

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

1. OCCURRED

DATE: **14-JAN-2006** TIME: **0300** HOURS

2. OPERATOR: **Freeport-McMoRan Energy LLC**

REPRESENTATIVE: **Julie Bowen**

TELEPHONE: **(504) 309-7411**

3. LEASE: **G01316**

AREA: **MP** LATITUDE:

BLOCK: **299** LONGITUDE:

4. PLATFORM: **FP**

RIG NAME

5. ACTIVITY: EXPLORATION(POE)

DEVELOPMENT/PRODUCTION
(DOCD/POD)

6. TYPE: FIRE

EXPLOSION

BLOWOUT

COLLISION

INJURY NO. 0

FATALITY NO. 0

POLLUTION

OTHER

7. OPERATION: PRODUCTION

DRILLING

WORKOVER

COMPLETION

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 Failure to follow procedures

9. WATER DEPTH: **209** FT.

10. DISTANCE FROM SHORE: **15** MI.

11. WIND DIRECTION: **N**

SPEED: **50** M.P.H.

12. CURRENT DIRECTION: **NE**

SPEED: **5** M.P.H.

13. SEA STATE: **10** FT.

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

Mr. Arthur Barnes

CITY: **Harvey**

STATE: **LA**

TELEPHONE: **(832) 213-5561**

CONTRACTOR: **Production Management
Industries, L.L.C.**

CONTRACTOR REPRESENTATIVE/
SUPERVISOR ON SITE AT TIME OF INCIDENT:

Mr. Arthur Barnes

CITY: **Harvey**

STATE: **LA**

TELEPHONE: **(832) 213-5561**

17. DESCRIBE IN SEQUENCE HOW ACCIDENT HAPPENED:

At approximately 3:00 a.m. the forced draft, fire component (EAL-420) for the Hot Oil Heater (HOH) experienced a shutdown. The PMI Operator was working the night shift. When the shut-in occurred, the PMI Operator woke up the PMI Lead Operator to inform him of what happened. Both men then assembled at the Instrument Control Panel for the HOH units. The Lead Operator observed that an indicator for the Pressure Safety Low on the Fuel Gas was "flagged" red. With this being known, they initiated the "Startup Procedures for the Hot Oil Heater 420" for the downed unit. The Lead Operator indicated that he moved the control setting on the Temperature Control Valve (TCV) down to approximately 100° F. He then walked to the north side of the HOH unit and closed the manual valves (A2 and A2R) on the main fuel line from the Fuel Gas Scrubber for the entire facility. Then he closed the two manual valves on the lines under the HOH unit that supply fuel to the smaller burners. He then closed the manual valves on the upstream side of the TCV. This action would have prevented gas from going to the Main Burner. At this point Relay # 1 (again referring to the Start-Up Procedures) was actuated, the button to start the blower motor was pushed and Relay # 3 was actuated to start the timing sequence for the system purge. After the timing circuit "timed out", steps were taken to light the Pilot Burner. All of the steps in the Procedure being followed to this point, he then re-opened the manual isolation valves (A25 and A2R) on the main fuel line located on the north side of the HOH unit. The igniter button (step 9, number 5 on the panel) was pressed. The igniter enabled the Pilot Burner to ignite and the PMI Operator observed a subsequent reading of 10 volts on the panel-mounted voltmeter. At this point he indicated to the Lead Operator that the lighting of the Pilot Burner had been completed, indicating a satisfactory flame on the pilot. Relay # 7 was then actuated. This action opened the two SDVs on the fuel gas to the Main Burner. The Lead Operator "cracked" opened the by-pass valve for the TCV. This manual action would allow a small, controlled amount of fuel gas to go to the main burner. When this action was performed, the PMI Operator indicated to Lead Operator that the panel-mounted voltmeter had dropped to 0 volts indicating a low or no pilot condition. The Lead Operator closed the by-pass valve he was controlling and moved to the north side of the HOH unit to manually close the two main valves (A2S & A2R). It is at this point that the explosion occurred.

Investigation Findings:

- 1) The operator failed to follow the Hot Oil Heater start up procedures. The two isolation valves, upstream and down stream of the temperature control valve (TCV) were left open during start up.
- 2) The supply gas scrubber, the temperature control valve (TVC), the bypass isolation around the TVC and the manually operated valves that supply gas to the "tip" burner (not the main burner) held no leaks. All valves were removed in the line and checked for foreign debris. None was discovered.
- 3) When tested the shut down valves (SDV) in the fuel gas system failed to obtain a full-closed position as indicated by the valve positioner on the actuator. The pilot burner assembly was disassembled. The orifice for the unit was restricted with condensate.
- 4) The purge cycle would start 5 minutes after unit shut-down.
- 5) Condensate in the fuel gas system prevented the pilot burner from attaining a full flow of fuel. Although the pilot burner was ignited, the flame was not sufficient to allow the BSL (UV-eye) to detect the flame or to ignite the main burner in a timely manner. High winds at the time may have also inhibited ignition of the main burner, which has been experienced in the past.
- 6) The operation of the re-circulation fan, used for the waste heat recovery is used to introduce air in sufficient quantities to create a gas/air mixture below the LFL- incapable of being ignited by the burner. As time into the startup procedure progressed, the introduction of ignitable vapors by both the main burner and the re-circulating fan into the fire chamber contributed to a concentration in excess of

that required for normal ignition.

Manufacturer recommendations to retrofit and upgrade the (2) Hot Oil Heater to include the following devices:

New Model Main Fuel regulator as per manufacturer recommendation
New Model Main Fuel SDV with a redundant SDV as per manufacturer recommendation
New Model Pilot Fuel regulator as per manufacturer recommendation
New Model Pilot Fuel SDV with a redundant SDV as per as per manufacturer recommendation
Combustible Gas Analyzer for monitoring
In-line filters on fuel gas supply to heater.

The size of the pilot fuel gas orifice was sufficient and will remain unchanged for optimal performance.

The present position of the BSL will not change.

The present position on the blow down valves on the BDV's on both Main and Pilot Fuel will remain the same.

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

Condensate in the fuel gas system prevented the Pilot Burner from attaining a full flow of fuel. Although the Pilot Burner was ignited, the flame was not sufficient to allow the BSL (U V-Eye) to detect the flame or to ignite the Main Burner in a timely manner. High winds at the time may have also inhibited ignition of the Main Burner, as has been experienced in the past.

Failure of the SDVs on both the Fuel Gas for the Main Burner and the Fuel Gas for the Pilot Burner to close fully.

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

The operation of the re-circulating fan, used for waste heat recovery, may have been a contributing factor. The operation of this fan introduced air in sufficient quantities to create a gas/air mixture below the LFL - incapable of being ignited by the pilot burner. As time into the startup procedure progressed, the introduction of ignitable vapors by both the main burner and the re-circulating fan into the firing chamber contributed to a concentration in excess of that required for normal ignition.

The operator failed to follow the Hot Oil Heater start up procedures. The two isolation valves, upstream and down stream of the temperature control valve (TCV) were left open during start up.

ADDITIONAL INFORMATION FROM ITEM 22:

7) The Start Up procedures (see attachment) for EAL 410 and 420 has been revised and implemented. New steps included in this procedure are:

a) Increase purge time from five to fourteen minutes.

b) Damper on the coil section (gas recirculation) will be full open during the first four minutes of the purge cycle and will then be closed for the last ten minutes of the purge. The recirculation ion damper will remain closed until the main burner has been lit.

21. PROPERTY DAMAGED:

NATURE OF DAMAGE:

Fire Box on Hot Oil Heater

Fire Box blown out.

ESTIMATED AMOUNT (TOTAL): \$250,000

22. RECOMMENDATIONS TO PREVENT RECURRENCE NARRATIVE:

No Recommendations to MMS.

The MMS New Orleans District concurred with Operator's recommendation to prevent recurrence.

- 1) The Hot Oil Heater EAL 410 that is presently online will be retrofitted with upgraded equipment to include the following devices:
 - a) New Model Main Fuel regulator as per manufacturer recommendation
 - b) New Model Main Fuel SDV with a redundant SDV as per manufacturer recommendation
 - c) New Model Pilot Fuel regulator as per manufacturer recommendation
 - d) New Model Pilot Fuel SDV with a redundant SDV as per manufacturer recommendation
 - e) Combustible Gas Analyzer for monitoring
 - f) In-line filters on fuel gas supply to heater

2) A newly constructed unit will replace the damaged one. This unit will be equipped with (in addition to all required safety devices) the equipment listed in number one above. The estimated completion date for this installation is April 2006.

3) After consultation with the engineering group of the manufacturer of these units, it was determined that the size of the pilot fuel gas orifice was sufficient and will remain unchanged for optimal performance.

4) After consultation with the engineering group of the manufacturer of these units, it was determined that the present position of the BSL will not change.

A preventative maintenance procedure has been implemented to check and inspect the Temperature Control Valve and an associated controller, the BSL and the Pilot Burner orifice, on a quarterly basis.

6) After consultation with the engineering group of the manufacturer of these units, it was determined that the present position of the BDV's on both the Main and Pilot Fuel will remain the same. Repositioning of these valves would not be beneficial.

SEE ITEM 20 FOR ADDITIONAL INFORMATION

23. POSSIBLE OCS VIOLATIONS RELATED TO ACCIDENT: NO

24. SPECIFY VIOLATIONS DIRECTLY OR INDIRECTLY CONTRIBUTING. NARRATIVE:

25. DATE OF ONSITE INVESTIGATION:

17-JAN-2006

26. ONSITE TEAM MEMBERS:

David Emelien / Eric Neal /

29. ACCIDENT INVESTIGATION

PANEL FORMED: **NO**

OCS REPORT:

30. DISTRICT SUPERVISOR:

FPausina for TTrosclair

APPROVED

DATE: **13-MAR-2006**

FIRE/EXPLOSION ATTACHMENT

1. SOURCE OF IGNITION: **Pilot Light**

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

3. FUEL SOURCE: **Fuel Gas Scrubber**

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