UNITED STATES DEPARTMENT OF THE INTERIOR
BUREAU OF SAFETY AND ENVIRONMENTAL ENFORCEMENT
GULF OF MEXICO REGION

ACCIDENT INVESTIGATION REPORT

1. OCCURRED
   DATE: **31-MAY-2023** TIME: **0900** HOURS
2. OPERATOR: **Hess Corporation**
   REPRESENTATIVE:
   TELEPHONE:
   CONTRACTOR: **Southey Contracting - Offshore**
   REPRESENTATIVE:
   TELEPHONE:

- [ ] STRUCTURAL DAMAGE
- [ ] CRANE
- [x] OTHER LIFTING **Rope access**
- [ ] DAMAGED/DISABLED SAFETY SYS.
- [ ] INCIDENT >$25K
- [ ] H2S/15MIN./20PPM
- [ ] REQUIRED MUSTER
- [ ] SHUTDOWN FROM GAS RELEASE
- [ ] OTHER

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

4. LEASE: **G26313**
   AREA: **GC** LATITUDE:
   BLOCK: **468** LONGITUDE:

5. PLATFORM: **A (Stampede)**
   RIG NAME:

6. ACTIVITY:
   - [ ] EXPLORATION(POE)
   - [x] DEVELOPMENT/PRODUCTION (DOCD/POD)

7. TYPE:
   INJURIES:
   - [ ] HISTORIC INJURY

	OPERATOR	CONTRACTOR
[x] REQUIRED EVACUATION	0	1
[ ] LTA (1-3 days)		
[x] LTA (>3 days)	0	1
[ ] RW/JT (1-3 days)		
[ ] RW/JT (>3 days)		
[ ] FATALITY		
[ ] Other Injury		

- [ ] POLLUTION
- [ ] FIRE
- [ ] EXPLOSION

LWC
- [ ] HISTORIC BLOWOUT
- [ ] UNDERGROUND
- [ ] SURFACE
- [ ] DEVERTER
- [ ] SURFACE EQUIPMENT FAILURE OR PROCEDURES

COLLISION [ ] HISTORIC [ ] >$25K [ ] <=$25K

8. OPERATION:
   - [x] PRODUCTION
   - [ ] DRILLING
   - [ ] WORKOVER
   - [ ] COMPLETION
   - [ ] HELICOPTER
   - [ ] MOTOR VESSEL
   - [ ] PIPELINE SEGMENT NO.
   - [ ] DECOMMISSIONING
     - [ ] PA [ ] PIPELINE [ ] SITE CLEARANCE
     - [ ] TA [ ] PLATFORM
   - [ ] OTHER

9. CAUSE:
   - [ ] EQUIPMENT FAILURE
   - [x] HUMAN ERROR
   - [ ] EXTERNAL DAMAGE
   - [x] SLIP/TRIP/FALL
   - [ ] WEATHER RELATED
   - [ ] LEAK
   - [ ] UPSET H2O TREATING
   - [ ] OVERBOARD DRILLING FLUID
   - [ ] OTHER _____

10. WATER DEPTH: **3360** FT.
11. DISTANCE FROM SHORE: **109** 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:

Incident Summary:
On May 31, 2023, Hess Corporation (Hess) notified the Bureau of Safety and Environmental Enforcement (BSEE) that an injured person (IP) had been evacuated from their tension leg platform (TLP) "Stampede" located within Block 468 (Lease OCS-G26313) of the Green Canyon area. While inspecting the Seawater Reject Caisson (SWRC), a Rope Access Technician (RAT) experienced an uncontrolled descent of 90' before his fall was arrested approximately 8' from the waterline. During the fall, the IP's left leg struck a SWRC support clamp resulting in injuries to his lower left leg. Rope Access (RA) teams worked together to rescue the IP by lifting him back onboard the platform. The IP was evacuated from the facility and flown by helicopter to a hospital onshore. The IP was flown back to his home in South Africa thereafter for further treatment.

At Stampede on November 28, 2022, facility personnel found the 30" SWRC overboard piping leaking chemically treated seawater from perforations caused by internal corrosion. The perforations were located on a 6" section above the horizontal shear plate (shear plate) and below the flange where the SWRC's carbon steel piping ties into Glass Reinforced Plastic (GRP) piping from the topsides of the facility. By design, the entire weight of the SWRC is supported by the shear plate, the only fixed axial connection welded to the TLP's NE Hull at the Top of the Column (ToC). Below the shear plate, six SWRC support clamps anchor the SWRC along the NE Hull Column, however the SWRC support clamps were designed to provide lateral restraint. The total length of the SWRC spans parallel to the NE Hull, approximately 188' downward to its overboard discharge point below the waterline. Due to the perforations and heaviest area of corrosion being located at the shear plate, Hess determined that an assessment of the condition of the SWRC was required. Multiple components of production-related equipment rely on the SWRC to perform their designated function and it is an essential element of the Stampede facility. Cessation of operations would be required without service of the SWRC.
On the morning of May 31, 2023, at 7:00, the Marine Structure Integrity Program Lead (MSIP Lead) called Stampede to speak with the Non-Destructive Testing (NDT) RAT Supervisor from Southey Offshore Contracting (Southey). The MSIP Lead informed the RAT Supervisor (Southey Supervisor) the job scope changed from inspection of fixed lifting equipment to additional inspection of the SWRC. The Southey Supervisor communicated challenges encountered during previous SWRC inspections and the MSIP Lead ascertained that NDT meters used by Southey were unsuitable. As a result, the MSIP Lead decided to have Southey gather physical measurements of the SWRC clamps instead of further Ultrasonic Thickness Measurement (UTM).
The Southey NDT RA team consisted of three Level 1 RAT's (RAT #1, RAT #2, RAT #3) and one Level 3 RAT- the Southey Supervisor. RAT's #1 and #2 donned waterproof coveralls, harnesses, Personal Flotation Devices (PFD's), and attempted to waterproof their boots by completely wrapping them in duct tape to prepare for the SWRC inspection. Southey only had two sets of ropes and a third was not available for emergency rescue.
At the NE ToC, the Southey Supervisor installed a "releasable anchor system" for both pairs of ropes for RAT #1 and RAT #2, which would allow workers to be lowered in case of an accident. I'D descender devices were installed at both working rope anchor points and Shunt backup devices were installed at both safety rope anchor points.
The Southey Supervisor then notified RAT's #1 and #2 that preparations were complete at the anchor points and gave verbal approval for RA work to begin. However, the Southey Supervisor failed to install the releasable anchor system per the manufacturers' recommendations: he did not thread the rope correctly through the anchor point I'D on RAT #2's working rope, he did not pass the excess working rope from either of the anchor ID's through directional carabiners to ensure function of the anti-error catch and did not tie-off all of the anchor devices to prevent accidental lowering of RAT's. The Southey Supervisor then walked away from the work site and left three Level 1 RAT's unsupervised.
RAT's #1 and #2 did not conduct independent assessments of the anchor point

installations prepared by their Southey Supervisor. Neither function testing nor buddy checks were completed on each other's personal RA kits. Their personal RA kit devices consisted of an I'D connected from their harnesses to their working rope and a Shunt as a personal backup device connected from their harness to their safety rope. RAT #1 was first to load onto his ropes and he descended approximately 6' down before having to stop and wait when he found out that RAT #2 had forgotten a radio. After RAT #3 retrieved the radio upstairs and brought it to RAT #2, RAT #3 then reported to his designated location at a vantage point across from the NE Hull at the NW Hull ToC where he maintained constant visual contact on RAT's #1 and #2. After attaching his personal RA kit devices from his harness to his set of ropes, RAT #2 crossed over the handrail and positioned himself in a seated position on the shear plate ledge at the ToC near the SWRC. RAT #2 began adjusting the rope protector (rope pro) around his working and safety ropes, but did not fully tighten the rope pro and did not remove the slack from his ropes in order to properly load onto them.

At 9:00, RAT #2 scooted off of the ledge and immediately began to free fall as his working rope slipped through the improperly threaded I'D at the anchor point. RAT #2 maintained grip on the unsecured rope pro above his Shunt which mechanically bypassed and defeated the Shunt continually as it slid down his safety rope. RAT #2 had fallen approximately 60' when his left leg struck the third SWRC support clamp, which lacerated his shin, tore a ligament in his calf, damaged the collateral ligament in his knee, and completely tore his posterior cruciate ligament. RAT #2 (now the IP) continued to fall and the stopper knot at the very end of the IP's working rope above him approached the anchor point I'D. The working rope whipped over a cable tray underneath the anchor point and shifted the angle of the rope feed direction through the I'D giving the anti-error catch safety feature an opportunity to function. As the teeth in the anti-error catch bit down within approximately one meter of the stopper knot at the top end of the working rope, the rope stretched and recoiled. The IP fell a total distance of 90' before his fall was arrested 8' above the water with him in his harness attached to the I'D of his working rope. The sudden jolt of the fall arrest took his breath away and put him in a daze.

RAT #3 witnessed the IP's uncontrolled descent and called the Southey Supervisor over the radio to inform him of the incident. However, the Southey Supervisor did not immediately report the incident to Hess personnel in order to initiate rescue assistance and preparation of a Fast Response Craft to lower the IP down to. RAT #1 responded by quickly descending to the fourth SWRC support clamp where he tied- off and secured himself. He began to call down to the IP to calm him and attempted to assess the extent of his injuries.

Another RA team working at Stampede, witnessed the incident from their work site near RAT #3 at the NW Hull ToC. At 9:05, the Southey Supervisor requested their assistance and they quickly grabbed their RA equipment and made their way across the lower catwalk to the NE Hull ToC. Upon arrival, the other RA crew, comprised of two Level 3 RAT's, one Level 2 RAT, and one Level 1 RAT, readily identified that the rescue system installed by the Southey Supervisor would not haul the IP close enough to the handrail to be rescued. One of the other RAT's then quickly installed another set of ropes in order to redirect the IP's retrieval path. Once the IP was calm, RAT #1 threw his safety rope down to the IP. The IP connected his ascender device from his harness onto RAT #1's safety rope and climbed approximately 8' to the fourth SWRC support clamp where he joined RAT #1. After sitting on the support clamp and having a rest, the IP secured himself onto RAT #1's working rope and RAT #1 radioed the Southey Supervisor over the radio that the IP was ready to be hauled up on RAT #1's original pair of ropes.

As other RA team began work on the IP's retrieval, the Southey Supervisor shifted his focus to correcting the IP's original set of ropes in order for RAT #1 to utilize them for self-rescue. The Southey Supervisor pulled the IP's original working rope up from out of the water and correctly threaded it through the I'D at the anchor point. After the ropes were corrected, the Southey Supervisor radioed RAT #1 to report that the ropes were safe and that he could begin climbing back onboard the platform.

At 9:25, the four other RAT's successfully hauled the IP back onboard. After the rescue was complete, the Southey Supervisor contacted Hess personnel to initiate medical attention and transport of the IP to the Sick Bay in preparation for evacuation. The Medic and Hess personnel arrived and transported the IP in a rescue chair upstairs from the NE Hull ToC at 9:49. The IP received first aid treatment from the onboard Medic and departed Stampede via helicopter at 11:35. A Safety Standdown of all RA work was called and the area of the incident surrounding the SWRC was barricaded.

BSEE Investigation:

At 15:19, on May 31, 2023, the BSEE Houma District received an initial email notification from Hess that an IP had been evacuated from Stampede following an injury. Hess reported that at 9:00 am, the IP was inspecting an overboard water caisson and as he began descent on his ropes, the main line slipped and the backup line and device failed to stop his fall, allowing him to drop approximately 90' and stopping approximately 8' from the waterline. During the fall, the IP struck a pipe clamp support that resulted in a 3 cm x 5cm (1"x 2") laceration to the shin and an overwater watchman who witnessed the fall radioed to enact the rescue plan. Hess' report mentioned that rescue gear was set up prior to starting work and two teams of abseilers worked to recover the IP. Hess' notification included that the onsite Medic initiated treatment and the IP was taken to the Sickbay as a MedEvac was called to transport the IP to shore. They concluded the report by mentioning that the scene and all associated work equipment were secured pending investigation. As a result of this notification from Hess, BSEE did not issue a preservation order.

On the morning of June 1, 2023, the BSEE Houma District AI began investigation of the uncontrolled descent incident that had taken place at Stampede. The BSEE AI requested Hess provide the following: witness statements, Job Safety Analysis (JSA) documents, personnel on board (POB) records, pictures of the RA gear and incident location, Southey NDT RA crew certifications and logbooks, and post-incident RA gear inspection results. BSEE also asked the following: was the I'D descender device loaded backwards, did the IP experience a free fall, how was the fall arrested, did the IP grab the Shunt backup device in a panic, were the IP's hands injured, and did the IP suffer suspension trauma.

Hess Regulatory Advisors arrived at Stampede on June 1, 2023, and began their internal investigation. Following the investigation, Hess reported to BSEE that during inspection of the IP's working rope, a notable compression was observed within a few feet of the stopper knot at the top end of the rope nearest the anchor point. This compression provided evidence that the anchor point I'D was loaded backwards and that the IP's fall was ultimately arrested by the anchor point I'D's anti-error catch safety feature. However, Hess reported to BSEE that they did not take pictures of the compression found on the IP's working rope. Hess provided BSEE with all pictures that were taken during their investigation. These pictures documented that only one safety device had been properly secured/tied-off by the Southey Supervisor per manufacturer recommendations at the anchor point- the Shunt on the IP's safety rope. Hess reported to BSEE that during their investigation, the rope pro was found near the water line at the end of the IP's safety rope. The location of the rope pro provided further evidence that the IP overrode his Shunt by pulling his unsecured rope pro down over it. Hess' investigation determined that by maintaining his grip on the rope pro, the IP changed the angle of the Shunt's rope grab mechanism and prevented the Shunt from performing its designed function. As a result, the IP's fall, which would have been arrested within only a few feet had the IP released his grip, became a potentially fatal uncontrolled descent of 90'.

Hess reported that the Southey Supervisor had to correct the original orientation of the IP's set of ropes in order to provide a means for RAT #1 to self -rescue. The

Southey Supervisor informed Hess that following the incident, he pulled the IP's working rope up out of the water and properly threaded the working rope through the anchor point I'D in order for RAT #1 to utilize the IP's original set of ropes to climb back on board. Hess informed BSEE that during their post-incident investigation, they asked the Southey and other RA contract crews to assist in inspecting the RA equipment in use at the time of the incident. During RA equipment inspection, the functionality of the anti-error catch safety feature was discussed. RA equipment in use at the time of the incident was altered from its original state in an attempt to determine the contributing causes of the incident. Devices were removed from the ropes and demonstrations of device functionality was performed.

Hess told BSEE that following their investigation, Southey insisted on disassembling and packing up their RA equipment for shipment back to South Africa for 3rd party testing. Hess reported that within three days of the incident, all witnesses and equipment were transported away from the Stampede facility. Hess' initial report stating "the scene of the incident including all associated work equipment was reported to have been secured" was inaccurate. BSEE gave no permission for the RA equipment to be removed from the facility. Consequently, BSEE did not have an opportunity to capture an independent, firsthand depiction of the incident details, and it became clear the investigation would greatly rely on Subject Matter Experts and witness testimony.

Hess submitted all requested documentation to BSEE including JSA's, SWRC NDT Inspection Reports, and company contact information for Southey and other contract companies. As a result, BSEE was able to conduct interviews with the other contract crews. During review of the JSA from the date of the incident, BSEE noted that Southey's fall rescue plan did not include installation of a third set of ropes to be available in the event of an emergency. Additionally, the rescue plan depicted that in an emergency situation, the Southey Supervisor would be the only person available to haul up an IP back onboard. Hess' initial report to BSEE mentioned that rescue gear was set up prior to starting work, however, that information was inaccurate. According to RA equipment inventory documentation provided to BSEE, a third set of rescue gear was unavailable.

Hess leadership facilitated meetings between BSEE and Hess personnel present at Stampede on the date of the incident. These interviews included review of the Closed-Circuit Television (CCTV) footage captured on the date of the incident by video cameras located at various points throughout the Stampede facility. Unfortunately, after review of the footage, BSEE was able to verify that no direct camera angles were fixed on the SWRC inspection work at the time of the incident. Hess provided BSEE with a copy of the CCTV video footage.

Representatives from the manufacturer of the safety devices in use at the time of the incident, served as SME's throughout BSEE's investigation and provided clarification on technical notices and manufacturer recommendations. The BSEE AI was granted international call access on September 12, 2023 and was able to conduct interviews with Southey (in South Africa), MSIP Lead's company (United Kingdom-UK), 3rd Party NDT RA from the UK (UK), and SME's from IRATA (UK) on October 3, 2023. BSEE visited a RA Training Facility and met with SPRAT and IRATA certified RA Instructors who demonstrated the proper installation of the exact RA equipment installed at Stampede at the time of the incident: "releasable anchor system", how I'D's should be locked off and secured at the anchor point to prevent accidental lowering of RAT's, and threading of rope through an I'D descender device. The functionality of the anti-error catch safety feature was illustrated when excess rope was run through a directional carabiner. BSEE took pictures and video of re-enactment of bypassing and defeating the Shunts by grabbing the body of the Shunt and the rope above it and the proper installation of a rope protector.

Hess reported to BSEE that Southey was certified through the Industrial Rope Access Trade Association (IRATA) and that the other contract RA company was certified through the Society of Professional Rope Access Technicians (SPRAT). Interviews with SME's from both organizations determined the organizations are very similar. During BSEE's interview with IRATA leadership in the UK, BSEE was able to verify the validity of the Southey RA Team certifications provided by Hess and found that all of them were certified by IRATA.

SWRC Inspection Timeline:

Four months prior to the incident at Stampede, Southey began its first work in the US at another Hess facility in the Gulf of Mexico. Southey was subcontracted by a Hess 3rd party contract company to perform NDT via RA. During this first hitch, Southey personnel were questioned regarding their use of a Shunt, a type of rope grab, as a backup device. Southey was informed by a MSIP Inspection Team member from a different company that use of a Shunt as a backup device was not allowed in the United States. Despite perceiving an unsafe condition, Stop Work Authority (SWA) was not exercised and no report was made to Hess leadership. The Southey crew then contacted their Project Manager/Technical Authority (Southey PM/TA) in South Africa to report that their use of a Shunt had come into question. The Southey PM/TA directed the crew to continue use of Shunts citing interpretation of statements from the manufacturer on use of the Shunt.

Southey's NDT RAT's were first mobilized to Hess' Stampede facility from February 20, 2023 to March 10, 2023 where they began work on Fixed Lifting Equipment Inspections. On April 7, 2023, Southey was mobilized back to Stampede to continue Fixed Lifting Equipment Inspections, but on April 14, 2023, the MSIP Lead redirected Southey's efforts toward inspection of the heavily corroded SWRC.

Between April 7, 2023 and May 1, 2023, Southey completed three days of NDT on the SWRC to acquire UTM. Southey concluded that their readings were erroneous and unreliable as a result of excessive SWRC vibration. Pictures and video taken during CVI captured images of the wet work conditions created by the SWRC discharge leak continuously cascading water 90' below to the waterline. The Southey NDT RA crew made an effort to stay dry by donning waterproof, hooded coveralls and attempting to seal them off by taping their pant legs around their leather boots. The Southey RAT's reported they experienced burning sensations in their eyes, nose, and mouth and suffered discomfort.

On May 1, 2023, 3rd party NDT RA contract company from the UK (UK), returned to Stampede. Prior to beginning inspection of the SWRC, UK reduced and redirected flow from the leaking SWRC in an effort to mitigate hazards associated with working in wet conditions caused by the leaking SWRC. UK wrapped tarps around the leak and secured them with slings and ratchet straps. The UK Level 3 RAT Supervisor (UK Supervisor) said that Hess provided them with the materials necessary to wrap the leak. The UK Supervisor reported that on May 11, 2023, his RAT's identified three new holes below the shear plate of the SWRC that were not previously present. The UK Supervisor determined that the leaks put his team in the immediate line of fire and called SWA. Hess did not document SWA or communicate the associated hazards to Southey prior to the succeeding SWRC inspection on May 31, 2023.

Southey's findings were mirrored in the UK final inspection report which concluded that high velocity passing through the SWRC disturbed the analysis of results as interference of noise and vibration. UK recommended isolation and removal of the SWRC from service to provide unobstructed results and findings.

On May 26, 2023, Southey traveled back to Stampede and returned to work on Fixed Lifting Equipment Inspections. However, on the morning of May 31, 2023, despite the Southey Supervisor expressing frustration with the challenges associated with SWRC inspection, the MSIP Lead made the decision to shift the work scope back to further inspection of the SWRC. Although Hess provided material to wrap the

leaking SWRC perforations during SWRC inspections on May 3 and May 11, a lack of continuity of communication between the TIP and MSIP Inspection Teams led to Southey unnecessarily facing repeating work in wet conditions during the succeeding inspection. On May 31, 2023, the date of the uncontrolled descent, no attempt was made to wrap the SWRC and mitigate the wet work conditions for Southey.

On June 12, 2023, a re-enactment of the Stampede RA incident was filmed at a RA Training facility in South Africa (SA). Video of the re-enactment highlighted nine different "Drop Test" scenarios recreated with the aim of determining the root cause of the incident. Findings concluded the following: that the rope was threaded through the I'D descender device improperly, the safety catch within the I'D was bypassed when the excess rope was laid to the front of the device as opposed to below or behind it, the I'D was not secured/tied-off per manufacturer recommendations, and the IP bypassed his personal backup Shunt device by grabbing and maintaining grip on his rope protector above the backup device. The Southey TA reported to BSEE that during Drop Testing at SA on June 12, 2023, the Southey Supervisor admitted he had threaded the rope through the I'D incorrectly. The Southey Supervisor provided a similar statement to BSEE during an interview on October 17, 2023.
From July 17, 2023 to July 21, 2023, the MSIP Lead subcontracted a 3rd Party NDT RA crew from an International Inspection Team (IT) to conduct the final NDT inspection of the SWRC at Hess' Stampede. During the inspection, the camera was exposed to the water leaking from the SWRC and it was damaged. The SIL requested a tarp from Hess and they initially tried directing the water off away from themselves, but their success was limited due to the volume of water being "way too much" and the water eventually came back across the work site. The SIL reported that no pictures of the tarp were taken due to the camera being damaged. Due to the wet conditions, the SIL decided to have a third safety rope attached to the IT so that at any point, they could be pulled free of the area and retrieved to safety should they need to be. The IT used ASAP Lock devices as their personal backup devices and had backup devices attached to the 3rd rope in the event they needed to make a changeover on their ropes. The IT completed inspection of the SWRC on July 19, 2023 and July 20, 2023 and the SIL stated that due to the fact that the water was a continuous hinderance to the technicians, he called off the inspection halfway through the second day. The Inspection Report states that the SIL prevented the team from inspecting between the fourth SWRC support clamp and the waterline due to safety concerns. The report concluded that the SWRC support clamps should be tensioned as soon as possible to prevent the SWRC from becoming a dropped object and reported the entire SWRC needs to be replaced.
On August 3, 2023, a 3rd Party Inspection was completed on the RA equipment utilized during the Stampede incident at SA. During the inspection, not all mechanical parts were found to function correctly. Excessive wear and tear, corrosion, and pitting in the metal parts was noted. However, it was stated that the assessed wear and damage seemed to directly result from the shock load applied to the equipment when the IP's fall was arrested. The findings in the final inspection report expressed no indication or reason to believe that the equipment was damaged prior to the incident or would not have functioned as per expectation. It was therefore concluded that the malfunction of equipment was unlikely to have been the root cause of the failure of the safety devices which resulted in the IP's uncontrolled descent.

On October 27, 2023, Hess provided BSEE with their Final SWRC Inspection Report. Ultimately, the report concluded that internal corrosion was significant and widespread throughout and that the entire SWRC needed to be replaced. The SWRC's wall thickness at the shear plate was reported as being very close to the limit required to resist axial loads and stresses would exceed allowable levels eventually resulting in failure. As of July 25, 2023, reports estimated that complete detachment of the SWRC from the ToC shear plate connection was likely to occur at some point with the next eight to eleven months. .

BSEE Findings from Southey Drop Testing:
Southey's Drop Test Report provides evidence that supports the necessity of installing directional carabiners per the manufacturer recommendations. Southey reported, "If the excess rope is laid in front of the descender…,the safety catch has a high likelihood to not activate, due to it being bypassed by the feeding rope passing through." Pictures and video provided by Southey exhibit that directional carabiners were not installed at either Stampede or during Drop Testing. The Technical Notice on the I'D from the manufacturer states: "WARNING: the anti-error catch will not work unless the rope passes through a directional carabiner on the anchor." BSEE's investigation of the manufacturers' I'D led to agreement with Southey's conclusion that "the excess rope coming out of the I'D at the anchor point should have been secured by a knot reducing the impact of the fall". the manufacturer states, "One simply puts the handle in the "work positioning" position and completes the setup by tying-off the device." As with all ropes in use during work at height operations, a knot should be tied at the end of the rope to prevent someone from descending off or being lowered off the end of a rope. For the specific use of making a releasable anchor with the I'D, it is imperative that the device is also tied off to prevent accidental lowering of the on-rope worker.

Southey's Use of the Shunt:
The Southey PM/TA stated that he directed the Southey crew to continue use of Shunts as personal back-up devices based on a letter from the manufacturer from June of 2009 that stated, "Professional operatives who choose to use the Shunt as a rope access and work positioning backup device must have received and mastered IRATA training or similar, and must use the Shunt with IRATA method. The Southey SHEQ and PM/TA reported that: "The letter from the manufacturer is a recommendation and not a directive, therefore the responsibility lies on the user to ascertain the level of risk. Further to this, the recommendation letter states, "The manufacturer recommends NOT to use the their Shunt as a back-up device in rope access whilst towed by a cord." Despite Southey's rationale for continued use of the Shunt, a manufacturer letter dated January 10, 2012, insisted the following: "In an emergency situation the natural human reflex is to increase the grip on the cord and therefore reduce the likelihood of the cord to be pulled from the hand, additionally this natural reflex may override any conscious action to open the hand and release the cord, and consequently, either of these hazards could result in overriding the braking function of the Shunt." In IRATA Safety Bulletin SB21.2 it acknowledged that during testing at the manfuacturers'headquarters, even when an experienced RAT expected the fall during testing of the ability to release the tow chord, 25 % failed to do so.

Southey's Final Investigation Report/Corrective Actions:
Southey's Final Investigation Report mirrored the same causes identified during Drop Testing. Causes included the IP's deviation from standard practice when failing to complete function testing of his equipment prior to the job, the Southey Supervisor threading the I'D incorrectly, the IP pulling down his rope pro over the Shunt and defeating it, and failure to tie off the I'D at the anchor point. Southey provided the following corrective actions moving forward: Removal of all Shunts as backup devices and replaced with another type, refresher training with RAT's Safety and Supervisory and Advanced Rescue Training implementation, review of Stop Work Procedures, procedures for changes of scope of work to mandate an assessment of equipment requirements, the addition of standard suitable and dedicated rescue kits, requisites for Supervisor's to maintain direct line of site with RAT's when operators move into position on their ropes, irrespective of level of competency or experience, and an Amendment of Southey Rope Access Procedure to include the inclusion of a suitable knot (e.g., alpine butterfly, attached to a sling and the structure to prevent potential slippage and/or failure of descending/retrieval device.

BSEE Findings from Southey's Final Investigation Report/Corrective Actions:
BSEE's investigation of the Shunt, namely the warnings provided by its very own manufacturer, have led BSEE to agree with Southey's decision to discontinue use of all Shunts. Upon review of Southey's Equipment Inspection Lists, it became evident, that Southey was not keeping accurate records of which specific RA equipment was assigned to each RAT. Post-incident, when equipment was shipped to the 3rd Party Inspection Facility, the inspection was incomplete, with no identification available on the rope pro, only one ID being inspected, and zero Shunts were inspected. There was no way to determine that the equipment included in the report was in fact that of the IP, no cross reference could be made from inspection documents prior to the incident. During interview of the Southey PM/TA, he stated that a pattern formed when inspecting the RA gear. Based on Southey's Corrective actions, they acknowledge that the rescue of the IP was poorly planned and that a risk assessment following changes to the work scope would have resulted in the requirement for a dedicated and suitable rescue kit. The incident that occurred at Stampede on May 31, 2023, was preventable and BSEE agrees that the Corrective Actions implemented by Southey in their post-incident are acceptable mitigations to prevent future reoccurrence.

Hess' Final Investigation Report/Corrective Actions:
Hess' final report listed three Causal Factors including: threading the I'D incorrectly at the anchor point which allowed the primary rope to feed out, the IP defeating his Shunt, and function tests not being completed. In Causal Factor #1, Hess reported that "Perceptual Confusion" resulted when six of the eight ropes were running in the same direction which created confusion between which rope was the load (RAT) and which rope was the slack side (excess rope). The work was similar to what was previously performed, required additional PPE, and was executed in wet conditions that created an adverse mental state. The Southey Supervisor exhibited a knowledge-based error as he thought the ID was error-proof, but the anti-error device only works if the slack end of the rope is run in the opposite direction as the load side. Causal Factor #2 lists reacting to the fall, the injured party grabbed at/above the shunt, which prevented the shunt from engaging. Contributing factors include improper technique leaving the platform along with the placement of shunt and rope protector, which put them in position to be easily grabbed. Hess noted in Causal Factor #3 leading up to the incident a procedural deviation occurred when double-checks and functional test were not completed by different members of the work group due to inadequate supervision. Hess identified other observations in their report which noted a stopper knot was not used directly behind the anchor point I'D. A closely located a stopper knot is a best practice that would have limited the fall distance to under 1-meter.

Post-incident, Hess' corrective actions included the development and implementation of a RA Checklist to make the permitting process more robust and communicate incident learnings globally. The checklist included putting checks in place to ensure the RA crew understood the work scope, if there were any reservations or concerns regarding the work scope, rights to exercise SWA, work scope changes allowing time for pre-job planning prior to the next job, ensuring buddy checks have been completed on equipment including inspection and function testing, rescue plan review, control room communication, and incident reporting expectations.

BSEE Conclusion:
The incident that occurred at Stampede on May 31, 2023, could have potentially resulted in a fatality. One of the factors that prevented the fatality is the IP's leg striking the SWRC support clamp which decreased the amount of kN that the IP's body experienced when the fall was arrested. BSEE agrees with all of the corrective actions provided by both Hess and Southey. BSEE does not support Hess' testing and reenactment of the actual RA equipment utilized during the Stampede RA incident during their investigation on June 1, 2023. The condition of the equipment could have been altered by making additional compressions on the ropes or weakened the equipment.

BSEE also does not support the removal of the RA equipment from the facility prior to BSEE having an opportunity to complete an Incident Follow-Up Inspection. The other RA Team also reported to BSEE that damage was noted in the IP's working rope near the stopper knot. Hess did not take pictures of the damage that they noted during the investigation.

BSEE also agrees with what both Hess and Southey provide as the causal factors in their Final Reports. An adequate fall rescue plan was not in place prior to beginning work on May 31, 2023. Had the other RA Team not have been present, prompt rescue would not have taken place as Southey did not have a third set of ropes available for rescue purposes. Despite Southey's policy and IRATA training requiring function testing and "buddy checks" of the RA equipment prior to beginning work, Southey did not comply. Southey was trained on both the use of an I'D and Shunt.However, Southey's training on both the I'D and Shunt were proven to be inadequate.Southey did not comply with the manufacturers' recommendations on the proper way to feed rope through the I'D or installation of a directional carabiner.

Neither Southey or Hess was aware of the manufacturers' requirement during post-incident Drop Testing and made statements that suggested they planned on discussing the rope feed angle with the manufacturer. Southey did not comply with the manufacturer recommendations for releasable anchor configurations which state the anchor point devices should be secured/locked- off with a knot to prevent accidental lowering.

The IP did not pull slack through his equipment prior to stepping over the side and "load" his ropes prior to removing his cows tail (3rd point of attachment) once over the side. The IP did not secure the rope protector properly. Had the rope pro been installed properly, the IP would not have been able to continually mechanically bypass his Shunt. The IP's hands would have been exposed to rope burn and would have let go of the rope above the Shunt resulting in the decrease in the distance of the IP's fall. Despite the IP's training on the IRATA method of use of the Shunt, he did not let go of his equipment as he fell.

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

Human Performance Error: Inadequate Knowledge of Equipment Operation: the safety catch within the I'D was bypassed when the excess rope was laid to the front of the device as opposed to below or behind it and it was not ran through a directional carabiner per manufacturer recommendations.

Personnel Training: Personnel not trained/poorly trained:
The Southey Supervisor failed to install the releasable anchor system per the manufacuters' recommendations: he did not thread the rope correctly through the anchor point I'D on RAT #2's working rope, he did not pass the excess working rope from either of the anchor ID's through directional carabiners to ensure function of the anti-error catch and did not tie-off all of the anchor devices to prevent accidental lowering of RAT's.
The Southey Supervisor then walked away from the work site and left three Level 1 RAT's unsupervised conflicting with IRATA training guidelines. RAT's #1 and #2 did not conduct independent assessments of the anchor point installations prepared by their Southey Supervisor and neither function testing nor buddy checks were completed on each other's personal RA kits. The IP did not comply with his training and mechanically bypassed his personal backup Shunt device by grabbing and maintaining grip on his rope protector above the backup device. The Southey Supervisor did not follow his training or manufacturer recommendations: The rope was threaded through the I'D descender device improperly, the I'D was not secured/tied-off to prevent accidental lowering of workers per manufacturer recommendations, the IP did not install the rope pro properly- had he done so, his fall would have been minimal as his back-up device would have functioned- he did not secure the rope pro tightly.

Despite his training on use of the Shunt, when RAT #2 began to free fall as his working rope slipped through the improperly threaded I'D at the anchor point, he maintained grip on the unsecured rope pro above his Shunt which mechanically bypassed and defeated the Shunt continually as it slid down his safety rope.

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

Work Environment: Other weather influences: Wet Work Conditions- Pictures and video taken during CVI captured images of the wet work conditions created by the SWRC discharge leak continuously cascading water 90' below to the waterline. The Southey NDT RA crew made an effort to stay dry by donning waterproof, hooded coveralls and attempting to seal them off by taping their pant legs around their leather boots. The Southey RAT's reported they experienced burning sensations in their eyes, nose, and mouth and suffered discomfort.

20. LIST THE ADDITIONAL INFORMATION:

21. PROPERTY DAMAGED:

2 ropes, 2 ID's(descenders), 2- Shunt backup devices, 1 harness, rope protector, wire slings, nylon work sling, pulleys, multiple anchor point connections including locking carabiners

NATURE OF DAMAGE:

Shockload Damage on the IP's rope system imposed by the uncontrolled descent and fall arrest

ESTIMATED AMOUNT (TOTAL): **$12,000**

22. RECOMMENDATIONS TO PREVENT RECURRANCE NARRATIVE:

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

24. SPECIFY VIOLATIONS DIRECTLY OR INDIRECTLY CONTRIBUTING. NARRATIVE:

25. DATE OF ONSITE INVESTIGATION:

28. ACCIDENT CLASSIFICATION:

29. ACCIDENT INVESTIGATION PANEL FORMED: **NO**

26. Investigation Team Members/Panel Members:
Brandon Dunigan- Author /

OCS REPORT:

27. OPERATOR REPORT ON FILE:

30. DISTRICT SUPERVISOR: **Amy Pellegrin**

APPROVED

DATE: **08-AUG-2024**