

STANDARD OPERATING PROCEDURE

Tire Fire or Electrification (OTR)

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TIRE FIRE OR ELECTRIFICATION (OTR)

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The following is a step-by-step procedure on how to complete a specific task or meet a facility specific requirement. Standard Operating Procedures (SOPs) are written for all identified critical tasks. By virtue of the hazard or complexity associated with critical tasks it is paramount that the SOP be followed as written. SOPs contain a listing of high-level hazards associated with the task, for detailed hazard analysis reference the applicable Task Hazard Assessments. SOPs do not replace the requirements contained in the company Standards, Codes, and Processes nor does it replace the need to comply with required legislation. Section 8.0 references documentation that the worker shall understand before work commences.

1.0 PURPOSE

- To establish a company standard to safely and effectively carry out work as it applies to approaching or working around equipment with Off-the-Road(OTR) tires that are on fire or have been electrified.

2.0 SCOPE AND APPLICATION

- This document applies to all company Heavy Construction Mining operations. Ensure all site-specific requirements are being met or exceeded before performing the task.

3.0 HAZARDS AND CONTROLS

- Equipment fire leading to tire fire, explosion or rapid deflation.
 - Operators will stop the equipment in a safe location, set park brake, shut down equipment and activate fire suppression system if it has not been already activated. Operators will notify supervision, safely dismount the unit and walk in a straight line away from the front of the truck.
 - No personnel will expose themselves to the sidewalls of a tire that is on fire.
 - Do not use a fire extinguisher to attempt to extinguish a tire fire. Only trained emergency response personnel, using appropriate fire suppression chemicals can attempt to suppress a tire fire.
 - An exclusion zone of a minimum of 300 metres will be established if a tire has ignited. After the fire has been suppressed, the exclusion zone will remain in place for a minimum of 24 hours.
- Equipment electrification leading to tire explosion or rapid deflation causing equipment damage or injury to the equipment operator or ground personnel outside of the equipment.
 - Operators will notify supervision immediately if their equipment has been struck by lightning or come in contact with a powerline.
 - Operators will stop equipment in a safe location, set park brake and shut down equipment.
 - Operators will follow the emergency response plan for safe evacuation and will be required to stay in the cab of the equipment until it has been confirmed that there is no electrical hazard present (i.e. electricity source has been disconnected).
 - Operators will walk in a straight line, directly away from the front of the truck to a safe area 300 metres away.
 - An exclusion zone of a minimum of 300 metres will be established and will remain in place for a minimum of 24 hours.

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4.0 CHECKLIST

- ☐ Attend all preparatory meetings (IE: daily PSI; job scope; review of JSA's and SOP's for the job).
- ☐ Complete FLRA cards before starting the work.
- ☐ Ensure all personnel involved in the task are aware of the hazards and the controls to be used, as identified in the SOP's; JSA's; and FLRA's.
- ☐ Conduct a pre-job inspection of all equipment to be worked on and tools to be used.
- ☐ **Standard of Training required for working on this job: On-the job training.**

5.0 DEFINITIONS

5.1 Company

Means North American Construction Group Ltd. (NACG) and all directly or indirectly owned subsidiary companies, including joint ventures.

5.2 Company Personnel

Includes the Company's employees, officers, directors, agents, associates, consultants/contractors, temporary employees and third-party processors.

5.3 HSE

Refers to the Health, Safety & Environment department.

5.4 Tire Pyrolysis

When a rubber tire becomes overheated, a chemical reaction in the rubber called pyrolysis can occur. Pyrolysis causes the rubber to deteriorate. At a certain point, this deterioration can create a very rapid pressure increase inside the tire that can lead to a sudden and unexpected explosion.

6.0 PROCEDURE

6.1 Equipment and Tire Electrification by Contact with High Voltage Overhead Power Line

- 1) Operator will freeze the scene and contact supervision by radio immediately.
- 2) Consider the area around the haul truck as live until the electricity source has been safely disconnected. Do not touch any metal components. Do not get out of the cab of the equipment unless instructed by a supervisor and only in situations of extreme danger, such as a tire fire.
- 3) When advised by the supervisor that it is safe to do so, move the equipment away from the area, park it safely, and shut it down. Ensure that the front of the truck points in the direction of safe egress. If practical, move the vehicle to an isolated area so that if a tire explosion occurs there is minimal rock and debris that could be picked up by the blast.
- 4) Remain in the cab until advised by supervision that it is safe to vacate.
- 5) When it is advised by supervision that it is safe, vacate the truck immediately. Exit the cab through the passenger door (the centre platform is a relatively safe place compared to the outer catwalk), slowly and safely descend to the ground and proceed directly away from the front of the truck to a safe area 300 meters away (minimize exposure to sides of tires).

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- Supervision will secure an area of 300 metres radius around the equipment/vehicle as the **exclusion zone**. All personnel must remain a minimum of 300 meters away for 24 hours in case of tire explosion due to an internal fire.

6.2 Equipment and Tire Electrification by Contact with Electric Shovel Power Cable

- Operator will freeze the scene and contact supervision by radio immediately.
- Consider the area around the equipment as live until the electricity source has been safely disconnected. Do not touch any metal components. Do not get out of the cab of the equipment unless instructed by a supervisor and only in situations of extreme danger, such as a tire fire.
- When advised by the supervisor that it is safe to do so, move the equipment away from the area, park it safely, and shut it down. Ensure that the front of the truck points in the direction of safe egress. If practical, move the vehicle to an isolated area so that if a tire explosion occurs there is minimal rock and debris that could be picked up by the blast.
- Remain in the cab until advised by supervision that it is safe to vacate.
- When it is advised by supervision that it is safe, vacate the truck immediately. Exit the cab through the passenger door (the centre platform is a relatively safe place compared to the outer catwalk), slowly and safely descend to the ground and proceed directly away from the front of the truck to a safe area 300 meters away (minimize exposure to sides of tires).
- Supervision will secure an area of 300 metres radius around the equipment/vehicle as the **exclusion zone**.
- Electrician will inspect the shovel power cable to determine if there was damage resulting in electrification of the equipment. If electrification is confirmed, the unit will remain in the quarantine/isolation zone for 24 hours in case of tire explosion due to an internal fire. If the cable has not been damaged and there has been no transfer of electrical energy from the cable to the equipment, then the equipment may be moved safely.

6.3 Equipment Electrification by Contact with Lightning

- Operator will freeze the scene and contact supervision by radio immediately.
- Operator will remain inside the cab of the equipment during an electrical storm. If the equipment is struck by lightning the electricity will run to ground through the tires; the equipment will not stay electrically charged. However, there is an increased risk of tire explosion due to tire pyrolysis caused by an internal fire. The operator must ensure that the equipment controls are in neutral, the park brake has been set and the unit is shut down. Note: due to the electrical surge from lightning contact there is limited possibility that the equipment will be able to operate after being struck; fire suppression systems will typically be deployed from the electrical surge also resulting in the unit's inoperability.
- When advised by supervision that it is safe to do so, vacate the truck immediately. Exit the cab through the passenger door (the centre platform is a relatively safe place compared to the outer catwalk), slowly

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and safely descend to the ground, and proceed directly away from the front of the truck to a safe area 300 metres away (minimize exposure to sides of tires).

- Supervision will secure an area of 300 metres radius around the equipment/vehicle as the **exclusion zone**. All personnel must remain a minimum of 300 metres away for 24 hours in case of tire explosion due to an internal fire.

6.4 External Tire Fires

- Do not attempt to extinguish a tire fire.
- If a tire fire is suspected contact supervision immediately.
- If safe to do so, drive the unit to a wet area if there is one nearby, otherwise move the unit to an isolated area so that if a tire explosion occurs there is minimal rock and debris that could be picked up by the blast.
- Stop the unit safely, apply the park brake and shut the unit down. Manually activate fire suppression system if it has not already been activated.
- Dismount the haul truck quickly and safely. Attempt to extinguish or knock down a fire with a portable extinguisher only if the fire affects the egress route down from the truck. **Only trained and designated emergency personnel can fight a fire.**
- The scene will be under the sole command of the emergency response commander. Refer to 910C-P-001 Emergency Preparedness and Response Plan as well as the onsite Emergency Response Plan.
- Immediately after the fire is extinguished, impose a 24-hour isolation period and a minimum 300 metre exclusion zone.

6.5 Detecting an Internal Tire Fire

After electrification or lightning strike, it should be assumed that all tires may have internal fires.

- Before testing for an internal tire fire, confirm a 24-hour period has already passed and no fire or smoke is visible.
- Only one person at a time will enter the exclusion zone. They will be competent in tire handling and evaluating the tire's condition. They will have continuous radio contact with the scene supervisor.
- An observer in a vehicle will be located at the zone perimeter (outside of exclusion zone).
- Any vehicle used to approach will be a heavy vehicle, such as a service truck, not a light vehicle.
- The person will make a quick assessment looking for smoke and, using a temperature gun, scan the tire and rim for hot spots.

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- 6) If this test indicates the possibility of a fire, **withdraw immediately** and impose a second 24-hour quarantine.
- 7) If the above tests are negative, do a more thorough examination:
 - a. Attach an air chuck (without hose) to the valve to bleed the air.
 - b. Confirm if a burning smell is present in some air from the valve and check for smoke (a burning smell may be present even after an internal fire is extinguished.).
 - c. Use a pressure & temperature gauge to check all tires on the truck.
 - d. If the suspect tire has a higher temperature or pressure than the rest, assume an internal fire exists.
 - e. If this test indicates the possibility of a fire, withdraw immediately and impose a second 24-hour quarantine.

6.6 After Fire and Explosion Hazards have been Eliminated

If no indications of combustion are found after 24-48 hours, it may be assumed that there is no longer a danger associated with tire explosion due to fire. However, the tire structure may be weakened and therefore continues to have an explosion hazard.

For any tire which may have been subject to heat or internal combustion, reduce the tire pressure to a maximum 10 psi and replace. If the truck must be driven to another location, speed cannot exceed 10 km/hr.

6.7 Examination of Tires Post Electrification & Heat Exposure

- 1) All tires on the vehicle must be stripped and examined by a competent person.
- 2) Discard the tire if:
 - a. There is visible electrical charge tracking on the inside or outside.
 - b. Evidence of combustion on the liner.
 - c. Electrical penetration to ground through the tread.
 - d. Any heat damage to the inner liner.
 - e. Surface defects or scorching of the outside deeper than 1mm.
- 3) Discard any hose or connector which has been subject to heat.

7.0 NOTES

If this task is to be done by a method different than described in this SOP, the work must **STOP** and the alternate method must be **DOCUMENTED** with an adequate hazard assessment tool such as a JSA. The document must be **APPROVED** by a supervisor before such procedures are implemented.

8.0 REFERENCES

- Goodyear Earthmover PTY Ltd. – SOP E002 Guidelines – Managing, Monitoring and Fighting Tyre Fires

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- Kal Tire – OTR Tire Fire/Electrification Hazard Management Recommendation December 2004
- 910C-P-001 Emergency Preparedness and Response Plan
- 950C-C-033 Inclement Weather Code
- 950C-C-042 Overhead Hazards – Limits of Approach Code

9.0 APPENDICES

No appendices