

Confined Space Entry Plan

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1.0 PURPOSE

This plan describes the general precautions required for protecting workers when entering a confined space. It defines responsibilities and practices for evaluating the work areas and developing the proper procedures and permit for safe entry.

It establishes requirements for confined space entry at the CLS facility for compliance with Part XI of the Canada Occupational Health and Safety Regulations.

2.0 BACKGROUND

Confined space means an enclosed or partially enclosed space that is not primarily designed or intended for human occupancy, except for the purpose of performing work and has a restricted means of entrance and exit. There are areas identified in the CLS facility that fit this definition. The Canada Occupational Health and Safety Regulations (Part XI) require that the employer identify these locations, the types of hazards that are or may exist at each confined space and where reasonably practicable use alternate means to perform the work without entering the confined space.

2.1 DEFINITIONS

Confined Space – means an enclosed or partially enclosed space that:

- i) is not primarily designed or intended for human occupancy, except for the purpose of performing work; and
- ii) has a restricted means of entrance and exit
- iii) may become hazardous to any person entering it owing to
 - a. its design, construction, location or atmosphere,
 - b. the materials or substances in it, or
 - c. any other conditions relating to it

Isolate – means to physically interrupt or disconnect pipes, lines and sources or energy from a confined space

3.0 REGULATORY REQUIREMENTS

- Identify the confined space and the associated hazards
- Avoid entry into a confined space if possible
- Ensure there is a safe entrance and exit
- Hazards are assessed and monitored by a competent person
- Entry permit must be completed
- Equipment necessary for a rescue is readily available and personnel are properly trained

4.0 RESPONSIBILITIES

4.1 EVERYONE AT CLS FACILITY

- Shall use safeguards, safety appliances and personal protective equipment provided.
- Shall follow safe work practices and procedures required.

4.2 MANAGERS AND SUPERVISORS

- Identify the types of confined space that a worker may be required to enter.
- Identify the types of hazards that are or may be present at each confined space.
- Identify alternative means to perform the work that will not require the worker to enter the confined space.
- Ensure there is a safe entrance and exit from the confined space.
- Prevent any unauthorized entry into a confined space.
- Before a worker enters a confined space, a competent person is appointed to assess the hazards and test the atmosphere for hazards.
- Ensure a Confined Space Entry permit is completed for each entry and a copy submitted to CLSI HSE Department.
- Post the permit at the work area.
- Provide training on the hazards and the proper use of PPE.

4.3 CLSI HEALTH, SAFETY AND ENVIRONMENT (HSE) DEPARTMENT

- Assist in the identification of the confined space and the hazards.
- Perform atmospheric testing to determine the presence of hazards in the confined space upon request from the Manager or Supervisor

5.0 HAZARD IDENTIFICATION

5.1 OXYGEN DEFICIENCY

Oxygen deficiency occurs in confined space when the oxygen has been consumed by the oxidation process of metals, bacterial action, combustion or the displacement of the oxygen by other gases.

Normal air contains 20.9% oxygen. An oxygen deficient atmosphere is one that contains less than 19.5% oxygen. Ventilation can be used to help maintain a normal atmosphere. Workers shall not be permitted to work in any atmosphere that is less than 19.5% oxygen without an air supply.

If the oxygen concentration is above 23% oxygen then there is an oxygen rich atmosphere and the area must be ventilated to reduce the concentration of oxygen.

5.2 COMBUSTIBLE GASES AND VAPOURS

Combustible gases and vapour hazards include naturally occurring gases and vapours used as fuel and solvents. Some of these materials vapourize quickly. When mixed with air they will burn or explode when ignited. This will cause a fire hazard and the gases could also be toxic. Purging the confined space and ventilating with fresh air will keep the gases and vapours below the lower explosive limits. The Material Safety Data Sheets (MSDS) will provide these limits. Ignition sources must also be eliminated.

5.3 TOXIC ATMOSPHERE

In confined spaces, toxic atmospheres can cause serious health effects and even death. The poisonous effects can be immediate (acute), delayed (chronic) or a combination of both. Contaminants of these kinds usually occur from material previously stored in the space or as a result of the use of coatings, solvents or preservatives. Decomposing organic matter can produce gases such as methane, carbon monoxide, carbon dioxide and hydrogen sulphide. Some have colour and odour but human senses cannot be relied upon for detection of these gases.

When evaluating the toxic hazard of a chemical or a contaminant it is important to know the route of entry into the body. Materials can enter the body through inhalation, ingestion, absorption and injection. Knowing the route of entry will assist with deciding the type of PPE required for the worker e.g. gloves, respirator, etc...

5.4 OTHER

There are numerous other hazards that can be associated with a confined space. Some of these include: radiation, vibration, noise, extreme temperatures, slippery surfaces, cramped quarters, electrical shock, moving equipment and sharp edges. The presence of these hazards must be evaluated and safe guards put in place to protect the worker.

6.0 HAZARD CONTROLS

6.1 ISOLATION AND LOCKOUT

Any confined space must be isolated from the possible release of hazardous substances into the work area and the start up of any equipment associated with the confined space. There are only 2 acceptable methods of isolating the flow of material from pipes into a confined space. The first is using a Blank in the pipeline and the second is the Double Block & Bleed Method. If there is a possibility of a startup of equipment then the equipment must be locked out using the CLSI "Lockout/Tagout Procedure" (11.7.37.1).

6.2 VENTILATION

Before any work starts, consideration must be given to ventilation. This may be through natural ventilation through clean-out doors or mechanical means.

Ventilation is used to maintain a safe breathing atmosphere while workers are inside. It can be used to displace or dilute potentially hazardous conditions before they become dangerous. Natural ventilation might not be sufficient alone because air will travel along the path of least resistance and the air might not reach all areas in the confined space. Air must be forced into the confined space to be effective. The length of time required for ventilation depends on many things: size of the confined space, the amount of air moved by the ventilation system, the source of the contamination and the vaporization rate of the contaminant. The ventilation of the confined space must continue until the work is complete and must not be interrupted while the worker is in the area. If the ventilation of the area stops then the workers must leave the area until ventilation resumes.

6.3 ENTRY PERMIT

The Entry Permit is an administrative tool used to document the completion of a hazard assessment for each confined space entry. All work done in a confined space must be done under a "Confined Space Entry Permit" (11.11.52.4). The purpose of the permit is to ensure that all necessary precautions are taken before any confined space entry is made. The type of operation to be performed in a confined space will determine the controls necessary to do the

work safely and protect the health of the workers. The permit outlines the precautions necessary before entering the confined space. The permit will contain job specific information and is only valid on the day that it was issued. The entry permit is unique for each confined space to be entered and must remain at the confined space entrance until the completion of the job.

6.4 PERSONAL PROTECTION EQUIPMENT (PPE)

Each confined space has its own particular hazards. There could be any number of physical hazards like slipping or physiological hazard such as a toxic gas. The most common PPE worn are for: eye protection, head protection, foot protection, respiratory protection, safety belts and lanyards, lifelines and fall arrest devices. The PPE could vary from one confined space to another. It is important that all PPE is used according to the manufacturer's instructions and that the equipment is properly maintained. Refer to the "Personal Protective Equipment Guide" (11.1.11.2).

6.5 ACCIDENT/INCIDENT REPORTING

Reporting accidents or incidents is an important key to allow the prompt correction of hazardous situations that could have serious affect on the health and safety of individuals. If an accident or incident occurs the worker should follow the "Accident/Incident Reporting Procedure" (11.7.52.2).

6.6 STAND-BY PERSON

A stand-by person has a critical role to play in confined space work. At no time should the stand-by person enter the confined space or allow his/her face to cross the plane of the confined space opening. The stand-by person is the only one who will be able to summon for help or begin a rescue operation from outside the confined space.

Some things a stand-by person should do:

- Know the location of the confined space and the configuration
- Know the hazards associated with the confined space
- Barricade the entrances to the confined space
- Be aware of the pre-entry air monitoring results
- Know the workers and how many will be in the confined space
- Ensure the proper PPE is being worn
- Ensure there is a means of communication with the workers inside
- Ensure all rescue equipment is at the confined space
- Have a method of summoning help if needed
- Prevent entanglement of lifelines
- Never leave the station unless the workers are out of the confined space
- Ensure the permit has been completed and posted at the entrance

This is not the complete list of duties for the Stand-by person. The more the Stand-by Person is involved, the more information he/she can give the rescue team should an emergency occur.

7.0 ENTRY PROCEDURES

7.1 ENTRY

Everyone working in a confined space must be properly trained in safe entry and rescue procedures and must have a knowledge and understanding of their equipment and potential hazards that exist. A "Confined Space Entry Permit" (11.11.52.4) must be completed and issued

prior to entry into the confined space. The work space must be made safe for the workers e.g. through purging or addition of proper ventilation if required. The workers entering the confined space must have the proper PPE as indicated by the Entry Permit. A system of communication must be established between the worker and the stand-by person.

7.2 RESCUE

Rescue procedures must be established prior to any worker entering the confined space. This is done so that injured workers may be quickly and safely removed. The time to prepare for the rescue is before entry. Doing this ensures staff know their assigned tasks and have the equipment ready if needed to perform an emergency rescue. The type of rescue equipment and procedures will vary with each confined space. The workers must be trained on the proper use of all safety equipment.

Rescuers must not enter a confined space unless others are standing by in the event additional help is required in the rescue.

8.0 RECORDS

Confined Space Entry Permits will be kept in a binder located in the Control Room a copy shall be submitted to the CLSI HSE Department.

Records of training provided to the workers shall be submitted to the CLSI HSE Department, entered into the training database and placed on the worker's personal file.

All hazard analysis documents shall be submitted to CLSI HSE Department for review and kept on file in Room 2018.

The list of Confined Space locations will be maintained by the CLSI HSE Department.

9.0 REFERENCES

Canada Occupational Health and Safety Regulations, Part XI.

Saskatchewan Construction Safety Association Inc. *Confined Space Entry in Construction*

Canadian Light Source Inc. *Personal Protective Implementation Guide*, 11.1.11.2

Canadian Light Source Inc. *Confined Space Entry Permit* (11.11.52.4).