

**Ethanolamines/Glycol Ethers
Tier 3 Procedure**

Section Number: 1326
Issue Number: 1.5
Original Date: 12-26-91 **Author:** Terry Pellowski
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Title: Cleaning T-240, T-250, T-260 And T-271
References: Glossary Of Equipment Identification (Text # 114)

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1326. Cleaning T-240, T-250, T-260 And T-271

1.0 Objective:

1.1 To shutdown the distillation towers in the ethanolamines plant for interior cleaning without damage to the equipment involved or injury to personnel.

2.0 Responsibility:

2.1 It is the responsibility of the operations personnel to ensure that this procedure is executed in a safe and efficient manner.

3.0 Safety Notations:

3.1 Special consideration should be given to wearing monogoggles when connecting or disconnecting hoses, removing plugs from bleeds, etc. During the process of boiling and flushing the towers in preparation for internal cleaning.

4.0 Special Notations:

4.1 Before water boil up begins, isolate the towers from the ejector system and open the 2" tower vent at the internal condenser.

4.2 It is important to flush all tower lines, bleeds, sample points, etc. (be sure to reflux condensate to the packing)

4.3 If the cleaning process involves more than just boiling the tower and will involve enclosure entry, a separate permit will be needed for each tower.

4.4 A safety observer must be stationed at each tower man way while someone is inside the tower.

4.5 A toxic limit valve (TLV) must be run on each tower prior to entry. An air mover must be placed on each tower and allowed enough time to cool down and remove all product vapor prior to the TLV analysis.

5.0 Procedure:

5.1 When the level in DV-243B is low, shutdown the feed to T-250 and swap T-230 bottoms to E-215. Shutdown T-240 overheads to E-215 and to CWT. Block in the steam on E-240, E-250, E-260 and E-270. Switch overheads on T-250, T-260 and T-271 to empty tanks.

5.2 Pump T-240, T-250 and T-260 bottoms to DV-243A and T-271 bottoms to DV-273A until all towers are empty. Block in T-240 to VP-240 and T-250, T-260 and T-271 to their ejectors.

5.3 Isolate T-240, T-250, T-260 and T-271 and slowly pressure up each tower with nitrogen. Pressure T-240 bottoms to DV-243A through E-244's. Also pressure T-250 Feed line through E-244 to DV-243A at the same time you are pressuring T-240 bottoms.

5.4 Pressure T-260 bottoms to DV-243A and T-271 bottoms to DV-273B. Pressure overhead lines on T-250, T-260 and T-271 to their respective empty tanks. Once towers are blown empty, bleed tower pressure to respective check tanks.

5.5 Hookup condensate to T-240 recirculation downstream bleed and open T-240, T-250, T-260 and T-271 boil out valves.

5.6 Hook up hot condensate to E-260 upper and lower level tap, bleeds to clean level tap of any plugged material.

5.7 Level control T-240 bottoms to T-250 to T-260 to DV-243A. Start a condensate flow to T-271 to the amines waste trailer.

5.8 Unblock the steam to E-240, E-250, E-260 and E-270-1 and start boiling all four towers. Put T-250, T-260 and T-271 overheads to DV243A.

5.9 Boil all four towers in this manner for one hour. Isolate T-240 bottoms from T-250 and T-250 from T-260.

5.10 Hookup condensate to T-250 and T-260 feed lines and start a condensate flow to each tower. From this point on each tower will be boiling separately.

5.11 When T-240, T-250, T-260 and T-271 bottoms are free of amines, start flushing each tower to the slab. TOD must be <10,000 ppm before flushing to sump.

5.12 Boil each tower and additional two hours after this point is reached. Make sure all lines on each tower are thoroughly flushed.

6.0 Revisions:

Revision No. 1	06-10-93	Yearly Review
Revision No. 2	12-23-94	Yearly review 12-23-94 Added last sentence to 1326.5.12
Revision No 3	12-29-95	Yearly Review
Revision No. 4	12-12-96	Replace 5.0 with new flushing procedure.
Revision No. 5	01-22-98	Added 5.6 and renumbered