

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: **24-OCT-2013** TIME: **0850** HOURS

2. OPERATOR: **Energy XXI GOM, LLC**

REPRESENTATIVE:

TELEPHONE:

CONTRACTOR:

REPRESENTATIVE:

TELEPHONE:

- STRUCTURAL DAMAGE
- CRANE
- OTHER LIFTING DEVICE
- DAMAGED/DISABLED SAFETY SYS.
- INCIDENT >\$25K
- 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: **00031**

AREA: **GI** LATITUDE:

BLOCK: **22** LONGITUDE:

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

5. PLATFORM: **L-CMP-VALVE**

RIG NAME:

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

8. CAUSE:

7. TYPE:

- HISTORIC INJURY
- REQUIRED EVACUATION 1
- LTA (1-3 days) 1
- 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

- FATALITY
- POLLUTION
- FIRE
- EXPLOSION

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

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

9. WATER DEPTH: **55** FT.
10. DISTANCE FROM SHORE: **7** MI.
11. WIND DIRECTION: **SE**
SPEED: **10** M.P.H.
12. CURRENT DIRECTION:
SPEED: M.P.H.
13. SEA STATE: FT.

17. INVESTIGATION FINDINGS:

Two Exterranean mechanics were in the process of replacing and testing the wiring harness on the magneto of the Gas Booster Compressor engine (Unit 72900) on GI 22-L-CMP platform. According to statements, one of the mechanics selected the 'start' sequence at the panel energizing a permissive start sequence while the other mechanic tested the voltage output of the magneto, which tested good. An electronic timing light was connected to the #1 spark plug wire and the 2" inspection cover had been removed to allow observance of the timing marks on the engine's flywheel in order to check the timing. The mechanic then selected the 'startup' sequence. Once the starter engaged and the engine started to turn, a noise was reported to have been heard that caused the mechanic at the panel to look up and say "flames". He immediately shut the compressor down and ran around the engine to check on the other mechanic who had been standing on the starter and magneto side of the engine. An Energy XXI Operator nearby also noticed the compressor attempting to start, but also noticed yellow and black flames rising up approximately four or five feet above the compressor's head to the muffler's cross pipe on the opposite side of the Compressor's panel. As the operator was in route to the ESD station, he observed one of the Exterranean mechanics engulfed in flames. His view was slightly obstructed, but he could see the mechanics upper body and head. His head was bowed down, hands lifted up chest high with palms up. As he went to help him he saw the mechanic falling from the compressor base, stumbled to the deck, stand up and walked slowly backwards to the firewall. He then noticed the other mechanic emerged from the front of the panel. They both went to assist the injured person (IP) who seemed disorientated and standing unstable. As the other mechanic attended to the IP the operator went to put out the fire which had ceased burning except for a small residual flame on the fuel supply piping which was then smothered out with a gloved hand. The IP was immediately taken across the catwalk to the GI 22-L Quarters platform to the Medic for first aid treatment for burns to the hands and face, then flown in for medical attention. The flash fire was reported to have lasted approximately 3 seconds. The mechanic was reported to have received 2nd degree burns on his face and hands. -

The Investigation revealed:-

According to Energy XXI investigation, a pin-hole leak in the 2" braided, flex starter exhaust piping was the source of fuel for the fire. The ignition source possibly being from the starter engaging with the engine flywheel creating a spark. -

BSEE's Accident Investigator's assessment based on the available information provided would suggest that the ignition source would have come from either, the opened conduit junction box, exposing the magneto voltage to the engine coils and spark plug-wires power source or portable timing light tool or volt meter ground. Note: The opened junction box was classified for use in hazardous locations and located at the height of where the mechanic's face and hands were burned at the time of the ignition-of the flash fire. -

It was reported that the flash occurred while the compressor was cranking and turning-over, which would suggest the starter was fully engaged and gears meshed and highly unlikely creating a spark. However, the engine's ignition and voltage systems would have been energized and active.

\$500 -

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

1. According to Energy XXI investigation, a pin-hole leak in the 2" braided, flex starter exhaust piping was the source of fuel for the fire.
2. The ignition source was reported by Energy XXI possibly being from the starter engaging with the engine flywheel creating a spark.

BSEE's Accident Investigator's assessment based on the available information provided would suggest that the ignition source would have come from either, the opened conduit junction box, exposing the magneto voltage to the engine coils and spark plug wires power source or portable timing light tool or volt meter ground. Note: The opened junction box was classified for use in hazardous locations and located at the height of where the mechanic's face and hands were burned at the time of the ignition of the flash fire.

3. It was reported that the flash occurred while the compressor was cranking and turning over, which would suggest the starter was fully engaged and gears meshed and highly unlikely creating a spark. However, the engine's ignition and voltage systems would have been energized and active.

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

It was determined by Energy XXI that the habit of personnel stepping up on the braided, flex, starter exhaust gas piping to access the equipment up on the compressor engine had created a hole or crack allowing natural gas to leak externally.

1. Evidence (pictures taken immediately after accident) indicates that an explosion proof cover had been removed for access to the ignition system wiring during the engine timing process. It has not be determined if the use of a gas detector to monitor the area for gas was being utilized prior to and at the time of the flash fire.

20. LIST THE ADDITIONAL INFORMATION:

1. Review of the Job Safety Environmental Analysis (JSEA) indicated that under Ignition Sources only one preventable control had been checked off. Remove, Isolate, or contain combustibile materials. However, evidence indicates that the removal of the cap from the explosion proof conduit box exposed potential voltage output and ignition sources from the magneto.
2. It was reported in Exterran's own Incident Report that the mechanic was holding the volt meter in the junction box to get a voltage reading during the 1st attempt at starting the engine. It measured 160 volts. During the 2nd attempt to start the engine the mechanic reached for the timing light, then the flash fire occurred.
3. Use of portable electrical equipment such as the volt meter and timing light should have been also checked off on the JSEA which would have Implemented continuous gas testing for protection.
4. Review of the JSEA indicated that the use of gas detection, gas monitoring or hot work requirements (hot work permit) had not been checked off or documented. Exterran's Incident Report states that their mechanics completed a JHA and an Energy-XXI Work Permit, and that Energy-XXI sniffed the area for the permit.
5. There were no Hot Work Permits or documents provided to the BSEE Investigator

indicating that a gas detector or gas monitor had been used during this operation. Note: During this type of operation gas detection requires continuous monitoring or until the exposed wiring junction box has been resealed and the portable electrical tools are no longer in use.

6. Review of the JSEA indicated that the injured Exterran mechanic's name and signature was not included on the form. There was only one name and signature on the JSEA.

7. Exterran performed its own Root Cause Investigation and submitted their report to Energy XXI.

8. The 2" braided flex piping was replaced and a metal plate has been installed over it to prevent personnel from stepping up on it.

9. There was no report of changes to the starter to prevent potential sparks upon startup. The 2" cover for flywheel timing marks viewing was re-installed.

10. Energy XXI Supervisors and Management came and met with BSEE personnel as requested on January 8, 2014 to discuss the accident that occurred on October 24, 2013. BSEE deemed the initial report prepared by Exterran Energy Solutions as unacceptable as the explanation of the root cause of the accident. BSEE has requested that Energy XXI provide a thorough final report within 2 weeks.

21. PROPERTY DAMAGED:

FLEX PIPING

NATURE OF DAMAGE:

Flash fire

22. ~~RECOMMENDATIONS TO PREVENT RECCURANCE NARRATIVE:~~
The BSEE New Orleans District makes no recommendations to the Agency.

23. POSSIBLE OCS VIOLATIONS RELATED TO ACCIDENT: YES

24. SPECIFY VIOLATIONS DIRECTLY OR INDIRECTLY CONTRIBUTING. NARRATIVE:

G-110 W 107(a) was issued for personnel performing repair maintenance operations on the Gas Booster Compressor (Unit 72900) did not provide for the protection of all personnel. Unsafe practices and procedures resulted in a flash fire injuring one personnel.

25. DATE OF ONSITE INVESTIGATION:

25-OCT-2013

26. ONSITE TEAM MEMBERS:

Gerald Taylor /

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

OCS REPORT:

30. DISTRICT SUPERVISOR:

David Trocquet

APPROVED

DATE: **06-JUN-2014**

FIRE/EXPLOSION ATTACHMENT

1. SOURCE OF IGNITION: **Spark created by Mechanic using electronic equipment for testing voltage during engine startup**

2. TYPE OF FUEL:
- GAS
 - OIL
 - DIESEL
 - CONDENSATE
 - HYDRAULIC
 - OTHER

3. FUEL SOURCE: **Natural gas from starter supply.**

4. WERE PRECAUTIONS OR ACTIONS TAKEN TO ISOLATE KNOWN SOURCES OF IGNITION PRIOR TO THE ACCIDENT ? **NO**

5. TYPE OF FIREFIGHTING EQUIPMENT UTILIZED:
- HANDHELD
 - WHEELED UNIT
 - FIXED CHEMICAL
 - FIXED WATER
 - NONE
 - OTHER

INJURY/FATALITY/WITNESS ATTACHMENT



INJURY/FATALITY/WITNESS ATTACHMENT

OPERATOR REPRESENTATIVE
 CONTRACTOR REPRESENTATIVE
 OTHER Exterran Mechanic

INJURY
 FATALITY
 WITNESS

NAME:

HOME ADDRESS:

CITY:

STATE:

WORK PHONE:

TOTAL OFFSHORE EXPERIENCE:

YEARS

EMPLOYED BY:

BUSINESS ADDRESS:

CITY:

STATE:

ZIP CODE:

OPERATOR REPRESENTATIVE
 CONTRACTOR REPRESENTATIVE
 OTHER Exterran Mechanic

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 FATALITY
 WITNESS

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