2016 MAJOR INCIDENTS

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This booklet has been developed to provide an overview of Major, Critical or High Potential incidents that occurred across TransCanada operations and projects in 2016. In order to promote continual improvement, it is important that we learn from incidents and near hits in order to prevent similar incidents from occurring. Collecting, communicating and sharing information related to our incidents will help create a culture that seeks to identify and control hazards, which will reduce risks and the potential for harm.

In 2016, 22 Major, Critical and High Potential events were reported using the Major/Critical/High Potential Incident Alert Form. Of these 22 incidents, 19 were directly related to TransCanada’s Life Saving Rules.

Please share the lessons learned identified throughout this booklet and continue to stress the importance of following TransCanada’s Life Saving Rules. These rules have been developed to protect us from high consequence hazards to ensure we go home safely at the end of every day.

“The wise learn from the experience of others, and the creative know how to make a crumb of experience go a long way.”

Eric Hoffer (1902–1983)
THE LIFE SAVING RULES

We will…

1. Drive safely and without distraction
2. Use the appropriate Personal Protective Equipment
3. Conduct a pre Job Safety Analysis (JSA)
4. Work with a valid work permit when required
5. Obtain authorization before entering a confined space
6. Verify isolation before work begins
7. Protect ourselves against a fall when working at heights
8. Follow prescribed lift plans and techniques
9. Control excavations and ground disturbances

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Incident:
Power Line Contact During Brushing Operations

Life Saving Rule Impacted:
We will conduct a pre Job Safety Analysis

Incident Summary:
Contact was made with a 14.4 KV overhead power line by a tree branch during mulching activity. The operator of the mulcher was completing his second pass of the right-of-way (RoW) and proceeding back towards the power line (westwards). A tree was mulched and fell towards the power line, contacting it and causing the line to sway. The operator noticed the line sway and stopped work.

Preliminary Causes:
Prior to work starting on site, a walk through was completed with all stakeholders and documented in FLRA and JSA. The plan was to mulch away from the power line so that the trees would fall in a suitable direction. This plan was not followed on the second pass.
**Actions Taken:**

- The mulcher operator immediately stopped and notified our inspector. The project team was notified, and the scene was frozen. The operator was sent for post incident testing. Site supervision contacted Fortis, the power line owner, who came to site. There was no concern from the representative; he measured the height of the line at 8.4m and advised there was no damage.

**The Life Saving Rules**

This incident is directly related to Life Saving Rule #3 ‘**We will conduct a pre Job Safety Analysis**’. In this situation, the JSA was completed but not followed throughout the course of the work.
Incident:
Ditch Wall Sloughs in and Contacts Line

Life Saving Rule Impacted:
We will control excavations and ground disturbances

Incident Summary:
A ditching crew was excavating when a ditch wall adjacent to a low pressure ¾” natural gas line sloughed in and made contact with the line, causing it to break and subsequently start to release Natural Gas. The excavator working in the immediate area was facing the opposite direction as it was digging away from the gas line at the time of the slough in. All equipment in the area was immediately shut down, and all personnel made their way to the closest muster points. All crew members working in the area were wearing FR coveralls, and a gas monitor was present at the time of the slough in. The ground conditions were very wet and poor as they had been excavating a drainage crossing.

Preliminary Causes:
Very wet soil conditions undermined the trench in this area.

Actions Taken:
The work area was shut down, and all spark producing equipment was shut off. All workers in this immediate area went to the emergency muster point for the work site. An investigation was completed, and it was determined that the sloping on the excavation of the gas line was inadequate. Had the wad been sloped to the depth of the line, the dirt would not have fallen directly on top of the line.
**The Life Saving Rules**

This incident is directly related to Life Saving Rule #9 ‘**We will control excavations and ground disturbances**’. In this situation, the sloping of the excavation was inadequate for the soil conditions.
Incident:
Vertical Steel Girt Fall

Life Saving Rule Impacted:
We will follow prescribed lift plans and techniques

Incident Summary:
A 6’ vertical girt fell from the SE corner of a building under construction. The incident occurred during the second shift, so employees were on break in the craft trailers and not in the immediate area at the time of the incident. The girt was connected using a single bolt. The specification requires two bolts when connecting, and the bolts must be snug tight, iron on iron. The vertical girts were attached to a horizontal girt on the ground to fly the steel into place. Ironworkers failed to snug the bolts once positioned, and an additional bolt was not used as required by specification. The girt fell onto the CTG foundation and created a 1’ diameter divot in the concrete.

Preliminary Causes:
The Prime Contractor did not follow the connection specification for number of bolts and tension of bolts prior to full detailing. The duration from connection to detailing was extended due to workforce availability and planning.

Actions Taken:
• Area was immediately secured. Workers removed remaining three vertical girts,
• Ironworkers performed a safety stand down to review the incident and corrective actions,
• Ironworkers installed and secured all connection bolts as per specification; and
• Connection areas were fully detailed with QA/QC review in all available areas.

The Life Saving Rules
This incident is directly related to Life Saving Rule #8 ‘We will follow prescribed lift plans and techniques’. In this situation, the prescribed technique/specification was not followed as the girt was not connected using two bolts as outlined in the specification.
Incident:  
Sling Load Detachment

Life Saving Rule Impacted:
We will follow prescribed lift plans and techniques

Incident Summary:
Facility work was being carried out at a remote meter station. While utilizing a helicopter to transport a longline load between sites, an uncommanded release from the cargo “belly” hook resulted in the disconnection of the longline and load from the helicopter. The load of structural components was lost in the muskeg below.

Preliminary Causes:
The preliminary investigation revealed that the primary cause of the loss of the longline and load from the helicopter was twisting of the manual release cable causing it to “self-release”.

Actions Taken:
After the uncommanded release, the pilot returned to base and an investigation was started. Post drug and alcohol testing was conducted with negative results being returned. All Bell 212 helicopters cargo hooks in the company’s fleet were inspected to determine if this was an isolated incident and not systematic within the fleet.

The manual release cable was found to be in an incorrect, looped (twisted) position, causing it to bind and to be in effect shortened due to its position (photo). This caused the cargo hook to release uncommanded while the hook
assembly swung, as it is designed, in an arcing motion. (Helicopter maintenance staff were able to replicate the uncommanded release during the investigation).

**The Life Saving Rules**

This incident is directly related to Life Saving Rule #8 *‘We will follow prescribed lift plans and techniques’*. In this situation, the inspection of the lifting equipment did not identify the potential for the manual release cable to bind and cause an unintended release.
Incident:
Worker Fall from Heights

Life Saving Rule Impacted:
We will protect ourselves against a fall when working at heights

Incident Summary:
A worker fell approximately 65’ while working from an Engineered Scaffold system, resulting in a fatality. The scaffold system was attached to the side of the tank’s top course and consisted of planking, cable rail system with top and mid rail and a tarp. The scaffold did not have toe board, and the tarp was only partially tied in to the scaffold railing system and not fully attached to the planking.

Preliminary Causes:
There were no witnesses, therefore it is difficult to determine the events that led to the fall. However, we learned:

- Fire Extinguisher Boxes had been used previously to provide greater reach for welding the roof lugs.
- Contractor had a tie-off policy in place when working on scaffolds in situations where the worker would elevate themselves.
- Worker was wearing a full body fall protection harness complete with lanyards
- Worker may have:
  - been standing on one of the Fire Extinguisher Boxes to extend reach
  - slipped on the box and in the process of losing his balance
- tripped over one of the following: overlapped planking, cords or cables laying across the scaffold planks, or the Fire Extinguisher Box

**Actions Taken:**

- Board and bracket scaffold system phase out and 100% tie off until the phase out is completed,
- Prime Contractor Company assembled a ‘Fall Protection Task Force’ to assess all fall protection procedures and policies,
- Scaffolding systems to be inspected and signed off by three independent qualified parties on a daily basis on all sites,
- A process was developed to ensure incident recommendations are managed to completion and reported to executive leadership for final review; and
- Reinforce ‘Zero Tolerance’ policy with regards to Fall Protection procedures.

**The Life Saving Rules**

This incident is directly related to Life Saving Rule #8 ‘We will protect ourselves against a fall when working at heights’, and #3 ‘We will conduct a pre Job Safety Analysis’. In this situation, a detailed pre Job Safety Analysis and associated Fall Protect plan may have prevented this tragic incident from occurring.
Incident:
Worker Struck by Pipe

Life Saving Rule Impacted:
We conduct a pre Job Safety Analysis

Incident Summary:
A welder’s helper was lying under a large bore pipe while buffing it. Because of the awkward work position, he reached up and removed a chock to use as a head rest. As a result of removing the pipe chock, the pipe began to roll. The welder, who was working with the helper, noticed the pipe rolling and yelled at the helper to get out of the way. The helper was unable to move away from the rolling pipe fast enough, and the pipe made contact with his leg, causing a serious injury.

Preliminary Causes:
The pipe was inadequately secured at both ends of the section.

Actions Taken:
First aid was provided on site and the worker was transported to medical facilities for assessment and treatment. A safety stand down was held immediately following the incident, and the importance of completing new JSAs and reassessing of new work scopes was discussed.
The Life Saving Rules

This incident is directly related to Life Saving Rule #3 ‘We will conduct a pre Job Safety Analysis’. In this situation, the scope of the work changed, and a new JSA was not completed to identify new hazards associated with the change in tasks.
Incident:
Water Truck Enters Ditch & Tips on its Side

Life Saving Rule Impacted:
We will drive safely and without distraction

Incident Summary:
A sub-contractor water truck was travelling northbound on a gravel road when a bee entered into the cab of the truck and startled the operator. The operator used their right hand to swat at the bee, which caused the operator’s left hand to inadvertently turn the wheel to the left, resulting in the truck veering into the shoulder, and eventually into the bar ditch. When the truck entered the ditch, it tipped over and came to rest on the vehicle driver’s side. No injuries were sustained to the operator. The cab and tank of the water truck were damaged, and approximately 5-7 liters of oil and hydraulic fluid contacted the ground.

Preliminary Causes:
Driver distraction resulting in loss of vehicle control.

Actions Taken:
- Project and Prime Contractor safety and supervision teams were notified of the event,
- The driver exited the vehicle on their own power and was examined by an on-site medic; and
- Water truck was recovered from the ditch, and the oil and hydraulic fluid was cleaned up according to protocol.
The Life Saving Rules

This incident is directly related to Life Saving Rule #1 ‘We will drive safely and without distraction’. In this situation, the driver was distracted by the bee entering the cab. As a result, the driver was not completely focused on the task of driving and ended up veering onto the shoulder, and eventually into the bar ditch.
Incident:
Facility Contact

Life Saving Rule Impacted:
We will control excavations and ground disturbances

Incident Summary:
While setting a pre-bent piece of pipe in the hole for the final tie in on a pipe modification project, it was determined that the ground level was still a little high in one area. The ground was too hard to dig with a shovel and was determined to be flow-able fill. An excavator was then utilized to get under the edge of the flow-able fill to get it out of the bottom of the ditch. When the material was lifted, a 6” fiberglass gas line that was under the material began to leak. The line was identified in the drawings and stakeout report but was not located and marked. There was a tracer wire installed with the fiberglass line; however, the wire was not brought above grade during installation that would allow locating of the line.

Preliminary Causes:
Flow-able fill in the bottom of the excavation prevented proper line up during tie in activities.

Actions Taken:
• Site personnel evacuated to muster point; and
• Safety stand down activated Operations shut down low pressure line.
The Life Saving Rules

This incident is directly related to Life Saving Rule #9 ‘We will control excavations and ground disturbances’. In this situation, the identification, location and marking of all underground facilities was not sufficiently completed to ensure all underground facilities were located and marked.
Incident:
Facility Contact

Life Saving Rule Impacted:
We will control excavation and ground disturbances

Incident Summary:
A Prime Contractor was installing a new air compressor building near an existing facility compressor station building. The project work involved tying into the compressor station building water condensate drain line. While cutting into the presumed drain line with a portable band saw, natural gas began releasing from the pipe after the saw blade cut into the pipe.

Preliminary Causes:
A facility drawing showed the 4” drain line located adjacent to the septic tank. In a separate facility drawing the 3” pressurized 650 psi. vent gas recovery pipe was shown in another location near the septic tank. The drain pipe and vent gas recovery pipe were found to be aligned in the same direction at different depths, and it was difficult to locate in the facility yard due to station yard interference. The vent gas recovery pipe was also not marked on the survey.

Actions Taken:
The vent gas recovery line was closed, evacuated and locked out. The project work was immediately stopped, and a safety stand down occurred with all project personnel.
The Life Saving Rules

This incident is directly related to Life Saving Rule #9 ‘We will control excavations and ground disturbances’. In this situation, the identification of the pipe was not sufficiently completed to ensure the water condensate drain line was correctly identified.
Incident:
Third Party Collision with Company Vehicle

Life Saving Rule Impacted:
We will drive safely and without distraction

Incident Summary:
A Contract Employee was proceeding to make a left hand turn through a controlled intersection after the traffic light had turned green and the intersection was deemed safe. While making the turn to clear the intersection, a third party motorcyclist struck the Company vehicle on the driver’s rear side back panel and doors. As a result of the incident, the vehicle was damaged (see photo) and the third party motorcyclist was injured.

Preliminary Causes:
- Driving at speeds above the posted legal speed limit by the third party motorcyclist;
- Inattention by the third party motorcyclist to yield the right-of-way (RoW) to the Company vehicle clearing the intersection; and
- Failing to slow down at the yellow light and then stop when the light was red by the third party motorcyclist.

Actions Taken:
- The leader of the Contract Employee was notified of the incident; and,
- The insurance agency was called and asked to mobilize to the incident scene to initiate the insurance process.
The Life Saving Rules

This incident is directly related to Life Saving Rule #1 ‘**We will drive safely and without distraction**’. In this situation, the third party motorcyclist was travelling at excessive speeds and failed to follow traffic laws. This incident illustrates the importance of increased vigilance behind the wheel as we always need to be aware of other drivers we share the roadways with.
Incident:  
**Personal Injury – Fall**

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**Life Saving Rule Impacted:**

**We will conduct a pre Job Safety Analysis**

**Incident Summary:**

A Contractor Employee was using pry bars to remove a compressor cap on a compressor cylinder and was unaware that a section of floor grating was removed behind their working area between the compressor cylinder and the control panel. When the worker stepped back, he fell approximately 4’ into the empty space. The worker landed on an I-beam on his back.

**Preliminary Causes:**

- Grating was removed,
- Open hole not identified or protective barricade or temporary cover installed; and
- Inadequate communication between contractors.

**Actions Taken:**

- The Contractor Employee was taken to the local medical facility for treatment. Employee returned to work on restricted work duty.
- Safety stand down with all parties was completed,
- Joint JSA/pre-job daily safety meeting completed each morning, or prior to shift, with all personnel working in the same area; and
- Awareness training was completed with the work crew on “Walking Working Surfaces”.

The Life Saving Rules

This incident is directly related to Life Saving Rule #3 ‘We will conduct a pre Job Safety Analysis’. In this situation, not all affected personnel were made aware of the hazards associated with the work. All affected workers should be made aware of the hazards by reviewing and signing a Job Safety Analysis.
Incident:  
**Distracted Driving**

Life Saving Rule Impacted:  
**We will drive safely and without distraction**

**Incident Summary:**

Driver 1 was traveling north bound in a sub-contractor vehicle on a secondary highway following Driver 2 to site. Driver 1 had leaned over to grab a 4-liter jug of water off the passenger side seat and did not see the approaching right hand turn in the road, although Driver 2 had just gone around the curve in the highway. At this point, Driver 1’s vehicle left the road at the junction of the secondary highway and a rural road, entering the bar ditch and was airborne for approximately 12 meters. Driver 1 was able to keep control of the vehicle, (did not apply brakes) and came to a stop in a field approximately 70m from the point of entry. Driver 1 had indicated that this was his first time driving on this secondary highway.

**Preliminary Causes:**

Driver 1 was not paying attention to the road while he was reaching for a 4-liter jug of water. Driver 1 had never travelled this highway before, but he reviewed and signed the Journey Management Plan.
Actions Taken:
The supervisor was contacted immediately, and Driver 1 was taken to the hospital where he was cleared by the doctor to return to work. A drug and alcohol test was conducted with negative results. The contractor’s management decided that Driver 1 should take a few days off to relax and ensure he was fit for duty, mentally and emotionally. Driver 1 will be taking an advanced defensive driving course prior to any further driving tasks being undertaken.

The Life Saving Rules
This incident is directly related to Life Saving Rule #1 ‘We will drive safely and without distraction’. In this situation, the Driver 1 took his eyes of the road briefly to grab his water bottle. This distraction caused the driver to miss the turn and resulted in the truck becoming airborne and coming to rest in a field.
Incident:
Fingertip Amputation from ATV Winch

Life Saving Rule Impacted:
We will conduct a pre Job Safety Analysis

Incident Summary:
Upon attempting to disengage the ATV winch while it was stuck, the Contractor Employee grabbed the hook to gently pull and attempt to loosen the winch cable. During the attempt to loosen the winch line, the winch retracted. This resulted in the contractor’s index finger getting caught between the hook and the two rollers of the winch fairlead. The finger was injured from the pinch point crush.

Preliminary Causes:
The worker placed his fingers into a potential pinch point. The winch was able to retract the hook through the rollers.

Actions Taken:
All quads will now have a winch stopper installed. Short slings will be issued to every quad to attach to hooks and remove hands from potential hazard.
The Life Saving Rules

This incident is directly related to Life Saving Rule #3 ‘We will conduct a pre Job Safety Analysis’. TransCanada’s Hoisting, Lifting, Towing and Winching Procedure advises that we should complete a JSA prior to towing or winching a stuck vehicle in order to and assess the hazards.
Incident:  
**Heavy Mobile Equipment Tip-Over**

**Life Saving Rule Impacted:**  
*We will drive safely and without distraction*

**Incident Summary:**
A Caterpillar 583 side-boom was descending a slope of 27 degrees (60% slope gradient) without the use of a mandatory mobile winch, and while doing so the operator lost control of the downhill movement of the piece of equipment, causing it to tip-over onto its side. A rollover was prevented by the boom. The side-boom was equipped with rollover protection structure (ROPS), and the operator was wearing his seatbelt restraint.

As a result of the incident, the side-boom was slightly damaged, but the operator was unharmed and was able to free himself from the equipment once it had come to rest.

**Preliminary Causes:**
Operator chose to use the right-of-way (RoW) instead of a temporary access road as previously instructed by supervision to gain access to another RoW location.

The mobile winch was in the top-slope position and was not used, which is required by this type of classified slope.

**Immediate Actions Taken:**
- Contractor’s emergency response plan was activated, and an ambulance arrived at the incident site to provide medical or first aid attention; there were no injuries sustained by the operator as a result of the incident,
- An administrative letter was issued to the operator of the side-boom,
• Safety stand downs were held across the project sharing the learnings of the incident,

• A safety bulletin was issued and posted on bulletin boards across the project’s main office and field office locations; and

• Supervision was increased on critical construction worksites.

**The Life Saving Rules**

This incident is directly related to Life Saving Rule #1 ‘**We will drive safely and without distraction**’. In this situation, the prescribed journey management plan was not followed as the operator chose to use the right-of-way (RoW) instead of a temporary access road as previously instructed by supervision.
Incident:  
Pipe Rolls off Skids

Life Saving Rule Impacted:  
We will control excavations and ground disturbances

Incident Summary:  
A client inspector and a coating crew arrived on site and noticed that a five joint section of NPS 36 Heavy Wall had come off the skid piles and rolled into the adjacent excavation. The event occurred over the weekend while the crews were on a scheduled day off. There were no personnel or equipment in the vicinity.

Preliminary Causes:  
Soft and wet ground conditions caused the skid piles to shift and sink, and the pipe section to roll off, despite the use of a box and crotch set-up.

Actions Taken:  
The investigation was initiated. The work area was inspected, and a plan for safely recovering and inspecting the pipe was developed. A notification was sent out to all foremen to immediately initiate inspections of ground conditions and skid piles in all active work areas. Sections were subsequently lowered on skid piles two-high to minimize the risk of shifting in wet, soft ground.
The Life Saving Rules

This incident is directly related to Life Saving Rule #9 ‘We will control excavations and ground disturbances’. In this situation, the skid piles were inadequate to support the pipe as the ground became muddy, soft and saturated as a result of recent rain and snow.
Incident:
**Contractor Line Strike**

**Life Saving Rule Impacted:**

*We will control excavations and ground disturbances*

**Incident Summary:**

The Contractor Employee was excavating a bell hole at a compressor station and struck a 10” live gas line. The coating was damaged on the line and repaired. No injuries resulted from the line strike.

**Preliminary Causes:**

The line markings for the 10” had not been refreshed for over two months and were less apparent due to rainfall and covered by road mats in the excavation area. The hydro-excavator only excavated to a depth of six feet, which was above the depth of the 10” line. The 10” live gas line ran under the lines on which the excavator was preparing the bell hole.

**Actions Taken:**

The line locations will be refreshed prior to excavating. Hydro-excavation will be performed to the intended depth of excavation activity. The contractor initiated a process for additional sign off prior to mechanical excavation.
The Life Saving Rules

This incident is directly related to Life Saving Rule #9 ‘We will control excavations and ground disturbances’. In this situation, the identification, location and marking of all underground facilities was not sufficiently completed to ensure the 10” line was exposed prior to mechanical excavation.
Incident:
Vehicle and Personal Injury

Life Saving Rule Impacted:
We will drive safely and without distractions

Incident Summary:
One Company Employee, “the driver,” and two Contractor Employees, “the passengers,” were travelling in a rented truck from the work site or regional office to the Company’s main office in Mexico City. The driver tried to make a lane change from an off-ramp onto the main toll highway. In doing so, a trailing third party vehicle collided broadside with the rear driver side quarter panel, causing the rental vehicle to spin, contact the highway barrier (i.e., rear passenger-side quarter side panel) and roll approximately twice, ending up upside down in the middle of the highway.

As a result of the vehicle incident, the rental vehicle and a roadside barrier were damaged, and the driver and two passengers received injuries requiring medical attention and in one case resulted in a lost time.

Preliminary Causes:
• The driver and passengers were distracted and not paying attention to the roadway signage indicating the approaching off-ramp;
• Driver was operating the rental vehicle at a speed too fast for a safe exit off of the approaching off-ramp; and,
• The driver was not fully aware of the trailing third party vehicle.
Actions Taken:

- All driving privileges of the driver were suspended until further notice,
- A joint incident investigation was initiated and completed,
- A safety stand down was held in the regional office with contract land and permits employees; and
- An email was sent by the onshore Area Manager of the Project to all Leaders sharing the incident.

The Life Saving Rules

This incident is directly related to Life Saving Rule #1 ‘We will drive safely and without distraction’. In this situation, the driver was operating the rental vehicle at a speed too fast for a safe exit onto the approaching off-ramp, and all occupants were distracted and not paying attention to the roadway signage indicating the approaching split in the highway.
Incident:  
**Vehicle Contact with Facility**

**Life Saving Rule Impacted:**

*We will drive safely and without distractions*

**Incident Summary:**

A TransCanada employee arrived at a town border station to change out charts. While parking his vehicle at the site, the employee backed into a 4” gas riser, causing minor damage to the vehicle. No damage occurred to the gas riser.

**Preliminary Causes:**

A company vehicle was backing into the location and did not stop in time before contacting the riser.

**Actions Taken:**

- Reinforce the importance of following driver training backing techniques and situational awareness when operating a vehicle,
- Install physical barriers to piping in order to mitigate potential damage in case of inadvertent contact from any vehicle,
- Increase the frequency of management ride along(s) in order to promote safe driving habits and coaching opportunities; and
- Identify areas that have limited access and develop plans to mitigate the area to prevent backing up incidents.
The Life Saving Rules

This incident is directly related to Life Saving Rule #1 ‘We will drive safely and without distraction’. In this situation, the driver was not aware of their surroundings and made contact with a 4” gas riser.
Incident:
Vehicle Contact with Facility

Life Saving Rule Impacted:
We will drive safely and without distractions

Incident Summary:
A TransCanada technician parked their truck near the natural gas storage well while conducting the well reads at the junior orifice fittings. After writing down the readings while in the truck, the technician drove away and struck the high head extension for the valve operator, causing extensive damage to the truck and to the valve operator.

Preliminary Causes:
The technician was in a hurry and behind schedule to complete the work. In addition, the technician was feeling frustrated because many of the previous orifice fittings had been frozen and required thawing out with hot water.

The technician did not use the situational awareness to complete the 360-degree circle check around the vehicle.

The technician parked close to the natural gas well and off the vehicle travel path around the well.

The truck was parked approximately 12–15’ from the valve operator extension with the height of the truck hood obstructing most of the valve operator in addition to blowing snow reducing visibility.
Actions Taken:
The technician stopped the truck and inspected the damage to the valve operator extension and truck. The truck was backed away from the operator, and the area was monitored for natural gas. The gas pipeline header was isolated from the lateral line well field pipeline, and it was checked for leaks.

The Life Saving Rules
This incident is directly related to Life Saving Rule #1 ‘We will drive safely and without distraction’. In this situation, technician was in a hurry and behind schedule to complete the work. In addition, the technician was feeling frustrated because many of the previous orifice fittings had been frozen and required thawing out with hot water.
Incident:  
**Multiple Line Strike**

**Life Saving Rule Impacted:**  
*We will control excavations and ground disturbances*

**Incident Summary:**
A 4” low pressure steel natural gas line was contacted in two locations 50’ apart during the course of right-of-way (RoW) clearing by a contractor.

**South location**
The bulldozer operator was levelling an area in order to allow the brush mulching operator to mobilize equipment into the clearing area. The brush mulching machine needs a level area to operate. The statement from bulldozer operator indicated the dozer blade contacted a large rock. Pushing the rock towards the line caused a puncture upon impact.

**North location**
The stump grinder operator was grinding a small stump. While carrying out this work, the stump grinder contacted the top of the pipeline causing three puncture holes.

**Preliminary Causes:**
The work plan advised that no excavation/ground disturbance would take place within 10’ of the line; however, the operator noted that the line was 8-10’ off the markers that were marking the line.
**Actions Taken:**

- Two repairs were immediately made to the pipeline,
- The contractor completed a safety stand down and developed a corrective action plan created and approved by TransCanada,
- The action plan included a company representative mark the lines and the use of pin flags rather than wooden stakes; and
- It was also recommended that regular inspections occur to ensure adequate markers remained in place.

**The Life Saving Rules**

This incident is directly related to Life Saving Rule #9 *‘We will control excavations and ground disturbances’*. In this situation, the identification, location and marking of all underground facilities was not adequate. The markers that were in place were not accurate and difficult to see.
Incident:  
**Truck Rolls into Excavation**

**Life Saving Rule Impacted:**  
*We will drive safely and without distractions*

**Incident Summary:**
A contractor’s pickup truck, which was left running and unattended, rolled approximately 80 meters. The truck came to rest in an excavation on top of a newly installed 20” pipe section. The operator of the vehicle had exited this part of the excavation moments before the incident occurred.

**Preliminary Findings:**
- The truck was left running while the workers conducted tasks in the area; wheel chocks and/or parking brakes were not used.
- The truck rolled unexpectedly after, according to the operator, being put into park.
- The truck was parked in a direction that allowed it to roll towards the excavation. The truck was parked parallel to the excavation, towards a small spoil pile. As the truck rolled, its passenger side tires contacted the spoil pile and redirected the truck into the excavation.
- The mechanical inspection of the truck found that the ‘Parking Pawl’ (a component that restricts power to the axles when the vehicle is in park) was worn and not engaging properly.
Actions Taken:
The operator of the vehicle entered the excavation to shut off the vehicle. The scene was subsequently frozen, and the investigation was initiated. A plan for safely recovering the vehicle was created, and the vehicle was extracted and sent for further mechanical inspection. The pipe was inspected for damage.

The Life Saving Rules
This incident is directly related to Life Saving Rule #1 ‘We will drive safely and without distraction’. In this situation, the parking brake was not used and the truck was parked in a direction that allowed it to roll towards the excavation.
Incident:
Skid Steer Breaks Through Ice

Life Saving Rule Impacted:
We will conduct a pre Job Safety Analysis

Incident Summary:
A John Deere 333 skid steer was salvaging snow from a bore pit. While backing up, the back end of the skid steer broke through the ice and sunk into the water below.

Actions Taken:
The operator exited through the front door of the skid steer and walked to the shore. No injuries occurred. The skid steer was successfully retrieved by a dozer from the shore later in the day.

Preliminary Causes:
The most recent measurement of ice thickness was 16-18”, which is within the recommended thickness for the weight of the unit. An incident investigation and Root Cause Analysis has been initiated to determine causes and future mitigation measures.
The Life Saving Rules

This incident is directly related to Life Saving Rule #3 ‘We will conduct a pre Job Safety Analysis’. In this situation, a Job Hazard Analysis was developed for working on ice but parameters for checking ice thickness were not identified.
Incident:
**Damaged Sidetap**

Life Saving Rule Impacted:
**We will drive safely and without distraction**

Incident Summary:
TransCanada Houston Gas Control was contacted by a landowner who had struck a tap valve causing a gas leak.

The third party landowner was cultivating the field when the field and farm equipment struck the pipe guard / high-head valve extension. The operator and equipment exited the area without injury.

Gas Control contacted the on-call technician(s) for emergency response activation. The TransCanada regional and Houston Emergency Operations Centers (EOC) were activated.

The pipeline section was isolated for the blow-down, and there was no immediate customer impact. All regulatory, environmental and media notifications were completed. The incident investigation is ongoing.

Preliminary Causes:
The third party landowner broke through the protective barricades with farm cultivating equipment and struck the pipe.
Actions Taken:
• The Houston Gas Control shut in the natural gas lines by utilizing the Mainline Valves. Regional and Houston
• EOCs initiated.

The Life Saving Rules
Although this incident was a result of third party activities, it highlights the importance of Life Saving Rule #1 ‘We will drive safely and without distraction’. In this situation, the landowner did not take the necessary steps to ensure the equipment would not come into contact with the valve.
Incident: 
**Contractor Tie-In Flash Fire**

**Life Saving Rule Impacted:**

*We will conduct a pre Job Safety Analysis*

**Incident Summary:**

The contractor welders were welding a plate on a 30” line during line tie-in activity at a compressor station. The line was initially cold cut and checked with an air monitor which indicated 0% LEL prior to the welding activity. Air movers were in use on the line. During welding activities, a flash fire occurred in the pipe. There were no injuries as a result of the flash fire.

**Preliminary Causes:**

The line was not rechecked after the initial LEL reading was obtained. There was an ESD valve found to be leaking which caused the flash fire.

**Actions Taken:**

- The contractor will perform atmospheric monitoring prior to each new weld and periodically during performance of the work.
- An air mover was applied directly to the leaking ESD valve.
The Life Saving Rules

This incident is directly related to Life Saving Rule #3 ‘We will conduct a pre Job Safety Analysis’. This incident highlights the importance of developing a safe work plan and adhering to the plan throughout the duration of the project/task. It is critical to reevaluate the tasks periodically as the scope of the work changes or when new hazards are identified.
Incident:  
**Horizontal Drill Rig (HDD) Stabilizer Failure**

**Life Saving Rule Impacted:**

**We will conduct a pre Job Safety Analysis**

**Incident Summary:**

A Horizontal Directional Drill (HDD) rig was conducting a pull of the drag section through the 42” casing at the Athabasca Entry when the rig stabilizer supports failed and folded up, pulling the rig 2.3 meters towards the casing.

There were no injuries as all affected personnel were outside the exclusion zone during the pull as per procedures.

At the time of the rig stabilizer supports failure, records indicate a 450,000 pound pull. The 1.2 million pound rated stabilizers failed. Further metallurgical testing was conducted to determine the causal failure.

The rig involved with the incident is being replaced with a larger unit.

**Preliminary Causes:**

Rig stabilizer supports failed.

**Actions Taken:**

Work was immediately stopped, the area secured and an investigation initiated. The equipment was replaced with a larger unit, and further testing and metallurgical analysis was conducted on the equipment to determine causal failure. The investigation revealed that the load rating of the anchor system was determined assuming I-Beams or screw piles were utilized in front of the rigs anchor foot assembly;
however, no additional I-Beams or piles were installed in this case. All existing rig support anchor arm designs were revised and re-designed in response to this event.

**The Life Saving Rules**

This incident touches on a number of aspects of the Life Saving Rules and highlights the importance of planning and communication. In this situation, working load limits were determined assuming the rig would have I-Beams or piles installed, but the drawings did not specify the use I-Beams or piles.
“Just as important as what we do, is how we do it. It’s about the pride we take in our business and how we feel about what we do every day. Safety has to be a guiding principle of how we operate this company and every employee and contractor has to go home from work safe, every day.”

- Russ Girling,
  TransCanada President & CEO