



STANDARD OPERATING PROCEDURE

Department: Engineering

TITLE: De-Scaling of Multicolumn Distillation Plant

SOP No.		Revision No.	
Effective Date		Supersedes No.	
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1.0 OBJECTIVE:

The purpose of this SOP is:

- 1.1 The Objective of this SOP is to describe the procedure for De-scaling of Multi Column Distillation Plant (MCDP).

2.0 SCOPE:

- 2.1 This SOP is applicable for the procedure for De-scaling of Multi Column Distillation Plant.
at

3.0 RESPONSIBILITY:

- 3.1 The Maintenance Operator shall be responsible:
 - 3.1.1 Responsible for De scaling of MCDP.
 - 3.1.2 Responsible for maintaining the De scaling record.
- 3.2 The Maintenance Engineer shall be responsible:
 - 3.2.1 Responsible for assurance for proper De scaling of the plant.
 - 3.2.2 Responsible to take corrective action if any deviation.

4.0 ACCOUNTABILITY

Head –Engineering Services

5.0 PROCEDURE:

5.1 DE-SCALING OF COLUMN:

- 5.1.1 Before starting the process switch OFF the main control panel of MCDP.



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- 5.1.2 Connect the feed water pump suction and out let of the last column to chemical preparation Stainless Steel (SS) tank.
- 5.1.3 Prepare 6 kg sodium hydroxide flakes and 200 liter purified water in chemical tank. Mix the solution properly.
- 5.1.4 Re-circulate the solution through the columns for 2 hrs by switch ON the feed water pump.
- 5.1.5 After 2 hours switch 'Off' the pump. Drain the solution and flush the column with purified water for neutralizing the system. (Check the pH, it should be 7-8).
- 5.1.6 After neutralization of column, prepare 30 kg citric acid and 200 liter purified water in chemical tank and mixes the solution properly.
- 5.1.7 Re-circulate the solution through the columns for 1hr by switch 'On' the feed water pump.
- 5.1.8 After one hour, mix 9 kg Ammonic Bifloride into the citric acid solution and continue the re- circulation for another 2 hours.
- 5.1.9 After the 2 hour re circulation, mix 60 liters of Ammonia solution (commercial grade) and 1 liter Teapot into the citric acid Ammonic Bifloride solution. Continue the re circulation for 2 hours.
- 5.1.10 After 2 hours re circulation again mix 1.5 kg of Sodium Nitrite into the above solution and re circulate for another one hour.
- 5.1.11 Switch 'Off' the feed pumps and drains the solution from the columns.
- 5.1.12 Flush the columns with purified water for 5-6 hours.
- 5.1.13 After flushing the columns, check the pH and conductivity. It should be same as feed water. Otherwise continue the flushing till get the pH and conductivity.
- 5.1.14 Reconnect the feed pump suction line and outlet line of the last column.



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5.2 DESCALING OF TOP COOLER (CONDENSOR):

- 5.2.1 Connect the cooling water pump suction and out let of the top cooler to chemical preparation SS tank.
- 5.2.2 Prepare 5 kg sulphamic acid (commercial grade) and 200-liter warm purified water in chemical tank. Mix the solution properly.
- 5.2.3 Re-circulate the solution through the top cooler for 2 hrs by switch ON the cooling water pump.
- 5.2.4 After 2 hours switch 'Off' the pump. Drain the solution and flush the top cooler with purified water for 4-5 hours.
- 5.2.5 After flushing check the pH and conductivity of the water. It should be same as feed purified water. Otherwise continue the flushing till get pH and conductivity.
- 5.2.6 Reconnect the feed pump suction line and outlet line of the top cooler.
- 5.2.7 Start the plant as per Ref. SOP.

5.3 FREQUENCY OF DESCALING:

- 5.3.1 De scaling of the columns and top cooler has to be carried out once in every year.
(Frequency is decided on the basis of manufacture's recommendation).

6.0 ANNEXURES:

Annexure –I : Multi Column Distillation Plant De Scaling Record.

7.0 References (S)

Nil



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8.0 Glossary

SOP	:	Standard Operating procedure
No	:	Number
MCDP	:	Multi Column Distillation Plant

