

UNITED STATES DEPARTMENT OF THE INTERIOR
 MINERALS MANAGEMENT SERVICE
 GULF OF MEXICO REGION

ACCIDENT INVESTIGATION REPORT

1. OCCURRED

DATE: **10-MAR-2010** TIME: **0140** HOURS

2. OPERATOR: **Energy Resource Technology GOM, Inc**
 REPRESENTATIVE: **Steve Champagne**
 TELEPHONE: **(281) 618-0484**
 CONTRACTOR: **Wood Group Production Services**
 REPRESENTATIVE: **Clyde Self**
 TELEPHONE: **(337) 234-0100**

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

4. LEASE: **G06655**
 AREA: **EC** LATITUDE:
 BLOCK: **346** LONGITUDE:

5. PLATFORM: **A**
 RIG NAME:

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

7. TYPE:

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

- FATALITY
- POLLUTION
- FIRE
- EXPLOSION

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

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

- STRUCTURAL DAMAGE
- CRANE
- OTHER LIFTING DEVICE
- DAMAGED/DISABLED SAFETY SYS.
- INCIDENT >\$25K **Pipeline pump #1**
- H2S/15MIN./20PPM
- REQUIRED MUSTER
- SHUTDOWN FROM GAS RELEASE
- OTHER

6. OPERATION:

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

8. CAUSE:

- EQUIPMENT FAILURE
- HUMAN ERROR
- EXTERNAL DAMAGE
- SLIP/TRIP/FALL
- WEATHER RELATED
- LEAK
- UPSET H2O TREATING
- OVERBOARD DRILLING FLUID
- OTHER **vibration/broken pipe nipple**

9. WATER DEPTH: **313** FT.

10. DISTANCE FROM SHORE: **103** MI.

11. WIND DIRECTION:
 SPEED: M.P.H.

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

13. SEA STATE: FT.

17. INVESTIGATION FINDINGS:

On 10 March 2010, at approximately 0140 hours the platform experienced a fire alarm and shut-in from activation of the Temperature Safety Element (TSE) loop. Prior to the platform shut-in and activation of the fire alarm, the three night tower Operators heard an explosion "boom". Upon responding to the alarm and platform shut-in, the Operators discovered a fire on the gas driven oil Pipeline Pump #1. One Operator remained on the production deck level and extinguished the fire that was falling onto the oil heater treater while the other two Operators responded to the scene of the fire at the pipeline pump skid. All non-essential personnel proceeded to the muster station and waited for further instruction while a total of six Operators extinguished the fire. The fire damage was confined to the #1 pipeline pump skid and there were no reported injuries associated with this incident.

The Operators utilized eight 30# handheld fire extinguishers, one 150# wheeled unit, and one 300# wheeled unit to extinguish the fire which lasted approximately 20 minutes. Subsequent to extinguishing the fire, the Operators monitored the area for 30 minutes then assessed the source of the oil. The Operators' assessment revealed that a ½ inch by 4 inch long nipple on the discharge piping of the gas driven oil pipeline pump #1 developed a crack and sprayed produced oil in the vicinity of the engine's exhaust. The parted nipple was equipped with a ball valve and gauge which increased the overall length of this set-up from approximately 10 to 12 inches. The weight of the valve and gauge combined with the vibration increased the stress on the base of the nipple and contributed to the failure.

The MMS investigation team discovered that the ½ inch nipple that failed was schedule 80. API RP 14E recommends that pipe nipples ¾ inches or smaller should be schedule 160 when used in hydrocarbon service and subject to vibration.

In addition, maintenance logs dated 1 January 2010 revealed that the Operator was aware of the vibration issue with the pipeline pumps. Records indicated that the Operator performed routine maintenance on both the gas driven and electric driven pipeline pumps and associated components on an as needed basis.

Field records also indicated that oil production rates were increased from 1,900 bbls/d to 8,000 bbls/d, during the period of February 4-10, 2010 and pipeline pump vibration increased. The Operator's log book entries indicated three separate leaks occurred on the gas driven oil pipeline pump #2 during the period of March 7-9, 2010. The first leak resulted from a failed sensing line, the second leak resulted from a leaking nipple and the third occurred from a broken pipe. On 8 March 2010 the Operator's log book states "see a trend starting with #2". On 10 March 2010, the day of the fire, the oil production rate was 8,000 bbls.

Subsequent to the fire incident, the Lessee conducted a vibration study on the oil pumping system. The study revealed design flaws that caused excessive vibration with the pumping system. Recommendations to reduce the vibration were presented to the Operator. The Operator made necessary modifications which reduced the vibration and the facility was allowed to resume production.

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

An improperly designed oil pumping system subjected a ½ inch nipple to abnormally high vibration stresses causing the nipple, sensing line and a pipe to fail. According to API RP 14E, the wall thickness of the failed nipple was too thin to be used in hydrocarbon service that was subject to vibration. Consequently, the ½ inch schedule

80 nipple on the gas driven oil pipeline pump #1 developed a crack at the base of the threads and sprayed produced oil on the engine exhaust and ignited.

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

- * The Operator utilized a schedule 80 thin wall ½ inch nipple on a hydrocarbon service line that was subjected to vibration, while the API RP 14E recommends a schedule 160 rated nipple.
- * The Operator failed to address the vibration issues in a timely manner.
- * The insulation barrier surrounding the expansion joint for the gas driven oil pipeline pump #1 engine exhaust was insufficient and did not adequately protect oil from contacting the hot surface.

20. LIST THE ADDITIONAL INFORMATION:

On 26 January 2010, MMS conducted an inspection of new and existing equipment prior to the increased oil production. The MMS Inspectors issued an Incident of Noncompliance (G-111) which noted a leaking Pressure Safety Valve (PSV) on the gas driven oil pipeline pump #2 and broken PSV fitting on a vessel associated with the gas compressor unit. Component vibration was not observed at the time of the inspection nor did the Operator express any concerns regarding vibration.

21. PROPERTY DAMAGED:

NATURE OF DAMAGE:

Multiple components associated with the gas driven pipeline pump #1. Fire damage

ESTIMATED AMOUNT (TOTAL): \$440,000

22. RECOMMENDATIONS TO PREVENT RECURRANCE NARRATIVE:

Due to the specific nature of this incident, the Lake Charles District has no recommendation for the Office of Safety Management (OSM).

23. POSSIBLE OCS VIOLATIONS RELATED TO ACCIDENT: YES

24. SPECIFY VIOLATIONS DIRECTLY OR INDIRECTLY CONTRIBUTING. NARRATIVE:

G-152 Insufficient insulation barrier on gas driven oil pipeline pump #1 engine exhaust.

G-110 The failure to mitigate the vibration issues associated with the oil pipeline pumps resulted in a significant fire.

25. DATE OF ONSITE INVESTIGATION:

12-MAR-2010

26. ONSITE TEAM MEMBERS:

Wayne Meaux / Scott Mouton / Carl Matte / Rick Smith /

29. ACCIDENT INVESTIGATION

PANEL FORMED: NO

OCS REPORT:

30. DISTRICT SUPERVISOR:

Larry Williamson

APPROVED

DATE: 24-JUN-2010

FIRE/EXPLOSION ATTACHMENT

1. SOURCE OF IGNITION: **Natural gas engine exhaust**

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

3. FUEL SOURCE: **Broken 1/2 inch nipple**

4. WERE PRECAUTIONS OR ACTIONS TAKEN TO ISOLATE
KNOWN SOURCES OF IGNITION PRIOR TO THE ACCIDENT ? **YES**

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

INJURY/FATALITY/WITNESS ATTACHMENT

OPERATOR REPRESENTATIVE

INJURY

CONTRACTOR REPRESENTATIVE

FATALITY

OTHER _____

WITNESS

NAME:

HOME ADDRESS:

CITY:

STATE:

WORK PHONE:

TOTAL OFFSHORE EXPERIENCE:

YEARS

EMPLOYED BY:

BUSINESS ADDRESS:

CITY:

STATE:

ZIP CODE:

OPERATOR REPRESENTATIVE

INJURY

CONTRACTOR REPRESENTATIVE

FATALITY

OTHER _____

WITNESS

NAME:

HOME ADDRESS:

CITY:

STATE:

WORK PHONE:

TOTAL OFFSHORE EXPERIENCE:

YEARS

EMPLOYED BY:

BUSINESS ADDRESS:

CITY:

STATE:

ZIP CODE:

INJURY/FATALITY/WITNESS ATTACHMENT

OPERATOR REPRESENTATIVE

INJURY

CONTRACTOR REPRESENTATIVE

FATALITY

OTHER OTHER

WITNESS

NAME:

HOME ADDRESS:

CITY:

STATE:

WORK PHONE:

TOTAL OFFSHORE EXPERIENCE:

YEARS

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BUSINESS ADDRESS:

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