

CHEMICALS



Safety

INTEROFFICE / LAKE CHARLES

TO Distribution

DATE April 22, 1974

FROM R. Lynch

SUBJECT Clearing Procedures for Equipment

The supervisors in the EC-VC-HCl area have prepared written clearing instructions for the chemicals present in their area. These instructions are in their Standard Operating Procedures book. These instructions emphasize the responsibility lead operators have when tagging out equipment. A copy of these instructions has been given to the maintenance foreman in the area.

RL/cg

Distribution:

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Kirk, Please make copy and put in our (S.O.P.) operating manual (black notebook labeled (For your info - Oglesby))

*~~Messick~~ - KMM
Clay - mce
Byars -
Mellard - KMM
Oglesby -*

ALSO, SHOULD WE MAKE UP A SIMILAR LIST FOR PARTICULAR FREQUENTLY ENTERED OR MAINTAINED PIECES OF EQUIPMENT (DH. FEED TANK, REACTORS, PREHEATERS, ETC.) INCLUDING BLIND LIST? *KMM* YES - mce
will do for Rx AREA.

SL 048715

CLEARING OF EQUIPMENT AND PIPING

One of the responsibilities of operators is to clear equipment and piping for maintenance work. There are a few general rules that apply no matter what is being cleared. The main thing is that the equipment or piping must be cleared so that maintenance workers are not subjected to unsafe working conditions. It must be remembered that the maintenance workers are not as aware as operators are of how to treat various chemicals. They also do not have a good understanding of plant operating procedures and piping systems.

Another very important consideration is tagging of equipment and piping by the lead operator. The lead operator has the same responsibility towards tagging as a supervisor does when the supervisor issues a welding or vessel entry permit. He is saying in writing (hanging a signed tag), that the equipment is then safe for maintenance mechanics to work on. One other thing that should be done when extensive piping systems are tagged is to trace out the piping carefully for all tagging locations. Do not depend on remembering all the block valve locations. It is not a bad idea to get someone (another lead operator or operator) to double check the tagging of a complex piping system.

A third factor that must be considered in all cases is to make sure that it is possible to purge completely through a cleared piece of equipment or piping. Also purges at low points must be possible to make sure these drains are not plugged.

The above discussion is to cover general considerations for clearing. However, there must be detailed written instructions covering the clearing of equipment and piping for each of the chemicals that are in our processes. The instructions must contain specific information about the hazard potential of the chemicals. More complete information about all process chemicals is in the operating manual safety section. The clearing instructions for each chemical are listed separately so that revisions to procedures may be easily made when improved methods are realized. Please do not hesitate to offer suggestions for changes in these written procedures.

CLEARING PROCEDURES FOR EQUIPMENT CONTAINING SULPHURIC ACID

Hazards of H₂SO₄:

1. Causes very rapid destruction of tissue (is the most hazardous chemical in the plant).
2. May splatter and produce heat when mixed with water.
3. Treat as a flammable material (because of hydrogen generation).

Treatment if Contact with the Body:

Flush quickly with large quantities of water and remove contaminated clothing during washing.

Protective Clothing Required:

Complete slicker suit, high top rubber boots, rubber gloves, and full face shield.

Other Safety Precautions:

1. Water hose should be available and in service.
2. Safety showers should be located, and a route to them planned.
3. Someone else should know what you are doing.

Clearing Procedure:

1. Isolate equipment or line.
2. Drain equipment or line.
3. Flush the area very well.
4. Wash the line or equipment with a large amount of water if possible.
5. Vessels should be filled with water and drained repeatedly until cleaned.
6. Purge to dry.
7. Check all bleeds and drains to make sure a purge is coming out.
8. Tag out.

Special Maintenance Worker Precautions:

1. Normally the same protective clothing and safety precaution requirements as for operators.
2. Break loose bolts of a flange first on the side away from the worker.

CLEARING PROCEDURE FOR EQUIPMENT CONTAINING HYDROCHLORIC ACID

Hazards of Hydrochloric Acid:

1. Causes irritation of the skin.
2. Treat as a flammable material (because of hydrogen generation).

Treatment if Contact with the Body:

Flush quickly with a large amount of water and remove contaminated during flushing.

Protective Clothing Required:

Rubber gloves, rubber shoes.

Other Safety Precautions:

1. Water hose should be available and in service.
2. Safety showers should be located, and a route to them planned.

Clearing Procedure:

1. Isolate equipment or line.
2. Drain equipment or line.
3. Flush the area very well.
4. Wash the line or equipment.
5. Check all bleeds and drains to make sure they are open.
6. Tag out.

Special Maintenance Worker Precautions:

1. Goggles should be worn.
2. Break loose bolts of a flange first on the side away from the worker.

CLEARING PROCEDURES FOR EQUIPMENT CONTAINING CAUSTIC SODA

Hazards of Caustic:

1. Causes very rapid destruction of tissue.
2. Will react with water to produce heat.
3. Reacts violently with many organic chemicals.
4. Will ruin wool or leather goods.

Treatment if Contact with Body:

Flush quickly with large quantities of water and remove contaminated clothing during washing.

Protective Clothing Required:

Rubber gloves, rubber shoes.

Other Safety Precautions:

1. Water hose should be available and in service.
2. Safety showers should be located, and a route to them planned.

Clearing Procedure:

1. Isolate equipment or line.
2. Drain equipment or line.
3. Flush the line or equipment with a large flow of water.
4. Fill vessels with water and overflow until all caustic is removed.
5. Flush the area very well.
6. Check all bleeds and drains to make sure they are unplugged.
7. Tag out.

Special Maintenance Worker Precautions:

1. Goggles should be worn.
2. Break loose bolts of a flange first on the side away from the worker.

CLEARING PROCEDURE FOR EQUIPMENT CONTAINING CHLORINE (GAS OR LIQUID)

Hazards of Chlorine:

1. Causes irritation of the respiration system.
2. Skin contact may cause skin irritation and blistering.

Treatment:

1. Clothing contaminated with liquid Cl_2 should be removed.
2. If respiratory problems are severe, injured person should go to First Aid for breathing of oxygen.

Protective Clothing Required:

Rubber gloves.

Other Safety Precautions:

1. Make sure respirator cartridge is fresh.
2. Do not allow grease or oil to get into Cl_2 lines.

Clearing Procedure:

1. Isolate equipment or line.
2. Vent equipment into a solution of soda ash or caustic until the pressure is down to 5-10 psi (to prevent the solution from sucking back into the line after all pressure bleeds off).
3. Purge (with air or nitrogen) through the equipment and into the solution until all Cl_2 is removed.
4. Take precautions to prevent water or other contaminants from entering the cleared equipment.
5. Tag out.

Special Maintenance Worker Precautions:

Break loose bolts of a flange first on the side away from the worker.

CLEARING PROCEDURE FOR EQUIPMENT CONTAINING HCl GAS

Hazards of HCl Gas:

1. Causes irritation of the skin or membranes of the respiratory system.
2. Treat as a flammable material (because of hydrogen generation).

Treatment if Contact with the Body:

Flush quickly with a large amount of water and remove contaminated clothing during flushing.

Protective Clothing Required:

Rubber gloves.

Other Safety Precautions:

1. Safety showers should be located, and a route to them planned.
2. Make sure respirator cartridge is fresh.

Clearing Procedure:

1. Isolate equipment or line.
2. Vent equipment to a scrubber or into a container of water until the pressure is down to 5-10 psi (to prevent water from sucking back into the line after all pressure bleeds off). The water in the container will become muriatic acid and should be handled carefully.
3. Purge (with air or nitrogen) through the equipment and into the scrubber until all HCl is removed.
4. Take precautions to prevent water from entering the cleared equipment.
5. Tag out.

Special Maintenance Worker Precautions:

Break loose bolts of a flange first on the side away from the worker. Some organic liquid or acid may be left in the line.

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CLEARING PROCEDURES FOR EQUIPMENT CONTAINING VOLATILE ORGANICS

Hazards of Volatile Organics:

1. Very highly flammable.
2. Irritant to skin or eyes.
3. Vapors are toxic.
4. May cause frost bite if liquid comes into contact.

Treatment if Contact with Body:

1. Wash thoroughly and remove contaminated clothing.
2. Apply skin cream to the affected area.
3. Take other measures as specified by production supervisors.

Protective Clothing Required:

Normally none required. Special clothing may be specified by supervision. Overalls will be required for vessel entry.

Other Safety Precautions:

1. Clearing should not be done when maintenance workers are in the area if at all possible.
2. Hoses and connections should be checked thoroughly.

Clearing Procedure:

1. Isolate equipment or line.
2. Push (with N₂) all possible liquid out and into other vessels or pipe.
3. Vent (through a Teflon-lined hose) the line or equipment at a slow rate (to a stack if possible). Frost on the outside of piping or equipment indicates organics is still present.
4. Nitrogen purge the equipment after venting has stopped.
5. Check all bleeds and drains to make sure they are not plugged.
6. Tag out.

Special Maintenance Worker Precautions:

1. Double check drains (for pumps especially) and vents by sticking a wire through an open valve.
2. Break loose bolts of a flange first on the side away from the worker.

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