

INDUSTRIAL HYGIENE REQUIREMENTS FOR CCU SHUTDOWN

I. Respiratory Protection Requirements

- A. Catalyst Unloading - during catalyst unloading the entire CCU area is designated as a respirator required area. All persons at the CCU site are required to wear at least a 3M 9920 dust mask.
- B. Entry into R&R vessels- Until it has been determined that a residual catalyst dust problem does not exist in the vessels, a minimum of a 3M 9920 dust mask is required for entry.
- C. Welding- Burning and welding on exotic metals (i.e., stainless steel) may require the use of air supplied respirators if inadequate air movement in the vessels is provided by the air movers. If the air movement is sufficient to remove the fume cloud from the breathing zone of the welder, a 3M 9920 dust mask should be worn while working with exotic metals. Welding jobs will in most cases need to be addressed on a case by case basis.
- D. Air-Arc Gouging- Welders performing arc gouging are required to wear an air supplied respirator. Half-face air supplied respirators designed to fit under a welder's hood are available at the Respiratory Service Center. Welder helpers are required to wear a 3M 9920 dust mask unless the work requires them to be in close proximity of the fume cloud. If the work does require the helper to remain in the same area as the welder, an air supplied respirator is also required for the helper during air arc gouging.
- E. Organic Vapors- The concern for personnel exposure to organic vapors, such as benzene, will require analyzing the atmosphere in a vessel prior to working on equipment. Safety and Industrial Hygiene personnel will be available to assist in these samples. Operating personnel will also be trained to collect and analyze samples. If a GLC is not available at CC Gas, the unit in the Industrial Hygiene laboratory can be used. The minimum DPMC respiratory requirements for benzene are as follows:

CONCENTRATION

1-10 PPM

RESPIRATOR SELECTION

Half-face air purifying respirator with the black organic vapor cartridges.

10-50 ppm

Full face air purifying respirator with black organic vapor cartridges.

50-1000 ppm

Supplied air respirator with full facepiece in positive pressure mode.

>1000 ppm

Self-contained breathing apparatus with full facepiece in positive pressure mode or full face positive pressure supplied air respirator with auxiliary self contained air supply.

II. Personal Protective Clothing

- A. Disposable Coveralls- White TYVEK coveralls will be required as minimum protection for entry into the CO furnace and the third stage separator. Entry into the reactor and regenerator will also require disposable coveralls until it is determined that the catalyst has been removed. The water washing process in the reactor and regenerator will in all likelihood, remove any residual catalyst.
- B. Disposable Chemical Suits- A special disposable coverall made of polyethylene coated TYVEK is available for use in the slurry oil and heavy gas oil sections. This coverall is far superior to the uncoated TYVEK and "slicker suits" previously used for protection from contact with oils. The disposable coveralls may be used for maintenance personnel working on equipment in the fractionation section. Operating personnel may wear the disposable coveralls during the decontamination process while draining slurry oil and/or heavy gas oil. These coveralls are sufficient protection for all jobs except when entry into the vessel is required.
- C. Entry Into Slurry or Heavy Gas Oil Equipment- On jobs that require entry into vessels that have residual amounts of oil, a Hi-Glo chemical suit may be required in place of the disposable chemical suit. Past experiences have shown that the disposable coveralls and disposable chemical suits do not hold up well when working in confined spaces. The durability of the Hi-Glo suit provides better long term protection when entry into vessels is required. If a possibility exists that gross contamination may occur to the employees

street clothes, cloth coveralls should be worn in place of street clothes.

III. Eye Protection- During catalyst unloading, the entire CCU unit will be a mandatory goggle area. There is a possibility that goggles could be required for entry in to the R&R vessels if catalyst dust becomes a problem. There have been situations in previous shutdowns where catalyst dust become a problem by falling from the dip legs. The water wash procedure may remove the catalyst and a decision may have to be made and/or modified after entry is obtained.

IV. Hearing Protection- Though the CCU area normally requires the use hearing protection at all times, after the compressors and turbine are shutdown, the noise levels are reduced to a level that does not require hearing protection. Sound level measurements made in previous shutdowns have shown that high noise levels remain in the following areas:

1. the area around the vacuum trucks during catalyst unloading
2. the area around the welding machines
3. jobs that require the chipping refractory and
4. air-arc gouging.

It is important to indicate the need for hearing protection by signs and barricades because of the large number of persons working in the area that may not be familiar with the noise levels associated with a shutdown at CCU.

V. Shower facilities- It is imperative that employees that do get slurry oil and heavy gas oil on their skin, wash up as soon as possible. The portable shower facilities need to be located convenient to CCU. All persons with more than incidental (arm and hands) exposure to slurry oil and heavy gas oil need to shower before leaving the complex. Wash basins for minor clean up also should be in the area for washing at breaks and lunch time.

VI. Servicing Protective Equipment-

To better service protective equipment during the shutdown, it is recommended that a trailer be set up at CCU for contractors to check out equipment. This will allow a better control on equipment and will facilitate cleaning and restocking of the necessary protective equipment. Experience has shown that shutdowns contribute to a large percentage of lost and destroyed equipment and this method of distributions allows an accurate tab to be kept on usage.