

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

1. OCCURRED

DATE: **29-JAN-2006** TIME: **1016** HOURS

2. OPERATOR: **BP Exploration & Production Inc.**

REPRESENTATIVE: **Ronie Sepulvado**

TELEPHONE: **(281) 366-7741**

3. LEASE: **G25792**

AREA: **KC** LATITUDE:

BLOCK: **292** LONGITUDE:

4. PLATFORM:

RIG NAME **T.O. DEEPWATER HORIZON**

5. ACTIVITY: EXPLORATION(POE)

DEVELOPMENT/PRODUCTION
(DOCD/POD)

6. TYPE: FIRE

EXPLOSION

BLOWOUT

COLLISION

INJURY NO. _____

FATALITY NO. _____

POLLUTION

OTHER **Item Lost Overboard**

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 _____

9. WATER DEPTH: **5873** FT.

10. DISTANCE FROM SHORE: **184** MI.

11. WIND DIRECTION: **SSE**

SPEED: **30** M.P.H.

12. CURRENT DIRECTION: **ESE**

SPEED: **1** M.P.H.

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

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

Ronie Sepulvado

CITY: **Zwolle**

STATE: **LA**

TELEPHONE: **(318) 663-2435**

CONTRACTOR: **Transocean Offshore**

CONTRACTOR REPRESENTATIVE/
SUPERVISOR ON SITE AT TIME OF INCIDENT:

Tim Williams

CITY: **Jean Lafitte**

STATE: **LA**

TELEPHONE: **(504) 689-4322**

17. DESCRIBE IN SEQUENCE HOW ACCIDENT HAPPENED:

Timeline and description of incident:

On January 26 at 0800 hrs - The T.O. Deepwater Horizon started picking up the 22 inch casing, which was made up using the mini derrick and run through the rotary at the BOP cart (see attachment 2). The 22 inch casing used Dril-Quip S-60/Multi Thread Connectors that were made up to a 25,000 ft-lbs minimum, recommended by Dril-Quip. Another requirement by Dril-Quip is for the installation of Anti-Rotation Vertical Slot Keys when using Dril-Quip's S-60/Multi Thread Connectors. The Anti-Rotation Vertical Slot Keys were installed. When the key is installed into a slot in the pin, the serrations bite into the ID of the box, preventing rotation of the pin relative to the box. The casing string was made up prior to being required to utilize the dual activity capability of the rig.

On January 26 at 2225 hrs - Finished picking up 22 inch casing in moonpool and hung-off on BOP transporter. Ran a total of 60 joints including the float shoe.

On January 28 at 2100 hrs - Moved 22 inch casing on transporter to well center and lifted to rig floor. Picked up and ran an additional 18 joints of 22 inch casing from rig floor. (Total 78 joints including float shoe)

On January 29 at 0230 hrs - Picked up 18-3/4 inch wellhead and landed at the rig floor. Deployed 5-1/2 inch inner string inside 22 inch casing.

On January 29 at 0600 hrs - Made up Dril-Quip running tool to inner string, and latched same to 18-3/4 inch wellhead. Ran wellhead assembly to water line using 6-5/8 inch landing string.

On January 29 at 0925 hrs - Casing would not fill-up with sea water. Deployed ROV to investigate.

On January 29 at 1016 hrs - ROV located the bottom 3 joints and float shoe of the 22 inch casing missing. The ROV began a search of the bottom 3 joints and float shoe. The 22 inch casing was located a distance of 125 feet from the well location standing upright in the mudline.

On January 29 @ 1030 hrs - The T.O. Deepwater Horizon moved 500 feet from the well location, so as not to damage the wellhead.

On January 29 at 1200 hrs - The rig crew began laying down the running tool, standing back the inner string and laying down 22 inch casing.

On January 30 at 0130 hrs - The rigs weight indicator lost 57 kips of string weight while continuing to lay down 22 inch casing.

On January 30 at 0430 hrs - Finished laying down 22 inch casing. A total of 67 joints of 22 inch casing were recovered. After laying down the 22 inch casing, BP discovered that an additional 7 joints of casing were missing. An ROV search for these 7 joints was unsuccessful. The rig was located 500 feet from the well location when the joints were lost.

On February 2 at 0800 hrs - Recovered and laid down 3 initially dropped joints of 22 inch casing.

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

The probable causes of the accident are as follows:

The inspection of the Dril-Quip S-60/Multi Thread Connectors indicates that the Anti-Rotation Vertical Slot Keys were improperly installed . The Anti-Rotation Vertical Slot Keys when properly installed provide significant torsional resistance to assist in maintaining connector preload when subjected to open water environmental conditions. Most of the Anti-Rotation Slot Keys were not driven deep enough into the slot of the pin end to achieve full engagement. Many were less than half engaged. This is particularly apparent upon Dril-Quips inspection of the pin of joint number 11 and the box of joint number 3 which are the two connectors which backed out. The teeth of the anti-rotation keys for each connector had minimal engagement (10-15%) and thus did not provide the normal margin of additional safety to maintain torque and preload.

The 22 inch casing was also exposed to severe environmental conditions while being suspended below the false rotary at the BOP cart . The currents ranged from 1.0 to 1.6 knots. A winter front moved through the area and the sea state was over 10 feet for a portion of the time the 22 inch casing was suspended from the BOP transporter in open water. These open water conditions imparted enough cyclic action and possible vortex induced vibrations to cause the connections to back out.

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

The contributing causes of the accident are as follows:

The casing string was suspended for approximately 74 hours before it was detected that the 22 inch casing had parted (January 26 at 0800 hours began picking up 22 inch casing through January 29 at 1016 hours when the ROV found bottom three joints missing).

The connectors were made up by the Weatherford casing crew with intermittent supervision by the Dril-Quip Service Tech. Anti-rotation Vertical Slot Keys were made up by a combination of the Dril-Quip Service Tech, Weatherford casing crew, and rig crew. The Dril-Quip Service Techs split time between running equipment at the main rotary, checking equipment as it was unloaded from the boat, and running equipment at the BOP cart.

21. PROPERTY DAMAGED:

NATURE OF DAMAGE:

A total of 306 feet of 22 inch casing was lost.

ESTIMATED AMOUNT (TOTAL): \$79,254

22. RECOMMENDATIONS TO PREVENT RECURRENCE NARRATIVE:

Recommendations to prevent a recurrence of this event are as follows:

MMS should publish a Safety Alert including a description of the event and recommendations to prevent a recurrence of the event.

Ensure that the Dril-Quip Service Tech is properly trained in and supervises the installation of the S-60/Multi Thread Connectors and the Anti-Rotation keys.

Increase the make up torques for the 22 inch S-60/Multi Thread Connectors from the Dril-Quip recommendation of 25,000 ft-lbs to Dril-Quip recommended maximum torque of 50,000 ft-lbs.

Develop a pneumatic tool to facilitate a more reliable installation of the Anti-Rotation keys.

Review and establish marine environmental guidelines and criteria for pre-running and hanging off casing on drilling rigs that have dual capability during the riser less drilling portion of the well.

23. POSSIBLE OCS VIOLATIONS RELATED TO ACCIDENT: NO

24. SPECIFY VIOLATIONS DIRECTLY OR INDIRECTLY CONTRIBUTING. NARRATIVE:

25. DATE OF ONSITE INVESTIGATION:

15-FEB-2006

26. ONSITE TEAM MEMBERS:

Marty Rinaudo / Johnny Serrette /
Patrick Finney /

29. ACCIDENT INVESTIGATION

PANEL FORMED: NO

OCS REPORT:

30. DISTRICT SUPERVISOR:

Elliott S. Smith

APPROVED

DATE: 28-MAR-2006