

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

# ACCIDENT INVESTIGATION REPORT

1. OCCURRED

DATE: **07-MAY-2022** TIME: **0910** HOURS

2. OPERATOR: **Fieldwood Energy LLC**

REPRESENTATIVE:

TELEPHONE:

CONTRACTOR:

REPRESENTATIVE:

TELEPHONE:

- STRUCTURAL DAMAGE
- CRANE
- OTHER LIFTING
- 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:

8. OPERATION:

4. LEASE: **G13917**

AREA: **SS** LATITUDE:

BLOCK: **193** LONGITUDE:

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

5. PLATFORM: **A-PRD**

RIG NAME:

6. ACTIVITY:

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

9. CAUSE:

7. TYPE:

INJURIES:

HISTORIC INJURY

OPERATOR CONTRACTOR

REQUIRED EVACUATION

LTA (1-3 days)

LTA (>3 days)

RW/JT (1-3 days)

RW/JT (>3 days)

FATALITY

Other Injury

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

POLLUTION

FIRE

EXPLOSION

LWC  HISTORIC BLOWOUT

UNDERGROUND

SURFACE

DEVERTER

SURFACE EQUIPMENT FAILURE OR PROCEDURES

10. WATER DEPTH: **87** FT.

11. DISTANCE FROM SHORE: **31** MI.

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

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

14. SEA STATE: FT.

15. PICTURES TAKEN:

16. STATEMENT TAKEN:

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

## 17. INVESTIGATION FINDINGS:

On May 7, 2022, a fire incident occurred on a fixed structure located at the Ship Shoal (SS) Block 193 "A-Production" Platform (OCS-G 13917). The operator on record is QuarterNorth Energy LLC (QNE). At approximately 0430 hours, a Burner Safety Low (BSL) Alarm activated on the EAW-1000 Natural Draft Fire Tube Burner (Burner) for Electrostatic Heater NBK-1000 (Heater Treater). When operations personnel exited the living quarters, they noticed black smoke coming from the stack of the Heater Treater. Upon arrival to the Heater Treater, they verified that the automated Shutdown Valve (SDV) was closed on the fuel gas and then closed both manual valves on the main burner and pilot burner. The operations personnel looked through the Burner inspection sight glass and observed a small liquid leak and ongoing flame inside the fire tube near the burner. As a result, personnel manually activated an Emergency Shutdown (ESD) to shut in the facility and sprayed water into the Burner's Flame Arrestor and the flame was smothered. The fire was estimated to have lasted two minutes. No injuries occurred as a result of the incident. The total estimated cost of damage associated with this incident is \$45,500.

Bureau of Safety and Environmental Enforcement (BSEE) conducted an onsite Incident Investigation on May 10, 2022. Upon arrival, the QNE Person in Charge (PIC) reported to BSEE that QNE began their investigation by removing the burner from the fire tube on May 9, 2022, and that no cracks were found in the fire tube. The PIC's report was consistent with QNE's immediate verbal and written notifications made to BSEE on May 7, 2022, stating that the cause of the fire was believed to be loose flange bolts at the main burner gasket where oil was found leaking. The PIC added that on the date of the incident, an oil leak was seen within the fire tube and that when the flange bolts were tightened, the oil leak stopped. When BSEE began physical inspection of the scene of the incident, they noted that scaffolding had been assembled near the burner flanges of the Heater Treater. BSEE was informed by the PIC that scaffolding had been erected in order to have the flange bolts retorqued to specifications prior to the restart of the equipment. BSEE requested that the retorquing operations be suspended and that the burner be removed once again for further inspection by BSEE. QNE immediately gathered personnel and arrangements were made for BSEE to witness the removal of the burner housing from the fire tube of the Heater Treater. During the removal of the burner, BSEE noted that multiple fire tube flanges were leaking oil. Once the burner housing was removed, BSEE inspected the fire tube and noticed an oily residue around the entire circumference of the fire tube along the first visible weld approximately 8-10" inside of the flange. Oil saturation was found along the entire weld extending approximately 4-6" from the weld on both sides. The weld seemed to be the origination point of a leak and BSEE began to look more closely at the weld. Additional lighting was provided to BSEE by QNE and a crack in the weld of the fire tube was discovered. The crack in the weld was located just inside the flange of the lower burner section of the fire tube above and near the burner. Photographs were taken by both BSEE and QNE.

Prior to departure from SS 193 on the day of the Incident Investigation, BSEE requested additional information regarding the Heater Treater and fire tube. QNE provided BSEE with documentation including Heater Treater Operating Procedures, Production Reports, facility chemical injection, and previous fire tube inspections. QNE reported to BSEE that the temperature, back pressure, oil bucket level sight glass, and the interphase level for the water and oil level on the Heater Treater are checked several times a day when making rounds. QNE stated that they did not keep any records of temperatures of the Heater Treater, but that the temperature controller on the Heater Treater is "always" kept at 150 degrees and has remained in good working condition. QNE described the Heater Treater's process as when the temperature gets to 145 degrees, the main burner will open and heat the oil to 150 degrees then shut off the burner. The water interphase level was controlled by the water dump. The level has been set and maintains the interphase level. The oil on top of the water interphase level overflows into the oil bucket. The oil bucket holds the level of oil above the fire tube. The oil dumps to the Good Oil Tank and the water dumps to the Water Skimmer. 50 psi of back-pressure is held on the Heater Treater. QNE reported

that all their levels, pressures, temperatures, and chemical rates have been good with no upsets of any type to report before or at the time of the incident. Facility engineering indicated that the Heater Treater has a maximum operating temperature of 250 degrees and maximum allowable working pressure of 75 psi. The facility records showed that the previous fire tube inspection took place on March 10, 2019.

During a records review of the previous 24 months of Production Reports provided to BSEE by QNE, BSEE found that production numbers were attributed to two flowing wells: the SS 193 "A-1" Well and the SS 193 "A-4" Well. Both wells come out of the Low Pressure Separator at going to the Heater Treater. Production Reports also indicated that in April of 2022, total production increase in production from previous months. QNE reported to BSEE regarding facility chemical injection. According to QNE, Emulsion Breaker (EB) and Paraffin Inhibitor (PI) were being injected at the time incident and no notable changes were present in the 24-month period prior to the incident. EB is injected into the Well A-4 flow line and PI is injected into the oil outlet going to the Good Oil Tank. The chemical rate for the EB on Well A-4 oil production is 1qt. per 12 bbls of Oil. The PI rate for total oil production is 1qt per 8 bbls of Oil. QNE also reported that the pH is not being monitored in the Heater Treater.

Following the BSEE onsite Investigation on May 10, 2022, QNE provided BSEE with updates on the fire tube repair. On June 2, 2022, the fire tube underwent a Magnetic Particle Inspection (MPI) where two cracks were identified. The line crack that was discovered by BSEE's onsite investigation was located at the "W7" test point location and an additional line crack was found in the weld at the "W13" test point location during MPI testing. Both cracks were in welds near the flanges that mate up to the Heater Treater. The 3rd party contractor companies that inspected, tested, and repaired the fire tube reported that the overall condition of the fire tube revealed no areas of relevant pitting, corrosion, or wall loss. The first cracked weld identified by BSEE was located at the top of the burner run of the fire tube, at the toe attachment weld of the tube-to-faceplate joint. An additional similar crack detected during MPI testing, which had not developed through the entire thickness of the tube, was discovered in the stack run of the fire tube in a similar location as the original crack. Both areas were excavated, and those areas were subjected to magnetic particle examination to verify that neither crack had propagated beyond the areas identified. The through-crack where the leak was found was also back-welded as a reinforcement measure. Both areas were repaired by rewelding, and the completed welds being subjected to MPI and shearwave Ultrasonic Testing examinations on June 3, 2022. The repaired fire tube was reinstalled on June 13, 2022. It was placed back

into service on June 28, 2022.

QNE provided only "possible" root causes to the fire incident in their Final Incident Investigation Report. QNE stated that no one item could be attributed to the cracks forming in the welds, but per their Code Vessel Advisor, the following three factors "may" have attributed to the cracks forming: 1) Different expansion and contraction rates of dissimilar material thickness, again with lower product flow over the surface of the tube and internal face of the faceplate; 2) Improperly set burner flame causing excessive heating directly at the location around the burner tip which is very near to the area of the tube-to-faceplate weld joint; and 3) Decreased production through the Heater Treater thereby reducing heat dissipation that would normally occur through movement of the product. BSEE noted that following the incident and prior to reinstallation of the fire tube, QNE made no adjustments to the setting of burner flame. QNE seemingly made no attempt to address dissimilar wall thickness, however, 3rd party repairs added reinforcement through back welding in the area of the identified leak.

SS 193 Production Reports indicated a distinctive spike in total production in the month prior to the incident and conversely, comparatively low production maintained for the several months prior. This data led BSEE to support two of the three proposed possible root causes of the incident identified by QNE. BSEE concludes that the lack of heat dissipation in conjunction with considerable increase in production, caused substantial temperature change resulting in expansion and contraction rates of dissimilar material thickness to cause failure of the welds of the fire tubes. Following the incident, QNE stated that they have set up a form to track daily temperature readings on the Heater Treater and that a file will be set up for tracking and trending purposes. BSEE recommended to QNE that consideration be given to adjusting the temperature of the Heater Treater accordingly when total production fluctuates.

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

Equipment Failure. BSEE concludes that the lack of heat dissipation in conjunction with considerable increase in production, caused substantial temperature change resulting in expansion and contraction rates of dissimilar material thickness to cause failure of the welds of the fire tubes.

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

Human Performance error. Operators were not taking into consideration the cause and effect nature of the fluctuations in total production and Heater Treater temperature. Significant changes in production should have warranted changes in temperature and/or retention time.

20. LIST THE ADDITIONAL INFORMATION:

N/a

21. PROPERTY DAMAGED:

NATURE OF DAMAGE:

Fire Tube

Cracked welds

ESTIMATED AMOUNT (TOTAL): \$45,500

22. RECOMMENDATIONS TO PREVENT RECURRENCE NARRATIVE:

The BSEE Houma District has no recommendations to OII at this time.

23. POSSIBLE OCS VIOLATIONS RELATED TO ACCIDENT: NO

24. SPECIFY VIOLATIONS DIRECTLY OR INDIRECTLY CONTRIBUTING. NARRATIVE:

**None**

25. DATE OF ONSITE INVESTIGATION:

**10-MAY-2022**

28. ACCIDENT CLASSIFICATION:

29. ACCIDENT INVESTIGATION

PANEL FORMED: **NO**

OCS REPORT:

26. INVESTIGATION TEAM MEMBERS:

**Leo Belanger / Author Brandon Dunigan /**

30. DISTRICT SUPERVISOR: **Amy**

**Pellegrin**

27. OPERATOR REPORT ON FILE:

APPROVED

DATE:

**07-OCT-2022**