

Investigation of October 20, 2015 Fatality During Pipe Handling

Lease OCS-G 33531, Keathley Canyon Block 96
Drillship Pacific Santa Ana

Gulf of Mexico Region, Lake Jackson District
Off Texas Coast

March 3, 2017



U.S. Department of the Interior
Bureau of Safety and Environmental Enforcement

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List of Acronyms

AD - Assistant Driller
BHA - Bottom Hole Assembly
BSEE - Bureau of Safety and Environmental Enforcement
HR - Hydra Racker
MHR - Main Hydra Racker
MODU - Mobile Offshore Drilling Unit
NOV - National Oilwell Varco
OCSLA - Outer Continental Shelf Lands Act
OJT - On the Job Training
PJSM - Pre Job Safety Meeting
PSA - Pacific Santa Ana
SES - Stress Engineering Services
SSE - Short Service Employee
TIH - Tripping in the Hole
TRA - Task Risk Assessment
USCG - United States Coast Guard

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Executive Summary

On October 20, 2015, an incident resulting in a single fatality occurred onboard the Drillship Pacific Santa Ana (PSA). The PSA, owned by Pacific Drilling, was operating approximately 250 miles south of Lake Charles, Louisiana in the Gulf of Mexico. The PSA under contract to Chevron USA Inc. (Chevron) was in the Keathley Canyon Area, Block 96 to drill an exploratory well under Lease OCS-G 33531.

The drill crew onboard the PSA was in the initial stages of the drilling process, lowering the Bottom Hole Assembly (BHA) and 36 inch structural casing to the sea floor in order to begin making the well. This process involved work on the drill floor to successively connect lengths of pipe and lower them through the rig's main drill center, referred to as "Tripping in the Hole" (TIH). At approximately 10:10 a.m., a floor hand employed by Pacific Drilling, died when he was struck in the head by the bottom end of 6 5/8 inch drill pipe¹ as it was being moved from its storage location to the main drill center. The victim, a Pacific Drilling employee since January 4, 2015, had previously worked as a roustabout. The victim had been training during off hours and when operations allowed with the drill crew. The day of the incident was the victim's first shift after having been fully promoted to floor hand.

The PSA is equipped with a dual activity derrick having a main well center and auxiliary well center along with a main and auxiliary National Oilwell Varco (NOV) Hydra Racker IV (HR) for pipe handling. Drill pipe is stored vertically in a setback area located between the two drill centers. The pipes are secured using two fingerboards in the derrick which maintain the pipes in the vertical orientation and prevents unintentional movement. The setback area was considered a no entry zone while the HR was handling pipes.

Standing on end, four single drill pipes (joints) are assembled to form a stand of pipe. At the time of the incident, each of the stands being worked was approximately 125 foot long. While stored in the setback area, referred to as "racked back", the stands are held in individual slots by pneumatic latches along each row of the upper and lower fingerboards. Each latch between the stand being handled and the opening of the fingerboard is only opened after the stand is secured by the HR. To retrieve a stand, the HR extends three arms which make contact with the stand. The center arm is equipped with a gripper head which grips and lifts the weight of the stand. The upper and lower arms of the HR have guide heads, which act to stabilize and maintain the stand in a vertical position. The guide heads have claws that close around the stand, but these claws are not intended to grip the stand while it is being moved. Once the gripper head has control of the stand, the stand would be lifted and all three arms would retract back to the base of the HR. The HR would then rotate and traverse down a track transporting the stand to the drill center. The HR would then be returned to the setback area.

During the TIH operation, the victim had been assigned to spot for the Assistant Driller (AD) who operated the Main Hydra Racker (MHR) from inside the drill shack. As a spotter, the victim had the responsibility of visually verifying latches on the lower and upper fingerboards in

¹ Pipe is referred to by its outside diameter.

the path of the stand being moved were in the open position prior to the retracting of the HR arms. This observation was done standing to the side of the HR base, and outside of the setback area. The victim would verbally convey the position of the latches (open or closed) to the AD by way of a hand held radio.

In addition to spotting, the victim had also been tasked with keeping the setback area clean, applying thread lubricant to the stands (referred to as doping), and re-numbering the stands with a paint stick.

By the time of the incident, the process of handling stands of 6⁵/₈ inch pipe with the MHR had repeated 31 times. The AD began the process of removing stand 32 with the MHR after hearing the victim over the radio verify that the latches were open. As the MHR arms retracted however, the stand was obstructed by a closed latch on the lower fingerboard. There were no indications that anyone was aware the latch was closed. As the HR continued to retract, the claws of the lower guide head remained closed and the stand of pipe began to bow as it was pulled against the closed fingerboard latch. The victim had at this point stepped into the setback area and into the path that the stand had travelled. The force being applied to the claws of the lower guide head by stand 32 ultimately forced open the aft claw.

All of the stored energy from the stand being bowed was released and it recoiled towards the setback area striking the victim. The injuries sustained by the victim were described by co-workers who came to his aide as immediate and obviously fatal. From the start of the sequence to retrieve stand 32 to the time the victim was struck, 6-8 seconds had passed.

The Bureau of Safety and Environmental Enforcement (BSEE) conducted a panel investigation into the victim's death and the causal factors that led to the incident. The panel consisted of professionals from both BSEE and the United States Coast Guard (USCG).

The Panel travelled to the PSA, conducted interviews, reviewed documents and witnessed the testing of components removed from the PSA. Based on the investigation, the Panel concluded that the fatal incident was the result of:

- The failure of a rod seal located within a lower finger board latch cylinder.
- The victim moving into the setback area while a pipe stand was being moved.

In addition, the Panel identified the following contributing factors:

- Insufficient supervision over an employee new to a position.
- Assignment of multiple tasks to an employee new to a position.
- Failure to recognize risks associated with an operation.

Introduction

Pursuant to 43 U.S.C. § 1348(d)(1), (2) and (f) [Outer Continental Shelf Lands Act, as amended] (OCSLA) and Department of the Interior regulations 30 CFR Part 250, the Bureau of Safety and Environmental Enforcement (BSEE) is required to investigate and prepare a public report of this incident.

BSEE convened a panel to conduct the investigation. Panel members were:

Michael Fornea, Field Engineer, BSEE Lake Jackson District
James Holmes, Inspector, BSEE Lake Jackson District
Michael Idziorek², Special Investigator, BSEE Safety and Incident Investigations Division
Troy Naquin, Inspector, BSEE Lafayette District

USCG Marine Casualty Investigator, Lt. Walter Hutchins from Marine Safety Unit Texas City assisted in the investigation.

The purpose of this investigation was to identify and document the cause or causes of the fatality which occurred onboard the PSA. The report prepared includes the conclusions made by the Panel. Also included are recommendations that may help to reduce the likelihood of a recurrence or similar incident in the future.

² Panel Chair

Lease Location and Information

Lease OCS-G 33531 (the lease) is approximately 250 miles south of Lake Charles, LA and covers approximately 5,760 acres encompassing all of Keathley Canyon Block 96 (KC 96), in the Gulf of Mexico Western Planning Area (Figure 1).

The block was purchased by BP Exploration & Production Inc., as the sole lease owner/operator, in the GOM Western Lease Sale 210 in 2009. Chevron USA Inc. became a partner and Lease Owner Group Operator in March of 2014; BP held 55% working interest (WI) and Chevron held 45% WI. ConocoPhillips Company joined as a partner on December 1, 2014; Chevron held 45% WI, BP held 34% WI and ConocoPhillips held 21% WI. As of December 31, 2014, the lease was owned by Chevron (36% WI), BP (34% WI), and ConocoPhillips (30% WI) with Chevron being the operator. Pacific Drilling was contracted to drill well number 1 (the well) located in KC 96 using the drillship PSA. The water depth at this location is 4,847 feet (1477 meters).



Figure 1- Lease Location & Position of Pacific Santa Ana on October 20, 2015

Pacific Santa Ana Drillship

The PSA is a 748 foot (228 meter) long, 60,538 Gross Ton Drillship. Constructed by Samsung Heavy Industries of South Korea in 2011 (Figure 2), The PSA is owned by Pacific Drilling Limited headquartered in Katy, Texas. The flag state for the PSA is Liberia.

As a drillship, the PSA falls into the category of being a Mobile Offshore Drilling Unit or MODU. MODU's like the PSA move under their own power as a conventional ship between drilling locations. Once at a drilling site, the PSA uses dynamic positioning to remain on station throughout the course of drilling operations.

The PSA has a dual derrick system consisting of main and auxiliary drill centers. This allows for dual activity operations.



Figure2- The Pacific Santa Ana

Pipe Stands and Fingerboards

The stands are stored vertically in the setback areas and held in place using two fingerboards. Each board is comprised of several fingers which extend horizontally with openings facing the center of the ship. A lower fingerboard (~50 feet above the deck) and an upper fingerboard (~108 feet above the deck) hold the stands in rows with each stand in its own slot (Figure 3). Pneumatic latches on each fingerboard secure the stands in their slots. The latches are opened when one of two vertical pipe handlers is used to move a stand.

Figure 3- Looking upward from the deck. In the foreground is the lower fingerboard. Latches in closed position can be seen holding stands of pipe in place.



Pipe Handling Equipment

To move stands of pipe in and out of the setback area, the PSA has two vertical pipe handlers, a main and auxiliary. Both are Hydra-Racker IV's manufactured by NOV. On October 20, 2015, the Main Hydra Racker (MHR) was being used during the TIH operation. The MHR was operated by the AD from controls located inside the drill shack.

To move and control pipes, the MHR has three arms: a gripper head in the center, a lower guide head at the bottom, and upper guide head at the top. The gripper head is used to grip and lift a selected pipe. The upper and lower arms of the MHR have guide heads, which act to stabilize and maintain the stand in a vertical position. The guide heads have claws that close around the stand, but these claws are not intended to grip the stand while it is being moved. Once the gripper head has control of the stand, the stand would be lifted and all three arms would retract back to the base of the MHR. The MHR rotates at its base so the pipe stand can be properly oriented to the drill center (Figure 4).

The MHR is operated using joystick hand controls on a “cyber chair” by the AD from a console with monitor displays inside the drill shack. The display provides the AD information such as the weight taken on by the MHR and the position of the three arms relative to each other.

The display digitally depicts each row of pipe in the fingerboard, with pipes depicted in individual slots as circles. The finger board latches are depicted as a solid black line between each slot. Once a desired stand is secured by the MHR, the AD selects the command to open the latches in that row. This command allows rig air pressure to open the latches in front of the selected stand. On the display, the black lines depicting the latches disappear. Despite this visual indication, the system cannot tell the AD if an individual latch is truly open or if one closes prematurely. The disappearance of lines in a selected row only confirms that the command to open was given or sent.

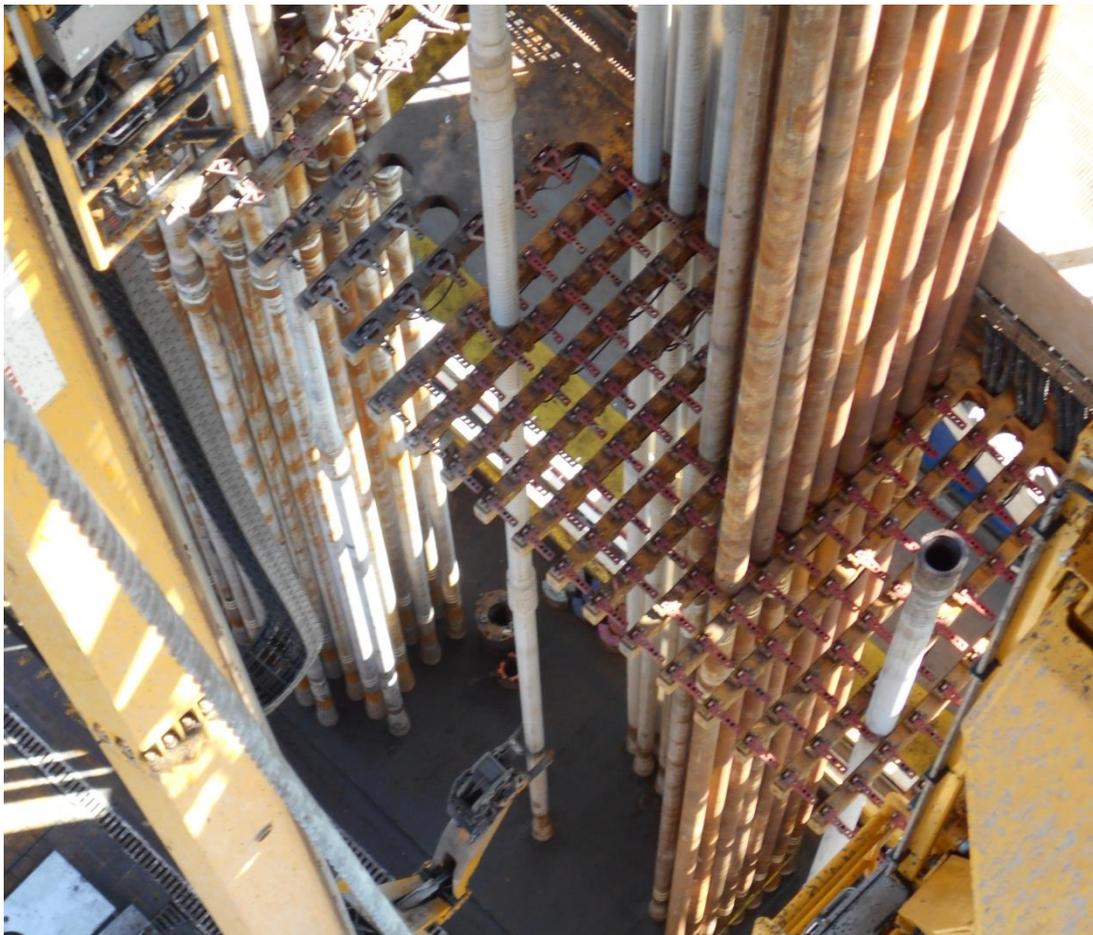


Figure 4- The MHR lower guide head is visible in its position around a pipe stand at the bottom of the photo.

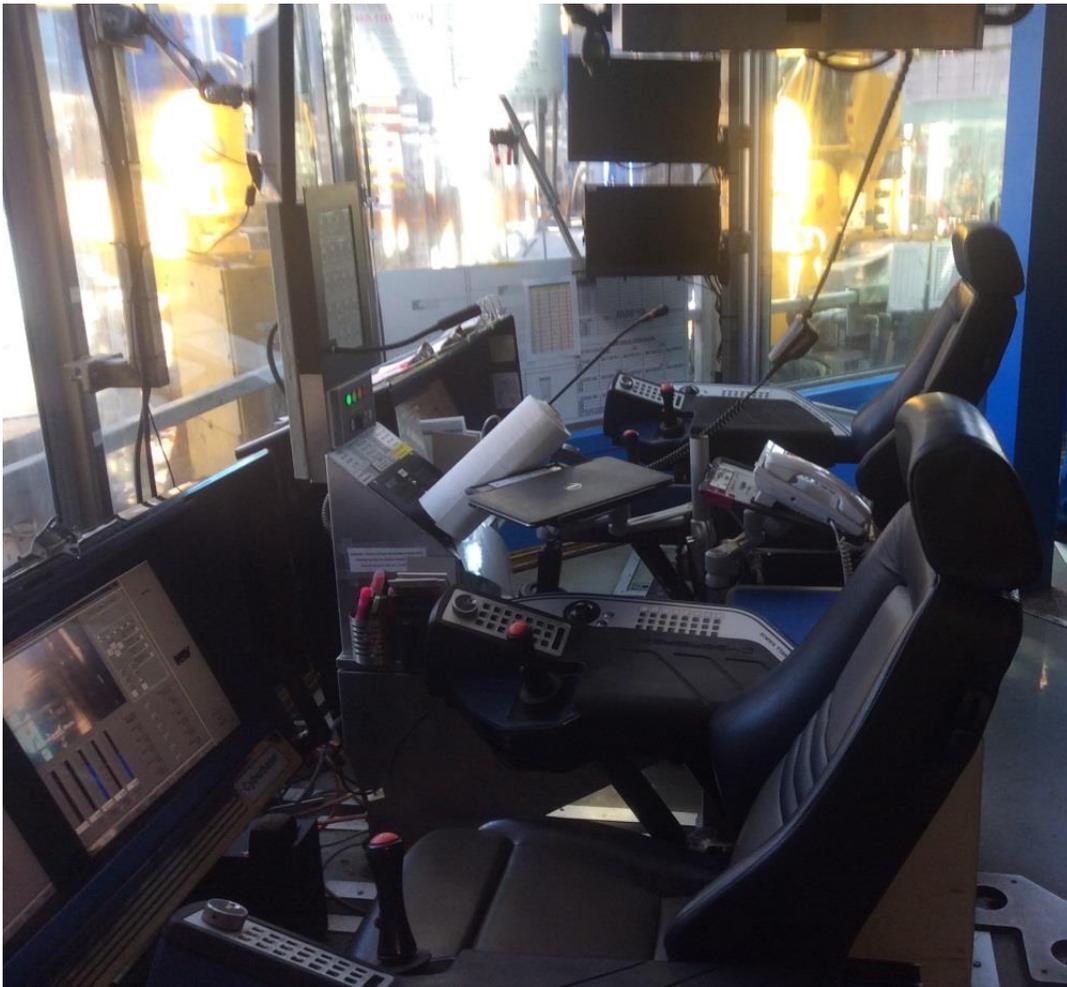


Figure 5- Inside the drill shack; The Assistant Driller (AD) control position is in the foreground. The driller would occupy the far chair. The yellow Main Hydra Racker (MHR) is seen in the upper right corner.

With the dual activity capability of the PSA, there are two complete sets of controls in the drill shack. There are chairs for both the Driller and AD. Each pair of chairs faces either the main or auxiliary drill centers (Figure 5).

The pipe being used for the TIH operation was stored in the auxiliary setback area, located towards the bow of the ship. The main well drill center where the pipe stands were being transported to was towards the aft. As seen in Figure 5 above, the Driller and AD control positions are facing the main well drill center. Pipe stands from the vertical rack would be gripped by MHR and pulled out of the setback area. The MHR would rotate clockwise at its base, and then traverse down a track towards the main well drill center. Once a stand of pipe was at the drill center, the AD would align the new stand to the top of the previous stand. Control of the pipe would then be transferred to the top drive. From the same control chair and console, the AD would transition to operating the Hydra Tongs to connect the two stands. The top drive, operated by the Driller, would then lower the stands through the drill center.

Incident Timeline

Under contract with Chevron Deepwater Exploration and Projects Business Unit (Chevron), the PSA arrived at KC 96 on October 17, 2015, to drill a new well. Preparations were made to begin drilling the well. This included surveying and marking the well location on the seafloor and inspecting the drill floor equipment. The next step would be to set a 36 inch casing into the seafloor, starting the well.

After beginning their tour at midnight on October 20th, the drill crew, which included the victim, started to prepare the casing handling equipment and bottom hole assembly. This process was completed at 5:30 a.m. At 7:30 a.m., work began to “trip in the hole” (TIH) with the 6 ⁵/₈ inch drill pipe through the main well drill center lowering the 36 inch casing 4,847 feet to the sea floor.

There were five crew members involved with the operations on the drill floor. Inside the drill shack were the Driller and AD. Two floor hands worked at the main well drill center to assist with connecting the pipe stands. A third floor hand, the victim, acted as a spotter when the MHR would retrieve stands out of the setback area. The spotter would notify the AD when the fingerboard latches were open so the movement of the pipe stand could proceed without being obstructed.

On October 20, 2015, the victim was working with the responsibility of spotting for the AD while pipe stands were being retrieved during the TIH operation. He was also tasked with renumbering³ pipe stands with a paint stick, cleaning and doping⁴ the pipe threads and keeping the setback area clean. The spotting was done while standing next to and forward of the MHR; however, the additional tasks involved him entering the setback area and working close to the stands.

By approximately 10:10 AM, 31 stands had been moved to the main well drill center. The AD was retrieving stand 32 from row 46 of the finger boards after receiving verbal confirmation over the radio from the victim that the latches were open (Figure 6). At some point during the movement of stand 32, the fourth latch from the opening of the row on the lower finger board dropped into the closed position blocking the moving stand. Despite this obstruction, the arms of the MHR continued to retract. Claws around the pipe on the lower guide head remained closed during this retraction and the pipe began to bow. As the bow in the pipe increased, the bottom of the pipe was pulled in an upward direction against the inside of the claws.

³ Each pipe has a hand written number placed on it to aid the Driller in keeping track of the drill strings total length. A pipe stand had been damaged during the PSA’s previous drilling operation and pulled from service removing it from the sequence.

⁴ Doping refers to the process of applying a lubricant to the pipe threads. This aids in a proper connection between pipes.

The lower guide head had retracted approximately four feet from directly under the obstructing latch. Under the strain of force the lower guide head aft gate opened freeing the pipe. The stored energy from the bowing of the pipe was suddenly released. The victim by this time had moved directly into the path of the pipe between the MHR and the setback area. The pipe struck him before it impacted other pipe stands and a horizontal steel beam at the rear of the setback area.

The jarring sound of the impact alerted other crew members on the drill floor and at 10:11 a.m. operations were halted. The injuries sustained by the victim were described by co-workers who came to his aide as immediate and obviously fatal. From the start of the sequence to move stand 32 to the time the victim was struck, 6-8 seconds had passed.



Figure 6 - View from drill floor. Stand #32 is obstructed by latch on lower finger board.

BSEE Investigation & Findings

At approximately 11:00 a.m. on October 20, 2015, a representative from Chevron U.S.A. notified the BSEE, Lake Jackson District that a fatality had occurred during operations onboard the PSA.

BSEE and United States Coast Guard personnel travelled to the PSA later that same day to begin the investigation into the incident. The BSEE/USCG team collected pertinent records, conducted preliminary interviews of personnel, and documented the incident area with photographs.

BSEE's Panel was convened to conduct the full investigation into the facts and circumstances that resulted in a fatality. Panel members travelled to the PSA to complete documentation of the incident location and speak to onboard crew members. The BSEE Panel reviewed electronic and written material, including but not limited to data, emails and other records related to operations on the PSA. The BSEE Panel conducted interviews of personnel and observed testing of involved equipment.

The Victim

The victim was a 34 year old man from Hope, Maine and had been employed by Pacific Drilling since January 4, 2015. The job onboard the PSA was the victim's first in the offshore oil and gas industry. As is normal with personnel new to the industry, the victim began work as a roustabout. In this entry level position the victim would work as a rigger on crane operations, perform general maintenance, and would assist the drill floor crew.

The crew on the PSA worked in 28 day hitches⁵. October 20th was day 20 of the victim's hitch. The victim was noted to be an enthusiastic worker. When operations allowed, the victim voluntarily trained with the drill floor crew. This training and work resulted in the victim being promoted to floor hand. The day the victim was killed, was the first day in that new position.

The victim was attended to by co-workers and the ships medic within minutes⁶ of the incident. The medic reported the injuries he observed were traumatic and "incompatible with the sustainment of life." The victim's body was flown from the PSA and ultimately taken to the Lafourche Parish (Louisiana) Coroner's Office. An autopsy report summarized the cause of death to have been blunt force trauma to the skull.

⁵ Offshore workers schedules follow multiple day rotations. For this crew the schedule was 28 days on, and 28 days off. Each worker would work a 12 hour tour (shift)/day.

⁶ Records from Pacific Drilling show that the medic was summoned at 10:12 a.m. and arrived on the drill floor at 10:15 a.m.

October 20th Tripping in the Hole

Prior to starting their tour, the drill crew, including the victim attended a pre-job safety meeting at 11:30 p.m. on October 19th. This meeting encompassed all of the different crews on the PSA that would be working various tasks over the next 12 hours. The victim's crew then held a job specific meeting and began the task of changing out equipment on the drill floor in order to run the 6⁵/₈ inch drill pipe.

The equipment change out was completed by 5:30 a.m. Led by the Driller, an additional pre job safety meeting (PJSM) was held by the drill crew to TIH with the 6⁵/₈ inch pipe. The victim was assigned the task of spotting for the AD who operated the MHR to pull pipe stored in the auxiliary setback area. Additionally, the victim was tasked with re-numbering pipe, doping the pipe threads, and cleaning any residual mud⁷ that dropped from the pipe stands when they were lifted.

The cleaning and doping were normal things done while TIH. The renumbering, although not unusual, was specific to the use of the 6⁵/₈ inch on this operation. When the pipe was being pulled out of the hole and stored from its last use, thread on one section was found to be damaged. That stand of pipe was removed from use, requiring the renumbering⁸.

A Task Risk Assessment (TRA) for the TIH operation was completed and signed by each member of the drill floor crew during the PJSM. The BSEE Panel's review of the TRA showed that tasks and risks noted were broad and encompassing of the overall TIH operation. Each member of the drill floor crew had a different responsibility during the operation. Tasks and risks associated were not specific to the positions. The TRA did call for a spotter to confirm the position of the latches; however, the additional duties assigned to the victim were not identified on the TRA.

During the operation, both the Driller and AD were in the chairs facing the main drill center. Pipe stands being run through the main drill center were stored in the auxiliary setback area and not in the direct line of sight of either the Driller or AD (Figure 7).

At various times during this operation, members of the drill crew recalled seeing the victim performing his assigned tasks. One crew member recalled to the Panel that he had seen the victim in the setback area, but that it was when the MHR was at the main drill center.

Neither the AD nor other floor hands had a direct line of sight to where the victim was working, and communication between the crew was conducted by using hand held radios. The AD, Driller and other floor hands stated to the Panel that they heard the victim say over the radio that the latches were open prior to hearing the sound of the recoiling pipe.

⁷ Drilling fluid, or mud, sometimes remains inside the drill pipe when it is pulled out of the hole.

⁸ This occurred on October 10, 2015 while pulling out of the hole (POOH) at another drilling location. The 6⁵/₈ inch pipe had not been used since then until the day of the incident.



Figure 7- The view from the Main Side AD control chair, looking towards the auxiliary setback area. During TIH operations the driller would be occupying the other chair.



Figure 8 – Fingerboard latches. Note the latch in the up (open) position. The silver top of the piston rod can be seen pulled down.

Lower Fingerboard Row 46 Latch # 4

The fingerboard latch assembly consists of a spring loaded piston that when air pressure is applied, pulls a rod into the cylinder body raising the latch (Figure 8). When there is insufficient pressure on the rod end of the piston to overcome the force of the spring the latch will close. This means that if there was a loss in air pressure, the latches would remain closed and the pipe stands will be secured (Figure 9).

On October 20th from 7:30 a.m. until the incident occurred, 31 stands of pipe had been retrieved from the auxiliary setback area. Stand 32 was located in slot 8 of row 46 in the fingerboard. Over the course of TIH operation, latch 4 in row 46 had functioned 4 times prior to retrieving stand 32.

As stand 32 was being retrieved, latch 4 closed. The force applied to the latch by stand 32 caused the latch to twist on its mount, but it did not break free or open. At the conclusion of the onsite visit to the PSA by the BSEE Panel, latch 4 was removed for testing.

Pacific Drilling contracted Stress Engineering Services (SES) in Houston, TX to conduct testing on the latch. BSEE Panel members reviewed the proposed testing protocols and witnessed the testing over multiple days.

After the tests, it was concluded the latch initially opened when air pressure was supplied; then immediately closed due to a leaking rod seal and pressure building up on the backside of the piston. During testing of the incident latch, it was found that air was flowing through the vent on the cylinder when air was supplied. This means air was flowing by the piston, due to the rod seal leak, at a faster rate than air flowing out of the vent. The vent on the cylinder is there to prevent pressure building up on the backside of the piston. When there is not significant pressure build up on the rod end of the piston the spring will extend the rod out of the cylinder, closing the latch.

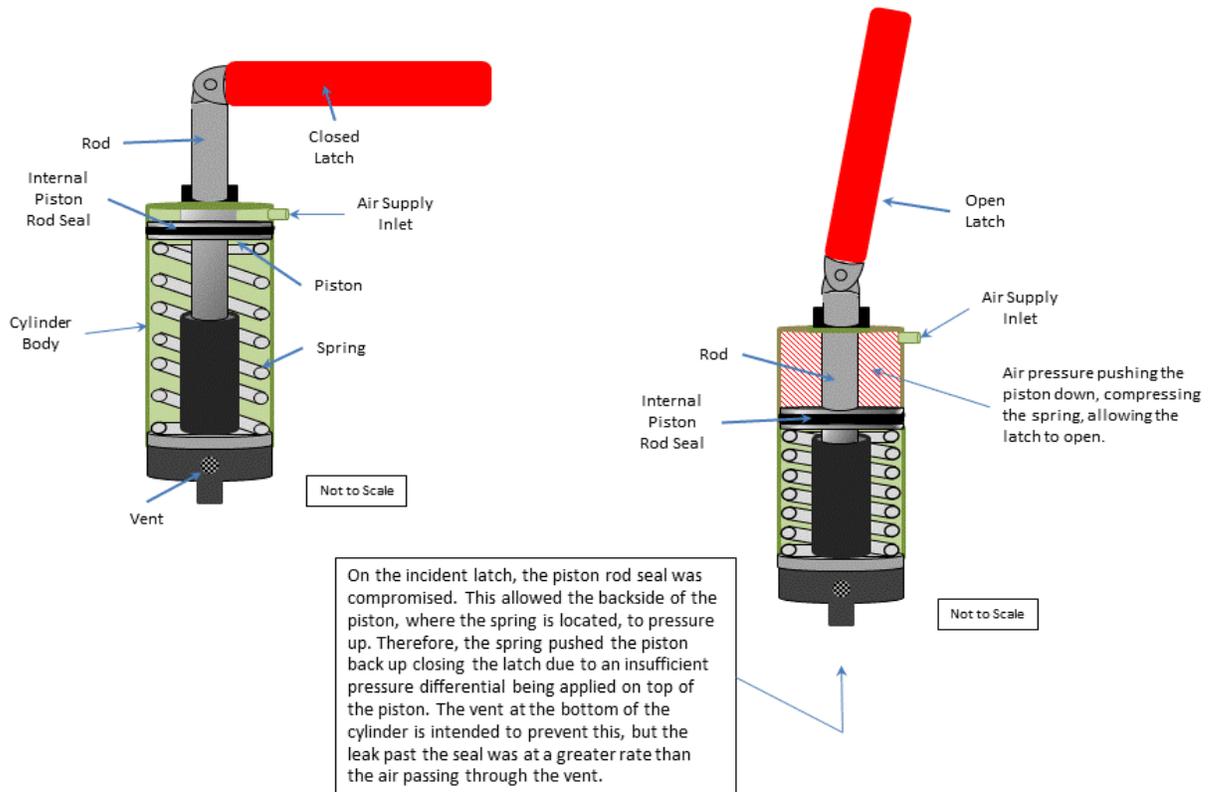


Figure 9 – Latch Cylinder Drawing

Dropped Object Hazard

During interviews, members of the crew explained the hazard they were concerned with regarding the latches was one could break free and drop to the drill floor.

Pacific Drilling provided the BSEE Panel an information bulletin sent out by the HR manufacturer, NOV. This bulletin highlighted there were past instances when a latch would not fully open or would close unexpectedly. It was for this reason the bulletin recommended the position of the latch be visually verified.

Worker Training

Onboard the PSA, a short service employee (SSE) would be anyone with less than six months experience on the ship. So other crew members would be aware of a person's experience level, SSE's on the PSA would wear a green hard hat instead of the normal white. After the six month mark, the employee would wear the white hard hat. This only applied to personnel new to the PSA and not to a new position on the ship.

The BSEE Panel reviewed training records for the victim provided by Pacific Drilling. The records showed that although the victim had completed a number of the training modules required by Pacific Drilling, none of the modules were specific to the operational tasks performed by a floor hand. Pacific Drilling conducted on the job training (OJT) in which a person in training would "shadow" a more experienced worker on a particular crew. If a person in training performed satisfactorily, they would be evaluated by the supervisor prior to any advancement. In the case of the victim, performance was evaluated by the Driller who approved and made a recommendation for promotion.

There was not, however, clear documentation of this OJT program. No determinations could be made as to when the victim had been trained on specific tasks or to what proficiency.

Members of the crew, when interviewed, indicated they had all trained as and worked as spotters during pipe handling operations. Crew members would relieve each other for breaks and meals based on the tasks being performed.

During the Panel's site visit to the PSA, crew members were asked to demonstrate how the spotter would perform their task. Since the MHR was going to move from the auxiliary setback area towards stern, it was demonstrated to the Panel the spotter would stand next to the MHR base. From this position, the spotter could see up to the fingerboards and the latches. Once the pipe had been gripped and the arms retracted, the MHR would rotate in a clockwise direction⁹ before moving down a track to the main well center.

⁹This properly orients the pipe string so that it can be lowered to the drill center.

The Panel found there was no standard practice as to when a person could enter the setback area during pipe handling operations. The floor hands interviewed all indicated that movement into the setback area while the stands were being moved was not allowed. However, determining exactly when it was safe to move into the setback area varied.

Operation of the Hydra Racker

The rows and slots for the stands needed for a particular operation are predetermined and loaded into the HR controls. The system is calibrated so once a command to move is input by the AD, the arms would secure at the proper points on the stand. The system displays the weight of the stand, and would shut down if an attempt was made to lift a stand exceeding the maximum weight set point. There was not, however, any way to display if during operation there was any resistance to the lateral movement of the stand. The system would also shut down if there was more than 11.8 inches difference in alignment between the upper and lower guide heads. Despite the resistance encountered the guide heads alignment did not exceed this limit during movement of stand 32.

The AD during the TIH operation was seated in the far left seat in the drill shack. This was the farthest station from the auxiliary setback area where the victim was working. The AD, not having a direct line of sight, relied on radio communication with the victim (Figure 10). The MHR did have a video camera mounted on its base. However, the camera was used primarily to confirm alignment with the targeted stand and when a connection was being made at the drill center with the hydra tongs. A second camera on the MHR had been located higher near the upper guide arm and used in a similar manner. This camera had reportedly been broken off during a prior operation and had not yet been replaced. Regardless, neither camera would show the fingerboards or the setback area.

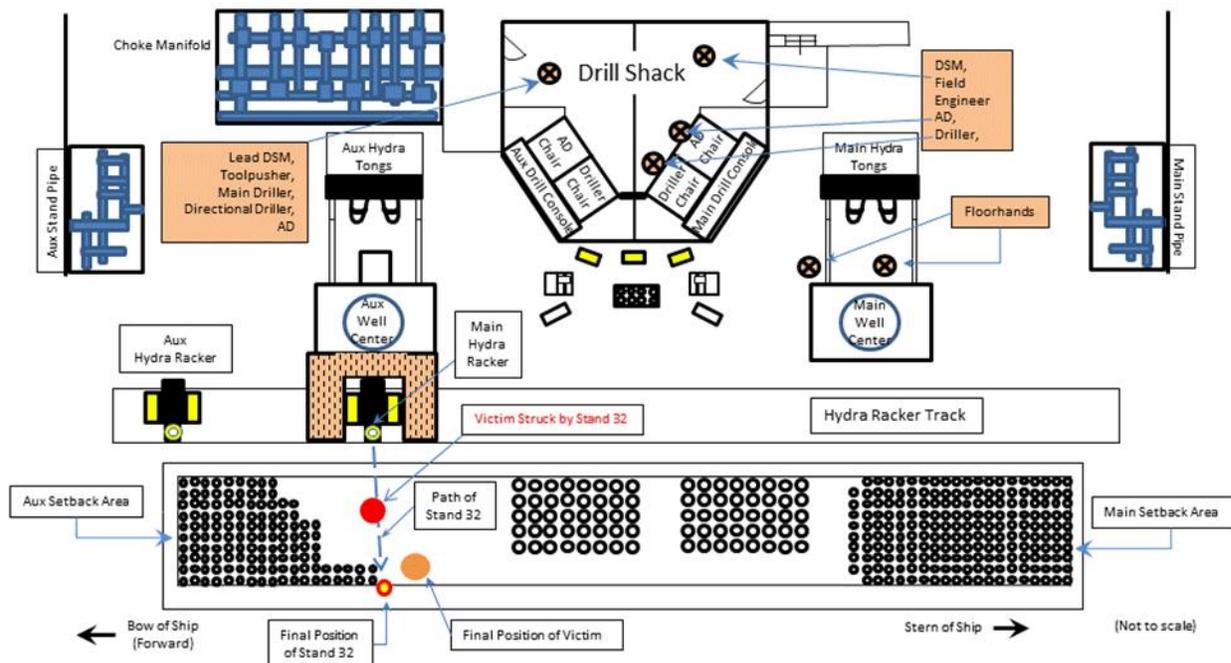


Figure 10 – Incident Location Plan View

Conclusions

The conclusions of direct and contributing factors reached by the BSEE Panel are based on the observations made during the investigation, interviews that were conducted and a review of documentation collected from Pacific Drilling and Chevron.

Taking into account the totality of circumstances, the Panel concluded that the death of the victim was the direct result of moving into the setback area and into the path of the pipe stand being held under tension when a latch on the lower fingerboard closed.

The Panel believes that the victim had correctly observed and communicated that the latches were open. After making this report, the victim went on to other tasks which had been assigned to him taking his attention from the fingerboards before the pipe stand cleared the last latch.

Post incident testing of the latch did show that a faulty seal on the latch cylinder allowed the latch to drop back into the closed position. However, if the victim had not moved into the setback area at the critical time, he would have been clear of the pipe when it recoiled from the lower arm of the HR.

It is the conclusion of the panel that the multiple tasks assigned to the victim required that he enter the setback area. His inexperience and lack of consistent training about when it was permissible to enter the setback area may have contributed to the victim's decision to step in when he did.

The Panel also concluded that the assignment of additional tasks to the victim was made without consideration as to how those tasks contributed to risk. None of the tasks were listed on the TRA prepared before the operation began.

The victim was also performing all of his duties out of the direct view of supervisors or other more experienced co-workers. Despite being his first day in the new position, there was no follow up or observation made to determine if he was performing the tasks in a safe manner.

Recommendations

Based on the findings from this investigation, the BSEE Panel recommends companies operating on the U.S. Outer Continental Shelf consider the following to further protect health, safety, property and the environment.

Pre-Job Safety Analysis: The BSEE Panel recommends that all tasks included in an operation be evaluated for risks. Evaluations should include how planned tasks relate to each other.

On The Job Training (OJT): Although an effective means for training, the BSEE Panel recommends that OJT programs be reviewed. Consideration should be made to formalize OJT programs to provide continuity between those conducting the training.

Short Service Employees (SSE): Most SSE supervision programs focus on personnel new to work offshore. The BSEE Panel recommends that management controls of SSE programs be evaluated and personnel new to a position should also be specifically addressed in these programs.

Finger Board Spotter: The BSEE Panel recommends that operations which use a spotter to verify the position of finger board latches review where that task is performed. Consideration should be made to the positioning of the spotter and their proximity to the moving pipe stands. No tasks should be assigned to the spotter that places them in setback areas during pipe handling operations.