

STANDARD OPERATING PROCEDURE # FAC 6.018**Subject: Storing, Handling and Changing Out Chlorine Gas Cylinders**

Purpose and Scope: To insure proper procedures are followed when storing, handling and changing out chlorine gas cylinders.

I. Chlorine Gas Information

- A. Exposure to chlorine is irritating to the eyes, nose, throat, and mucous membranes. At high levels, exposure could cause serious injury or death.
- B. Chlorine gas is greenish-yellow and smells like bleach. It is highly corrosive and reacts violently with petroleum products such as gasoline, diesel, oil, solvents, and turpentine. Chlorine can also react with carbon monoxide and other combustion products to make highly toxic and corrosive gases.
- C. Chlorine gas weighs about 2.5 times more than air and will settle in low-lying areas unless there is sufficient wind to disperse it.

II. In case of emergency

- A. Dial 911
- B. University of West Florida Police: Phone 850-474-2415
- C. Ferry Pass Fire Department: Phone 850-477-1747

III. Protective Equipment Required When Storing, Handling or Connecting Chlorine Gas Cylinders

- A. Respiratory equipment where employees handle chlorine: Equipment should meet National Institute for Occupational Safety and Health requirements. It should use compressed air, have at least a 30-minute capacity and be:
 1. Available where employees handle chlorine gas.
 2. Kept in a convenient location, but not inside any room where chlorine is used or stored.
 3. Compatible with—or identical to—the units the local fire department (Ferry Pass) uses.
 4. Tested and refilled regularly. Ask local fire department to inspect and test the unit(s).
- B. Each person should have:
 1. Rubber gloves

2. Protective clothing
3. Goggles or a facemask.

IV. Chlorine Cylinder Storage, Handling and Changing Out

- A. Empty and full chlorine cylinders shall be stored in Building 44, Pump House Well No. 4 chlorine cylinder storage room inside cylinder storage cage and separated into appropriate compartment (Full or Empty).
- B. The chlorine storage and feed rooms should be at least 60° F but protected from extreme heat or direct sunlight.
- C. The Chlorine Rooms should have:
 1. A room temperature at or above 60° F and protection from extreme heat or direct sunlight.
 2. A shatter-resistant inspection window mounted in the wall or door of the chlorine room.
 3. Doors equipped with panic hardware that provides an easy escape by opening outward from the chlorine room.
 4. A ventilating fan that exchanges the air at least once a minute. Run the fan whenever the room is occupied.
 5. An air intake near the ceiling and an exhaust near the floor. Make sure the fan exhausts outdoors and moves air as far as possible away from doors, air inlets, or occupied areas.
 6. Motorized louvers that provide airtight closure.
 7. Individual vandal-proof switches for the fan and lights located both outside the chlorine room and at the inspection window.
 8. A nonslip floor.
 9. No floor drains.
- D. Chlorine Leak Detection
 1. The chlorine room should have continuous leak-detection equipment with audible and visual alarms employees throughout the treatment plant can see and hear. Follow the manufacturer's recommendation for calibrating and testing the equipment. Record your findings.
 2. Use a concentrated ammonia solution to locate gas leaks at fittings and pipe connections.
 3. A white cloud or vapor indicates a leak.
- E. Chlorine Safety Tips
 1. Have a second person present when changing or handling chlorine cylinders. Do not work alone.
 2. Take shallow breaths in the chlorine room until you are sure there is no chlorine leak.
 3. Never lift a cylinder by its hood.
 4. Always keep the hood in place, except when the cylinder is in use.
 5. Never expose a cylinder to heat or direct sunlight.

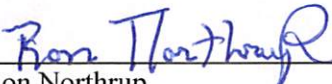
6. Never drop a cylinder, or knock a cylinder over.
7. Always keep empty cylinders separate from full ones.
8. Always secure empty and full cylinders with a cable or chain.
9. Never tamper with a fusible plug.
10. Never store chlorine with ammonia.
11. Never store combustible or flammable materials near chlorine containers.
12. Never attempt to weld an “empty” chlorine pipeline without purging it with air.
13. Do not spray water on a leaking container. It will make the leak worse.
14. Immediately contact your gas supplier if the cylinder valve or cylinder is defective.

F. Changing Out Chlorine Cylinders


1. Turn well pump to “Off” position to avoid pumping of untreated water.
2. Turn valve stem clockwise to close cylinder valve.
3. Turn booster pump to “On” position to allow float in flow meter to drop to zero. Indicator on front of gas feeder should indicate no gas.
4. Wait about one minute. Float should remain at zero. Turn booster pump off.
5. Loosen gas feeder yoke screw. Remove gas feeder from valve.
6. Replace gas cylinder. Be sure to use a chain or cable to secure the new cylinder properly.
7. Remove old lead gasket. Inspect and clean mating surfaces of gas feeder and valve. Install new lead gasket.
8. Position gas feeder on new gas cylinder and tighten yoke screw. Do not tighten excessively.
9. Crack open gas cylinder valve.
10. Use ammonia solution to check for leaks. If a white cloud or vapor appears correct leaks.
11. After you verify there are no leaks, open gas cylinder valve, about ¼-turn only, and leave cylinder wrench on valve.
12. Adjust scales.
13. Place booster pump in “Auto” position.
14. Place well pump in the “Auto” position.

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