

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: 21-SEP-2021 TIME: 1608 HOURS

2. OPERATOR: Cantium, LLC

REPRESENTATIVE:

TELEPHONE:

CONTRACTOR:

REPRESENTATIVE:

TELEPHONE:

- STRUCTURAL DAMAGE
- CRANE
- OTHER LIFTING
- DAMAGED/DISABLED SAFETY SYS.
- INCIDENT >\$25K Property Damage from Fire
- 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: 00375

AREA: MP LATITUDE:

BLOCK: 42 LONGITUDE:

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

5. PLATFORM: L

RIG NAME:

6. ACTIVITY:

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

9. CAUSE:

7. TYPE:

INJURIES:

HISTORIC INJURY

OPERATOR CONTRACTOR

REQUIRED EVACUATION 24

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: 35 FT.

11. DISTANCE FROM SHORE: 9 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

INCIDENT SUMMARY:

On 21 September 2021, a fire requiring evacuation occurred in the compressor-generator building of Main Pass (MP) 42 D, L, and M (D/L/M) complex owned and operated by Cantium LLC. The MP 42 complex is comprised of three structures (D, L, and M) connected by catwalks. The 'L' platform contains a compressor-generator building that houses the turbine compressor where the fire originated. After a failed attempt to extinguish the fire by platform personnel, the Person In Charge (PIC) of the facility gave the command to retreat and muster to the boat landing of the 'M' platform. Once all personnel were accounted for, the crew boarded Motor Vessel (M/V) Miss Dee, where they were safely transported to a nearby platform. No injuries or pollution occurred from this incident.

SEQUENCE OF EVENTS:

On 21 September 2021 at approximately 1550 hours, a platform Emergency Shut Down (ESD) occurred at the MP 42 D/L/M facility. The PIC went across to the 'D' platform to assist platform operators to try and bring the platform back online. While checking for possible leaks within the ESD system, the PIC noticed heavy black smoke coming from the compressor-generator building of the 'L' platform. Moments later, a platform operator who was taking a break in the 'M' platform's smoke room, noticed flames coming out of the roof of the compressor-generator building on the 'L' platform. The operator yelled "Fire" out from the Smoke Room where it was then announced over the radio.

The PIC and several others grabbed fire extinguishers and headed to the 'L' platform in an attempt to extinguish the fire. After minutes of fighting the fire without making any progress, the PIC made the decision to retreat from the 'L' platform and muster at the boat landing of the 'M' platform where the M/V Miss Dee was waiting.

Once on board the M/V Miss Dee, the PIC used a satellite phone to contact the United States Coast Guard (USCG) and Cantium's Operations Manager, alerting them both of the incident that occurred. The crew was then brought to MP 41 N until the fire could be contained and the platform was deemed safe to return.

On 21 September 2021 at approximately 1630 hours, the field Production Foreman (PF) located at MP 299, flew to MP 41 N. The PF and PIC boarded M/V Miss Dee and headed back to MP 42 L where they used the boat's water cannons to continuously spray water on the compressor-generator building for the next few hours.

At approximately 1830 hours, the M/V Miss Dee returned to MP 41 N to pickup key personnel to return to MP 42 D/L/M. After carefully observing the 'L' platform and not seeing any flames from inside or outside of the compressor-generator building, the key personnel boarded the 'M' platform, where they used red danger tape to flag off the bridge to 'L' and the bridge to 'D'. The M/V Miss Dee, accompanied by M/V Miss Emily, remained on site and continued to spray water and monitor the compressor-generator building through the night.

On 22 September 2021, a New Orleans District (NOD) Supervisory Inspector (SI) and a Field Engineer (FE) with the Office of Incident Investigations (OII) from the Bureau of Safety and Environmental Enforcement (BSEE), arrived at MP 42 D/L/M to examine the damage caused by the fire on 'L' platform's compressor-generator building.

On 23 September 2021, an Accident Investigator (AI) with the BSEE NOD arrived at MP 42 D/L/M to begin an investigation, take photographs, and obtain documentation in relation to the compressor-generator fire on the 'L' platform.

On 21 September 2021 at 1630 hours, BSEE NOD received notification of a fire that occurred at MP 42 L.

On 15 October 2021, the BSEE NOD AI received and reviewed a portion of the requested data from Cantium.

On 18 October 2021, the compressor, engine, and assembly were sent to the 3rd party compressor company location for a complete tear-down.

On 19 October 2021, the NOD AI and OII FE returned to MP 42 D/L/M to gather more data, statements and observe the compressor-generator building since the removal of the compressor, engine, and assembly.

On 2 November 2021, the NOD AI, accompanied by a representative from Cantium, met with personnel from 3rd party compressor company to observed, inspect, photograph, and document the disassembled compressor and engine assembly. During visits to the complex, BSEE personnel found the fire damage around the compressor to be concentrated on one side of the compressor turbine engine near the exhaust. Cantium stated in their investigation that the fire was caused by "natural gas [making] its way or migrat[ing] into the turbine lube oil tank, over pressuring it, blowing the oil tank lid and spraying lube oil and natural gas onto the compressor engine, and igniting." The lube oil tank is in the area where the worst fire damage occurred, and the tank lid was not in place during BSEE's initial site visit. This corresponds to Cantium's conclusion for the cause of the fire.

According to documents provided by the 3rd party compressor company, the lube oil system is protected from overpressurization from produced gas by a complex system that utilized wet seals and buffer gas. The wet seals keep gas from entering the lube oil system by pumping oil through labyrinth seals at a pressure greater than the gas pressure created in the gas compression compartments. An auxiliary, or electrical pump is the primary means for providing pressure for the seal oil with a pneumatic pump as a secondary.

On the morning of 21 September 2021, Cantium personnel began to bring production back on at locations that had been offline due to Hurricane Ida. According to data and analysis provided by Cantium, a gas pipeline from another platform that is tied into the first stage of the turbine compressor experienced liquid slugging. This was caused by a combination of increased production going into that pipeline along with presence of liquid in the pipeline due to being down from Hurricane Ida. Personnel at Cantium stated that this caused a liquid carryover event in the first stage suction scrubber prior to the fire event.

At approximately 1553 hours, according to analysis from Cantium, a leak in the ESD/TSE loop on the 'D' platform initiated a facility shut in. The shut in closed the inlets to the compressor, opened the blowdown valve, and caused the turbine compressor to conduct a fast stop. Due to the compressor being shut down, the facility lost fuel gas supplying the generators resulting in a loss of main power. This loss of power means that the primary seal oil pump was not able to operate. Additionally, the secondary seal oil pump, a pneumatic pump, lost supply pressure due to the shutdown from the leaking ESD/TSE loop, rendering the pump inoperable.

At approximately 1558 hours, UV/IR fire detectors detected a fire in the compressor-generator building. The inability to provide seal oil pressure to the wet seals of the compressor along with the liquid carryover event allowed produced gas to bypass the wet seals and enter the lube oil system. The gas then pressurized the lube oil tank, blowing the lid off of the tank, spraying oil and gas onto the hot turbine engine, and ignited.

CONCLUSIONS:

For Public Release

Gas migrated into the lube oil tank from a failed wet seal, overpressuring the lube oil tank. The gas and lube oil blew out from the oil tank lid, spraying lube oil and natural gas onto the hot compressor engine. This caused the oil and gas on the compressor engine to ignite and spread rapidly. All safety systems on the platform functioned as designed and all personnel were safely evacuated from the platform with no injuries. No pollution into the Gulf of Mexico occurred from this incident. The Turbine compressor was not overdue for any maintenance.

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

- **Equipment Failure - Flawed equipment design or construction: Seals failed causing gas to migrate into the lube oil tank.**

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

- **Equipment Failure - Capacity of equipment exceeded: Gas entered into the lube oil tank exceeding the tanks capacity, causing gas and lube oil to blow out the tank's lid and onto the compressor engine.**

20. LIST THE ADDITIONAL INFORMATION:

N/A

21. PROPERTY DAMAGED:

NATURE OF DAMAGE:

Compressor Engine

ESTIMATED AMOUNT (TOTAL): **\$10,000,000**

22. RECOMMENDATIONS TO PREVENT RECURRENCE NARRATIVE:

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

24. SPECIFY VIOLATIONS DIRECTLY OR INDIRECTLY CONTRIBUTING. NARRATIVE:

25. DATE OF ONSITE INVESTIGATION:

22-SEP-2021

26. INVESTIGATION TEAM MEMBERS:

**Nathan Bradley / Lee Carter / Stephen
Harris / Michael Baham /**

27. OPERATOR REPORT ON FILE:

28. ACCIDENT CLASSIFICATION:

29. ACCIDENT INVESTIGATION

PANEL FORMED: **NO**

OCS REPORT:

30. DISTRICT SUPERVISOR:

David Trocquet

For Public Release

APPROVED

DATE:

17-FEB-2022