

STANDARD OPERATING PROCEDURE

Dragline Operations		Document Number: 962C-SOP-051
Original Approval Date: Jun 03, 2024	Revision Number: 1	Page 1 of 17
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DRAGLINE OPERATIONS

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1	APP	Jun 03, 2024	Approved	Walter Simpson	Tammy Siver / Curt Weittenhiller	Craig Nauta
Rev	Status	Rev. Date	Status Description	Prepared by	Reviewed by	Approved by



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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 carry out work safely and effectively as it applies to dragline operations.

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

- Dragline contact with other equipment or personnel on the ground.
 - Refer to Appendix A – Conducting Work in Dragline Boom Radius.
 - Positive communication and approval must be received from the dragline operator prior to approaching the dragline.
 - Positive radio communication is required for people to work and /or machinery to pass in front of or in close proximity to the dragline (within the Boom Radius). A verbal agreement must be established between the Dragline Operator and the accessing equipment prior to entering the Boom Radius.
 - When equipment is required to work or pass within the Dragline’s Active Operating Angle, the bucket must be raised out of the way and
 - At no time can any person or machine work under a suspended bucket.
 - The primary function of the Dragline Operator during this process is to coordinate the activity.
 - When the activity is completed, if this is non-dragline support equipment, excluding coal cleaning equipment, the dragline may not return to digging until the equipment has left the swing radius.
 - If it is dragline support equipment (“Dragline Family”), digging may not begin until the equipment is at a safe location outside the Shoe Swing Radius and the dragline operator is aware of that safe working location.
 - Only members of the “Dragline Family” are authorized to work within the dragline Boom Radius while the dragline is working. Work is not permitted inside the dragline’s active operating angle (dig to dump zone) while the dragline is working.
 - Positive communication must be maintained while working around the dragline.

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- The Dragline Operator must dump near the toe of the spoil, away from equipment or personnel inside the dragline swing radius.
- The Dragline Operator must always know the location of the equipment or personnel inside the dragline Boom Radius.
- When work is completed, the Dragline Operator must be notified that the Boom Radius is clear.
- Parking is not allowed inside the Boom Radius while the Dragline is in operation.
- The Dragline boom shall never swing over any person, vehicle, or equipment with operators present. Dragline must not swing over the power cable without protective covers over the cable.
- When personnel are within 100 feet of the Boom Radius, the Dragline shall not swing in their direction.
- When the Dragline is not in use, the bucket shall be placed on the ground, excitation killed, and all brakes set. This includes, but is not limited to, making shift changes, outage periods, and waiting on work by others inside the Boom Radius, etc.
- Dragline Operator must know the location of the machine's "kill switch" and when to use it if operator loses control of machine.
- Dragline Operator must be aware of all activity in the Boom Radius as well as the location of the Dragline Family.
- Do not rely on hoist and drag limits. Dragline Operator must check the hoist and drag limits at the beginning of each shift.
- All personnel must know the dragline horn signals:
 - a. One blast to stop.
 - b. One long blast to signal an emergency.
 - c. Two blasts to swing.
 - d. Three blasts – clear to propel.
- Personnel are not permitted to stand on the shoe when the dragline is operating or walking. If such activity is required for a specific task (i.e. maintenance trouble shooting), a Hazard Assessment and Live Work Checklist must be completed prior to the task. Personnel performing the task must be tied off such that they cannot get in the walking mechanism and are protected from a fall. A Pre-job Brief must be conducted prior to performing this type of task with all involved personnel including but not limited to Maintenance personnel, Supervisor, Dragline Operator and Oiler. A designated observer shall maintain visual contact with the maintenance personal and radio contact with the Dragline Operator at all times during these types of tasks.
- Dragline bucket contact with highwall or spoil pile resulting in equipment damage.
 - Do not contact the highwall or spoil pile unless it is a last resort to avoid contacting equipment or personnel in the work area. Care must be taken to avoid the possibility of contact with highwall or spoil pile while swinging. Allowing the Dragline bucket to contact the highwall or spoil pile while swinging can cause major damage to the bucket, boom, and other support structures.

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- Dragline trailing cable damage from incorrect use, placed incorrectly in work area or using improper tooling. Injury caused by improper handling of dragline trailing cable or using improper tooling.
 - Refer to Appendix B – High Voltage Power Cables.
 - Do not handle Dragline or Pump cable unless trained to do so (see Appendix B). Before full certification, the Grounds Person must be involved with one cable change, one deadhead, and one simulated highwall failure exercise.
 - Hot gloves must be worn when manually handling cables. Where possible “D” Ring handle cable puller should be used.
 - Do not manually handle cable at a splice.
 - When using a cable tractor or other mobile equipment to move cable, do not bend cable directly at a splice.
 - Do not pull the cable in a manner that puts strain on the cable potheads. This can result in pulling the pothead apart.
 - Report any visual damage to the cable jackets to the Electrical Department. Mark the location of the damaged cable so it can be found easily.
 - Should a cable inadvertently get damaged, it must be reported so that the cable can be checked by the Electrical Department
 - Pylons and markers must be placed at regular intervals, so the cable location is visible to others.
 - Trail cable crossing blocks shall be established to accommodate vehicles and equipment travel around draglines.
 - High voltage hot gloves should be in three locations at the dragline, must be inspected prior to use, and checked for proper placement. Locations can include – 1) Cable Tractor, 2) Dragline Shoe Box, and 3) Revolving Frame (Center Walkway).
 - All tools must be inspected and accessible in good working condition, including but not limited to cable tractor, electrical gloves, slings and hooks. All tools must be stored properly.

- Unauthorized entrance to dragline work area.
 - A Dragline sign shall be placed outside the Boom Radius at all dragline road entrances/approach ways including those in the pit and above the dragline tub level. The Dragline Operator/Oiler is responsible for maintaining the placement of these signs.
 - Positive two-way radio communication must be made between the person entering the dragline work area and the Dragline Operator. The Dragline Operator must give permission to anyone entering the dragline work area.
 - Positive two-way radio communication must be made with the Dragline Operator when exiting the area.

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- Only Authorized Personnel may work on the ground inside the shoe Swing Radius of a Dragline. This work may only be performed with the Dragline in the non-productive mode with the swing brakes set and radio communications maintained at all times with the Dragline Operator.
- Refer to Appendix C – Duties Allowed in the Non-Active Operating Angle of the Boom Radius by Authorized Personnel for a list of duties that may be completed while the machine is actively working.
- Ground control – highwall and spoil failures.
 - Ground Control – highwall and spoil failures can happen at any time with or without warning. Therefore, it is imperative that all members of the dragline team be alert to any potential ground control hazardous conditions.
 - The Authorized Personnel of the dragline team shall be trained in and understand the Ground Control Plan.
 - The dragline shall be operated within the safe operating limits as detailed in the Ground Control Plan.
 - The Dragline Operator shall check ground conditions with every swing.
 - The Oiler and Ground Person shall continually check ground conditions while on foot, dozing, moving trail cable, and when performing any other functions on the dragline bench. Supervision must be notified immediately of any concerns with highwall or spoil stability.
 - Highwall inspections shall include checking for:
 - Bench cracking, and
 - Changes in known bench crack condition.
 - Typical key inspection points which can provide assist in recognizing a stability hazard before failure are:
 - proper pit floor preparation,
 - cracking bench or spoils,
 - bulging pit floor,
 - slumping spoils,
 - piping holes in bench,
 - moisture,
 - freeze/thaw conditions, and
 - spoil overload.
 - If a highwall or spoil failure occurs, the Dragline Operator shall notify the supervisor immediately, notify the Ground Person and Oiler by radio, and give one continuous horn blast to indicate help is needed to move the machine.

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.

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- 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 Active Operating Angle

Means all the area inside the dig to dump Boom Radius.

5.2 Authorized Personnel

Miners specially trained in dragline operations as members of the dragline team, to include the Dragline Operator, Oiler, and Ground Person.

5.3 Boom Radius

Means the entire 360 degrees around the dragline at the boom point plus 100 feet.

5.4 Company

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

5.5 Company Personnel

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

5.6 Counterweight Radius

Means the entire 360-degrees around the dragline at the counterweight location.

5.7 Dragline Family

Dragline support equipment and personnel. Includes Dragline Operator, Dozer Operator, and Cable Tractor Operator/Ground Person/Oiler.

5.8 Dragline Sign

A sign located at all access points to the dragline identifying the location of the Boom Radius and the dragline horn signals. No one may proceed past this point without first notifying the Dragline Operator and following the proper protocol for entering the Boom Radius.

5.9 Handheld Communication

Company two-way radio set to the channel used by the dragline.

5.10 HSE

Refers to the Health, Safety & Environment department.

5.11 Non-Active Operating Angle

Means all area outside the dig to dump Boom Radius.



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5.12 Non-Productive Mode

Means not using the hoist or drag with the brakes set and the bucket empty.

5.13 Shoe Radius

Means the entire 360-degrees around the dragline at the shoe location.

6.0 PROCEDURE

- Prior to any and all tasks, workers will complete a task specific hazard assessment (i.e. FLRA). Workers will notify supervision of any hazards outside of their control. Workers will follow up with supervision if unsure of task.
- Supervisors will ensure workers are adequately trained and competent for all assigned tasks or under the direct supervision of a trained and competent worker.
- Workers will ensure all equipment and tools are inspected prior to use. Any deficient or defective tooling unsafe to use will be removed from service and reported to supervision.

6.1 Safe Approach to Dragline

- 1) Contact the Dragline Operator for authorization to approach the machine.
- 2) Outline work activity to be conducted. Follow Appendix A – Conducting Work in Dragline Boom Radius & Appendix C – Duties Allowed in the Non-Active Operating Angle of the Boom Radius to determine appropriate controls required and activities permitted.
- 3) Receive confirmation from Dragline Operator to conduct activities in area.
- 4) Notify Dragline Operator when leaving the area.

6.1.1 Travel Between the Cut and the Front of the Dragline

- 1) Performed by operators familiar with the process or while being directed by experienced operators familiar with the process.
- 2) Contact the Dragline Operator for authorization to approach the machine.
- 3) The dragline shall be in the Non-Productive Mode.
- 4) Only one vehicle or piece of equipment at a time may pass.
- 5) The vehicle or equipment shall be positioned in the “slot” so that it is not under the boom or ropes at any time during the process.
- 6) Radio communications shall be maintained at all times.
- 7) The Dragline Operator shall maintain a visual of the passing vehicle or equipment.
- 8) When the vehicle or equipment has passed, the dragline shall continue to swing around and not swing over the vehicle or equipment.

6.2 Boarding Dragline

6.2.1 Boarding Dragline with Handheld Radio Communication

- 1) Park outside the Boom Radius and contact the Dragline Operator for authorization to approach the machine.

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- 2) Discuss with the Dragline Operator where to park outside the Boom Radius and which shoe to board.
- 3) With a handheld radio, walk to the dragline in the Non-Active Operating Angle while the machine is working.
- 4) Stop before entering the Shoe Swing Radius of the dragline and notify the Dragline Operator you are ready to board.
- 5) The Dragline Operator shall stop the machine, kill excitation, and set all brakes.
- 6) When the dragline stops, confirm that excitation is killed and all brakes are set, then board the shoe.
- 7) When off the shoe and on the dragline, notify the Dragline Operator via handheld radio that you are clear for the machine to work.

6.2.2 Boarding Dragline without a Handheld Radio Communication

- 1) Park outside the Boom Radius and contact the Dragline Operator for authorization to approach the machine.
- 2) Discuss with the Dragline Operator where to park outside the Boom Radius and which shoe to board.
- 3) The Dragline Operator shall stop the machine, kill excitation, and set all brakes.
- 4) When the dragline stops, confirm with the dragline operator that excitation is killed and all brakes are set, then walk inside the Boom Radius to board the shoe.
- 5) When on the dragline, enter the dragline operator's cab and verbally notify the Dragline Operator you are clear for the machine to work.

6.2.3 De-Boarding Dragline with Handheld Radio Communication

- 1) Prior to de-boarding the dragline, notify the Dragline Operator with a handheld radio that you are ready to leave the machine.
- 2) Prior to getting on the shoe, the machine must be stopped, excitation killed, and all brakes set.
- 3) Once on the ground in the Non-Active Operating Angle and clear of the Shoe Swing Radius, notify the Dragline Operator with the hand-held radio that you are clear for the dragline to go back to work.
- 4) Walk immediately and without deviation within the Non-Active Operating Angle directly away from the machine to a point outside the Boom Angle.
- 5) Once outside the Boom Angle, notify the Dragline Operator on the hand-held radio that you are clear.

6.2.4 De-Boarding Dragline without Handheld Radio Communication

- 1) Prior to de-boarding the dragline, verbally notify the Dragline Operator you are ready to leave the machine.
- 2) Prior to getting on the shoe, the machine must be stopped, excitation killed, and all brakes set.
- 3) The dragline must remain stopped, excitation killed, and all brakes set until you are clear of the Boom Radius.
- 4) Walk immediately and without deviation directly away from the machine outside the Boom Radius.
- 5) Once outside of the Boom Radius, notify the Dragline Operator on a Company two-way radio that you are clear for the dragline to work.

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6.2.5 Approaching and/or parking inside the Boom Radius of a Dragline in outage

- 1) Attempt shall be made to contact the Dragline Operator for authorization to enter the Boom Radius and approach the machine.
- 2) If there is no response and there is evidence that the dragline is in outage (other vehicles or equipment parked inside the Boom Radius and the bucket is on the ground), approach the dragline cautiously.
- 3) For any non-dragline activity to come within or close proximity of the Boom Radius of a dragline in outage, it is the responsibility of that work group's supervisor to notify the Dragline Operator or their supervisor. This includes, but not limited to, loading operations, pumping, etc.
- 4) For draglines being placed back in service after an outage, bucket & boom inspection, maintenance, surveying, trail cable routing, or any other activity where the dragline ceased operation, it is the responsibility of the Dragline Operator to verify that no vehicles, equipment, or personnel are within the Boom Radius before resuming operation.

6.3 Dragline Operations

6.3.1 Dragline Startup

- 1) Walk through the house and make certain everyone is clear for startup.
- 2) Ensure all locks and do not operate tags have been removed (following hazardous energy isolation / LOTO procedures).
- 3) Check that all tools, cords, hoses, garbage, etc. are picked up and properly stored before starting house fans.
- 4) Close all doors before pressurizing the house.
- 5) Turn on circulating pumps, air compressor, and lube system (Machine Specific).
- 6) Make sure the overhead crane is immobilized.
- 7) Check that all air valves to the brakes are turned on.
- 8) Check swing rack, rails, and rollers (use caution around access doors).
- 9) Check the oil level and oil rings on the MG sets.
- 10) To start the dragline, have electricians:
 - a. Turn on PSCB on GE regulator panel in DC room.
 - b. Turn on ECB in DC room.
 - c. Turn on PFB in DC room.
 - d. Turn on exciter breaker MCCI.
 - e. Start excitation and ensure all blower fans are running.
 - f. Start MG sets (start Set 1 first. Check for both green indicator lights. After 20 seconds start set 2.
 - g. Assist Operator with spooling ropes onto drums.
 - h. Make sure that the hoist and drag limits are reset if any rope work is done on the PM.

6.3.2 Digging Phase

- 1) Dig with corner of bucket in hard material.
- 2) Load bucket in as short a distance as possible.
- 3) Do not drop spreader bar on bucket.
- 4) Have hoist chains tight as soon as bucket is full.

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- 5) Slow drag speed in rocky material.
- 6) Boom should be centered over bucket when bucket is lifted from cut.
- 7) Avoid stalling drag motors while loading the bucket.
- 8) Avoid dragging ropes through dirt.
- 9) Avoid casting bucket if possible.
- 10) Don't overfill bucket - it wastes time.
- 11) Don't gouge coal while cleaning the coal.
- 12) Watch the condition of teeth.

6.3.3 Cutting Highwall

- 1) Position machine properly.
- 2) Know proper angle.
- 3) Scale highwall.
- 4) Berm highwall.
- 5) Know material condition - lay angle back if necessary.

6.3.4 Chop-cutting

- 1) Make sure the area is clear of power cable and electrical boxes.
- 2) Have the ground person place cable covers over cable.
- 3) Berm chopped off roadways.
- 4) Watch for bucket kick up and hitting spreader bar.
- 5) Keep bucket under control while dozer is leveling chop-cut, as dragline is still chop cutting.
- 6) Keep drag ropes high.
- 7) Communicate with ground person for depth of cut.
- 8) Sub-cut poor material.

6.3.5 Swing Phase

- 1) Smooth start as soon as bucket clears ground.
- 2) Pay out drag as soon as possible to make hoisting easier.
- 3) Time hoist so it is a steady hoist to the dumpsite.
- 4) Reverse plugging action when about 3/4 through swing cycle.

6.3.6 Dump Phase

- 1) Bucket should be under boom when it dumps.
- 2) Make sure drag chains clear spoil while dumping.
- 3) Do not lower the bucket until it has completely dumped.
- 4) Do not allow too much slack in drag ropes.
- 5) Avoid hoisting any higher than necessary to dump.

6.3.7 Return Phase

- 1) Start swinging as soon as bucket dumps.
- 2) Keep rigging smooth.

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- 3) Bucket should stop swinging just as it touches the ground ready to dig.

6.3.8 Working with Ground Dozer building bench or other duties inside the Active Swing Radius while dragline is in dig mode

- 1) The Ground Dozer shall not work inside the Active Swing Angle of the Boom Radius.
- 2) The Ground Dozer will request permission from the Dragline Operator to enter the In-Active Swing Angle of the Boom Radius.
- 3) After permission is granted, the Ground Dozer may proceed with work inside the Boom Radius.
- 4) The Dragline Operator must dump near the toe of the spoil, carrying the bucket low.
- 5) The Dragline Operator must always know the location of the Ground Dozer.
- 6) While the Ground Dozer is in the Boom Radius, the Dragline Operator and the Ground Dozer shall be in constant communication, informing when the dragline or the dozer is going to make a change in position or operation.
- 7) When work is completed, the Ground Dozer will notify the Dragline Operator when out of the Boom Radius.

6.3.9 Dragline Shutdown

- 1) Check and drain all water traps (cold weather).
- 2) Cover the intake fans (cold weather).
- 3) Make sure all house heaters are on (cold weather).
- 4) Turn on all gear case heaters (cold weather).
- 5) Turn on anti-condensation heaters (cold weather).
- 6) Turn on revolving frame heaters (cold weather).
- 7) Check with Dragline Maintenance Supervisor to see if the circulating pumps should be left running.
- 8) Shut lube system off.
- 9) Make sure that the fire detection system is armed.

6.3.10 Dragline Shift Changes

- 1) The Dragline Operator will continue digging during the shift change process, stopping the dragline only for the boarding or dismounting of the operating crew.
- 2) Dragline Operator approval is required before the shift change vehicle may enter the Non-Active Swing Angle of the Boom Radius.
- 3) The shift change vehicle must park outside of the dragline Shoe Swing Radius during shift change.
- 4) The off-going crew and the on-coming crew shall perform a pass-on meeting at the shift change vehicle to share such things as operating plan, digging conditions, machine issues, ground control, and safety concerns.
- 5) Boarding should take place on the operator's side if possible, away from the highwall.
- 6) The shift change vehicle shall notify the Dragline Operator when clear of the Boom Radius.

6.4 Cable Tractor & Dragline Trailing Cable

- 1) Establish a dragline escape route layout in preparation for emergency egress.
- 2) Cable tractor operator must maintain radio communication with Dragline Operator and follow all safe approach requirements.



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- 3) The trail cable should be routed in a manner that allows the dragline to walk two steps away from potential ground control problems. Layout the trail cable in preparation for the next planned dragline move.
- 4) Do not park the cable tractor inside the Boom Radius. If highwall ground control conditions are unsafe or uncertain, parking the cable tractor inside the Boom Radius near the dragline may be warranted for expedited action. In that case, follow up with supervision and the Dragline Operator to determine the appropriate location to park the cable tractor. If required to park the cable tractor inside the Boom Radius, it must not be within the Active Operating Angle or within 10' of the Shoe Swing Radius. Also, the cable should be secured to the D-ring of the tractor. The cable should be wrapped with a nylon sling and positioned in such a manner to allow quick cable handling processes.

6.5 Walking Dragline

- 1) Place machine in propel phase. Blow the horn three times indicating the dragline is to propel.
- 2) Ensure the Ground Person has prepared the bench properly.
- 3) Water if bench is too dry. If muddy, clean mud and watch for tub spinning.
- 4) Never walk machine unless the Ground Person has given clear signal.
- 5) Watch the front edge of the tub to make sure it's not pulling a roll.
- 6) Establish positive communications with Cable Tractor Operator and Ground Person.

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

- 950C-C-028 Hazardous Energy Isolation Code
- 962C-SOP-042 Safe Approach to Equipment

9.0 APPENDICES

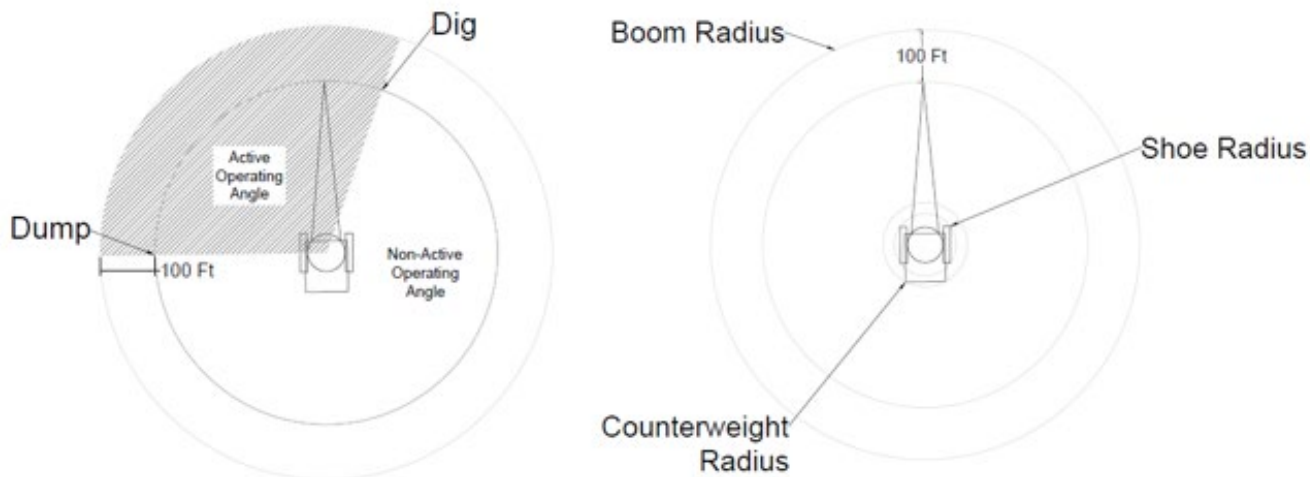
- Appendix A Conducting Work in Dragline Boom Radius
- Appendix B High Voltage Power Cables
- Appendix C Duties Allowed in the Non-Active Operating Angle of the Boom Radius

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Appendix A Conducting Work in Dragline Boom Radius



NON-DRAGLINE FAMILY

No equipment operated by non-dragline personnel may enter the Boom Radius of a dragline without first establishing radio contact with the dragline operator.

- The dragline operator will acknowledge the request, stop motion, set the brakes, and allow the equipment into the Boom Radius. Due to the disruption of productive digging, this practice needs to be kept to an absolute minimum.
- If equipment needs to pass in front of the dragline, the dragline bucket must be raised to provide proper clearance of the drag ropes and the hoist brakes set. At no time can any person or equipment work under a suspended bucket.
- No equipment servicing or repairs should be performed inside the Active Operating Angle.

DRAGLINE FAMILY

The dragline family (Dragline Operator, bulldozer operator, and cable tractor ground person) may be operated inside the Boom Radius of the dragline only with the full knowledge and permission of the Dragline Operator. They may not work within Active Operating Angle (Dig to Dump Zone) of the dragline.

- Radio communication must be maintained.
- Digging sequence may need to be altered to allow the activity (dumping short against spoils to avoid work area).
- Dragline equipment must be parked outside the Boom Radius when equipment is not in use.

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- No dragline family members may be inside the dragline Shoe Radius or Counterweight Radius under any circumstances while the machine is engaging in a swing motion.

WALKING THE DRAGLINE

While in propel mode (walking), if personnel need to be inside Counterweight Radius or Shoe Radius, the Dragline may not step until given the "all clear" to do so by the personnel involved.

- Any personnel inside the Counterweight or Shoe Radius will be in constant radio communication with the Dragline Operator.
- Each step the dragline takes will need to be cleared by the personnel within the Counterweight or Shoe Radius until such time as those personnel can exit the Counterweight or Shoe Radius.
- Under no circumstances will any personnel be allowed on the dragline shoe during normal operation of the dragline, including while propelling (walking).
- When using grease bags to lubricate the walking mechanism, the dragline shall be stopped and the swing and propel brakes set.

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Appendix B High Voltage Power Cables

- 1) Power cables are not to be driven over at any time by any vehicle – neither energized nor de-energized. Cable crossings must be used to cross Power Cables (preferably, overhead crossings).
- 2) Overhead crossings are to be painted or taped with reflective tape or have flashers for easy visibility during dark hours of operation.
- 3) Overhead crossings are to be placed in all locations where needed and placed in such a manner that equipment can pass through safely. If two-way traffic exists for coal haulers, scrapers, or other heavy equipment, overhead crossings must allow for adequate clearance.
- 4) Whenever handling energized electrical cables, electrical gloves must be worn. These gloves are provided at all draglines. If additional gloves are needed, contact the electrical supervisor or the safety department.
- 5) Electrical gloves are made of high-grade rubber that can withstand 20,000 volts. This rubber glove is protected by an outer leather glove. The gloves must be inspected and tested by a laboratory every 30 days to ensure their insulating properties. Avoid body contact with the cable when handling Power Cable with electrical gloves. Before using electrical gloves, inspect them to ensure that the rubber liner is in good condition and that the outside leather glove is in good condition. The gloves are to be stored in a clean, dry location. After use, ensure electrical gloves are stored properly in canvas bags. If there is a question about the safe condition of the electrical gloves, do not move forward with the task and notify your supervisor or the electrical department for replacement.
- 6) Moving Cable – Several precautions must be taken when moving power cables. Care must be taken to ensure that the bending diameter does not become too tight and damage the internal conductors. The correct bending diameter, according to manufacturers' specifications for cables over 5,000 is 16 times the diameter of the cable. Therefore, the minimum bending diameter allowable is:
 - a. 8kv cable diameter 2-3/8 inches x 16 = 38-inch bending radius
 - b. 25kv cable diameter 3-5/8 inches x 16 = 58-inch bending radius
- 7) Cable bending diameter is measured from the inside to inside of cable.
- 8) When moving the power cable, a D-Ring should be used whenever possible. If it is necessary to use a sling to pull the cable, the sling must be tied to the cable in at least two locations to ensure that the proper bending diameter is maintained.
- 9) The length of the cable loop being pulled must not exceed 250 feet under any circumstances.
- 10) Electrical gloves are not necessary on de-energized cable if Lock Out / Tag Out Procedures are followed. A visible check of the disconnect is required to ensure the knives are open and the prongs must be grounded out for static charge.
- 11) Electrical gloves must be worn when using the cable hook.

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- 12) Power Cables must be properly tied off at electrical connections to provide strain relief. Use Kalum grips to secure PLM plugs together.
- 13) Always notify supervisor or electrician when in doubt about cable procedures.
- 14) When moving cable, avoid pulling cable over edges, rocks, and or jagged surfaces.
- 15) Inspect the area where the cable will be laid (rocks, water, mud, obstructions, etc.). Avoid laying Power Cable in low lying areas where water may pool.
- 16) Be aware of the opposite end of cable being pulled (the end attached to skid).
- 17) Cable can be damaged under normal use. Inspect for nicks, cuts, and stretched out areas before handling.
- 18) Report any damaged cable to your supervisor and the electrical department.
- 19) Power Cable must be marked with pylons immediately after the cable is moved. Pylons should be placed right next to the cable, no farther than 100 feet apart.
- 20) Look for potential hazards:
 - a. Power Cable lying too close to highwall (potential slides and falling chunks).
 - b. Power Cable lying close to spoils (spoil slide potential).
 - c. Power Cable lying out too close to work active areas (potential of equipment damaging cable).
- 21) Nylon slings must be inspected. If red threads are showing or slings are frayed and knotted, they must be taken out of service and disposed of.

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Appendix C Duties Allowed in the Non-Active Operating Angle of the Boom Radius

The following list includes duties that are permitted in the Non-Active Operating Angle of the Boom Radius by authorized personnel while the dragline is actively working. If an additional task is required, it must be reviewed with Supervision and the Dragline Operator as well as documented on a hazard assessment.

- Position power cable for the next walking sequence.
- Check dig off width and set stakes for the next cut.
- Align and position machine.
- Check for proper safety berm height along highwall.
- Position crossing blocks.
- Keep walkway prepared for the next walking sequence.
- Maintain return walkway with proper safety berms in place.
- Keep safety berms along the top of the bench when needed.
- Push dirt rolls down at face of cut to avoid dragging ropes in the dirt.
- Push coal cleaning to the face of the cut to be removed by the dragline.
- During wet weather, clean the mud off the walkway with the dozer to avoid having the dragline tub spin.
- When necessary, keep the old pit floor clear of mud and water.
- Maintain a good road to the dragline.
- Placing offset stakes that are used for highwall alignment.
- Check tub elevation.
- Check and maintain grade for drainage.
- Check walkway grade.
- Inspect active working area.
- Inspect first 1000' cable.
- Position and adjusting trail cable.
- Troubleshoot trail cable.
- Cleaning coal.
- Topping soil peaks.

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Final Audit Report

2024-06-06

Created:	2024-06-06
By:	Tammy Siver (tsiver@nacg.ca)
Status:	Signed
Transaction ID:	CBJCHBCAABAAMRFf27r6FqQpU6JrdHL8tarcfquppOpx

"962C-SOP-051-R1 Dragline Operations_2024-06-03" History

-  Document created by Tammy Siver (tsiver@nacg.ca)
2024-06-06 - 3:36:36 PM GMT
-  Document emailed to Craig Nauta (cnauta@nacg.ca) for signature
2024-06-06 - 3:37:08 PM GMT
-  Email viewed by Craig Nauta (cnauta@nacg.ca)
2024-06-06 - 5:19:10 PM GMT
-  Document e-signed by Craig Nauta (cnauta@nacg.ca)
Signature Date: 2024-06-06 - 5:26:47 PM GMT - Time Source: server
-  Agreement completed.
2024-06-06 - 5:26:47 PM GMT