

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: 30-NOV-2021 TIME: 1917 HOURS

2. OPERATOR: Shell Offshore Inc.

REPRESENTATIVE:

TELEPHONE:

CONTRACTOR:

REPRESENTATIVE:

TELEPHONE:

- STRUCTURAL DAMAGE
- CRANE
- OTHER LIFTING
- DAMAGED/DISABLED SAFETY SYS.
- INCIDENT >\$25K 701 generator enclosure
- 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: G33733

AREA: MC LATITUDE: 28.57350034
BLOCK: 437 LONGITUDE: -87.93421264

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

5. PLATFORM: A-Appomattox
RIG NAME:

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

9. CAUSE:

7. TYPE:

INJURIES:

- HISTORIC INJURY
 - REQUIRED EVACUATION
 - LTA (1-3 days)
 - LTA (>3 days)
 - RW/JT (1-3 days)
 - RW/JT (>3 days)
 - FATALITY
 - Other Injury
- OPERATOR CONTRACTOR

- 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

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

- 10. WATER DEPTH: 7400 FT.
- 11. DISTANCE FROM SHORE: 92 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:

INCIDENT SUMMARY:

On 30 November 2021 at 1917 hours, a fire requiring full muster occurred at Mississippi Canyon 437 A (Appomattox), a semi-submersible production platform owned and operated by Shell Offshore Inc. (Shell). Flame detectors installed in the ZAN-700 turbine generator enclosure alerted the control room, who then dispatched a deck operator to investigate. The deck operator observed smoke and sparks from the generator housing, prompting activation of the generator's Emergency Shutdown (ESD) system. An Incident Command System (ICS) responders alarm was activated, platform ESD was initiated, and the Primary Muster alarm was sounded. No injuries, explosions or harm to the environment occurred as a result of this incident.

SEQUENCE OF EVENTS:

On 20 November 2021 at 1917 hours, the control room received an alarm from a flame detector located inside the ZAN-700 turbine generator enclosure. A deck operator making rounds received a call over the radio from the control room, notifying the deck operator of the alarm, and requesting the deck operator to verify the alarm. A second alarm was received as the deck operator was approaching the generator. Smoke and sparks were observed from the generator housing, so the deck operator initiated the ESD on the generator and alerted the control room that the fire team was needed. The control room activated the Incident Control System (ICS) team alarm, prompting the fire team to don their firefighting gear and Self-contained Breathing Apparatus (SCBA). Moments later, the Offshore Installation Manager (OIM) instructed the control room to sound the alarm for a full muster and ESD of the platform. A camera from the Closed-Circuit Television (CCTV) system was focused on the generator, allowing the control room to monitor the situation. Two fire teams were dispatched to strike the generator enclosure from both sides with fire hoses. For approximately ten minutes, the fire crews sprayed down the generator with water. Once the fire hoses were shut off, the fire team lead checked inside both doors of the generator enclosure and did not observe any flames. Fire teams used a temperature gun and a thermal imaging camera to check for heat and ensure the area was safe to enter. Two fire team members equipped with SCBA's entered the enclosure and reported that there were no sparks, fire, or smoke observed; however, damage to the exhaust hatch, fiberglass grating, cable tray and insulation was noted.

After the area was deemed safe, a Third Party, subject matter expert (SME) accompanied by Shell's technical team, reported to the scene and performed an assessment. Burnt Visqueen (plastic tarp) was found outside of the enclosure from where painters had been working. The OIM instructed for all Visqueen to be removed from all areas around generator enclosures. A fire watch was posted at the ZAN-700 generator enclosure and the night crew rotated throughout the night as fire watches. The platform remained shut in.

BSEE INVESTIGATION:

On 30 November 2021 at approximately 2300 hours, the Bureau of Safety and Environmental Enforcement (BSEE) received notice of a fire that occurred at Appomattox inside a turbine generator enclosure.

On 1 December 2021, the BSEE Accident Investigator (AI) received witness statements that were obtained by United States Coast Guard (USCG).

On 18 February 2022, the BSEE AI received an update from Shell providing information about their investigation. Findings from Shell pointed to a loss of fastener preload

as the primary cause of escalation. The bolts and hatch cover were sent by Shell to stress engineering for analysis. Vibration appears to have caused a loss of fastener preload, loosening the bolts of the exhaust hatch. Once the bolts came loose or broke off, the hot exhaust was redirected to the inside wall of the turbine enclosure, igniting the Visqueen and melting the cables.

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CONCLUSIONS:

Vibration caused a loss of fastener preload and the exhaust hatch cover to break loose, allowing hot exhaust to escape and ignite the Visqueen.

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

- **Equipment Failure - Flawed equipment design or construction: Loss of fastener preload in bolts due to vibration.**

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

20. LIST THE ADDITIONAL INFORMATION:

21. PROPERTY DAMAGED:

NATURE OF DAMAGE:

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

22. RECOMMENDATIONS TO PREVENT RECURRENCE NARRATIVE:

The BSEE New Orleans District has no recommendations for the Office of Incident Investigations at this time.

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

24. SPECIFY VIOLATIONS DIRECTLY OR INDIRECTLY CONTRIBUTING. NARRATIVE:

25. DATE OF ONSITE INVESTIGATION:

28. ACCIDENT CLASSIFICATION:

26. INVESTIGATION TEAM MEMBERS:

Nathan Bradley /

29. ACCIDENT INVESTIGATION

PANEL FORMED: **NO**

OCS REPORT:

27. OPERATOR REPORT ON FILE:

30. DISTRICT SUPERVISOR:

David Trocquet

APPROVED

DATE:

04-MAR-2022