Amity University Haryana
Minutes of Meeting on Policy Review

Amity University Haryana has a huge commitment towards environment and sustainability. A lot of teaching learning research and other activities revolve around this highly significant issue to make the planet a better place. A meeting was organized on 04.02.2021 with experts to review some major policies related to these aspects. The meeting was presided over by the honorable Pro Vice Chancellor Dr. Padmakali Banerjee with following members:

1. Member Secretary Dr. Ravi Manuja
2. Member Dr. Vikas Madhukar
3. Member Dr. Kushagra Rajendra
4. Member Dr. Pallavi Sharma
5. Member Dr. Seema R Pathak
6. Member Dr. Anil Kumar

Agenda 1: To review the policy to maximise water reuse across the university

Agenda 2: To review the Environmental and Sustainability Policy

Agenda 3: To review the policy for ensuring all renovations / new builds follow the energy efficiency standards

Agenda 4: To review the policy on divesting investments from carbon-intensive energy industries especially coal and oil

Resolution: The committee recommended that at this point of time, no changes to the policy are necessary. Hence AUH may maintain the same policies for the time being.

The meeting was adjourned after Vote of thanks to the Chair

Registrar
Amity University Haryana
Manesar Gurgaon-122413

Registrar
Amity University Haryana

AMITY UNIVERSITY HARYANA

Plan to Reduce Energy Consumption

Building Operating Plan

2016

Building Operating Plan

1.0 Basis of Design of Air Conditioning

A) Site Location — Manesar (Haryana)

Geographic Location — 28.35 N & 76.93 E

B) Introduction

The centralized HVAC system has been designed, installed & commissioned to provide thermally controlled environment during summer and monsoon season for the Academic Blocks and partly to hostel.

C) Outside design conditions	DBT °C	WBT °C
Summer	43.30	23.90
Monsoon	35.00	28.30

D) Inside Design Conditions	DBT °C
Summer / Monsoon	26
Winter	No provision of winter heating is made.

E) Filtration

Pre filters of efficiency 90% down to 10 micron particle size have been installed in all the AHU / FCU for AC application.

F) Exposed Roof

All exposed roof / terraces shall be provided with Brick Koba and insulation to getan overall heat transmission factor of 0.12 BTU/HR/SFT/°F.

G) Power Supply

Stabilized three phase four wire AC supply i.e. 415 Volts ± 10 % & 50 Hz ± 5 % with double earthing made available to AC Main Panels, Sub Panel for AHU / Fan. Single phase power supply with earthing provided near single phase AHUs & FCUs

H) Light Power Density

Light Power Density in the various areas has been taken as 0.5 watt per sqft.

2.0 Design Parameters

A) For Water cooled Chilling Machine

a) Temperature of chilled water entering the chillers °C	:	12.22
b) Temperature of chilled water leaving the chillers °C	:	6.67
c) Chilled water flow rate US GPM / TR	:	2.4
d) Fouling factor of chillers (MKS)	:	0.0001
e) Temperature of water to inlet of condenser °C	:	32.22
f) Temperature of water leaving the condenser °C	:	36.39
g) Condenser water flow rate US GPM / TR	:	4.0
h) Fouling factor of Condenser MKS	:	0.0002
i) Maximum water velocity MPS	:	2.5

B) For Air handlers

a) Maximum Face velocity across cooling coil MPM	:	152.0
b) Maximum face velocity across pre filter MPM	:	152.0
c) Maximum water pressure drop across the coil in Mt.	:	4.6
d) Maximum water velocity through coil in MPS	:	2.5
e) Maximum Fan outlet velocity MPS	:	10.0

C) For Ducting Work

a) Method of Duct Design	:	Equal friction
b) Maximum air velocity in supply duct (AC) MPM	:	550.0
c) Maximum air velocity in return duct (AC) MPM	:	457.0
d) Friction loss in duct (Max.) MM Wg in 100 Mt run.	:	8.33
e) Maximum Velocity at supply air grill outlet (AC) MPM	:	150.00

D) For Piping Work

a) Friction loss (Maximum) Mt / 100 Mt lengths	:	5.0
b) Flow velocity (Maximum) m/s	:	2.5

3.0 HVAC SYSTEM OPERATION AND MAINTENANCE ACTIVITY

The HVAC system comprising of centrally located chiller system shallbe operated and

maintained as per the following details:

A) Operation of Plant :

The plant comprising of chiller, pumps and cooling towers shall beoperated from 09.00 AM – 05.00 PM

B) Operation of Air Handling Units :

Air Handling units shall be switched on / off by user depending on theirrequirement.

C) Operation of Fan Coil Units:

Fan coil units shall be switched on / off by room occupant depending ontheir requirement.

OBSERVED PARAMETERS

The below mentioned standard operating parameters shall be monitored by theplant operator during operation;

- SOP for 600 TR chiller : As per Annexure - 1
- SOP for 600 TR chiller : As per Annexure - 2
- SOP for 800 TR chiller : As per Annexure - 3
- SOP for pumps : As per Annexure - 4
- SOP for cooling tower : As per Annexure - 5

The operation of chiller system shall be monitored and documented as under:

- Plant operating parameters capturing in Log book every two hours Temperature in the block measured and recorded on each operation day onsample basis in cyclic manner.
- Cooling tower water level monitoring on hourly basisContinuous monitoring for any abnormal noise

As per attached Annexure – 6 and 7.

4.0 MAINTENANCE SCHEDULE FOR EQUIPMENT

Maintenance of chiller and other equipment shall be carried out as per followingschedule

Daily general activity

External cleaning of all equipment

Check drainage system of plant room for proper functioning

CHILLERS:

- **OEM SCOPE**

Maintenance service of chillers shall be carried out by OEM. In case of Troubleshooting in chiller, complaint is logged with OEM and is attended by OEM technical team.

- **OPERATION TEAM SCOPE**

Physical checkup of chillers is carried out by operation team on weekly basis asper defined format (refer Attached annexure 8)

PUMPS

- Pumps are checked and maintained on weekly basis as per defined format
- Monthly checks and preventive maintenance on pumps are carried out as perdefined format
- Refer Attached Annexure 9

AHUs

- Preventive maintenance on air handling units is carried out once in threemonths as per defined format.
- Air filters are cleaned on monthly basis.
- Yearly preventive maintenance is carried out during off season (Dec to Feb).

COOLING TOWERS

- Cooling Towers are checked and maintained on weekly basis as per definedformat (Refer Attached Annexure 10)
- Sump water is drained and cleaned once in 15 days.
- Fresh water is filled after this cleaning.

5.0 COMPLAINT MANAGEMENT

The complaints received in relation to cooling with central plant shall be recorded and resolved by operation team.

Sqd. Ldr. S K Singh
Director Administration
Amity University Haryana

Sqn Ldr SK Singh
Director Admin
AUH Manesar

Annexure for Reference

Annexure - 1

Chiller Capacity	**600TR**	
Chilled Water IN - Min	50	F
Chilled Water IN - Max	65	F
Chilled Water Out - Min	45	F
Chilled Water OUT - Max	60	F
Condensor Water IN - Min	70	F
Condensor Water IN - Max	91	F
Condensor Water Out - Min	75	F
Condensor Water OUT - Max	98	F
Condensor Approach temp - Max	10	F
Compressor Amps	530	Amps
Voltage Range	380-420	Volts

Annexure - 2

Chiller Capacity **600TR**

Chilled Water IN - Min	50	F
Chilled Water IN - Max	65	F
Chilled Water Out - Min	45	F
Chilled Water OUT - Max	60	F
Condensor Water IN - Min	70	F
Condensor Water IN - Max	91	F
Condensor Water Out - Min	75	F
Condensor Water OUT - Max	98	F
Condensor Approach temp - Max	10	F
Compressor Amps	530	Amps
Voltage Range	380-420	Volts

Annexure - 3

Chiller Capacity	**800 TR**	
Chilled Water IN - Min	50	F
Chilled Water IN - Max	65	F
Chilled Water Out - Min	45	F
Chilled Water OUT - Max	60	F
Condensor Water IN - Min	70	F
Condensor Water IN - Max	91	F
Condensor Water Out - Min	75	F
Condensor Water OUT - Max	98	F
Condensor Approach temp - Max	10	F
Compressor Amps	710	Amps
Voltage Range	380-420	Volts

Annexure - 4

Pumps

	DP Max	Amps Max
Chiller pump - 1	100	76.5
Chiller pump - 2	100	76.5
Chiller pump - 3	100	76.5
Condenser Pump -1	85	76.5
Condenser Pump -2	85	76.5
Condenser Pump -3	85	76.5

Annexure – 5

COOLING TOWER

Fan motor current	max	12.5 amps
Sump water temperature	max	90F
Bleed off water	average	1%

LOG BOOK

Date :

AIRCONDITIONING PLANT AT.....

Power consumed in KW

Chiller 1 :

Chiller 2 :

Chiller 3 :

Total Power KW

Aircon Technique Pvt. Ltd.
418, Pocket-C, Sector-19, Rohini, Delhi-110085.

TIME HRS	Outside Temp DB/E WB/E	Main Power Supply				CH UNIT NO.1												CH UNIT NO.2												CH UNIT NO.3												REMARK
						Compressor					Condenser				Chiller			Compressor					Condenser			Chiller			Compressor					Condenser			Chiller			
		R Y	Y B	B Y	Amps	HP	LP	OP	Oil LVL in LDV in	Amps	Water IN		Water OUT		Operating data			Water IN		Water OUT		Operating data			Water IN		Water OUT							Water IN		Water OUT		Operating data			Water IN		Water OUT		
											Temp	PR	Temp	PR	Ref PR	Cond Approach Temp	Cond Ref Temp	Temp	PR	Temp	PR	Ref PR	Cond Approach Temp	Cond Ref Temp	Temp	PR	Temp	PR						Temp	PR	Temp	PR	Ref PR	Cond Approach Temp	Cond Ref Temp	Temp	PR	Temp	PR	
06.00 A.M.																																								
08.00 A.M.																																								
10.00 A.M.																																								
12.00 P.M.																																								
02.00 P.M.																																								
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10.00 P.M.																																								
12.00 A.M.																																								
02.00 A.M.																																								
04.00 A.M.																																								

Taken over from 3rd shift operator at time :
1 st Shift operator .....
Handed over to 2nd shift operator at time :

Taken over from 1 st shift operator at time :
II nd Shift .....
Handed over to 3rd shift operator at time :

Observations :

Taken over from 2nd shift operator at time :
III rd Shift .....
Handed over to 1st shift operator at time :

Failures / Interruptions & Breakdown :

Mechanical :

Electrical

Instrumentation Electronic

Spares Used :

Environment Waste record

Refrigerant

Lub Oil

Contaminated water

others

Annexure - 6

Annexure - 7

AIRCONDITIONING PLANT AT.....

LOG BOOK

Aircon Technique Pvt. Ltd.
418, Pocket - C, Sector-19, Rohini, Delh - 110089.

TIME HRS	Condensor Water Pumps												Chiller Water Pumps												C.T. Fan Colling Tower Motor											
	Amps.				Water Pr Inlet				Water Pr Outlet				Amps.				Water Pr Inlet				Water Pr Outlet				Amps.											
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	5	6	7	8	9	10	11	12
06.00 A.M.																																				
08.00 A.M.																																				
10.00 A.M.																																				
12.00 P.M.																																				
02.00 P.M.																																				
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06.00 P.M.																																				
08.00 P.M.																																				
10.00 P.M.																																				
12.00 A.M.																																				
02.00 A.M.																																				
04.00 A.M.																																				
Power consumed KW																																				

Total Power Consumed :

Supervisor / Operator : .....

Failures / Interruptions & Breakdown :

Mechanical :

Electrical

Instrumentation/Electronic

Spares Used :

Enviornment Waste record

Retrigerent

Lub Oil

Contaminated water

Others

INSTALLATION LOCATION :

PREVENTIVE MAINTENANCE OF WATERCOOLED CHILLERS

Annexure - 8

PLANT CAPACITY :

PLANT MAKE

S NO.	Work Description	W-1	W-2	W-3	W-4	
1	Clean the equipments externally					
2	Check foundation status					
3	Check oil level					
4	Check pressure gauges					
5	Check ref. piping for vibrations					
6	Check ref. piping for signs of oil leaks					
7	Ensure tightness of all connections and fittings					
8	Check starter connections					
9	Check starter contactors					
10	Check starter operation					
11	Check for proper water flow in the evaporator					
12	Leak test for refrigerent					
	Signature of operator					

	OPERATING PARAMETERS					
1	Evaporator Suction Temperature					
2	Evaporator Refrigerent Pressure					
3	Evaporator Approach					
4	Condensor Refrigerent Temperature					
5	Condensor Refrigerent Pressure					
6	Condensor Approach					
7	Chiller Water in Temp					
8	Chiller Water out Temp					
9	Chiller Water in Pressure					
10	Chiller Water out Pressure					
11	Condensor Water in Temp					
12	Condensor Water out Temp					
13	Condensor Water in Pressure					
14	Condensor Water out Pressure					
15	Lubrication Oil Tank Pressure					
16	Oil Tank Temperature					
17	Running Ampers					
	Signature of Operator					

Annexure - 9

Preventive Maintennce Checklist for Pumps

Job Name: Type: Weekly

Pump Model: Sr. No.:

Location: Moter HP :

Application : Condensor Water / chilled water Month :

Dateof PPM:						Remarks
Sr.No.	Description of Work	W-1	W-2	W-3	W-4	(If Any)
1	CLEAN THE MOTOR & PUMP IN GENERAL					
2	CHECK THE MOTOR COUPLINGS AND ALIGNMENT					
3	CHECK & TIGHTEN ALL THE FOUNDATION BOLTS					
4	ENSURE MOTOR AND PUMP BEARINGS ARE GREASED PROPERLY					
5	CHECK/TIGHTEN ALL THE ELECTRICAL CONTACT POINTS					
6	CHECK COUPLING CONDITION					
7	CHECK THE GLAND PLATE FOR LEAKAGE					
8	CHECK CLEAN BUTTERFLY VALVES					
9	CHECK AND CLEAN NON RETURN VALVE					
10	ENSURE DRAIN IS NOT CLOGGED					
11	CHECK THE PRESSURE GAUGES					
12	CURRENT PER PHASE IN AMP.					
a	R-PHASE					
b	Y-PHASE					
c	B-PHASE					
13	CHECK PUMP DISCHARGE PRESSURE					

Observations:

Sign. Of Technician Sign of supervisor

Annexure - 10

Preventive Maintennce Checklist Cooling Tower						
Job Name		Type				
Tower Model		Sr. No.				
Location		Capacity				
Date						Remarks
Sr.No.	Description of Work	W-1	W-2	W-3	W-4	(If Any)
1	CHECK COOLING TOWER FOR UNUSUAL NOISE / VIBRATION					
2	CHECK CONDITION OF MOTOR AND FAN ASSEMBLY					
3	CHECK TOWER SUMP FOR ANY DAMAGE					
4	CHECK SUCTION SCREENS PROPERLY FIXED					
5	CHECK FAN OPERATION					
6	CHECK THE ELECTRICAL CONTACT POINT AND TIGHTEN THE LOOSE POINTS					
7	CHECK FAN COUPLING BOLT AND ALIGNMENT					
8	CHECK AND CORRECT LOOSE CABLE					
9	ENSURE DRAIN IS NOT CLOGGED					
10						
Sr.No.	Observation	W-1	W-2	W-3	W-4	Remark
1	Current in Amps 1					
	2					
	3					
	4					
2	Sump Water Tempreture					
3	Ambient Air WB / DB Temp					
4	Water Inlet Temperture					
5	Water out Temperture					
	Sign of Supervisor:	Sign of Supervisor				