Title: Operation of Purified Water Circulation Loop

SOP No.:		**Revision No.:**	00
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1.0 OBJECTIVE:

To lay down a procedure for Operation of Purified Water Circulation Loop.

2.0 SCOPE:

This SOP is applicable for Operation of Purified Water Circulation Loop.

3.0 RESPONSIBILITY:

Officer / Executive – Engineering

4.0 ACCOUNTABILITY:

Head – Engineering

5.0 DEFINATION:

5.1 **Purified water** is water that has been mechanically filtered or processed to remove impurities and make it suitable for use.

6.0 PROCEDURE:

6.1 PRE STARTUP CHECKS:

6.1.1 Check the Water Level of PW make up.

6.1.2 Check the Air Pressure should be 5 Kg / cm^2 for Pneumatic Valve Operation.

6.2 OPERATION:

6.2.1 Switch **"ON"** the Main Control of PW distribution system.

6.2.2 'Log in' screen shall appear, enter the user name and password.

6.2.3 Press the PW distribution button, the PW distribution screen shall appear.

6.2.4 Press the AUTO button, then the START and STOP button shall appear.

6.2.5 Press the START button, the PW circulation pump shall start.

6.2.6 Switch ON the main panel of WFI distribution system.

6.2.7 'Log in' screen shall appear, enter the user name and password.

6.2.8 Press the AUTO button, then the START and STOP button shall appear.

6.2.9 Press the START button, the WFI circulation pump shall start.

6.2.10 Observe parameters mentioned in following table.

S.No.	Parameter	Range
1.	Flow Rate	NLT 7300 L/Hr
2.	Conductivity	<1.3 µS/cm
3.	Temperature (WFI)	NLT 80 Deg. C
4.	Temperature (PW)	Ambient
5.	UV Intensity	NLT 30 w/m^2

NOTE: The Purified Water dump valves will be operated if the limits of conductivity & TOC are out of limit (mentioned above).

6.3 VELOCITY:

6.3.1 Velocity (M/Sec.) for 2" Dia Loop Line Pipe = Flow (LPH) **X** K /1000

Where, K = Conversion Factor (0.167)

6.3.2 Velocity (M/Sec.) for 1" Dia Loop Line Pipe = Flow (LPH) **X** K /1000

Where, K = Conversion Factor (0.802)

6.4 STAND BY PUMP CHANGE OVER:

Stop the distribution pump operation.

6.4.1 Check the electrical terminal connection and Switch ON manually for few seconds for the stand by pump rotation direction.

6.4.2 Switch OFF the pump and open the pump outer cover.

6.4.3 Wash properly the impeller blade and outer cover with Purified water.

6.4.4 Then again rinse impeller and outer cover with Purified water.

6.4.5 Fix the outer cover in a position.

6.4.6 Collect water in storage tank for pump final rinsing.

6.4.7 Close the tank outlet main valve and position the pipe accessories to connect the stand by Pump.

6.4.8 Tighten the all TC clamps for the suction line and keep open the discharge line end.

6.4.9 Connect the hose pipe in discharge end mouth and open the tank out let valve.

6.4.10 Keep the hose pipe end in main drain of the water system area.

6.4.11 Switch ON the pump and allow water to drain out for 5 Min.

6.4.12 Switch Off the pump and connect the pump discharge line to main loop line system.

6.4.13 Record the details in stand by pump change over record as per **Annexure-III**.

6.4.14 **Frequency:** Before sanitizing the loop system / whenever required / if any pump breakdown / when ever plant shutdown.

(Note: During all the above mentioned frequency cases Sanitization process should be carried out.)

6.5 Record the Operation Details in **"Purified Water Circulation Loop Operation Record"** as shown in **Annexure-I**.

6.6 Record the Purified Water and Water for Injection (SCADA Printout) Details in **Annexure-II, Titled "Record for Purified Water"**.

7.0 ABBREVIATIONS:

SOP	Standard Operating Procedure
QA	Quality Assurance
No.	Number
PW	Purified Water
WFI	Water For Injection
UVD	Ultra Violet Detector
kg	Kilogram
cm	Centimeter
TOC	Total Organic Carbon

8.0 ANNEXURES:

ANNEXURE No.	TITLE OF ANNEXURE	FORMAT No.
Annexure-I	Purified Water Circulation Loop Operation Record	
Annexure-II	Record for Purified Water (SCADA Printout)	
Annexure-III	Stand by Pump Change Over Record	

9.0 DISTRIBUTION:

- Controlled Copy No. 01 Head Engineering
- Master Copy Quality Assurance

10.0 REFERENCES:

Not Applicable

11.0 REVISION HISTORY:

Revision No.	Change Control No.	Details of Changes	Reason of Changes	Effective Date	Done By

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ANNEXURE – I

PURIFIED WATER CIRCULATION LOOP OPERATION RECORD

Section: **Frequency:** Hourly

Date:……	**PW- Purified Water System**					**Checked By (Sign & Date)**
Time	**Water level (CLT-1001)**	**Conductivity (NMT 1.3µS/cm)**	**Flow Rate (NLT 7300 L/Hr.)**	**Temperature (Ambient)**	**Done By (Sign & Date)**	

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ANNEXURE – II

RECORD FOR PURIFIED WATER (SCADA PRINTOUT)

From Date & Time: **Time Interval:** One Hour

To Date & Time: **Print Date & Time:**

Date	Time	Purified Water System				Remarks
		Water Level (CLT-1001)	Conductivity <1.3µS/cm	Flow Rate NLT 7300 L/Hr	Temperature Ambient	

Prepared By: **Reviewed By:**
Date: **Date:**

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ANNEXURE – III

STAND BY PUMP CHANGE OVER RECORD

Frequency: Whenever before sanitizing the loop system / whenever required necessary / if any pump breakdown / when ever plant shutdown.

S.No.	Change Over Date	Pump ID No.	Reason for Change Over	Done By (Sign & Date)	Checked By (Sign & Date)	Remarks