



Chlorination Buildings and Regulatory Requirements

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- ❖ The Occupational Health and Safety Division is responsible for the enforcement of the Occupational Health and Safety Act and Regulations.
- ❖ There are numerous sections of legislation which can apply to chlorination systems.



Occupational Health and Safety Program

- ❖ Under Section 36.1 of the Occupational Health and Safety Act “ *Where 10 or more workers are employed at a workplace, the employer shall establish and maintain an occupational health and safety program in accordance with the regulations.*”
- ❖ Where less than 10 workers are employed an occupational health and safety policy shall be established.



Respiratory Protection

- ❖ Respiratory Protection is often required for work in chlorination buildings. This may include
 - Full face air purifying respirators for eye protection as well as respiratory protection.
 - SCBA respirators for emergency response or when the full face respirator does not provide enough protection.
 - Particulate/OV respirators where powdered calcium hypochlorite is being used.



Assigned Protection Factors (APF)

Concentration of Chlorine Gas	PPE Required
Less than 0.5ppm	<ul style="list-style-type: none">• No specialized PPE required
0.5ppm to 10ppm	<ul style="list-style-type: none">• Full Face Respirator fitted with Acid Gas Cartridges
Greater than 10ppm*	<ul style="list-style-type: none">• SCBA• Full Body Protective Clothing



When are respirators required?

- ❖ Respirators are required when changing a gas cylinder in gas chlorination systems.
- ❖ When there is a leak that needs to be repaired.
- ❖ If using powdered chlorine a particulate respirator may be required.
- ❖ Depending on ventilation and quantity of liquid sodium hypochlorite a respirator may be required.



Respiratory Protection Program

- ❖ When a respirator is required an employer is required to have a respiratory protection program in compliance with CSAZ94.4-11.
 - Key elements of this program include:
 - Designation of a Program Administrator
 - Roles and Responsibilities
 - Hazard Assessments
 - Change out Schedules
 - Training and Education
 - Care and Maintenance
 - Record Keeping



Working Alone

- ❖ An employer must have a policy and procedures for checking on workers who are working alone.
 - This must include:
 - Time interval between checks
 - Procedure to be implemented if contact is not made at the designated time.
 - To be developed in consultation with the worker and the OHS committee or designate.
 - Provisions for emergency response.



Safe Work Procedures

- ❖ Safe Work Procedures shall be developed and implemented for the following:
 - Changing Chlorine Cylinders
 - Leak Detection and Control
 - Adding sodium hypochlorite
 - Adding calcium hypochlorite
 - Container repair and use of repair kit
 - Disposal of damaged containers.
 - Preventative Maintenance Procedures



Emergency Response Procedures

- ❖ Written Emergency Response procedures must be developed and be ready for implementation.
- ❖ If using local fire departments to assist, the fire department must be trained (HazMat Training) and have appropriate equipment available.
- ❖ There must also be an agreement with the fire department indicating that they are willing and able to respond to an emergency.
- ❖ Emergency response plans must also include radius around pump house that must be evacuated.

First Aid



- ❖ Employer must make sure required number of staff are trained in first aid.
 - For up to two employees, one worker must have Emergency First Aid Training with Level A CPR.
 - First Aid Kit must be available.
 - Number 2 Kit with Schedule C supplies.



Material Safety Data Sheets (MSDS)

- ❖ Must be available in chlorination building for staff to access in the event of an emergency.
- ❖ PPE and Emergency wash requirements will be in accordance with the MSDS for the product in use.
- ❖ Note: Must be the MSDS for the actual product, generic MSDS will not be considered sufficient.

Ventilation



- ❖ Switches for fans must be located outside chlorination room
- ❖ Exhaust fans must be kept at floor level (Chlorine is heavier than air)
- ❖ Exhausted chlorine must be directed away from the path or workers entering or exiting the building.
- ❖ For Calcium Hypochlorite Powder local exhaust ventilation at the addition point must be used.



Gas Detection Equipment

- ❖ Gas Detection systems must be installed in accordance with the manufacturers specifications.
- ❖ Calibrations and bump tests must be performed in accordance with the Manufacturers recommendations.
- ❖ Records of calibrations and bump tests shall be maintained.
- ❖ In the case of detector tubes workers shall ensure tubes are not expired prior to use.



Alarm System

- ❖ Alarms must be tested and calibrated in accordance with the manufacturers specifications.
- ❖ Workers must know the alarm levels and what actions must be taken at various set points.
- ❖ Alarm settings should be 0.5ppm for the first alarm and 1.0ppm for the second alarm.



Confined Spaces.

- ❖ It is possible for chlorine pits to be considered confined spaces.
- ❖ In order to be a confined space it must meet 3 criteria:

Definition



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

- a) Is not designed or intended for human occupancy except for the purpose of performing work;
- b) Has restricted means of access and egress; and
- c) May become hazardous to a person entering it as a result of
 - i. Its design, construction, location or atmosphere;
 - ii. The materials or substances in it; or
 - iii. Any other conditions relating to it.



- ❖ Not designed for human occupancy except for the purpose of doing work.
 - If a space is equipped with stairs and ventilation it has been designed for human occupancy and thus unlikely to be a confined space.



What Is a Restricted Space?



Do you have to use your hands?

Yes



No





Do you have to contort your body in any way to get in or out of the space?

Yes



No





Is your entry or exit slowed or impeded in any way?

Yes



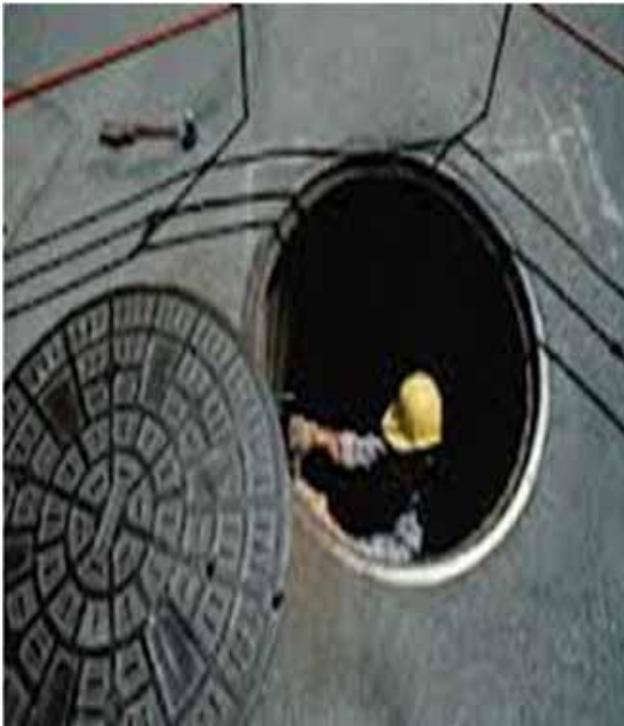
No





Would you be forced to enter or exit in a way that might slow rescue or self rescue?

Yes



No





❖ Hazardous Condition

- Does not always have to be atmospheric.
- Could be mechanical in nature.
- Must be related to the space, while the possibility of a health issue arising and necessitating the need for an emergency response plan, this does not necessarily mean it is a confined space.



Other points of interest relating to Confined Spaces

- ❖ Importance of Hazard Assessments by qualified people.
- ❖ Emergency Response Plans
 - Must be specific
 - Class E harness for restricted access in vertical entry.



Thank you!