT (TOTAL):

22. RECOMMENDATIONS TO PREVENT RECURRENCE NARRATIVE:

The Houma District has no recommendations for the Regional Office at this time.

23. POSSIBLE OCS VIOLATIONS RELATED TO ACCIDENT: **YES**

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24. SPECIFY VIOLATIONS DIRECTLY OR INDIRECTLY CONTRIBUTING. NARRATIVE:

The E-100 issued following the incident states:

"While performing drilling operations for Anadarko Petroleum, the Diamond Ocean Blackhawk experienced a system malfunction on two separate occasions, both of which led to Synthetic Based Mud being discharged into the Gulf of Mexico. The system malfunction has since been identified and corrective actions put into place to mitigate the issue."

"- The first incident occurred on July 4, 2015, when a malfunction in the system caused the Lower Slip Joint Packer to close and the Upper Slip Joint Packer to vent causing approximately 2.5 barrels of Synthetic Based Mud to be inadvertently discharged into the Gulf of Mexico."

"- On August 8, 2015, a second release of approximately 3.3 barrels of Synthetic Based Mud was released from the vent line of the Lower Slip Joint Packer into the Gulf of Mexico. The cause of the second release was due to the same system malfunction."

25. DATE OF ONSITE INVESTIGATION:

06-AUG-2015

26. ONSITE TEAM MEMBERS:

Clint Campo / James Richard /

29. ACCIDENT INVESTIGATION

PANEL FORMED: **NO**

OCS REPORT:

30. DISTRICT SUPERVISOR:

Bryan Domangue

APPROVED

DATE: **04-NOV-2015**