



PHARMA DEVILS

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QUALITY ASSURANCE DEPARTMENT

PROTOCOL No.:

**OPERATIONAL QUALIFICATION PROTOCOL FOR PURIFIED WATER STORAGE &
DISTRIBUTION SYSTEM**

**OPERATIONAL QUALIFICATION
PROTOCOL
FOR
PURIFIED WATER STORAGE &
DISTRIBUTION SYSTEM**



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1.0 PROTOCOL APPROVAL:

Signing of this approval page of Protocol indicates agreement with the qualification approach described in this document. If modification to the qualification approach becomes necessary, an addendum shall be prepared and approved. The protocol cannot be used for execution unless approved by the following authorities.

This Operational Qualification protocol of Purified water Storage & Distribution System been reviewed and approved by the following persons:

FUNCTION	NAME	DEPARTMENT	SIGNATURE	DATE
PREPARED BY		QUALITY ASSURANCE		
REVIEWED BY		PROJECTS / ENGINEERING		
REVIEWED BY		PRODUCTION		
APPROVED BY		QUALITY ASSURANCE		



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2.0 OVERVIEW:

2.1 OBJECTIVE:

The objective of this protocol is to collect sufficient data pertaining to the purified water distribution system and define the operational qualification verification procedure and acceptance criteria for the purified water distribution system.

2.2 PURPOSE:

The purpose of this document is to establish documentary evidence to ensure that the purified water storage & distribution system is operated as full range specification and also to ensure that it is comply the design specification.

2.3 SCOPE:

This document is applicable to operational qualification of purified water storage & distribution system at services floor.

2.4 RESPONSIBILITY:

The following shall be responsible:

Quality Assurance officer/ Executive-Preparation of protocol its execution and support

Execution team –for execution of protocol

Projects / Engineering Head – For execution support and review of protocol/report

Production Head – For execution support and review of protocol/report

Quality Assurance Head – For adequacy and final approval



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2.5 EXECUTION TEAM:

The satisfactory installation of the purified water storage & distribution system shall be verified by executing the qualification studies described in this protocol. The successfully executed protocol documents that the purified water storage & distribution system is operated satisfactorily.

Execution team is responsible for the execution of operational qualification of purified water storage & distribution system, Execution team comprises of:

NAME	DEPARTMENT	DESIGNATION	SIGNATURE	DATE
	PROJECTS/ ENGINEERING			
	PRODUCTION			
	QUALITY ASSURANCE			



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3.0 ACCEPTANCE CRITERIA:

- 3.1 The equipment should be operational as per its specified operating instructions
- 3.2 All SOPs for the equipment shall be verified and checked
- 3.3 The Purified water storage & distribution system shall be operated by PLC.
- 3.4 Training shall be given to all the concerned personnel.
- 3.5 All the functionality of equipment & components to shall be verified.
- 3.6 All the safety features/interlocking system of the equipment shall be verified.
- 3.7 The validity of the calibration of tests instruments shall be checked and all the required calibration of the components of the equipment shall be performed.

4.0 REQUALIFICATION CRITERIA:

The purified water storage & distribution system shall be re qualified if

- ☞ There are any major changes in system components which affect the performance of the system.
- ☞ After major breakdown maintenance is carried out.
- ☞ After change in the location
- ☞ As per revalidation date and schedule

5.0 OPERATIONAL QUALIFICATION PROCEDURE:

5.1 SYSTEM DESCRIPTION:

Equipment Name	:	Purified water storage & Distribution System
Supplier/Manufacturer	:
Capacity	:	7.5 KL
Location	:



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PROCESS EQUIPMENT DESCRIPTION:

PURIFIED WATER STORAGE & DISTRIBUTION SYSTEM:

- 7.5 KL SS 316L Purified Water Storage Tank along with accessories
- Process Loop Pumps
- User Points
- Flow Transmitter in return line
- Temperature Sensor cum Controller
- Conductivity Indicator cum Controller with Alarm
- Flow Diverter Valve

PURIFIED WATER STORAGE TANK ASSEMBLY:

The size of the tank is based on the feed flow rate of the Purified Water Storage & Distribution Loop and the peak load of the user points. Existing Purified Water Storage Tank assembly consists of following components:

1. Vertical Storage tank of working capacity 7.5 KL of SS 316L, Internally Electro Polished
2. Level Indicator cum Controller
3. Jacketed Vent Filter with Filter Cartridge
4. Spray Ball
5. Tank Drain Valve
6. Sanitary Diaphragm Valves
7. Compound Pressure Gauge

PURIFIED WATER DISTRIBUTION:

- 1 Centrifugal pump of capacity 12 m³/hr. @ 75 mWC.
- 2 Interconnecting piping, instruments and diaphragm valves for various applications (i.e. Sampling, Controlling, and Isolation)
- 3 Sanitary Diaphragm Valves (ZDV)
- 4 Pressure Indicators
- 5 Temperature Transmitter
- 6 Conductivity Sensor with Flow Diverter Valve
- 7 Flow Transmitter
- 8 Sampling Valves



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PURIFIED WATER DISTRIBUTION LOOP PIPING:

- The whole distribution loop shall be fabricated and installed as per standard norms complying with the Purified Water and to be fabricated out of SS 316L stainless steel tubes and tube fittings (sanitary type). The tubes shall have an inside surface Finish of $Ra < 0.4\mu$.
- The fabrication shall be done by using **COBRA TIG** orbital welding machine with a closed head in an inert atmosphere of argon gas to give crevice free welds with the concavity and convexity of the weld well within permissible limits.
- Care shall be taken that there is minimum amount of dead leg in the fabricated Distribution System. (Less than 1.5D).
- The Distribution System on the whole shall be designed so as to give minimum load on the Purified Water Generation Plant, which reflects a good-engineered system taking care of the cost factors involving the initial set up cost as well as the maintenance and running cost.
- The distribution loop will consist of user points (as per requirement), which are located at various locations.
- The user point valves shall be of Zero Dead Leg Diaphragm Valve.
- The return line of the distribution loop shall be connected back to the top of the Purified Water Storage Tank with the Spray Ball provided inside the tank.
- The Loop temperature shall be maintained at ambient.
- In normal operating condition, a minimum velocity of 1.2 m/s shall be maintained in the return loop at peak consumption.

The Storage and Distribution System design shall be suitable for meeting the requirements stated above and shall comply with the following:

5.2 INSTRUCTION FOR FILLING THE CHECKLIST:

- 5.2.1 In case of identification of major component actual observation should be written in specified location.
- 5.2.2 In case of the compliance of the test actual observation should be written in specified location.
- 5.2.3 For identification of utilities actual observation should be written in specified location.
- 5.2.4 Give the detailed information in the summary and conclusion part of the installation Qualification report.
- 5.2.5 Actual observation of the component should be written in specified location
- 5.2.6 Whichever column is blank or not used 'NA' shall be used.



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5.3 TEST INSTRUMENT DETAILS:

This test is intended to describe the equipments/instruments and its complete details to have a traceability to the national standard which is to be used for the verification of the operation.

S.No.	Name of Instrument	Instrument ID No.	Calibration Valid Upto	Checked By/Date

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5.4 VERIFICATION OF FUNCTIONAL & KEY FUNCTIONAL PARAMETERS:

5.4.1 Initial set parameters shall be verified before starting the operational qualification:

S.No.	Parameters	Set Parameters	Method of Verification	Observation	Verified by Sign & Date
1.	Loop return temperature during Sanitization (TT-202)	85°C	Set temperature shall be verified by visual observation in HMI		
2.	Conductivity in the return line of Distribution System (CIC-201)	1.25 us/cm	Set conductivity shall be verified by visual observation in HMI		
3.	High - High Level of Purified Water Storage Tank	7000 Ltrs	Set high-high level shall be verified by visual observation in HMI		
4.	High Level of Purified Water Storage Tank	6750 Ltrs	Set high level shall be verified by visual observation in HMI		
5.	Low Level of Purified Water Storage Tank	750 Ltrs	Set low level shall be verified by visual observation in HMI		
6.	Low -Low level of Purified Water Storage Tank	500 Ltrs	Set low-low level shall be verified by visual observation in HMI		
7.	Sanitization level	5250 Ltrs	Set sanitization shall be verified by visual observation in HMI		
8.	Time for Sanitization	60 minutes	Set sanitization shall be verified by visual observation in HMI		
9.	Temperature control HYST	2 °C	Set temperature shall be verified by visual observation in HMI		

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5.4.2 VERIFICATION OF KEY FUNCTIONALITY:

The key functionality of distribution system shall be verified as per following.

Name of components	Procedure	Acceptance criteria	Observation	Verified by sign & date
Main switch ON/OFF	<ul style="list-style-type: none">☞ Switch ON the main switch manually.☞ Switch OFF the main switch manually.	<p>Power supply to the control panel should start.</p> <p>Power supply to the control panel should stop.</p>		
Auto-Manual selector switch	Switch the selector switch at auto & manual position by manually and check	Two way switch provided for change over from Auto to manual operation		
HMI	Touch the HMI by finger and check the different level of operation	Touch screen provided different mode for operation plant. (Auto & Manual)		
Selector switch PLP-201 /PLP-202	To select the pump PLP-201 turn the selector switch to PLP-201 position	Pump-201 should selected		
	To select the pump PLP-202 turn the selector switch to PLP-202 position	Pump-202 should selected		
Push start button for process loop pump-I (PLP-201)	Push the start button by manually and check.	Process loop pump-I should start in manual mode and green light should glow.		



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Name of components	Procedure	Acceptance criteria	Observation	Verified by sign & date
Push stop button for process loop pump-I (PLP-201)	Push the stop button by manually and check.	Process loop pump-I should stop in manual mode and red light should glow.		
Push button for process loop pump-II (PLP-202)	Push the start button by manually and check.	Process loop pump-I should start in manual mode.		
Push stop button for process loop pump-II (PLP-202)	Push the stop button by manually and check.	Process loop pump-I should stop in manual mode and red light should glow.		
Hooter reset button	Press the reset button manually when acknowledge the alarm	To reset the hooter alarm		
Emergency switch	Press the emergency push button at running condition	System should stop immediately		

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5.4.3 VERIFICATION OF OPERATIONAL SEQUENCE:

Test Parameters	Procedure	Acceptance Criteria	Observation	Verified by Sign & Date
Auto mode operation				
Power supply	Switch ON the main supply from the selector switch.	Power supply to the control panel should start.		
Distribution plant	Select the distribution plant from the HMI.	Distribution plant should select and screen with select menu of auto and manual mode should appear.		
Auto mode	Select the auto mode and observe.	Password screen for auto mode operation should appear.		
Login	Enter the correct password and press the next key and observe	Auto mode screen with following parameters should appear Mode select Auto mode ON/OFF key Start key Stop key Process parameter key Set parameter key		



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Test Parameters	Procedure	Acceptance Criteria	Observation	Verified by Sign & Date
		Sanitization key Main. Key PID KEY Alarm key overview key		
Auto mode ON/OFF key	Press the auto mode ON/OFF key and observe.	Auto mode should ON and OFF by pressing auto ON/OFF key.		
Start key	Press the start key and observe	Auto mode should start		
Stop key	Press the stop key and observe	auto mode should stop		
Process parameters key	Press the process parameters key and observe.	Screen with supervisory login should appear.		
Login	Enter the correct supervisory password and press next key	Set parameters screen 1 should appear.		
PWS tank HH level	Select the PWS tank HH level and set the value in the range 0-7500 ltrs.	PWS tank HH level value should set in the given range.		
PWS tank H level	Select the PWS tank H level option	PWS tank H level value should display on the HMI.		
PWS tank L	Select the PWS tank L level option.	PWS tank L level value should display		



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Test Parameters	Procedure	Acceptance Criteria	Observation	Verified by Sign & Date
level		on the HMI.		
PWS tank LL level	Select the PWS tank LL level and set the value in the range 0-7500 ltrs.	PWS tank LL level value should set in the given range.		
>>> Next key	Press the next key and observe.	Set parameters screen 2 should appear.		
PWS loop cond.	Select the PWS loop cond. And set the value in the range 0-20 $\mu\text{s}/\text{cm}$	PWS loop conductivity should set in the given range.		
Delay to check CI at loop	Select the delay to check CI at loop and set the value in the range 0-999 sec.	Delay to check CI at loop value should set in the given range.		
Loop Flow	Select the loop flow and set the flow in the range of 0-9999LPH.	Loop Flow should set in the given range.		
Loop flow low	Select the Loop flow low and set the flow in the range of 0-9999LPH.	Loop Flow low should set in the given range.		
PLP Pump select	Select the PLP pump and observe	PLP1 pump should sleeted		
PWS control temp.	Select the PWS control temp. and set the value in the range 0-90°C	PWS control temp. should set in the given range.		
PWS temp. Control Hystr.	Select the PWS temp. control Hystr. And set the value in the range 0-	PWS temp. control hysteresis. Should set in the given range.		



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Test Parameters	Procedure	Acceptance Criteria	Observation	Verified by Sign & Date
	20°C			
PWS loop TOC	Select the PWS loop TOC and set the value in the range 0-999 PPB	PWS loop TOC value should set in the given range.		
>>> Next key	Press the next key and observe.	Set parameters screen 3 should appear.		
PWS sanitization level	Select the PWS sanitization level and set the value in the range 0-9999 LTRS.	PWS sanitization level value should set in the given range.		
PWS sanitization time	Select the PWS sanitization time and set the value in the range 1-999 mins.	PWS sanitization time value should set in the given range.		
PWS sanitization start temperature	Select the PWS sanitization start temperature and set the value in the range 0-90°C	PWS sanitization start temperature value should set in the given range.		
PWS temp. control Hysteresis	Select the PWS temp. control Hysteresis and set the value in the range 0-20°C	PWS temp. control Hysteresis value should set in the given range.		
PWS EVF control	Select the PWS EVF control temperature and set the value in the	PWS EVF control temperature value should set in the given range.		



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Test Parameters	Procedure	Acceptance Criteria	Observation	Verified by Sign & Date
temperature	range 0-90°C			
PWS EVF temperature HYSTR.	Select the PWS EVF temperature HYSTR. And set the value in the range 0-20°C	PWS EVF temperature HYSTR. Value should set in the given range.		
Sanitization pump speed	Select the Sanitization pump speed and set the value in the range 10-100%	Sanitization pump speed value should set in the given speed.		
Process parameters	Select the process parameters key and observe	Process parameter screen with following parameters in display mode should appear: PWS loop cond.,PWS tank level, PWS loop flow, PWS EVF temp., PWS tank temp. PWS loop temp., PWS loop TOC,PWS UV intensity,PWS loop pH		
Sanitization	Select the sanitization from the main auto mode screen and observe.	Sanitization screen should appear		
Select mode	Select the mode ON/OFF and	Sanitization mode should ON/OFF		



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Test Parameters	Procedure	Acceptance Criteria	Observation	Verified by Sign & Date
ON/OFF	observe			
Start button	Select the sanitization start button and observe	Sanitization should start.		
Stop button	Select the sanitization stop button and observe	Sanitization should stop.		
Alarm option	Select the alarm option from the main auto mode screen and observe.	List of alarm should display.		
Overview option	Select the Overview option from the main auto mode screen and observe.	Overview screen (PID diagram) should display.		
Auto mode of Operation	After setting the auto mode values start the auto mode operation and observe.	<ul style="list-style-type: none">☞ Distribution pump should be started. (PLP-201 or PLP 201)☞ The conductivity of return line should be show in CIC-201.☞ UV system should be started.☞ Flow transmitter FT-201 shall show the flow rate in return line.☞ Dumping Valve FDV-202 shall be on collection mode		



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Test Parameters	Procedure	Acceptance Criteria	Observation	Verified by Sign & Date
		<ul style="list-style-type: none">☞ Temperature of return line should be shown by temperature sensor TT-203 on panel☞ Return purified water shall collected in tank water shall collected in		
Manual mode operation				
Distribution plant	Select the distribution plant from the HMI.	Distribution plant should select and screen with select menu of auto and manual mode should appear.		
Manual mode	Select the manual mode and observe.	Password screen for manual mode operation should appear.		
Login	Enter the correct password and press the next key and observe	Manual mode screen with following parameters should appear Mode select manual mode ON/off key PLP-201 ON/OFF PLP-202 ON/OFF AV-201 ON/OFF AV-202 ON/OFF		



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Test Parameters	Procedure	Acceptance Criteria	Observation	Verified by Sign & Date
		HIUV-201 ON/OFF FDV-201 ON/OFF EVF-201 ON/OFF		
Mode select manual mode ON/off key	Select the manual mode ON/OFF key and observe	Manual mode should ON/OFF		
PLP-201 ON/ OFF KEY	Select The PLP-201 to ON/OFF position.	Distribution pump PLP-201 should start and stop by selecting ON/OFF key.		
PLP-202ON/ OFF KEY	Select The PLP-202 to ON/OFF position.	Distribution pump PLP-202 should start and stop by selecting ON/OFF key.		
AV-201 ON/OFF key	Select The AV-201 to ON/OFF position.	Actuated valve AV-201 should ON/OFF by operating ON/OFF key		
AV- 202ON/OFF key	Select The AV-202 to ON/OFF position.	Actuated valve AV-202 should ON/OFF by operating ON/OFF key		



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Test Parameters	Procedure	Acceptance Criteria	Observation	Verified by Sign & Date
HIUV-201 ON/OFF Key	Select The HIUV-201 to ON/OFF position	UV lamp should turned ON/OFF by operating ON/OFF key		
EVF-201 ON/OFF key	Select The EVF-201 to ON/OFF position	Vent filter should turned ON/OFF by operating ON/OFF key		
Auto Mode sanitization	Put the system in sanitization mode turn ON auto mode. Stat the pump by pressing start button, The Distribution pump shall start to circulate the water in loop and valve AV-201 opens to allow steam in to the jacket of tank. This process should be done till loop temperature attains 85°C. Water should be circulated for 60 minutes after attaining 85°C & then loop and purified water tank has to be drained.	<ul style="list-style-type: none">☞ Steam Valve AV-201 will open and start heating the Purified Water.☞ Water should be heated up to 85°C.☞ After water reaches 85°C Sanitization Timer starts for 60 min.☞ The Steam valve AV-201 will open if loop temperature falls below set point.☞ The Steam valve AV-201 will Close if loop temperature rise above the set point.☞ After sanitization is completed FDV-201 should open and drain the Water up to Low -Low level in Purified Water Storage Tank. The Process		



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Test Parameters	Procedure	Acceptance Criteria	Observation	Verified by Sign & Date
		<p>Loop Pump will stop.</p> <ul style="list-style-type: none">☞ Drain the Purified Water Storage Tank manually by opening tank drain valve DV-201☞ There should be indication on MMI that Sanitization Cycle over.		
Manual Mode sanitization	Select the manual mode sanitization and turned the pump manually on, steam on and wait fro the temperature 85°C and START the sanitization for 60 mins. After completion of the sanitization manually turned on the FDV-201 to drain the purified water and turned the Dv-201 on manually to drain the water from the storage tank.	<ul style="list-style-type: none">☞ Steam Valve AV-201 shall open and start heating the Purified Water.☞ Water should be heated up to 85° C.☞ After water reaches 85°C Sanitization should be done for 60 min.☞ After sanitization is completed DV-201 should open manually The Process Loop Pump will stop.☞ Drain the Purified Water Storage Tank manually by opening tank drain valve DV-201.		
Return velocity	Step I : Close all the user points run	<ul style="list-style-type: none">☞ Flow meter reading should be		



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Test Parameters	Procedure	Acceptance Criteria	Observation	Verified by Sign & Date
	the distribution pump on full speed, and check the flow meter reading Step II : Now open all the user points one by one and check the flow meter reading	NLT 8000 LPH. ☞ The flow meter reading should be NLT 7500 LPH (i.e. equal to 1.2m/sec velocity)		

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5.5 VERIFICATION OF PROVIDED INTERLOCKING / SAFETY FEATURE:

All interlocking/safety feature provided in system shall be verified as per following procedure:

Interlock/Safety feature Description	Procedure	Acceptance Criteria	Observation	Verified by Sign& Date
High-high level sensor	Operate the Purified Water Storage & Distribution System as per the standard operating procedure. Do not consume the water in the Purified water loop and let the level rise in the Purified Water Storage Tank. As soon as the level of water reaches high-high level in Purified Water Storage Tank. After an operation record the response.	FDV-201 Valve should close and water should start circulating back in the Post UF feed tank and alarm PWS HH level should generate on the HMI.		
High level sensor	Drain the water from the Purified Water Storage Tank such that the level in the Purified Water Storage Tank falls down to High level or set the high level value as per the actual level in the tank.	As soon as the high level is achieved in the Purified Water Storage Tank, FDV-201 open and generation system should start automatically in normal mode in normal sequence.		
Low-low level sensor	Operate the Purified Water Distribution System as per the standard operating procedure. Drain the water from the Purified Water Storage Tank such that the level in the Purified Water Storage	As soon as the Low-Low level is achieved in the Purified Water Storage Tank, Process Loop Pump should stop immediately. The same should be		



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Interlock/Safety feature Description	Procedure	Acceptance Criteria	Observation	Verified by Sign & Date
	Tank falls down to Low -Low level	indicated on the HMI with Hooter		
Low level sensor	Operate the Purified Water Storage & Distribution System as per the standard operating procedure and fill the water in the Purified Water Storage Tank such that the level in the Purified Water Storage Tank reaches to Low level.	As soon as the Low level is achieved in the Purified Water Storage Tank, Process Loop Pump should start immediately		
Low temperature in return loop during sanitization	Operate Purified Water Storage & Distribution System in Sanitization mode. Reset the low temperature limits higher than the actual temperature at return loop of distribution system.	The Steam Valve AV-201 will Open		
High temperature in return loop during sanitization	Operate Purified Water Storage & Distribution System in Sanitization mode. Reset the high temperature limits lower than the actual temperature at return loop line	The Steam Valve AV-201 will Close		
High conductivity in return line	Operate the Purified Water Storage & Distribution System as per the standard operating procedure and reset the conductivity	The Flow Diverter Valve –FDV-202 should open immediately & dump the water for 300 sec. The CIC- 201 High		



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Interlock/Safety feature Description	Procedure	Acceptance Criteria	Observation	Verified by Sign & Date
	set point below the actual operating value. Allow the set point below the actual reading for more than 5 minutes.	should be indicated on the panel. “COND HIGH AT PWS LOOP” After the conductivity value is changed to the original present value (1.25 $\mu\text{s/cm}$). After 30 seconds of consistent low value below the set point the control value FDV will automatically close. After 300 seconds of consistent dumping it will trip the system with alarm and indication on the panel. The HMI should indicate the message “COND VERY HIGH AT PWS LOOP” and Hooter should ON.		
Emergency stop	Press Emergency Stop on main control panel during normal operation. Note the alarm is generated and message is displayed on MMI when Emergency Stop is pressed. Release the Emergency stop button. Switch ON the control power and reset the system by pressing reset	E-stop button shall be locked upon pressed. Purified Water Generation & Distribution System should stop operation immediately. Audio visual Alarm shall generate “EMERGENCY PRESSED” .		



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Interlock/Safety feature Description	Procedure	Acceptance Criteria	Observation	Verified by Sign & Date
	button on MMI			

Inference: -----

Reviewed by
(Sign/Date)



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5.6 REVIEW OF CALIBRATION STATUS OF MEASURING DEVICES:

S.No.	Instrument name	Instrument ID No.	Calibration Done On	Calibration Due On	Verified By Sign & Date

Inference:
.....
.....

Reviewed by
(Sign/Date)



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5.7 Verification of Standard Operating Procedure:

All identified standard operating procedure shall be verified during operational qualification of system.

S.No.	SOP Title	SOP No.	Status	Verified by Sign & Date

Inference:

Reviewed by
(Sign/Date)



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5.9 ABBREVIATIONS:

Following Abbreviations are used in the installation qualification protocol of Purified water storage & distribution system

mm : Millimeter

m/sec : Meter/second

P&ID : Piping & instrumentation diagram

PW : Purified water

NMT : Not more than

NLT : Not less than

HMI : Human machine interface

μ S/cm : Micro Siemens per centimeter

PWD : Purified water distribution

POQ : Protocol for operational qualification

ROQ : Report for operational qualification



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5.10 DEFICIENCY AND CORRECTIVE ACTION (S) REPORT (S):

Following deficiency was verified and corrective actions taken in consultation with the Engineering Department.

Description of Deficiency: -----

Corrective Action(s) taken: -----

**Reviewed by
Sign & Date**



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6.0 OPERATIONAL QUALIFICATION FINAL REPORT:

The operational qualification final summary & conclusion shall be written in below given space.

6.1 Summary: -----

6.2 Conclusion : -----

**Reviewed By
Sign & Date**



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6.3 FINAL REPORT APPROVAL:

It has been verified that all tests required by this protocol are completed, reconciled and attached to this protocol or included in the qualification summary report. Verified that all amendments and discrepancies are documented, approved and attached to this protocol, (if applicable)

Signatures in the block below indicate that all items in this qualification report of Purified water storage & distribution system have been reviewed and found to be acceptable and that all variations or discrepancies have been satisfactorily resolved.

NAME	DESIGNATION	DEPARTMENT	SIGNATURE	DATE
		PROJECTS / ENGINEERING		
		PRODUCTION		
		QUALITY ASSURANCE		