

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: 16-OCT-2015 TIME: 2015 HOURS

2. OPERATOR: **Murphy Exploration & Production Co**  
REPRESENTATIVE:  
TELEPHONE:  
CONTRACTOR:  
REPRESENTATIVE:  
TELEPHONE:

- STRUCTURAL DAMAGE
- CRANE
- OTHER LIFTING DEVICE
- DAMAGED/DISABLED SAFETY SYS.
- INCIDENT >\$25K 1.5 million
- H2S/15MIN./20PPM
- REQUIRED MUSTER
- SHUTDOWN FROM GAS RELEASE
- OTHER

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

6. OPERATION:

4. LEASE: **G21790**  
AREA: **GC** LATITUDE:  
BLOCK: **338** LONGITUDE:

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

5. PLATFORM: **A-Front Runner**  
RIG NAME:

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

8. CAUSE:

7. TYPE:

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

- EQUIPMENT FAILURE
- HUMAN ERROR
- EXTERNAL DAMAGE
- SLIP/TRIP/FALL
- WEATHER RELATED
- LEAK
- UPSET H2O TREATING
- OVERBOARD DRILLING FLUID
- OTHER **LP Pipe Rupture**

- FATALITY
- POLLUTION
- FIRE
- EXPLOSION

9. WATER DEPTH: 3330 FT.

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

10. DISTANCE FROM SHORE: 110 MI.

11. WIND DIRECTION: **E**  
SPEED: 20 M.P.H.

12. CURRENT DIRECTION: **W**  
SPEED: 10 M.P.H.

COLLISION  HISTORIC  >\$25K  <=\$25K 13. SEA STATE: 6 FT.

At approximately 2015 hours on October 16, 2015, an incident occurred on the Front Runner spar at Green Canyon Block 338-A (GC 338A), Lease Number OCS-G 21790. The operator on record is Murphy Exploration and Production Company USA. After a two-day planned shut-in for repairs on vapor recovery unit (VRU) compressor CBA-5010, the operator began the process of ramping up the platform. Just prior to the incident, three subsea wells and two surface wells were flowing. The operator was attempting to bring surface well A-4 online when the 18-inch pipe leading from the Low Pressure (LP) Header GAY-610 to the LP Separator MBD-1040 ruptured, spraying approximately 25 barrels of oil and an undetermined amount of gas throughout the production, cellar and mezzanine decks, as well as on the top and side of the hull. The escaping gas and oil activated the analyzer safety high (ASH) gas detectors in the area, resulting in a total structure shutdown--including the platform generator. All personnel were accounted for (44 total). Operators assigned to the response team were deployed throughout the structure for firewatch and damage assesment. The remaining non-essential personnel were transported to shore via helicopters throughout the night, along with one injured Woodgroup employee (operator). The injured employee was treated and released from a shore-based medical clinic the following morning, thereby approved to return to work.

Investigation reveals that internal corrosion of the 18-inch LP piping was the likely cause of this accident. Contributing causes include: (1) failure to efficiently distribute acidic chemicals midstream through the use of quills and (2) reliance on improper injection point testing that could not effectively identify metal loss. These causes are discussed at full length in the sections that follow.

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

Failure of the 18-inch LP piping due to severe internal corrosion:

The pipe coming from the LP Production Header to the LP Separator initially had a designed maximum allowable working pressure (MAWP) of 285 psig but ruptured at 252 psig. The rupture occurred at the chemical injection point where the line penetrated the production deck and extended approximately 10 feet down. A third party company was sent to the platform on October 18, 2015, to perform non-destructive testing (NDT) on the ruptured piping and found metal loss as high as 50.4%.

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

A chemical injection program was in place on the platform on or about the time of first production on December 15, 2004. Several types of chemicals were being injected into the LP line at that time. Among these were a scale inhibitor with a pH balance of 5 and a demulsifier with a pH balance of 0.5 to 2.5. These chemicals are acidic by nature. At the start of the chemical injection program, Caproco fittings were installed at the injection points; however no quills were installed into the fittings to enable the injected chemicals to be released midstream into the pipe. This would have ensured efficient distribution of the introduced chemicals. By injecting the chemicals into the piping without the use of the quills, the chemicals concentrated on the interior pipe wall and down the length of the pipe, causing severe deterioration and metal loss in the piping. This is evident in the pictures taken of the inside of the ruptured pipe during the investigation. The operator also failed to realize an ongoing problem was occurring when on May 1, 2014, a hole was found in the thread-o-let (TOL) of the demulsifier injection point on the LP pipe. The TOL was replaced, and a third party contractor was sent to the platform to perform NDT of the pipe. An eight-point NDT test was performed but not at or downstream of the chemical injection points. If the tests would have been performed at these areas, results would have shown the extent of metal loss occurring inside of the pipe, and corrective action

could have been taken.

20. LIST THE ADDITIONAL INFORMATION:

Immediately following the incident, the operator performed piping inspections throughout the structure where chemical injection points were located. Internal erosion from chemical injection was evident, resulting in repair or replacement of sections of inlet piping for the low pressure, high pressure, intermediate pressure, and test separators. The failed LP piping has been sent to a metallurgist to perform a full root cause investigation.

21. PROPERTY DAMAGED:

- 1. 18 inch LP Header piping
- 2. Platform lighting and fixtures
- 3. Production, cellar, and mezzanine decks

NATURE OF DAMAGE:

- 1. Ruptured pipe
- 2. Hydrocarbon release covering lighting and fixtures
- 3. Hydrocarbon release covering decks

ESTIMATED AMOUNT (TOTAL): \$1,500,000

22. RECOMMENDATIONS TO PREVENT RECURRENCE NARRATIVE:

The Houma District has no recommendations for the Regional Office.

23. POSSIBLE OCS VIOLATIONS RELATED TO ACCIDENT: YES

24. SPECIFY VIOLATIONS DIRECTLY OR INDIRECTLY CONTRIBUTING. NARRATIVE:

E-100: " Is the operator preventing unauthorized discharge of pollutants into offshore waters?"  
 On October 16,2015, an incident occurred on the structure. An 18-inch line leading from the LP Header GAY-610 to the LP Seperator MBD-1040 ruptured, spraying a large amount of oil throughout the Production and Cellar decks and into the Gulf waters.

25. DATE OF ONSITE INVESTIGATION:

17-OCT-2015

26. ONSITE TEAM MEMBERS:

Terry Hollier /

29. ACCIDENT INVESTIGATION

PANEL FORMED: NO

OCS REPORT:

30. DISTRICT SUPERVISOR:

Bryan Domangue

APPROVED  
DATE:

24-DEC-2015

***For Public Release***