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#### FINAL

SYSTEM DESCRIPTION (Index No. 34B)

#### HEATING, VENTILATION AND AIR CONDITIONING SYSTEM CONTROL BUILDING AREA (B&R Dwg. No. 2040, Rev. 13)

#### JERSEY CENTRAL POWER & LIGHT COMPANY

THREE MILE ISLAND NUCLEAR STATION

UNIT NO. 2

Issue Date January, 1976

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Burns and Roe, Inc. 700 Kinderkamack Road Oradell, N. J. 07649 196 250

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HEATING, VENTILATION AND AIR CONDITIONING SYSTEM

CONTROL BUILDING AREA

#### 1.0 INTRODUCTION

#### 1.1 System Functions

The purpose of the Control Building Area Heating and Ventilating System is as follwos:

- (a) Provide fresh filtered tempered air
- (b) Recirculate and distribute cooled filtered air
- (c) Provide heating during a winter shutdown and cooling during normal operation.

The Ventilation System interfaces with the following systems:

- (a) Nuclear Service River Water (Dwg. No. 2003)
- (b) H&V River Water Pump House (Dwg. No. 2047)
- (c) HVAC Service Bldg. (Dwg. No. 2385)
- 1.2 <u>Summary Description of System Description</u> (Ref. to B&R Dwg. No. 2040 Rev. 13)

The Control Building area is divided into East and West sections separated by a wall. The East Section contains the air compressors and associated ancillaries, motor driven Feed Pumps, and the Service and Control Building River Water Booster Pumps. From the stand point of HVAC, the 280'level of the Service Building is part of the control Building Area East Section. The West Section contains Feedwater and Steam Piping, associated penetration cooling fans, the Emergency Steam Driven Feed Pump, and switchgear.

In the East Section a Fresh Air Unit filters, heats and distibutes 2000 CFM taken from the Air Intake Tunnel. Half of the Fresh Air is distributed through the tendon gallery to the West Section. Eight hundred CFM is circulated back through another part of the tendon gallery to the East Section, and 200 CFM 196 253

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is exhausted to the River Water Pump House through a six inch pipe. The West Section temperature is controlled by 4 Unit heaters and 10 Fan Coil Spot Coolers.

Eighteen hundred CFM is exhausted from the East Section through the Contaminated Drain Tank and Pump Room to the Service Building Ventilating System Discharge path.

The temperature in the East Section is controlled by two fan coil units and four Unit Heaters. The Fan Coil Units are cooled by Nuclear Service River Water and have rolle-type filters.

#### 1.3 System Design Requirements

The system is designed to remove adequate heat from the Control Building Area to maintain a  $104^{\circ}$ F inside temperature with an outside temperature of  $92^{\circ}$ F.

With no heat from the Control Building Area components, the system will maintain a 50°F inside temperature with an outside temperature of 4°F.

During normal operation of the East Section, one fan coil unit, AH-C-50A or B, is required for cooling.

On a hot day with two Emergency Feed Pumps runnings, the second cooling coil fan unit should be started. The units are powered from the ESF buses and must be started locally after a loss of power.

The system is designed to prevent combustible fumes from entering the Riverwater Pump House by stopping the River Water Pump House Supply fan and shutting the supply valves. The

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recirculation fans are automatically stopped and their dampers shut to prevent a fire from spreading. Design, fabrication, and inspection for ductwork is in accordance with ASHRAE and SMACNA, and for piping in accordance with ANSI B 31.1. Power Piping. The ductwork is designed to withstand the forces of a Class II Seismic event, except over the Emergency Feed Pumps which is of Seismic I designed. The Fan Coil Units, AH-C-50A and B coolers and Seismic II. The isolation valves are Seismic I. The Fan Coil Units, AH-C-50A and B coolers is designed to Quality Q-4 and Cleanliness D classification. If there is a Seismic event and the spot cooler or fan coil unit rupture, flow will be stopped by shutting excess flow valve NR-V246 located upstream in the supply line common to all cooling units.

#### 2.0 DETAILED DESCRIPTION OF SYSTEM

#### 2.1 Components

#### 2.1.1 Supply Fan Unit, AH-E-51

This 2000 CFM Unit filters and preheats air supplied from the intake tunnel. The air is distibuted equally to both the East and West Sections. The air is filtered by a replaceable cartridge filter. Local DP indication is provided. The two stage 24 KW heaters are controlled by an inlet temperature indicator controller. The fan shuts down with a fire condition in the Control Building Area or the Intake Tunnel. The fan can be controlled locally or from Panel 317. The heater has a local OFF/ON permissive switch and indicating light. Fan AH-C-51 and its associated heaters are supplied by bus 2-37 and 2-42C respectively.

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#### 2.1.2 <u>Control Building Area East Section Fan Coil Units</u>, <u>AH-C-50A and 50B</u>

The two 26,000 CFM fans distribute, recirculate, and cool the air in the East Section. Fans AH-C-50A and 50B receive power from buses 2-12E and 2-22E which are supplied by the diesels during a loss of power. The Units have no auto start capability. 1. ....

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The associated fan coilsare cooled by Nuclear Services River - Water. The coil inlet valve, NR-V78A(B) is interlocked to open with fan start. The cooler outlet valve, NR-V79A (B), opens with increasing fan cooler air inlet temperature.

2.1.3 <u>Air Handling System Air Filters AH-F-22 and AH-F-22B</u> The air handling system air filters (Table 5) are located in the AH-C-50A (B) inlet. They filter recirculated air before it passes through the fan coil unit.

> The air filters consist of an automatic renewable media filter and replaceable cartridge which has an efficiency of 85% as determined by the NBS dust spot method of testing. The media is a continuous, interlaced bonded fiberglass material having a norminal thickness of 2" which, when clean, does not compress more than 1/4" when subjected to air flow at 500 FPM. The media for the air filters is designed with a varying glass fiber diameter on the air entering and air leaving sides of the media. This feature, together with progressive density, enables the dirt to penetrate the full depth of the media and eliminates the possibility of face loading.

Each roll of media is reinforced for greater strength by steel wires firmly bonded to the air-leaving side of the media.

The air filter media drive is actuated by a pressurestat sensitive to pressure difference across the filter and designed to advance the media at a differential pressure. across the filter of .5" ( $H_2$ 0) until the differential pressure reaches .45" ( $H_2$ 0). A differential pressure indicator is mounted across each filter. The drive for the air filter media consists of a 1/6 HP motor for each roll-aire media drive with built-in thermal overload protection. AH-F-22A and 22B are powered from MP 2-42C.

2.1.4 Stairwell Recirculation Fan, AH-E-62

This fan, located in the West Section, circulates air in a stairwell which otherwise would be stagnant. The 120V fan is controlled locally and is automatically shutdown with a fire condition.

2.1.5 River Water Pump House Supply Fan, AH-E-13

This fan discharges 200 CFM from the West Section through a 6" pipe to the River Water Pump House. If a fire condition is present in either the Control Building area or the River Water Pump House or if there is combustible vapors in the supply line, the fan will stop and both the fan discharge valve is the West Section, AH-V84, and the supply valve in Pump House, AH-V56, will shut. The fan may be controlled locally or from panel 317.

2.1.6 Unit Heaters AH-C-52A through 52H

The East and West Sections each have four 7.5KW Unit Heaters. The Unit Heaters consist of a fintube resistance heating element and an electric fan which are energized simultaneously. The unit is protected by a high temperature cutout. Each heater

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is equipped with adjustable horizontal louvers. The unit is controlled by an ON-OFF-AUTO thermostat control switch.

2.1.7 Spot Cooler Fan Coil Units, AH-C-58A through 58J

The ten spot coolers are located in the West Section. The fan will start with increasing temperature and the 1" Nuclear Service Water Supply valve opens. The filter of each unit has a differential pressure indicator switch. The fan may be started or stopped locally or remotely from Panel 317. The units will be shutdown with a fire signal. A high differential on any one of the filters will cause an alarm on Panel 317.

#### 2.1.8 Major System Dampers

# 2.1.8.1 Control Building Area Supply and Discharge Dampers, AH-D5560 and D5559

These dampers automatically open and shut as the Fresh Air Supply Fan, AH-C-51, is started and stopped. The same fire protection signals which stop the fan, shut the dampers. With a loss of instrument air AH-P-5560 fails closed and AH-P-5559 fails as is.

# 2.1.8.2 <u>Control Building Area East Section Cooling Fan Discharge Dampers,</u> <u>AH-D-5548 and D5550</u>

These dampers automatically open and shut as their corresponding fans, AH-C-50A and 50B, are started, and stopped. A shut damper prevents backflow through an idle fan. The dampers fail as is with a loss of instrument air.

2.1.9 Major System Valves

# Spot Coolers Solenoid Isolation Valves, NR-V233A through 233J These one inch solenoid valves initiate flow through the spot cooler units, AH-58A through 58J. The valve opens and flow is initiated simultaneously with fan motor start.

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- 2.1.9.2 <u>River Water Pump House Supply Valves, AH-V84 and AH-V56</u> AH-V84, located in the West Section, and AH-V56, located in the River Water Pump House open and shut as the River Water Pump House Supply Fan, AH-E-13 starts and stops. The 6" air operated valves will shut with a fire signal in either the Control Building Area, in the River Water Pump House, or if combustible fumes are in the supply line. The valves fail closed on a loss of instrument air.
- 2.1.9.3 <u>Control Building Area East Section Fan Coil Cooling Shutoff</u> Valves, NR-V78A and 78B.

These 150 psi, 3 inch, carbon steel on/off gate values open and shut when their respective fan coil unit motor, AH-C-50A and 50B, is energized. The pneumatically operated values. fail open with a loss of instrument air.

2.1.9.4 Control Building Area East Section Fan Coil Cooling Temperature Control Valves, NR-V79A and 79B These 150 psi, 3 inch carbon steel butterfly valves modulate Nuclear River Water flow through the fan cooling coil. With increasing ambient temperature, the pneumatically operated valves open. They fail open with a loss of instrument air.
2.2 Instruments, Controls, Alarms, and Protective Devices In the East Section, the Fresh Air Fan, AH-C-51, has control and indication locally and on Panel No. 317. The inlet air filter has a differential pressure indicator. The associated two stage heater has a permissive CN/OFF pushbutton. The stages are energized at differential setpoints with decreasing temp-

erature. The heaters can be energized if the AH-C51 Fan is running, there is minimum flow and the pushbutton is in ON.

The heater is additionally protected by two high temperature trips, one automatic reset and the other manual reset.

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A local red lite is energized when a heater is energized.

AH-C-50A and 50B have control and indication both locally and on Panel No. 317. With a loss of power the fans must be restarted manually. The logic associated with the fan cooling water valves and dampers are discussed in Sections 2.1.9.3, 2.1.9.4 and 2.1.8.2.

The roll-type filters, AH-F-22A and 22B are progressed with a high differential pressure or manually in JOG. The need for filter media cartridge replacement is alarmed.

AH-C-51, AH-C-50A, and 50B have flow switches which cause an alarm with low flow when the corresponding fan motor is energized.

The unit heaters, in both the East and West Section, are normally in AUTO. Both the resistance heater and the fans are simultaneously energized by decreasing temperature. Each unit has a high temperature cutout. Each unit may be controlled by placing its thermostat control switch in CN or OFF.

In the West Section, the ten spot cooler fan motors, AH-C-58A through 58J, are interlocked with their associated inlet solenoid valves. The coolers have local and Panel 317 control and indication. In the normal AUTO mode, the unit starts with increasing ambient temperature. The units may be placed in continuous operation or be secured by placing the control switch in MAN or OFF respectively. The ten units are controlled by five thermostats. A common alarm sounds on Panel 317 if any one of the ten filters have excessive differential pressure.

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The River Water Pump House Supply Fan, AH-E-13, is started locally but has indication on both Panel 317 and 320 (River Water Pump House). The inlet valve in the West Control area, AH-V-84, and the outlet valve in the River Water Pump House, AH-V56, shut when the fan is secured. The fan is stopped with a fire condition in either location, or combustible vapor in the supply line.

With the exception of the Unit Heater Fans, all control Building Area fans are shut down with a fire condition.

#### 3.0 PRINCIPAL MODES OF OPERATION

#### 3.1 Startup

The Fresh Air Supply Fan, AH-C-51, may be started locally or from Panel 317. The associated heaters are placed into operation by placing its control switch in ON. Either Cooling Coil Fan, AH-C-50A or 50B, is started locally or from Panel 317. The filters AH-F-22A and 22B control switches are put in AUTO. The stairwell fan, AH-E-62, and River Water Pump House Supply fan, AH-E-13 are started locally.

#### 3.2 Normal Operation

During normal operation the supply fan, exhaust fan (River Water Supply Fan), stairwell fan, and one cooling unit are operating. As the ambient temperature increases, flow is intiated through the cooling coils and the spot coolers by their local thermostat. As the ambient temperature decreases, the Unit Heaters are energized by their local thermostat. The Fresh Air Supply step Heaters are energized as the inlet air temperature decreases. A motor progresses the filter media, AH-F-22A and B,

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with high differential pressure. Half the fresh air is distributed in the West Section, and the other half is distributed to the East Section through the tendon gallery. Two hundred of the 1000 CFM is exhausted to the River Water.. Pump House. The remaining 800 CFM is returned through the other portion of the tendon gallery to the East Section. One thousand eight hundred CFM is exhausted from the East Section through the Contaminated Drain Tanks and Pump Room to the Service Building Exhaust Header. Periodic replacement of filters is necessary. -

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#### 3.3 Shutdown

The Fresh Air Supply Fan (AH-E-51), River Water Pump House Supply Fan (AH-E-13) and fan coil units (AH-C-50A and B) may be secured locally or from Panel 317.

The Stairwell Exhaust Fan (AH-E-62) fan coil unit filter motor (AH-F-22A and B) and Fresh Air Heaters, are secured locally. The Spot Cooler motors are deenergized from Panel 317. The local unit heater thermostat controller is put in the OFF position.

#### 3.4 Special or Infrequent Operation

#### 3.4.1 Emergency Feed Pump Operation

When Control Building Area East Section is hot, an additional fan coi unit, AH-C-50A or B, should be started. Operation of motor driven Emergency Feed Pumps will cause ambient temperature to increase.

#### 3.4.2 Manual Operation of Unit Heaters

The heaters may be started/stopped by putting their thermostat controller in ON/OFF.

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#### 3.4.3 Manual Operation of Spot Coolers

The fan motor may be started, and Nuclear River Flow initiated by putting the control switch MANUAL or holding the local pushbutton in START.

#### 3.5 Emergency

With a loss of instrument air, Nuclear River Water Supply valve, NR-V246, will close. This will stop all cooling water flow to the Control Building Area. Simultaneously with a loss of instrument air, the three Emergency Feed Pumps will start. If NR-V246 is not manually opened, in 10 minutes the temperature will increase from its design maximum (104°F) to the design ambient temperature for the motors (122°F).

The Control Building Area HVAC System is not required for a LOCA. If the fan coil or spot cooler ruptures, Nuclear River Water flow will be shut off by excess flow valve NR-V246.

#### 4.0 HAZARDS AND PRECAUTIONS

Care should be taken to ensure that the manual isolation valves for the cooling fan coils and spot coolers are not shut. Consideration should be given to heating/cooling requirements when taking a unit heater/cooler out of service.

The Nuclear River supply value to the fan coil cooler and spot cooler fail closed with a loss of instrument air. The value should be quickly manually reopened.

During a Loss of power the fan coil units AH-C-50A and AH-C-50B will have to be manually started before the Emergency Feed Pump Motors increases the ambient air to a harmful temperature level.

There is no high temperature alarm in the East Section. Neither section has a low temperature alarm. 196 263

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# CONTROL BUILDING AREA FRESH AIR SUPPLY FAN

Fan Details

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Identification	AH-C-51
Number Installed	1
Manufacturer	Buffalo Fordge
Model No.	Later
Туре	Centrifugal
Rated Capacity (CFM)	2,000
Static Press. (in. H <sub>2</sub> 0)	2
Rated Speed (RPM)	1720

Fan Motor Details

Manufacturer	Later
Туре	
Enclœure	Later
Rated HP	2
Rated Speed, RPM	
Lubricant-coolant	· Oil/Air
Power Requirements	480V/3Ø/60 H
Power Source	MCC 2-37

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# Classification

Code	с
Quality	4
Seismic	II
Cleanliness	D

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# CONTROL BUILDING AREA FRESH AIR DUCT PREHEATER

Heater Details	
Identification	AH-C-51
Number Installed	1
Manufacturer	Indeeco
Model No.	Later
Туре	Resistance Duct Heater
Capacity (KW)/Step	24
Power Requirements (Heating Element)	480V/3Ø/60Hz
Power Source (Heating Element)	480V MCC-42C
Steps	2
Classification	
Code	c
Quality	4
Seismic	II
Cleanliness	D

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TABLE 3

# CONTROL BUILDING AREA FRESH AIR FILTER

# Filter Details

Identification	AH-F-32
No. Installed	1
Manufacturer	MSA
Туре	Panel
Model No.	None
Size	2'0" X 2'0"
Capacity, CFM	2000
Press, drop, clean, in. OFH <sub>2</sub> 0 <sup>°</sup>	0.1
Efficiency	85% (NSP Dust Spot Test)

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# Classification

Code	с
Quality	4
Seismic	II
Cleanliness	c

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#### CONTROL BUILDING AREA EAST SECTION FAN COIL UNITS

- Unit Details
- IdentificationAH-C-50A & BNo. Installed2ManufacturerBuffalo ForgeModel No.Later

Cooling Coil Details

Manufacturer	Buffalo Forge
Model No.	Type 86C
Cooling Coil Area .ft <sup>2</sup>	49.8
Rows/Nominal Fins per inch	6/8
Circuit	Half
Cooling Capacity	250,000 BTU/hr.
Cooling Water Flow ,GPM,	38
Air Velocity ,FPM,	522
Cooling Water Head Loss ,ft H <sub>2</sub> 0	8
Cooling Water Temperature,	
In <sup>°</sup> F/Out, <sup>°</sup> F.	85/98
Entering Air , Dry-Bulb, <sup>O</sup> F	104
Leaving Air ,Dry-Bulb, <sup>O</sup> F.	95

#### Fan Details

Туре	Centrifugal
Rated Capacity CFM,	26,000
Static Press. in H <sub>2</sub> 0	3.00
Rated Speed RPM	1021
EP	25

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# TABLE 4 (Continued)

# CONTROL BUILDING AREA EAST SECTION FAN COIL UNITS

Fan Motor Details

Manufacturer	Later	
Туре		
Enclosure	Later	
Rated HP	25	
Speed, RPM	1800	
Lubricant-Coolant		
Power Requirements	480V/3Ø/60 Hz	
Power Source	AH-C-50A MCC 2-12E	
	AH-C-50B MCC 2-22E	

# Classification

Code	С
Quality	4
Seismic	II
Cleanliness	с

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#### AIR HANDLING SYSTEM AIR FILTER

AH-F-22A, AH-F-22B
Two
MSA
Roll-Aire, Horizontal
Later
10'4" X 6'0"
26,000
0.16
85%

Roll-Aire Motor Details Manufacturer Type Enclosure Rated HP per filter Rated Speed ,RPM Lubricant-Coolant Power Requirements Power Source

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<u>Classification</u> Code Quality Seismic Cleanliness Von Weise Gear Co. Later Later 1/6 each 6 Oil/Air 120V, 60Hz, 1Ø AH-F-22A 120V MCC 2-42C AH-F-22B 120V MCC 2-42C

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# CONTROL BUILDING AREA STAIRWELL EXHAUST FAN

Fan Details

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Identification	AH-E-62
Number Installed	1
Manufacturer	Buffalo Forge
Model No.	Later
Туре	Centrifugal
Rated Capacity , CFM,	85
Static Press. ; in. H <sub>2</sub> 0	.125
Rated Speed , RPM,	Later

Fan Motor Details

Manufa cturer	Later
Туре	Later
Enclosure	Later
Rated HP	.05
Rated Speed, RPM	Later
Lubricant-coolant	Oil/Air
Power Requirements	120V/2Ø/60 H
Power Source	MP 2-42C

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#### Classification

Code				с
Quality				4
Seismic				II
Cleanlines	s			D

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# MECHANICAL EQUIPMENT RIVER WATER PUMP HOUSE SUPPLY FAN

## Fan Details

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Identification	AH-E-13	
Number Installed	1	
Manufacturer	Buffalo Fordge	
Model No.	E #3 E	
Туре	Centrifugal	
Rated Capacity , CFM	200	
Static Press. , in. H <sub>2</sub> 0.	. 3"	
Rated Speed , RPM	Later	

Fan Motor Details

Manufacturer	Later
Туре	Later
Enclosure	Later
Rated HP	.33
Rated Speed, RPM	Later
Lubricant-coolant	Later
Power Requirements	120 V/ 2Ø / 60 Hz
Power Source	MP 2-42C

# Classification

Code	С
Quality	4
Seismic	II
Cleanliness	D

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#### CONTROL BUILDING AREA 7.5 KW UNIT HEATERS

Identification	AH-C-52A thru H
Number Installed	8.
Manufacturer	Chromalux
Model No.	LUH -07
Туре	Forced Air Electric Unit Heater
Capacity (KW)/Heater	7.5
Power Requirements (Heating Element)	480V/3Ø/60 Hz
Power Source (Heating Element)	

#### Heater Fan Details

Heater Details

Rated	Capacity	CFM. 55	0
Rated	Speed ;RPM	4. 15	50

#### Heater Fan Motor Details

Manufacturer	Later
Туре	Squirrel Cage Induction
Enclosure	Open
Rated Horsepower	0.04
Speed , RPM	. 1550
Lubricant-Coolant	Oil/Air
Power Requirements	480V/3Ø/60 Hz
Power Source	2-4 2C

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# TABLE 8 (Continued)

# CONTROL BUILDING AREA 7.5 KW UNIT HEATERS

Classification	
Code	c
Quality	4
Seismic	II
Cleanliness	D

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# CONTROL BUILDING AREA WEST SECTION SPOT COOLERS

Unit Details

Identification No. Installed Manufacturer Model No.

AH-C-58A,B,C,D,E,F,G,G,I,J 10 . Buffalo Forge Later 

#### Cooling Coil Details

Manufacturer	Buffalo Forge
Model No.	Type 88C
Cooling Coil Area, ft <sup>2</sup>	5.83
Rows/Nominal Fins per inch	8/8
Circuit	Half
Cooling Capacity	52,000
Cooling Water Flow, GPM	8
Air Velocity, FPM	910
Cooling Water Head Loss, ift H20	3
Cooling Water Temperature, In <sup>o</sup> F/Out, <sup>o</sup> F.	85/98
Entering Air , Dry-Bulb, °F.	104
Leaving Air , Dry-Bulb, °F	95

#### Fan Details

Туре	Axial
Rated Capacity, CFM	5300
Static Press., in H <sub>2</sub> 0'	2.25
Rated Speed, RPM	1750
Horsepower	3

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# TABLE 9 (Continued)

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# CONTROL BUILDING AREA WEST SECTION SPOT COOLERS

Fan Motor Details			
Manufacturer			Later
Туре			
Enclosure	1		
Rated Horsepower			
Speed, RPM			
Lubricant-Coolant			
Power Requirements			480 / 3Ø, 60 Ha
Power Source		•	AH-C-58A,C,E, H & J 2-42C AH-C-58B,D,F, G & J 2-31B
<u>Classification</u>			
Code			c .
Quality			4
Seismic			п

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1	7	0	1.	1	С

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TABLE 10

#### CONTROL BUILDING AREA WEST SECTION SPOT COOLER FILTERS

Filter Details

Identification	AH-C-58A thru J
No. Installed	1
Manufacturer	MSA
Туре	Panel
Model No.	None
Size	42" X 34" (HIGH)
Capacity, CFM	1100
Press, drop, clean in. OF. H20.	0.1
Efficiency	85% (NSP Dust Spot Test)

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Classification

Code	· c
Quality	4
Seismic	. II
Cleanliness	c

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		1.2	1
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53.2		1.3	119
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112		24	18
Sec.			470
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19.00			
122.67	Ε.	8.	
11121	12.4	12.1	
C# 19	1	223	1
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2001		1.21	100
100			6-1
	13	121	
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2742	11	1 2	27
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# INSTRUMENTATION AND CONTROLS

ntification	Description	<u>Nunction</u>	location	22	Input Kange	Putput Mange 1	Setpoint
m-3500	Thermostat	Controls Heater AH-C-318	Local	Tesperature Buitch	30-90°r		°°3
TE-5301 and	hermetet	Controls cooling water outlat valve MR-V75A and MR-V75B	leel	fragerature Avitch	1°461-01	\$	
78-1514, 1511, 5519, 5542 5, 5555, and 5540	Thermostat	Controle Meaters AH-C-510, 93C, 938. 53E, 53A, and 530 respectively.	1	Teperature Mitch	10-40°	Ş	•5
RL-3536	Indicating Light	Provides light indication for fan AH-8-62	Local	Indicating Light	\$		5
	Resistance Thermometer	Senses Ambient temperature in west section.	Ĩ	Resistance sleepet	30-130°r	A 15. 111-15. 16	\$
	Tesperature Indicator	Provides ablent temperature indication of West section .		Muiti temperature Indicator	10-50 Ma do	<b>3</b> 0-130 <b>°</b>	\$
0122-1777	Temperature Recorder	Record temperature indication from AH-MTI-5540, 3554, and 3547		Multi temperature Recorder	J. 15. 011-32.64	1001-01	\$
- 166-51-	Temperature Pulitch	Provides indication of Control Bidy. Area West Section for AN-DUN-5541	laool	Rosistance eleant	13-113°r	ş	110°r
rt-5513, 5544	riow Indicator	Provides indication of flow from fame AH-C-508, 50A, and 51 respectively		Indicating Light	\$	\$	\$
P1-5513, 5544	rice suitch	Detect flow from AN-C-509, 50A, and 51	lecal	rilot Tube	0-100 FM	ş	15 fpe
018-3546 and 3551	Differential Pressure Buitch	Measures pressure drop across filters AM-F-32A and 22B. Provides input signal to media drive to advance filter.	I	Disphrage	:	£	
-ta-5546 and 5551	Position Petch	Provides signal when filter media on AH-F-32A and AH-F-22B are exhausted.	Leoal	1	ş	Ş	\$
TR-5554 and 5547	Assistance Therecenter	Bases cooling water outlet temperature for AH-C-50m and 50A	leoal	Resistance element	30-130°r	99.56-119.24 J	5
Ma 1882-ITH	Temperature	Provides indication from AN-C-508 and 508	111 1	multi temperature	J. 12. 411-30.49	30-120°r	5

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INSTRUMENTATION AND CONTROLS

ntification	Quest iption	Punction	.location	4	Input Range	Output Range	Setre
nd 5558, 5550, nd 5558	Randwitch	Provides control and indication for Air-C-504, 508, and 51	11	1	ş	5	\$
rl-5548, 5550, ad 5559	Indicating Light	Provides indication for AM-C-50A, 50B and 51	Tenel 117	Indicating Light	\$	Ş	\$
ric-5957	Indicator Controlle	r Control Au-C-31 Instare	lexal	Capillary tube- presentio	10 to 134"r	1-15 pet	3
1055 P	Differential Pressure Endirptor	Provide Indication of pressure drop ecrose AN-F-22A and 22B	1	olephere	ş	:	S
R/N565-B	Proventic to Electric Converter	mayine At-51 tes mite	lecal	1	3-15 pei.	ę	ŝ
<b>8565-14</b>	Differential Pressure	Provides signal for Freeh Air Filter An-P-13		Indicating	•1•	Ş	ş
11-12-FL	Differential Presente Beitch	Provide signet for Eam coil - Eilter differential pressure - Unite AI-C-500 three 500	1	Indicating	:	- \$	6
8-3564 ETE2 with	Name auton	Provide control for fan coil coolere NH-C-SM thru SAJ		I	ş	Ş	3
1-9364 are 9573	Indicating Light	Provide indication for fem coil coolere motor Mr-C-584 thru 59J		Light	ş	ş	\$
8-5574A	Tesperature.	Provide controls for fan coil ocolars AH-C-944 thru 90J	I	Tesperature Builtch	30-90°r	3-15 pet	•

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TANGL WOMTED ANNUNCIATORS AND COMPTER INFUTE

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PANEL NCUNTED ANNUNCIATORS						
Ident   flcation	measured Descriptions, Unite	Alar 6		Input Source	Variable Range	
AP-458-5346 and 3351	Control Bidy. Area 7an Coil Unit Fileur An-P-124 and D Limit	\$	ş	1222 bes 3152-23-W	\$	a
An-ral-5562	Control Bidy. Area Tave Low Flow	¥.	* :	Au-75-5544. 5543. 5356	ç	11
1155-102-11	Control 1149. Ann mut Ann Twy II	110%	\$	Au-19-5141-A and 5341-B	1°215-25	8
AN-FAL-5519A	Airer Vater Nump Bouse Air Bupply No flow	\$	19 <b>2</b> -	AH-F8-5549	\$	
AH-RJA-5573A	A.M. Nurp Nouse Funne Canger	۲.	V.	AII-8-75-5573	\$	111
AM-DM-5606	Control Bidg. Area Unit Cooler AN-C-38A thru AN-C-38J filter Bigh	••	5	AII-DVIB-9564 thru 5573	:	8
	Control Bldg. Aree Pan Coll Unit Am-C-50% trip	\$	Ş	8	\$	
	Control Bidy. Area Fan Coil Unit AN-C-508 trip	\$	5	3	\$	111
	Control Building Area Pacal 317 Trouble	\$	\$	<b>\$</b>	\$	8
	Control 8189. Area Unit Cooler. Am-C-544 thru J trip	\$	5	3	Ş	m
	Control aidy Area Freeh Air Fan An-C-91 Trip	\$	<b>\$</b>	3	\$	a.

COMPUTER INPUTS

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Wilda R. Mullinix, NRC

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