

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

1. OCCURRED
 DATE: **20-FEB-2008** TIME: **0915** HOURS

2. OPERATOR: **McMoRan Oil & Gas LLC**
 REPRESENTATIVE: **Keller, Jo Ann**
 TELEPHONE: **(504) 582-4818**
 CONTRACTOR: **Rowan Companies, Inc.**
 REPRESENTATIVE:
 TELEPHONE:

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

4. LEASE: **G21669**
 AREA: **ST** LATITUDE:
 BLOCK: **168** LONGITUDE:

5. PLATFORM:
 RIG NAME: **ROWAN GORILLA IV**

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 **2**
 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
 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 _____

9. WATER DEPTH: **70** FT.

10. DISTANCE FROM SHORE: **35** MI.

11. WIND DIRECTION: **S**
 SPEED: **10** M.P.H.

12. CURRENT DIRECTION: **N**
 SPEED: **5** M.P.H.

13. SEA STATE: **4** FT.

17. DESCRIBE IN SEQUENCE HOW ACCIDENT HAPPENED:

On February 20, 2008, at approximately 0915 hours, the port bow crane on the U.S. flagged jack-up rig Rowan Gorilla IV collapsed while crews were installing a boat tie-up rope on the port side of the forward leg. Two (2) fatalities occurred because of this incident. As the port bow crane was being used to install the boat tie-up rope, the hook load on the auxiliary hoist or "fast line" had one roustabout over the side of the rig harnessed into a "Billy Pugh" workbasket and the inboard main hoist line was unloaded. The procedure for installing the tie-up rope on the forward leg placed the port bow crane in the maximum vertical position.

The crane was being operated with a remote control panel which was located forward of the crane pedestal at the main deck level near the rig handrail and closer to the work operation. After the workbasket was positioned adjacent to the bowleg, the crane operator stepped away from the control panel to observe the crewmember working over the side. Before the crane operator stepped away, the boom in/out hoist control lever was returned to center, this would normally set the boom hoist brake for the main boom arm.

With the boom lever in the center position, the boom arm continued to be pulled in a vertical motion and against the travel stops. With the enormous stress load caused by this exceeded vertical motion, it caused the head assembly to brake apart, and this caused the tip section of the boom arm, the harnessed roustabout and workbasket to plunge into the Gulf of Mexico. Commercial divers in approximately 70 foot of water discovered the individual's body the next day. When the tip of the boom arm broke off, the bridle section did not sustain the rest of the boom armload, so this made the boom arm nose-dive. When the boom arm reached the deck below it sheered off at the hinge plate, and the bail assembly fell and crushed a second roustabout killing him instantly.

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

Probable cause was the crane arm traveling too far due to a possible broken secondary travel limit switch (STLS), the primary travel limit switch (PTLS) being intentionally bypassed and unintentionally moving due to a control panel malfunction.

After the incident, technicians from the crane manufacturer, Le Tourneau Technologies Inc. (LTI), were dispatched to survey the crane damage and inspect limit/control devices. During inspection of the port bow crane, LTI technicians found the primary causes to be the following:

1. The PTLS was in the bypass position. Interviews conducted immediately following the incident indicated that the primary limit switch was placed in bypass to provide access to the leg mounted raw water well on the bowleg, so installation of the water well was completed prior to beginning the installation of the boat tie-up ropes on the bowleg, but the primary limit switch was never reset. If the PTLS was operational, the PTLS would have stopped the electric motor and set the hoist brake.

2. The STLS also failed to activate, and the failure of the backup limit switch was

not able to be determined, but the LTI technicians found the boom hoist breaker tripped, and that the breaker was possibly tripped by falling debris during the collapse. If the STLS was operational, the STLS would have tripped the hoist motor circuit breaker located in the main machinery house.

3. The inspection of the remote control panel used during the incident revealed that the boom joystick potentiometer (POT) wiper voltage was out of tolerance. Interviews indicated the original remote control panel had been damaged, and a new control box had been fabricated on the rig, and components from the damaged control box were transferred to the newly fabricated box. The newly fabricated box was not constructed to the same standard for protecting internal components from exposure to the elements as the original design. Based on crew interviews, the POT wiper voltage range was not calibrated to the neutral position prior to being placed into service. With the POT out of adjustment and the control lever being in the neutral position, the control system sensed a requirement to rotate at low speed. If the crane operator had followed Rowan's operational procedures, he would have shutdown the control panel when it was left unattended.

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

The extent of operator error, maintenance deficiencies and equipment design flaws may have contributed to the boom arm encountering the travel stop, the winch pulling on the head assembly and causing the bail assembly to collapse to the deck. The possible contributing causes are as follows:

1. The first of two limit switches was in bypassed and the second limit switch failed to perform its design function.
2. The boom joystick control potentiometer was replaced but not calibrated.
3. Investigation suggests that the crane operator did not check required items prior to crane operations.
4. Training program requires testing of controls and limit switches prior to operations, but crane operator denies knowledge of the limit switch being in bypass.
5. Failure to turnoff function switches when portable control console is not in use or left unattended.

20. LIST THE ADDITIONAL INFORMATION:

Rowan's Remedial Measures:

1. A technical advisory was sent to the fleet on February 25, 2008.
2. Replacing limit switches and implementing an engineering review throughout the fleet.
3. Modifying daily crane inspections are being conducted throughout the fleet.
4. Enhancing procedures to manage limit switch bypass.

5. OEM inspections are being conducted throughout the fleet.
6. Preventative maintenance deployment is scheduled for 1Q 09.
7. JSA/Work permit improvements are being developed throughout fleet.
8. Rowan is enhancing crane operator training throughout fleet.

Recommendations from the investigative committee include the following:

1. Replace all end-of-travel limit switches.
2. Fill out a comprehensive one page PRE-USE or daily crane inspection procedure form prior to every crane use.
3. An original equipment manufacturer (OEM) inspection shall be conducted throughout Rowan's fleet.
4. A software plant maintenance implementation (SAP) shall be conducted throughout Rowan's fleet.
5. Work permit and JSA improvements for boat tie-ups.
6. Enhanced operator training shall be implemented throughout Rowan's fleet.

21. PROPERTY DAMAGED:

NATURE OF DAMAGE:

**Port Bow Crane - LeTourneau PCM350SS
Crane**

Crane collapse

ESTIMATED AMOUNT (TOTAL): **\$750,000**

22. RECOMMENDATIONS TO PREVENT RECURRENCE NARRATIVE:

23. POSSIBLE OCS VIOLATIONS RELATED TO ACCIDENT: **NO**

24. SPECIFY VIOLATIONS DIRECTLY OR INDIRECTLY CONTRIBUTING. NARRATIVE:

There were no violations issued.

25. DATE OF ONSITE INVESTIGATION:

20-FEB-2008

26. ONSITE TEAM MEMBERS:

**/ Tim McGraw, MMS / LT. Angel
Flood, USCG / LT. John Luff, USCG
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29. ACCIDENT INVESTIGATION

PANEL FORMED: **NO**

OCS REPORT:

30. DISTRICT SUPERVISOR:

Bryan A. Domangue

APPROVED

DATE: **01-DEC-2008**

INJURY/FATALITY/WITNESS ATTACHMENT

| | | | |
|-------------------------------------|---------------------------|-------------------------------------|----------|
| <input type="checkbox"/> | OPERATOR REPRESENTATIVE | <input type="checkbox"/> | INJURY |
| <input checked="" type="checkbox"/> | CONTRACTOR REPRESENTATIVE | <input type="checkbox"/> | FATALITY |
| <input type="checkbox"/> | OTHER _____ | <input checked="" type="checkbox"/> | WITNESS |

NAME:

HOME ADDRESS:

CITY:

STATE:

WORK PHONE:

TOTAL OFFSHORE EXPERIENCE:

YEARS

EMPLOYED BY: **Rowan Companies, Inc. / 00302**

BUSINESS ADDRESS: **5450 Transco Tower
2800 Post Oak Blvd.**

CITY: **Houston**

STATE: **TX**

ZIP CODE: **77056-6196**

| | | | |
|-------------------------------------|---------------------------|-------------------------------------|----------|
| <input type="checkbox"/> | OPERATOR REPRESENTATIVE | <input type="checkbox"/> | INJURY |
| <input checked="" type="checkbox"/> | CONTRACTOR REPRESENTATIVE | <input checked="" type="checkbox"/> | FATALITY |
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OPERATOR REPRESENTATIVE

INJURY

CONTRACTOR REPRESENTATIVE

FATALITY

OTHER _____

WITNESS

NAME:

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