Title: Operation of Chiller System			
SOP No.:		**Revision No.:**	00
Effective Date:		**Supersedes No.**	Nil
Review Date:		**Page No.**	1 of 6

1.0 OBJECTIVE:
To lay down a procedure for Operation of Chiller System.

2.0 SCOPE:
This SOP is applicable for Operation of Chiller System.

3.0 RESPONSIBILITY:
Operator/Officer / Executive - Engineering

4.0 ACCOUNTABILITY:
Head – Engineering

5.0 ABBREVIATIONS:

ID No.	Identification Number
LT	Low Tension
LTD.	Limited
PVT.	Private
HMI	Human Machine Interface
KPA	Kilo Pascal
QA	Quality Assurance
SOP	Standard Operating Procedure
Kg/cm^2	Kilogram per centimeter square
NMT	Not more than
NLT	Not less Than

6.0 PROCEDURE:

6.1 CHECK BEFORE START-UP OF CHILLER PLANT:

6.1.1 Check and ensure that all the measuring device/instrument are in calibrated stage.

6.1.2 Check and ensure that inlet pressure at chiller from condenser pump is NMT 3.0 kg/cm^2.

6.1.3 Check and ensure that outlet pressure from condenser pump is NMT 2.5 kg/cm^2.

6.1.4 Check and ensure that inlet pressure at chiller from evaporator pump is NMT 6.0 kg/cm^2.

6.1.5 Check and ensure that outlet pressure from evaporator pump is NMT 5.0 kg/cm^2.

6.1.6 Make sure that all pressure gauges are indicating proper pressure before start.

6.1.7 Make sure that cooling tower sump is filled with water and make up inlet is open.

6.1.8 Check and ensure that all the line valves of circulation of chilled water & cooling tower are in open condition.

6.1.9 Before starting chiller, check and ensure that crankcase heaters have operated.

6.1.10 Check the refrigerant system for any leakage by the use of soap solution.

6.1.11 Ensure that power supply is available at the main electrical panel for the operation of chiller.

6.1.12 Switch on the power supply of local electrical panel to start cooling tower pumps and chilled water circulation pumps from LT panel.

6.1.13 Switch on the required compressor by moving selector switch towards manual side.

6.1.14 Check on local control panel of chiller that green light emitting device (LED) which indicates that the chiller is in operation.

6.1.15 The unit shall start automatically.

6.2 OPERATION PROCEDURE:

6.2.1 Check that the chiller system is running normally**.**

6.2.2 Check that the suction pressure is in between NLT 180 KPA if the same is not achieved than check the refrigerant level and if found low than charge the refrigerant system.

6.2.3 Check that the discharge pressure is NMT 1000 KPA, if the same is not achieved and found in higher side than check the inlet cooling tower, water inlet temperature at condenser inlet, it should be NMT 35^0C, if the same is not achieved than check the cooling tower fan operation for proper working and also check the condenser tubes for any scaling by stopping the chiller and cooling tower circulation pump.

6.2.4 Check the inlet and outlet pressure of cooling tower at condenser, it should be NMT 3 Kg/cm^2 for inlet & not more than 2.5 Kg/cm^2 for outlet.

6.2.5 Check the inlet and outlet pressure of chilled water circulation, it should be NMT 6.0 Kg/cm^2 for inlet & 5.0 kg/cm^2 for outlet.

6.2.6 Check and ensure that outlet temperature of chilled water shall be NMT 15°C.

6.2.7 Check for any leakage in refrigerant circuit with the use of soap solution, if in any case leakage is observed than stop the respective chiller immediately and close the suction and discharge valve of compression. Rectify the leakage and charge the refrigerant gas and start the respective chiller system.

6.3 CHECKS THE FAULT ALARMS DURING OPERATION:

6.3.1 Check whether any unusual sound is coming from moving parts.

6.3.2 Check for the "High Pressure alarms" for low water flow and high condenser water temperature.

6.3.3 Check for the inlet and outlet water temperature difference in both Condenser and Evaporator units.

6.3.4 Check for the "Load Alarm" if compressor stops suddenly. To rectify check the High pressure & low pressure transducer.

6.3.5 Check for "Low Oil Pressure Alarms". Check for low condenser water temperature and oil filter pressure sensor.

6.4 AT THE TIME OF STOPPING CHILLER:

6.4.1 To stop the chiller, press the push button of compressors one by one.

6.4.2 After stoppage of chiller, stop the respective condenser and chiller pump.

6.4.3 Now stop the cooling tower fans and switch off the power supply from electrical panel.

6.5 Record the Operation Details of Chiller System in **Annexure-I**, Titled **"Chiller System Operation Record"**.

6.6 Record the Operation Details of Circulation Pump in **Annexure-II**, Titled **"Circulation Pump Operation Record"**.

7.0 ANNEXURES:

ANNEXURE No.	TITLE OF ANNEXURE	FORMAT No.
Annexure-I	Chiller System Operation Record	
Annexure-II	Circulation Pump Operation Record	

ENCLOSURES: SOP Training Record

8.0 DISTRIBUTION:

- Controlled Copy No. 01 Quality Assurance
- Controlled Copy No. 02 Engineering
- Master Copy Quality Assurance

9.0 REFERENCES:

Operation & Maintenance Manual of Chiller.

10.0 REVISION HISTORY:

CHANGE HISTORY LOG

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

Title: Operation of Chiller System

SOP No.:		**Revision No.:**	00
Effective Date:		**Supersedes No.**	Nil
Review Date:		**Page No.**	5 of 6

ANNEXURE – I

CHILLER SYSTEM OPERATION RECORD

Block: _____ **Chiller ID No. : _____** **Frequency: 3 Hours** **Date: _____**

Start Time	**Stop Time**	**Reading Time**	**Chilled Water Temperature**		**Chilled Water Pressure**		**Condenser Water Pressure**		**Cond. Water Temp.**		**Suction Pressure NLT: 180 KPA**	**Discharge Pressure NMT : 1050 KPA**	**Compressor C1**		**Compressor C2**		**Done By Sign & Date**	**Remarks**
			Inlet NMT: 18°C	Outlet NMT: 15°C	Inlet NMT: 5 Kg/cm^2	Outlet NMT:5 Kg/cm^2	Suction NMT: 3 Kg/cm^2	Discharge NMT: 2.5 Kg/cm^2	Inlet NLT: 26°C	Outlet NMT: 40°C			**Amp.**	**Load**	**Amp.**	**Load**		

Reviewed By
Sign & Date

Title: Operation of Chiller System

SOP No.:		**Revision No.:**	00
Effective Date:		**Supersedes No.**	Nil
Review Date:		**Page No.**	6 of 6

ANNEXURE – II

CIRCULATION PUMP OPERATION RECORD

Block: _____ **Frequency: 3 Hours** **Date: _____**

Chilled Water Pump (Amp.)											Cooling Tower Pump (Amp.)										Cooling Tower Fan (Amp.)										Done By Sign & Date	Remarks
Primary Pump						Secondary Pump															C.T-01		C.T-02		C.T.-03		C.T-04		C.T.-05			
S. No.	1	2	3	4	5	6	7	8	9	10	1	2	3	4	5	6	7	8	9	10	1	2	1	2	1	2	1	2	1	2		