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: **17-OCT-2013** TIME: **2130** HOURS

2. OPERATOR: **Nexen Petroleum U.S.A. Inc.**
   REPRESENTATIVE:
   TELEPHONE:
   CONTRACTOR:
   REPRESENTATIVE:
   TELEPHONE:

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

4. LEASE: **G00985**
   AREA: **EI** LATITUDE:
   BLOCK: **259** LONGITUDE:

5. PLATFORM: **B**
   RIG NAME:

6. ACTIVITY:
- [ ] EXPLORATION(POE)
- [X] DEVELOPMENT/PRODUCTION (DOCD/POD)

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
- [X] FIRE
- [ ] EXPLOSION
- LWC
  - [ ] HISTORIC BLOWOUT
  - [ ] UNDERGROUND
  - [ ] SURFACE
  - [ ] DEVERTER
  - [ ] SURFACE EQUIPMENT FAILURE OR PROCEDURES
- COLLISION [ ] HISTORIC [ ] >$25K [ ] <=$25K
- [ ] STRUCTURAL DAMAGE
- [ ] CRANE
- [ ] OTHER LIFTING DEVICE
- [ ] DAMAGED/DISABLED SAFETY SYS.
- [ ] INCIDENT >$25K
- [ ] H2S/15MIN./20PPM
- [ ] REQUIRED MUSTER
- [ ] SHUTDOWN FROM GAS RELEASE
- [X] OTHER **compressor**

6. OPERATION:
- [X] PRODUCTION
- [ ] DRILLING
- [ ] WORKOVER
- [ ] COMPLETION
- [ ] HELICOPTER
- [ ] MOTOR VESSEL
- [ ] PIPELINE SEGMENT NO.
- [ ] OTHER

8. CAUSE:
- [X] EQUIPMENT FAILURE
- [ ] HUMAN ERROR
- [ ] EXTERNAL DAMAGE
- [ ] SLIP/TRIP/FALL
- [ ] WEATHER RELATED
- [ ] LEAK
- [ ] UPSET H2O TREATING
- [ ] OVERBOARD DRILLING FLUID
- [ ] OTHER

9. WATER DEPTH: **170** FT.

10. DISTANCE FROM SHORE: **51** MI.

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

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

13. SEA STATE: FT.

17. INVESTIGATION FINDINGS: -

On 17 October 2013 at approximately 2130 hours, a field boat reported a fire that was the result of a compressor failure.

The compressor was an Ariel JGC-4, Serial number F-11439R, 110,000 lb. rod load with a 1000 rpm compressor frame. The compressor was operating with a suction pressure of 34 psi and the final discharge pressure at 1140 psi.

At approximately 2130 hours, the field boat reported a fire to the main facility that occurred on an unmanned structure. The field boat began to extinguish the fire utilizing the boats fire pump. The field boat actuated the Emergency Shut Down (ESD) at the boat landing but the compressor had shut down due to vibration according to the indication on the compressor panel.

The following morning, an investigation team boarded the facility to determine the cause of the fire. The frame top cover at the rear of the compressor was broken in several pieces. The crosshead shoes were found broken and the wiper packing gland was found in pieces. All of the valves were pulled from the cylinders and were in good condition. The first stage cylinder had a small amount of fluid inside the pockets. The piston was broken and cracked in several places. This is an indication the piston came in contact with an incompressible fluid or object.

The compressor was transported to a third party facility and dismantled to determine the cause of the failure. As the investigation began, the rod bearings apparently had spun and melted to the journal. Also, the connection main journal bearing spun in the saddle. These circumstances caused a loss of lubrication that damaged the connecting rod, wrist pin and crosshead. The loss of lubrication created slack on the journal causing a loss of piston clearance in the cylinder. The piston made contact inside the cylinder resulting in broken con-rod bolts.

Damage to the second stage cylinder was a result of the spun bearings causing a loss of oil.

The third stage cylinder had busted valve plates which placed the cylinder into non-pin reversal causing the wrist pin to seize in the crosshead and destroyed the wrist pin bushing.

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

It is believed the failure was due to a liquid carry over in the third stage cylinder that broke the valve plates in the crank and discharge valves. The process gas and lubricating oil was ignited by the hot crankshaft and con rod or by sparks generated from the rotating equipment.

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

The failed #3 rod bearing stopped the flow of lubrication to the crosshead pin and bushings. Once these bushings failed, the crosshead became overloaded, causing the Babbitt to de-bond.

20. LIST THE ADDITIONAL INFORMATION:

21. PROPERTY DAMAGED:

Compressor

NATURE OF DAMAGE:

Fluid in cylinder resulting in fire

ESTIMATED AMOUNT (TOTAL): **$800,000**

22. RECOMMENDATIONS TO PREVENT RECURRANCE NARRATIVE:

The BSEE Lafayette District office makes no recommendations to the Regional Office of Safety Management (OSM).

23. POSSIBLE OCS VIOLATIONS RELATED TO ACCIDENT: **NO**

24. SPECIFY VIOLATIONS DIRECTLY OR INDIRECTLY CONTRIBUTING. NARRATIVE:

None

25. DATE OF ONSITE INVESTIGATION:

18-OCT-2013

26. ONSITE TEAM MEMBERS:

Raymand Johnson / Wade Guillotte / Gerald Gonzales /

29. ACCIDENT INVESTIGATION PANEL FORMED: **NO**

OCS REPORT:

30. DISTRICT SUPERVISOR:

Elliott S. Smith

APPROVED DATE: **06-FEB-2014**