

Safe Work Instruction - Operation of a Satellite Chlorinator

DO NOT use this plant* or complete this task unless you have been inducted in its safe use and operation by an Authorised Experienced Operator

This SWI may not cover all possible hazards and risks and should be referred to as a control measure in the risk assessment process. Additional training may be required for high risk plant. Site and task may change required PPE.

PERSONAL PROTECTIVE EQUIPMENT



Eye protection must be worn



Long and loose hair must be contained or covered.



Half face mask respiratory protection must be worn



Foot protection must be worn



Hand protection must be worn



Self-Contained Breathing Apparatus must be present

POTENTIAL HAZARDS AND RISKS

- Crushing**
Crushing due to plant tipping or rolling over
- Manual Task Injury**
Manual task injury from incorrect manual handling techniques
- Other**
Injury due to plant malfunction or misuse
Burn injury
- Explosion**
Explosion of gases, vapours or liquids
- Slip, Trips, Falls**
Slip, trip, fall due to uneven or slippery work surfaces
- Chemicals**
Exposure to hazardous chemicals
Exposure to toxic fumes

PRE-OPERATIONAL SAFETY CHECKS

- ✓ Complete site-specific risk assessment
- ✓ Complete the appropriate pre-operational plant checklist
- ✓ Ensure you are familiar with plant operations and controls
- ✓ Ensure that guards are fitted, secured and functional in accordance with manufacturers guidelines
- ✓ Before commencement of work inside the chlorine room, the operator must ensure the safety eye wash facility is in good working order, also be familiar with its operation

OPERATING PROCEDURES

- ✓ **WARNING: This chemical is considered a hazardous substance as well as a dangerous goods. Before carrying out the following procedure the workers are to be familiar with the relevant SDS and follow all safety precautions listed on the data sheet prior to handling the chemical. Particular care should be taken with this chemical, as its fumes are an irritant and toxic**
- ✓ Keep clear of moving plant parts
- ✓ Operate plant to the conditions of the work area
- ✓ The IXOM Chlorine handbook contains important information on handling and storage of liquefied chlorine gas. All employees working with Chlorine should be familiar with the contents of this Handbook.

ROUTINE INSPECTION PROCEDURES

- ✓ Check SCADA telemetry software to compare actual satellite chlorinator chlorine residual with targeted levels to determine whether any change in dosage is required
- ✓ Also check SCADA telemetry software to determine the need to replace any empty cylinder at the site to be visited.
- ✓ Carry out a chlorine residual test on a reticulated sample from the relevant supply
- ✓ Deactivate the Intruder Alarm at the relevant Chlorinator. This may involve deactivation via the telemetry system prior to the site visit
- ✓ Before opening the Chlorinator room door, push the vacuum switch button to evacuate the internal atmosphere of any potential chlorine gas.
- ✓ Open the entry door, making sure to latch the door in the open position to prevent accidental closure. The ventilation fan will automatically operate while ever the entry door is in the open position
- ✓ Enter chlorinator building and record all relevant information necessary to update the appropriate electronic records
- ✓ Take a sample from sampling point and test chlorine residual using Hach portable analyser
- ✓ If required adjust the analyser to match the portable chlorine residual analysers reading
- ✓ Make any necessary adjustments to the chlorine dosage controller to achieve the desired residual after taking into consideration the trending graph of the chlorine residual and any adjustment to the online chlorine analyser

CONNECTION & DISCONNECTION PROCEDURE

- ✓ Using the purpose-built chlorine cylinder handling trailer, two or more trained workers must be used to load the necessary chlorine cylinders onto the trailer from the Bamarang WTP Chlorine drum/storeroom. Make sure the cylinders are secured using the individual cylinder clamps provided
- ✓ Record the details of the cylinders removed from the storage area in the relevant "Bamarang Flows and Stocks" spreadsheet
- ✓ Prior to any work involving the connection or disconnection of a chlorine container the following conditions must be met
 - Two or more trained workers must be present at all times. At least one of these should not become involved in the operation and should remain on site as the safety observer
 - Self-contained breathing apparatus (SCBA) should be present and should be checked for serviceability and made ready for immediate use if necessary. At least one of the workers involved in these operations are to have been trained in the use of SCBA
 - The ventilation fan must be operational and must remain on until the operation has been completed
 - All doors to the chlorine plant must be opened to provide additional ventilation and allow a steady exit if a leak was to develop. Also, the exits must not be obstructed by any equipment or article
 - Appropriate PPE's such as Goggles and chemical resistant gloves should be worn
 - A bottle containing 5% ammonia solution must be provided to assist with leak detection if required
- ✓ Once all other preparations & precautions have been made, turn off the chlorine cylinder valve
- ✓ Turn on chlorinator to draw chlorine from line to the cylinder being changed then close the plastic ball valve
- ✓ Loosen the cylinder regulators yolk bolts using the cylinder key and evacuate to a safe distance to allow the residual chlorine gas to dissipate to atmosphere
- ✓ Once the gas has cleared from the room, remove cylinder chain, disconnect the cylinder regulator unit and suspend using the chain mounted from the ceiling, making sure to remove the old lead washer
- ✓ Transfer full cylinder from the trailer and position on cylinder scale, making sure to chain the new cylinder in place to prevent it from falling
- ✓ Remove cylinder regulator from the chain, fit new lead washer and reconnect to the new cylinder via the yolk assembly, making sure that it is tight
- ✓ Open the ball valves in cylinder pipework
- ✓ Crack open, then close the cylinder valve and check for leaks using the 5% ammonia solution

- ✓ If a leak is detected, check the tension of the yolk, and or lead washer and replace if necessary
- ✓ If no leak is detected open the cylinder valves 1½ turns
- ✓ Press the reset button on the cylinder changeover unit to reset the scale (should now read around 70kg)
- ✓ Note the details of the cylinder disconnected and the new cylinder connected in order to record the details in the relevant "Chlorinator Flows & Stocks" spreadsheet at the WTP

CHLORINE LEAK PROCEDURE

- ✓ If a chlorine leak is detected by the chlorine leak sensor, a Telemetry alarm will be triggered to page & dial out an alarm message to the Coordinator
- ✓ The Coordinator will then call the WTP on-call operator in order to first establish the validity of the alarm. This will be done by the operator and a standby person visiting the site and cautiously approaching the chlorinator and its immediate surrounds to determine if a chlorine leak is present
- ✓ If a leak is detected two or more trained personnel must be present at all times in order to isolate the chlorine leak. At least one of these should not become involved in the operation and should remain onsite as a safety observer
- ✓ All workers participating in this operation must use a serviceable Self-Contained Breathing Apparatus set
- ✓ The worker entering the Chlorinator room shall shut down the chlorine cylinder valves and then evacuate to fresh air as soon as possible
- ✓ Time should then be allowed for the chlorine gas to dissipate prior to attempting to establish the location of the gas leak and making good the repairs

ENDING OPERATIONS

- ✓ Replace any used tools etc. to the toolbox
- ✓ Resecure the Chlorinator room
- ✓ Re-activate the Intruder alarm for the relevant Chlorinator. This may involve reactivation via the telemetry system following the site visit
- ✓ Record the plant readings in the relevant "Chlorinator Flows & Stocks" spreadsheet

DO NOT

- ✗ Do not use if plant is faulty. Attach an Out of Service tag and report fault to your supervisor
 - ✗ Do not open Chlorinator room door until the vacuum switch has returned to the normal position (approx. 2 minutes) as per the signage adjacent to the entry door
 - ✗ Do not obstruct exits with any equipment or article
 - ✗ Do not wear loose jewellery
 - ✗ Do not use mobile phone while operating plant
- *Plant in this SWI refers to any machinery, equipment, appliance, container, implement and tool.