



STANDARD OPERATING PROCEDURE

Department: Engineering

TITLE: Cleaning of Reverse Osmosis (RO) Plant Membrane

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1.0 OBJECTIVE:

The purpose of this SOP is:

- 1.1 To describe the procedure for the cleaning of Reverse Osmosis plant membranes (RO).

2.0 SCOPE:

- 2.1 This SOP is applicable for the procedure for cleaning of RO plant membranes at

3.0 RESPONSIBILITY:

- 3.1 The Maintenance Operator shall be responsible:
 - 3.1.1 Responsible for cleaning of RO Plant.
 - 3.1.2 Responsible for maintain the cleaning record.
- 3.2 The Maintenance Engineer shall be responsible:
 - 3.2.1 Responsible for proper operation of the plant.
 - 3.2.2 Responsible to take corrective action if any deviation observed.

4.0 ACCOUNTABILITY

Head –Engineering Services

5.0 PROCEDURE:

5.1 PRIMARY CHECKS:

- 5.1.1 Ensure that the cleaning system is cleaned.

5.2 STARTING PROCEDURE:

- 5.2.1 Before starting the cleaning, note down the system pressure, conductivity and pH.
- 5.2.2 Stabilize the pH of the cleaning solution at 4.5 by adding caustic soda flakes.
- 5.2.3 Switch ‘On’ the solution feed pump.



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- 5.2.4 Mix chemical in chemical cleaning tank. i.e. 7 kg citric acid and 200 liters RO permeate water.
- 5.2.5 Introduce the solution to the RO stages.
- 5.2.6 Displace the water in the stages to drain, then route the solution back to the chemical cleaning tank.
- 5.2.7 Re circulates the solution for about 15 min. at low flow to dislodge the loosely adhered particulate material by throttling the pump discharge valve.
- 5.2.8 Re circulate the solution for about 60 min. at high flow by opening the pump discharge valve to dislodge the maximum amount of particulate materials.
- 5.2.9 After chemical re-circulation, drain the solution and rinse the stages with RO permeate water for about 30 minutes by using the same cleaning system.
- 5.2.10 After rinsing the stages, flush with pre-filtered water using normal feed water without starting RO high-pressure pump for about 10 min.
- 5.2.11 After slow flushing, switch ON the high pressure pump for final flushing and keep the flushing till reject water is clean and reject conductivity is same as the feed water conductivity (with adequate flow rate).
- 5.2.12 After final flushing, put the unit into service.
- 5.2.13 Check system pressure, conductivity & pH of permeate water (system pressure and Conductivity should be less than 10% (percentage) of actual before cleaning the plant and pH 6- 6.5), if it is not within the limit; continue the flushing till we get the specified Parameters.

5.3 PURPOSE OF CLEANING:



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5.3.1 To remove fouling & scaling materials from the membrane.

5.4 FREQUENCY OF CLEANING:

5.4.1 When the permeate flow decreased to 10% of actual flow or conductivity increased to 10% of actual conductivity or once in a month whichever comes earlier.

6.0 ANNEXURES:

ANNEXURES-I : Multi Column Distillation Plant Sanitization Record

7.0 References (S)

NIL

8.0 Glossary

SOP : Standard Operating procedure
No. : Number
RO : Reverse Osmosis
Kg : Kilogram
% : Percentage
& : And
min : Minutes

