

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: 14-JUL-2019 TIME: 2150 HOURS

2. OPERATOR: LLOG Exploration Offshore, L.L.C.

REPRESENTATIVE:

TELEPHONE:

CONTRACTOR: DANOS, L.L.C.

REPRESENTATIVE:

TELEPHONE:

- STRUCTURAL DAMAGE
- CRANE
- OTHER LIFTING
- DAMAGED/DISABLED SAFETY SYS.
- INCIDENT >\$25K **Fire damage**
- 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: G32334

AREA: MC LATITUDE:

BLOCK: 547 LONGITUDE:

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

5. PLATFORM: A- WHO DAT

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

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

10. WATER DEPTH: 3280 FT.

11. DISTANCE FROM SHORE: 79 MI.

12. WIND DIRECTION: NW
SPEED: 14 M.P.H.

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

14. SEA STATE: 4 FT.

15. PICTURES TAKEN:

16. STATEMENT TAKEN:

INCIDENT SUMMARY:

On 14 July 2019, at 21:50 a fire occurred on LLOG's deep draft semi-submersible facility Mississippi Canyon (MC) 547 A platform, Lease OCS-G 32334. A 1/2" isolation valve on a pressurized pipeline pump's discharge piping developed a crack. Hydrocarbons sprayed onto the hot turbo exhaust system Pipeline Pump A engine and ignited. The Temperature Safety Element (TSE) Zone 1 over Pipeline Pump A initiated the Emergency Shutdown (ESD)/TSE. All production shut in and the firewater pumps activated as personnel mustered. A 3-man fire team arrived at the scene and extinguished the fire in 16 minutes. LLOG indicated that no pollution occurred. No injuries occurred.

SEQUENCE OF EVENTS:

At the time of the incident, only 19 persons were aboard the platform. Not all crewmembers had returned after Hurricane Barry. Pipeline Pumps PAX-1150 A and C were operational. Pipeline Pump PAX-1150 B was offline for several weeks. On 14 July 2019, at 11:01 personnel removed the PAX-1150 A Pump from service to replace a ring gasket. PAX-1150 A returned to service at 13:59. At 21:50, a TSE activated on Zone One. The Control Room Operator (CRO) looked out of the control room and visually confirmed the fire. The CRO activated the well bay deluge system. All non-essential personnel mustered at Lifeboat #2 and donned Personal Floatation Devices (PFDs) preparing for evacuation.

The On-Scene-Commander monitored the fire while the fire team dressed out. The fire team used two fire hoses with Aqueous Film Forming Foam (AFFF), a fire monitor cannon, and a 150# wheel unit to extinguish the fire in 16 minutes. The fire team gave the all clear signal to the platform.

After extinguishing the fire, personnel pumped flow assurance chemicals and bled pressure from the subsea flow lines.

The Offshore Installation Manager (OIM) on duty immediately notified LLOG's office personnel, and they notified BSEE and USCG representatives. LLOG photographed the fire damage to the pipeline pump and Lease Automatic Custody Transfer (LACT) skid immediately to the south of the Pipeline Pump A. LLOG gathered pump maintenance records, alarm logs, statements, reports, and photos of the incident area.

BSEE granted LLOG approval to clean the area on 15 July 2019 at 06:30.

BSEE INVESTIGATION:

The BSEE Investigator arrived on location on 17 July 2019. The platform remained shut in since the time of the fire. He observed the Grand Island Shipyard (GIS) crew power washing produced oil off a 3 level module on the northwest corner of the platform. The Investigator saw produced oil on the sides of the I-beams, structural supports, vessels, piping, and deck grating. The Investigator observed oil in the drain skid of the PAX-1150 A pipeline pump. He also observed oil covering the "B" and "C" pipeline pumps. BSEE observed evidence that oil sprayed upwards and carried by the wind (11 to 12 knots). The Investigator observed oil residue 40 feet vertically from the source. The Investigator noted the complete melting of an aluminum pan located four feet above the pump that shielded the engine's muffler.

The operational pressure for the Pipeline Pump A at the time of the fire was 1900 psi. The leak was not sizable enough to activate the Pressure Safety Low (PSL) sensor. Review of the alarm summary and the Safety Analysis Function Evaluation (SAFE) charts

showed that the platform's safety system functioned as designed. BSEE noted the TSE properly initiated the shutdown sequence.

BSEE confirmed MC 547 had two 50-man life capsules and all required life floats. The Investigator interviewed the OIM who reported the incident. The oil on the deck grating over open water and on the platform's outer supports indicates that pollution occurred. However, personnel did not report pollution to the National Response Center (NRC). The incident occurred at 21:50 and personnel fighting the fire stated they could not see a sheen on the water.

CONCLUSIONS:

A crack in an isolation valve on the Pipeline Pump A went undetected. LLOG's analysis of the vibration trends showed no abnormal vibration levels prior to or during the leak. BSEE and LLOG conclude the isolation valve was not installed with proper support. The lack of support and high vibration service caused fatigue damage. As the produced oil sprayed on vessels, equipment, and into the environment, the hot exhaust system for the pipeline pump engine ignited the fire.

The initial total damage assessment was greater than \$50,000. Platform personnel performed an adequate job fighting the fire and preparing for abandonment. The 19 personnel on board followed proper procedures. The platform's automated safety system functioned as designed.

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

Equipment failure: Flawed equipment design or construction -

A 1/2" stainless steel isolation valve cracked due to the improper installation of the isolation valves and the sensing line tubing for the pipeline pump service. The height of the assembly, weight of two valves, and the potential pulling effects of the tubing had not been properly considered.

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

None

20. LIST THE ADDITIONAL INFORMATION:

The PAX-1150 "A" No. 1 Engine and Pump consists of a Waukesha L7042 GSI/ESM natural gas engine. The pump was rated for 1480 BHP at 1200 RPM. The dry oil pipeline pump is a Quintuplet rated for 26,230 BPD at 2480 PSI Discharge. The normal operational discharge pressure for the pump is 1900 PSI. The PSHL (Pressure Safety High Low) pilot settings are 2152/91. There are pulsation dampeners on the pump suction and discharge piping. There is no required vibration sensor on the engine/ pump connection.

Although, the pollution or sheen on the Gulf Waters was not visible at the time of the leak and fire, there is evidence that suggests produced oil from the leaking valve entered the Gulf. However, it is not possible to determine the size and amount discharged.

On 26 September 2019, a follow up visit by BSEE Investigator and Inspectors observed that full production was in-service with the use of the "B" and "C" Pipeline Pumps. The "A" Pump was still in the process of reassembly. The "B" Pump had an additional vibration dampener installed and in-service on the suction end of the pump.

LLOG is preparing a PSV Modification MOC for review by BSEE, designed to eliminate the fluctuating pipeline pressure effects on the pipeline pumps at MC 547. New pump suction piping, an oil collecting pot, and 3 additional Pump Pressure Safety Valves (PSV) are installed, but still isolated from production. The Investigator received a copy of the MOC Work Pack Description (Work Pack No.MWP-001) prepared by Jody Walker and dated for construction on November 18, 2018.

21. PROPERTY DAMAGED: NATURE OF DAMAGE:

PAX-115 A Pipeline Pump and Engine. Fire damage Fire Damage

ESTIMATED AMOUNT (TOTAL): \$50,000

22. RECOMMENDATIONS TO PREVENT RECURRANCE NARRATIVE:

The BSEE New Orleans District makes no recommendations to the Office of Incident Investigation.

23. POSSIBLE OCS VIOLATIONS RELATED TO ACCIDENT: NO

24. SPECIFY VIOLATIONS DIRECTLY OR INDIRECTLY CONTRIBUTING. NARRATIVE:

25. DATE OF ONSITE INVESTIGATION:

17-JUL-2019

28. ACCIDENT CLASSIFICATION:

26. INVESTIGATION TEAM MEMBERS:

Gerald Taylor /

29. ACCIDENT INVESTIGATION PANEL FORMED: NO

27. OPERATOR REPORT ON FILE:

OCS REPORT:

30. DISTRICT SUPERVISOR:

David Trocquet

APPROVED

DATE: 22-JAN-2020