STANDARD OPERATING PROCEDURE

Department: Engineering

TITLE: Operation of Multi Column Distillation Plant

SOP No.		**Revision No.**	
Effective Date		**Supersedes No.**	
Review Date		**Page No.**	1 of 6

1.0 OBJECTIVE

The purpose of this SOP is:

1.1 To describe the procedure for Operation of Multi Column Distillation Plant (MCDP).

2.0 SCOPE

2.1 This SOP is applicable for the procedure for Operation of multi column distillation plant at

at ……………..

3.0 RESPONSIBILITY:

3.1 The Maintenance Operator shall be responsible:

    3.1.1 Responsible for operation of Multi Column Distillation Plant.

    3.1.2 Responsible for record the operational data's in the performance log book.

3.2 The Maintenance Engineer shall be responsible:

    3.2.1 Responsible for assurance of proper working of the plant.

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

4.0 ACCOUNTABILITY

Head –Engineering Services

STANDARD OPERATING PROCEDURE

Department: Engineering			
TITLE: Operation of Multi Column Distillation Plant			
SOP No.		**Revision No.**	
Effective Date		**Supersedes No.**	
Review Date		**Page No.**	2 of 6

5.0   PROCEDURE:

5.1 SAFETY MEASURES:

5.1.1   Ensure that air inlet valve open and pressure is 6 –7 kg/cm^2 (Kilogram per Centimeter Square).

5.1.2   Ensure that raw steam inlet valve open and pressure is minimum 3 kg/cm^2.

5.1.3   Ensure that feed water (purified water) and cooling water (reverse osmosis water) are available.

5.1.4   Open the bypass ball valve of boiler steam condensate, purified water drain out valve and close condensate trap assembly valve of the first column.

5.1.5   Close the feed water control valve and cooling water control valve.

5.1.6   Remove air from the pump by opening Air vent bolt fitted with pump at top housing. Close the vent valve immediately when water starts coming out from there.

5.2 STARTING PROCEDURE:

5.2.1   Open the raw steam supply valve and allow steam to go in the first column.

5.2.2   Allow the steam condensate with impurities to go out through bypass ball valve, so as to Avoid the choke up of steam trap.

5.2.3   Switch On Switch.

5.2.4   MMI F2 User Name the Enter.

5.2.5   MMIF3 user password enters.

5.2.6   MMI F8 button press the process start.

5.2.7   As soon as clean steam starts coming out from the bypass valve, close the bypass valve and open the trap assembly valve. Keep it open till plant is in running.

STANDARD OPERATING PROCEDURE

Department: Engineering	
TITLE: Operation of Multi Column Distillation Plant	

SOP No.		**Revision No.**	
Effective Date		**Supersedes No.**	
Review Date		**Page No.**	3 of 6

5.2.8   The steam will enter the heat exchanger of the first column. And the condensate will be discharged from the steam trap. The discharging function of the trap will be automatic.

5.2.9   As soon as the feed water pump starts, slowly open the feed water control valve such that the water flow meter will indicate the flow of water at about 1/3 of the plant Now evaporation in first column will take place and prevents extra accumulation of purified Water in first column and pre heat all columns rapidly. Close the purified water drain out Valve.

5.2.10   Cooling water pump will get starts as soon as the temperature of WFI becomes more than 85^0C. now increase the flow of feed water and cooling water by opening the feed water Control valve and cooling water control valve respectively. Feed water flow-1800 liter /hour and cooling water flow-2250 liter /hour.

5.2.11   Adjust the flow rates of cooling water and feed waters such that the temperature of Distillate remains below 100^0C for avoiding the failure of conductivity sensor.

5.2.12   Within 5-15 minutes the system will get set and all the controls through the PLC will work Automatically.

5.2.13   Monitor the parameters like conductivity of distillate, temperature of the distillate, Temperature of raw steam, temperature of cooling water and flow rates of feed and Cooling water. Such data to be noted in performance log book.

5.2.14   For collecting sample of distilled water open the sampling valve provided in the discharge line.

5.2.15   Air vent valve will operate automatically through the timer setted in PLC.

STANDARD OPERATING PROCEDURE

Department: Engineering

TITLE: Operation of Multi Column Distillation Plant

SOP No.		Revision No.	
Effective Date		**Supersedes No.**	
Review Date		**Page No.**	4 of 6

5.3   STOPPING PROCEDURE:

5.3.1   To stop the plant first close the raw steam valve and then wait the feed water pump and

Cooling water pump stops automatically.

5.3.2   MMI F8 Button the Process Stop.

5.3.3   MMI F1 button main menu and F3 logout.

5.3.4   Switch 'OFF' the switch.

5.4   OPERATION OF THE PLC DISPLAY:

5.4.1   When any fault is generated in the plant, the respective fault will be indicated at the PLC

Window. Then the fault rectification sequence given in supplier's manual to be followed.

5.5   PREVENTIVE MAINTENANCE OF THE PLANT:

5.5.1   Preventive maintenance of the plant to be carried out as per SOP.

5.6   DE SCALING OF THE PLANT:

5.6.1   De scaling of the plant to be carried out as per SOP.

6.0   ANNEXURES:

Annexure –I: Performance Log sheet of MCDP.

7.0   REFERENCE (S)

Nil

8.0   Glossary

SOP   :   Standard Operating procedure

No   :   Number

STANDARD OPERATING PROCEDURE

Department: Engineering			
TITLE: Operation of Multi Column Distillation Plant			
SOP No.		**Revision No.**	
Effective Date		**Supersedes No.**	
Review Date		**Page No.**	5 of 6

MCB   :   Mixed Column Base.

PLC   :   Programmable Logic Controller.

MCDP   :   Multi Column Distillation Plant

&   :   And.

kg/cm^2 :   Kilogram per Centimeter Square

STANDARD OPERATING PROCEDURE

Department: Engineering

TITLE: Operation of Multi Column Distillation Plant

SOP No.		**Revision No.**	
Effective Date		**Supersedes No.**	
Review Date		**Page No.**	6 of 6

ANNEXURE-I
Performance Log sheet of MCDP

Date	
Shift	
Operator	

Time (Hrs)	Raw steam inlet pressure (kg/cm^2)	Feed water inlet pressure (kg/cm^2)	Feed water flow (lph)	Cooling water flow (lph)	Raw steam temperature (^{0}C)	Cooling water temperature (^{0}C)	Distilled water temperature (^{0}C)	Feed water conductivity (µs/cm)	Distilled water conductivity (µs/cm)	Remarks	Operators sign.

ACCEPTANCE CRITERIA

Feed water conductivity	Distilled water conductivity	Feed water flow	Cooling water flow	Distilled water temp.	Raw steam pressure	Checked by: (Engineer)
NMT 5 µs/cm	NMT 1µs/cm	1800 - 2000 lph	NLT 1800 lph	NLT 80^{0}C	3-6 kg/cm^2	