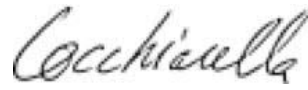
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SIGNATURE

DATE

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July 15, 2020

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ISSUE/REVISION INDEX

Issue Code	Revision					Revision Details
	No.	By	Rev'd.	App.	Date	
RR	PA	EC	SC			Originate date of creation

Issue Codes: RC = Released for Execution, RD = Released for Design, RF = Released for Fabrication, RI = Released for Information, RP = Released for Purchase, RPA = Released for Permit Application, RQ = Released for Quotation, RR = Released for Review and Comments.



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1.0 PURPOSE & SCOPE

1.1 Purpose

To ensure there is enough illumination to safely carry out construction activities at all NAPG managed projects.

1.2 Scope

This procedure applies to all NAPG construction workplaces, walkways and other areas where workers may be present. Also, it applies to all indoor or outdoor locations where natural illumination is insufficient such as night-time work.

2.0 ROLES AND RESPONSIBILITIES


The **Project Construction Manager** has overall responsibility for implementing the requirements of the procedure and ensuring adequate lighting is maintained through all construction phases. Also, this role shall ensure all existing Vale lighting is functional and maintained.

Contractors are responsible for the lighting for the scope of their work activities, unless otherwise stated in contract documents.

The **Project HSE Advisors** are responsible for monitoring workplace conditions to ensure the requirements of this procedure are met.

Construction management is responsible to enforce this procedure and ensure that JHAs consider lighting.

Each **worker** is responsible to follow this procedure.

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3.0 DEFINITIONS

Area lighting: used to illuminate general work environments, laydown area, drop off and pick up locations, pedestrian access and egress, crossings and travel ways. Typically, is positioned overhead hardwired on posts or temporarily installed mobile light towers.

Decalux: A measure of illumination intensity. 5 decalux (or 50 lux) is about as bright as a fully overcast sunrise or sunset.


Intrinsically Safe Device: A device termed intrinsically safe is designed to be incapable of producing heat or spark sufficient to ignite an explosive atmosphere. In normal use, electrical equipment often creates tiny electric arcs (internal sparks) in switches, motor brushes, connectors, and in lights. Compact electrical equipment generates heat as well, which under some circumstances can become an ignition source. For handheld electronics, intrinsic safety is a method that allows a device to be explosion-proof.

Supplemental lighting: typically, personalized lighting used to illuminate close-proximity high dexterity tasks and eliminate shadows in cabinets, equipment compartments, and other covered or shaded areas. Supplement task and area lighting methods include:

- 0 Directional lights,
- 0 Handheld work lights,
- 0 Snake lights, and
- 0 Headlamps.

Task lighting: used to brightly illuminate work platforms and immediate working environments. While primarily established to complete work tasks, this type of lighting is also used in stairwells, ladder ways and platforms etc. Types typically include:

- 0 Overhead halogen and string lights,
- 0 Halogen and LED work lights, and
- 0 Wobble lights.

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4.0 REGULATORY AND OTHER REQUIREMENTS

Regulations in jurisdictions where Vale operates all require adequate workplace lighting, including:

Construction Projects, O. Reg. 213/91: requires adequate lighting, bulb protection and emergency lighting in some situations.

Workplace Safety and Health Regulation, Manitoba Reg. 217/2006: requires adequate lighting and minimum 5 decalux where workers pass.

Occupational Health and Safety Regulations, Newfoundland and Labrador Reg. 5/12: requires sufficient and suitable lighting; refers to standards set by American National Standards Institute - Illuminating Engineering Society.

5.0 REQUIREMENTS

5.1 Lighting Evaluation and Installation


The work group supervisor and contractor’s management team shall complete lighting evaluations, set requirements and install all required lighting prior to the mobilization of other workers.

Contractors shall assess lighting requirements for the worksite and work activity through the JHA process to determine the types and quantity of lighting required for safe work conditions. Various types of worksite lighting are available, and each work location must be individually assessed to ensure work can be carried out safely. This lighting can include *area lighting, task lighting or supplemental lighting*.

Where natural lighting is inadequate, *area or task lighting* must be provided in all work areas, access ways and for rescue equipment.

Area lighting must be bright enough to allow workers to distinguish ground condition, changes in elevation, and avoid slips trips and falls hazards. It **must** also be bright enough for operators of mobile equipment and light vehicles to see and distinguish pedestrian and dismounted personnel. Lighting shall be positioned to not blind heavy equipment operators such as scoops, trucks, etc.

Tasks **must not** be completed in the dark, shadows or without adequate lighting. Light sources must be positioned to eliminate shadows. All hazards must be visible to personnel.

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All materials used for lighting systems shall be suitable for the work environment, any known potential hazards and reasonably protected from damage. The best way to protect lighting system from damage is to typically mount or suspend them in an elevated position. Always coordinate with operational and project management prior to installation. Use caution in areas of mobile equipment use or moving operational systems like mills or cranes when placing lights and their power supplies.

Lighting near work activities must be designed and manufactured for purpose of construction and or mining work (heavy industry). Lights should have guard or cage systems bulbs are required to be rough service or ruggedized. Where PMRA or JHA assessments or conditions warrant the use of *intrinsically safe devices*, lighting sources must be certified as such.

All indoor work without adequate natural light, **and** all afternoon and nightshift work require lighting systems. Supervisors **shall visually ensure** on the beginning of the first shift that all required lighting is installed and functional. Lighting must be turned on from 30 to 60 minutes before dusk and remain on until 30 to 60 minutes after dawn. If natural light is inadequate, then lights must remain on 24/7.

The project shall ensure emergency lighting is available at a worksite if personnel are in danger should the normal lighting system fail. Emergency lighting must generate enough light to allow personnel to leave the worksite safely, start any necessary shut down procedures, and restore normal lighting. Emergency lighting systems are to be functionally checked on a regular basis.

5.2 Portable and Temporary Lighting

Portable lights **must** have adequate stability and be fitted with a mechanical guard to protect the lamp. Portable light plants must follow the electrical safety/grounding requirements in *NAPG Working Near Electrical Equipment and Power Lines* (NAPG-SAF-SPI-0014).


Temporary lighting must be grounded, insulated and supported at least 2.5m above the floor if possible.

As a last resort, additional lighting can be provided by vehicles systems. And should be used for mobile equipment activity **only**. No pedestrians should be co-located without hard barriers or adequate area lighting as a minimum.

5.3 Worker Requirements

Workers **must not** work where visibility is restricted.

Fog, dust, and all types of precipitation, structure and obstacles are all significant impediments to lighting efforts and can create their own hazards. These situations **must** be overcome with appropriate controls.

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6.0 MONITORING

The HSE Advisor may perform illumination checks for nighttime or indoor work to check conformance to minimum light requirements. The lighting requirements must meet applicable standards for the project's jurisdiction.

7.0 REFERENCE

NAPG-SAF-SPI-0005 NAPG Health and Safety Plan

NAPG-SAF-SPI-0014 NAPG Working Near Electrical Equipment and Power Lines,

Construction Projects, O. Reg. 213/91

Workplace Safety and Health Regulation, Manitoba Reg. 217/2006

Occupational Health and Safety Regulations, Newfoundland and Labrador Reg. 5/12

American National Standards Institute - Illuminating Engineering Society.

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