

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: 14-JAN-2019 TIME: 1500 HOURS

2. OPERATOR: Walter Oil & Gas Corporation

REPRESENTATIVE:  
TELEPHONE:

CONTRACTOR: Seadrill Limited

REPRESENTATIVE:  
TELEPHONE:

- STRUCTURAL DAMAGE
- CRANE
- OTHER LIFTING
- DAMAGED/DISABLED SAFETY SYS. BOP/LMRP broke away from riser
- INCIDENT >\$25K BOP/LMRP broke away from riser
- H2S/15MIN./20PPM
- REQUIRED MUSTER
- SHUTDOWN FROM GAS RELEASE
- OTHER

3. OPERATOR/CONTRACTOR REPRESENTATIVE/SUPERVISOR 8. OPERATION:

ON SITE AT TIME OF INCIDENT:

4. LEASE: G20051

AREA: GC LATITUDE:  
BLOCK: 243 LONGITUDE:

5. PLATFORM:

RIG NAME: SEADRILL SEVAN LOUISIANA

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

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

9. CAUSE:

- EQUIPMENT FAILURE
- HUMAN ERROR
- EXTERNAL DAMAGE
- SLIP/TRIP/FALL
- WEATHER RELATED
- LEAK
- UPSET H2O TREATING
- OVERBOARD DRILLING FLUID
- OTHER \_\_\_\_\_

- 10. WATER DEPTH: 3048 FT.
- 11. DISTANCE FROM SHORE: 91 MI.
- 12. WIND DIRECTION:  
SPEED: M.P.H.
- 13. CURRENT DIRECTION:  
SPEED: M.P.H.
- 14. SEA STATE: FT.
- 15. PICTURES TAKEN:
- 16. STATEMENT TAKEN:

## 17. INVESTIGATION FINDINGS:

On January 14, 2019, an incident occurred on the ultra-deep water rig Seadrill Sevan Louisiana working under contract for Walter Oil and Gas Corporation (WOG). The Sevan Louisiana was located at Green Canyon Block 243 OCS - G - 20051 at the time of the incident, and it had just completed a temporary abandonment of well SS002. While functioning the primary wellhead connector unlatch with the ROV, the riser adapter failed and ultimately allowed the blow out preventers (BOP's) to fall off the wellhead and lay partially buried in the mud on the seafloor. The well was secured via multiple plugs prior to the BOP's falling and no pollution was attributed to this incident.

On the morning of January 14, 2019, Walter Oil and Gas completed the temporary abandonment (TA) operation of the SS002 well. The surface bridge plug was set at 3,330 feet with cement placed on top and pressure tested as permitted by BSEE. After completing the pressure test against the Lower Blind Shear Rams and performing a full BOP function test, the drill crew displaced the riser's 11.0 pounds per gallon (PPG) Calcium Chloride with 8.6 PPG seawater. WOG had approval from BSEE to hop the BOP stack to the next well, and part of the stack hop procedure was functioning the wellhead connector open with the ROV by supplying pressure/fluid through the hot stab for the wellhead primary unlatch port. Step one of the procedure was to set a pre-determined weight down on the BOP stack by slacking off the riser tensioner system. The ROV placed the flying lead hot stab into the wellhead primary unlatch port and applied 2100 psi to the unlatch function. Moments after the function was complete, the BOP stack started to tilt. The ROV backed away from the stack and inspected the BOP stack and riser. The ROV observed the BOP stack was off the wellhead, barely resting on top of the connection and found the riser adapter partially ruptured. Seventeen hours later, the riser adapter fully parted and the BOP stack fell off the wellhead and came to rest on the sea floor.

The Bureau of Safety and Environmental Enforcement (BSEE) investigation team conducted the initial onsite investigation on January 14, 2019. The team collected evidence, videos, interviewed personnel, and wrote down statements from all involved. The investigation team noted that the procedure stated to apply a predetermined weight down on the BOP stack by slacking off the riser tensioners, but did not provide a specific weight. Through interviews, it was learned that 150,000 thousand pounds (150 KIPS) was the predetermined weight that was to be applied by slacking off the riser tensioners. The Subsea Supervisor, the Drilling Section Leader (DSL) and the Company Representative all agreed that 150 KIPS was the weight needed to hold down the BOP stack when opening the primary connector unlatch. The Subsea Supervisor, who was responsible for adjusting the riser tensioners, adjusted the tensioners from the electrical technician's office located on the drill floor. The controls in the drill floor electrical technician's office has the functionality to display the tensioner weight information. According to the digital graphs that were acquired by the investigation team, the initial weight was approximately 805 KIPS before the Subsea Supervisor slacked off of the riser tensioners thereby increasing the weight pushing down on the BOP stack. The top tension was reduced to approximately 440 KIPS instead of 650 KIPS as had been agreed. The ROV operator positioned the ROV in front of the BOP's and inserted the flying lead into the hydraulic stab on the BOP ROV panel and proceeded to unlock the primary connector from the wellhead. Once completed, the ROV flew around to the opposite side for verification of the function, when unexpectedly the BOPs tilted approximately 45 degrees, putting significant stress on the beveled area of the riser adapter, causing it to rupture. The BOP stack rested in this precarious position on the wellhead for approximately 17 hours before the riser adapter fully failed and the BOP stack fell to the seafloor. During this time, Walter Oil and Gas contacted BSEE Houma District and started working on plans to recover the BOP stack while it was still on the wellhead. Unfortunately, the BOP stack fell to the seafloor before it could be recovered.

On February 2, 2019, qualified personnel recovered the BOP stack and transported the stack to Cameron (the equipment manufacturer) to be thoroughly cleaned, inspected, and repaired as necessary. Qualified personnel sent the riser adapter to Stress Engineering Services (SES) for further analysis. SES visually inspected the riser adapter and determined it was mechanically sound and did not have any pre-existing degradation that would have led to this incident. Utilizing finite element (FE) analysis modeling, SES determined that the riser adapter failed due to reduced top tension while unlatching the wellhead connector. The FE analysis took into account the actual weights that were used at the time of the incident (as well as the environmental conditions). With the top tension reduced to 440 KIPS, the FE models documented that tilting of the BOP stack was the likely outcome if the wellhead connector were to be functioned open at that reduced tension. The tilting of the BOP stack caused the lower flex joint to kink and the riser adapter and bottom slick joint of riser to experience significant bending loads. It was determined through modeling that the bending load on the riser adapter was sufficiently high such that failure of the riser adapter was likely to be the outcome. The SES report documents that the actual failure of the riser adapter was consistent with their FE analysis and the failure was the likely outcome at the reduced top tension of 440 KIPS.

The BSEE investigation team agrees with SES' report in determining the primary cause of this incident to be reduced top tension while unlatching the wellhead connector. The BSEE investigation team concludes that poor procedures led to this incident. The procedure simply stated to "set a pre-determined weight down on the stack by slacking off the tensioners," and "ensure the pre-determined set down weight is well above the buckling tension on the riser." During a meeting held between BSEE Houma District, WOG, and Seadrill, the investigation team learned the following: 1) The rig was given free will to determine the set down weight, and 2) There was no known engineering analysis and/or simulation performed to aid the operational personnel to determine a maximum or minimum set down weight. The Subsea Supervisor applied more weight than agreed upon. However, WOG and/or Seadrill did not give the rig guidance on the proper set down weight. Furthermore, the safe working parameters for this operation were not established. The lack of analysis into safe parameters for setting down weight by slacking off the riser tensioners allowed substantial errors to be made. Seadrill stated that they plan to further study what the safe parameters should be for each of their rigs, but the current preventative action is to limit all of their rigs to 50 KIPS when disconnecting from wells. This weight (50 KIPS) has been frequently used by Seadrill and has a history of success.

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

1) The reduction in riser tension was substantial enough to place the entire riser system in compression, causing significant stress on the riser adapter when the wellhead connector was functioned open.

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

- 1) Poor procedure. The procedure did not state a specific weight to be applied by slacking off the riser tensioners.
- 2) Lack of safe operating parameters when setting down weight with the riser tensioners.

20. LIST THE ADDITIONAL INFORMATION:

21. PROPERTY DAMAGED:

Riser Adapter

ESTIMATED AMOUNT (TOTAL): \$13,000,000

NATURE OF DAMAGE:

Riser Adapter broke off from the Subsea BOP stack.

22. RECOMMENDATIONS TO PREVENT RECURRENCE NARRATIVE:

The BSEE Houma District recommends the Office of Incident Investigations use the information and findings from this investigation to coordinate with the Office of Safety Management and District Operations Support, and issue a Safety Alert with the purpose of raising awareness about utilizing proper rig procedures when disconnecting.

23. POSSIBLE OCS VIOLATIONS RELATED TO ACCIDENT: NO

24. SPECIFY VIOLATIONS DIRECTLY OR INDIRECTLY CONTRIBUTING. NARRATIVE:

25. DATE OF ONSITE INVESTIGATION:

14-JAN-2019

26. INVESTIGATION TEAM MEMBERS:

Gabe Orellana / Troy Boudreaux / Paul Reeves - author /

28. ACCIDENT CLASSIFICATION:

29. ACCIDENT INVESTIGATION  
PANEL FORMED: NO

OCS REPORT:

30. DISTRICT SUPERVISOR:

Bryan A. Domangue

APPROVED DATE: 30-MAY-2019

27. OPERATOR REPORT ON FILE: