

INCIDENT INVESTIGATION REPORT

Incident Name: Milne Point Drilling Fatality from Head Strike

Date and Time of Incident: December 7, 2018

Location: Milne Point Field, Alaska, E Pad, Well 35

Date of Report: December 19, 2018

Classification: Injury - Fatal

Executive Summary:

On December 7, 2018, at 03:40 AM a Drilling Rig Floorhand passed away at the Milne Point Medical Clinic as a result of injuries sustained from a blow to the head during an industrial accident. At approximately 02:28 AM the deceased worker (Injured Person – IP) was struck on the left side of his head by a joint of drill pipe that was 5” diameter X 31’ in length, weighing approximately 700 lbs. A root cause incident investigation was conducted. The investigation revealed that the hydraulic elevators were opened, causing the joint of pipe to be released. The affected crew called for the facility emergency response team while rendering first aid care, followed by CPR. Trained medical responders were on the scene within three minutes and a qualified Nurse Practitioner (NP) stationed at Milne Point arrived at the scene and rendered care within nine minutes of the incident. After having transported the IP to the Milne Point Clinic, resuscitation efforts continued for a total of 72 minutes. The IP was pronounced deceased at 03:40 AM by the NP who was in consultation with the Medical Director for Beacon Occupational Health and Safety Services. Required notifications to law enforcement authorities and regulatory agencies were made beginning at 04:12 AM. The accident scene was immediately secured pending release of scene by law enforcement authorities.

Description of the Incident:

On the morning of December 7, 2018 an eleven person contract drilling crew was pulling pipe out of well and placing it in the pipe shed utilizing an alternating current (AC) drilling rig. The work crew in the immediate area (Affected Crew) consisted of:

- A Driller operating the driller’s controls and a Motorman being mentored by the Driller in the drill rig doghouse
- Three Drilling Rig Floorhands (1,2,3) who performed tasks on the drill rig floor
 - Floorhand – 1 (Off Driller’s Side)(ODS)
 - Floorhand – 2 (Driller’s Side)(DS)
 - Floorhand – 3 (IP)(Center)
- A Derrickhand and a Roustabout working in the pipe shed

The work crew began their work shift at midnight on December 7, 2018. The crew completed their pre-tour coordination and safety meeting at approximately 00:15 AM and began normal drill rig activities of removing the drill string from well and placing single joints of drill pipe into the pipe shed. Normal drill rig activities continued for approximately two hours without any anomalies or incidents.

Immediately before the time of the incident the IP was standing on the DS of the rotary table towards the drawworks. Floorhand 1 was on the ODS of the rotary table, further towards the drawworks than the IP, but still on the rotary table. Floorhand 2 was on the DS towards the V-Door, between the rotary table and the pipe rack. The Motorman was in the Doghouse behind the Driller observing the Driller to learn driller's duties. As the Driller continued to pull drill pipe out of the well, he was verbally describing his actions to the Motorman. The Driller maintained console control, viewing the rig floor and Floorhands through the doghouse window while operating the drilling console. While the Driller continued lowering the joint of drill pipe onto the catwalk (which is in the V-Door) and describing his actions to the Motorman, the IP was walking around the rotary table while spray painting the box end of the drill pipe (the stump) in order to identify it as bad. While the IP was moving around the stump in the rotary table, the Driller actuated the 2-stage opening mechanism, causing the elevators to open. The Driller tried to stop the opening of the elevators by engaging the "close" button on the driller's joystick, while also yelling over the intercom to alert the crew. Floorhands 1 and 2 heard the yell and reacted to the Driller's warning. The IP did not appear to respond to the warning, and was struck by the drill pipe which fell approximately 28'.

Factors of Consideration:

The following conditions existed at the time of the incident:

- The contract drilling company had been operating the AC drilling rig since December 15, 2016, when the rig started drilling operations on the North Slope.
- The crew had drilling rig experience ranging from one to forty years.
- Affected crew personnel had 18 hours off duty prior to the start of the shift on 12/7/18.
- Affected crew personnel were trained in their primary duties.

Contributing Factors to Incident:

Contributing factors and root causes titles from Comprehensive List of Causes

1. **Distracted by Other Concerns 4-2:** Driller was mentoring Motorman while operating the drilling rig. His attention was split between the routine task of operating the control console as part of normal operations, and mentoring.
2. **Routine Activity without Thought 4-8:** Driller was operating hydraulic elevators while also mentoring the Motorman on the driller console. Driller's attention was not fully on the task of simultaneously operating the hydraulic elevators and top drive controls. Driller did not recall functioning the 2-stage opening mechanism of the hydraulic elevators.
3. **Improper position or posture for task 1-5:** IP was performing a task under a secured overhead load.

4. **Engineering/Design Other 10-9(improve upon current design):** Hydraulic elevators were able to be opened with no elevation restriction. Drill rig elevators are typically designed to allow the Driller to open elevators at any height for contingent operational reasons. The opening function of the elevators was designed with a 2-stage opening mechanism to prevent the Driller from inadvertently opening the elevators.

Root Causes of Incident:

1. **Extreme Concentration or perception demands 4-8:** Driller was performing two tasks at the same time (operating & mentoring).
2. **Inadequate Implementation of Work Rules, Policies, Standards, Procedures due to Contradictory Requirements 14-3:** Safe work practices were in place to limit worker exposure to overhead loads. However, while performing drill rig activities workers are exposed to secured overhead loads while the top drive is in motion and drill pipe is being moved with elevators. In this instance, IP was performing a task on the drill rig floor (i.e., spray painting bad pipe) while under a secured overhead load.

Corrective Actions of the Incident:

1. CA1: When training or mentoring on the drillers console, give verbal communications to the crew about training or mentoring and operate drill rig at reduced speed. Toolpusher must authorize mentoring or training activities, each time. – Toolpusher, Start implementation at re-start
2. CA2: Reaffirm to drillers and rest of crew that when distractions are introduced to the doghouse, Driller is empowered to stop all rig floor activities until the distraction is removed/resolved – Toolpusher, Start implementation at re-start
3. CA3: Prior to re-start, Initiate and implement hazard hunt process prior to re-starting rig operations – Toolpusher
4. CA4: Prior to re-start, conduct Pre-Start up & incident review safety meeting with rig crew – Toolpusher
5. CA5: Prior to re-start, the Company Man and Toolpusher will reinforce with crew members the long-standing message to restrict work under a suspended load. The Company Man and Toolpusher will develop a list of activities that will not be permitted while the top drive is in motion (e.g., spray painting the box end of the drill pipe (the stump) when it is in the rotary table and while the driller is manipulating drill pipe above the rotary table), maintain an updated list, and add it to JSA's as applicable.
6. CA6: Prior to re-start, discuss with Ariss Controls and Technology establishing engineering controls to ensure hydraulic elevators cannot be opened outside of the safe zone. Options include setting PLC operational limits for the hydraulic elevators. Establish safe zones with height restrictions where hydraulic elevators are able to open in conjunction with the current 2-stage opening mechanism. An override function, operated by the driller, would enable hydraulic elevators to open outside the programmed limits when required for non-routine operations.

This override would reset automatically. The new process will go through the Hazards Analysis Process before implementation. – Rig Foreman

7. CA7: Hilcorp Drilling and Kuukpik Drilling will visually inspect and conduct a function test of the elevators prior to resuming operations, and will document the inspection and testing with video and a report.