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: **08-JUN-2022** TIME: **1310** HOURS
2. OPERATOR: **BP Exploration & Production Inc.**
   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
- [x] OTHER **Subsea Leak**

3. OPERATOR/CONTRACTOR REPRESENTATIVE/SUPERVISOR ON SITE AT TIME OF INCIDENT:

4. LEASE: **G09868**
   AREA: **MC** LATITUDE:
   BLOCK: **778** LONGITUDE:

5. PLATFORM: **A(Thunder Horse**
   RIG NAME:

6. ACTIVITY:
   - [ ] EXPLORATION(POE)
   - [x] 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		

   - [x] POLLUTION
   - [ ] FIRE
   - [ ] EXPLOSION

   LWC
   - [ ] HISTORIC BLOWOUT
   - [ ] UNDERGROUND
   - [ ] SURFACE
   - [ ] DEVERTER
   - [ ] SURFACE EQUIPMENT FAILURE OR PROCEDURES

   COLLISION [ ] HISTORIC [ ] >$25K [ ] <=$25K

8. OPERATION:
   - [x] PRODUCTION
   - [ ] DRILLING
   - [ ] WORKOVER
   - [ ] COMPLETION
   - [ ] HELICOPTER
   - [ ] MOTOR VESSEL
   - [ ] PIPELINE SEGMENT NO.
   - [ ] OTHER

9. CAUSE:
   - [x] EQUIPMENT FAILURE
   - [ ] HUMAN ERROR
   - [ ] EXTERNAL DAMAGE
   - [ ] SLIP/TRIP/FALL
   - [ ] WEATHER RELATED
   - [x] LEAK
   - [ ] UPSET H2O TREATING
   - [ ] OVERBOARD DRILLING FLUID
   - [ ] OTHER _____

10. WATER DEPTH: **6200** FT.
11. DISTANCE FROM SHORE: **66** 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 08 June 2022 at 1208 hours at Mississippi Cannon (MC) 778 A Thunderhorse South, Lease OCS-G 09868, production personnel reported an external subsea leak at the P2 Riser Touchdown Connector- Pipe Line End Termination (PLET) No. 5. The volume of pollution is estimated to be 12.8 to 128.1 gallons of oil. BP Exploration & Production Inc. (BP) is the designated operator of the lease.

SEQUENCE OF EVENTS:

On 6 June 2022, a subsea inspection of the DC45 Thunderhorse South field was being performed by a Remote Operated Vehicle (ROV) because of a reported sheen of unknown origin passing near the field. The ROV found an external subsea leak at the P2 Riser Touchdown Connector at PLET #5, Pipeline Segment Number (PSN) 14505. Prior to shutting in the segment, the P2 side of the loop was treated with Low Dosage Hydrate Inhibitor (LDHI). After the treatment, the two wells, MC 822-11/TD002 (S44) and MC 822-12/TD003 (S45), flowing up P2 riser were shut in (around 1220 hours). A leakage rate of 100-200 bubbles/minute was estimated at the time of ROV observation at 1207 hours. On 8 June 2022 around 1310 hours, the bubbles stopped.

On 9 June 2022, a dead oil circulation procedure, begun on 8 June, was successfully completed with a few observations of a bubble during circulation. The P2 riser remained shut in with dead oil, isolated from the remainder of the South loop, and sub ambient until testing could be completed.

On 13 June 2022, a Connector Actuation Tool (CAT) was installed onto the P2 Riser Touchdown connector. The CAT applied pressure to reseal the gasket to the mating hub. BP then pressure tested the flowline and did not observe any further release. The CAT will remain installed until a replacement is completed.

BSEE INVESIGATION:

The BSEE New Orleans District (NOD) Accident Investigator (AI) launched an investigation after receiving notification of the incident on 6 June 2022. The AI reviewed the eWell report and corresponding emails. The AI requested and held a meeting with BP's leadership to discuss this subsea leak as well as two other separate pollution events that were identified in this timeframe on nearby subsea equipment. The AI reviewed a preliminary report prepared by BP's investigation team that was presented to the BSEE NOD supervisors on 16 June 2022. The report addressed the three pollution release locations in the Thunderhorse area. First, the S47 SCSSV released 9 barrels of oil subsea. BSEE has created a separate investigation and report for this event. Next, the P41E – F-J03 Jumper Connector released 12.8–128.1 gallons of oil. And last, the S43 SCSSV released 0.7 gallons of oil, which did not meet the reporting threshold described in the Code of Federal Regulations. The BSEE AI, Supervisor Inspector (SI), and Office of Incident Investigation (OII) made a follow-up visit to MC 778 to express additional concerns and discuss BP's plan of action moving forward.

The BSEE investigation determined that there had been a total "platform blackout" of MC 778 Thunderhorse and a fieldwide shutdown on 5 June 2022. And as a result, BP had initiated a ROV to survey the subsea fields. During this survey, the subsea leaks were recorded. The AI spoke with BP's Regulatory Compliance Advisor where precise locations of the leaks were identified on a subsea field schematic.

BSEE agrees with BP's investigation which revealed that the cause of the leak was due to a connector failure on the PLET.

Three NRC reports are likely related to this event. First, NRC# 1338032, NOAA reported an image from 7 June 2022 at 0645 hours that described a sheen as follows: "possible, unconfirmed oil was observed in satellite imagery. the anomaly appeared dark and stood out well against the background, and was located close to two oil facilities. the anomaly was 6.5nm long and up to 2.8nm at its widest section. the wind at the time was from the S at 8kt." and next, NRC# 1338045, BP reported at that same day at 1418 hours: “caller reported an unknown sheen from an unknown source during a flyover. the sheen has made its way to their facility. The sheen was 1.5 miles by 300 yards." Last, NRC# 1338091, on 8 June 2022 at 1314 hours, BP reported "crude oil is releasing from the P2 riser connection to PLET #5 in the Thunder Horse North Field due to an unknown cause at this time. The release occurred underwater at the sea floor at an unknown depth." BP reported "remedial actions: taking action to shut in two wells and the ROV is continuing to investigate. They initiated the shut in at 1250 hours and they estimate it will take about 5 hours". BP reported a release rate of 1 ounce of oil per minute.

BSEE investigated BP’s subsea leak detection system to determine whether it was effective in identifying this leak. BP’s subsea leak detection system known as C-ROC uses a conditional rate of change (which is an algorithmic sensor-based leak detection technique) which detects changes in pressure trends. BSEE confirmed that the system was active at the time of the leak but could not detect this relatively small discharge.

CONCLUSION:

BSEE concludes that there was an equipment failure that caused the pollution from the P2 Riser PLET #5 connector. BSEE will engage with BP to understand the root cause of the connector leak once it has been removed from service.

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

Equipment Failure: Failure related to the design and wear and tear of the sealing equipment.

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

Equipment Failure: The leak was due to connector failure on the PLET. This equipment failure could have been caused by a design flaw, improper installation, or manufacturing defects.

20. LIST THE ADDITIONAL INFORMATION:

Until this P2 Riser connector segment can be replaced, BP requested and BSEE NOD approved the following: Circulate hydrocarbons through the P2 flowline in intermittent operations (ex. Hurricane Safe-out, Process Trip restart, etc.). BP shall also conduct routine maintenance of the Thunder Horse South Flowlines (including the P2 flowline via pigging). This is part of regular Thunder Horse South Loop maintenance (conducted about every 8-12 weeks) to prevent build up/blockage within the flowlines due to tar, asphaltenes, etc. When not circulating or pigging, the P2 flowline will remain out of service. Once the final replacement plan for the P2 section is determined, the path forward for that scope will be communicated separately.

21. PROPERTY DAMAGED:

P2 Riser Touchdown Connector.

NATURE OF DAMAGE:

The results will be included in BP's overall diagnostics and root cause of the connector leak.

ESTIMATED AMOUNT (TOTAL): **$**

22. RECOMMENDATIONS TO PREVENT RECURRANCE NARRATIVE:

BSEE NOD recommends the Gulf of Mexico Regional Office Production Operation Support Section review.

23. POSSIBLE OCS VIOLATIONS RELATED TO ACCIDENT: **YES**

24. SPECIFY VIOLATIONS DIRECTLY OR INDIRECTLY CONTRIBUTING. NARRATIVE:

E-100 (C) - 30 CFR 250.107(a) - BP did not prevent the unauthorize discharge of hydrocarbon into the Gulf waters from the P2 Riser Touchdown Connector PLET #5.

25. DATE OF ONSITE INVESTIGATION:

14-OCT-2022

26. Investigation Team Members/Panel Members:

Gerald Taylor / Pierre Lanoix / Darryl Williams /

27. OPERATOR REPORT ON FILE:

28. ACCIDENT CLASSIFICATION:

29. ACCIDENT INVESTIGATION PANEL FORMED: **NO**

OCS REPORT:

30. DISTRICT SUPERVISOR:

David Trocquet

APPROVED DATE: **11-FEB-2023**