

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

ACCIDENT INVESTIGATION REPORT

1. OCCURRED

DATE: 01-JUL-2009 TIME: 1332 HOURS

2. OPERATOR: BP Exploration & Production Inc.

REPRESENTATIVE: Sustala, Dennis

TELEPHONE: (713) 865-6824

CONTRACTOR:

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:

AREA: GC LATITUDE:
BLOCK: 787 LONGITUDE:

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

5. PLATFORM: A (Atlantis)

RIG NAME:

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

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

9. WATER DEPTH: 7050 FT.

10. DISTANCE FROM SHORE: 124 MI.

11. WIND DIRECTION: SE
SPEED: 5 M.P.H.

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

13. SEA STATE: 1 FT.

17. INVESTIGATION FINDINGS:

While performing inspections on the lower level, a Facility Operator (FO) heard what sounded like gas escaping at 1331 hours. The FO then observed a gas cloud (approximately 25' wide x 15' high) at the sales gas skid, when two Line of Sight (LOS) gas detectors activated at 1332 hours. The FO then activated the manual push button to initiate a facility ESD/blow-down, all personnel mustered accordingly and the fire team was placed on standby until blow-down (approximately 10 MCF) was sufficient to evaluate the area. A plan to isolate and complete pressure bleed-off of the sales gas meter run was established and implemented. The situation was declared safe and all personnel stood down with the facility secured at 1457 hours.

The investigation revealed that the gas release resulted from a failed Teflon O-ring seal between the mated flanges of two flange-type instrumentation manifold assemblies for the riser gas lift buy-back meter.

Facility personnel have limited knowledge of maintenance procedures for this assembly because the subject equipment is owned and maintained by a third-party gas pipeline company (Enbridge). There were no written procedures available from the pipeline representatives for installing and inspecting the flange-type instrumentation manifold assembly. There is no documented preventive maintenance or routine equipment inspection by the third-party owner of these assemblies.

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

Improper or inadequate alignment and/or torque applied to the flange.

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

The lack of written procedures available from the pipeline representatives for installing and inspecting the flange-type instrumentation manifold assembly.

20. LIST THE ADDITIONAL INFORMATION:

BP and Enbridge immediately identified, inspected and corrected deficiencies on similar flange-type instrument manifolds on Atlantis and review with other assets is currently ongoing. BP is working with both Enbridge and the manifold manufacturer to ensure proper procedures are in place. If PGI International manufactured flanged-type instrument manifold assemblies are installed, the following checks will be made to ensure the integrity of the installation:

- 1) For Teflon o-ring seals, the gap between flanges measured at center of each side of assembly should be between 0.015" to 0.020"
- 2) For Vilton o-ring seals, the flanges should be drawn metal to metal on all four sides.
- 3) If found that installation is not as per above, appropriate PGI torque procedures should be followed to correct. Flanges will not be torqued while under pressure.

MMS requested that BP provide information concerning their plan of action to prevent future occurrences. This was received by MMS on 6 October 2009. This plan states the following:

- 1) That all Enbridge maintained PGI stacked manifold systems were inspected and repaired as needed to prevent the incident from reoccurring.
- 2) BP determined that the Teflon seal could be replaced with an elastomeric "O-Ring." This will allow the mated flanges to be drawn metal-to-metal which will eliminate the

need for the precise gap requirements that are mentioned above.

3) BP has also investigated alternatives to Teflon seals and determined that an elastomeric GTC 938 is a better compound. BP and Enbridge are in agreement to use the GTC 938 on all the PGI stacked manifold systems owned by Enbridge; however, they are waiting on PGI's response.

4)BP is having PGI create an "Installation, Operating and Maintenance Manual" for their use. This manual will consist of installation and maintenance procedures as per the manufacturer's recommendations. BP Technicians will review this manual and observe all maintenance procedures performed by Enbridge.

21. PROPERTY DAMAGED:

NATURE OF DAMAGE:

The property that was damaged was a failed Teflon O-ring. It was repaired on-site. Improper alignment and and/or torque applied to the flange.

ESTIMATED AMOUNT (TOTAL): \$200

22. RECOMMENDATIONS TO PREVENT RECURRENCE NARRATIVE:

Due to the specific nature of this incident, the Houma District has no recommendations to report to the Regional Office.

23. POSSIBLE OCS VIOLATIONS RELATED TO ACCIDENT: NO

24. SPECIFY VIOLATIONS DIRECTLY OR INDIRECTLY CONTRIBUTING. NARRATIVE:

N/A

25. DATE OF ONSITE INVESTIGATION:

26. ONSITE TEAM MEMBERS:

Casey Bisso /

29. ACCIDENT INVESTIGATION

PANEL FORMED: NO

OCS REPORT:

30. DISTRICT SUPERVISOR:

Bryan A. Domangue

APPROVED

DATE: 16-OCT-2009