

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

ACCIDENT INVESTIGATION REPORT

1. OCCURRED

DATE: **24-NOV-2019** TIME: **0700** HOURS

2. OPERATOR: **Cox Operating, L.L.C.**

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: **00023**

AREA: **WD** LATITUDE:

BLOCK: **27** LONGITUDE:

5. PLATFORM: **A**

RIG NAME:

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

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

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

9. CAUSE:

- 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: **40** FT.

11. DISTANCE FROM SHORE: **7** MI.

12. WIND DIRECTION: **S**
SPEED: **17** M.P.H.

13. CURRENT DIRECTION: **SW**
SPEED: **6** M.P.H.

14. SEA STATE: **4** FT.

15. PICTURES TAKEN:

16. STATEMENT TAKEN:

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

17. INVESTIGATION FINDINGS:

On 24 November 2019, at 0700, on West Delta (WD) 27 A Platform, owned by Cox Operating L.L.C., a fire occurred. The fire involved the cooler fan tower package (HAL 1161/62/63) for the gas compressor unit (CBA-1101). Personnel extinguished the fire in six minutes. There were no injuries to personnel. The only noticeable physical damages from the fire was the charred metal on the side of the cooling tower resulting in \$2,040 in equipment damage.

SEQUENCE OF EVENTS:

On the morning of 24 November 2019, Cox's morning production crew completed their morning rounds just before 0700 and entered the quarters/galley to prepare a breakfast when the crew heard a loud "blow-out" sound. After personnel heard the loud noise in the direction of the compressor, they approached the area and witnessed a fire on the northwest side of the compressor's cooler fan tower. Escaping gas from the cooler fan tower reached the compressor's hot exhaust system causing the ignition. One of the Temperature Safety Elements (TSE) on the cooling tower automatically activated the Emergency Shut Down (ESD). All nine producing wells, along with both compressors (CBA-1101 and CBA-1102), safely shut in as designed. Several personnel also activated ESD stations in response to the event. Personnel immediately grabbed several handheld fire extinguishers and extinguished the fire within six minutes. Personnel then used a 150 lb wheel unit and water hose to keep the tower cool to ensure the fire did not reignite. Shutting in production attenuated the leaking gas. Personnel locked out and tagged out (LOTO) the compressor, and Cox began notifying appropriate personnel.

At 0734 Cox made verbal notification to Mr. Justin Ledet via BSEE after hours cell phone with follow up email notifications.

At 0815 the following personnel arrived to begin an investigation: Cox Health Safety Environment Specialist (HSE), Production Foreman, Production Superintendent, Compliance Technician, and Archrock Lead Mechanic.

At 1330 the gas compressor (CBA-1102) returned to service and all production resumed, except for the A-11 and B-5 wells. Later that evening, Archrock mechanics began disassembling the cooling fan tower.

BSEE INVESTIGATION:

At 0900 on 24 November 2019, an Accident Investigator (AI) from the Bureau of Safety and Environmental Enforcement's (BSEE) New Orleans District arrived on location and began an investigation. The AI gathered reports and statements, conducted interviews, and took photos while performing a walkthrough of the incident area. After interviewing witnesses, the AI reviewed statements and the incident timeline. The AI confirmed that the tubing rupture, subsequent fire, automatic platform shut down, and extinguishing of the fire all happened within a few minutes. Also, the AI determined that due to the location of the fire, there was no immediate threat to any surrounding equipment. At 1030, Cox requested for BSEE to allow the Archrock mechanics to disassemble the cooling tower to determine the cause of the cooler tube rupture and ensuing fire. BSEE granted the request. Archrock determined that the leak came from the tubing in the compressor's third stage cooler (HAL-1163).

According to Cox's incident report, the tubing's rupture was likely caused by long term exposure of the tubes to the offshore environment. The integrity of the cooler tubes could not be fully determined during routine inspection. According to the Archrock's Root Cause Report, no practical procedure exists to identify potential weak spots in the cooler tubes.

The PSL on the compressor discharge upstream of the cooling fan tower was verified to be installed to detect leaks within the cooling tower. However, the leak may not have been large enough to drop the pressure downstream of the compressor below the PSL set point of 714 psi.

BSEE found that the compressor engine exhaust was installed in a Class 1 Division 2 area. However, API RP 14F states in 5.2.3 "It is recommended that engine exhausts be located in unclassified locations, whenever possible, to minimize the risk of ignition of flammable mixtures." The compressor engine's hot exhaust system was mounted directly above the Heat Exchanger. The exhaust temperatures can exceed 900 °F. The ignition temperature of natural gas is usually considered to be 900 °F according to API RP 14F.

CONCLUSION:

BSEE determined that the fire was caused by the ignition of gas from a tubing leak from the tubes of the cooling fan tower. The leaking gas was ignited by the compressor engine exhaust system which operates above the ignition temperature of natural gas. Platform personnel successfully extinguished the fire within minutes. BSEE found the operator's inspection and maintenance of the coolers tubing was inadequate to prevent loss of integrity, thereby allowing a gas leak. BSEE also found that the exhaust was mounted in a classified area which is contrary to industry best practices. BSEE found that the facility's TSE and ESD system worked as designed and mitigated the damage and risk of injury from the incident. BSEE found that the facility's firefighting capability was adequate to fight fires in their incipient stage. BSEE found that the personnel on the facility were well trained to respond to fire related incidents.

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

Equipment Failure -Inadequate preventive maintenance: BSEE found the operator's inspection and maintenance of the coolers tubing was inadequate to prevent loss of integrity, thereby allowing a gas leak.

Equipment Failure - Flawed equipment design or construction: The compressor engine's exhaust system is located on the top of the Gas Cooling Fan Tower creating an ignition source. Even though the muffler is wrapped with an insulation blanket, the final exhaust pipe is exposed and is within the classified area created by the gas tubes within the coolers.

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

None

20. LIST THE ADDITIONAL INFORMATION:

The cooling fan tower for the CBA-1101 gas compressor was disassembled, sent in and replaced with an entirely new cooling tower unit. Additional parts were ordered to perform a complete rebuild of the compressor unit. The Gas Compressor was returned to service on December 13, 2019.

The two Gas Compressors at WD 27 A are rental units that are owned by Archrock LLC.

Both Compressors are located on the platform's top deck.

Cox is working to find a solution for cooler tubing maintenance and inspection. Cox is evaluating options for rerouting compressor exhaust out of classified areas.

21. PROPERTY DAMAGED:

NATURE OF DAMAGE:

Cooling Fan Tower

Ruptured cooling tube

ESTIMATED AMOUNT (TOTAL): \$2,040

22. RECOMMENDATIONS TO PREVENT RECURRANCE NARRATIVE:

BSEE New Orleans district recommends that OII and OSM draft a safety alert to address the following concerns:

Inspection of tubing within cooling towers

Engine exhaust located in classified areas

23. POSSIBLE OCS VIOLATIONS RELATED TO ACCIDENT: YES

24. SPECIFY VIOLATIONS DIRECTLY OR INDIRECTLY CONTRIBUTING. NARRATIVE:

G111 - Operator failed to adequately maintain the tubing within the induced draft heat exchanger aftercooler HAL-1163 on the discharge of CBA-1101 compressor which led to a gas release and subsequent fire. The correction to the INC shall include a maintenance plan that addresses inspection of tubing integrity within the cooler tower.

25. DATE OF ONSITE INVESTIGATION:

28. ACCIDENT CLASSIFICATION:

24-NOV-2019

26. INVESTIGATION TEAM MEMBERS:

29. ACCIDENT INVESTIGATION
PANEL FORMED: NO

Gerald Taylor /

OCS REPORT:

27. OPERATOR REPORT ON FILE:

30. DISTRICT SUPERVISOR:

David Trocquet

APPROVED

DATE: 09-MAR-2020