# AP 6 – Chlorine Release

# AP Summary

This Action Plan applies to an uncontrolled release of any quantity of chlorine gas. Chlorine is a highly toxic gas stored under pressure on this site. Chlorine is toxic by inhalation and high concentrations can cause skin irritation and severe eye injury. See MSDS for more information.

## Initiation and Notification

When a release of chlorine gas has been confirmed, the individual who first notices the release should contact the [WUERM] or [Alternative WUERM] immediately by whatever means of communication may be available.

Notification phone numbers can be obtained from the Organization Contact List in the Appendices as well as from Section III.D of the ERP.

### Equipment

Fully PPE protected personnel may be required to rescue personnel in the release area.

This equipment is available to assist in the execution of this AP:

|  |  |
| --- | --- |
| Equipment | Location |
| Self-Contained Breathing Apparatus (SCBA), level “A” Personal Protective Equipment (PPE) |  |
| Chlorine Emergency Kits |  |
| Ammonia bottle for small leaks |  |
| Designated chlorine use tools |  |
| Portable chlorine/oxygen alarm |  |
|  |  |

# Assess the Problem

* 1. Determine number and severity of any injured personnel. Instruct all personnel to seek shelter and carefully move injured personnel away from the Chlorine release area.
  2. Estimate the impact of the Chlorine release on both on-site and off-site personnel. Rate and volume of release, size of container, and wind direction will all influence the impact of the spread of the Chlorine gas.
  3. Determine response capability (in-house or off-site personnel), based on number of adequately trained and equipped personnel.

# Isolate and Fix the Problem

1. Activate the facility Emergency Operations Center (EOC), as appropriate. Shelter-in-Place, Evacuation, or a combination may be an appropriate response. See Section VIII of ERP. The facility [Incident Commander] (IC), will have the best initial information on the magnitude of the release and be best informed to dictate on-site as well as suggest off-site actions.

**Only trained personnel using pre-planned procedures should respond to uncontrolled chlorine releases. Attempt to install a Chlorine Emergency Kit ONLY if you are familiar with the kit and trained in its use.**

1. Remove clothing of contaminated personnel. Victims need to be provided with fresh air (and oxygen by trained personnel) and have contaminated clothing removed to prevent further injury.
2. Bag the clothing.
3. Wash victims thoroughly with soap and water.
4. Rinse eyes with plain water for 10 to 15 minutes.
5. Have Safety/Security notify the incoming emergency equipment and ambulances of staging location.
6. Detect small chlorine leaks with an atomizer or squeeze bottle filled with aqueous ammonia. (A white cloud will show the location of the leak).
7. Attempt to close the main source valve prior to entering the area. Only trained and properly equipped personnel can assure a successful control of this release. Untrained or under-equipped personnel will only become more victims.
8. IF this does not stop the release (or it is not possible to reach the valve), THEN allow the gas to release in place or remove it to a safe area and allow the gas to be released there.

# Monitoring

1. Monitor the surrounding area for Chlorine gas levels and oxygen. The Chlorine level must be below 0.5 ppm and the atmosphere must have at least 19.5 percent oxygen before personnel can be allowed in the area without Self Contained Breathing Apparatus (SCBA’s).

* A 0.5 ppm chlorine over 8 hours has shown no effects.
* Oxygen can be replaced by chlorine gas in the lungs.
* A 19.5% O2 level is required for Oxygen to outcompete Chlorine.
* Facility area monitoring should continue until all levels reach below 0.5 ppm after repairs are completed.

1. Victim should be monitored for signs of exposure. Some symptoms of exposure can be delayed so all potentially exposed personnel should be routinely monitored. Symptoms include:

* Coughing
* Burning sensation in the nose, throat, and eyes
* Blurred Vision
* Fluid in the lungs within 2-4 hours
* Watery Eyes
* Chest Tightness
* Burning pain, redness, and blisters similar to frostbite
* Nausea and vomiting
* Difficulty breathing or shortness of breath

# Recovery and Return to Safety

1. Maintain detailed notes of all actions. Notes will provide details of who, what, when, and why decisions were made. This will help in the evaluation of the incident response and in cost recovery.
2. Re-entry by un-protected facility personnel should not occur until all repairs are made and the ppm of chlorine is below 0.5. Community re-entry levels should be established by off-site emergency personnel but should not be higher than 0.5 ppm. Exposure to chlorine should not exceed OSHA levels for workers. Lower levels of exposure to chlorine may be established for members of the community. Exposure levels for community members should be separately determined.
3. Conduct a detailed evaluation of the failure that caused the release. This could include engineering, personnel, security, and/or metallurgical evaluations.
4. Hold post-incident discussions to include all responders and actors in the response and recovery.

# Report of Findings

1. All the components of the incident should be correlated and established in writing. This would include why the release occurred, how the response was managed and suggestions to improve the facility/community response in the future. The report should incorporate all relevant data from the forensics of the release to suggested changes in the emergency response plans and procedures.
2. Report of Findings should be provided to the decision makers for the Utility Operations team to learn from the incident and reduce the likelihood of future such event. Changes in facility structure, security, procedures, or personnel may be considered. Suggestions should be included in the report to the governing board/individuals for evaluation and actions to be taken.

# AP 6 Revision Dates

* 10/01/2020