PHARMA DEVILS

ENGINEERING DEPARTMENT

STANDARD OPERATING PROCEDURE			
Department: Engineering			
TITLE: Sanitization of RO Water plant			
SOP No.		**Revision No.**	
Effective Date		**Supersedes No.**	
Review Date		**Page No.**	1 of 5

1.0 OBJECTIVE

The purpose of this SOP is:

1.1 The Objective of this SOP is to describe the procedure for sanitization of Reverse Osmosis Plant.

2.0 SCOPE

2.1 This SOP is applicable for the procedure for sanitization of Reverse Osmosis Plant.

3.0 RESPONSIBILITY:

3.1 The Maintenance Operator shall be responsible:

3.1.1 Responsible for sanitization of Reverse Osmosis plant.

3.1.2 Responsible for maintaining the sanitization record.

4.2 The Maintenance Engineer shall be responsible:

4.2.1 Responsible for assurance of proper sanitization of the plant.

4.2.2 Responsible for take corrective action if any operational deviation observed.

4.0 Accountability

Head –Engineering Services

5.0 PROCEDURE:

5.1 PRIMARY CHECKS:

5.1.1 Clean the CIP system with RO permeates water and ensure that the CIP system is properly cleaned.

5.1.2 Ensure that CIP cartridge filters are new.

5.2 CHEMICAL PREPARATION:

5.2.1 Close all valves in the RO plant which is used for normal operation.

5.2.2 Switch ON the electric heaters provided in the CIP tank for heating up the water or use Pure steam by opening steam control valve provided in the steam line.

5.2.3 Take RO permeate water in CIP tank.

5.2.4 Now the water temperature will start to increase. As soon as the temperature reaches to 50^0C, open CIP pump outlet valve BFV (partially), CIP cartridge filter outlet valve BFV, CIP re- circulation valve BFV.

5.2.5 Then Switch 'ON' the CIP pump.

5.2.6 Now the hot water will pass through the RO membranes.

5.2.7 Slowly rises the water temperature to above 80^0C by keeping the heat input ON.

5.2.8 As soon as the water temperature reaches above 80^0C, open the CIP outlet valve fully and Re circulates the hot water for one hour.

5.2.9 After one hour, switch OFF the electric heaters (in the case of steam close the steam control valve) and continue the re circulation till the water temperature reaches to ambient temperature.

5.2.10 After reaching the ambient temperature, switch OFF the CIP pump and drain the water by

opening CIP drain valve BFV .

5.2.11 Now close the CIP tank drain valve BFV.

5.2.12 Fill the CIP tank with RO Permeate water and rinse the membranes for 30 minutes by Staring the CIP pump.

5.2.13 After rinsing, switch OFF the CIP pump and close valves BFV

5.2.14 Then flush the RO plant by starting and RO plants as per normal feed water without starting RO high-pressure pump and reject control valve BFV is open. Keep it for 15 minutes.

5.2.15 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 (Approx. 30 min. with adequate flow rate).

5.2.16 After final flushing, put the unit into service.

5.2.17 Check Conductivity & pH of permeate water, if it is not within the limit; continue the flushing till get the specified parameters.

5.2.18 Note down the Temperature of water used for sanitization in Sanitization record.

5.3 **PURPOSE OF SANITIZATION:**

5.3.1 To Kill/control the growth of microorganism.

5.4 **FREQUENCY FOR SANITIZATION:**

5.4.1 Sanitization of RO membranes to be carried out once in every month. (Frequency is decided on the basis of past experience), However QC will monitor the quality

parameters related to microorganism and if any changes required in frequency, should be incorporated.

6.0 ANNEXURES:

Annexure –1: Reverse Osmosis Membrane Sanitization Record.

8.0 REFERENCES (S)

Nil

9.0 GLOSSARY

SOP	:	Standard Operating procedure
No	:	Number
CIP	:	Clean In Place
RO	:	Reverse Osmosis Plant

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ANNEXURE I

REVERSE OSMOSIS MEMBRANES (HSRO PLANT) SANITIZATION RECORD

S.No.	Date of Sanitization	Sanitization Time		Temperature of hot water During Sanitization Cycle ^{0}C			RO Permeate water parameters, after Sanitization		Remarks	Operator Signature	Engineer Signature
		From	To	Cycle started at	Cycle continued at	Cycle stopped at	Conductivity (µs/cm)	pH			