

	NAPG Confined Space Procedure NAPG-SAF-SPI-0032		Revision	
			#	Date
	Report No (DM#): 1440464		00	2020-09-09 annual
NORTH ATLANTIC PROJECTS GROUP				

	SIGNATURE	DATE
<i>PREPARED BY:</i> Ed Cocchiarella	_____	_____
<i>REVIEWED BY:</i> Shelley Cox	_____	_____
<i>APPROVED BY:</i> Darren Toner	_____	_____

ISSUE/REVISION INDEX

Issue Code	Revision					Revision Details
	No.	By	Rev'd.	App.	Date	
RR	PA	EC			2019-01-06	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

This document describes the minimum requirements and recommended best practices to undertake work safely in a confined space (CS) on a NAPG managed project.

1.2 Scope

This document applies to any NAPG project work that requires entry into a CS as defined by applicable local legislation or the CS program of the local Vale Operations, whichever is more stringent.

This document primarily applies to NAPG projects in execution phase but may also be applied to fieldwork or early works during Front End Loading (FEL) studies at the discretion of the Project Director/Manager.

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2.0 ROLES AND RESPONSIBILITIES

The following sections identify responsibilities related to confined space entry and work on NAPG projects. The role names listed should not be considered job titles but rather roles that may be assumed by various individuals depending on the scope and organization of a project.

2.1 Project

2.1.1 Project Manager/Director

The Project Manager (sometimes called Project Director for larger projects) role has overall responsibility for project execution performance including health and safety. The Project Manager represents the owner and sometimes acts as the constructor/prime contractor or employer. The role holds his or her subordinate managers, other supervision and contractors accountable to carry out the obligations of their roles.

With respect to CS management the Project Manager shall:

- Approve the CS program to be adopted on the project.
- Provide resources to ensure adequately trained and competent CS workers, including attendants, testing technicians and rescuers.
- Provide resources to ensure there is adequate and well-maintained CS PPE, ventilation, testing, communication and rescue equipment.
- Hold project staff and contractors accountable for CS work performance and regulatory compliance through reporting, inspections and audits.

2.1.2 Construction Manager/Area Managers

The Construction Manager has overall accountability for construction activities including all facets of HSE, labour relations, project execution, site administration and general management. Depending on the size and execution strategy the role may have subordinate area managers, may work for the constructor/prime contractor or the role may be integrated with the Project Manager role.

With respect to CS management the Construction Manager shall:

- Ensure CSs are identified, secured and appropriately signed.
- Ensure the PMRA and JHA processes are followed and adequately supported to identify CS risks and controls.
- Hold contractors accountable to follow all CS regulatory and program requirements.
- Implement the project work permit system including CS Entry.
- Ensuring appropriate CS and rescue training is provided.
- Maintain an inventory of all CS on the project.

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2.1.3 Engineering Manager

The Engineering Manager role manages the development of the project's technical specifications to meet the project's purpose, legislative requirements and best practices, including H&S standards.

With respect to CS management the Engineering Manager shall:

- Identify potential for CS work during construction and future operations, and take reasonable measures to eliminate them through detailed engineering.
- Provide for suitable confined spaces features through detailed engineering,
- Ensures CS engineered features meet all regulatory and Vale requirements.

2.1.4 Manager- Health, Safety, Environment and Risk (HSER)

Reports directly to the Project Director and provides overall direction for all health, safety, environment and risk accounting activities at site. Depending on the scope of the project this role may also have subordinate HSE Coordinators. Together the roles provide overall direction for all health, safety, environment and risk accounting activities on the project.

With respect to CS management the Manager, HSER and HSE Coordinators shall:

- Advise the project management and contractors on CS program requirements.
- Support the Project Manager to approve the CS program to be adopted.
- Support the work permit, PMRA and JHA processes for CS work.
- Inspect and audit CS work for conformance with regulatory and program requirements.
- Support training for workers involved in CS work.
- Liaise with Vale Operations Health and Safety Manager to adopt their CS Program and request training, information and interpretation as required.

2.2 Local Vale Operations

2.2.1 Health and Safety Manager (H&S)

The Vale Operations H&S Manager works for the host or closest Vale operation for a project and plays a key role to ensure their CS Program is appropriately adopted on the project.

With respect the CS management on the project the H&S Manager is expected to:

- Support the project by providing CS Program documentation, procedures, assessment forms, CS entry permit forms and any other CS documentation required.
- Liaise with the project Manager-HSER to provide information, interpretation and training as may be required.

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- Provide or advise on other support as may requested, e.g., CS atmospheric testing.

2.3 Contractors

Contractors have the employer role in most CS work situations. On some projects, depending on their scope and organization, a contractor may also undertake the constructor/prime contractor role. The employer and constructor roles have legal obligations as set out by the regulatory jurisdiction where the project is located.

With respect to CS work, contractors shall:

- Meet all regulatory obligations and follow the adopted CS Program.
- Implement the PMRA and JHA processes to identify CS risks and controls to the project's satisfaction.
- Provide trained and competent workers to safely carry out CS work, including designating a Confined Space Entry Supervisor.
- Obtain all necessary work release permits required for CS work.
- Provide or arrange for all necessary attendant, rescue and atmospheric testing personnel and equipment for all CS work.
- Ensure all rescue, communication and atmospheric testing equipment is inspected, calibrated and maintained, as required.
- Maintain all records required by regulation or Vale and make them readily available for inspection or audit.

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3.0 DEFINITIONS

Codes: Rules and standards that have been adopted, by a Government agency or professional regulatory body, as mandatory regulations having the force and effect of law.

Confined Space (CS): For the purposes of this document the definition from Ontario Regulation 632/05, which has the broadest application, is adopted:

“confined space” means a fully or partially enclosed space,

(a) that is not both designed and constructed for continuous human occupancy, and

(b) in which atmospheric hazards may occur because of its construction, location or contents or because of work that is done in it;

If there is uncertainty about whether a work area should be deemed a confined space, then NAPG projects may evaluate whether there are:

- Restricted means of access and egress, or
- Conditions that pose a hazard other than atmospheric hazards, e.g. its design, construction, location, and the materials or substances in it.

HSE: Acronym signifying Health, Safety & Environment.

Job Hazard Analysis (JHA): A systematic analysis of the steps involved in doing a task, the hazards or loss exposures involved and the controls necessary to prevent loss. It is a pre-requisite to the development of Safe Work Procedures (SWPs) and focuses on the relationship between the worker, the task, the tools, and the work environment.

KPIs: Key Performance Indicators, or specific behaviours expected of managers, i.e. being involved in specific environmental and safety activities and demonstrating safe behaviours to others.

Legal Requirement: A requirement that can be enforced by law.

Non-conformity*: The non-fulfillment of specified requirements. Examples may include:

- injury,
- imminent danger or high potential incident (Vale Class A without injury),
- property damage (including proven ‘upsets’ to Vale water treatment facilities),
- audit finding,
- regulatory inspection order,

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- exceedance of legal requirement,
- environmental occurrence, or
- substantiated public or employee complaint.

Other Requirement: Other requirements include company codes of practice, industry codes of practice; agreements with public authorities; and non-regulatory guidelines to which the organization subscribes, e.g. Vale Critical Activity Requirements.

Preventive: Those objectives/measures/indicators/targets etc. that focus on “processes” or systems to prevent HSE-related incidents (often termed “pro-active”) such as the development/implementation of management systems (e.g. inspection, communication, incident investigation, training & competency assessment, auditing systems etc).

Procedure: An established and defined method of performing specified work in a step-by-step or sequential manner. There are generally “management procedures” that describe systematic management processes and “work procedures” that describe the various steps required to safely undertake a particular task.

Pre-Mobilization Risk Analysis (PMRA): Vale’s program to identify and evaluate potential HSE hazards and risks associated with work activities and the area in which work will be undertaken. Generally completed once per contract.

Project: Refers to an NAPG Project, and the executing project team.

Records: Evidence that the task(s) have been performed. Examples include reports, forms, personnel qualification records, equipment qualification records, inspection and test records.


Regulatory Authority: The Federal, Provincial, Territorial, or Municipal agency having the lawful right and power to interpret the law and exercise authority.

Risk: The chance of something happening that will have an impact on objectives.

Note: A risk is often specified in terms of an event or circumstance and the consequences that may flow from it.

Standard: The defined criterion for effective HSE performance or accepted behaviours. HSE performance standards define who is responsible for performing what work and at what frequency or when.

Work Practice: A set of guidelines for performing a specific work assignment properly (efficiently – safely – productively).

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4.0 COMPLIANCE OBLIGATIONS

All jurisdictions in which Vale has mining and smelting operations have regulatory requirements for entry and work in confined spaces. Each NAPG project must comply with all regulatory requirements for the jurisdiction where confined space work is taking place. These include but are not limited to the following:

- For Ontario: O. Reg. 632/05, Confined Spaces,
- For Newfoundland and Labrador: Reg. 70/09 s.XXVII, Confined Space Entry,
- For Manitoba: Reg. 217/2006 Part 15, Confined Spaces.

In addition, NAPG projects must comply with all Vale Critical Activity Requirements including Confined Spaces (RAC 6).

Appendix A provides a summary of the compliance obligations of each jurisdiction and RAC 6. These should be considered as a guide only. Refer to the actual regulations for detailed requirements.

In almost all cases the responsibility to carry out the requirements or ensure they are met is assigned to the employer. One exception is development of a coordinating document for multiple contractors working in a CS for projects in Ontario that is assigned to the Constructor/Prime Contractor. All parties on an NAPG project must be aware of and accept their responsibilities as employers under their applicable regulations.

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5.0 REQUIREMENTS

In a brownfield situation each NAPG project shall adopt the CS Program of the host Vale operation.

In a greenfield situation, each NAPG project should adopt the CS Program of the nearest Vale operation located in the same regulatory jurisdiction, if practical. For example, the project must consider how training requirements would be delivered for remote locations and whether a project-specific CS Program would be more effective.

All NAPG projects must also meet the legal requirements of the regulatory jurisdiction where the project is located.

The following sections indicate the CS program elements that NAPG must implement if they are:

- part of the Operations CS program that the project is adopting,
- a RAC requirement, or
- a regulatory requirement.

Otherwise these elements should be considered best practices that each project may choose to adopt.

5.1 Detailed Engineering

The detailed engineering process should identify potential CS situations for both construction and future operations, and make reasonable efforts to eliminate them in the design or to minimize the work requiring CS entry. Where a CS work is unavoidable, suitable access should be provided including, adequate rescue considerations, access doors, platforms, stairways, anchor points for rescue equipment, etc.

When developing work packages for bidding, the anticipated CS work must be clearly identified and communicated to contractors. This will allow the technical bid review to consider how bidders plan to address CS work.

5.2 Confined Space Program

Provide the CS program, procedures, and coordinating documents, and the related forms to the Constructor/Prime Contractor, Contractors and project staff, as required.

Develop an inventory of CSs within the scope of the project either using an existing inventory as a base (brownfields) and from design information. These should be transferred to Vale operations as part of commissioning activities.

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5.3 Hazard Assessment

Conduct CS hazard assessments through the PMRA and JHA processes and prepare assessment documentation required by the adopted program or relevant legal requirements.

Ensure a competent person leads, documents and signs off on CS hazard assessment document.

Include a copy of the CS hazard assessment as part of the CS entry permit.

Make the CS hazard assessment available to the project Joint Health and Safety Committee (JHSC) and all workers involved in the CS work.

If multiple contractors are required to work in a CS at the same time, then the constructor must prepare a coordinating document to ensure the safety of all workers and distribute copies of it to the affected contractors/employers and the project JHSC, if any.

5.4 Work Method

Develop a detailed written work method through the JHA process before entry to the CS. Include hazard and risk controls to be implement by a competent person.

Instruct all CS workers on the work method and ensure the workers understand the work and the hazard/risk controls.

Include a suitable and adequate means of entry and exit for all CS workers, including a means of extraction in an emergency. This may require additional stairways, platforms, scaffolding, and/or access point modifications.

If the work method requires altering the CS to improve access and egress then structural integrity of the CS must be maintained.

5.5 Training

Provide CS hazard recognition training to all project workers as part of project orientation.

Provide CS Supervisor training to all supervisors involved in CS work and approvers of CS entry permits, including first aid and cardio-pulmonary resuscitation (CPR) elements.

Provide CS Attendant and Authorized Entry training to workers involved in CS work, as required, including first aid and CPR.

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Provide training on rescue procedures and equipment to all designated CS Rescue team members, including first aid and CPR.

Ensure the employer keeps records of all CS training for their employees and makes them readily available for inspection and audit.

5.6 Entry Permits

Implement the CS entry permit system and forms required by the CS program adopted by the project. CS entry permits must be attached to project work release permits along with other relevant permits e.g. hot work permit, etc.

The CS entry permit must contain all the information required by applicable regulations and the adopted CS program.

A designated, trained and competent person verifies information and approves CS entry permit.

The approved CS entry permit is provided to all CS workers and made available at the CS location.

5.7 Rescue Procedures and Equipment

Workers may only enter a CS and perform work according to the approved plan. If work method changes are required then all workers must safely exit the CS and the plan must be reviewed and re-approved through the CS Entry Permit process before re-entry.

For each CS job determine if workers require a full harness, lifeline and/or personal hoisting device, e.g., a top entry CS. If not practicable, an alternate effective method must be available.

Establish and follow adequate written emergency rescue procedures and make them available for immediate implementation in the event of a CS accident.

Make appropriate rescue equipment and communications devices readily available to the CS rescue team. A competent person must inspect rescue equipment and communications devices at least daily on first entry.

The CS attendant must have a suitable communications device to summon the rescue team, if required.

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The emergency rescue procedure must specify the number of trained rescuers are required to respond and how many of them must be readily available, i.e, able to attend the CS within 5 minutes of notification. A minimum of two rescuers (the rescue team supervisor and another trained person) must be readily available. The attendant stands by to provide communication but cannot be part of the rescue effort.

The rescue plan must be tested with a walk-through exercise before CS work begins. In some cases a mock emergency drill may be required.

5.8 Personal Protective Equipment (PPE)

Provide CS workers with PPE and respiratory protection suitable for the hazards as determined in CS hazard assessment. PPE may include a full harness, a retractable line and salo block, if suitable, should emergency extraction be required.

5.9 Lock Out/Tag Out

Identify and take measures to ensure all energy sources are put into a zero energy state and locked out and tagged according to the project lock and tag procedure.

Measures may include disconnecting, blanking, and/or de-energizing equipment, pipes, and supply lines. Also ensure liquids and free flowing materials do not cause a CS hazard. Pay special attention to sudden release of overflow materials, e.g., water slurry or dust into sumps and tanks, as well as transient or fugitive contamination from sources outside of the system's isolations, e.g., SO2 or CO from stacks or burners, and acid gas from adjacent lines or plants.

5.10 Attendant

Designate a trained attendant to be stationed outside the CS whenever there are workers inside.

The attendant must be in continuous communication with the workers inside, monitor their activities and be ready to assist and/or summon rescue if required.

The attendant may tend lifelines for workers inside, if specified in the work method.

The attendant cannot perform other tasks that may otherwise limit their ability to fulfill the role.

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5.11 Unauthorized Entry

Secure and provide permanent warning signs at all entrances to CSs to inform about the hazard and prevent unauthorized entry. Temporary signs may be used for construction and later replaced with permanent warnings signs.

During the CS work, provide barricades, warning signs and any other appropriate barriers to keep vehicles and unauthorized personnel away.

5.12 Atmospheric Testing

Do not allow any entry to the confined space without appropriate atmospheric testing for hazards identified in the hazard assessment that shows an acceptable atmosphere.

A trained competent person must perform CS atmospheric testing and any calibration and maintenance of the test equipment required before each use.

Test for explosive, flammable or harmful substances and oxygen deficiency, before entry, after work interruptions and at suitable intervals. In some cases continuous monitoring may be required.

5.13 Explosive and Flammable Limits

Regulations for acceptable explosive or flammable levels and oxygen ranges in CSs vary by jurisdiction and the type of work being performed. The CS Program adopted by the project may have more stringent requirements. Each project must establish what standards are applicable for use on the project.

Regulations may require a monitoring and alarm system with an exit procedure if explosive limits or oxygen ranges are exceeded for some types of work, e.g. hot work.

In order to avoid potential leaks of flammable materials into a confined space, the work method should include:

- Keeping compressed tanks for cutting, burning, heating or other combustion out of the CS.
- Appliances and lines must not be left in a CS during breaks, overnight or other periods of no work. Lines should be rolled back. Valves and regulators should be turned off when not in use.
- Drainage or purging should not occur in the CS.
- No repairs to equipment should be made in the CS.

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5.14 Ventilation and Purging

Use ventilation, purging, and/or cleaning by a competent person to maintain the CS atmosphere within acceptable limits.

Mechanical ventilation must have a failure warning function.

If ventilation/purging cannot achieve an acceptable atmosphere then respiratory protection, other PPE, eliminating sources of ignition, making the atmosphere inert, keeping rescue equipment on hand and other measures in an appropriate combination may achieve an acceptable risk level to carry out the work.

If an explosive or flammable hazard has been identified for a CS then certified explosion-proof equipment, electrical devices and illumination must be used.

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6.0 REFERENCES

- Ontario Regulation 632/05, Confined Spaces,
- Newfoundland and Labrador Regulation 70/09 s.XXVII, Confined Space Entry,
- Manitoba Regulation 217/2006 Part 15, Confined Spaces.
- NAPG Health & Safety Plan

**APPENDIX A:
REQUIREMENTS FOR WORK IN CONFINED SPACES BY JURSDICTION AND RACS**

DOCUMENT END