

Ethanolamines/Glycol Ethers Tier 3 Procedure

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Title: **Cleaning and Flow Checking Distributors in Amines Columns**
References: **USA-5, Confined Space Entry**

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238. Cleaning and Flow Checking Distributors in Amines Columns

1.0 Objective:

1.1 To insure optimum flow distribution in columns for efficient column operation by thorough cleaning and visually checking the flow from the distributors during maintenance outages.

2.0 Responsibility:

2.1 It is the responsibility of the area engineer to insure that the flow distribution in the columns has been optimized and that problems are identified for resolution .

2.2 It is the responsibility of the operations personnel issuing the confined entry permits and the operations personnel doing the cleaning and flow check to insure that all aspects of this procedure are followed.

3.0 Special Notations:

3.1 Personal protective equipment required during vessel entry for this job include safety glasses and leather gloves. Leather gloves are to be worn due to the potential for cuts. Paper suits and knee pads are recommended, but not required. Due to the limited space, hard hats are not required, but are recommended due to the potential to bump the head on obstructions in the tight area.

3.2 The amines columns are part of a food grade process. No chewing or spitting is allowed in the columns. Soles of shoes should be wiped off prior to entering the manway to minimize foreign material in the column.

3.3 Material collected during the cleaning process should be disposed of in the Area 2 sump to insure environmental compliance.

3.4 A GFCI must be used for the vacuum cleaner.

3.5 Flow checking the columns is covered under a Division-wide variance to USA-3 and USA-5 (isolation of all energy sources).

3.6 Hoses and cords should be run up the column and secured so that they do not affect ladder access or tripping hazards.

4.0 Procedure:

4.1 The liquid and solids will be vacuumed from the trough and channels of the distributor using a Wet-Vac vacuum. A 1/4" stainless tubing tip needs to be used for better cleaning of the distributor.

4.2 Once the liquid and solids are removed, the holes/openings need to be cleaned or opened if they are plugged. A welding rod with a bent end can be used to unplug the material in the openings.

4.3 Once the cleaning process has been completed, a flow check needs to be done to determine possible problems with the distributor. Unleveled distributors, plugging, and wear due to erosion or corrosion are all potential problems that could affect liquid distribution and therefore the column performance.

4.4 Cold condensate will be used to flow check the distributors. Process water leaves residual buildup on the distributors.

4.5 Water hoses can be used for the cold condensate. Hot condensate should not be used in regular water hoses or used to flow check the distributors.