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0029570

Mr. John Grantham
State of Washington
Department of Ecology
Nuclear & Mixed Waste Program
P. O. Box 47600
Olympia, WA 98504-7600

FLUOR DANIEL, INC.

Date: September 14, 1992

Reference: Hanford Waste Vitrification Plant
DOE Contract DE-AC06-86RL10838
Fluor Contract 8457

Transmittal No.: WDOE-219

Dear Mr. Grantham:

TRANSMITTAL

We enclose 2 copy of the items listed below. These are issued per US-DOE request.

Response due to Fluor: N/A
Responds to: N/A

NUMBER	Rev.	Date	TITLE
SEE TRANSMITTAL ATTACHMENT			HVAC P&ID
			PROCESS CONTROL DESCRIPTION
CONTROLLED MANUAL 25 & 26			PLEASE REMOVE OLD REVISIONS AND TABLE OF CONTENTS FROM YOUR HVAC P&ID MANUAL AND REPLACE WITH THE ATTACHED REVISIONS.

9312975.1275

Distribution:
REFERENCE: FRP-559, FUP-234
R. L. Long: DOE-RL w/1 CC#24
VPO/AME Corresp Cntrl Cntr, MSIN A5-10
(HVAC SYSTEM 05),w/1
P. Felise, WHC-RL (MSIN G6-16) w/0
Environmental Data Management Center
(MSIN H4-44) w/1 CC#31
D. Duncan, US EPA, Region X w/0

Very truly yours,

Rosalie Cadenas for
R. S. Poulter
Project Director

RSP:REF:ts

JUL 1993
RECEIVED
EDMC

TRANSMITTAL ATTACHMENT

DRAWING NUMBER	SHT NO.	REV	DATE	DRAWING TITLE
H-2-129730	01	02	09/09/92	SYST 05 CSB COMPOSITE
H-2-129731	01	02	09/09/92	SYST 05 CSB OFFICE AREAS
H-2-129731	02	00	09/09/92	SYST 05 CSB OFFICE AREAS
H-2-129731	03	00	09/09/92	SYST 05 CSB OFFICE AREAS
H-2-129732	01	02	09/09/92	SYSTEM 05 CANISTER STORAGE SYSTEM HVAC EQUIPMENT SUPPLY SYSTEM
H-2-129732	02	02	09/09/92	SYSTEM 05 CANISTER STORAGE BUILDING HVAC EQUIPMENT SUPPLY SYSTEM
H-2-129733	01	02	09/09/92	SYSTEM 05 CANISTER STORAGE BUILDING MECHANICAL ROOM AREAS
H-2-129733	02	02	09/09/92	SYSTEM 05 CANISTER STORAGE BUILDING MECHANICAL ROOM AREAS
H-2-129734	01	02	09/09/92	SYST 05 CSB MECH RM & OPER AREA
H-2-129734	02	00	09/09/92	SYST 05 CSB MECH RM & OPER AREA
H-2-129734	03	00	09/09/92	SYST 05 CSB MECH RM & OPER AREA
H-2-129735	01	02	09/09/92	SYSTEM 05 CANISTER STORAGE BUILDING ZONE II VENTILALATION SYSTEM
H-2-129736	01	02	09/09/92	SYSTEM 05 ZONE II HVAC EQUIPMENT CANISTER STORAGE BUILDING EXHAUST SYSTEM
H-2-129736	02	02	09/09/92	SYSTEM 05 CANISTER STORAGE BUILDING ZONE II HVAC EQUIPMENT EXHAUST SYSTEM
H-2-129737	01	02	09/09/92	SYSTEM 05 CANISTER STORAGE BUILDING ZONE II EXHAUST STACK
H-2-129737	02	02	09/09/92	SYSTEM 05 CANISTER STORAGE BUILDING ZONE II EXHAUST STACK
H-2-129738	01	02	09/09/92	SYST 05 CSB VAULT & STACK

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HVAC PIPING AND INSTRUMENT DIAGRAMS
VOLUME 2A
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DRAWING NO.	SH NO	REV	DRAWING TITLE	CWBS NO
** VOLUME NUMBER: 2A				
H-2-129600	01	00	SYSTEM 05 VIT BLDG 3RD FLOOR AND 4TH FLOOR ZONES II & IIIA COMPOSITE	3228
H-2-129601	01	00	SYSTEM 05 VIT BLDG 3RD & 4TH FLOOR ZONE IIIA OSA SUPPLY	3228
H-2-129601	02	00	SYSTEM 05 VIT BLDG 3RD & 4TH FLOOR ZONE IIIA OSA SUPPLY	3228
H-2-129601	03	00	SYSTEM 05 VIT BLDG 3RD & 4TH FLOOR ZONE IIIA OSA SUPPLY	3228
H-2-129602	01	00	SYSTEM 05 VIT BLDG 3RD & 4TH FLOOR ZONE IIIA SUPPLY	3228
H-2-129603	01	00	SYSTEM 05 VIT BLDG 3RD & 4TH FLOOR ZONE II SUPPLY	3228
H-2-129603	02	00	SYSTEM 05 VIT BLDG 3RD & 4TH FLOOR ZONE II SUPPLY	3228
H-2-129603	03	00	SYSTEM 05 VIT BLDG 3RD & 4TH FLOOR ZONE II SUPPLY	3228
H-2-129604	01	00	SYSTEM 05 VIT BLDG 3RD & 4TH FLOOR ZONE II SUPPLY	3228
H-2-129604	02	00	SYSTEM 05 VIT BLDG 3RD & 4TH FLOOR ZONE II SUPPLY	3228
H-2-129605	01	00	SYSTEM 05 VIT BLDG 3RD & 4TH FLOOR ZONE II EXHAUST PLENUM	3228
H-2-129605	02	00	SYSTEM 05 VIT BLDG 3RD & 4TH FLOOR ZONE II EXHAUST PLENUM	3228
H-2-129606	01	00	SYSTEM 05 VIT BLDG 3RD & 4TH FLOOR ZONE II EXHAUST FAN	3228
H-2-129606	02	00	SYSTEM 05 3RD & 4TH FLOOR ZONE II EXHAUST FAN	3228
H-2-129606	03	00	SYSTEM 05 VIT BLDG 3RD & 4TH FLOOR ZONE II SUPPLY FAN	3228
H-2-129610	01	00	SYSTEM 05 VIT BLDG - EAST ZONES II, III & IIIA COMPOSITE	3228
H-2-129611	01	00	SYSTEM 05 VIT BLDG - EAST ZONE III/IIIA OSA SUPPLY	3228
H-2-129611	02	00	SYSTEM 05 VIT BLDG - EAST ZONE III/IIIA OSA SUPPLY	3228
H-2-129611	03	00	SYSTEM 05 VIT BLDG - EAST ZONE III/IIIA OSA SUPPLY	3228
H-2-129612	01	00	SYSTEM 05 VIT BLDG - EAST ZONE IIIA SUPPLY	3228
H-2-129612	02	00	SYSTEM 05 VIT BLDG - EAST ZONE IIIA SUPPLY	3228
H-2-129613	01	00	SYSTEM 05 VIT BLDG - EAST ZONE III SUPPLY	3228

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HVAC PIPING AND INSTRUMENT DIAGRAMS
VOLUME 2A
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DRAWING NO.	SH NO	REV	DRAWING TITLE	CWBS NO
H-2-129613	02	00	SYSTEM 05 VIT BLDG - EAST ZONE III SUPPLY	3228
H-2-129614	01	00	SYSTEM 05 VIT BLDG - EAST ZONE II SUPPLY	3228
H-2-129614	02	00	SYSTEM 05 VIT SYSTEM - EAST ZONE II SUPPLY	3228
H-2-129614	03	00	SYSTEM 05 VIT BLDG - EAST ZONE II SUPPLY	3228
H-2-129615	01	00	SYSTEM 05 VIT BLDG - EAST ZONE II SUPPLY	3228
H-2-129615	02	00	SYSTEM 05 VIT BLDG - EAST ZONE II SUPPLY	3228
H-2-129615	03	00	SYSTEM 05 VIT BLDG - EAST ZONE II SUPPLY	3228
H-2-129616	01	00	SYSTEM 05 VIT BLDG - EAST ZONE II SUPPLY	3228
H-2-129616	02	00	SYSTEM 05 VIT BLDG - EAST ZONE II SUPPLY	3228
H-2-129617	01	00	SYSTEM 05 VIT BLDG - EAST ZONE II EXHAUST PLENUM	3228
H-2-129617	02	00	SYSTEM 05 VIT BLDG - EAST ZONE II EXHAUST PLENUM	3228
H-2-129618	01	00	SYSTEM 05 VIT BLDG - EAST ZONE II EXHAUST FAN	3228
H-2-129618	02	00	SYSTEM 05 VIT BLDG - EAST ZONE II EXHAUST FAN	3228
H-2-129618	03	00	SYSTEM 05 VIT BLDG - EAST ZONE II EXHAUST FAN	3228
H-2-129620	01	00	SYSTEM 05 VIT BLDG - WEST ZONES II, III & IIA COMPOSITE	3228
H-2-129621	01	00	SYSTEM 05 VIT BLDG - WEST ZONE III/IIIA SUPPLY	3228
H-2-129621	02	00	SYSTEM 05 VIT BLDG - WEST ZONE III/IIIA SUPPLY	3228
H-2-129621	03	00	SYSTEM 05 VIT BLDG - WEST ZONE III/IIIA SUPPLY	3228
H-2-129622	01	00	SYSTEM 05 VIT BLDG - WEST ZONE III SUPPLY - OC/REB	3228
H-2-129623	01	00	SYSTEM 05 VIT BLDG - WEST ZONE III SUPPLY - OC/REB	3228
H-2-129624	01	00	SYSTEM 05 VIT BLDG - WEST ZONE III SUPPLY	3228
H-2-129624	02	00	SYSTEM 05 VIT BLDG - WEST ZONE III SUPPLY	3228

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HVAC PIPING AND INSTRUMENT DIAGRAMS
VOLUME 2A
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H-2-129624	03	00	SYSTEM 05 VIT BLDG - WEST ZONE III SUPPLY	3228
H-2-129624	04	00	SYSTEM 05 VIT BLDG - WEST ZONE III SUPPLY	3228
H-2-129625	01	00	SYSTEM 05 VIT BLDG - WEST ZONE II SUPPLY	3228
H-2-129625	02	00	SYSTEM 05 VIT BLDG - WEST ZONE II SUPPLY	3228
H-2-129625	03	00	SYSTEM 05 VIT BLDG - WEST ZONE II SUPPLY	3228
H-2-129626	01	00	SYSTEM 05 VIT BLDG - WEST ZONE II SUPPLY	3228
H-2-129626	02	00	SYSTEM 05 VIT BLDG - WEST ZONE II SUPPLY	3228
H-2-129627	01	00	SYSTEM 05 VIT BLDG - WEST ZONE II SUPPLY	3228
H-2-129627	02	00	SYSTEM 05 VIT BLDG - WEST ZONE II SUPPLY	3228
H-2-129627	03	00	SYSTEM 05 VIT BLDG - WEST ZONE II SUPPLY	3228
H-2-129627	04	00	SYSTEM 05 VIT BLDG - WEST ZONE II SUPPLY	3228
H-2-129628	01	00	SYSTEM 05 VIT BLDG - WEST ZONE II EXHAUST PLENUM	3228
H-2-129628	02	00	SYSTEM 05 VIT BLDG - WEST ZONE II EXHAUST PLENUM	3228
H-2-129629	01	00	SYSTEM 05 VIT BLDG - WEST ZONE II EXHAUST FAN	3228
H-2-129629	02	00	SYSTEM 05 VIT BLDG - WEST ZONE II EXHAUST FAN	3228
H-2-129629	03	00	SYSTEM 05 VIT BLDG - WEST ZONE II EXHAUST FAN	3228
H-2-129630	01	00	SYSTEM 05 VIT BLDG FUME HOOD AND GLOVE BOX COMPOSITE	3228
H-2-129631	01	00	SYSTEM 05 VIT BLDG LABORATORY SUPPLY	3228
H-2-129631	02	00	SYSTEM 05 VIT BLDG LABORATORY SUPPLY	3228
H-2-129631	03	00	SYSTEM 05 VIT BLDG LABORATORY SUPPLY	3228
H-2-129632	01	00	SYSTEM 05 VIT BLDG LABORATORY AREAS	3228
H-2-129632	02	00	SYSTEM 05 VIT BLDG HOODS VENTILATION	3228
H-2-129633	01	00	SYSTEM 05 VIT BLDG ZONE II ANALYTICAL LABORATORY HOODS	3228
H-2-129633	02	00	SYSTEM 05 VIT BLDG ZONE II ANALYTICAL LABORATORY HOODS	3228
H-2-129633	03	00	SYSTEM 05 VIT BLDG ZONE II ANALYTICAL LABORATORY HOODS	3228

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HVAC PIPING AND INSTRUMENT DIAGRAMS
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H-2-129633	04	00	SYSTEM 05 VIT BLDG ZONE II ANALYTICAL LABORATORY HOODS	3228
H-2-129634	01	00	SYSTEM 05 VIT BLDG HOOD VENTILATION	3228
H-2-129635	01	00	SYSTEM 05 VIT BLDG LABORATORY & GALLERY EXHAUST PLENUM	3228
H-2-129635	02	00	SYSTEM 05 VIT BLDG LABORATORY & GALLERY EXHAUST PLENUM	3228
H-2-129636	01	00	SYSTEM 05 VIT BLDG LABORATORY EXHAUST FAN	3228
H-2-129636	02	00	SYSTEM 05 VIT BLDG LABORATORY EXHAUST FAN	3228
H-2-129636	03	00	SYSTEM 05 VIT BLDG LABORATORY EXHAUST FAN	3228
H-2-129730	01	02	SYST 05 CSB COMPOSITE	3229
H-2-129731	01	02	SYST 05 CSB OFFICE AREAS	3229
H-2-129731	02	00	SYST 05 CSB OFFICE AREAS	3229
H-2-129731	03	00	SYST 05 CSB OFFICE AREAS	3229
H-2-129732	01	02	SYSTEM 05 CANISTER STORAGE SYSTEM HVAC EQUIPMENT SUPPLY SYSTEM	3229
H-2-129732	02	02	SYSTEM 05 CANISTER STORAGE BUILDING HVAC EQUIPMENT SUPPLY SYSTEM	3229
H-2-129733	01	02	SYSTEM 05 CANISTER STORAGE BUILDING MECHANICAL ROOM AREAS	3229
H-2-129733	02	02	SYSTEM 05 CANISTER STORAGE BUILDING MECHANICAL ROOM AREAS	3229
H-2-129734	01	02	SYST 05 CSB MECH RM & OPER AREA	3229
H-2-129734	02	00	SYST 05 CSB MECH RM & OPER AREA	3229
H-2-129734	03	00	SYST 05 CSB MECH RM & OPER AREA	3229
H-2-129735	01	02	SYSTEM 05 CANISTER STORAGE BUILDING ZONE II VENTILALATION SYSTEM	3229
H-2-129735	02		NOT USED	
H-2-129735	03		NOT USED	
H-2-129735	04		NOT USED	
H-2-129736	01	02	SYSTEM 05 ZONE II HVAC EQUIPMENT CANISTER STORAGE BUILDING EXHAUST SYSTEM	3229
H-2-129736	02	02	SYSTEM 05 CANISTER STORAGE BUILDING ZONE II HVAC EQUIPMENT EXHAUST SYSTEM	3229
H-2-129737	01	02	SYSTEM 05 CANISTER STORAGE BUILDING ZONE II EXHAUST STACK	3229
H-2-129737	02	02	SYSTEM 05 CANISTER STORAGE BUILDING ZONE II EXHAUST STACK	3229
H-2-129738	01	02	SYST 05 CSB VAULT & STACK	3229

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HVAC PIPING AND INSTRUMENT DIAGRAMS
VOLUME 2A
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DRAWING NO.	SH NO	REV	DRAWING TITLE	CWBS NO
H-2-129800	01	1	SYSTEM 05 VITRIFICATION BUILDING ZONE I COMPOSITE	3228
H-2-129801	01	1	SYSTEM 05 VITRIFICATION BUILDING ZONE II & III COMPOSITE	3228
H-2-129802	01	1	SYSTEM 05 VITRIFICATION BUILDING ZONE I SUPPLY	3228
H-2-129802	02	1	SYSTEM 05 VITRIFICATION BUILDING ZONE I SUPPLY	3228
H-2-129803	01	1	SYSTEM 05 VITRIFICATION BUILDING ZONE I ST/ET & CDC AREAS	3228
H-2-129804	01	0	SYSTEM 05 VITRIFICATION BUILDING ZONE I CANYON, CBMC & CMA AREAS	3228
H-2-129805	01	1	SYSTEM 05 VITRIFICATION BUILDING ZONE I CANYON, RW & CDMC AREAS	3228
H-2-129806	01	1	SYSTEM 05 VITRIFICATION BUILDING ZONE I REDC, HEME, RLST & CPC AREAS	3228
H-2-129806	02	1	SYSTEM 05 VITRIFICATION BUILDING ZONE I REDC, HEME, MC, RLST & CPC AREAS	3228
H-2-129807	01	1	SYSYEM 05 VITRIFICATION ZONE I SAND FILTER & EMERGENCY BYPASS FILTER PLENUM	3228
H-2-129807	02	1	SYSTEM 05 VITRIFICATION ZONE I SAND FILTER & EMERGENCY BYPASS FILTER PLENUM	3228
H-2-129807	03	1	SYSTEM 05 VITRIFICATION ZONE I SAND FILTER & EMERGENCY BYPASS FILTER PLENUM	3228
H-2-129808	01	1	SYSTEM 05 VITRIFICATION BUILDING ZONE I EXHAUST FILTER PLENUM	3228
H-2-129808	02	1	SYSTEM 05 VITRIFICATION BUILDING ZONE I EXHAUST FILTER PLENUMS	3228
H-2-129808	03	1	SYSTEM 05 VITRIFICATION BUILDING ZONE I EXHAUST FILTER PLENUMS	3228
H-2-129809	01	1	SYSTEM 05 VITRIFICATION BUILDING ZONE I EXHAUST FANS	3228
H-2-129809	02	1	SYSTEM 05 VITRIFICATION BUILDING ZONE I EXHAUST FANS	3228
H-2-129809	03	1	SYSTEM 05 VITRIFICATION BUILDING ZONE I EXHAUST FANS	3228
H-2-129809	04	1	SYSTEM 05 VITRIFICATION BUILDING ZONE I EXHAUST FANS	3228
H-2-129810	01	1	SYSTEM 05 VITRIFICATION BUILDING ZONE III SUPPLY	3228

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HVAC PIPING AND INSTRUMENT DIAGRAMS
VOLUME 2A
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DRAWING NO.	SH NO	REV	DRAWING TITLE	CWBS NO
H-2-129810	02	1	SYSTEM 05 VITRIFICATION BUILDING ZONE III SUPPLY	3228
H-2-129811	01	1	SYSTEM 05 VITRIFICATION BUILDING ZONE III AREAS	3228
H-2-129811	02	1	SYSTEM 05 VITRIFICATION BUILDING ZONE III AREAS	3228
H-2-129811	03	1	SYSTEM 05 VITRIFICATION BUILDING ZONE III AREAS	3228
H-2-129811	04	1	SYSTEM 05 VITRIFICATION BUILDING ZONE III AREAS	3228
H-2-129811	05	1	SYSTEM 05 VITRIFICATION BUILDING ZONE III AREAS	3228
H-2-129812	01	1	SYSTEM 05 VITRIFICATION BUILDING ZONE III EXHAUST AND ZONE II SUPPLY	3228
H-2-129812	02	1	SYSTEM 05 VITRIFICATION BUILDING ZONE III EXHAUST AND ZONE II SUPPLY	3228
H-2-129812	03	1	SYSTEM 05 VITRIFICATION BUILDING ZONE III EXHAUST AND ZONE II SUPPLY	3228
H-2-129812	04	1	SYSTEM 05 VITRIFICATION BUILDING ZONE III EXHAUST AND ZONE II SUPPLY	3228
H-2-129812	05	1	SYSTEM 05 VITRIFICATION BUILDING ZONE III EXHAUST AND ZONE II SUPPLY	3228
H-2-129812	06	1	SYSTEM 05 VITRIFICATION BUILDING ZONE III EXHAUST AND ZONE II SUPPLY	3228
H-2-129812	07	1	SYSTEM 05 VITRIFICATION BUILDING ZONE III EXHAUST AND ZONE II SUPPLY	3228
H-2-129812	08	1	SYSTEM 05 VITRIFICATION BUILDING ZONE III EXHAUST AND ZONE II SUPPLY	3228
H-2-129813	01	1	SYSTEM 05 VITRIFICATION BUILDING ZONE II AREAS	3228
H-2-129813	02	1	SYSTEM 05 VITRIFICATION BUILDING ZONE II AREAS	3228
H-2-129813	03	1	SYSTEM 05 VITRIFICATION BUILDING ZONE II AREAS	3228
H-2-129813	04	1	SYSTEM 05 VITRIFICATION BUILDING ZONE II AREAS	3228
H-2-129813	05	1	SYSTEM 05 VITRIFICATION BUILDING ZONE II AREAS	3228
H-2-129813	06	1	SYSTEM 05 VITRIFICATION BUILDING ZONE II AREAS	3228
H-2-129813	07	1	SYSTEM 05 VITRIFICATION BUILDING ZONE II AREAS	3228
H-2-129813	08	1	SYSTEM 05 VITRIFICATION BUILDING ZONE II AREAS	3228

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HVAC PIPING AND INSTRUMENT DIAGRAMS
VOLUME 2A
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DRAWING NO.	SH NO	REV	DRAWING TITLE	CWBS NO
H-2-129813	09	1	SYSTEM 05 VITRIFICATION BUILDING ZONE II AREAS	3228
H-2-129813	10	1	SYSTEM 05 VITRIFICATION BUILDING ZONE II AREAS	3228
H-2-129814	01	1	SYSTEM 05 VITRIFICATION BUILDING ZONE II AREAS	3228
H-2-129814	02	1	SYSTEM 05 VITRIFICATION BUILDING ZONE II AREAS	3228
H-2-129815	01	1	SYSTEM 05 VITRIFICATION BUILDING ZONE II AREAS	3228
H-2-129815	02	1	SYSTEM 05 VITRIFICATION BUILDING ZONE II AREAS	3228
H-2-129816	01	1	SYSTEM 05 VITRIFICATION BUILDING ZONE II EXHAUST PLENUM	3228
H-2-129816	02	1	SYSTEM 05 VITRIFICATION BUILDING ZONE II EXHAUST PLENUM	3228
H-2-129816	03	1	SYSTEM 05 VITRIFICATION BUILDING ZONE II EXHAUST PLENUM	3228
H-2-129816	04	1	SYSTEM 05 VITRIFICATION BUILDING ZONE II EXHAUST PLENUM	3228
H-2-129816	05	1	SYSTEM 05 VITRIFICATION BUILDING ZONE II EXHAUST PLENUM	3228
H-2-129816	06	1	SYSTEM 05 VITRIFICATION BUILDING ZONE II EXHAUST PLENUM	3228
H-2-129816	07	1	SYSTEM 05 VITRIFICATION BUILDING ZONE II EXHAUST PLENUM	3228
H-2-129816	08	1	SYSTEM 05 VITRIFICATION BUILDING ZONE II EXHAUST PLENUM	3228
H-2-129817	01	1	SYSTEM 05 VITRIFICATION BUILDING ZONE II EXHAUST FANS	3228
H-2-129817	02	1	SYSTEM 05 VITRIFICATION BUILDING ZONE II EXHAUST FANS	3228
H-2-129818	01	0	SYSTEM 05 TRAIN A ZONE I EXHAUST STACK	3229
H-2-129818	02	0	SYSTEM 05 TRAIN B ZONE I EXHAUST STACK	3229
H-2-129819	01	1	SYSTEM 05 VITRIFICATION BUILDING ZONE I ANALYTICAL CELLS & SAMPLE CELL SUPPLY FANS	3228
H-2-129820	01	0	SYSTEM 05 VITRIFICATION BUILDING ZONE I ANALYTICAL CELLS & SAMPLE CELL FILTER PLENUM	3228
H-2-129821	01	0	SYSTEM 05 VITRIFICATION BUILDING ZONE I ANALYTICAL CELLS AND SAMPLE CELL	3228

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HVAC PIPING AND INSTRUMENT DIAGRAMS
VOLUME 2A
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DRAWING NO.	SH NO	REV	DRAWING TITLE	CWBS NO
H-2-129822	01	1	SYSTEM 05 REGULATED ENTRANCE BUILDING ZONE II / III AREAS	3228
H-2-129822	02	1	SYSTEM 05 REGULATED ENTRANCE BUILDING ZONE II / III AREAS	3228

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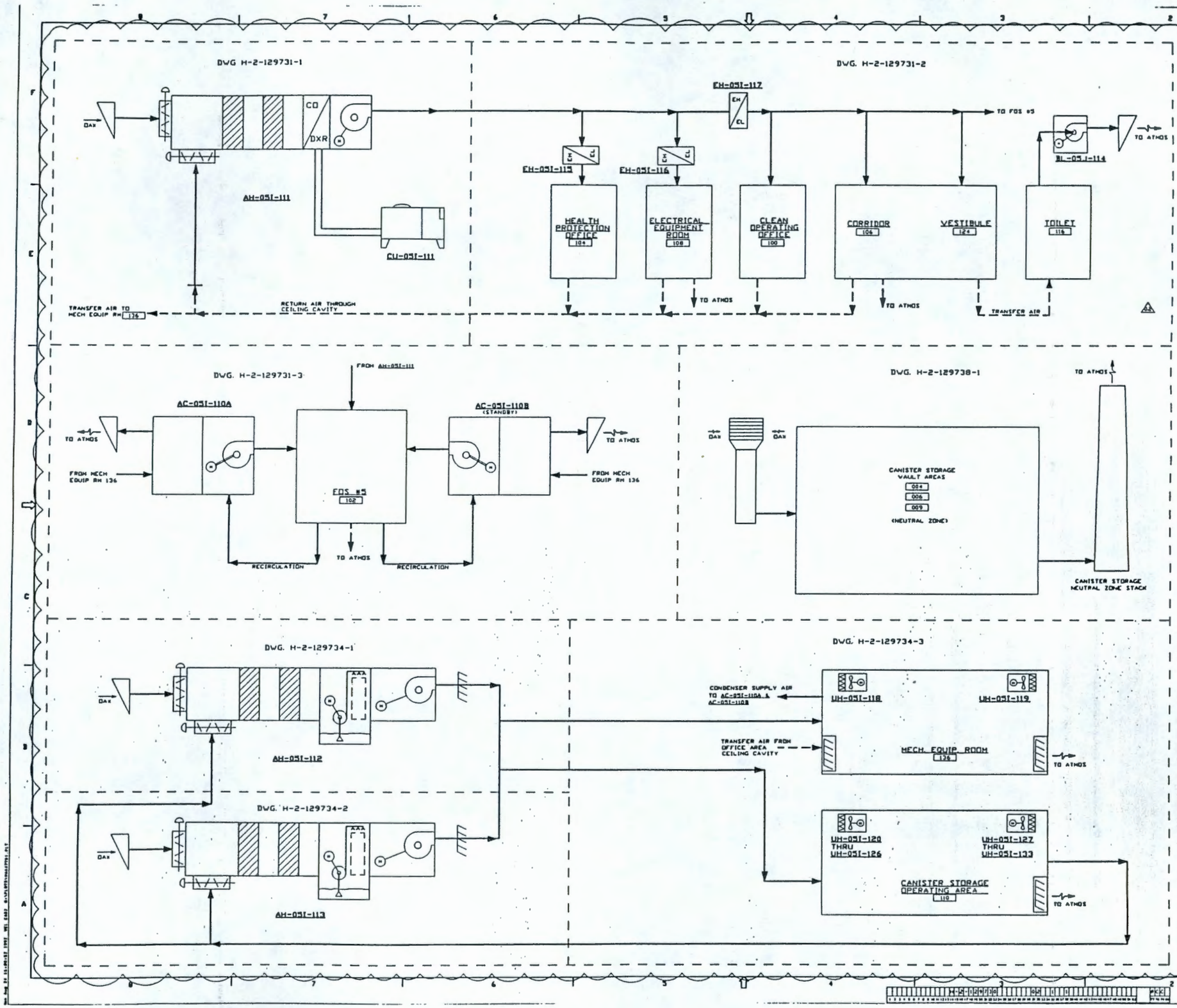


GENERAL NOTES:

A. THE INTENT OF THIS DRAWING IS TO PROVIDE A GENERAL OVERVIEW OF THE SYSTEM SPECIFIC DETAILS ARE PROVIDED ON THE REFERENCED DRAWINGS.

B. THE DESIGN SHALL CONSIDER / ADDRESS FIRE DAMPER ALTERNATIVES RELATIVE TO THE HVAC SYSTEM CONFINEMENT FUNCTIONS. FIRE DAMPER TESTING AND FIRE DAMPER INADVERTENT CLOSURE SO THAT FLOW REVERSAL BETWEEN CONFINEMENT ZONES IS ELIMINATED. THE DESIGN SHALL ADHERE TO CODE REQUIREMENTS.

C. REFER TO DRAWING H-2-123001 "LEGEND OF SYMBOLOGY FOR PROCESS FLOW AND PIPING AND INSTRUMENT DIAGRAMS" FOR AN EXPLANATION OF SYMBOLS AND ABBREVIATIONS.

SEP 9 1992

FOR REVIEW AND COMMENT

DATE_____

REV		REVISION DESCRIPTION				
02		REMOVE ASS. NOTE a, b & c AND d	TB			
		REV'D PER PROJ. DIR. DOL REV 0				
01		ADDED ASSUMPTION NOTES a,b,c&d	SFV	SA	RCF	VWG
		PER CR-HVVP-0730	CDG		JGK	RSP
00		RELEASED FOR FLUOR DANIEL	RII		RMD	
		CONFIGURATION CONTROL				

DWG NO 12973012 — SCHEME 2B1BMACDX-10C2SS

ENGINEERING RELEASE
REV _____ DATE _____
CPG

DESIGNED BY	R N GIBBONS	
CHECKED BY	D P CHAVLA	
ENGINEERING UNIT	A K YEE	
DRAFTING	J L SMETS	12-3-91
LEAD DRAFTER	C R PHILLIPS	12-3-91
PROJECT ENGINEER	R E TAGNEY	12-3-91
REVIEWED BY	S ANVAR	12-3-91
PROJECT MANAGER	S AITTAI	12-3-91
APPROVED BY	R C FLYE	12-3-91
APPROVED BY	R INVINA	12-3-91

U.S. DEPARTMENT OF ENERGY
Richland Operations Office
DE - AC06-00RL00220

FLUOR DANIEL, INC.
ADVANCED TECHNOLOGY DIVISION

HVAC FCD. SYST 05
CSB
COMPOSITE

PROJECT TITLE: HANFORD WASTE VITRIFICATION PLANT

PROJECT	PLANT CONTROL NO	TYPE NO
3-595	8457	3229

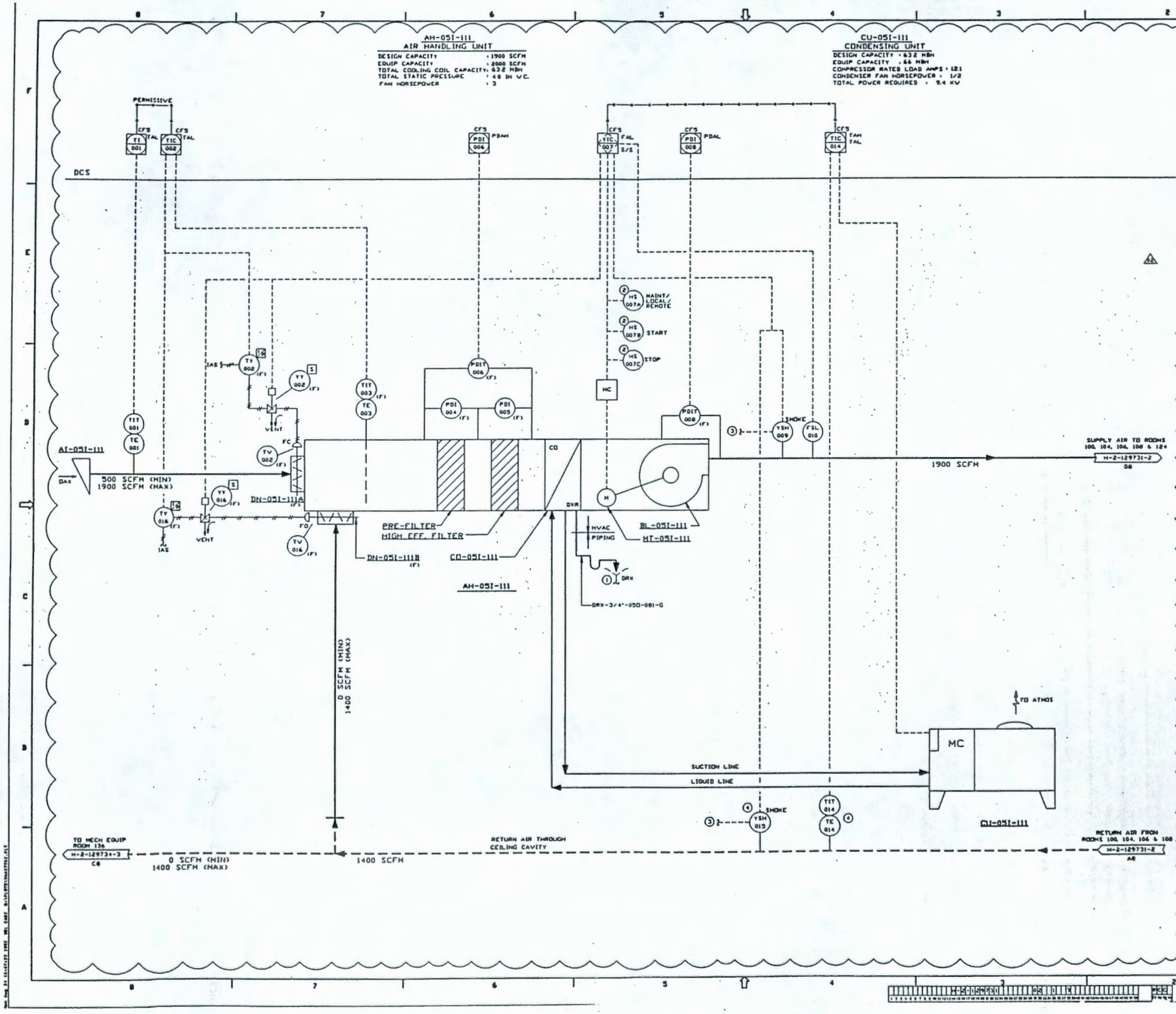
SCALE	SHEET NO	SHEETS NO
NONE	5	

SIZE	CODE NO	DWG NO	REV
NONE	NOT REQ'D	H-2-129730	02

DISTRIBUTION CODE: ACAB

TB 09-24-92

9312975.128



GENERAL NOTES:

A. INSTRUMENTS AND PIPING BULK MATERIAL ITEMS, SUCH AS BLOCK, DRAIN AND VENT VALVES ARE NUMBERED IN THE SAME NUMBERING SYSTEM

B. INSTRUMENT TAG NUMBERS ON THIS DRAWING ARE PREFIXED WITH CSS UNLESS OTHERWISE NOTED

C. PIPING BULK MATERIAL ITEMS ARE PREFIXED BY THEIR SERVICE ABBREVIATION. FOR EXAMPLE VALVE NUMBER HV-001 IN A PROCESS WATER (LVP) LINE WOULD BE TAGGED HV-LPV-001

D. FOR DEFINITION OF LOGIC CONTAINED IN DIAMOND SYMBOLS ◇, AND HEX SYMBOLS ⬡, SEE PROCESS CONTROL DESCRIPTION (PCD) SPECIFICATION B-595-C-17500-DS-053.

E. REFER TO DRAWING H-2-123061 "LEGEND OF SYMBOLOGY FOR PROCESS FLOW AND PIPING AND INSTRUMENT DIAGRAMS" FOR AN EXPLANATION OF SYMBOLS AND ABBREVIATIONS.

NOTES:

1. FOR DRAIN PIPING CONNECTION SEE DRAWING H-2-123361-7
2. HANDSWITCH LOCATED ON MCC.
3. FIRE PANEL SUPERVISORY SIGNAL.
4. LOCATED IN THE RETURN AIR CEILING CAVITY.

FOR REVIEW AND COMMENT
DATE_____

SEP 9 1992

SAFETY CLASS 3

REV NO	DATE	REVISION DESCRIPTION	DRAWN	CHECKED	ENGINEERING	PROJECT ENGINEER
02	9/9/92	REMOVED ASSUMPTION NOTE 6. REV'D PER PROJ. DIR. 001, REV. 6	TB	SKF	SEP	INJ
01	6/25/92	ADDED ASSUMPTION NOTE 6. PER CR-HVVP-0331	JFW	SA	RCF	VVC
00	6/4/92	RELEASED FOR FLUOR DANIEL CONFIGURATION CONTROL	CDG	MJH	JCH	RSP
			RG	SA	MRG	SA

DRAWING 12973112 SUBMITTED 28 IBM ACDX 10 C2-SS

ENGINEERING RELEASE
REV. ____ DATE ____
ENG. ____

PREPARED BY	R N GIBBONS
	G P CHAVLA
PROJECT ENGINEER	A K YEE
	J L SMETS
DESIGN ENGINEER	C R PHILLIPS
	F E TAGNEY
STRUCTURAL	S ANVAR
ELECTRICAL	S AITAI
INSTRUMENT	R E FLYE
	R INVINA
CHECKED BY	NONE
APPROVED BY	NOT REQ'D

U.S. DEPARTMENT OF ENERGY
Richland Operations Office
DE - AC06-88RL01830

FLUOR DANIEL, INC.
ADVANCED TECHNOLOGY DIVISION

HVAC FCD, SYST 05
CSB
OFFICE AREAS

PROJECT TITLE: HANFORD WASTE VITRIFICATION PLANT

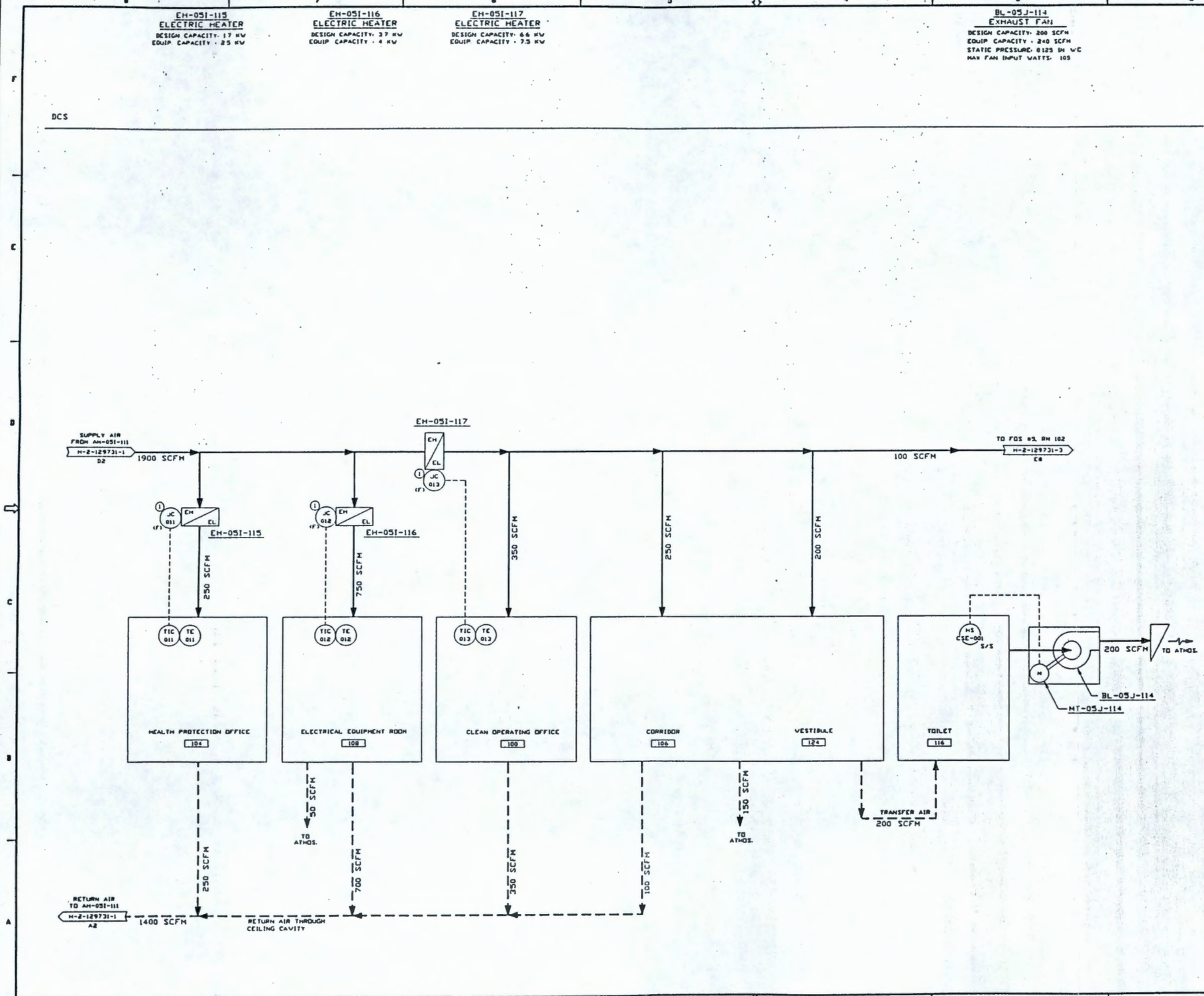
PROJECT	PLANT DESIGNATOR	SYSTEM	SHEET
B-595	0457	3229	
SCALE	DATE		
NONE	5		

DRAWING NUMBER H-2-129731 REV. 1 | 3 | 02

DISTRIBUTION CODE: ACAD

TB 08-20-92

9312975.1288F



GENERAL NOTES:

A FOR GENERAL NOTES, REFER TO H-2-129731, SHEET 1.

NOTES:

1. THE MULTI-STEP ELECTRIC HEATER POWER CONTROLLER SYSTEM INCLUDES A MULTI-STAGE STEP CONTROLLER, LOW AIR FLOW AND HIGH HEATER TEMPERATURE OUTPUT

FOR REVIEW AND COMMENT

DATE_____

SEP 9 1992

SAFETY CLASS 3

00		RELEASED FOR F/D CONFIG CONTROL PER PROJ. DIRECTIVE DOL REV. 0	TB			

1297312X		2B1BMACD210C2SS	

ENGINEERING RELEASE
REV. _____ DATE _____
CRD. _____

U.S. DEPARTMENT OF ENERGY

FLUOR DANIEL, INC.
ADVANCED TECHNOLOGY DIVISION

R S POULTER
J G KELLY
A K YEE
V V GRAY
C D GUENTHER
R E FLYTE
S F GUY
T BUI

HVAC FCD, SYST 05
CSB
OFFICE AREAS

HANFORD WASTE VITRIFICATION PLANT

D-595	8457		3229
NONE	5		
NONE	NOT REQ'D	H-2-129731	2 3 00

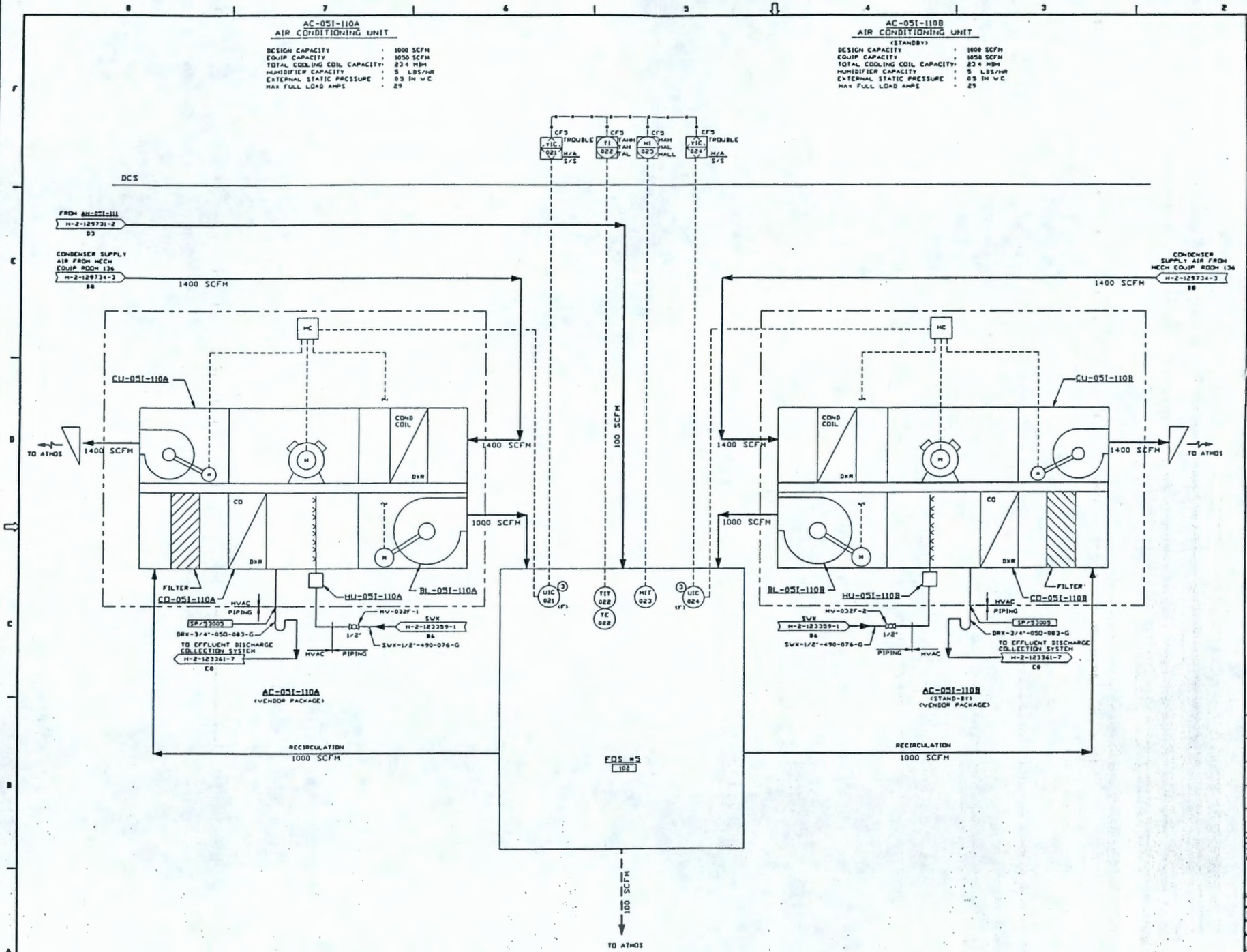
ACAD

INITIALS: TB
DATE: 08-24-92

DISTRIBUTION CODE:

9312975.T287

9312975.1288



GENERAL NOTES

A FOR GENERAL NOTES, REFER TO H-2-129731 SHEET 1

NOTES:

1. DELETED
2. DELETED
3. UNIT IS SUPPLIED WITH A CONTROL SYSTEM PANEL WHICH PROVIDES TEMPERATURE, HUMIDITY ALARM AND REMOTE/START/STOP CAPABILITY

FOR REVIEW AND COMMENT

DATE _____

SEP 9 1992

SAFETY CLASS 3

REV NO	DATE	REVISION DESCRIPTION	DRAWN	CHECKED	ENGINEERING	PROJECT ENGINEER	CONSTRUCTION
00	9/9/92	RELEASED FOR F/D CONFIG CONTROL PER PROJ. DIRECTIVE DCL REV. 8	TB	SKB	RED	VWA	

ENGINEERING RELEASE
REV _____ DATE _____
ECN _____

U.S. DEPARTMENT OF ENERGY
Richland Operations Office
RL - 400-Richland, WA 99

FLUOR DANIEL, INC.
ADVANCED TECHNOLOGY DIVISION

R S POLLITER
J G KELLY
A K YEE
V V GRAY
C D GUE
R E FLY
S F GUY
T BUI

HVAC FCD, SYST 05
CSB
OFFICE AREAS

HANFORD WASTE VITRIFICATION PLANT

8-595	8457	3229	
NONE	5		

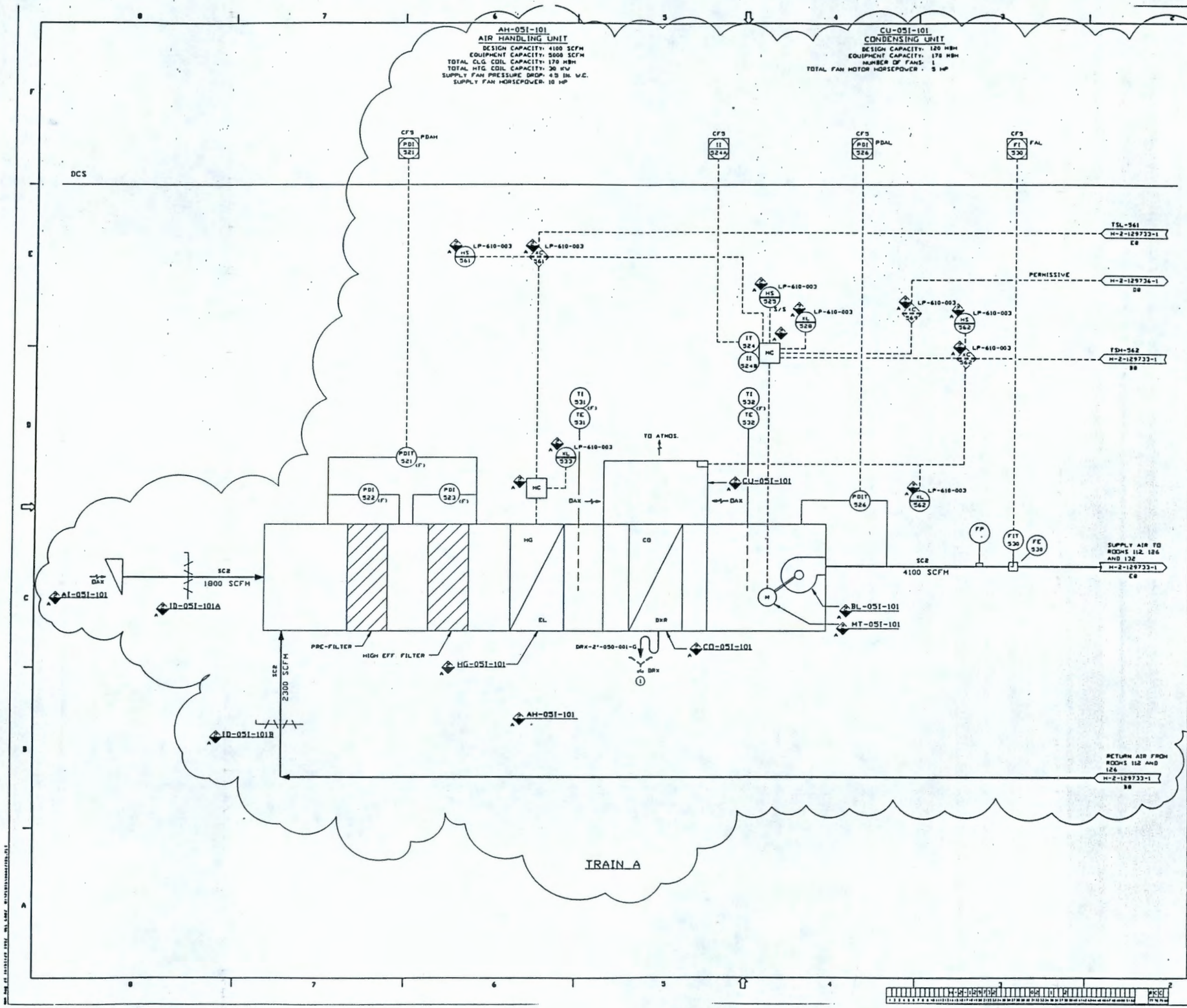
NONE | NOT REQ'D | H-2-129731 | 3 | 3 | 00

DISTRIBUTION CODE

ACAD

INITIALS TB
DATE 08-26-92

9312975.1289



GENERAL NOTES:

A. THREE DIGIT INSTRUMENT TAG NUMBERS ARE PREFIXED WITH 051 UNLESS A SIX DIGIT NUMBER IS SHOWN TO INDICATE ANOTHER SYSTEM.

B. FOR DEFINITION OF LOGIC CONTAINED IN DIAMOND SYMBOLS, ⊠, AND HEX SYMBOLS, ⬡, SEE PROCESS CONTROL DESCRIPTION (PCD) SPECIFICATION B-595-C-17500-DS-051.

C. REFER TO DRAWING H-2-123001 "LEGEND OF SYMBOLOGY FOR PROCESS FLOW AND PIPING AND INSTRUMENT DIAGRAMS" FOR AN EXPLANATION OF SYMBOLS AND ABBREVIATIONS.

D. FIRE DAMPER LOCATIONS AND REQUIREMENTS WILL BE VERIFIED IN DETAILED DESIGN.

E. SAFETY CLASS PANELS LP-610-003 AND 004 ARE LOCATED IN DC/REB BUILDING.

NOTES:

1. FOR DRAIN PIPING CONNECTION, SEE DRAWING H-2-123361-7

FOR REVIEW AND COMMENT

DATE_____

SEP 9 1992

SAFETY CLASS 2 AS NOTED

REV						
02		VOID THIS DRAWING PER PROJECT DIRECTIVE 001, REV. 0	TD			
01		ADDED ASSUMPTION NOTE 6 PER CR-HVVP-0730	JFV	SA	RCF	VVG
			CDG	HJH	JGK	NHV
00		RELEASED FOR FLUOR DANIEL CONFIGURATION CONTROL	RH			

REV NO | DATE | REVISION DESCRIPTION | APPROVAL INITIALS

DWG# 12973212 | FORMAT 2B1BMACDX10C2SS

ENGINEERING RELEASE
REV _____ DATE _____
CPG

DRAWN BY	R N GIBBONS	
DESIGNED BY	G P CHAWLA	
PROJECT ARCHITECT	A K TEE	
DRAFTING SUPVR	J L SMETS	12-5-91
SYSTEM ENGINEER	C R PHILLIPS	12-5-91
PROJECT ENGINEER	A G TAUNEY	12-5-91
CONSTRUCTION SUPVR	S ANWAR	12-5-91
REGULATORY ENGINEER	S AITAI	12-5-91
PROJECT MANAGER	R E FLYE	12-5-91
APPROVED	R DIVINA	12-5-91

U.S. DEPARTMENT OF ENERGY
Richland Operations Office
RL - ACAD-DARLINGTON

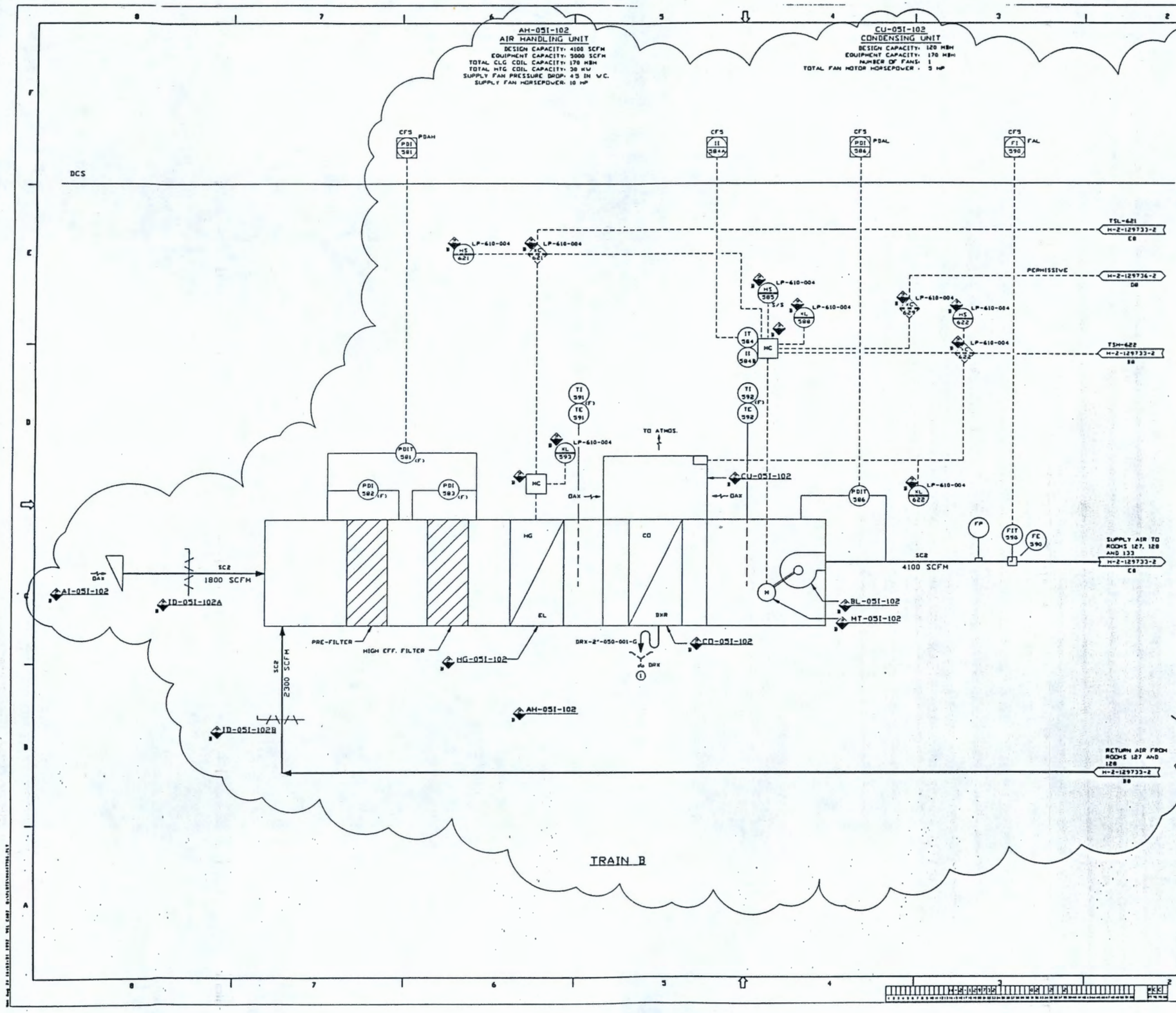
FLUOR DANIEL, INC.
ADVANCED TECHNOLOGY DIVISION

HVAC FLOW & CONTROL DIAGRAM
SYSTEM 05
CANISTER STORAGE SYSTEM
HVAC EQUIPMENT SUPPLY SYSTEM

PROJECT TITLE: HANFORD WASTE VITRIFICATION PLANT

PROJECT NO. B-595	PLANT ENGINEERING NO. 8457	SUB NO. 3229	
SCALE NONE	SUB NO. 5		
CLASSIFICATION NONE	NOT REQ'D	DRAWING NUMBER H-2-129732	SHEET 1 / TOTAL 2 / REV 02

DISTRIBUTION CODE: ACAD



GENERAL NOTES:

A. FOR GENERAL NOTES, REFER TO H-2-129732 SHEET 1

NOTES:

1. FOR DRAIN PIPING CONNECTION SEE DRAWING H-2-123361-7

FOR REVIEW AND COMMENT

DATE_____

SEP 9 1992

SAFETY CLASS 2 AS NOTED

REV	DATE	DESCRIPTION	DR	CHK	PCE	INA
02	9/9/92	VOID THIS DRAWING PER PROJECT DIRECTIVE DOL REV. 0.	TB			
01	6/24/92	ADDED ASSUMPTION NOTE 6. PER CR-HWVP-0738	JW / CDG	SA / HJM	RCF / JGK	VVC / MPW
00	12/4/91	RELEASED FOR FLUOR DANIEL CONFIGURATION CONTROL.	RG		RMG	

SHEET 12973222 | DRAWING 2B1BMACDX-10C2SS

ENGINEERING RELEASE
REV _____ DATE _____
EPG

PROJECT ENG R N GIBBONS	
PROJ. MANAGER D P CHAVLA	
DESIGN GROUP ARCHITECT A K TEE	
DESIGNER J.L. SMETS	12-5-91
DESIGN MANAGER E.P. PHILLIPS	12-5-91
PROJ. ENGINEER R.C. TAGNEY	12-5-91
CONSTRUCTION S ANVAR	12-5-91
INSTRUMENTATION S.AITTAI	12-5-91
PROJ. CONTROLS R.C. LYE	12-5-91
QA R INVINA	12-5-91

U.S. DEPARTMENT OF ENERGY
Richland Operations Office
RL - ACAD-RMLWR30

FLUOR DANIEL, INC.
ADVANCED TECHNOLOGY DIVISION

HVAC FLOW & CONTROL DIAGRAM
SYSTEM 05
CANISTER STORAGE BUILDING
HVAC EQUIPMENT SUPPLY SYSTEM

PROJECT TITLE: HANFORD WASTE VITRIFICATION PLANT

PROJECT	PLANT CONTROL NO.	CAD NO.
D-595	8457	3229

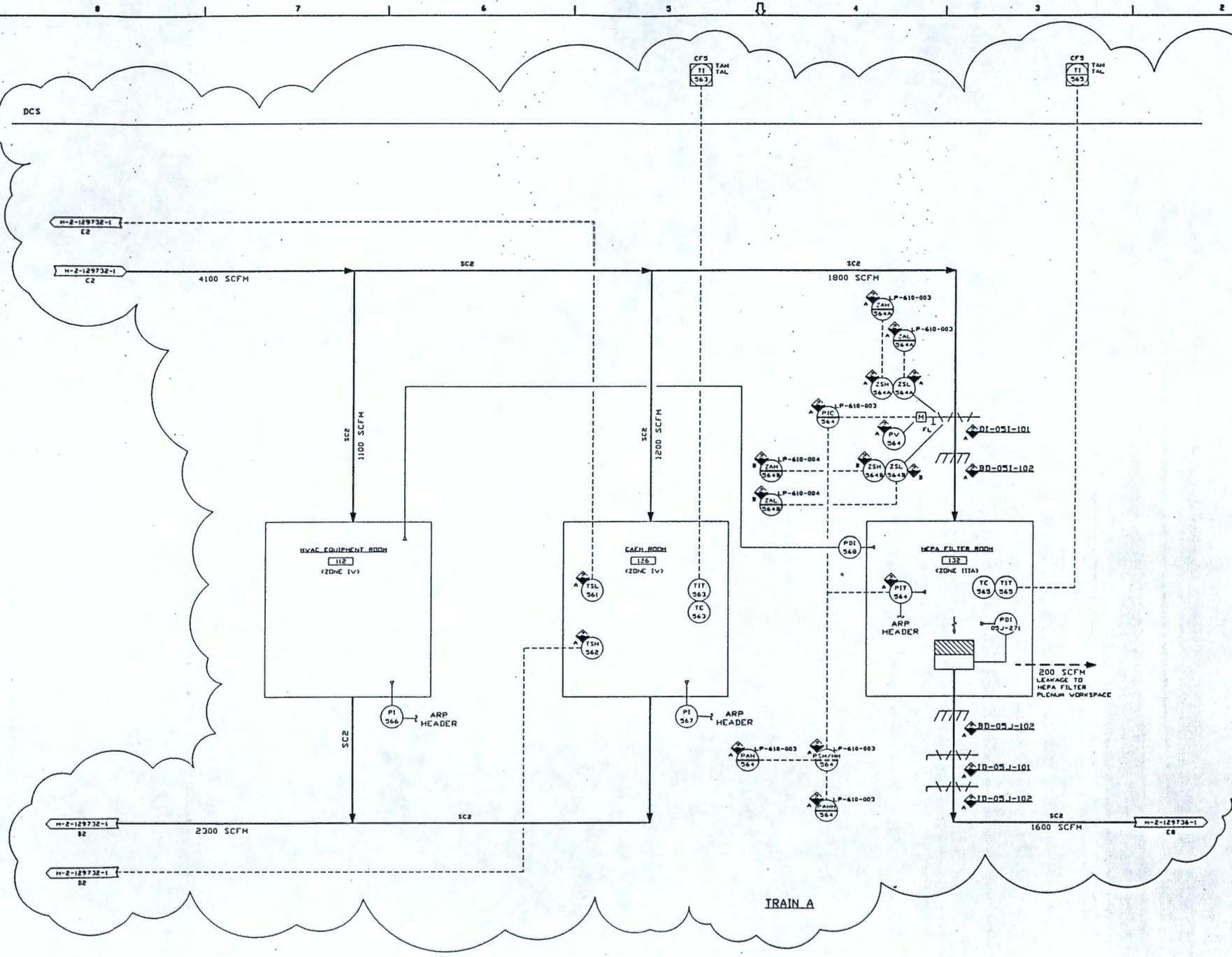
SCALE	SHEET NO.
NONE	3

CLASSIFICATION		DRAWING NUMBER	SHEET	OF	REV
NONE	NOT REQ'D	H-2-129732	2	2	02

DISTRIBUTION CODE: ACAD

JW 08-19-92

9312975.0290



GENERAL NOTES:

A. THREE DIGIT INSTRUMENT TAG NUMBERS ARE PREFIXED WITH 051 UNLESS A SIX DIGIT NUMBER IS SHOWN TO INDICATE ANOTHER SYSTEM

B. FOR DEFINITION OF LOGIC CONTAINED IN DIAMOND SYMBOLS, ⊟, AND HEX SYMBOLS, ⬡, SEE PROCESS CONTROL DESCRIPTION (PCD) SPECIFICATION B-595-C-17500-05-05J.

C. REFER TO DRAWING H-2-123001 "LEGEND OF SYMBOLOGY FOR PROCESS FLOW AND PIPING AND INSTRUMENT DIAGRAMS" FOR AN EXPLANATION OF SYMBOLS AND ABBREVIATIONS

D. FIRE DAMPER LOCATIONS AND REQUIREMENTS WILL BE VERIFIED IN DETAILED DESIGN

E. SAFETY CLASS PANELS LP-610-003 AND 004 ARE LOCATED IN DC/PEB BUILDING

FOR REVIEW AND COMMENT

DATE_____

SEP 9 1992

SAFETY CLASS 2 AS NOTED

REV NO	DATE	REVISION DESCRIPTION	APPROVAL DETAILS
02	12/3/91	VOID THIS DRAWING PER PROJECT DIRECTIVE 001, REV. 0.	TB SAS CEJ VWG
01	6/4/91	ADDED ASSUMPTION NOTE 6 PER CR-HVVP-0730	SV SA REP VWG CDG MJH JGK MHW
00	12/6/90	RELEASED FOR FLUOR DANIEL CONFIGURATION CONTROL	RH RT SA RPG SA VWG SV

DWG NO 12973312 DRAWING 2B IBM ACDX-10 C2 SS

ENGINEERING RELEASE
REV _____ DATE _____
ENG _____

PROJECT ENG	R N GIBBONS	
LEAD ENGINEER	D P CHAVLA	
MECHANICAL LEAD	A K LEE	
LEAD ENGINEER	J L SMETS	12-3-91
LEAD DESIGNER	E R PHILLIPS	12-3-91
P & I DESIGNER	R G TACKEY	12-3-91
CONSTRUCTION	S ANVAR	12-3-91
DATA TECHNICIAN	S ATTAI	12-3-91
QA	R C FLYE	12-3-91
DRAFTER	R INVINA	12-3-91

U.S. DEPARTMENT OF ENERGY
Richland Operations Office
RL - 0246-0UR-00020

FLUOR DANIEL, INC.
ADVANCED TECHNOLOGY DIVISION

HVAC FLOW & CONTROL DIAGRAM
SYSTEM 05
CANISTER STORAGE BUILDING
MECHANICAL ROOM AREAS

PROJECT TITLE: HANFORD WASTE VITRIFICATION PLANT

PROJECT B-595	PLANT ENGINEERING NO. 0457	FILE NO. 3229	
SCALE NONE	A/E NO. 5	SHEET NO.	

NONE | NOT REQ'D | H-2-129733 | 1 | 2 | 02

DISTRIBUTION CODE: ACAD

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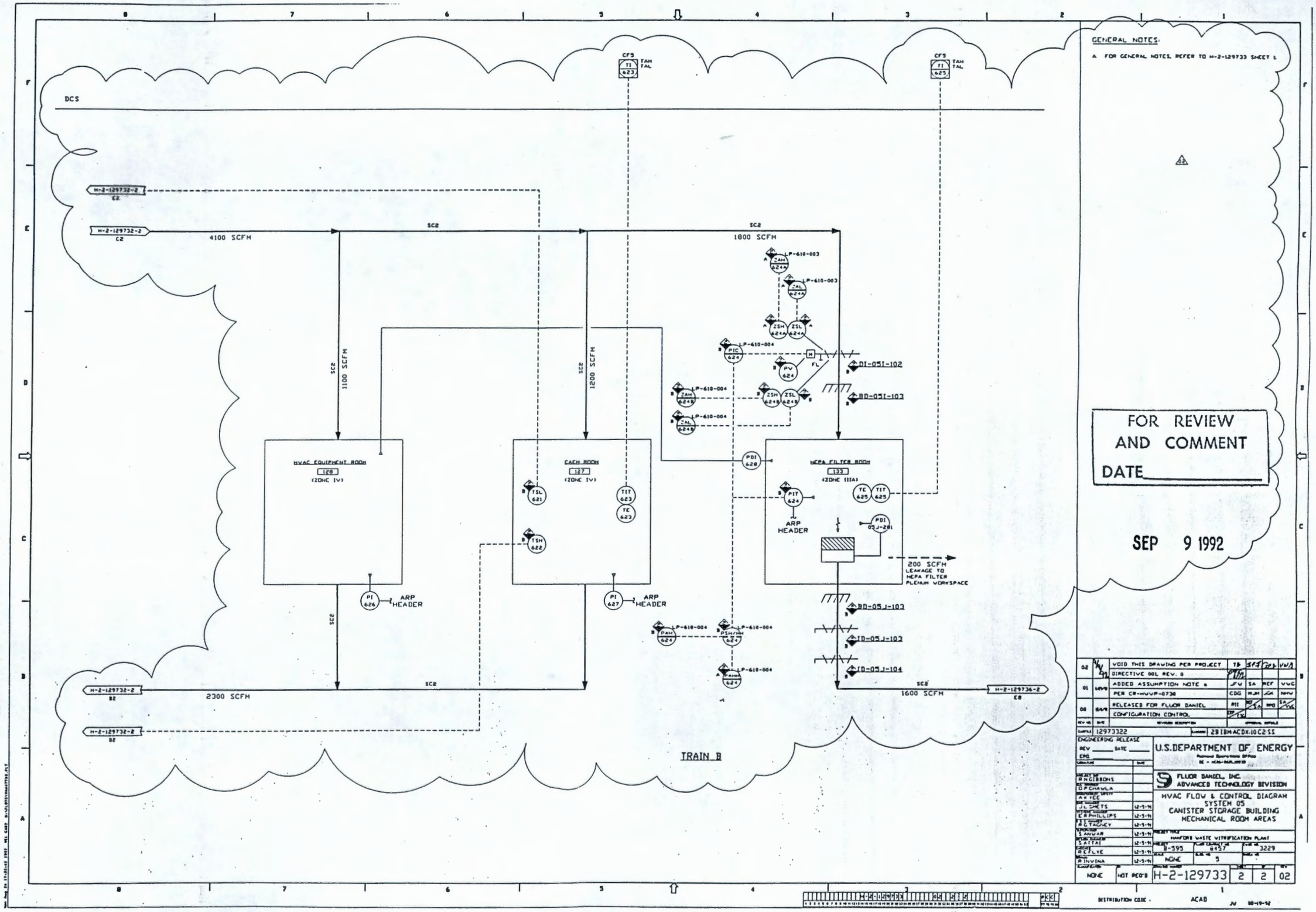

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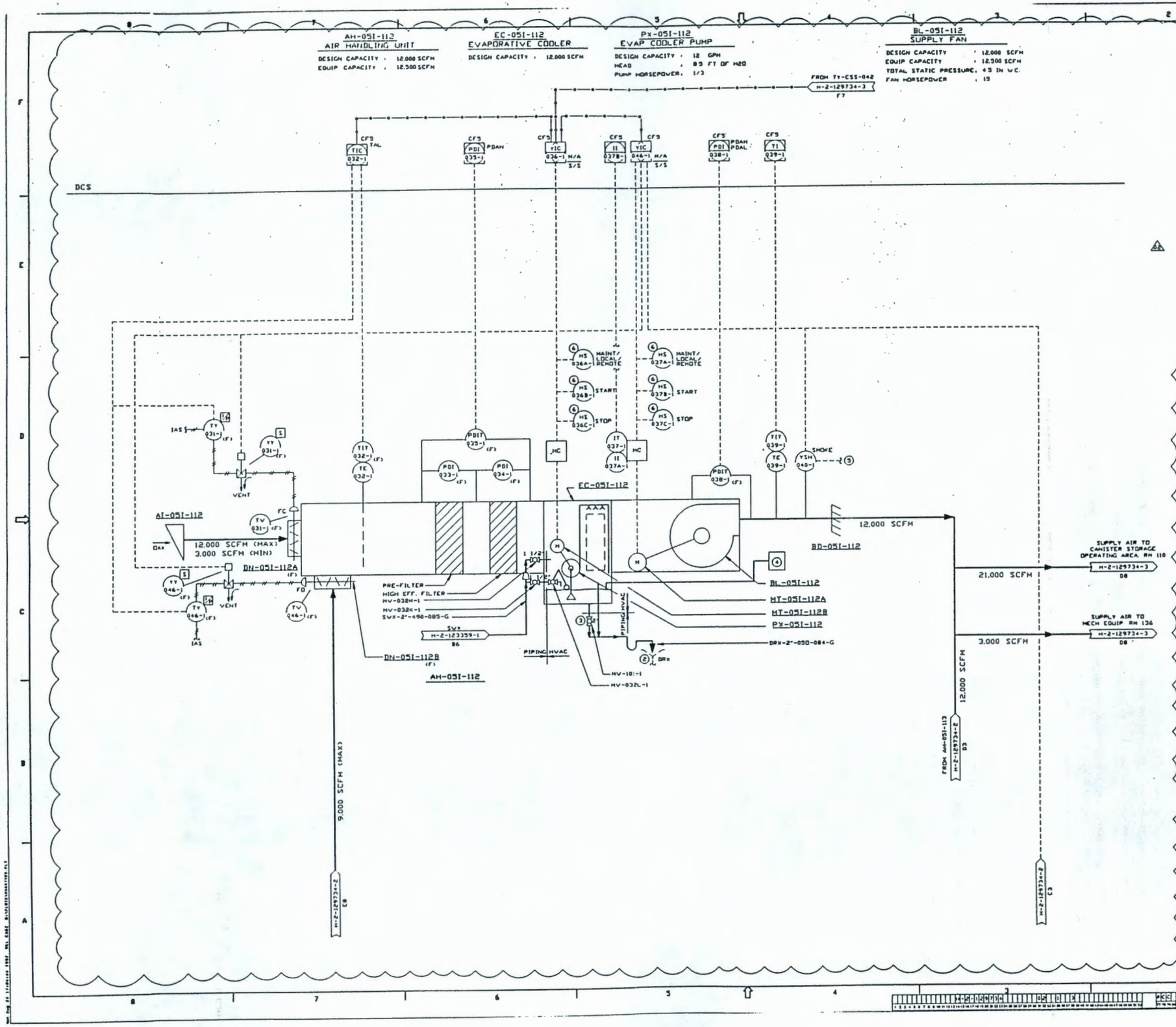


GENERAL NOTES:

A. INSTRUMENTS AND PIPING BULK MATERIAL ITEMS SUCH AS BLOCK, DRAIN AND VENT VALVES ARE NUMBERED IN THE SAME NUMBERING SYSTEM

B. INSTRUMENT TAG NUMBERS ON THIS DRAWING ARE PREFIXED WITH CSS UNLESS OTHERWISE NOTED

C. PIPING BULK MATERIAL ITEMS ARE PREFIXED BY THEIR SERVICE ABBREVIATION. FOR EXAMPLE, VALVE NUMBER HV-001 IN A PROCESS WATER (LVP) LINE WOULD BE TAGGED HV-LPW-001

D. FOR DEFINITION OF LOGIC CONTAINED IN DIAMOND SYMBOLS, AND HEX SYMBOLS, SEE PROCESS CONTROL DESCRIPTION (PCD) SPECIFICATION B-595-C-17300-05-05J

E. REFER TO DRAWING H-2-123001 "LEGEND OF SYMBOLOGY FOR PROCESS FLOW AND PIPING AND INSTRUMENT DIAGRAMS" FOR AN EXPLANATION OF SYMBOLS AND ABBREVIATIONS

NOTES:

1. DELETED
2. FOR DRAIN PIPING CONNECTION SEE DRAWING DRAWING H-2-123361-7
3. POSITIVE WATER BLEED VALVE, FLOW RATE TO BE DETERMINED DURING START-UP
4. MINERAL CONTROL BUILD-UP SYSTEM BY CLIENT.
5. FIRE PANEL SUPERVISORY SIGNAL
6. HANDSWITCH LOCATED AT MCC

FOR REVIEW AND COMMENT

DATE_____

SEP 9 1992

SAFETY CLASS 3

REV	DATE	REVISION DESCRIPTION					
02	9/9/92	REV'D TO ADD EVAP COOLING FOR OPER AREA PER P.D. 001, REV. 0	TB	JFS	RCF	VWG	
		ADDED ASSUMPTION NOTE 6	JFV	SA	RCF	VWG	
01	8/25/92	PER CR-HVVP-0730	CDG	HJH	JGH	RSP	
00	12/4/91	RELEASED FOR F/B CONFIGURATION CONTROL PER CR HVVP-0480	RH	RT SA	RPG	SA VG	

SHEETS 12973412 — SCHEME 2B IBMACDX.10C2 SS

ENGINEERING RELEASE
REV _____ DATE _____
CPG

DRAWN BY R.N.GIBBONS		
DESIGNED BY D.P.CHAVLA		
ENGINEERING SPEC A.K.TEE		
CAD ENGINEER J.L.SMETS		12-5-91
PROJECT ENGINEER E.A.PHILLIPS		12-5-91
PROJECT MANAGER R.C.TAGNEY		12-5-91
REVIEWED BY S.NAVAR		12-5-91
DESIGN REVIEWER S.AITAI		12-5-91
CONCURRENCE R.E.LYE		12-5-91
APPROVED BY R.N.VINA		12-5-91
CONCURRENCE NONE	NOT REQ'D	

U.S. DEPARTMENT OF ENERGY
Richland Operations Office
DE - AC06-89RL01830

FLUOR DANIEL, INC.
ADVANCED TECHNOLOGY DIVISION

HVAC FCD, SYST 05
CSB
MECH RM & OPER AREA

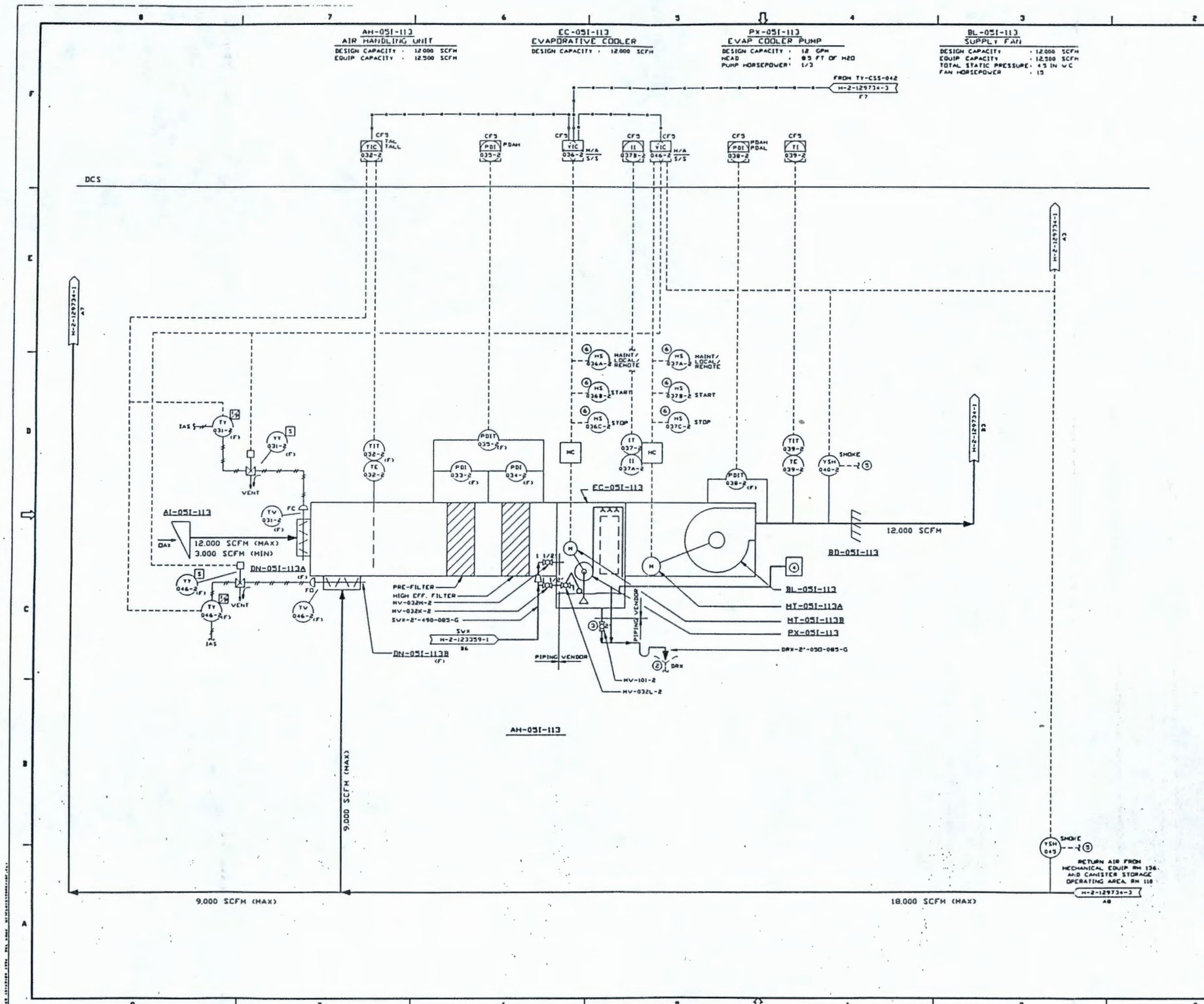
PROJECT TITLE: HANFORD WASTE VITRIFICATION PLANT

PROJECT	PLANT CONTROL NO.	CAD NO.
B-595	N457	3229
SCALE	B.M. NO.	SHEET NO.
NONE	5	

DRAWING NUMBER	SHEET	OF	REV
H-2-129734	1	3	02

DISTRIBUTION CODE: ACAD TB 08-26-92

9312975.1292



GENERAL NOTES

A FOR GENERAL NOTES, REFER TO H-2-129734 SHEET 1.

NOTES:

1. DELETED
2. FOR DRAIN PIPING CONNECTION, SEE DRAWING H-2-123361-7
3. POSITIVE WATER BLEED VALVE FLOW RATE TO BE DETERMINED DURING START-UP
4. MINERAL CONTROL BUILD-UP SYSTEM BY CLIENT
5. FIRE PANEL SUPERVISORY SIGNAL
6. HANDSWITCH LOCATED AT MCC.

FOR REVIEW AND COMMENT

DATE_____

SEP 9 1992

SAFETY CLASS 3

REV NO	DATE	REVISION DESCRIPTION	APPROVAL INITIALS
00		RCL'D FOR F/B CONFIG CONTROL PER PROJ DIRECTIVE 001 REV 0	TB SFS TEB WMA

1297342X — 2B1BHACD210C2SS

ENGINEERING RELEASE
REV. _____ DATE _____
ENG. _____

U.S. DEPARTMENT OF ENERGY
Richland Operations Office
RL - HCSS-00A, 00.00

FLUOR DANIEL, INC.
ADVANCED TECHNOLOGY DIVISION

DESIGNED	D S POULTER	
DRAWN	J G KELLY	
CHECKED	A K YEE	
LEAD ENGINEER	V V CRAWFORD	8/17/92
PROJECT ENGINEER	C D GUENTHER	8/17/92
APPROVED	R E FLYTZE	8/17/92
PROJECT	S F GUY	8-24-92
CONSTRUCTION	T BUI	8-24-92
CONCURRENCE	NONE	

HVAC FCD, SYST 05
CSB
MECH RM & OPER AREA

HANFORD WASTE VITRIFICATION PLANT

CONTRACT NO.	PLANT SEQUENCE NO.	PLANT NO.	PAGE NO.
8-595	8457	3229	
SCALE	SCALE NO.		
NONE	5		

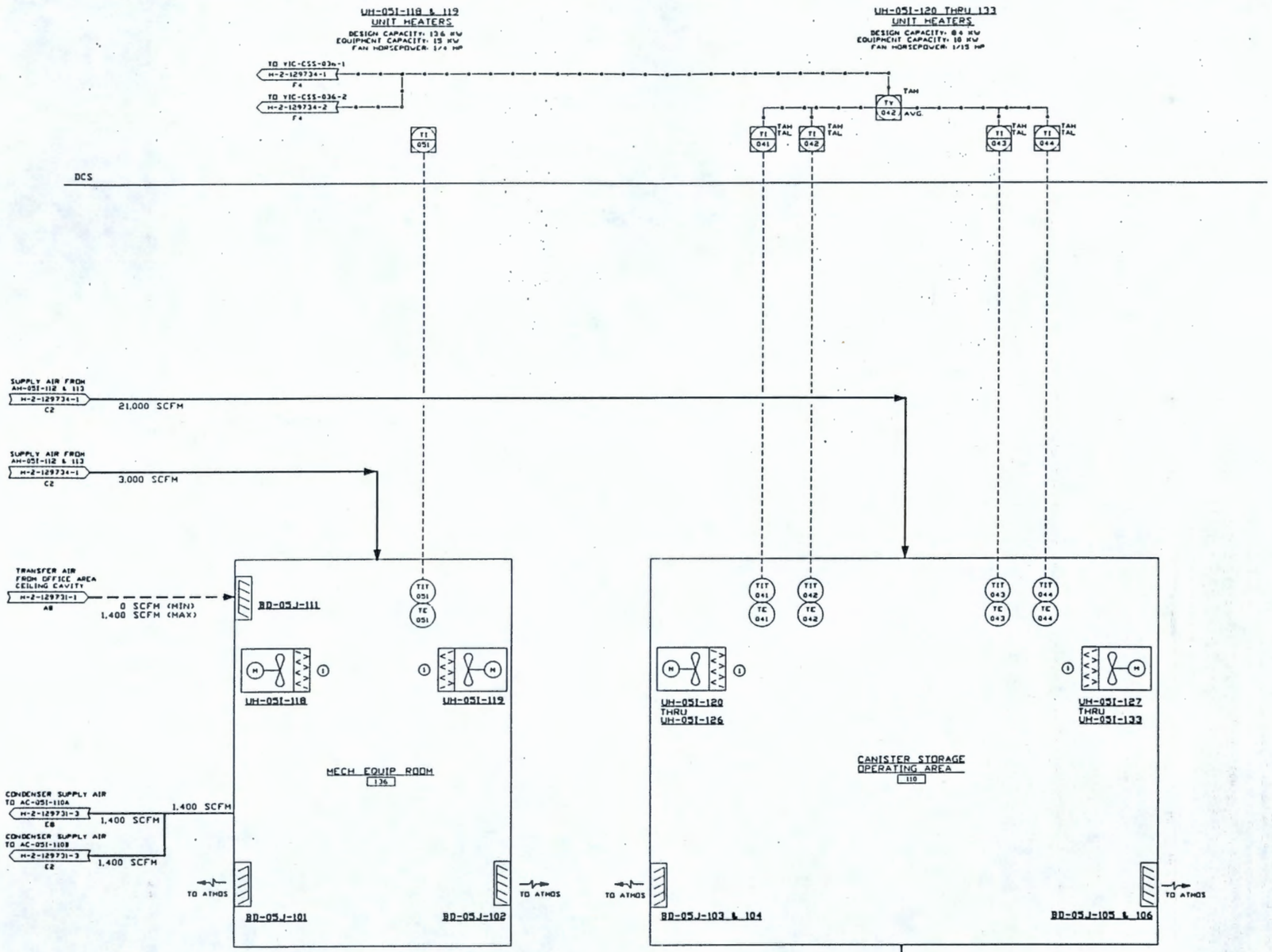
CONCURRENCE		DRAWING NUMBER	SHEET	X	REV
NONE	NOT REQ'D	H-2-129734	2	3	00

DISTRIBUTION CODE :

ACAD

INITIALS: TB
DATE: 08-26-92

9312975.1294



GENERAL NOTES:

A FOR GENERAL NOTES, REFER TO H-2-129734 SHEET 1

NOTES:

1. UNIT HEATER IS FURNISHED WITH HEATING ELEMENT, FAN AND INTEGRAL TEMPERATURE CONTROL SWITCH

FOR REVIEW AND COMMENT

DATE_____

SEP 9 1992

SAFETY CLASS 3

REV NO.	DATE	REVISION DESCRIPTION					
00		REL'D FOR F/D CONFIG CONTROL	TB				
		PER PROJ DIRECTIVE 001, REV 0					

129734 3X — 2B1BMACD210C2SS

ENGINEERING RELEASE
REV _____ DATE _____
ENG _____

U.S. DEPARTMENT OF ENERGY
RICHLAND OPERATIONS OFFICE
RE - ACDS-RIVERLAND

FLUOR DANIEL, INC.
ADVANCED TECHNOLOGY DIVISION

R S POULTER
J G KELLY
A K YEE
V V CRAWFORD
C D GUENTHER
R E FLYE
S F GUYSE
T BUI

HVAC FCD, SYST 05
CSB
MECH RM & OPER AREA

HANFORD WASTE VITRIFICATION PLANT

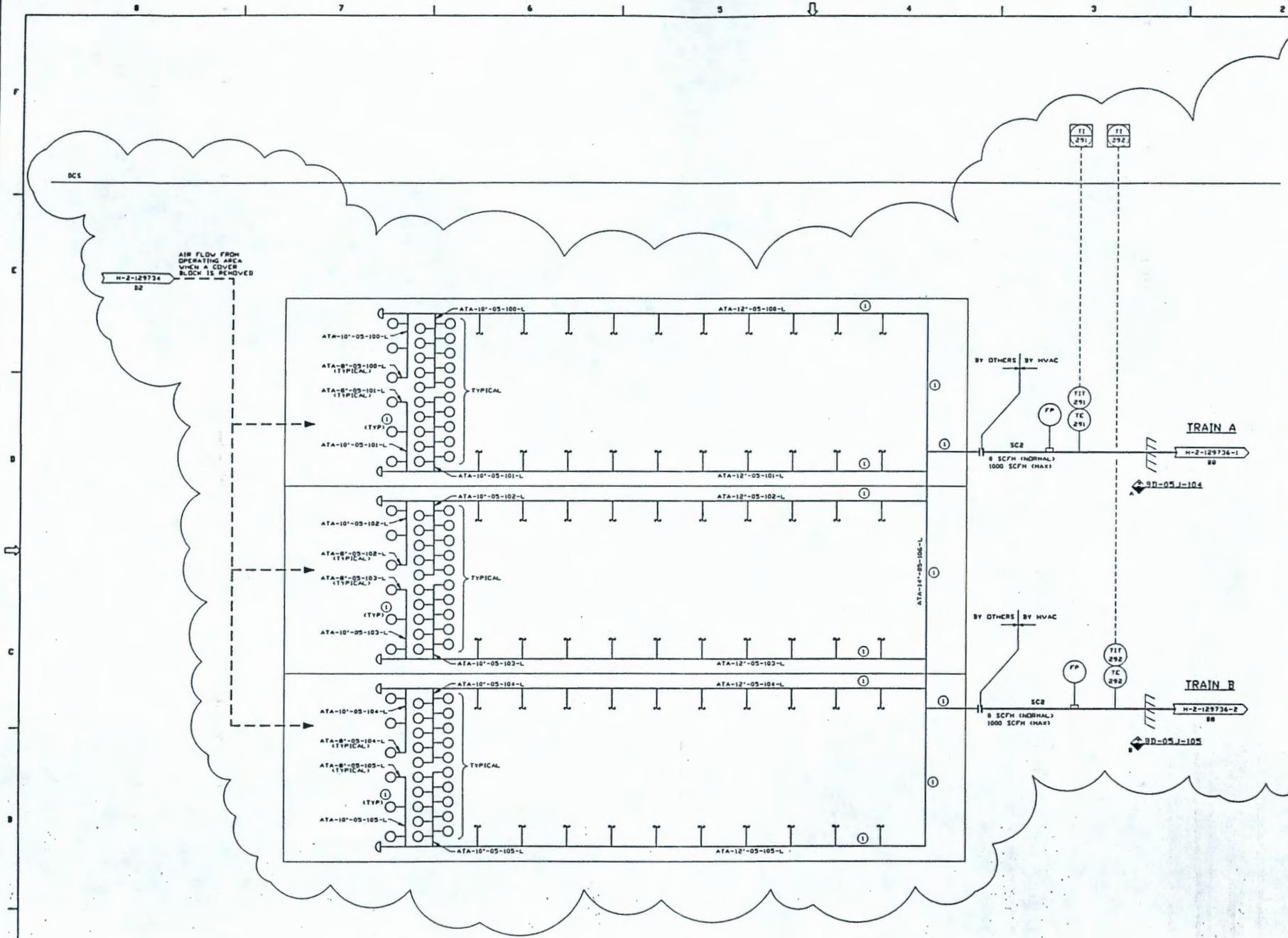
B-595	8457	3229	
NONE	3		
NONE	NOT REQ'D	H-2-129734	3 3 00

DISTRIBUTION CODE:

ACAD

INITIALS: TB
DATE: 08-18-92

93129975.1295



GENERAL NOTES:

A THREE DIGIT INSTRUMENT TAG NUMBERS ARE PREFIXED WITH 05J UNLESS A SIX DIGIT NUMBER IS SHOWN TO INDICATE ANOTHER SYSTEM

B FOR DEFINITION OF LOGIC CONTAINED IN DIAMOND SYMBOLS, ⊟, AND HEX SYMBOLS, ⬡ SEE PROCESS CONTROL DESCRIPTION (PCD) SPECIFICATION B-595-C-17500-05-05J

C REFER TO DRAWING H-2-123001 "LEGEND OF SYMBOLOGY FOR PROCESS FLOW AND PIPING AND INSTRUMENT DIAGRAMS" FOR AN EXPLANATION OF SYMBOLS AND ABBREVIATIONS

D. FIRE DAMPER LOCATIONS AND REQUIREMENTS WILL BE VERIFIED IN DETAILED DESIGN

NOTE:

1 THE ATMOSPHERIC AIR (ATA) PIPING SYSTEM IS FOR SAFETY CLASS 1 DESIGN BASIS EARTHQUAKE (DBE)

FOR REVIEW AND COMMENT

DATE_____

SEP 9 1992

SAFETY CLASS 2 AS NOTED

REV. NO.	DATE	REVISION DESCRIPTION	DRAWN	CHKD	APPD	APPD
02	9/9/92	VOID THIS DRAWING PER PROJECT DIRECTIVE 00L REV. 0	TB	GFS	CEG	WHA
01	6/8/92	ADDED ASSUMPTION NOTE 6 PER CR-HWVP-0730	JW	SA	REF	VVC
			CDG	HJH	JGK	MHV
00	12/4/91	RELEASED FOR FLUOR DANIEL CONFIGURATION CONTROL	RII	RP	SA	MHS	SA
			RP	SA			VVC

SHEET 12973512 CAD FILE 2B1BMACDX-10C2SS

ENGINEERING RELEASE
REV. _____ DATE _____
CDG _____

PROJECT ENG.	R N GIBBONS	
ED ENGINEER	D P CHAWLA	
DESIGN ENGINEER	A K TEE	
DR. ENGINEER	J L SMITS	12-5-91
DESIGN ENGINEER	C A PHILLIPS	12-5-91
DESIGN ENGINEER	A S TAGACY	12-5-91
DESIGN ENGINEER	S ANWAR	12-5-91
DESIGN ENGINEER	S JATTAL	12-5-91
DESIGN ENGINEER	R C LYE	12-5-91
DESIGN ENGINEER	R INVINA	12-5-91

U.S. DEPARTMENT OF ENERGY
Richland Operations Office
RE - 1420-DOE-0020

FLUOR DANIEL, INC.
ADVANCED TECHNOLOGY DIVISION

HVAC FLOW & CONTROL DIAGRAM
SYSTEM 05
CANISTER STORAGE BUILDING
ZONE II VENTILATION SYSTEM

PROJECT TITLE: HANFORD WASTE VITRIFICATION PLANT

PROJECT	PLANT SEQUENCE NO.	CAD NO.
B-595	8457	3229
SCALE: NONE	SHEET NO. 5	

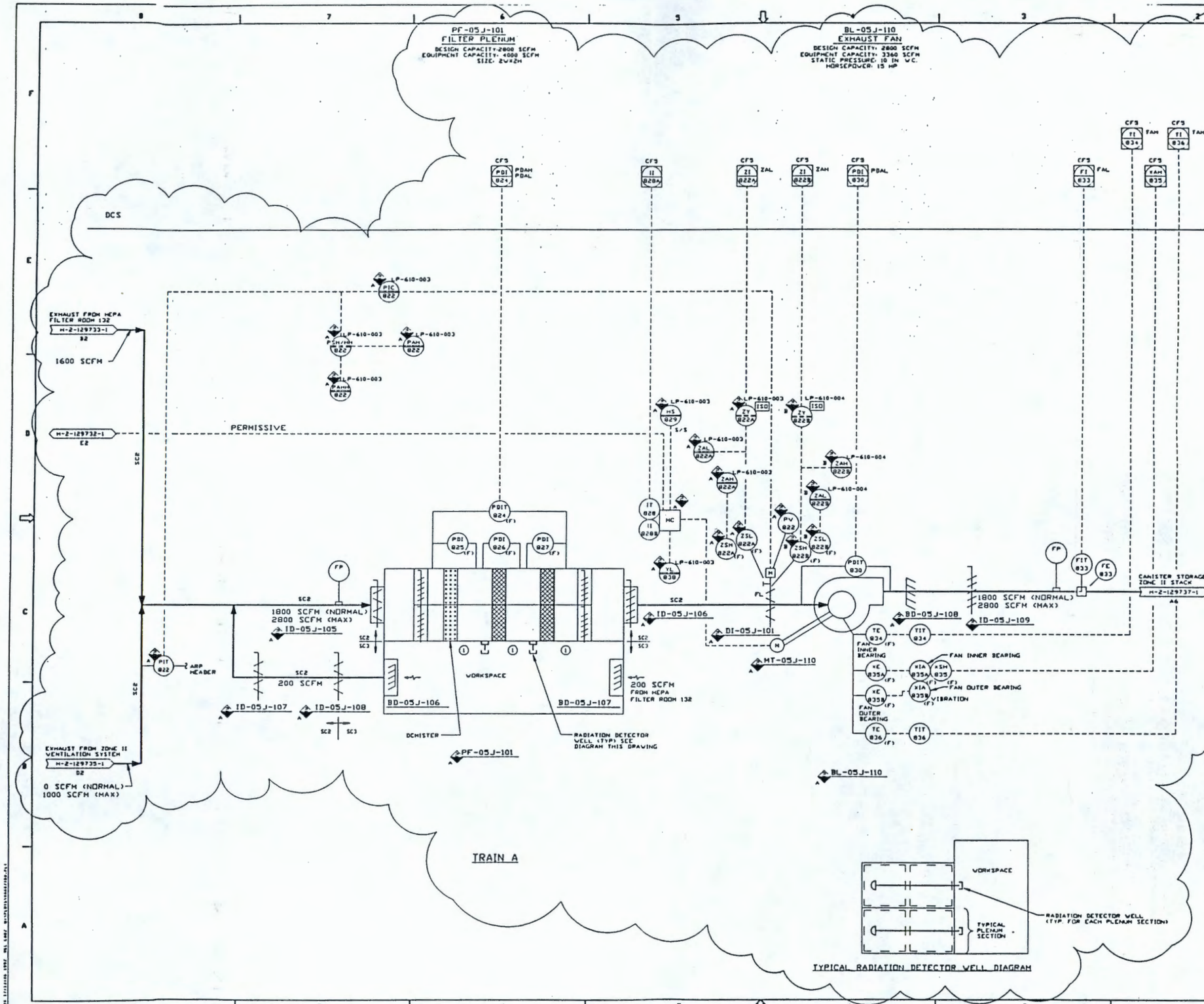
SIZE	SHEET	REV.
NONE	NOT REQ'D	H-2-129735	1	1	02

DISTRIBUTION CODE: ACAD

JV 08-19-92

9312975.12364

9312975.1297



GENERAL NOTES

A. THREE DIGIT INSTRUMENT TAG NUMBERS ARE PREFIXED WITH 05J UNLESS A SIX DIGIT NUMBER IS SHOWN TO INDICATE ANOTHER SYSTEM

B. FOR DEFINITION OF LOGIC CONTAINED IN DIAMOND SYMBOLS, ⊟, AND HEX SYMBOLS, ⬡, SEE PROCESS CONTROL DESCRIPTION (PCD) SPECIFICATION B-595-C-17300-DS-05J

C. REFER TO DRAWING H-2-123001 "LEGEND OF SYMBOLOGY FOR PROCESS FLOW AND PIPING AND INSTRUMENT DIAGRAMS" FOR AN EXPLANATION OF SYMBOLS AND ABBREVIATIONS.

D. FIRE DAMPER LOCATIONS AND REQUIREMENTS WILL BE VERIFIED IN DETAILED DESIGN.

E. SAFETY CLASS PANELS LP-610-003 AND 004 ARE LOCATED IN DC/MEB BUILDING.

NOTES:

1. FACTORY BUILT IN-PLACE CHALLENGE AEROSOL INLET PORTS, DIFFUSERS, SAMPLE TEST PORTS, AND TEST SECTIONS UPSTREAM AND DOWNSTREAM SHALL BE PROVIDED FOR EACH HEPA FILTER

FOR REVIEW AND COMMENT

DATE_____

SEP 9 1992

SAFETY CLASS 2 AS NOTED

REV	DATE	REVISION DESCRIPTION				
02	12/1/92	VOID THIS DRAWING PER PROJECT DIRECTIVE 00L REV. 0	TS	SFS		
01	12/2/92	ADDED ASSUMPTION NOTE 6 PER CR-HWVP-0730	SW	SA	RCF	VWG
			CDG	HJH		
00	12/4/92	RELEASED FOR FLUOR DANIEL	RII			
		CONFIGURATION CONTROL				

SHEET 12973612 FORMAT 28 IBM ACD x 10 C2 SS

ENGINEERING RELEASE
REV _____ DATE _____
ERD

U.S. DEPARTMENT OF ENERGY

FLUOR DANIEL, INC.
ADVANCED TECHNOLOGY DIVISION

HVAC FLOW & CONTROL DIAGRAM
SYSTEM 05
ZONE II HVAC EQUIPMENT
CANISTER STORAGE BUILDING
EXHAUST SYSTEM

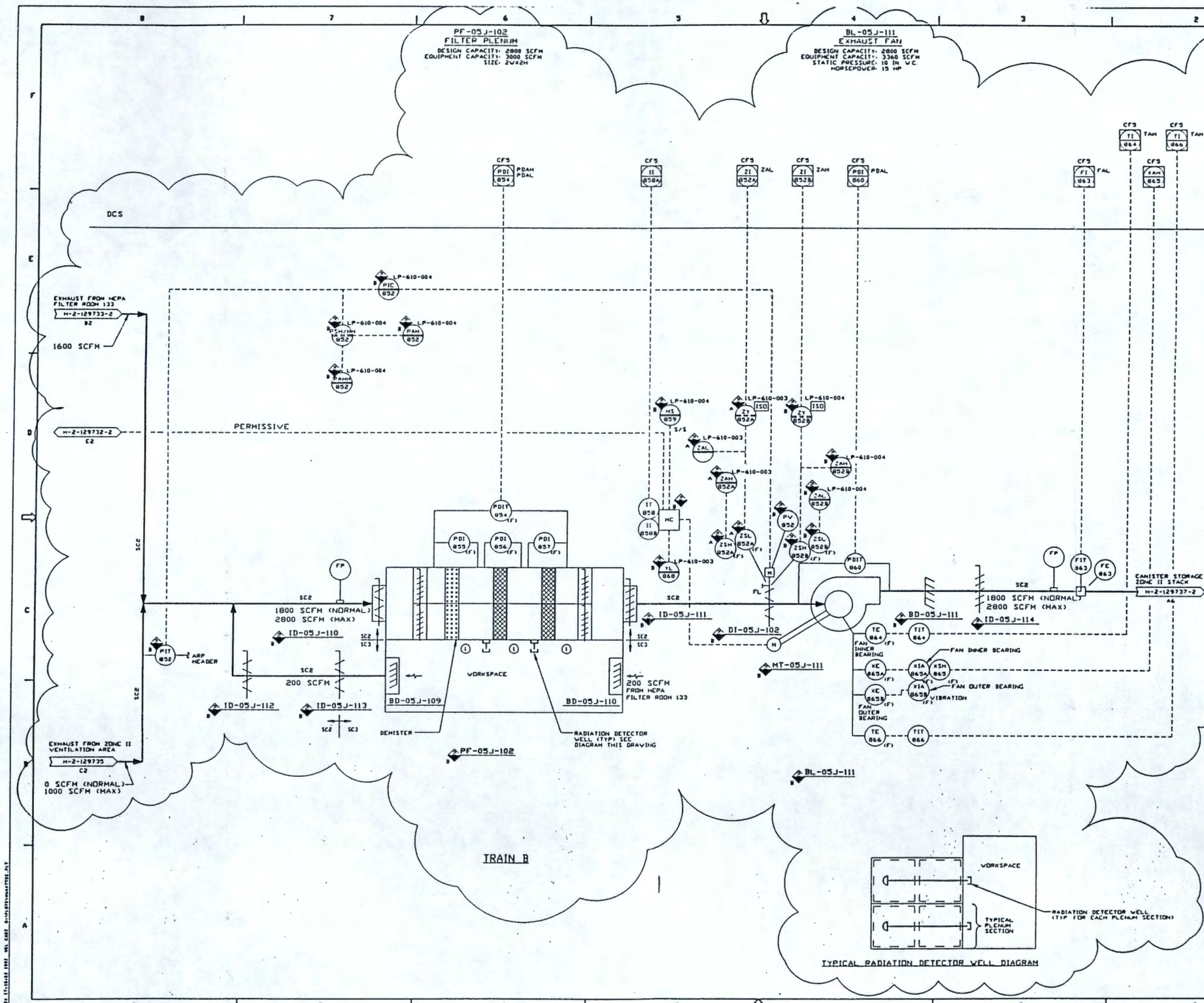
HANFORD WASTE VITRIFICATION PLANT

B-595 | 8457 | 3229

NONE | 5

NONE | NOT REQ'D | H-2-129736 | 1 | 2 | 02

DISTRIBUTION CODE: ACAD



GENERAL NOTES:

A. FOR GENERAL NOTES, REFER TO H-2-129736 SHEET 1.

NOTES:

1. FACTORY BUILT IN-PLACE CHALLENGE AEROSOL INLET PORTS, DIFFUSERS, SAMPLE TEST PORTS AND TEST SECTIONS UPSTREAM AND DOWNSTREAM SHALL BE PROVIDED FOR EACH HEPA FILTER

FOR REVIEW AND COMMENT

DATE_____

SEP 9 1992

SAFETY CLASS 2 AS NOTED

REV NO	DATE	REVISION DESCRIPTION	TB	SAS	DEB	VWA
02	8/9/92	VOID THIS DRAWING PER PROJECT DIRECTIVE 001 REV 0	TB			
01	6/2/92	ADDED ASSUMPTION NOTE 6	SV	SA	REF	VWG
		PER CR-HVVP-0730	CDG	HJM	JGA	NHV
00	8/4/91	RELEASED FOR FLUOR DANIEL	RH			
		CONFIGURATION CONTROL				

DRAWING 12973622 CADDIE 2B1BMACDX10C2SS

ENGINEERING RELEASE
REV. _____ DATE _____
ERQ _____

SIGNATURE	DATE
DESIGNED BY R.N.GIBBONS	
DESIGN ENGINEER D.P.CHAWLA	
DRAFTSMAN A.K.TEE	
DESIGN ENGINEER J.L.SMITS	12-5-91
SYSTEMS ENGINEER C.R.PHILLIPS	12-5-91
SYS. ENGINEER R.G.TAGNEY	12-5-91
REVIEWED BY S.ANWAR	12-5-91
DESIGN ENGINEER S.AITAI	12-5-91
APPROVED BY R.E.FLYE	12-5-91
APPROVED BY R.INVINA	12-5-91

U.S. DEPARTMENT OF ENERGY
Richland Operations Office
RE - ACAD-00A, 00.10

FLUOR DANIEL, INC.
ADVANCED TECHNOLOGY DIVISION

HVAC FLOW & CONTROL DIAGRAM
SYSTEM 05
CANISTER STORAGE BUILDING
ZONE II HVAC EQUIPMENT
EXHAUST SYSTEM

PROJECT TITLE: HANFORD WASTE VITRIFICATION PLANT

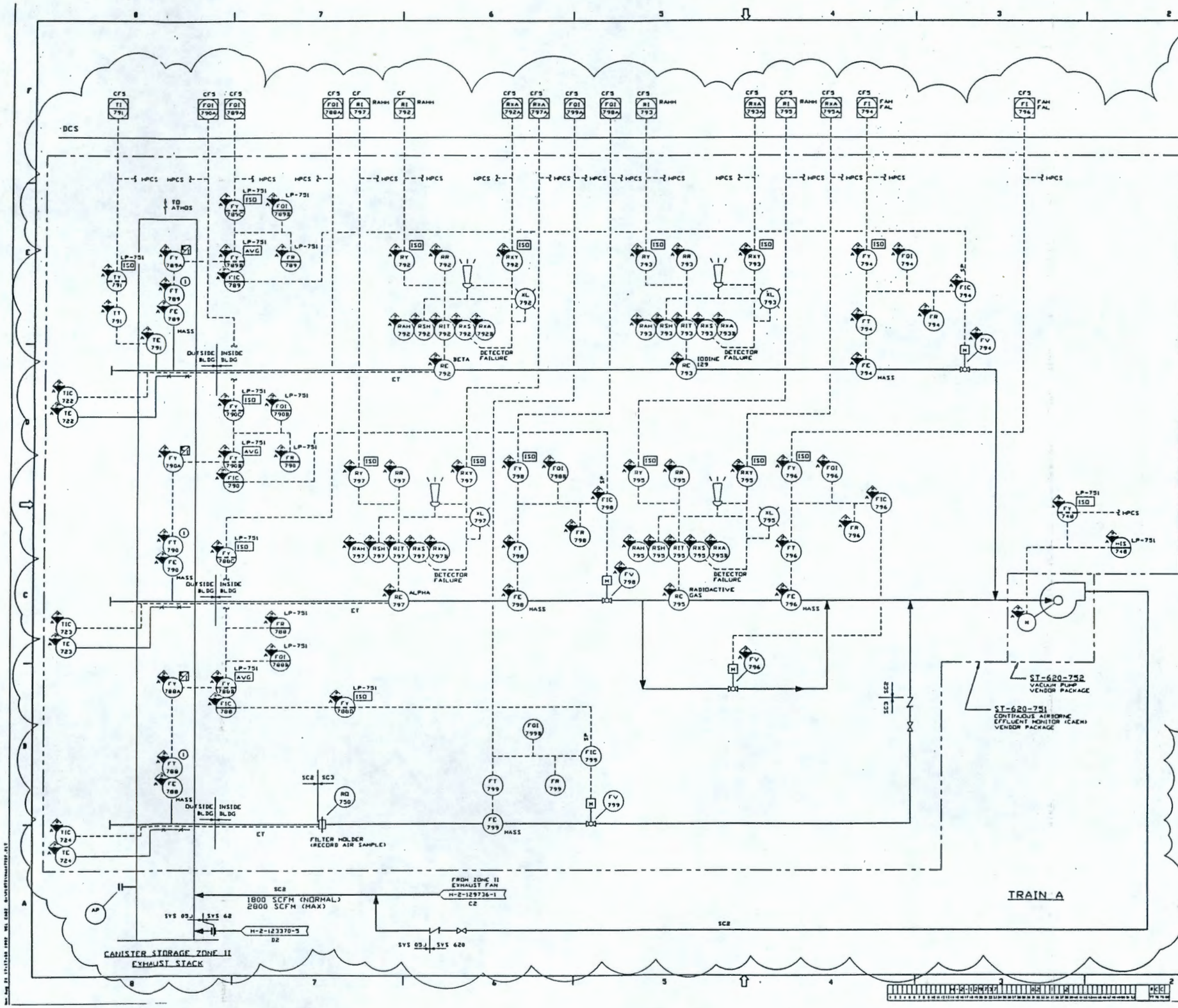
PROJECT NO.	PLANT ENGINEERING NO.	PLANT NO.
B-595	8457	3229

SCALE: NONE | SCALE NO. 5 | DRAWING NO.

SIZE	DRAWING NUMBER	SHEET	OF	REV
NONE	H-2-129736	2	2	02

DISTRIBUTION CODE: ACAD TB 08-19-92

9312975.1298



GENERAL NOTES:

A THREE DIGIT INSTRUMENT TAG NUMBERS ARE PREFIXED WITH 620 UNLESS A SIX DIGIT NUMBER IS SHOWN TO INDICATE ANOTHER SYSTEM

B REFER TO DRAWING H-2-123001 "LEGEND OF SYMBOLOGY FOR PROCESS FLOW AND PIPING AND INSTRUMENT DIAGRAMS" FOR AN EXPLANATION OF SYMBOLS AND ABBREVIATIONS

NOTES:

1. MULTIPLE REXPTS WILL EXIST ON EACH PROBE QUANTITY TBD IN DETAIL DESIGN

FOR REVIEW AND COMMENT

DATE_____

SEP 9 1992

SAFETY CLASS 2 AS NOTED

02		VOID THIS DRAWING PER PROJECT DIRECTIVE 001, REV 0	TB			
01	6/8/92	ADDED ASSUMPTION NOTE 6 PER CR-HWVP-0730	JFV CDG	SA MJM	REF JGK	VWG MHW
00	8/4/92	RELEASED FOR FLUOR DANIEL CONFIGURATION CONTROL	RII LP	RF SA	RMG	SA VWG

DWG NO 12973712 SIZE 28 IBM ACDX-10 C2-SS

ENGINEERING RELEASE
REV _____ DATE _____
ENG _____

U.S. DEPARTMENT OF ENERGY
Richland Operations Office
RL - HQ-DOE-RL-UR-320

FLUOR DANIEL, INC.
ADVANCED TECHNOLOGY DIVISION

HVAC FLOW & CONTROL DIAGRAM
SYSTEM 05
CANISTER STORAGE BUILDING
ZONE II EXHAUST STACK

PROJECT MGR	R NGIBBONS
PROJECT ENGR	D P CHAVLA
MECHANICAL ENGR	A K EE
DESIGNER	J L SMITS 12-5-91
DESIGN CHECKER	C R PHILLIPS 12-5-91
DESIGN MGR	R E TAYLOR 12-5-91
CONSTRUCTION	S SANVAR 12-5-91
INSTRUMENTATION	S SATTAI 12-5-91
SAFETY	R E FLYE 12-5-91
QA	R INVINA 12-5-91

PROJECT TITLE: HANFORD WASTE VITRIFICATION PLANT

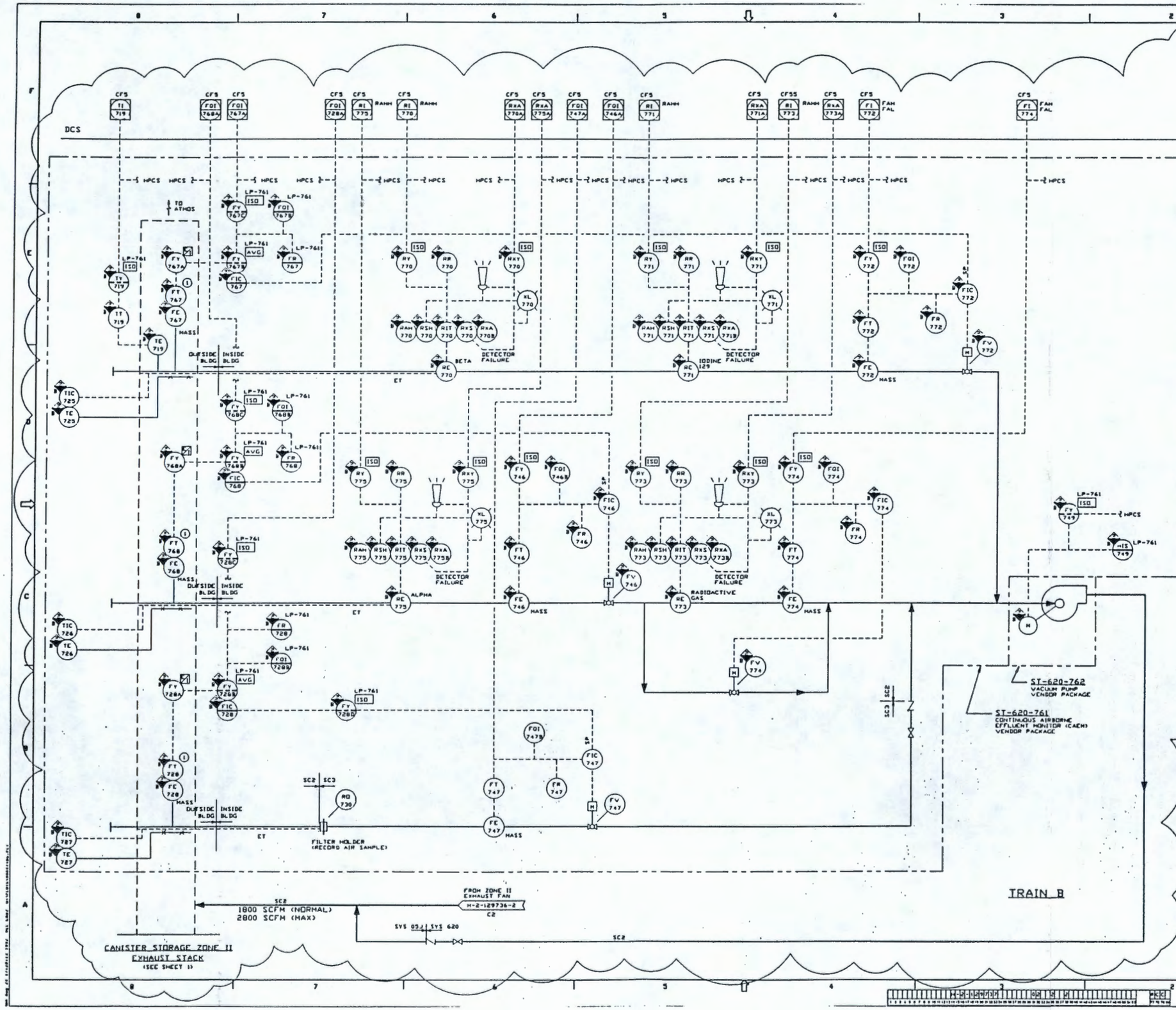
PROJECT	PLANT CONTROL NO.	PLANT CONTROL NO.
8-595	8457	3229
SCALE	SCALE NO.	SHEET NO.
NONE	5	

NONE	NOT REQ'D	H-2-129737	1	2	02

DISTRIBUTION CODE: ACAD

TB 08-19-92

9312975.1299



GENERAL NOTES:

A FOR GENERAL NOTES, REFER TO H-2-129737 SHEET 1

NOTES:

1. MULTIPLE FE/FT'S WILL EXIST ON EACH PROBE QUANTITY TBD IN DETAIL DESIGN

FOR REVIEW AND COMMENT

DATE_____

SEP 9 1992

SAFETY CLASS 2 AS NOTED

REV						
02		VOID THIS DRAWING PER PROJECT	TB			
		DIRECTIVE 001, REV. 0				
01		ADDED ASSUMPTION NOTE 6	JFW	SA	RCF	VWG
		PER CR-HVVP-0730	CDG			
00		RELEASED FOR FLUOR DANIEL	RH			
		CONFIGURATION CONTROL				

CAD FILE 12973722 — 2B1BMACDX-10C2 SS

ENGINEERING RELEASE
REV _____ DATE _____
EPG

U.S. DEPARTMENT OF ENERGY

FLUOR DANIEL, INC. ADVANCED TECHNOLOGY DIVISION

HVAC FLOW & CONTROL DIAGRAM
SYSTEM 05
CANISTER STORAGE BUILDING
ZONE II EXHAUST STACK

HANFORD WASTE VITRIFICATION PLANT

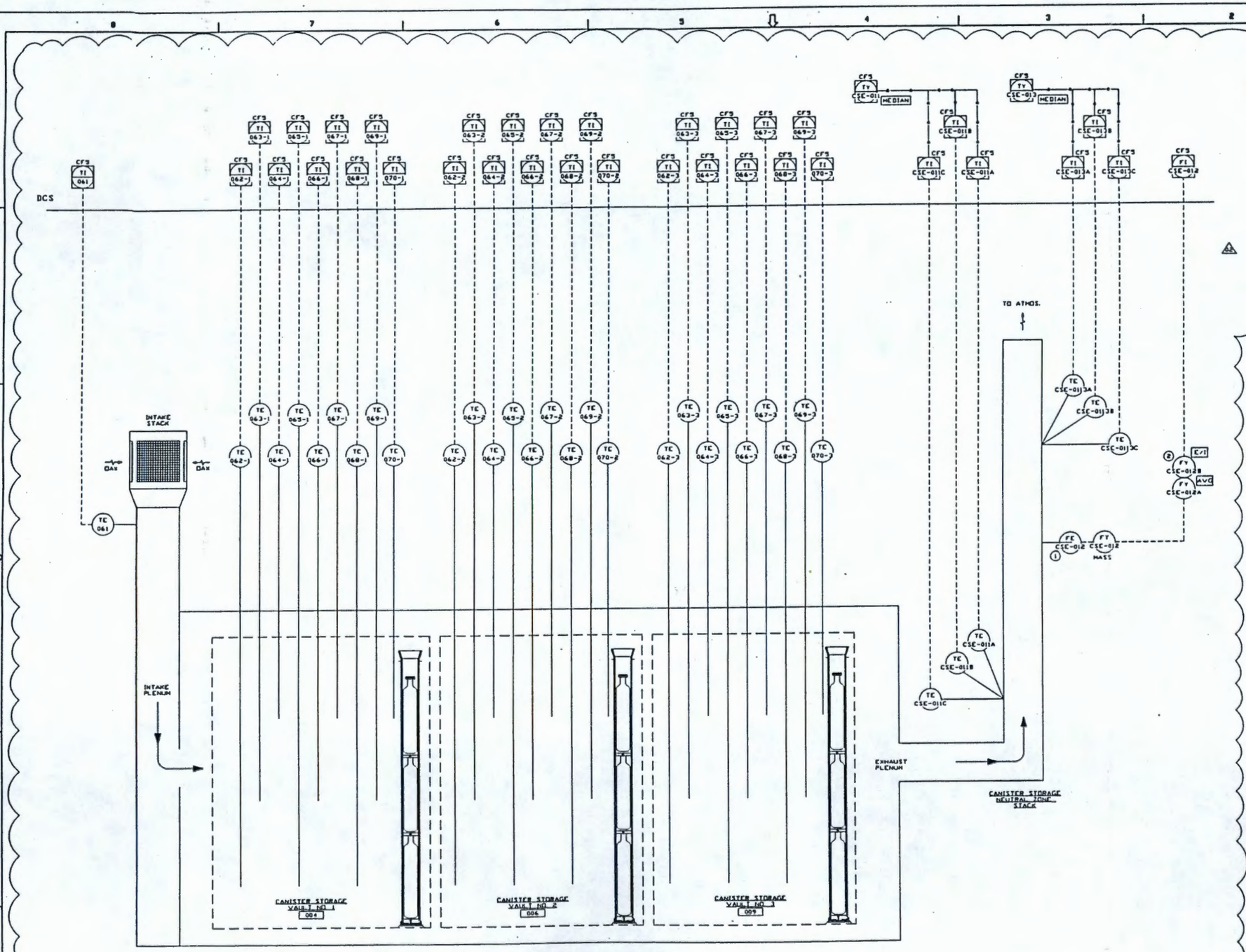
R N GIBBONS	
O P CHAWLA	
A A TEE	
J L SHETS	12-3-91
E R PHILLIPS	12-3-91
R C TAGNEY	12-3-91
S ANWAR	12-3-91
S AFTAB	12-3-91
R C FLYE	12-3-91
R INVINA	12-3-91

B-595	8457		3229
NONE	3		
NONE	NOT REQ'D	H-2-129737	2 / 2 / 02

DISTRIBUTION CODE: ACAD

TB 08-19-92

9312975.1300



GENERAL NOTES:

A. INSTRUMENTS AND PIPING BULK MATERIAL ITEMS, SUCH AS BLOCK, DRAIN AND VENT VALVES ARE NUMBERED IN THE SAME NUMBERING SYSTEM.

B. INSTRUMENT TAG NUMBERS ON THIS DRAWING ARE PREFIXED WITH CSE UNLESS OTHERWISE NOTED.

C. PIPING BULK MATERIAL ITEMS ARE PREFIXED BY THEIR SERVICE ABBREVIATION. FOR EXAMPLE, VALVE NUMBER HV-001 IN A PROCESS WATER (LVP) LINE WOULD BE TAGGED HV-LPW-001.

D. FOR DEFINITION OF LOGIC CONTAINED IN DIAMOND SYMBOLS ◇ AND HEX SYMBOLS ⬡ SEE PROCESS CONTROL DESCRIPTION (PCD) SPECIFICATION B-595-C-17500-DS-003.

E. REFER TO DRAWING H-2-123001 "LEGEND OF SYMBOLOGY FOR PROCESS FLOW AND PIPING AND INSTRUMENT DIAGRAMS" FOR AN EXPLANATION OF SYMBOLS AND ABBREVIATIONS.

F. ALL INSTRUMENTS ON THIS DRAWINGS ARE WAPA ITEMS

NOTES:

1. MULTIPLE FE'S WILL EXIST ON THE PROBE WITH FT'S. QUANTITY TO BE DETERMINED IN DETAIL DESIGN
2. 120 VAC UPS REQUIRED

FOR REVIEW AND COMMENT

DATE_____

SEP 9 1992

WAPA (SEE NOTE F)
SAFETY CLASS 3

REV	DATE	REVISION DESCRIPTION	TB	SAB	CES	VWA
02	9/9/92	REMOVED ASSUMPTION NOTE 6.				
		REVISED PER PROJ DIR BOL REV. 0				
01	6/25/92	ADDED ASSUMPTION NOTE 6 PER	JFV	SA	RCF	VWC
		CR-HWVP-0730	CDG	MJH	JGH	RSP
00	12/4/91	RELEASED FOR FLUOR DANIEL	RB	RF	SA	RMB	SA	VWA
		CONFIGURATION CONTROL				

CONTROL 12973812 — 2B1BMACDX-10C2-SS

ENGINEERING RELEASE
REV. _____ DATE _____
CHG. _____

PROJECT ENGINEER	R N GIBBONS	
PROJECT MANAGER	D P CHAVLA	
PROJECT DIRECTOR	A K YEE	
DESIGN ENGINEER	J L SMETS	12-3-91
SYSTEM ENGINEER	C R PHILLIPS	12-3-91
DESIGNED	R C TAGNEY	12-3-91
CHECKED	S AMYAR	12-3-91
SYSTEM DESIGNER	S AITAI	12-3-91
DRAWN	R C LYE	12-3-91
APPROVED	R INVINA	12-3-91

U.S. DEPARTMENT OF ENERGY
Richland Operations Office
DE - AC06-89RL01830

FLUOR DANIEL, INC.
ADVANCED TECHNOLOGY DIVISION

HVAC FCD, SYST 05
CSB
VAULT & STACK

PROJECT TITLE: HANFORD WASTE VITRIFICATION PLANT

PROJECT	B-595	CAD DRAWING NO. 8457	DWG NO. 3229
SCALE	NONE	S.B. NO. 3	

NONE	NOT REQ'D	H-2-129738	1	1	02

DISTRIBUTION CODE: ACAD

TB 08-26-92

9312975.F301

TITLE: SYSTEMS 05I/J, K/L, M/N, P/Q, R/S, T/U, V/W, X/Y MISCELLANEOUS BUILDING HVAC SYSTEMS

1.0 GENERAL DESCRIPTION

The PCD is divided into sections according to plant buildings as follows:

- Section 1 General Description is an overview of the miscellaneous building HVAC systems.
- Sections 2 through 11 cover the Canister Storage Building HVAC systems for Supply (System 05I) and Exhaust (System 05J).
- Sections 12 through 19 cover the Operations Control/Regulated Entrance Building (OC/REB) HVAC systems for Supply (System 05K) and Exhaust (System 05L). These sections also cover the OC/REB Control Room and Computer Room HVAC systems for Supply (System 05M) and Exhaust (System 05N).
- Sections 22 through 29 cover the Manipulator Repair Building HVAC systems for Supply (System 05P) and Exhaust (System 05Q).
- Sections 32 through 39 cover the Frit Storage/Cold Chemical, and Mech./Elect. Services Buildings HVAC systems for Supply (System 05R) and Exhaust (System 05S).
- Sections 42 through 49 cover the Fan House HVAC systems for Supply (System 05T) and Exhaust (System 05U).
- Sections 52 through 61 cover the Waste Hold Tank (WHT) Building HVAC systems for Supply (System 05V) and Exhaust (System 05W).
- Sections 62 through 69 cover the Switchgear/Generator Building HVAC systems for Supply (System 05X) and Exhaust (System 05Y).

1.1 CANISTER STORAGE BUILDING HVAC SYSTEMS (05I AND 05J)

The Canister Storage Building HVAC System consists of four (4) subsystems which are shown on HVAC Flow and Control Diagrams H-2-129730, 731, 734 and 738 which performs the following functions:

- Office area HVAC system functions to maintain the required temperature and ventilation for Rooms 100, 104, 106, 108, 116, and 124.
- Field Operating Station (FOS) #5 is supplied with two (2) 100% capacity HVAC systems (AC-05I-110A and 110B) to maintain the required temperature, humidity and ventilation for Room 102.

9312975.1302

- Canister Storage Vault Areas (Rooms 004, 006 and 009) are cooled by natural convection and controls are limited to monitoring the vault rooms ambient temperature, outside air intake stack temperature and Exhaust stack temperature and flow.

- Canister Storage Operating Area (Room 110) and Mechanical Equipment Room (Room 136) are supplied with two (2) 50% capacity Air Handling Units (AH-05I-112 and 113) consisting of Pre-filters, High Efficiency Filters, Evaporative Coolers (EC-05I-112 and 113) and Supply Fans (BL-05I-112 and 113).

2.0 OPERATING DESCRIPTION NARRATIVE
CANISTER STORAGE BUILDING SUPPLY SYSTEM (05I)
CANISTER STORAGE BUILDING EXHAUST SYSTEM (05J)

2.1 ROUTINE OPERATIONS

2.1.1 Air Handling Unit (AH-05I-111)

Air Handling Unit (AH-05I-111) supplies conditioned air to Clean Operating Office (Room 100), Health Protection Office (Room 104), Corridor (Room 106), Vestibule (Room 124), Electrical Equipment Room (Room 108), and Toilet (Room 116), via leakage from Vestibule (Room 124). The corresponding associated controls are shown on HVAC Flow and Control Diagrams H-2-129731-1, and 2.

Temperature indicator TI-CSS-001 indicates outside air temperature and sends permissive signal to TIC-CSS-002 for economizer operation. Low temperature is alarmed (TAL).

Temperature indicating controller TIC-CSS-002 controls the Return Air Damper TV-CSS-016 and Outside Air Damper TV-CSS-002 by input from TIT-CSS-003 which is located in the mixing air plenum. Low temperature is alarmed (TAL) in the AH-05I-111 mixing air plenum.

Pressure differential indicator PDI-CSS-006 indicates the Pre-filter and High Efficiency filters total pressure drop. High pressure differential is alarmed (PDAH).

Logic indicating controller YIC-CSS-007 provides START/STOP control for the following items:

1) START/STOP Supply Fan (BL-05I-111).

2) Permits starting of Air Cooled Condensing Unit (CU-05I-111) by air flow switch FSL-CSS-010.

3) Permits outside air and return air damper operations (DN-05I-111A and 111B) via solenoid valves YY-CSS-002 and 016, respectively.

Pressure differential indicator PDI-CSS-008 indicates the Supply Fan (BL-05I-111) pressure differential. Low pressure differential is alarmed (PDAL).

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The AHU Return Air Temperature Indicating Controller TIC-CSS-014 controls cooling at a set temperature of 75°F by staging the air cooled Condensing Unit (CU-05I-111). Return air temperature of 85°/65°F is alarmed (TAH/TAL).

Air Handling Unit (AH-05I-111) has local selector and START/STOP switches which are used for maintenance and run-in of the equipment under administrative control. The function of these switches are described in the table below. The selector switch must be in the REMOTE position during normal operation.

EQUIPMENT	DESCRIPTION	SWITCH NO.
BL-05I-111	AHU Blower	HS-CSS-007 A,B,C

LOCAL SELECTOR SWITCH POSITION			
MAINT	LOCAL	REMOTE	
YES	YES	NO	LOCAL MANUAL START
YES	YES	YES	LOCAL MANUAL STOP
YES	YES	YES	HARDWIRED INTERLOCK STOP
NO	NO	YES	DCS MANUAL START
NO	YES	YES	DCS MANUAL STOP
NO	YES	YES	DCS INTERLOCK STOP
NO	NO	YES	DCS CONTROL PROGRAM START/STOP

* Selector Switch is "A", Local START Pushbutton is "B", Local STOP Pushbutton is "C".

Smoke Detectors YSH-CSS-009 and 015 upon detecting smoke will send a smoke existing condition to the Fire Panel. A STOP signal will be initiated to Supply Fan (BL-05I-111) via YIC-CSS-007. The same initiated signal will close the Outside Air Damper (DN-05I-111A) and Return Air Damper (DN-05I-111B).

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2.1.2 Air Conditioning Unit (AC-05I-110A and 110B)

Air Conditioning Unit (AC-05I-110A) supplies conditioned air to the Field Operating Station (FOS) #5 (Room 102). The operation of AC-05I-110B (back-up) is similar. The corresponding associated controls are shown on HVAC Flow and Control Diagram H-2-129731-3.

Logic Indicating Controller YIC-CSS-021 provides START/STOP control for Air Conditioning Unit (AC-05I-110A) in the MANUAL mode. In the AUTO mode (AC-05I-110A) is started and stopped with a signal from TI-CSS-022 or MI-C55-023.

1) Unit indicating controller UIC-CSS-021 provides a local START/STOP control of (AC-05I-110A), based on temperature and humidity set points. The UIC can be overridden by YIC-C55-021 to START/STOP AC-05I-110A, remotely.

2) Air Conditioning trouble is alarmed (Trouble) at the DCS.

3) Temperature indicator TI-CSS-022 indicates Field Operating Station (FOS) #5 (Room 102) air temperature. High-High/High/Low temperatures are alarmed (TAHH/TAH/TAL).

4) Moisture indicator MI-CSS-023 indicates the relative humidity in the Field Operating Station (FOS) #5 (Room 102). High/Low/Low-Low moisture in the room is alarmed (MAH/MAL/MALL).

5) When either temperature alarm High-High (TAHH) or moisture alarm Low-Low (MALL) are alarmed the appropriate Interlocked Logic indicating controller (YIC-CSS-021 or 024) will shutdown the operating A/C unit and turn on the standby A/C unit.

2.1.3 Air Handling Unit (AH-05I-112 and 113)

Air Handling Units (AH-05I-112 and 113) supply conditioned air to the Canister Storage Operating Area (Room 110) and Mechanical Equipment Room (Rom 136). Air Handling Unit (AH-05I-112) and its associated controls are described below. The operation of (AH-05I-113) is similar. The corresponding associated controls are shown on HVAC Flow and Control Diagram H-2-129734 sheets 1, 2 and 3.

Pressure differential indicator PDI-CSS-035-1 indicates the Pre-filter and High Efficiency filters total pressure drop. High pressure differential is alarmed (PDAH).

Pressure differential indicator PDI-CSS-038-1 indicates the Supply Fan (BL-05I-112) pressure differential. High/low pressure differentials are alarmed (PDAH/PDAL).

Temperature indicating controller TIC-CSS-032-1 indicates and controls the mix air temperature into the Air Handling Unit by modulating the Outside Air Damper (DN-05I-112A) and Return Air Damper (DN-05I-112B). TIC-CSS-032-1 is also interlocked to YIC-CSS-036-1. Low temperature is alarmed (TAL) at TIC-CSS-032-1.

Supply Fan logic indicating controller YIC-CSS-046-1 provides START/STOP control for Supply Fan (BL-05I-112) and opens/closes Outside Air Damper (DN-05I-112A), and Return Air Damper (DN-05I-112B) via solenoid valves YY-CSS-031-1 and 046-1, respectively. YIC-CSS-046-1 is interlocked with YIC-CSS-036-1.

Motor current indicator II-CSS-037A-1 indicates Motor (MT-05I-112A) current.

Logic indicating controller YIC-CSS-036-1 provides MANUAL/AUTO, START/STOP control for Evaporative Cooler Pump (PX-05I-112) and is interlocked to YIC-CSS-046-1.

Smoke Detector YSH-CSS-040-1 upon detecting smoke will send a smoke existing condition to the Fire Panel. A STOP signal will be initiated to Supply Fan (BL-05I-112) via YIC-CSS-046-1. The same initiated signal will close the Outside Air Damper (DN-05I-112A) and Return Air Damper (DN-05I-112B).

Smoke Detector YSH-CSS-040-2, upon detecting smoke will send a smoke existing condition to the Fire Panel. A STOP signal will be initiated to Supply Fan (BL-05I-113) via YIC-CSS-046-2. The same initiated signal will close the Outside Air Damper (DN-05I-113A) and Return Air Damper (DN-05I-113B).

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Smoke Detector YSH-CSS-045 upon detecting smoke will send a signal to the fire panel. A STOP signal will be initiated to Supply Fan (BL-05I-112 and 113) via YIC-CSS-046-1 and 046-2, respectively. The same initiated signal will close the Outside Air Dampers and Return Air Dampers of the respective Air Handling Units.

Temperature indicator TI-CSS-039-1 indicates supply air temperature downstream of AH-05I-112.

The following Air Handling Units (AH-05I-112 and AH-05I-113) have local selector and START/STOP switches which are used for maintenance and run-in of the equipment under administrative control. The equipment that these switches operate are described in the table below. The selector switch must be in the REMOTE position during normal operation.

EQUIPMENT	DESCRIPTION	SWITCH NO.
BL-05I-112	AHU Blower	HS-CSS-037 A,B,C-1
BL-05I-113	AHU Blower	HS-CSS-037 A,B,C-2
EC-05I-112	AHU Evap Cooler	HS-CSS-036 A,B,C-1
EC-05I-113	AHU Evap Cooler	HS-CSS-036 A,B,C-2

LOCAL SELECTOR SWITCH POSITION			
MAINT	LOCAL	REMOTE	
YES	YES	NO	LOCAL MANUAL START
YES	YES	YES	LOCAL MANUAL STOP
YES	YES	YES	HARDWIRED INTERLOCK STOP
NO	NO	YES	DCS MANUAL START
NO	YES	YES	DCS MANUAL STOP
NO	YES	YES	DCS INTERLOCK STOP
NO	NO	YES	DCS CONTROL PROGRAM START/STOP

* Selector Switch is "A", Local START Pushbutton is "B", Local STOP Pushbutton is "C".

Temperature indicator TI-CSS-051 indicates Mechanical Equipment Room (Room 136) air temperature.

The Canister Storage Operating Area (Room 110) average temperature is computed at TY-CSS-042 with inputs from temperature indicators TI-CSS-041, 042, 043 and 044. Temperature converter TY-CSS-042 is interlocked with YIC-CSS-036-1 and 036-2.

2.1.4 Vault Areas Temperature Monitoring System (Vault Areas 004, 006, and 009) and Outside Air Intake Stack Temperature

Temperature indicator TI-CSS-062-1 through 070-1 monitor the Canister Storage Vault Area (004), at varying elevations. Vaults 006 and 009 are similar. Vault 006 are tagged (-2), vault 009 are tagged (-3). The corresponding associated controls are shown on HVAC Flow and Control Diagram H-2-129738.

9312975.1306

Temperature indicator TI-CSS-061 in the outside air intake stack indicates the inlet air temperature to the vault area.

2.1.5 Canister Storage (Neutral Zone) Exhaust Stack Temperature and Flow Monitoring

Temperature indicators TI-CSE-011 A,B,C and TI-CSE-013 A,B,C monitor the air temperature in the exhaust stack. Temperature interlock TY-CSE-011 and 013 indicates the median exhaust air temperature of the exhaust stack.

Flow Indicator FI-CSE-012 measures the mass flow of exhausted air from the stack.

3.0 APPLICATIONS PROGRAM SPECIFICATIONS

(Not Applicable)

4.0 LOGIC CONTROLLER SPECIFICATIONS

(Not Applicable)

5.0 SPECIAL ANALOG FUNCTIONS

(Not Applicable)

6.0 ACRONYMS

ACRONYM	TERM
AHU	Air Handling Unit
DCS	Distributed Control System
HVAC	Heating, Ventilating and Air Conditioning

7.0 GLOSSARY

(Not Applicable)

7.1 SYSTEM SPECIFIC TERMS

TAG NUMBER	TERM
TIC-CSS-001	Fresh Air and Return Air Temperature Indicating Controller
YIC-CSS-007	CSB Office Area Supply Fan and Damper Logic Controller
TIC-CSS-014	CSB Office Area Condensing Unit Temperature Indicating Controller
YIC-CSS-021	CSB (FOS) #5 Temperature, Humidity Logic Controller AC-05I-110A
YIC-CSS-024	CSB (FOS) #5 Temperature, Humidity Logic Controller AC-05I-110B
TIC-CSS-032-1	CSB Mech. Rm. AFD Oper. Area AHU Plenum Temperature Indicating Controller
YIC-CSS-036-1	CSB Mech. Rm. and Oper. Area Evap. Cooler Logic Controller
YIC-CSS-046-1	CSB Mech. Rm. and Oper. Area, Smoke Detection and Supply Fan Logic Controller
TIC-CSS-032-2	CSB Mech. Rm. and Oper. Area AHU Plenum Temperature Indicating Controller
YIC-CSS-036-2	CSB Mech. Rm. and Oper. Area Evap. Cooler Logic Controller
YIC-CSS-046-2	CSB Mech. Rm. and Oper. Area, Smoke Detection and Supply Fan Logic Controller
TY-CSS-042	CSB Mech. Rm. and Oper. Area, Temperature Averaging Converter
TY-CSE-011	CSB Canister Storage, Neutral Zone Exhaust Stack Median Temperature
TY-CSE-013	CSB Canister Storage, Neutral Zone Exhaust Stack Median Temperature

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8.0 REFERENCE LIST

8.1 DOCUMENTS AND EQUIPMENT COVERED BY THIS PCD

SYS NO.	DESCRIPTION	EQUIPMENT NUMBER	P&ID H-2-XXXXXX-XX
05I	Air Handling Unit	AH-05I-111	129731-1
05I	Air Conditioning Unit	AC-05I-110A	129731-3
05I	Air Conditioning Unit	AC-05I-110B	129731-3
05I	Air Handling Unit	AH-05I-112	129724-1
05I	Air Handling Unit	AH-05I-113	129724-1
05I	Air Cooled Condensing Unit	CU-05I-111	129731-1
05I	Air Cooled Condensing Unit	CU-05I-110A	129731-3
05I	Air Cooled Condensing Unit	CU-05I-110B	129731-3
05I	Cooling Coil	CO-05I-110A	129731-3
05I	Cooling Coil	CO-05I-110B	129731-3
05I	Cooling Coil	CO-05I-111	129731-1
05I	Electric Duct Heater	EH-05I-115	129731-2
05I	Electric Duct Heater	EH-05I-116	129731-2
05I	Electric Duct Heater	EH-05I-117	129731-2
05I	Motor Supply Fan	MT-05I-111	129731-1
05I	Motor Supply Fan	MT-05I-110A	129731-3
05I	Motor Evaporative Cooler	MT-05I-112B	129734-1
05I	Motor Supply Fan	MT-05I-112A	129734-1
05I	Motor Evaporative Cooler	MT-05I-112B	129734-1
05I	Motor Supply Fan	MT-05I-112A	129734-1
05I	Supply Fan	BL-05I-111	129731-1
05I	Supply Fan	BL-05I-110A	129731-3
05I	Supply Fan	BL-05I-110B	129731-3
05I	Supply Fan	BL-05I-112	129734-1
05I	Supply Fan	BL-05I-113	129734-2
05I	Unit Heater	UH-05I-118	129734-3
05I	Unit Heater	UH-05I-119	129734-3
05I	Unit Heater	UH-05I-120-126	129734-3
05I	Unit Heater	UH-05I-127-133	129734-3
05J	Exhaust Fan	BL-05J-114	129731-2
05J	Exhaust Fan	BL-05J-110A	129731-3
05J	Exhaust Fan	BL-05J-110B	129731-3
05I	Control Damper	DN-05I-111A	129731-1
05I	Control Damper	DN-05I-111B	129731-1
05I	Control Damper	DN-05I-112A	129734-1
05I	Control Damper	DN-05I-112B	129734-1
05I	Control Damper	DN-05I-113A	129734-2
05I	Control Damper	DN-05I-113B	129734-2
05J	Motor Exhaust	MT-05J-114	129731-2
05J	Air Cooled Condensing Unit	CU-05I-110A	129731-3
05J	Air Cooled Condensing Unit	CU-05I-110B	129731-3
05I	Evaporative Cooler	EC-05I-112	129734-1
05I	Evaporative Cooler Pump	PX-05I-112	129734-1
05I	Evaporative Cooler	EC-05I-113	129734-2
05I	Evaporative Cooler Pump	PX-05I-113	129734-2

9.0 ATTACHMENTS

(This Section Not Used)

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10.0

(This Section Not Used)

11.0

(This Section Not Used)

12.0 OPERATING DESCRIPTION NARRATIVE; OPERATIONS CONTROL/REGULATED ENTRANCE BUILDING HVAC SUPPLY SYSTEM 05K; OPERATIONS CONTROL/REGULATED ENTRANCE BUILDING HVAC EXHAUST SYSTEM 05L; CONTROL/COMPUTER ROOM HVAC SUPPLY SYSTEM 05M; CONTROL/COMPUTER ROOM HVAC EXHAUST SYSTEM 05N

12.1 ROUTINE OPERATIONS

12.1.1 Operations Control/Regulated Entrance Building Air Handling Unit (AH-05K-703).

Air Handling Unit (AH-05K-703) supplies conditioned air to the Operations Control/ Regulated Entrance Building office and operation areas. The Air Handling Unit and its associated controls are described below. The corresponding associated controls are shown on HVAC Flow and Control Diagram H-2-129861, Sheet 1.

AHU Supply Fan Logic Controller (YIC-05K-004) provides START/STOP control for Supply Fan (BL-05K-703). YIC-05K-004 activates Variable Inlet Vane (VV-05K-703) through solenoid valve YY-05K-004A and activates chilled water control valve TV-05K-007 through solenoid valve YY-05K-004B. If VV-05K-703 does not open, the CLOSE position is alarmed (ZAL). YIC-05K-004 is interlocked to YIC-05L-010 as a permissive signal which enables YIC-05L-010 to start Return/Exhaust Fan (BL-05L-704). YIC-05K-004 is interlocked with PDAL-05K-005.

Temperature indicating controller TIC-05K-007 modulates the chilled water control valve TV-05K-007 to the AHU Cooling Coil (CO-05K-703) to maintain set discharge air temperature of (TBD)°F (adjustable). High temperature is alarmed (TAH).

Temperature indicating controller TIC-05K-001 controls the AHU mixed air temperature at a setpoint of (TBD)°F by modulating the outside air Control Damper (DN-05K-703A), return air Control Damper (DN-05L-703B) and exhaust air Control Damper (DN-05L-703C). The outside air Control Damper and the exhaust air Control Damper modulate together. The return air Control Damper modulates in opposition to the outside air Control Damper. Low temperature is alarmed (TAL).

Pressure differential indicator PDI-05K-002 indicates pressure drop across the Pre-filter. High pressure differential is alarmed (PDAH).

Pressure differential indicator PDI-05K-003 indicates pressure drop across the High Efficiency Filter. High pressure differential is alarmed (PDAH).

Pressure differential indicator PDI-05K-005 indicates pressure differential across the Supply Fan (BL-05K-703). Low pressure differential is alarmed (PDAL-05K-005) and interlocked with YIC-05K-004.

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Pressure indicating controller PIC-05K-006 modulates the Variable Inlet Vane (VV-05K-703) of the Supply Fan to maintain supply duct pressure. High/Low pressures are alarmed (PAH/PAL).

12.1.2 Operations Control/Regulated Entrance Building Return/Exhaust Fan (BL-05L-704).

Return/Exhaust Fan Logic Controller (YIC-05L-010) provides START/STOP control for Return/Exhaust Fan (BL-05L-704). YIC-05L-010 is interlocked with YIC-05K-004. YIC-05L-010 activates Variable Inlet Vane (VV-05L-704) through solenoid valve YY-05L-010. If VV-05L-704 does not open, then YIC-05L-010 alarms (ZAL), stops Motor (MT-05L-704) and sends signal to YIC-05K-004 to stop Motor (MT-05K-703).

Pressure differential indicator PDI-05L-008 indicates the pressure drop across the Return/Exhaust Fan (BL-05L-704). Low pressure differential is alarmed (PDAL-05L-008) and interlocked with YIC-05L-010.

Pressure indicating controller PIC-05L-009 modulates Variable Inlet Vane (VV-05L-704) of the Return/Exhaust Fan (BL-05L-704) to maintain Return/Exhaust duct pressure. High/Low pressures are alarmed (PAH/PAL).

12.1.3 Operations Supplies (Room 102)/Day Shift Operations (Room 104)/Receiving (Room 122)

The following controls are described for the Operations Supplies (Room 102)/ Day Shift Operations (Room 104)/Receiving (Room 122). Similar controls are provided for other zones in the Operations Control/Regulated Entrance Building. The corresponding associated controls are shown on HVAC Flow and Control Diagram H-2-129861, Sheet 2.

Local temperature indicating controller TIC-05K-101 modulates the electric power controller JC-05K-101 of the Electric Duct Heater (EH-05K-101) to maintain the set temperature (TBD)°F in the Operations Supplies Room/Day Shift Operations Room/Receiving Room. The multistep Electric Duct Heater power controller JC-05K-101 is furnished with Electric Duct Heater (EH-05K-101) and includes a multistage step controller and a modulating Silicon Controlled Rectifier (SCR) to provide modulating control between each successive stage. Low airflow and high heater temperature cutouts are also included.

12.1.4 Exhaust Fan (BL-05L-702)

Exhaust Fan (BL-05L-702) exhausts the air from the Lunch Room (Room 103) in the Operations Control/Regulated Entrance Building.

The Exhaust Fan (BL-05L-702) and its associated controls are described below. The corresponding associated controls are shown on HVAC Flow and Control Diagram H-2-129861, Sheet 2.

Hand indicating switch HIS-05L-351 provides START/STOP control for Exhaust Fan (BL-05L-702).

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12.1.5 Exhaust Fan (BL-05L-703)

Exhaust Fan (BL-05L-703) exhausts the air from the Clean Blues (Room 123), Soiled Blues (Room 124), and the Clean SWP (Room 125) in the Operations Control/Regulated Entrance Building.

The Exhaust Fan (BL-05L-703) and its associated controls are described below. The corresponding associated controls are shown on HVAC Flow and Control Diagram H-2-129861, Sheet 2.

Hand indicating switch HIS-05L-352 provides START/STOP control for Exhaust Fan (BL-05L-703).

12.1.6 Exhaust Fan (BL-05L-705)

Exhaust Fan (BL-05L-705) exhausts the air from the Men's and Women's Clean Change Rooms (Room 120) and (Room 119) respectively in the Operations Control/Regulated Entrance Building.

The Exhaust Fan (BL-05L-705) and its associated controls are described below. The corresponding associated controls are shown on HVAC Flow and Control Diagram H-2-129861, Sheet 2.

Hand indicating switch HIS-05L-304 provides START/STOP control for Exhaust Fan (BL-05L-705).

12.1.7 Filter Plenum (PF-05M-701)

Filter Plenum (PF-05M-701) filters the intake air to Air Handling Units (AH-05M-701 and 702) and consists of a Pre-filter and a HEPA filter.

Filter Plenum (PF-05M-701) and its associated controls are described below. The corresponding associated controls are shown on HVAC Flow and Control Diagram H-2-129862, Sheet 1.

Pressure Differential Indicators (PDI-05M-411 and 412) indicate pressure differential across the Pre-filter and the HEPA filter, respectively. High/Low pressure differential is alarmed (PDAH/PDAL).

Hand indicating switch HIS-05M-413A is used to select the NORMAL or EMERG. position of Automatic Isolation Dampers DI-05M-001, 002, 003, and 004. When emergency conditions exist, the outside air Automatic Isolation Dampers DI-05M-001 and DI-05M-004 are closed and Automatic Isolation Dampers DI-05M-002 and DI-05M-003 are opened. This allows the outside air to pass through PF-05M-701.

12.1.8 Control Rooms Air Handling Units (AH-05M-701 and 702)

Air Handling Units (AH-05M-701 and 702) supply conditioned air to the Control Rooms and Computer Rooms 112, 113, 114, 115, 116, 138, 139, 140, and Elec. Inst. Shop (Room 111) located in the Operations Control/Regulated Entrance Building. Only one of these two 100% AHUs is operated; the other one serves as a standby AHU. Air Handling Unit (AH-05M-701) and its associated controls are described below. The

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operation of AH-05M-702 is similar. The corresponding associated controls are shown on HVAC Flow and Control Diagram H-2-129862, Sheet 1.

Control Rooms AHU Fan Logic Controller (YIC-05M-402) provides START/STOP control for Supply Fan (BL-05M-701) in the MANUAL mode. In the AUTO mode, BL-05M-701 is started and stopped with a signal from the Control/Computer Rooms AHU Fan Select Control Program (YCP-05M-010).

1. Upon signal from YCP-05M-010, YIC-05M-402 starts Motor (MT-05M-701). YIC-05M-402 activates chilled water control valve TV-05M-404 through solenoid valve YY-05M-402.

2. After a set period of time, if pressure differential is not established (PDAL-05M-403), YIC-05M-402 stops Motor (MT-05M-701), and sends signal to YCP-05M-010 to start the standby Supply Fan (BL-05M-702) through YIC-05M-406.

Pressure differential indicator PDI-05M-401 indicates pressure differential across the Pre-filter. High pressure differential is alarmed (PDAH).

Pressure Differential indicator PDI-05M-409 indicates pressure differential across the High Efficiency Filter. High pressure differential is alarmed (PDAH).

Pressure differential indicator PDI-05M-403 indicates pressure differential across the fan. Low pressure differential is alarmed (PDAL-05M-403) and interlocked with YIC-05M-402.

Temperature indicating controller TIC-05M-404 modulates chilled water control valve TV-05M-404 to the AHU Cooling Coil (CO-05M-701) to maintain set discharge air temperature (TBD)°F. High temperature is alarmed (TAH).

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12.1.9 Air Conditioning Units (AC-05M-701 and 702)

Air Conditioning Units (AC-05M-701 and 702) maintain temperature in the Computer Room (Room 140). The corresponding associated controls are described below and are shown on HVAC Flow and Control Diagram H-2-129862, Sheet 2.

Only one of these two 100% Air Conditioning Units is operated; the other serves as a standby Air Conditioning Unit. Each of the units has associated self-contained controls and 100% capacity. Malfunction of each Air Conditioning Unit is alarmed (UA-05M-514 and 515 respectively). Switch over to the alternate unit is performed locally. Heating of the room is accomplished by introducing a small volume of supply air from the Air Handling Unit (AH-05M-701 or 702), which air is heated by Electric Duct Heater (EH-05M-001).

Temperature indicator TI-05M-516 monitors Computer Room (Room 140) temperature. High temperature is alarmed (TAH).

12.1.10 Programming Room (Room 112)

The following indicators, alarms, and controls are described for the Programming Room supply air. Similar supply air indicators, alarms, and controls are provided for the Elec. Inst. Shop (Room 111), Computer Storage (Room 138), Computer Software

Room (Room 139), Crane Control Room (Room 115), Operator Station Central Control Room (Room 113), Supervisor Station Central Control Room (Room 114), and Health Protection Control Room (Room 116). The corresponding associated controls are shown on HVAC Flow and Control Diagram H-2-129862, Sheets 2 and 3.

Temperature indicating controller TIC-05M-501 modulates the electric power controller JC-05M-501 of Electric Duct Heater (EH-05M-002) to maintain the set temperature (TBD)°F in the Programming Room and the Elec. Inst. Shop. High temperature is alarmed (TAH). The multistep electric heater power controller JC-05M-501 is furnished with Electric Duct Heater (EH-05M-002) and includes a multi-stage step controller and a modulating Silicon Controlled Rectifier (SCR) to provide modulating control between each successive stage. Low airflow and high heater temperature cutouts are also included.

12.1.11 Air Handling Unit (AH-05K-705)

Air Handling Unit (AH-05K-705) supplies conditioned air to the HVAC Equipment Room (Room 200) and Canister Staging (Room 141). Air Handling Unit (AH-05K-705) and its associated controls are described below. The corresponding associated controls are shown on HVAC Flow and Control Diagram H-2-129863.

HVAC Equipment Room Supply Fan Logic Controller (YIC-05K-705) provides START/STOP control for Supply Fan (BL-05K-705). It is interlocked with low-low temperature alarm (TALL-05K-701) from temperature indicating controller TIC-05K-701 which controls the AHU mixed air temperature.

Equipment Room AHU Evaporative Cooler Logic Controller (YIC-05K-704) provides START/STOP control for Evaporative Cooler (EC-05K-705) in the MANUAL mode. In the AUTO mode, EC-05K-705 is started by the high temperature alarm (TAH-05K-703) and reset (stopped) by low temperature alarm TAL-05K-703 from the Equipment Room Temperature Indicating Controller (TIC-05K-703). YIC-05K-704 is interlocked with YIC-05K-705.

Equipment Room Temperature Indicating Controller (TIC-05K-703) controls heating and cooling of the HVAC Equipment Room. When the room temperature is above (TBD)°F, high temperature alarm TAH-05K-703 starts the Evaporative Cooler (EC-05K-705) through YIC-05K-704 to provide cooling. EC-05K-705 is stopped by TAL-05K-703. When temperature is between (TBD)°F and (TBD)°F, cooling or heating is not provided. Heating is controlled to maintain a minimum room temperature with a set point of (TBD)°F. TIC-05K-703 controls the power controller JC-05K-703. The multistep electric heater power controller JC-05K-703 is furnished with Electric Heating Coil (HG-05K-705) and includes a multi-stage step controller and a modulating Silicon Controlled Rectifier (SCR) to provide modulating control between each successive stage. Low airflow and high heater temperature cutouts are also included.

Temperature indicating controller TIC-05K-701 controls AHU mixed air temperature at a setpoint of (TBD)°F by modulating the outside air Control Damper (DN-05K-705A) and return air Control Damper (DN-05L-705B). Low temperature is alarmed (TAL) and low-low temperature (TALL-05K-701) is interlocked with YIC-05K-705 to stop BL-05K-705. A mechanical stop is installed on DN-05K-705A to provide (TBD) percent minimum outside air for room pressurization.

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Pressure differential indicator PDI-05K-702 indicates the Pre-filter pressure drop. High pressure differential is alarmed (PDAH).

Pressure differential indicator PDI-05K-706 indicates the Supply Fan (BL-05K-705) pressure differential. Low pressure differential is alarmed (PDAL).

Temperature indicator TI-05K-707 indicates the AHU average discharge air temperature. High/low temperatures are alarmed (TAH/TAL).

12.2 INFREQUENT NORMAL OPERATIONS

12.2.1 System Start-Up

(TBD in Detailed Design)

12.3 ABNORMAL CONDITIONS

(TBD in Detailed Design)

13.0 CONTROL PROGRAM SPECIFICATIONS

Control Program Specifications are documented in the DCS Specification. Tag Numbers and Control Program names are listed below:

13.1 YCP-05M-010 Control/Computer Rooms AHU Fan Select Control Program

14.0 LOGIC CONTROLLER SPECIFICATIONS

Logic Controller Specifications are to be documented during Detailed Design. Tag Numbers and Logic Controller Program names only are listed below:

14.1	YIC-05K-004	AHU Supply Fan Logic Controller
14.2	YIC-05L-010	Return/Exhaust Fan Logic Controller
14.3	YIC-05M-402	Control Rooms AHU Fan Logic Controller. Logic for Control Rooms AHU Fan Logic Controller YIC-05M-406 is similar
14.4	YIC-05K-704	Equipment Room AHU Evaporative Cooler Logic Controller
14.5	YIC-05K-705	HVAC Equipment Room Supply Fan Logic Controller
14.6	YIC-05M-406	Control Rooms AHU Fan Logic Controller

15.0 SPECIAL ANALOG FUNCTIONS

(Not Applicable)

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16.0 ACRONYMS

ACRONYM	TERM
AHU	Air Handling Unit
HVAC	Heating, Ventilating and Air Conditioning
SCR	Silicon Controlled Rectifier

17.0 GLOSSARY

17.1 SYSTEM SPECIFIC TERMS

TAG NUMBER	TERM
YIC-05K-004	AHU Supply Fan Logic Controller
TIC-05K-703	Equipment Room Temperature Indicating Controller
YIC-05K-704	Equipment Room AHU Evaporative Cooler Logic Controller
YIC-05K-705	HVAC Equipment Room Supply Fan Logic Controller
YIC-05L-010	Return/Exhaust Fan Logic Controller
YCP-05M-010	Control/Computer Rooms AHU Fan Select Control Program
YIC-05M-402	Control Rooms AHU Fan Logic Controller
YIC-05M-406	Control Rooms AHU Fan Logic Controller

18.0 REFERENCE LIST

18.1 DOCUMENTS AND EQUIPMENT COVERED BY THIS PCD

SYS NO.	DESCRIPTION	EQUIPMENT NUMBER	P&ID H-2-XXXXXX-XX
05K	Electric Duct Heater	EH-05K-101	129861-2
05K	Electric Duct Heater	EH-05K-102	129861-2
05K	Electric Duct Heater	EH-05K-103	129861-2
05K	Electric Duct Heater	EH-05K-104	129861-2
05K	Electric Duct Heater	EH-05K-105	129861-2
05K	Electric Duct Heater	EH-05K-106	129861-2
05K	Electric Duct Heater	EH-05K-107	129861-2
05K	Air Handling Unit	AH-05K-703	129861-1
05K	Supply Fan	BL-05K-703	129861-1
05K	Cooling Coil	CO-05K-703	129861-1
05K	Motor	MT-05K-703	129861-1
05K	Variable Inlet Vane	VV-05K-703	129861-1
05K	Outside Air Control Damper	DN-05K-703A	129861-1
05K	Air Handling Unit	AH-05K-705	129863-1
05K	Supply Fan	BL-05K-705	129863-1
05K	Evaporative Cooler	EC-05K-705	129863-1
05K	Electric Heating Coil	HG-05K-705	129863-1
05K	Motor	MT-05K-705A	129863-1
05K	Motor	MT-05K-705B	129863-1
05K	Return Air Control Damper	DN-05L-703B	129861-1
05L	Exhaust Air Control Damper	DN-05L-703C	129861-1
05L	Exhaust Fan	BL-05L-702	129862-2
05L	Motor	MT-05L-702	129862-2
05L	Exhaust Fan	BL-05L-703	129862-2
05L	Motor	MT-05L-703	129862-2
05L	Return/Exhaust Fan	BL-05L-704	129861-1

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18.1 DOCUMENTS AND EQUIPMENT COVERED BY THIS PCD (Continued)

SYS NO.	DESCRIPTION	EQUIPMENT NUMBER	P&ID H-2-XXXXXX-XX
05L	Motor	MT-05L-704	129861-1
05L	Variable Inlet Vane	VV-05L-704	129861-1
05L	Exhaust Fan	BL-05L-705	129861-2
05L	Motor	MT-05L-705	129861-2
05K	Outside Air Control Damper	DN-05K-705A	129863-1
05K	Return Air Control Damper	DN-05L-705B	129863-1
05M	Automatic Isolation Damper	DI-05M-001	129862-1
05M	Automatic Isolation Damper	DI-05M-002	129862-1
05M	Automatic Isolation Damper	DI-05M-003	129862-1
05M	Automatic Isolation Damper	DI-05M-004	129862-1
05M	Electric Duct Heater	EH-05M-001	129862-2
05M	Electric Duct Heater	EH-05M-002	129862-2
05M	Electric Duct Heater	EH-05M-003	129862-3
05M	Electric Duct Heater	EH-05M-004	129862-3
05M	Electric Duct Heater	EH-05M-005	129862-3
05M	Air Conditioning Unit	AC-05M-701	129862-2
05M	Air Handling Unit	AH-05M-701	129862-1
05M	Supply Fan	BL-05M-701	129862-1
05M	Cooling Coil	CO-05M-701	129862-1
05M	Motor	MT-05M-701	129862-1
05M	Filter Plenum	PF-05M-701	129862-1
05M	Air Conditioning Unit	AC-05M-702	129862-2
05M	Air Handling Unit	AH-05M-702	129862-1
05M	Supply Fan	BL-05M-702	129862-1
05M	Cooling Coil	CO-05M-702	129862-1
05M	Motor	MT-05M-702	129862-1

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19.0

(This section not used)

20.0

(This section not used)

21.0

(This section not used)

22.0 OPERATING DESCRIPTION NARRATIVE - MANIPULATOR REPAIR BUILDING HVAC SUPPLY SYSTEM 05P; MANIPULATOR REPAIR BUILDING HVAC EXHAUST SYSTEM 05Q

22.1 ROUTINE OPERATIONS

The Manipulator Repair Building Zone II and Zone III HVAC Systems operate continuously.

22.1.1 Zone II and III Supply Air Handling Unit (AH-05P-701)

Two (2) 100% capacity Air Handling Units (AH-05P-701 and AH-05P-702) supply the Manipulator Repair Building Zone II and Zone III areas. Air Handling Unit (AH-05P-701) and its associated controls are described below. The operation of standby Air Handling Unit (AH-05P-702) is similar. The corresponding associated controls are shown on HVAC Flow and Control Diagram H-2-129851, Sheet 1.

Hand indicating switch HIS-05P-021 opens the inlet control valve of Heat Recovery Coil (HR-05P-701) and the Automatic Isolation Damper (DI-05P-701B).

Temperature indicating controller TIC-05P-005 controls the temperature of AHU discharge air by modulating either chilled water temperature control valve TV-05P-005 for Coiling Coil (CO-05P-701) or power controller JC-05P-005 for Heating Coil (HG-05P-701). High/low temperatures are alarmed (TAH/TAL). The multistep electric heater power controller JC-05P-005 is furnished with Heating Coil (HG-05P-701) and includes a multistage step controller and a modulating Silicon Controlled Rectifier (SCR) to provide modulating control between each successive stage. Low airflow and high heater temperature cutouts are also included.

Pressure differential indicator PDI-05P-003 indicates the Pre-filter pressure drop. High pressure differential is alarmed (PDAH).

Supply air to Zone II and III rooms are maintained by Reheat Coils and room temperature indicating controllers as described in Sections ? and ?

Pressure differential indicator PDI-05P-004 indicates the High Efficiency Filter pressure drop. High pressure differential is alarmed (PDAH).

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22.1.2 Zone II and III Supply Fans (BL-05P-711 and BL-05P-712).

Two (2) 100% capacity Supply Fans (BL-05P-711 and BL-05P-712 as standby) supply conditioned air to Zone II and Zone III areas. Supply Fan (BL-05P-711) and its associated controls are described below. The operation of standby Supply Fan (BL-05P-712) is similar. The corresponding associated controls are shown on HVAC Flow and Control Diagram H-2-129851.

Zone II and III Supply Fan Logic Controller (YIC-05P-010) provides START/STOP control for Supply Fan (BL-05P-711) in the MANUAL mode. In the AUTO mode, BL-05P-711 is started and stopped with a signal from the Zone II and III Supply Fan Select Control Program (YCP-05P-010).

1) Upon a start signal from YCP-05P-010, YIC-05P-010 activates Variable Inlet Vane (VV-05P-711) through solenoid valve YY-05P-010A and opens Automatic Isolation Damper (DI-05P-711) through solenoid valve YY-05P-010B. If VV-05P-711 or DI-05P-711 do not open after a predetermined time, then YIC-05P-010 alarms (ZAL) and sends a signal to YCP-05P-010 to activate the standby Supply Fan (BL-05P-712). OPEN/CLOSE status of DI-05P-711 is indicated (ZIH/ZIL). CLOSE status of VV-05P-711 is also indicated.

2) Upon start permissive signal from PIC-05Q-258 through YCP-05P-010, YIC-05P-010 starts Motor (MT-05P-711).

3) After a set period of time, if flow signal is not established from FI-05P-011 or pressure differential from PDI-05P-009 is not established, YIC-05P-010 stops Motor (MT-05P-711), closes VV-05P-711 through YY-05P-010A, and closes DI-05P-711 through YY-05P-010B. YIC-05P-010 sends a signal to YCP-05P-010 to start standby Supply Fan (BL-05P-712) through YIC-05P-016. Low flow is alarmed (FAL).

Motor current indicator II-05P-006A indicates Motor (MT-05P-711) current.

Motor running time indicator KQI-05P-010 indicates running time for Motor (MT-05P-711).

Pressure differential indicator PDI-05P-009 indicates pressure differential across the Supply Fan. Low pressure differential is alarmed (PDAL-05P-009) and interlocks with YIC-05P-010.

Pressure indicating controller PIC-05P-008 controls the Manipulator Repair Building Zone II and III supply air plenum by modulating Variable Inlet Vane of the operating Supply Fan. High/low pressures are alarmed (PAH/PAL).

Flow indicator FI-05P-011 indicates supply airflow to the Manipulator Repair Building Zone II and III areas. Low flow is alarmed (FAL-05P-001) and interlocks with YIC-05P-010.

22.1.3 Zone II Areas

The controls are shown on HVAC Flow and Control Diagram H-2-129852. Zone II areas consist of Repair Shop (Room 107), MSM Decontamination Rooms (Rooms 112, 113), Step Off Pads (Rooms 111, 203, 210, 211, 227), Lag Storage (Room 104), Corridor (Room 204), Monitor Room (Room 206), Decontamination Room (Room 205), Soiled Storage (Room 209), Storage (Room 110), M.S.M. Storage (Room 114), and Vestibule and Passage areas. Zone II areas are kept under negative pressure by pressure indicating controllers PIC-05P-113, PIC-05P-151, PIC-05P-152 and PIC-05P-153, which modulate Control Dampers (DN-05P-002, DN-05P-005, DN-05P-004 and DN-05P-001) respectively. High/low room pressures are alarmed (PAH/PAL).

Temperature indicating controllers TIC-05P-106, 107 and 109 maintain the set temperature in the Zone II rooms by modulating the corresponding electric heater power controllers, JC-05P-106, 107 and 109 for Electric Duct Heaters (EH-05P-005, 004 and 006) respectively. High temperatures are alarmed (TAH).

22.1.4 Zone III Areas

Zone III areas consist of Shop Waste Storage (Room 108), Soiled Storage (Room 106), Clean Storage (Rooms 105, 208), Corridors (Rooms 217, 219), Locker/ Change Rooms (Rooms 213, 214, 218, 220), Men's Room (Room 221), Women's Room (Room 215), H.P. Control (Room 222) and Vestibule (Room 223).

Zone III areas are kept under negative pressure (with respect to Zone IV areas) by pressure indicating controller PIC-05P-118 which modulates the Control Damper (DN-05P-003).

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Temperature indicating controllers TIC-05P-102, 103 and 104 maintain the set temperature in the Zone III rooms by modulating the corresponding electric heater power controllers JC-05P-102 and 103 for Electric Duct Heaters (EH-05P-001, 002 and 003) respectively. High temperatures are alarmed (TAH).

22.1.5 Zone II Exhaust Filter Plenums (PF-05Q-701, 702, 703 and 704); Zone III Exhaust Filter Plenums (PF-05Q-705 and 706)

The following description is for Zone II Exhaust Filter Plenum (PF-05Q-701). The description for the other Filter Plenums is similar. The corresponding associated controls are shown on HVAC Flow and Control Diagram H-2-129853, Sheets 1, 2, and 3.

PDI-05Q-202 indicates pressure drop across the Mist Eliminator. High pressure differential is alarmed (PDAH).

PDI-05Q-203 and PDI-05Q-204 indicate pressure drop across each HEPA filter bank. High/low pressure drop across each filter bank is alarmed (PDAH/PDAL).

PDIC-05Q-205 maintains a preset total pressure drop across both HEPA filter banks by modulating Control Damper (DN-05Q-701). High/low pressure differential is alarmed (PDAH/PDAL).

PI-05Q-210 and 309 indicates pressure at the inlet to the Zone II and III Exhaust Filter Plenums, respectively.

22.1.6 Zone II and III Exhaust Fans (BL-05Q-711 and 712)

Two (2) 100% capacity fans, Zone II and III Exhaust Fan (BL-05Q-711 and BL-05Q-712 as standby) exhaust Zone II and III air from the Manipulator Repair Building to the Vitrification Building Zone II and III Exhaust Stack. Exhaust Fan (BL-05Q-711) and its associated controls are described below. The operation of the other Exhaust Fan is similar. The corresponding associated controls are shown on HVAC Flow and Control Diagram H-2-129853, Sheet 4.

Zone II and III Exhaust Fan Logic Controller (YIC-05Q-402) provides START/STOP control in the MANUAL mode. In the AUTO mode, BL-05Q-711 is started and stopped by Zone II and III Exhaust Fan Select Control Program (YCP-05Q-010).

1) Upon a start signal from YCP-05Q-010, YIC-05Q-402 activates variable Inlet Vane (VV-05Q-711) through solenoid valve YY-05Q-402A and opens Automatic Isolation Damper (DI-05Q-711) through solenoid valve YY-05Q-402B. If VV-05Q-711 or DI-05Q-711 does not open, then YIC-05Q-402 sends signal to YCP-05Q-010 to activate the standby Exhaust Fan (BL-05Q-712) through YIC-05Q-406.

2) When isolation damper sequence is completed, YIC-05Q-402 starts Motor (MT-05Q-711).

3) After a set period of time, if flow is not established from FI-05Q-403, or pressure differential is not established from PDI-05Q-401, YIC-05Q-402 stops Motor (MT-05Q-711), closes DI-05Q-711, deactivates VV-05Q-711, and sends signal to YCP-05Q-010 to start standby Exhaust Fan (BL-05Q-712) through YIC-05Q-406.

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4) OPEN/CLOSE position of DI-05Q-711 is indicated (ZIH/ZIL). CLOSE position of VV-05Q-711 is indicated (ZIL). Also, CLOSE position is alarmed (ZAL).

Motor current indicator II-05Q-404A indicates Motor (MT-05Q-711) current.

Motor running time indicator KQI-05Q-402 indicates running time for Motor (MT-05Q-711).

Pressure differential across the Exhaust Fan is indicated by PDI-05Q-401. Low pressure differential is alarmed (PDAL-05Q-401) and is interlocked with YIC-05Q-402.

Flow indicator FI-05Q-403 measures flow in discharge duct of the fan. Low flow is alarmed (FAL-05Q-403) and is interlocked with YIC-05Q-402.

Pressure indicating controller PIC-05Q-258 controls the Manipulator Repair Building Zone II and III exhaust air plenum by modulating Variable Inlet Vane (VV-05Q-711) of the Exhaust Fan. High pressure is alarmed (PAH).

The Exhaust Fan inner bearing temperature and fan outer bearing temperature are indicated by TI-05Q-411 and 413, respectively. High bearing temperatures are alarmed (TAH). The fan inner and outer bearing temperatures are indicated locally by TIT-05Q-411 and 413, respectively.

Fan inner bearing vibration is locally monitored (XIA-05Q-412A). Fan outer bearing vibration is locally monitored XIA-05Q-412B. Common vibration alarm switch XSH-05Q-412 provides common vibration monitor alarm XAH-05Q-412.

22.1.7 Zone IV HVAC Equipment Room Air Handling Unit (AH-05P-703)

The Manipulator Repair Building Zone IV HVAC System operates continuously to maintain the HVAC Equipment Room (Room 301) temperature of (TBD)°F.

Air Handling Unit (AH-05P-703) supplies conditioned air to the Zone IV HVAC Equipment Room (Room 301). Air Handling Unit (AH-05P-703) and its associated controls are described below. The corresponding associated controls are shown on HVAC Flow and Control Diagram H-2-129854.

Equipment Room AHU Supply Fan Logic Controller (YIC-05P-605) provides START/STOP control for Supply Fan (BL-05P-703). It is interlocked with low-low temperature alarm TALL-05P-601 from temperature indicating controller TIC-05P-601 which controls the AHU outside air temperature.

Equipment Room AHU Evaporative Cooler Logic Controller (YIC-05P-604) provides START/STOP control for Evaporative Cooler (EC-05P-703) in the MANUAL mode. In the AUTO mode, EC-05P-703 is started by the high temperature alarm TAH-05P-603 and reset (stopped) by low temperature alarm TAL-05P-603 from the Equipment Room Temperature Indicating Controller (TIC-05P-603).

Equipment Room Temperature Indicating Controller (TIC-05P-603) controls heating and cooling of the HVAC Equipment Room. When the room temperature is above 85 °F, high temperature alarm TAH-05P-603 starts the Evaporative Cooler (EC-05P-703) via YIC-05P-604, to provide cooling. EC-05P-703 is stopped by TAL-05P-603. When the HVAC Equipment Room temperature is between 85 °F and 65 °F, cooling or heating is

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not provided. Heating is controlled to maintain a minimum room temperature with a set point of 65°F. TIC-05P-603 modulates power controller JC-05P-603 for the Electric Heating Coil (HG-05P-703). High-high temperature is alarmed (TAHH).

The multistage electric heater power controller JC-05P-603 is furnished with the Heating Coil (HG-05P-703) and includes a multistage step controller and a modulating Silicon Controlled Rectifier (SCR) to provide modulating control between each successive stage. Low airflow and high heater temperature cutouts are also included.

Temperature indicating controller TIC-05P-601 controls the AHU outside air temperature at a setpoint of (TBD)°F by modulating the Outside Air Control Damper (DN-05P-703B). Low temperature is alarmed (TAL) and low-low temperature (TALL-05P-601) is interlocked with YIC-05P-605 to stop BL-05P-703. A mechanical stop is installed on DN-05P-703B to provide for (TBD) percent minimum outside air for room pressurization.

Pressure differential indicator PDI-05P-602 indicates the Pre-filter pressure drop. High pressure differential is alarmed (PDAH).

Pressure differential indicator PDI-05P-606 indicates the Supply Fan (BL-05P-703) pressure differential. Low pressure differential is alarmed (PDAL).

Temperature indicator TI-05P-607 indicates the AHU average discharge temperature. High/low temperatures are alarmed (TAH/TAL).

22.1.8 Zone IV Supply Air Handling Unit (AH-05P-704 and 705)

Air Handling Units (AH-05P-704 and 705) supply pre-filtered air to the Canister Loadout (Room 117) and S.C.T. Washdown (Room 116) located in the Manipulator Repair Building. Only one of these two 100% AHUs is operated; the other one serves as a standby AHU. Air Handling Unit (AH-05P-704) and its associated controls are described below. The operation of AH-05P-705 is similar. The corresponding associated controls are shown on HVAC Flow and Control Diagram H-2-129854.

Canister Loadout/S.C.T. Washdown AHU Supply Fan Logic Controller (YIC-05P-652) provides START/STOP control for Supply Fans (BL-05P-704 and 705) and Exhaust Fans (BL-05Q-001, 002, 003 and 004). Only one Supply Fan can run at one time.

Canister Loadout/S.C.T. Washdown Temperature Indicating Controller (TIC-05P-651) controls heating of the Canister Loadout and S.C.T. Washdown Rooms. Heating is controlled to maintain a minimum room temperature in the Canister Loadout Room with a set point of (TBD) °F. TIC-05P-651 modulates power controller JC-05P-651 for Electric Duct Heater (EH-05P-007). High/low temperatures are alarmed (TAH/TAL).

The multistage electric heater power controller JC-05P-651 is furnished with the Electric Duct Heater (EH-05P-007) and includes a multistage step controller and a modulating Silicon Controlled Rectifier (SCR) to provide modulating control between each successive stage. Low airflow and high heater temperature cutouts are also included.

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22.1.9 Unit Heater (UH-05P-001, 002, 003 and 004)

Unit Heater (UH-05P-001 and 002) provide heating for S.C.T. Washdown (Room 116). Local temperature indicating controllers TIC-05P-610 and 611 control Unit Heaters (UH-05P-001 and 002) respectively.

Unit Heater (UH-05P-003 and 004) provide heating for the Canister Loadout (Room 117). Local temperature indicating controllers TIC-05P-653 and 654 control Unit Heaters (UH-05P-003 and 004) respectively.

22.2 INFREQUENT NORMAL OPERATIONS

22.2.1 System Start-Up

(TBD in Detailed Design)

22.3 ABNORMAL CONDITIONS

(TBD in Detailed Design)

23.0 CONTROL PROGRAM SPECIFICATIONS

Control Program Specifications are to be documented in Detailed Design. Tag Numbers and Control Program names are listed below:

23.1 YCP-05P-010 Zone II and III Supply Fan Select Control Program

23.2 YCP-05Q-010 Zone II and III Exhaust Fan Select Control Program

24.0 LOGIC CONTROLLER SPECIFICATIONS

Logic Controller Specifications are documented in the DCS Specification. Tag Numbers and Logic Controller Program names only are listed below:

24.1 YIC-05P-010 Zone II and III Supply Fan Logic Controller. Logic for Zone II and III Supply Fan Logic Controller YIC-05P-016 is similar.

24.2 YIC-05P-604 Equipment Room AHU Evaporative Cooler Logic Controller

24.3 YIC-05P-605 Equipment Room AHU Supply Fan Logic Controller

24.4 YIC-05Q-402 Zone II and III Exhaust Fan Logic Controller. Logic for Zone II and III Exhaust Fan Logic Controller YIC-05Q-406 is similar.

24.5 YIC-05P-016 Zone II and III Supply Fan Logic Controller

24.6 YIC-05Q-406 Zone II and III Exhaust Fan Logic Controller

24.7 YIC-05P-652 Canister Loadout/S.C.T. Washdown AHU Supply Fan Logic Controller

25.0 SPECIAL ANALOG FUNCTIONS

(Not Applicable to System 05P and 05Q)

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26.0 ACRONYMS

ACRONYM	TERM
AHU	Air Handling Unit
HEPA	High Efficiency Particulate Air
HVAC	Heating, Ventilating and Air Conditioning
SCR	Silicon Controlled Rectifier

27.0 GLOSSARY

27.1 SYSTEM SPECIFIC TERMS

TAG NUMBER	TERM
YCP-05P-010	Zone II and III Supply Fan Select Control Program
YIC-05P-010	Zone II and III Supply Fan Logic Controller
YIC-05P-016	Zone II and III Supply Fan Logic Controller
TIC-05P-603	Equipment Room Temperature Indicating Controller
YIC-05P-604	Equipment Room AHU Evaporative Cooler Logic Controller
YIC-05P-605	Equipment Room AHU Supply Fan Logic Controller
TIC-05P-651	Canister Loadout/S.C.T. Washdown Temperature Indicating Controller
YIC-05P-652	Canister Loadout/S.C.T. Washdown AHU Supply Fan Logic Controller
YCP-05Q-010	Zone II and III Exhaust Fan Select Control Program
YIC-05Q-402	Zone II and III Exhaust Fan Logic Controller
YIC-05Q-406	Zone II and III Exhaust Fan Logic Controller

28.0 REFERENCE LIST

28.1 DOCUMENTS AND EQUIPMENT COVERED BY THIS PCD

SYS NO.	DESCRIPTION	EQUIPMENT NUMBER	P&ID H-2-XXXXXX-XX
05P	Control Damper	DN-05P-001	129852-1
05P	Control Damper	DN-05P-002	129852-1
05P	Control Damper	DN-05P-003	129852-1
05P	Control Damper	DN-05P-004	129852-1
05P	Control Damper	DN-05P-005	129852-1
05P	Electric Duct Heater	EH-05P-001	129852-1
05P	Electric Duct Heater	EH-05P-002	129852-1
05P	Electric Duct Heater	EH-05P-003	129852-1
05P	Electric Duct Heater	EH-05P-004	129852-1
05P	Electric Duct Heater	EH-05P-005	129852-1
05P	Electric Duct Heater	EH-05P-006	129852-1
05P	Electric Duct Heater	EH-05P-007	129854-1
05P	Unit Heater	UH-05P-001	129854-1
05P	Unit Heater	UH-05P-002	129854-1
05P	Unit Heater	UH-05P-003	129854-1
05P	Unit Heater	UH-05P-004	129854-1
05P	Air Handling Unit	AH-05P-701	129851-1
05P	Cooling Coil	CO-05P-701	129851-1
05P	Heating Coil	HG-05P-701	129851-1
05P	Heat Recovery Coil	HR-05P-701	129851-1
05P	Air Handling Unit	AH-05P-702	129851-1
05P	Cooling Coil	CO-05P-702	129851-1

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28.1 DOCUMENTS AND EQUIPMENT COVERED BY THIS PCD (Continued)

SYS NO.	DESCRIPTION	EQUIPMENT NUMBER	P&ID H-2-XXXXXX-XX
05P	Heating Coil	HG-05P-702	129851-1
05P	Heat Recovery Coil	HR-05P-702	129851-1
05P	Air Handling Unit	AH-05P-703	129854-1
05P	Supply Fan	BL-05P-703	129854-1
05P	Evaporative Cooler	EC-05P-703	129854-1
05P	Heating Coil	HG-05P-703	129854-1
05P	Pump	PX-05P-703	129854-1
05P	Control Damper	DN-05P-703A	129854-1
05P	Motor	MT-05P-703A	129854-1
05P	Control Damper	DN-05P-703B	129854-1
05P	Motor	MT-05P-703B	129854-1
05P	Supply Fan	BL-05P-711	129851-1
05P	Automatic Isolation Damper	DI-05P-711	129851-1
05P	Motor	MT-05P-711	129851-1
05P	Variable Inlet Vane	VV-05P-711	129851-1
05P	Supply Fan	BL-05P-712	129851-1
05P	Automatic Isolation Damper	DI-05P-712	129851-1
05P	Motor	MT-05P-712	129851-1
05P	Variable Inlet Vane	VV-05P-712	129851-1
05Q	Supply Fan	BL-05Q-001	129854-1
05Q	Supply Fan	BL-05Q-002	129854-1
05Q	Supply Fan	BL-05Q-003	129854-1
05Q	Supply Fan	BL-05Q-004	129854-1
05Q	Control Damper	DN-05Q-701	129853-1
05Q	Heat Recovery Coil	HR-05Q-701	129853-4
05Q	Filter Plenum	PF-05Q-701	129853-1
05Q	Control Damper	DN-05Q-702	129853-1
05Q	Heat Recovery Coil	HR-05Q-702	129853-4
05Q	Filter Plenum	PF-05Q-702	129853-1
05Q	Control Damper	DN-05Q-703	129853-2
05Q	Filter Plenum	PF-05Q-703	129853-2
05Q	Control Damper	DN-05Q-704	129853-2
05Q	Filter Plenum	PF-05Q-704	129853-2
05Q	Control Damper	DN-05Q-705	129853-3
05Q	Filter Plenum	PF-05Q-705	129853-3
05Q	Control Damper	DN-05Q-706	129853-3
05Q	Filter Plenum	PF-05Q-706	129853-3
05Q	Exhaust Fan	BL-05Q-711	129853-4
05Q	Automatic Isolation Damper	DI-05Q-711	129853-4
05Q	Motor	MT-05Q-711	129853-4
05P	Variable Inlet Vane	VV-05Q-711	129853-4
05Q	Exhaust Fan	BL-05Q-712	129853-4
05Q	Motor	MT-05Q-712	129853-4
05P	Variable Inlet Vane	VV-05Q-712	129853-4
05Q	Automatic Isolation Damper	DI-05Q-712	129853-4

29.0

(This section not used)

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30.0

(This section not used)

31.0

(This section not used)

32.0 OPERATING DESCRIPTION NARRATIVE
FRIT STORAGE/COLD CHEMICAL and MECH./ELECT. SERVICES BUILDINGS
SUPPLY HVAC SYSTEM 05R
FRIT STORAGE/COLD CHEMICAL and MECH./ELECT. SERVICES BUILDINGS
EXHAUST HVAC SYSTEM 05S

32.1 ROUTINE OPERATIONS

32.1.1 Frit Storage/Cold Chemical Building
Air Handling Unit (AH-05R-704)

Air Handling Unit (AH-05R-704) supplies conditioned air to the Frit Storage Area (Room 106), Slurry Preparation Area (Room 107), Formic Acid Transfer Pump Room (Room 003), Cold Chemical Area (Room 100), Cold Chemical HVAC Room(Room 104), and Analytical Lab (Room 101) in the Frit Storage/Cold Chemical Building. The corresponding associated controls are shown on HVAC Flow and Control Diagram H-2-129871.

Chemical Storage AHU Supply Fan Logic Controller (YIC-05R-004) provides START/STOP control for Supply Fan (BL-05R-704). It is interlocked with low pressure differential alarm (PDAL-05R-005).

The AHU Evaporative Cooler Logic Controller (YIC-05R-003) provides START/STOP control for Evaporative Cooler (EC-05R-704) in the MANUAL mode. In the AUTO mode, EC-05R-704 is started by the high temperature alarm TAH-05R-002 and reset (stopped) by low temperature alarm TAL-05R-002 from temperature indicating controller TIC-05R-002.

The Supply Air Temperature Indicating Controller (TIC-05R-002) controls heating and cooling of the Chemical Storage Areas. When the supply air temperature is above (TBD)°F, high temperature alarm TAH-05R-002 starts the Evaporative Cooler (EC-05R-704) via YIC-05R-003 to provide cooling. EC-05R-704 is stopped by TAL-05R-002. High-high temperature is alarmed (TAHH). When the temperature is between (TBD)°F and (TBD)°F, cooling or heating is not provided. Heating is controlled to maintain a minimum supply air temperature with a set point of (TBD)°F. TIC-05R-002 controls the power controller JC-05R-002. The multistep electric heater power controller JC-05R-002 is furnished with Electric Heating Coil (HG-05R-704) and includes a multistage step controller and a modulating Silicon Controlled Rectifier (SCR) to provide modulating control between each successive stage. Low airflow and high heater temperature cutouts are also included.

Pressure differential indicator PDI-05R-001 indicates the filter pressure drop across the Pre-filter of AH-05R-704. High pressure differential is alarmed (PDAH).

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Pressure differential indicator PDI-05R-005 indicates the Supply Fan (BL-05R-704) pressure differential. Low pressure differential is alarmed (PDAL).

Motor current indicator II-05R-024A indicates Motor (MT-05R-704A) current.

32.1.2 Frit Storage/Cold Chemical Building Exhaust Fans (BL-05S-704 through 707).

Exhaust Fans (BL-05S-704 through 707) exhaust room air from the Frit Storage/Cold Chemical Building. The operation of Exhaust Fan BL-05S-704 is described below. The operation of Exhaust Fans BL-05S-705 through BL-05S-707 is similar. The corresponding associated controls are shown on HVAC Flow and Control Diagram H-2-129871.

Exhaust Fan (BL-05S-704) exhausts the room air from the Cold Chemical HVAC Room (Room 104). Hand indicating switch HIS-05S-013 is used to START and STOP Motor (MT-05S-704). Pressure differential indicator PDI-05S-014 indicates the Exhaust Fan (BL-05S-704) pressure differential. Low pressure differential is alarmed (PDAL).

32.1.3 Frit Storage/Cold Chemical Building Unit Heaters (UH-05R-701 and 702)

Unit Heaters (UH-05R-701 and 702) provide heating for the Cold Chemical HVAC Room (Room 104). Temperature indicating controllers TIC-05R-020 and 021 control Unit Heaters (UH-05R-701 and 702).

32.1.4 Frit Storage/Cold Chemical Building Analytical Lab Air Handling Unit (AH-05R-705)

Air Handling Unit (AH-05R-705) supplies conditioned air to the Analytical Lab (Room 101). The associated controls are shown on HVAC Flow and Control Diagram H-2-129871.

The AHU Fan Logic Controller (YIC-05R-017) provides START/STOP control for the Supply Fan (BL-05R-705). It is interlocked with low pressure differential alarm (PDAL-05R-019).

Temperature indicating controller TIC-05R-016 controls heating and cooling of the Analytical Lab (Room 101). Heating is controlled to maintain a minimum room temperature with a set point of (TBD) °F. The multistep electric heater power controller JC-05R-016 is furnished with Electric Heating Coil (HG-05R-705) and includes a multistage step controller and a modulating Silicon Controlled Rectifier (SCR) to provide modulating control between each successive stage. Low airflow and high heater temperature cutouts are also included. Cooling is provided by the Air Cooled Condensing Unit (CU-05R-705). Cooling is controlled to maintain a maximum room temperature with a set point of (TBD) °F by opening/closing the expansion valve TV-05R-016. The Air Cooled Condensing Unit CU-05R-705 is started and stopped by Logic Controller YIC-05R-017.

Pressure differential indicator PDI-05R-015 indicates the Pre-filter pressure drop. High pressure differential is alarmed (PDAH).

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Pressure differential indicator PDI-05R-019 indicates the Supply Fan (BL-05R-705) pressure differential. Low pressure differential is alarmed (PDAL).

32.1.5 Mech./Elect. Services Building Air Handling Unit (AH-05R-101)

Variable Volume Air Handling Unit (AH-05R-101) supplies conditioned air to the Offices (Rooms 103, 105, 107, 111 and 117), Men's Toilet (Room 110), Women's Toilet (Room 108), Corridor (Rooms 102 and 124), Stairs/Emergency Exits (Rooms 125 and 127), Staging Area (Room 123), Tool Crib (Room 104), Tool Closet (Room 106), Maintenance Shop (Room 101), and Electrical Shop (Room 113) in the Mech./Elect. Services Building. The corresponding associated controls are shown on HVAC Flow and Control Diagram H-2-129721, Sheets 1 thru 6.

Offices AHU Supply Fan Logic Controller (YIC-05R-XXX) provides START/STOP control for the Supply Fan (BL-05R-101). It is interlocked with the following: (1) electric heaters (EH-05R-01, EH-05R-02, and EH-05R-03); (2) toilet exhaust fan (BL-05S-101T); (3) welding exhaust fan (BL-05S-101W); (4) extract fan (BL-05S-101) and; (5) pressure differential alarm (PIC-05R-XXX).

The Office AHU Supply Fan Logic Controller (YIC-05R-XXX) may be overridden by either: (1) a signal from the fire alarm panel which will make the supply fan (BL-05R-101), extract fan (BL-05S-101), toilet exhaust fan (BL-05S-101T) and welding exhaust fan (if running) (BL-05S-101W) stop after a two minute time delay (allowing building evacuation), Fan Power Boxes FPB-05R-01 thru 06 will stop immediately; or (2) the fireman's door switches. The fireman's door switches shall override all other signals to either start or stop the supply fan (BL-05R-101), the extract fan (BL-05S-101), the welding exhaust fan (BL-05R-101W) and Toilet exhaust fan (BL-05R-101T).

Logic Controller (YIC-05R-XXX) provides START/STOP control for the extract fan (BL-05S-101). It is interlocked with Supply Fan BL-05R-101 and starts when supply is operating and stops when supply fan stops. The exception to this is operation under fireman's switch control.

The smoke detector YSH-05R-XXX shall also override DCS signals and stop the following fans two minutes after detecting smoke: supply fan (BL-05R-101); extract fan (BL-05S-101); toilet exhaust fan (BL-05S-101T); welding exhaust fan (BL-05S-101W); and all Fan Power Boxes (FPB-05R-01 thru 06). The smoke detector shall inform the fire panel immediately upon detecting smoke. The smoke detector has a self-diagnosing fault detection system, a "trouble with smoke detector" signal shall be sent to the DCS. A smoke existing condition is alarmed.

The fireman's switch(es), the fire alarm signal and the smoke detector signal shall also immediately override the economizer damper controls and open both the outside air damper DN-05R-101 and exhaust air damper DN-05S-101 and close the recirculation air damper DN-05R-101R. Each signal (or signals) shall also open the supply fan variable volume damper VV-05R-101, the exhaust fan variable volume damper VV-05S-101 and all the variable air volume dampers in each Fan Power Box FPB-05R-01 thru 06. During an ashfall or sand storm event, the system operator shall type "Dust" and all on-site economizer dampers shall go to minimum outside air. Typing "Normal" will make them revert to normal operation.

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TITLE: SYSTEMS 05I/J, K/L, M/N, P/Q, R/S, T/U, V/W, X/Y MISCELLANEOUS BUILDING HVAC SYSTEMS

1.0 GENERAL DESCRIPTION

The PCD is divided into sections according to plant buildings as follows:

- Section 1 General Description is an overview of the miscellaneous building HVAC systems.
- Sections 2 through 11 cover the Canister Storage Building HVAC systems for Supply (System 05I) and Exhaust (System 05J).
- Sections 12 through 19 cover the Operations Control/Regulated Entrance Building (OC/REB) HVAC systems for Supply (System 05K) and Exhaust (System 05L). These sections also cover the OC/REB Control Room and Computer Room HVAC systems for Supply (System 05M) and Exhaust (System 05N).
- Sections 22 through 29 cover the Manipulator Repair Building HVAC systems for Supply (System 05P) and Exhaust (System 05Q).
- Sections 32 through 39 cover the Frit Storage/Cold Chemical, and Mech./Elect. Services Buildings HVAC systems for Supply (System 05R) and Exhaust (System 05S).
- Sections 42 through 49 cover the Fan House HVAC systems for Supply (System 05T) and Exhaust (System 05U).
- Sections 52 through 61 cover the Waste Hold Tank (WHT) Building HVAC systems for Supply (System 05V) and Exhaust (System 05W).
- Sections 62 through 69 cover the Switchgear/Generator Building HVAC systems for Supply (System 05X) and Exhaust (System 05Y).

1.1 CANISTER STORAGE BUILDING HVAC SYSTEMS (05I AND 05J)

The Canister Storage Building HVAC System consists of four (4) subsystems which are shown on HVAC Flow and Control Diagrams H-2-129730, 731, 734 and 738 which performs the following functions:

- Office area HVAC system functions to maintain the required temperature and ventilation for Rooms 100, 104, 106, 108, 116, and 124.
- Field Operating Station (FOS) #5 is supplied with two (2) 100% capacity HVAC systems (AC-05I-110A and 110B) to maintain the required temperature, humidity and ventilation for Room 102.

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- Canister Storage Vault Areas (Rooms 004, 006 and 009) are cooled by natural convection and controls are limited to monitoring the vault rooms ambient temperature, outside air intake stack temperature and Exhaust stack temperature and flow.

- Canister Storage Operating Area (Room 110) and Mechanical Equipment Room (Room 136) are supplied with two (2) 50% capacity Air Handling Units (AH-05I-112 and 113) consisting of Pre-filters, High Efficiency Filters, Evaporative Coolers (EC-05I-112 and 113) and Supply Fans (BL-05I-112 and 113).

2.0 OPERATING DESCRIPTION NARRATIVE
CANISTER STORAGE BUILDING SUPPLY SYSTEM (05I)
CANISTER STORAGE BUILDING EXHAUST SYSTEM (05J)

2.1 ROUTINE OPERATIONS

2.1.1 Air Handling Unit (AH-05I-111)

Air Handling Unit (AH-05I-111) supplies conditioned air to Clean Operating Office (Room 100), Health Protection Office (Room 104), Corridor (Room 106), Vestibule (Room 124), Electrical Equipment Room (Room 108), and Toilet (Room 116), via leakage from Vestibule (Room 124). The corresponding associated controls are shown on HVAC Flow and Control Diagrams H-2-129731-1, and 2.

Temperature indicator TI-CSS-001 indicates outside air temperature and sends permissive signal to TIC-CSS-002 for economizer operation. Low temperature is alarmed (TAL).

Temperature indicating controller TIC-CSS-002 controls the Return Air Damper TV-CSS-016 and Outside Air Damper TV-CSS-002 by input from TIT-CSS-003 which is located in the mixing air plenum. Low temperature is alarmed (TAL) in the AH-05I-111 mixing air plenum.

Pressure differential indicator PDI-CSS-006 indicates the Pre-filter and High Efficiency filters total pressure drop. High pressure differential is alarmed (PDAH).

Logic indicating controller YIC-CSS-007 provides START/STOP control for the following items:

1) START/STOP Supply Fan (BL-05I-111).

2) Permits starting of Air Cooled Condensing Unit (CU-05I-111) by air flow switch FSL-CSS-010.

3) Permits outside air and return air damper operations (DN-05I-111A and 111B) via solenoid valves YY-CSS-002 and 016, respectively.

Pressure differential indicator PDI-CSS-008 indicates the Supply Fan (BL-05I-111) pressure differential. Low pressure differential is alarmed (PDAL).

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The AHU Return Air Temperature Indicating Controller TIC-CSS-014 controls cooling at a set temperature of 75°F by staging the air cooled Condensing Unit (CU-05I-111). Return air temperature of 85°/65°F is alarmed (TAH/TAL).

Air Handling Unit (AH-05I-111) has local selector and START/STOP switches which are used for maintenance and run-in of the equipment under administrative control. The function of these switches are described in the table below. The selector switch must be in the REMOTE position during normal operation.

EQUIPMENT	DESCRIPTION	SWITCH NO.
BL-05I-111	AHU Blower	HS-CSS-007 A,B,C

LOCAL SELECTOR SWITCH POSITION			
MAINT	LOCAL	REMOTE	
YES	YES	NO	LOCAL MANUAL START
YES	YES	YES	LOCAL MANUAL STOP
YES	YES	YES	HARDWIRED INTERLOCK STOP
NO	NO	YES	DCS MANUAL START
NO	YES	YES	DCS MANUAL STOP
NO	YES	YES	DCS INTERLOCK STOP
NO	NO	YES	DCS CONTROL PROGRAM START/STOP

* Selector Switch is "A", Local START Pushbutton is "B", Local STOP Pushbutton is "C".

Smoke Detectors YSH-CSS-009 and 015 upon detecting smoke will send a smoke existing condition to the Fire Panel. A STOP signal will be initiated to Supply Fan (BL-05I-111) via YIC-CSS-007. The same initiated signal will close the Outside Air Damper (DN-05I-111A) and Return Air Damper (DN-05I-111B).

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2.1.2 Air Conditioning Unit (AC-05I-110A and 110B)

Air Conditioning Unit (AC-05I-110A) supplies conditioned air to the Field Operating Station (FOS) #5 (Room 102). The operation of AC-05I-110B (back-up) is similar. The corresponding associated controls are shown on HVAC Flow and Control Diagram H-2-129731-3.

Logic Indicating Controller YIC-CSS-021 provides START/STOP control for Air Conditioning Unit (AC-05I-110A) in the MANUAL mode. In the AUTO mode (AC-05I-110A) is started and stopped with a signal from TI-CSS-022 or MI-C55-023.

1) Unit indicating controller UIC-CSS-021 provides a local START/STOP control of (AC-05I-110A), based on temperature and humidity set points. The UIC can be overridden by YIC-C55-021 to START/STOP AC-05I-110A, remotely.

2) Air Conditioning trouble is alarmed (Trouble) at the DCS.

3) Temperature indicator TI-CSS-022 indicates Field Operating Station (FOS) #5 (Room 102) air temperature. High-High/High/Low temperatures are alarmed (TAHH/TAH/TAL).

4) Moisture indicator MI-CSS-023 indicates the relative humidity in the Field Operating Station (FOS) #5 (Room 102). High/Low/Low-Low moisture in the room is alarmed (MAH/MAL/MALL).

5) When either temperature alarm High-High (TAHH) or moisture alarm Low-Low (MALL) are alarmed the appropriate Interlocked Logic indicating controller (YIC-CSS-021 or 024) will shutdown the operating A/C unit and turn on the standby A/C unit.

2.1.3 Air Handling Unit (AH-05I-112 and 113)

Air Handling Units (AH-05I-112 and 113) supply conditioned air to the Canister Storage Operating Area (Room 110) and Mechanical Equipment Room (Rom 136). Air Handling Unit (AH-05I-112) and its associated controls are described below. The operation of (AH-05I-113) is similar. The corresponding associated controls are shown on HVAC Flow and Control Diagram H-2-129734 sheets 1, 2 and 3.

Pressure differential indicator PDI-CSS-035-1 indicates the Pre-filter and High Efficiency filters total pressure drop. High pressure differential is alarmed (PDAH).

Pressure differential indicator PDI-CSS-038-1 indicates the Supply Fan (BL-05I-112) pressure differential. High/low pressure differentials are alarmed (PDAH/PDAL).

Temperature indicating controller TIC-CSS-032-1 indicates and controls the mix air temperature into the Air Handling Unit by modulating the Outside Air Damper (DN-05I-112A) and Return Air Damper (DN-05I-112B). TIC-CSS-032-1 is also interlocked to YIC-CSS-036-1. Low temperature is alarmed (TAL) at TIC-CSS-032-1.

Supply Fan logic indicating controller YIC-CSS-046-1 provides START/STOP control for Supply Fan (BL-05I-112) and opens/closes Outside Air Damper (DN-05I-112A), and Return Air Damper (DN-05I-112B) via solenoid valves YY-CSS-031-1 and 046-1, respectively. YIC-CSS-046-1 is interlocked with YIC-CSS-036-1.

Motor current indicator II-CSS-037A-1 indicates Motor (MT-05I-112A) current.

Logic indicating controller YIC-CSS-036-1 provides MANUAL/AUTO, START/STOP control for Evaporative Cooler Pump (PX-05I-112) and is interlocked to YIC-CSS-046-1.

Smoke Detector YSH-CSS-040-1 upon detecting smoke will send a smoke existing condition to the Fire Panel. A STOP signal will be initiated to Supply Fan (BL-05I-112) via YIC-CSS-046-1. The same initiated signal will close the Outside Air Damper (DN-05I-112A) and Return Air Damper (DN-05I-112B).

Smoke Detector YSH-CSS-040-2, upon detecting smoke will send a smoke existing condition to the Fire Panel. A STOP signal will be initiated to Supply Fan (BL-05I-113) via YIC-CSS-046-2. The same initiated signal will close the Outside Air Damper (DN-05I-113A) and Return Air Damper (DN-05I-113B).

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Smoke Detector YSH-CSS-045 upon detecting smoke will send a signal to the fire panel. A STOP signal will be initiated to Supply Fan (BL-05I-112 and 113) via YIC-CSS-046-1 and 046-2, respectively. The same initiated signal will close the Outside Air Dampers and Return Air Dampers of the respective Air Handling Units.

Temperature indicator TI-CSS-039-1 indicates supply air temperature downstream of AH-05I-112.

The following Air Handling Units (AH-05I-112 and AH-05I-113) have local selector and START/STOP switches which are used for maintenance and run-in of the equipment under administrative control. The equipment that these switches operate are described in the table below. The selector switch must be in the REMOTE position during normal operation.

EQUIPMENT	DESCRIPTION	SWITCH NO.
BL-05I-112	AHU Blower	HS-CSS-037 A,B,C-1
BL-05I-113	AHU Blower	HS-CSS-037 A,B,C-2
EC-05I-112	AHU Evap Cooler	HS-CSS-036 A,B,C-1
EC-05I-113	AHU Evap Cooler	HS-CSS-036 A,B,C-2

LOCAL SELECTOR SWITCH POSITION			
MAINT	LOCAL	REMOTE	
YES	YES	NO	LOCAL MANUAL START
YES	YES	YES	LOCAL MANUAL STOP
YES	YES	YES	HARDWIRED INTERLOCK STOP
NO	NO	YES	DCS MANUAL START
NO	YES	YES	DCS MANUAL STOP
NO	YES	YES	DCS INTERLOCK STOP
NO	NO	YES	DCS CONTROL PROGRAM START/STOP

* Selector Switch is "A", Local START Pushbutton is "B", Local STOP Pushbutton is "C".

Temperature indicator TI-CSS-051 indicates Mechanical Equipment Room (Room 136) air temperature.

The Canister Storage Operating Area (Room 110) average temperature is computed at TY-CSS-042 with inputs from temperature indicators TI-CSS-041, 042, 043 and 044. Temperature converter TY-CSS-042 is interlocked with YIC-CSS-036-1 and 036-2.

2.1.4 Vault Areas Temperature Monitoring System (Vault Areas 004, 006, and 009) and Outside Air Intake Stack Temperature

Temperature indicator TI-CSS-062-1 through 070-1 monitor the Canister Storage Vault Area (004), at varying elevations. Vaults 006 and 009 are similar. Vault 006 are tagged (-2), vault 009 are tagged (-3). The corresponding associated controls are shown on HVAC Flow and Control Diagram H-2-129738.

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Temperature indicator TI-CSS-061 in the outside air intake stack indicates the inlet air temperature to the vault area.

2.1.5 Canister Storage (Neutral Zone) Exhaust Stack Temperature and Flow Monitoring

Temperature indicators TI-CSE-011 A,B,C and TI-CSE-013 A,B,C monitor the air temperature in the exhaust stack. Temperature interlock TY-CSE-011 and 013 indicates the median exhaust air temperature of the exhaust stack.

Flow Indicator FI-CSE-012 measures the mass flow of exhausted air from the stack.

3.0 APPLICATIONS PROGRAM SPECIFICATIONS

(Not Applicable)

4.0 LOGIC CONTROLLER SPECIFICATIONS

(Not Applicable)

5.0 SPECIAL ANALOG FUNCTIONS

(Not Applicable)

6.0 ACRONYMS

ACRONYM	TERM
AHU	Air Handling Unit
DCS	Distributed Control System
HVAC	Heating, Ventilating and Air Conditioning

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7.0 GLOSSARY

(Not Applicable)

7.1 SYSTEM SPECIFIC TERMS

TAG NUMBER	TERM
TIC-CSS-001	Fresh Air and Return Air Temperature Indicating Controller
YIC-CSS-007	CSB Office Area Supply Fan and Damper Logic Controller
TIC-CSS-014	CSB Office Area Condensing Unit Temperature Indicating Controller
YIC-CSS-021	CSB (FOS) #5 Temperature, Humidity Logic Controller AC-05I-110A
YIC-CSS-024	CSB (FOS) #5 Temperature, Humidity Logic Controller AC-05I-110B
TIC-CSS-032-1	CSB Mech. Rm. AFD Oper. Area AHU Plenum Temperature Indicating Controller
YIC-CSS-036-1	CSB Mech. Rm. and Oper. Area Evap. Cooler Logic Controller
YIC-CSS-046-1	CSB Mech. Rm. and Oper. Area, Smoke Detection and Supply Fan Logic Controller
TIC-CSS-032-2	CSB Mech. Rm. and Oper. Area AHU Plenum Temperature Indicating Controller
YIC-CSS-036-2	CSB Mech. Rm. and Oper. Area Evap. Cooler Logic Controller
YIC-CSS-046-2	CSB Mech. Rm. and Oper. Area, Smoke Detection and Supply Fan Logic Controller
TY-CSS-042	CSB Mech. Rm. and Oper. Area, Temperature Averaging Converter
TY-CSE-011	CSB Canister Storage, Neutral Zone Exhaust Stack Median Temperature
TY-CSE-013	CSB Canister Storage, Neutral Zone Exhaust Stack Median Temperature

8.0 REFERENCE LIST

8.1 DOCUMENTS AND EQUIPMENT COVERED BY THIS PCD

SYS NO.	DESCRIPTION	EQUIPMENT NUMBER	P&ID H-2-XXXXXX-XX
05I	Air Handling Unit	AH-05I-111	129731-1
05I	Air Conditioning Unit	AC-05I-110A	129731-3
05I	Air Conditioning Unit	AC-05I-110B	129731-3
05I	Air Handling Unit	AH-05I-112	129724-1
05I	Air Handling Unit	AH-05I-113	129724-1
05I	Air Cooled Condensing Unit	CU-05I-111	129731-1
05I	Air Cooled Condensing Unit	CU-05I-110A	129731-3
05I	Air Cooled Condensing Unit	CU-05I-110B	129731-3
05I	Cooling Coil	CO-05I-110A	129731-3
05I	Cooling Coil	CO-05I-110B	129731-3
05I	Cooling Coil	CO-05I-111	129731-1
05I	Electric Duct Heater	EH-05I-115	129731-2
05I	Electric Duct Heater	EH-05I-116	129731-2
05I	Electric Duct Heater	EH-05I-117	129731-2
05I	Motor Supply Fan	MT-05I-111	129731-1
05I	Motor Supply Fan	MT-05I-110A	129731-3
05I	Motor Evaporative Cooler	MT-05I-112B	129734-1
05I	Motor Supply Fan	MT-05I-112A	129734-1
05I	Motor Evaporative Cooler	MT-05I-112B	129734-1
05I	Motor Supply Fan	MT-05I-112A	129734-1
05I	Supply Fan	BL-05I-111	129731-1
05I	Supply Fan	BL-05I-110A	129731-3
05I	Supply Fan	BL-05I-110B	129731-3
05I	Supply Fan	BL-05I-112	129734-1
05I	Supply Fan	BL-05I-113	129734-2
05I	Unit Heater	UH-05I-118	129734-3
05I	Unit Heater	UH-05I-119	129734-3
05I	Unit Heater	UH-05I-120-126	129734-3
05I	Unit Heater	UH-05I-127-133	129734-3
05J	Exhaust Fan	BL-05J-114	129731-2
05J	Exhaust Fan	BL-05J-110A	129731-3
05J	Exhaust Fan	BL-05J-110B	129731-3
05I	Control Damper	DN-05I-111A	129731-1
05I	Control Damper	DN-05I-111B	129731-1
05I	Control Damper	DN-05I-112A	129734-1
05I	Control Damper	DN-05I-112B	129734-1
05I	Control Damper	DN-05I-113A	129734-2
05I	Control Damper	DN-05I-113B	129734-2
05J	Motor Exhaust	MT-05J-114	129731-2
05J	Air Cooled Condensing Unit	CU-05I-110A	129731-3
05J	Air Cooled Condensing Unit	CU-05I-110B	129731-3
05I	Evaporative Cooler	EC-05I-112	129734-1
05I	Evaporative Cooler Pump	PX-05I-112	129734-1
05I	Evaporative Cooler	EC-05I-113	129734-2
05I	Evaporative Cooler Pump	PX-05I-113	129734-2

9.0 ATTACHMENTS

(This Section Not Used)

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10.0

(This Section Not Used)

11.0

(This Section Not Used)

12.0 OPERATING DESCRIPTION NARRATIVE; OPERATIONS CONTROL/REGULATED ENTRANCE BUILDING HVAC SUPPLY SYSTEM 05K; OPERATIONS CONTROL/REGULATED ENTRANCE BUILDING HVAC EXHAUST SYSTEM 05L; CONTROL/COMPUTER ROOM HVAC SUPPLY SYSTEM 05M; CONTROL/COMPUTER ROOM HVAC EXHAUST SYSTEM 05N

12.1 ROUTINE OPERATIONS

12.1.1 Operations Control/Regulated Entrance Building Air Handling Unit (AH-05K-703).

Air Handling Unit (AH-05K-703) supplies conditioned air to the Operations Control/ Regulated Entrance Building office and operation areas. The Air Handling Unit and its associated controls are described below. The corresponding associated controls are shown on HVAC Flow and Control Diagram H-2-129861, Sheet 1.

AHU Supply Fan Logic Controller (YIC-05K-004) provides START/STOP control for Supply Fan (BL-05K-703). YIC-05K-004 activates Variable Inlet Vane (VV-05K-703) through solenoid valve YY-05K-004A and activates chilled water control valve TV-05K-007 through solenoid valve YY-05K-004B. If VV-05K-703 does not open, the CLOSE position is alarmed (ZAL). YIC-05K-004 is interlocked to YIC-05L-010 as a permissive signal which enables YIC-05L-010 to start Return/Exhaust Fan (BL-05L-704). YIC-05K-004 is interlocked with PDAL-05K-005.

Temperature indicating controller TIC-05K-007 modulates the chilled water control valve TV-05K-007 to the AHU Cooling Coil (CO-05K-703) to maintain set discharge air temperature of (TBD)°F (adjustable). High temperature is alarmed (TAH).

Temperature indicating controller TIC-05K-001 controls the AHU mixed air temperature at a setpoint of (TBD)°F by modulating the outside air Control Damper (DN-05K-703A), return air Control Damper (DN-05L-703B) and exhaust air Control Damper (DN-05L-703C). The outside air Control Damper and the exhaust air Control Damper modulate together. The return air Control Damper modulates in opposition to the outside air Control Damper. Low temperature is alarmed (TAL).

Pressure differential indicator PDI-05K-002 indicates pressure drop across the Pre-filter. High pressure differential is alarmed (PDAH).

Pressure differential indicator PDI-05K-003 indicates pressure drop across the High Efficiency Filter. High pressure differential is alarmed (PDAH).

Pressure differential indicator PDI-05K-005 indicates pressure differential across the Supply Fan (BL-05K-703). Low pressure differential is alarmed (PDAL-05K-005) and interlocked with YIC-05K-004.

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Pressure indicating controller PIC-05K-006 modulates the Variable Inlet Vane (VV-05K-703) of the Supply Fan to maintain supply duct pressure. High/Low pressures are alarmed (PAH/PAL).

12.1.2 Operations Control/Regulated Entrance Building Return/Exhaust Fan (BL-05L-704).

Return/Exhaust Fan Logic Controller (YIC-05L-010) provides START/STOP control for Return/Exhaust Fan (BL-05L-704). YIC-05L-010 is interlocked with YIC-05K-004. YIC-05L-010 activates Variable Inlet Vane (VV-05L-704) through solenoid valve YY-05L-010. If VV-05L-704 does not open, then YIC-05L-010 alarms (ZAL), stops Motor (MT-05L-704) and sends signal to YIC-05K-004 to stop Motor (MT-05K-703).

Pressure differential indicator PDI-05L-008 indicates the pressure drop across the Return/Exhaust Fan (BL-05L-704). Low pressure differential is alarmed (PDAL-05L-008) and interlocked with YIC-05L-010.

Pressure indicating controller PIC-05L-009 modulates Variable Inlet Vane (VV-05L-704) of the Return/Exhaust Fan (BL-05L-704) to maintain Return/Exhaust duct pressure. High/Low pressures are alarmed (PAH/PAL).

12.1.3 Operations Supplies (Room 102)/Day Shift Operations (Room 104)/Receiving (Room 122)

The following controls are described for the Operations Supplies (Room 102)/ Day Shift Operations (Room 104)/Receiving (Room 122). Similar controls are provided for other zones in the Operations Control/Regulated Entrance Building. The corresponding associated controls are shown on HVAC Flow and Control Diagram H-2-129861, Sheet 2.

Local temperature indicating controller TIC-05K-101 modulates the electric power controller JC-05K-101 of the Electric Duct Heater (EH-05K-101) to maintain the set temperature (TBD)°F in the Operations Supplies Room/Day Shift Operations Room/Receiving Room. The multistep Electric Duct Heater power controller JC-05K-101 is furnished with Electric Duct Heater (EH-05K-101) and includes a multistage step controller and a modulating Silicon Controlled Rectifier (SCR) to provide modulating control between each successive stage. Low airflow and high heater temperature cutouts are also included.

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12.1.4 Exhaust Fan (BL-05L-702)

Exhaust Fan (BL-05L-702) exhausts the air from the Lunch Room (Room 103) in the Operations Control/Regulated Entrance Building.

The Exhaust Fan (BL-05L-702) and its associated controls are described below. The corresponding associated controls are shown on HVAC Flow and Control Diagram H-2-129861, Sheet 2.

Hand indicating switch HIS-05L-351 provides START/STOP control for Exhaust Fan (BL-05L-702).

12.1.5 Exhaust Fan (BL-05L-703)

Exhaust Fan (BL-05L-703) exhausts the air from the Clean Blues (Room 123), Soiled Blues (Room 124), and the Clean SWP (Room 125) in the Operations Control/Regulated Entrance Building.

The Exhaust Fan (BL-05L-703) and its associated controls are described below. The corresponding associated controls are shown on HVAC Flow and Control Diagram H-2-129861, Sheet 2.

Hand indicating switch HIS-05L-352 provides START/STOP control for Exhaust Fan (BL-05L-703).

12.1.6 Exhaust Fan (BL-05L-705)

Exhaust Fan (BL-05L-705) exhausts the air from the Men's and Women's Clean Change Rooms (Room 120) and (Room 119) respectively in the Operations Control/Regulated Entrance Building.

The Exhaust Fan (BL-05L-705) and its associated controls are described below. The corresponding associated controls are shown on HVAC Flow and Control Diagram H-2-129861, Sheet 2.

Hand indicating switch HIS-05L-304 provides START/STOP control for Exhaust Fan (BL-05L-705).

12.1.7 Filter Plenum (PF-05M-701)

Filter Plenum (PF-05M-701) filters the intake air to Air Handling Units (AH-05M-701 and 702) and consists of a Pre-filter and a HEPA filter.

Filter Plenum (PF-05M-701) and its associated controls are described below. The corresponding associated controls are shown on HVAC Flow and Control Diagram H-2-129862, Sheet 1.

Pressure Differential Indicators (PDI-05M-411 and 412) indicate pressure differential across the Pre-filter and the HEPA filter, respectively. High/Low pressure differential is alarmed (PDAH/PDAL).

Hand indicating switch HIS-05M-413A is used to select the NORMAL or EMERG. position of Automatic Isolation Dampers DI-05M-001, 002, 003, and 004. When emergency conditions exist, the outside air Automatic Isolation Dampers DI-05M-001 and DI-05M-004 are closed and Automatic Isolation Dampers DI-05M-002 and DI-05M-003 are opened. This allows the outside air to pass through PF-05M-701.

12.1.8 Control Rooms Air Handling Units (AH-05M-701 and 702)

Air Handling Units (AH-05M-701 and 702) supply conditioned air to the Control Rooms and Computer Rooms 112, 113, 114, 115, 116, 138, 139, 140, and Elec. Inst. Shop (Room 111) located in the Operations Control/Regulated Entrance Building. Only one of these two 100% AHUs is operated; the other one serves as a standby AHU. Air Handling Unit (AH-05M-701) and its associated controls are described below. The

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operation of AH-05M-702 is similar. The corresponding associated controls are shown on HVAC Flow and Control Diagram H-2-129862, Sheet 1.

Control Rooms AHU Fan Logic Controller (YIC-05M-402) provides START/STOP control for Supply Fan (BL-05M-701) in the MANUAL mode. In the AUTO mode, BL-05M-701 is started and stopped with a signal from the Control/Computer Rooms AHU Fan Select Control Program (YCP-05M-010).

1. Upon signal from YCP-05M-010, YIC-05M-402 starts Motor (MT-05M-701). YIC-05M-402 activates chilled water control valve TV-05M-404 through solenoid valve YY-05M-402.

2. After a set period of time, if pressure differential is not established (PDAL-05M-403), YIC-05M-402 stops Motor (MT-05M-701), and sends signal to YCP-05M-010 to start the standby Supply Fan (BL-05M-702) through YIC-05M-406.

Pressure differential indicator PDI-05M-401 indicates pressure differential across the Pre-filter. High pressure differential is alarmed (PDAH).

Pressure Differential indicator PDI-05M-409 indicates pressure differential across the High Efficiency Filter. High pressure differential is alarmed (PDAH).

Pressure differential indicator PDI-05M-403 indicates pressure differential across the fan. Low pressure differential is alarmed (PDAL-05M-403) and interlocked with YIC-05M-402.

Temperature indicating controller TIC-05M-404 modulates chilled water control valve TV-05M-404 to the AHU Cooling Coil (CO-05M-701) to maintain set discharge air temperature (TBD)°F. High temperature is alarmed (TAH).

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12.1.9 Air Conditioning Units (AC-05M-701 and 702)

Air Conditioning Units (AC-05M-701 and 702) maintain temperature in the Computer Room (Room 140). The corresponding associated controls are described below and are shown on HVAC Flow and Control Diagram H-2-129862, Sheet 2.

Only one of these two 100% Air Conditioning Units is operated; the other serves as a standby Air Conditioning Unit. Each of the units has associated self-contained controls and 100% capacity. Malfunction of each Air Conditioning Unit is alarmed (UA-05M-514 and 515 respectively). Switch over to the alternate unit is performed locally. Heating of the room is accomplished by introducing a small volume of supply air from the Air Handling Unit (AH-05M-701 or 702), which air is heated by Electric Duct Heater (EH-05M-001).

Temperature indicator TI-05M-516 monitors Computer Room (Room 140) temperature. High temperature is alarmed (TAH).

12.1.10 Programming Room (Room 112)

The following indicators, alarms, and controls are described for the Programming Room supply air. Similar supply air indicators, alarms, and controls are provided for the Elec. Inst. Shop (Room 111), Computer Storage (Room 138), Computer Software

Room (Room 139), Crane Control Room (Room 115), Operator Station Central Control Room (Room 113), Supervisor Station Central Control Room (Room 114), and Health Protection Control Room (Room 116). The corresponding associated controls are shown on HVAC Flow and Control Diagram H-2-129862, Sheets 2 and 3.

Temperature indicating controller TIC-05M-501 modulates the electric power controller JC-05M-501 of Electric Duct Heater (EH-05M-002) to maintain the set temperature (TBD)°F in the Programming Room and the Elec. Inst. Shop. High temperature is alarmed (TAH). The multistep electric heater power controller JC-05M-501 is furnished with Electric Duct Heater (EH-05M-002) and includes a multi-stage step controller and a modulating Silicon Controlled Rectifier (SCR) to provide modulating control between each successive stage. Low airflow and high heater temperature cutouts are also included.

12.1.11 Air Handling Unit (AH-05K-705)

Air Handling Unit (AH-05K-705) supplies conditioned air to the HVAC Equipment Room (Room 200) and Canister Staging (Room 141). Air Handling Unit (AH-05K-705) and its associated controls are described below. The corresponding associated controls are shown on HVAC Flow and Control Diagram H-2-129863.

HVAC Equipment Room Supply Fan Logic Controller (YIC-05K-705) provides START/STOP control for Supply Fan (BL-05K-705). It is interlocked with low-low temperature alarm (TALL-05K-701) from temperature indicating controller TIC-05K-701 which controls the AHU mixed air temperature.

Equipment Room AHU Evaporative Cooler Logic Controller (YIC-05K-704) provides START/STOP control for Evaporative Cooler (EC-05K-705) in the MANUAL mode. In the AUTO mode, EC-05K-705 is started by the high temperature alarm (TAH-05K-703) and reset (stopped) by low temperature alarm TAL-05K-703 from the Equipment Room Temperature Indicating Controller (TIC-05K-703). YIC-05K-704 is interlocked with YIC-05K-705.

Equipment Room Temperature Indicating Controller (TIC-05K-703) controls heating and cooling of the HVAC Equipment Room. When the room temperature is above (TBD)°F, high temperature alarm TAH-05K-703 starts the Evaporative Cooler (EC-05K-705) through YIC-05K-704 to provide cooling. EC-05K-705 is stopped by TAL-05K-703. When temperature is between (TBD)°F and (TBD)°F, cooling or heating is not provided. Heating is controlled to maintain a minimum room temperature with a set point of (TBD)°F. TIC-05K-703 controls the power controller JC-05K-703. The multistep electric heater power controller JC-05K-703 is furnished with Electric Heating Coil (HG-05K-705) and includes a multi-stage step controller and a modulating Silicon Controlled Rectifier (SCR) to provide modulating control between each successive stage. Low airflow and high heater temperature cutouts are also included.

Temperature indicating controller TIC-05K-701 controls AHU mixed air temperature at a setpoint of (TBD)°F by modulating the outside air Control Damper (DN-05K-705A) and return air Control Damper (DN-05L-705B). Low temperature is alarmed (TAL) and low-low temperature (TALL-05K-701) is interlocked with YIC-05K-705 to stop BL-05K-705. A mechanical stop is installed on DN-05K-705A to provide (TBD) percent minimum outside air for room pressurization.

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Pressure differential indicator PDI-05K-702 indicates the Pre-filter pressure drop. High pressure differential is alarmed (PDAH).

Pressure differential indicator PDI-05K-706 indicates the Supply Fan (BL-05K-705) pressure differential. Low pressure differential is alarmed (PDAL).

Temperature indicator TI-05K-707 indicates the AHU average discharge air temperature. High/low temperatures are alarmed (TAH/TAL).

12.2 INFREQUENT NORMAL OPERATIONS

12.2.1 System Start-Up

(TBD in Detailed Design)

12.3 ABNORMAL CONDITIONS

(TBD in Detailed Design)

13.0 CONTROL PROGRAM SPECIFICATIONS

Control Program Specifications are documented in the DCS Specification. Tag Numbers and Control Program names are listed below:

13.1 YCP-05M-010 Control/Computer Rooms AHU Fan Select Control Program

14.0 LOGIC CONTROLLER SPECIFICATIONS

Logic Controller Specifications are to be documented during Detailed Design. Tag Numbers and Logic Controller Program names only are listed below:

14.1	YIC-05K-004	AHU Supply Fan Logic Controller
14.2	YIC-05L-010	Return/Exhaust Fan Logic Controller
14.3	YIC-05M-402	Control Rooms AHU Fan Logic Controller. Logic for Control Rooms AHU Fan Logic Controller YIC-05M-406 is similar
14.4	YIC-05K-704	Equipment Room AHU Evaporative Cooler Logic Controller
14.5	YIC-05K-705	HVAC Equipment Room Supply Fan Logic Controller
14.6	YIC-05M-406	Control Rooms AHU Fan Logic Controller

15.0 SPECIAL ANALOG FUNCTIONS

(Not Applicable)

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16.0 ACRONYMS

ACRONYM	TERM
AHU	Air Handling Unit
HVAC	Heating, Ventilating and Air Conditioning
SCR	Silicon Controlled Rectifier

17.0 GLOSSARY

17.1 SYSTEM SPECIFIC TERMS

TAG NUMBER	TERM
YIC-05K-004	AHU Supply Fan Logic Controller
TIC-05K-703	Equipment Room Temperature Indicating Controller
YIC-05K-704	Equipment Room AHU Evaporative Cooler Logic Controller
YIC-05K-705	HVAC Equipment Room Supply Fan Logic Controller
YIC-05L-010	Return/Exhaust Fan Logic Controller
YCP-05M-010	Control/Computer Rooms AHU Fan Select Control Program
YIC-05M-402	Control Rooms AHU Fan Logic Controller
YIC-05M-406	Control Rooms AHU Fan Logic Controller

18.0 REFERENCE LIST

18.1 DOCUMENTS AND EQUIPMENT COVERED BY THIS PCD

SYS NO.	DESCRIPTION	EQUIPMENT NUMBER	P&ID H-2-XXXXXX-XX
05K	Electric Duct Heater	EH-05K-101	129861-2
05K	Electric Duct Heater	EH-05K-102	129861-2
05K	Electric Duct Heater	EH-05K-103	129861-2
05K	Electric Duct Heater	EH-05K-104	129861-2
05K	Electric Duct Heater	EH-05K-105	129861-2
05K	Electric Duct Heater	EH-05K-106	129861-2
05K	Electric Duct Heater	EH-05K-107	129861-2
05K	Air Handling Unit	AH-05K-703	129861-1
05K	Supply Fan	BL-05K-703	129861-1
05K	Cooling Coil	CO-05K-703	129861-1
05K	Motor	MT-05K-703	129861-1
05K	Variable Inlet Vane	VV-05K-703	129861-1
05K	Outside Air Control Damper	DN-05K-703A	129861-1
05K	Air Handling Unit	AH-05K-705	129863-1
05K	Supply Fan	BL-05K-705	129863-1
05K	Evaporative Cooler	EC-05K-705	129863-1
05K	Electric Heating Coil	HG-05K-705	129863-1
05K	Motor	MT-05K-705A	129863-1
05K	Motor	MT-05K-705B	129863-1
05K	Return Air Control Damper	DN-05L-703B	129861-1
05L	Exhaust Air Control Damper	DN-05L-703C	129861-1
05L	Exhaust Fan	BL-05L-702	129862-2
05L	Motor	MT-05L-702	129862-2
05L	Exhaust Fan	BL-05L-703	129862-2
05L	Motor	MT-05L-703	129862-2
05L	Return/Exhaust Fan	BL-05L-704	129861-1

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18.1 DOCUMENTS AND EQUIPMENT COVERED BY THIS PCD (Continued)

SYS NO.	DESCRIPTION	EQUIPMENT NUMBER	P&ID H-2-XXXXXX-XX
05L	Motor	MT-05L-704	129861-1
05L	Variable Inlet Vane	VV-05L-704	129861-1
05L	Exhaust Fan	BL-05L-705	129861-2
05L	Motor	MT-05L-705	129861-2
05K	Outside Air Control Damper	DN-05K-705A	129863-1
05K	Return Air Control Damper	DN-05L-705B	129863-1
05M	Automatic Isolation Damper	DI-05M-001	129862-1
05M	Automatic Isolation Damper	DI-05M-002	129862-1
05M	Automatic Isolation Damper	DI-05M-003	129862-1
05M	Automatic Isolation Damper	DI-05M-004	129862-1
05M	Electric Duct Heater	EH-05M-001	129862-2
05M	Electric Duct Heater	EH-05M-002	129862-2
05M	Electric Duct Heater	EH-05M-003	129862-3
05M	Electric Duct Heater	EH-05M-004	129862-3
05M	Electric Duct Heater	EH-05M-005	129862-3
05M	Air Conditioning Unit	AC-05M-701	129862-2
05M	Air Handling Unit	AH-05M-701	129862-1
05M	Supply Fan	BL-05M-701	129862-1
05M	Cooling Coil	CO-05M-701	129862-1
05M	Motor	MT-05M-701	129862-1
05M	Filter Plenum	PF-05M-701	129862-1
05M	Air Conditioning Unit	AC-05M-702	129862-2
05M	Air Handling Unit	AH-05M-702	129862-1
05M	Supply Fan	BL-05M-702	129862-1
05M	Cooling Coil	CO-05M-702	129862-1
05M	Motor	MT-05M-702	129862-1

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19.0

(This section not used)

20.0

(This section not used)

21.0

(This section not used)

22.0 OPERATING DESCRIPTION NARRATIVE - MANIPULATOR REPAIR BUILDING HVAC SUPPLY SYSTEM 05P; MANIPULATOR REPAIR BUILDING HVAC EXHAUST SYSTEM 05Q

22.1 ROUTINE OPERATIONS

The Manipulator Repair Building Zone II and Zone III HVAC Systems operate continuously.

22.1.1 Zone II and III Supply Air Handling Unit (AH-05P-701)

Two (2) 100% capacity Air Handling Units (AH-05P-701 and AH-05P-702) supply the Manipulator Repair Building Zone II and Zone III areas. Air Handling Unit (AH-05P-701) and its associated controls are described below. The operation of standby Air Handling Unit (AH-05P-702) is similar. The corresponding associated controls are shown on HVAC Flow and Control Diagram H-2-129851, Sheet 1.

Hand indicating switch HIS-05P-021 opens the inlet control valve of Heat Recovery Coil (HR-05P-701) and the Automatic Isolation Damper (DI-05P-701B).

Temperature indicating controller TIC-05P-005 controls the temperature of AHU discharge air by modulating either chilled water temperature control valve TV-05P-005 for Coiling Coil (CO-05P-701) or power controller JC-05P-005 for Heating Coil (HG-05P-701). High/low temperatures are alarmed (TAH/TAL). The multistep electric heater power controller JC-05P-005 is furnished with Heating Coil (HG-05P-701) and includes a multistage step controller and a modulating Silicon Controlled Rectifier (SCR) to provide modulating control between each successive stage. Low airflow and high heater temperature cutouts are also included.

Pressure differential indicator PDI-05P-003 indicates the Pre-filter pressure drop. High pressure differential is alarmed (PDAH).

Supply air to Zone II and III rooms are maintained by Reheat Coils and room temperature indicating controllers as described in Sections ? and ?

Pressure differential indicator PDI-05P-004 indicates the High Efficiency Filter pressure drop. High pressure differential is alarmed (PDAH).

22.1.2 Zone II and III Supply Fans (BL-05P-711 and BL-05P-712).

Two (2) 100% capacity Supply Fans (BL-05P-711 and BL-05P-712 as standby) supply conditioned air to Zone II and Zone III areas. Supply Fan (BL-05P-711) and its associated controls are described below. The operation of standby Supply Fan (BL-05P-712) is similar. The corresponding associated controls are shown on HVAC Flow and Control Diagram H-2-129851.

Zone II and III Supply Fan Logic Controller (YIC-05P-010) provides START/STOP control for Supply Fan (BL-05P-711) in the MANUAL mode. In the AUTO mode, BL-05P-711 is started and stopped with a signal from the Zone II and III Supply Fan Select Control Program (YCP-05P-010).

1) Upon a start signal from YCP-05P-010, YIC-05P-010 activates Variable Inlet Vane (VV-05P-711) through solenoid valve YY-05P-010A and opens Automatic Isolation Damper (DI-05P-711) through solenoid valve YY-05P-010B. If VV-05P-711 or DI-05P-711 do not open after a predetermined time, then YIC-05P-010 alarms (ZAL) and sends a signal to YCP-05P-010 to activate the standby Supply Fan (BL-05P-712). OPEN/CLOSE status of DI-05P-711 is indicated (ZIH/ZIL). CLOSE status of VV-05P-711 is also indicated.

2) Upon start permissive signal from PIC-05Q-258 through YCP-05P-010, YIC-05P-010 starts Motor (MT-05P-711).

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3) After a set period of time, if flow signal is not established from FI-05P-011 or pressure differential from PDI-05P-009 is not established, YIC-05P-010 stops Motor (MT-05P-711), closes VV-05P-711 through YY-05P-010A, and closes DI-05P-711 through YY-05P-010B. YIC-05P-010 sends a signal to YCP-05P-010 to start standby Supply Fan (BL-05P-712) through YIC-05P-016. Low flow is alarmed (FAL).

Motor current indicator II-05P-006A indicates Motor (MT-05P-711) current.

Motor running time indicator KQI-05P-010 indicates running time for Motor (MT-05P-711).

Pressure differential indicator PDI-05P-009 indicates pressure differential across the Supply Fan. Low pressure differential is alarmed (PDAL-05P-009) and interlocks with YIC-05P-010.

Pressure indicating controller PIC-05P-008 controls the Manipulator Repair Building Zone II and III supply air plenum by modulating Variable Inlet Vane of the operating Supply Fan. High/low pressures are alarmed (PAH/PAL).

Flow indicator FI-05P-011 indicates supply airflow to the Manipulator Repair Building Zone II and III areas. Low flow is alarmed (FAL-05P-001) and interlocks with YIC-05P-010.

22.1.3 Zone II Areas

The controls are shown on HVAC Flow and Control Diagram H-2-129852. Zone II areas consist of Repair Shop (Room 107), MSM Decontamination Rooms (Rooms 112, 113), Step Off Pads (Rooms 111, 203, 210, 211, 227), Lag Storage (Room 104), Corridor (Room 204), Monitor Room (Room 206), Decontamination Room (Room 205), Soiled Storage (Room 209), Storage (Room 110), M.S.M. Storage (Room 114), and Vestibule and Passage areas. Zone II areas are kept under negative pressure by pressure indicating controllers PIC-05P-113, PIC-05P-151, PIC-05P-152 and PIC-05P-153, which modulate Control Dampers (DN-05P-002, DN-05P-005, DN-05P-004 and DN-05P-001) respectively. High/low room pressures are alarmed (PAH/PAL).

Temperature indicating controllers TIC-05P-106, 107 and 109 maintain the set temperature in the Zone II rooms by modulating the corresponding electric heater power controllers, JC-05P-106, 107 and 109 for Electric Duct Heaters (EH-05P-005, 004 and 006) respectively. High temperatures are alarmed (TAH).

22.1.4 Zone III Areas

Zone III areas consist of Shop Waste Storage (Room 108), Soiled Storage (Room 106), Clean Storage (Rooms 105, 208), Corridors (Rooms 217, 219), Locker/ Change Rooms (Rooms 213, 214, 218, 220), Men's Room (Room 221), Women's Room (Room 215), H.P. Control (Room 222) and Vestibule (Room 223).

Zone III areas are kept under negative pressure (with respect to Zone IV areas) by pressure indicating controller PIC-05P-118 which modulates the Control Damper (DN-05P-003).

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Temperature indicating controllers TIC-05P-102, 103 and 104 maintain the set temperature in the Zone III rooms by modulating the corresponding electric heater power controllers JC-05P-102 and 103 for Electric Duct Heaters (EH-05P-001, 002 and 003) respectively. High temperatures are alarmed (TAH).

22.1.5 Zone II Exhaust Filter Plenums (PF-05Q-701, 702, 703 and 704); Zone III Exhaust Filter Plenums (PF-05Q-705 and 706)

The following description is for Zone II Exhaust Filter Plenum (PF-05Q-701). The description for the other Filter Plenums is similar. The corresponding associated controls are shown on HVAC Flow and Control Diagram H-2-129853, Sheets 1, 2, and 3.

PDI-05Q-202 indicates pressure drop across the Mist Eliminator. High pressure differential is alarmed (PDAH).

PDI-05Q-203 and PDI-05Q-204 indicate pressure drop across each HEPA filter bank. High/low pressure drop across each filter bank is alarmed (PDAH/PDAL).

PDIC-05Q-205 maintains a preset total pressure drop across both HEPA filter banks by modulating Control Damper (DN-05Q-701). High/low pressure differential is alarmed (PDAH/PDAL).

PI-05Q-210 and 309 indicates pressure at the inlet to the Zone II and III Exhaust Filter Plenums, respectively.

22.1.6 Zone II and III Exhaust Fans (BL-05Q-711 and 712)

Two (2) 100% capacity fans, Zone II and III Exhaust Fan (BL-05Q-711 and BL-05Q-712 as standby) exhaust Zone II and III air from the Manipulator Repair Building to the Vitrification Building Zone II and III Exhaust Stack. Exhaust Fan (BL-05Q-711) and its associated controls are described below. The operation of the other Exhaust Fan is similar. The corresponding associated controls are shown on HVAC Flow and Control Diagram H-2-129853, Sheet 4.

Zone II and III Exhaust Fan Logic Controller (YIC-05Q-402) provides START/STOP control in the MANUAL mode. In the AUTO mode, BL-05Q-711 is started and stopped by Zone II and III Exhaust Fan Select Control Program (YCP-05Q-010).

1) Upon a start signal from YCP-05Q-010, YIC-05Q-402 activates variable Inlet Vane (VV-05Q-711) through solenoid valve YY-05Q-402A and opens Automatic Isolation Damper (DI-05Q-711) through solenoid valve YY-05Q-402B. If VV-05Q-711 or DI-05Q-711 does not open, then YIC-05Q-402 sends signal to YCP-05Q-010 to activate the standby Exhaust Fan (BL-05Q-712) through YIC-05Q-406.

2) When isolation damper sequence is completed, YIC-05Q-402 starts Motor (MT-05Q-711).

3) After a set period of time, if flow is not established from FI-05Q-403, or pressure differential is not established from PDI-05Q-401, YIC-05Q-402 stops Motor (MT-05Q-711), closes DI-05Q-711, deactivates VV-05Q-711, and sends signal to YCP-05Q-010 to start standby Exhaust Fan (BL-05Q-712) through YIC-05Q-406.

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4) OPEN/CLOSE position of DI-05Q-711 is indicated (ZIH/ZIL). CLOSE position of VV-05Q-711 is indicated (ZIL). Also, CLOSE position is alarmed (ZAL).

Motor current indicator II-05Q-404A indicates Motor (MT-05Q-711) current.

Motor running time indicator KQI-05Q-402 indicates running time for Motor (MT-05Q-711).

Pressure differential across the Exhaust Fan is indicated by PDI-05Q-401. Low pressure differential is alarmed (PDAL-05Q-401) and is interlocked with YIC-05Q-402.

Flow indicator FI-05Q-403 measures flow in discharge duct of the fan. Low flow is alarmed (FAL-05Q-403) and is interlocked with YIC-05Q-402.

Pressure indicating controller PIC-05Q-258 controls the Manipulator Repair Building Zone II and III exhaust air plenum by modulating Variable Inlet Vane (VV-05Q-711) of the Exhaust Fan. High pressure is alarmed (PAH).

The Exhaust Fan inner bearing temperature and fan outer bearing temperature are indicated by TI-05Q-411 and 413, respectively. High bearing temperatures are alarmed (TAH). The fan inner and outer bearing temperatures are indicated locally by TIT-05Q-411 and 413, respectively.

Fan inner bearing vibration is locally monitored (XIA-05Q-412A). Fan outer bearing vibration is locally monitored XIA-05Q-412B. Common vibration alarm switch XSH-05Q-412 provides common vibration monitor alarm XAH-05Q-412.

22.1.7 Zone IV HVAC Equipment Room Air Handling Unit (AH-05P-703)

The Manipulator Repair Building Zone IV HVAC System operates continuously to maintain the HVAC Equipment Room (Room 301) temperature of (TBD)°F.

Air Handling Unit (AH-05P-703) supplies conditioned air to the Zone IV HVAC Equipment Room (Room 301). Air Handling Unit (AH-05P-703) and its associated controls are described below. The corresponding associated controls are shown on HVAC Flow and Control Diagram H-2-129854.

Equipment Room AHU Supply Fan Logic Controller (YIC-05P-605) provides START/STOP control for Supply Fan (BL-05P-703). It is interlocked with low-low temperature alarm TALL-05P-601 from temperature indicating controller TIC-05P-601 which controls the AHU outside air temperature.

Equipment Room AHU Evaporative Cooler Logic Controller (YIC-05P-604) provides START/STOP control for Evaporative Cooler (EC-05P-703) in the MANUAL mode. In the AUTO mode, EC-05P-703 is started by the high temperature alarm TAH-05P-603 and reset (stopped) by low temperature alarm TAL-05P-603 from the Equipment Room Temperature Indicating Controller (TIC-05P-603).

Equipment Room Temperature Indicating Controller (TIC-05P-603) controls heating and cooling of the HVAC Equipment Room. When the room temperature is above 85 °F, high temperature alarm TAH-05P-603 starts the Evaporative Cooler (EC-05P-703) via YIC-05P-604, to provide cooling. EC-05P-703 is stopped by TAL-05P-603. When the HVAC Equipment Room temperature is between 85 °F and 65 °F, cooling or heating is

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not provided. Heating is controlled to maintain a minimum room temperature with a set point of 65°F. TIC-05P-603 modulates power controller JC-05P-603 for the Electric Heating Coil (HG-05P-703). High-high temperature is alarmed (TAHH).

The multistage electric heater power controller JC-05P-603 is furnished with the Heating Coil (HG-05P-703) and includes a multistage step controller and a modulating Silicon Controlled Rectifier (SCR) to provide modulating control between each successive stage. Low airflow and high heater temperature cutouts are also included.

Temperature indicating controller TIC-05P-601 controls the AHU outside air temperature at a setpoint of (TBD)°F by modulating the Outside Air Control Damper (DN-05P-703B). Low temperature is alarmed (TAL) and low-low temperature (TALL-05P-601) is interlocked with YIC-05P-605 to stop BL-05P-703. A mechanical stop is installed on DN-05P-703B to provide for (TBD) percent minimum outside air for room pressurization.

Pressure differential indicator PDI-05P-602 indicates the Pre-filter pressure drop. High pressure differential is alarmed (PDAH).

Pressure differential indicator PDI-05P-606 indicates the Supply Fan (BL-05P-703) pressure differential. Low pressure differential is alarmed (PDAL).

Temperature indicator TI-05P-607 indicates the AHU average discharge temperature. High/low temperatures are alarmed (TAH/TAL).

22.1.8 Zone IV Supply Air Handling Unit (AH-05P-704 and 705)

Air Handling Units (AH-05P-704 and 705) supply pre-filtered air to the Canister Loadout (Room 117) and S.C.T. Washdown (Room 116) located in the Manipulator Repair Building. Only one of these two 100% AHUs is operated; the other one serves as a standby AHU. Air Handling Unit (AH-05P-704) and its associated controls are described below. The operation of AH-05P-705 is similar. The corresponding associated controls are shown on HVAC Flow and Control Diagram H-2-129854.

Canister Loadout/S.C.T. Washdown AHU Supply Fan Logic Controller (YIC-05P-652) provides START/STOP control for Supply Fans (BL-05P-704 and 705) and Exhaust Fans (BL-05Q-001, 002, 003 and 004). Only one Supply Fan can run at one time.

Canister Loadout/S.C.T. Washdown Temperature Indicating Controller (TIC-05P-651) controls heating of the Canister Loadout and S.C.T. Washdown Rooms. Heating is controlled to maintain a minimum room temperature in the Canister Loadout Room with a set point of (TBD) °F. TIC-05P-651 modulates power controller JC-05P-651 for Electric Duct Heater (EH-05P-007). High/low temperatures are alarmed (TAH/TAL).

The multistage electric heater power controller JC-05P-651 is furnished with the Electric Duct Heater (EH-05P-007) and includes a multistage step controller and a modulating Silicon Controlled Rectifier (SCR) to provide modulating control between each successive stage. Low airflow and high heater temperature cutouts are also included.

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22.1.9 Unit Heater (UH-05P-001, 002, 003 and 004)

Unit Heater (UH-05P-001 and 002) provide heating for S.C.T. Washdown (Room 116). Local temperature indicating controllers TIC-05P-610 and 611 control Unit Heaters (UH-05P-001 and 002) respectively.

Unit Heater (UH-05P-003 and 004) provide heating for the Canister Loadout (Room 117). Local temperature indicating controllers TIC-05P-653 and 654 control Unit Heaters (UH-05P-003 and 004) respectively.

22.2 INFREQUENT NORMAL OPERATIONS

22.2.1 System Start-Up

(TBD in Detailed Design)

22.3 ABNORMAL CONDITIONS

(TBD in Detailed Design)

23.0 CONTROL PROGRAM SPECIFICATIONS

Control Program Specifications are to be documented in Detailed Design. Tag Numbers and Control Program names are listed below:

23.1 YCP-05P-010 Zone II and III Supply Fan Select Control Program

23.2 YCP-05Q-010 Zone II and III Exhaust Fan Select Control Program

24.0 LOGIC CONTROLLER SPECIFICATIONS

Logic Controller Specifications are documented in the DCS Specification. Tag Numbers and Logic Controller Program names only are listed below:

24.1 YIC-05P-010 Zone II and III Supply Fan Logic Controller. Logic for Zone II and III Supply Fan Logic Controller YIC-05P-016 is similar.

24.2 YIC-05P-604 Equipment Room AHU Evaporative Cooler Logic Controller

24.3 YIC-05P-605 Equipment Room AHU Supply Fan Logic Controller

24.4 YIC-05Q-402 Zone II and III Exhaust Fan Logic Controller. Logic for Zone II and III Exhaust Fan Logic Controller YIC-05Q-406 is similar.

24.5 YIC-05P-016 Zone II and III Supply Fan Logic Controller

24.6 YIC-05Q-406 Zone II and III Exhaust Fan Logic Controller

24.7 YIC-05P-652 Canister Loadout/S.C.T. Washdown AHU Supply Fan Logic Controller

25.0 SPECIAL ANALOG FUNCTIONS

(Not Applicable to System 05P and 05Q)

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26.0 ACRONYMS

ACRONYM	TERM
AHU	Air Handling Unit
HEPA	High Efficiency Particulate Air
HVAC	Heating, Ventilating and Air Conditioning
SCR	Silicon Controlled Rectifier

27.0 GLOSSARY

27.1 SYSTEM SPECIFIC TERMS

TAG NUMBER	TERM
YCP-05P-010	Zone II and III Supply Fan Select Control Program
YIC-05P-010	Zone II and III Supply Fan Logic Controller
YIC-05P-016	Zone II and III Supply Fan Logic Controller
TIC-05P-603	Equipment Room Temperature Indicating Controller
YIC-05P-604	Equipment Room AHU Evaporative Cooler Logic Controller
YIC-05P-605	Equipment Room AHU Supply Fan Logic Controller
TIC-05P-651	Canister Loadout/S.C.T. Washdown Temperature Indicating Controller
YIC-05P-652	Canister Loadout/S.C.T. Washdown AHU Supply Fan Logic Controller
YCP-05Q-010	Zone II and III Exhaust Fan Select Control Program
YIC-05Q-402	Zone II and III Exhaust Fan Logic Controller
YIC-05Q-406	Zone II and III Exhaust Fan Logic Controller

28.0 REFERENCE LIST

28.1 DOCUMENTS AND EQUIPMENT COVERED BY THIS PCD

SYS NO.	DESCRIPTION	EQUIPMENT NUMBER	P&ID H-2-XXXXXX-XX
05P	Control Damper	DN-05P-001	129852-1
05P	Control Damper	DN-05P-002	129852-1
05P	Control Damper	DN-05P-003	129852-1
05P	Control Damper	DN-05P-004	129852-1
05P	Control Damper	DN-05P-005	129852-1
05P	Electric Duct Heater	EH-05P-001	129852-1
05P	Electric Duct Heater	EH-05P-002	129852-1
05P	Electric Duct Heater	EH-05P-003	129852-1
05P	Electric Duct Heater	EH-05P-004	129852-1
05P	Electric Duct Heater	EH-05P-005	129852-1
05P	Electric Duct Heater	EH-05P-006	129852-1
05P	Electric Duct Heater	EH-05P-007	129854-1
05P	Unit Heater	UH-05P-001	129854-1
05P	Unit Heater	UH-05P-002	129854-1
05P	Unit Heater	UH-05P-003	129854-1
05P	Unit Heater	UH-05P-004	129854-1
05P	Air Handling Unit	AH-05P-701	129851-1
05P	Cooling Coil	CO-05P-701	129851-1
05P	Heating Coil	HG-05P-701	129851-1
05P	Heat Recovery Coil	HR-05P-701	129851-1
05P	Air Handling Unit	AH-05P-702	129851-1
05P	Cooling Coil	CO-05P-702	129851-1

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28.1 DOCUMENTS AND EQUIPMENT COVERED BY THIS PCD (Continued)

SYS NO.	DESCRIPTION	EQUIPMENT NUMBER	P&ID H-2-XXXXXX-XX
05P	Heating Coil	HG-05P-702	129851-1
05P	Heat Recovery Coil	HR-05P-702	129851-1
05P	Air Handling Unit	AH-05P-703	129854-1
05P	Supply Fan	BL-05P-703	129854-1
05P	Evaporative Cooler	EC-05P-703	129854-1
05P	Heating Coil	HG-05P-703	129854-1
05P	Pump	PX-05P-703	129854-1
05P	Control Damper	DN-05P-703A	129854-1
05P	Motor	MT-05P-703A	129854-1
05P	Control Damper	DN-05P-703B	129854-1
05P	Motor	MT-05P-703B	129854-1
05P	Supply Fan	BL-05P-711	129851-1
05P	Automatic Isolation Damper	DI-05P-711	129851-1
05P	Motor	MT-05P-711	129851-1
05P	Variable Inlet Vane	VV-05P-711	129851-1
05P	Supply Fan	BL-05P-712	129851-1
05P	Automatic Isolation Damper	DI-05P-712	129851-1
05P	Motor	MT-05P-712	129851-1
05P	Variable Inlet Vane	VV-05P-712	129851-1
05Q	Supply Fan	BL-05Q-001	129854-1
05Q	Supply Fan	BL-05Q-002	129854-1
05Q	Supply Fan	BL-05Q-003	129854-1
05Q	Supply Fan	BL-05Q-004	129854-1
05Q	Control Damper	DN-05Q-701	129853-1
05Q	Heat Recovery Coil	HR-05Q-701	129853-4
05Q	Filter Plenum	PF-05Q-701	129853-1
05Q	Control Damper	DN-05Q-702	129853-1
05Q	Heat Recovery Coil	HR-05Q-702	129853-4
05Q	Filter Plenum	PF-05Q-702	129853-1
05Q	Control Damper	DN-05Q-703	129853-2
05Q	Filter Plenum	PF-05Q-703	129853-2
05Q	Control Damper	DN-05Q-704	129853-2
05Q	Filter Plenum	PF-05Q-704	129853-2
05Q	Control Damper	DN-05Q-705	129853-3
05Q	Filter Plenum	PF-05Q-705	129853-3
05Q	Control Damper	DN-05Q-706	129853-3
05Q	Filter Plenum	PF-05Q-706	129853-3
05Q	Exhaust Fan	BL-05Q-711	129853-4
05Q	Automatic Isolation Damper	DI-05Q-711	129853-4
05Q	Motor	MT-05Q-711	129853-4
05P	Variable Inlet Vane	VV-05Q-711	129853-4
05Q	Exhaust Fan	BL-05Q-712	129853-4
05Q	Motor	MT-05Q-712	129853-4
05P	Variable Inlet Vane	VV-05Q-712	129853-4
05Q	Automatic Isolation Damper	DI-05Q-712	129853-4

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29.0

(This section not used)

30.0

(This section not used)

31.0

(This section not used)

32.0 OPERATING DESCRIPTION NARRATIVE
FRIT STORAGE/COLD CHEMICAL and MECH./ELECT. SERVICES BUILDINGS
SUPPLY HVAC SYSTEM 05R
FRIT STORAGE/COLD CHEMICAL and MECH./ELECT. SERVICES BUILDINGS
EXHAUST HVAC SYSTEM 05S

32.1 ROUTINE OPERATIONS

32.1.1 Frit Storage/Cold Chemical Building
Air Handling Unit (AH-05R-704)

Air Handling Unit (AH-05R-704) supplies conditioned air to the Frit Storage Area (Room 106), Slurry Preparation Area (Room 107), Formic Acid Transfer Pump Room (Room 003), Cold Chemical Area (Room 100), Cold Chemical HVAC Room(Room 104), and Analytical Lab (Room 101) in the Frit Storage/Cold Chemical Building. The corresponding associated controls are shown on HVAC Flow and Control Diagram H-2-129871.

Chemical Storage AHU Supply Fan Logic Controller (YIC-05R-004) provides START/STOP control for Supply Fan (BL-05R-704). It is interlocked with low pressure differential alarm (PDAL-05R-005).

The AHU Evaporative Cooler Logic Controller (YIC-05R-003) provides START/STOP control for Evaporative Cooler (EC-05R-704) in the MANUAL mode. In the AUTO mode, EC-05R-704 is started by the high temperature alarm TAH-05R-002 and reset (stopped) by low temperature alarm TAL-05R-002 from temperature indicating controller TIC-05R-002.

The Supply Air Temperature Indicating Controller (TIC-05R-002) controls heating and cooling of the Chemical Storage Areas. When the supply air temperature is above (TBD)°F, high temperature alarm TAH-05R-002 starts the Evaporative Cooler (EC-05R-704) via YIC-05R-003 to provide cooling. EC-05R-704 is stopped by TAL-05R-002. High-high temperature is alarmed (TAHH). When the temperature is between (TBD)°F and (TBD)°F, cooling or heating is not provided. Heating is controlled to maintain a minimum supply air temperature with a set point of (TBD)°F. TIC-05R-002 controls the power controller JC-05R-002. The multistep electric heater power controller JC-05R-002 is furnished with Electric Heating Coil (HG-05R-704) and includes a multistage step controller and a modulating Silicon Controlled Rectifier (SCR) to provide modulating control between each successive stage. Low airflow and high heater temperature cutouts are also included.

Pressure differential indicator PDI-05R-001 indicates the filter pressure drop across the Pre-filter of AH-05R-704. High pressure differential is alarmed (PDAH).

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Pressure differential indicator PDI-05R-005 indicates the Supply Fan (BL-05R-704) pressure differential. Low pressure differential is alarmed (PDAL).

Motor current indicator II-05R-024A indicates Motor (MT-05R-704A) current.

32.1.2 Frit Storage/Cold Chemical Building Exhaust Fans (BL-05S-704 through 707).

Exhaust Fans (BL-05S-704 through 707) exhaust room air from the Frit Storage/Cold Chemical Building. The operation of Exhaust Fan BL-05S-704 is described below. The operation of Exhaust Fans BL-05S-705 through BL-05S-707 is similar. The corresponding associated controls are shown on HVAC Flow and Control Diagram H-2-129871.

Exhaust Fan (BL-05S-704) exhausts the room air from the Cold Chemical HVAC Room (Room 104). Hand indicating switch HIS-05S-013 is used to START and STOP Motor (MT-05S-704). Pressure differential indicator PDI-05S-014 indicates the Exhaust Fan (BL-05S-704) pressure differential. Low pressure differential is alarmed (PDAL).

32.1.3 Frit Storage/Cold Chemical Building Unit Heaters (UH-05R-701 and 702)

Unit Heaters (UH-05R-701 and 702) provide heating for the Cold Chemical HVAC Room (Room 104). Temperature indicating controllers TIC-05R-020 and 021 control Unit Heaters (UH-05R-701 and 702).

32.1.4 Frit Storage/Cold Chemical Building Analytical Lab Air Handling Unit (AH-05R-705)

Air Handling Unit (AH-05R-705) supplies conditioned air to the Analytical Lab (Room 101). The associated controls are shown on HVAC Flow and Control Diagram H-2-129871.

The AHU Fan Logic Controller (YIC-05R-017) provides START/STOP control for the Supply Fan (BL-05R-705). It is interlocked with low pressure differential alarm (PDAL-05R-019).

Temperature indicating controller TIC-05R-016 controls heating and cooling of the Analytical Lab (Room 101). Heating is controlled to maintain a minimum room temperature with a set point of (TBD) °F. The multistep electric heater power controller JC-05R-016 is furnished with Electric Heating Coil (HG-05R-705) and includes a multistage step controller and a modulating Silicon Controlled Rectifier (SCR) to provide modulating control between each successive stage. Low airflow and high heater temperature cutouts are also included. Cooling is provided by the Air Cooled Condensing Unit (CU-05R-705). Cooling is controlled to maintain a maximum room temperature with a set point of (TBD) °F by opening/closing the expansion valve TV-05R-016. The Air Cooled Condensing Unit CU-05R-705 is started and stopped by Logic Controller YIC-05R-017.

Pressure differential indicator PDI-05R-015 indicates the Pre-filter pressure drop. High pressure differential is alarmed (PDAH).

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Pressure differential indicator PDI-05R-019 indicates the Supply Fan (BL-05R-705) pressure differential. Low pressure differential is alarmed (PDAL).

32.1.5 Mech./Elect. Services Building Air Handling Unit (AH-05R-101)

Variable Volume Air Handling Unit (AH-05R-101) supplies conditioned air to the Offices (Rooms 103, 105, 107, 111 and 117), Men's Toilet (Room 110), Women's Toilet (Room 108), Corridor (Rooms 102 and 124), Stairs/Emergency Exits (Rooms 125 and 127), Staging Area (Room 123), Tool Crib (Room 104), Tool Closet (Room 106), Maintenance Shop (Room 101), and Electrical Shop (Room 113) in the Mech./Elect. Services Building. The corresponding associated controls are shown on HVAC Flow and Control Diagram H-2-129721, Sheets 1 thru 6.

Offices AHU Supply Fan Logic Controller (YIC-05R-XXX) provides START/STOP control for the Supply Fan (BL-05R-101). It is interlocked with the following: (1) electric heaters (EH-05R-01, EH-05R-02, and EH-05R-03); (2) toilet exhaust fan (BL-05S-101T); (3) welding exhaust fan (BL-05S-101W); (4) extract fan (BL-05S-101) and; (5) pressure differential alarm (PIC-05R-XXX).

The Office AHU Supply Fan Logic Controller (YIC-05R-XXX) may be overridden by either: (1) a signal from the fire alarm panel which will make the supply fan (BL-05R-101), extract fan (BL-05S-101), toilet exhaust fan (BL-05S-101T) and welding exhaust fan (if running) (BL-05S-101W) stop after a two minute time delay (allowing building evacuation), Fan Power Boxes FPB-05R-01 thru 06 will stop immediately; or (2) the fireman's door switches. The fireman's door switches shall override all other signals to either start or stop the supply fan (BL-05R-101), the extract fan (BL-05S-101), the welding exhaust fan (BL-05R-101W) and Toilet exhaust fan (BL-05R-101T).

Logic Controller (YIC-05R-XXX) provides START/STOP control for the extract fan (BL-05S-101). It is interlocked with Supply Fan BL-05R-101 and starts when supply is operating and stops when supply fan stops. The exception to this is operation under fireman's switch control.

The smoke detector YSH-05R-XXX shall also override DCS signals and stop the following fans two minutes after detecting smoke: supply fan (BL-05R-101); extract fan (BL-05S-101); toilet exhaust fan (BL-05S-101T); welding exhaust fan (BL-05S-101W); and all Fan Power Boxes (FPB-05R-01 thru 06). The smoke detector shall inform the fire panel immediately upon detecting smoke. The smoke detector has a self-diagnosing fault detection system, a "trouble with smoke detector" signal shall be sent to the DCS. A smoke existing condition is alarmed.

The fireman's switch(es), the fire alarm signal and the smoke detector signal shall also immediately override the economizer damper controls and open both the outside air damper DN-05R-101 and exhaust air damper DN-05S-101 and close the recirculation air damper DN-05R-101R. Each signal (or signals) shall also open the supply fan variable volume damper VV-05R-101, the exhaust fan variable volume damper VV-05S-101 and all the variable air volume dampers in each Fan Power Box FPB-05R-01 thru 06. During an ashfall or sand storm event, the system operator shall type "Dust" and all on-site economizer dampers shall go to minimum outside air. Typing "Normal" will make them revert to normal operation.

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Pressure Indicating Controller (PIC-05R-XXX) controls the duct air pressure by modulating the supply air fan variable volume damper (VV-05R-101). Fan pressure is indicated and low pressure is alarmed (PDAL).

Temperature indicating controller (TIC-05R-XXX) controls the discharge duct temperature at TBD°F ± 3°F in three stages: First stage, electric pre-heater (PH-05R-101); second stage, modulating economizer dampers (DN-05R-101, outside air), (DN-05S-101, exhaust air) and (DN-05R-101R, recirculation air); third stage, chilled water control valve TV-05R-306. High/low temperatures are alarmed (TAH/TAL). Outside air temperature sensor TE/TIT-05R-XXX shall override the economizer damper signal when the outside air temperature exceeds 80°F putting the damper into minimum outside ventilation air position. However, whenever the welding extract fan (BL-05S-101W) is operated, the economizer dampers shall open more to accommodate the extra 3400 SCFM exhaust to atmosphere by the welding exhaust fan.

Air Flow Indicating Controller (FIC-05R-XXX) senses the air flow rate in the supply air duct via transmitter (FIT-05R-XXX). It senses if the toilet extract fan (BL-05S-101T) and welding extract fan (BL-05S-101W) are operating and calculates the extract air volume required at Air Flow Transmitter (FIT-05S-XXX). It adjusts the extract variable volume damper VV-05S-101 until the calculated extract air volume is achieved.

Pressure differential indicator PDI-05R-XXX indicates the filter pressure differential pressure drop. High pressure differential is alarmed (PDAH).

Local pressure differential indicators PDI-05R-XXX and PDI-05R-XXX monitors pressure drop across the prefilter and high efficiency filters respectively.

Temperature indicator TI-05R-XXX monitors the mixed air temperature after the Preheater (PH-05R-101). Low temperature is alarmed (TAL).

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32.1.6 Mech./Elect. Services Building (Rooms 101 and 113)

The following operating description is for duct equipment and associated controls supplying conditioned air to Rooms 101 and 113. The corresponding associated controls are shown on HVAC Flow and Control Diagram H-2-129721, Sheet 2.

Temperature indicating controller TIC-05R-XXX maintains set temperature in the Maintenance Shop Room 101 in two stages: (1) The cooling air variable volume damper on FPB-05R-01 modulates from open at 78°F to minimum air flow at 75°F; (2) The Electric Duct Heater on FPB-05R-01 is controlled by modulating the power controller JC-05R-XXX to maintain temperature between 75°F (no heat) and 72°F (maximum heat). A modulating Silicon Controlled Rectifier (SCR) shall be provided to modulate the control between each successive stage. Low airflow and high temperature cutouts are also included.

Local Hand Switch (HS-05R-XXX) provides START/STOP control for the welding exhaust fan (BL-05S-101W). Welding Exhaust Fan Logic Controller (YIC-05R-XXX) is interlocked with flow indicating controller (FIC-05R-XXX). The flow indicating controller reduces the extract fan volume by 3400 SCFM each time the welding exhaust

fan is started and increases the extract fan (BL-05S-101) air volume by 3400 SCFM each time the weld exhaust fan is stopped.

Logic Controller (YIC-05R-XXX) provides START/STOP control for the Fan Power Box motor. It is interlocked with the welding exhaust fan (BL-05S-101W) and starts/stops each time the welding exhaust fan is started/stopped. It is also interlocked with its associated electric reheater such that the reheater only operates when the Fan Power Box motor is operating. Fan Power Box motor is also interlocked via YIC-05R-XXX with Supply Fan (BL-05R-101) and starts each time the supply fan starts. The Fan Power Box can operate when the supply fan is not operating.

Pressure differential indicator PDI-05R-XXX indicates the filter pressure differential pressure drop. High pressure differential is alarmed (PDAH).

Temperature indicating controller TIC-05R-XXX maintains set temperature in the Electrical Shop Room 113 in two stages: (1) The cooling air variable volume damper on FPB-05R-02 modulates from open at 78°F to minimum air flow at 75°F; (2) The Electric Duct Heater on FPB-05R-02 is controlled by modulating the power controller JC-05R-XXX to maintain temperatures between 75°F (no heat) and 72°F (maximum heat). A modulating Silicon Controlled Rectifier (SCR) shall be provided to modulate the control between each successive stage. Low airflow and high temperature cutouts are also included.

Logic Controller (YIC-05R-XXX) provides START/STOP control for the Fan Power Box motor. It is interlocked with its associated electric reheater such that the reheater only operates when the Fan Power Box motor is operating. Fan Power Box motor is also interlocked via YIC-05R-XXX with Supply Fan (BL-05R-101) and starts each time the Supply Fan starts. The Fan Power Box can operate when the supply fan is not operating.

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32.1.7 Mech./Elect. Services Building (Rooms 125, 127, 110 and 108)

The following operating description is for duct equipment and associated controls supplying conditioned air to Rooms 125, 127, 110 and 108. The corresponding associated controls are shown on HVAC Flow and Control Diagram H-2-129721, Sheet 3.

Temperature indicating controller TIC-05R-XXX maintains set temperature in the Stairs Room 125 and 127 by modulating the power controller JC-05R-XXX for Electric Duct Heater (EH-05R-03). High and low temperature are alarmed (TAH/TAL). The multistep electric heater power controller JC-05R-XXX is furnished with Electric Duct Heater (EH-05R-03) and includes a multistage step controller and a modulating Silicon Controlled Rectifier (SCR) to provide modulating control between each successive stage. Low airflow and high temperature cutouts are also included. Temperature Indicating Controller (TIC-05R-XXX) is also interlocked with Supply Fan (BL-05R-101) allowing Electric Heater (EH-05R-03) to operate only when Supply Fan is running.

Temperature indicating controller TIC-05R-XXX maintains set temperature in the Men's Room 110 and Women's Room 108 by modulating the power controller JC-05R-XXX for Electric Duct Heater (EH-05R-01). High and low temperatures are alarmed (TAH/TAL). The multistep electric heater power controller JC-05R-XXX is furnished with Electric Duct Heater (EH-05R-01) and includes a multistage step controller and a modulating

Silicon Controlled Rectifier (SCR) to provide modulating control between each successive stage. Low airflow and high heater temperature cutouts are also included. Temperature Indicating Controller (TIC-05R-XXX) is also interlocked with Supply Fan (BL-05R-101) allowing Electric Heater (EH-05R-01) to operate only when Supply Fan is running.

Temperature indicating controller TIC-05R-XXX is also interlocked via YIC-05R-XXX with Toilet Exhaust Fan (BL-05S-101T) to provide START/STOP fan control.

32.1.8 Mech./Elect. Services Building (Rooms 102, 124, 103 and 117)

The following operating description is for duct equipment and associated controls supplying conditioned air to Rooms 102, 124, 103 and 117. The corresponding associated controls are shown on HVAC Flow and Control Diagram H-2-129721, Sheet 4.

Temperature indicating controller TIC-05R-XXX maintains set temperature in the Corridor Rooms 102 and 124 by modulating the power controller JC-05R-XXX for Electric Duct Heater (EH-05R-02). High and low temperatures are alarmed (TAH/TAL). The multistep electric heater power controller JC-05R-XXX is furnished with Electric Duct Heater (EH-05R-02) and includes a multistage step controller and a modulating Silicon Controlled Rectifier (SCR) to provide modulating control between each successive stage. Low airflow and high heater temperature cutouts are also included. Temperature Indicating Controller (TIC-05R-XXX) is also interlocked with Supply Fan (BL-05R-101) allowing Electric Heater (EH-05R-02) to operate only when Supply Fan is running.

Temperature indicating controller TIC-05R-XXX maintains set temperature in the Office Rooms 103 and 117 in two stages: (1) The cooling air variable volume damper on FPB-05R-06 modulates from open at 78°F to minimum air flow at 75°F; (2) The Electric Duct Heater on FPB-05R-06 is controlled by modulating the power controller JC-05R-XXX to maintain temperatures between 75°F (no heat) and 72°F (maximum heat). A modulating Silicon Controlled Rectifier (SCR) shall be provided to modulate the control between each successive stage. Low airflow and high temperature cutouts are also included.

_____ Logic Controller (YIC-05R-XXX) provides START/STOP control for the Fan Power Box motor. It is interlocked with its associated electric reheater such that the reheater only operates when the Fan Power Box Motor is operating. Fan Power Box motor is also interlocked via YIC-05R-XXX with Supply Fan (BL-05R-101) and starts each time the Supply Fan starts. The Fan Power Box can operate when the supply fan is not operating. The Fan Power Box Motor is also interlocked with the fireman's switch and fire alarm panel and operates as previously described.

32.1.9 Mech./Elect. Services Building (Rooms 105, 107 and 111)

The following operating description is for duct equipment and associated controls supplying conditioned air to Rooms 105, 107, and 111. The corresponding associated controls are shown on HVAC Flow and Control Diagram H-2-129721, Sheet 5.

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Temperature indicating controller TIC-05R-XXX maintains set temperature in the Office Rooms 105, 107 and 111 in two stages: (1) The cooling air variable volume damper on FPB-05R-03 modulates from open at 78°F to minimum air flow at 75°F; (2) The Electric Duct Heater on FPB-05R-03 is controlled by modulating the power controller JC-05R-XXX to maintain temperatures between 75°F (no heat) and 72°F (maximum heat). A modulating Silicon Controlled Rectifier (SCR) shall be provided to modulate the control between each successive stage. Low airflow and high temperature cutouts are also included.

Logic Controller (YIC-05R-XXX) provides START/STOP control for the Fan Power Box motor. It is interlocked with its associated electric reheater such that the reheater only operates when the Fan Power Box Motor is operating. Fan Power Box motor is also interlocked via YIC-05R-XXX with Supply Fan (BL-05R-101) and starts each time the Supply Fan starts. The Fan Power Box can operate when the supply fan is not operating. The Fan Power Box Motor is also interlocked with the fireman's switch and fire alarm panel and operates as previously described.

32.1.10 Mech./Elect. Services Building (Rooms 104, 106 and 123)

The following operating description is for duct equipment and associated controls supplying conditioned air to Rooms 104, 106, and 123. The corresponding associated controls are shown on HVAC Flow and Control Diagram H-2-129721, Sheet 6.

Temperature indicating controller TIC-05R-XXX maintains set temperature in the Tool Crib Room 104 and Tool Closet Room 106 in two stages: (1) The cooling air variable volume damper on FPB-05R-04 modulates from open at 78°F to minimum air flow at 75°F; (2) The Electric Duct Heater on FPB-05R-04 is controlled by modulating the power controller JC-05R-XXX to maintain temperatures between 75°F (no heat) and 72°F (maximum heat). A modulating Silicon Controlled Rectifier (SCR) shall be provided to modulate the control between each successive stage. Low airflow and high temperature cutouts are also included.

Logic Controller (YIC-05R-XXX) provides START/STOP control for the Fan Power Box motor. It is interlocked with its associated electric reheater such that the reheater only operates when the Fan Power Box Motor is operating. Fan Power Box motor is also interlocked via YIC-05R-XXX with Supply Fan (BL-05R-101) and starts each time the Supply Fan starts. The Fan Power Box can operate when the supply fan is not operating. The Fan Power Box Motor is also interlocked with the fireman's switch and fire alarm panel and operates as previously described.

Temperature indicating controller TIC-05R-XXX maintains set temperature in the Staging Area Room 123 in two stages: (1) The cooling air variable volume damper on FPB-05R-05 modulates from open at 78°F to minimum air flow at 75°F; (2) The Electric Duct Heater on FPB-05R-05 is controlled by modulating the power controller JC-05R-XXX to maintain temperatures between 75°F (no heat) and 72°F (maximum heat). A modulating Silicon Controlled Rectifier (SCR) shall be provided to modulate the control between each successive stage. Low airflow and high temperature cutouts are also included.

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_____ Logic Controller (YIC-05R-XXX) provides START/STOP control for the Fan Power Box motor. It is interlocked with its associated electric reheater such that the reheater only operates when the Fan Power Box Motor is operating. Fan Power Box motor is also interlocked via YIC-05R-XXX with Supply Fan (BL-05R-101) and starts each time the Supply Fan starts. The Fan Power Box can operate when the supply fan is not operating. The Fan Power Box Motor is also interlocked with the fireman's switch and fire alarm panel and operates as previously described.

32.2 INFREQUENT NORMAL OPERATIONS

32.2.1 System Start-Up

(TBD in Detailed Design)

32.3 ABNORMAL CONDITIONS

(TBD in Detailed Design)

33.0 CONTROL PROGRAM SPECIFICATIONS

(None identified for these systems)

34.0 LOGIC CONTROLLER SPECIFICATIONS

Logic Controller Specifications are documented in the DCS Specification. Tag Numbers and Logic Controller Program names only are listed below:

34.1 YIC-05R-003 AHU Evaporative Cooler Logic Controller

34.2 YIC-05R-004 Chemical Storage AHU Supply Fan Logic Controller

34.3 YIC-05R-017 AHU Fan Logic Controller

34.4 YIC-05R-204 AHU Evaporative Cooler Logic Controller

34.5 YIC-05R-205 Equipment Room AHU Supply Fan Logic Controller

34.6 YIC-05R-304 Offices AHU Supply Fan Logic Controller

34.7 YIC-05S-211 Return/Exhaust Fan Logic Controller

35.0 SPECIAL ANALOG FUNCTIONS

Not Applicable to Systems 05R and 05S.

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36.0 ACRONYMS

ACRONYM	TERM
AHU	Air Handling Unit
HVAC	Heating, Ventilating and Air Conditioning
SCR	Silicon Controlled Rectifier

37.0 GLOSSARY

37.1 SYSTEM SPECIFIC TERMS

TAG NUMBER	TERM
TIC-05R-002	Supply Air Temperature Indicating Controller
YIC-05R-003	AHU Evaporative Cooler Logic Controller
YIC-05R-004	Chemical Storage AHU Supply Fan Logic Controller
YIC-05R-017	AHU Fan Logic Controller
TIC-05R-203	Supply Air Temperature Indicating Controller
YIC-05R-204	AHU Evaporative Cooler Logic Controller
YIC-05R-205	Equipment Room AHU Supply Fan Logic Controller
HIS-05R-210	Battery Room AHU Supply Fan Hand Switch
YIC-05R-304	Offices AHU Supply Fan Logic Controller
YIC-05S-211	Return/Exhaust Fan Logic Controller

38.0 REFERENCE LIST

38.1 DOCUMENTS AND EQUIPMENT COVERED BY THIS PCD

SYS NO.	DESCRIPTION	EQUIPMENT NUMBER	P&ID H-2-XXXXXX-XX
05R	Electric Duct Heater	EH-05R-001	129873-1
05R	Electric Duct Heater	EH-05R-002	129873-1
05R	Electric Duct Heater	EH-05R-003	129873-1
05R	Electric Duct Heater	EH-05R-004	129873-1
05R	Electric Duct Heater	EH-05R-005	129874-1
05R	Electric Duct Heater	EH-05R-006	129874-1
05R	Electric Duct Heater	EH-05R-007	129874-1
05R	Electric Duct Heater	EH-05R-008	129873-1
05R	Control Damper	DN-05R-201A	129874-1
05R	Control Damper	DN-05R-201B	129874-1
05R	Control Damper	DN-05R-201C	129874-1
05R	Air Handling Unit	AH-05R-701	129873-1
05R	Supply Fan	BL-05R-701	129873-1
05R	Cooling Coil	CO-05R-701	129873-1
05R	Condensing Unit	CU-05R-701	129871-1
05R	Motor	MT-05R-701	129873-1
05R	Unit Heater	UH-05R-701	129871-1
05R	Air Handling Unit	AH-05R-702	129874-1
05R	Supply Fan	BL-05R-702	129874-1
05R	Evaporative Cooler	EC-05R-702	129874-1
05R	Unit Heater	UH-05R-702	129871-1
05R	Motor	MT-05R-702A	129874-1
05R	Motor	MT-05R-702B	129874-1
05R	Air Handling Unit	AH-05R-703	129874-1

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38.1 DOCUMENTS AND EQUIPMENT COVERED BY THIS PCD (Continued)

SYS NO.	DESCRIPTION	EQUIPMENT NUMBER	P&ID H-2-XXXXXX-XX
05R	Supply Fan	BL-05R-703	129874-1
05R	Cooling Coil	CO-05R-703	129874-1
05R	Heating Coil	HG-05R-703	129874-1
05R	Motor	MT-05R-703	129874-1
05R	Unit Heater	UH-05R-703	129874-1
05R	Air Handling Unit	AH-05R-704	129871-1
05R	Supply Fan	BL-05R-704	129871-1
05R	Evaporative Cooler	EC-05R-704	129871-1
05R	Electric Heating Coil	HG-05R-704	129871-1
05R	Unit Heater	UH-05R-704	129874-1
05R	Motor	MT-05R-704A	129871-1
05R	Motor	MT-05R-704B	129871-1
05R	Air Handling Unit	AH-05R-705	129871-1
05R	Supply Fan	BL-05R-705	129871-1
05R	Cooling Coil	CO-05R-705	129871-1
05R	Electric Heating Coil	HG-05R-705	129871-1
05R	Motor	MT-05R-705	129871-1
05S	Control Damper	DN-05S-202A	129874-1
05S	Control Damper	DN-05S-202B	129874-1
05S	Control Damper	DN-05S-202C	129874-1
05S	Exhaust Fan	BL-05S-701	129873-1
05S	Motor	MT-05S-701	129873-1
05S	Return/Exhaust Fan	BL-05S-702	129874-1
05S	Motor	MT-05S-702	129874-1
05S	Exhaust Fan	BL-05S-703	129874-1
05S	Motor	MT-05S-703	129874-1
05S	Exhaust Fan	BL-05S-704	129871-1
05S	Motor	MT-05S-704	129871-1
05S	Exhaust Fan	BL-05S-705	129871-1
05S	Motor	MT-05S-705	129871-1
05S	Exhaust Fan	BL-05S-706	129871-1
05S	Motor	MT-05S-706	129871-1
05S	Exhaust Fan	BL-05S-707	129871-1
05S	Motor	MT-05S-707	129871-1

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39.0

(This section not used)

40.0

(This section not used)

41.0

(This section not used)

42.0 OPERATING DESCRIPTION NARRATIVE FAN HOUSE HVAC ZONE IV SUPPLY SYSTEM 05T FAN HOUSE HVAC ZONE IV EXHAUST SYSTEM 05U

42.1 ROUTINE OPERATIONS

The Fan House Zone IV HVAC system operates continuously.

42.1.1 Air Handling Units (AH-05T-711 and 712) and Return/Exhaust Fans (BL-05U-731 and 732)

Two (2) 50% capacity Air Handling Units (AH-05T-711 and 712) supply conditioned air to the Zone I Exhaust Fan Rooms (Room 210, 216, 218) , Vestibule (Room 114), and Damper Operator Room (Room 214). Two (2) 50% capacity Return/Exhaust Fans (BL-05U-731 and 732) are utilized to return/exhaust air. Two (2) 50% capacity Air Handling Units maintain the design room temperature of (TBD)°F. Air Handling Unit (AH-05T-711) and Return/Exhaust Fan (BL-05U-731), and their associated controls are described below. The operation of AH-05T-712 and BL-05U-732 is similar. The corresponding associated controls are shown on HVAC Flow and Control Diagram H-2-129891, Sheets 1 and 2.

Fan Room AHU Supply Fan Logic Controller (YIC-05T-103) provides START/STOP control for Supply Fan (BL-05T-711) in the MANUAL mode. In the AUTO mode, it is interlocked with low-low temperature alarm (TALL-05T-101), low pressure differential alarm (PDAL-05T-107), and FSL-05T-106 to stop the Supply Fan. Upon a START command from YIC-05T-103, control damper DN-05T-711A is enabled by solenoid valve YY-05T-103, BL-05U-731 is started through YIC-05U-102, and evaporative cooler Motor (MT-05T-711B) start is enabled. Then Motor (MT-05T-711A) is started.

Return/Exhaust Fan Logic Controller (YIC-05U-102) provides START/STOP control for Return/Exhaust Fan (BL-05U-731) in the MANUAL mode. In the AUTO mode, BL-05U-731 is started and stopped via Fan Room AHU Supply Fan Logic Controller (YIC-05T-103), and interlocked with PDAL-05U-123.

Fan Room AHU Evaporative Cooler Logic Controller (YIC-05T-105) provides START/STOP control for Evaporative Cooler (EC-05T-711) in the MANUAL mode. In the AUTO mode, EC-05T-711 is started by the high temperature alarm (TAH-05T-205) and reset (stopped) by low temperature alarm (TAL-05T-205). It is also interlocked with YIC-05T-103.

Fan Room Temperature Indicating Controller (TIC-05T-205) controls cooling of the Fan Room. When the room temperature is above (TBD) °F, high temperature alarm TAH-05T-205 starts the Evaporative Coolers (EC-05T-711 and 712) via YIC-05T-105 and 116 respectively to provide cooling. EC-05T-711 and 712 are stopped by TAL-05T-205. High-high temperature is alarmed (TAHH).

Temperature indicating controller TIC-05T-101 controls the average AHU mixed air temperature at a setpoint of (TBD)°F by modulating the outside air Control Damper (DN-05T-711A). Low temperature is alarmed (TAL) and low-low temperature alarm(TALL-05T-101) is interlocked with YIC-05T-103 to stop BL-05T-711. Mechanical stops are installed on DN-05T-711A to provide (TBD) percent minimum outside air for room pressurization.

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Pressure indicating controller PIC-05U-051, controls the negative pressure in the Zone I Exhaust Fan Rooms by modulating the Variable Inlet Vane of the Exhaust Fans. High/low pressure is alarmed (PAH/PAL). PIC-05U-051 is interlocked with YIC-05T-103 and YIC-05T-114.

Motor current indicator II-05T-109A indicates Motor (MT-05T-711A) current.

Motor running time indicator KQI-05T-103 indicates running time for Motor (MT-05T-711A).

Pressure differential indicator PDI-05T-104 indicates the Pre-filter drop. High pressure differential is alarmed (PDAH).

Pressure differential indicator PDI-05T-108 indicates the High Efficiency Filter pressure drop. High pressure differential is alarmed (PDAH).

Pressure differential indicator PDI-05T-107 indicates the Supply Fan (BL-05T-711) pressure differential. Low pressure differential is alarmed (PDAL-05T-107) and is interlocked with YIC-05T-103.

Pressure differential indicator PDI-05U-123 indicates the Return/Exhaust Fan (BL-05U-731) pressure differential. Low pressure differential is alarmed (PDAL-05U-123) and is interlocked with YIC-05U-102.

Temperature indicator TI-05T-206 indicates the supply air temperature. High/low temperatures are alarmed (TAH/TAL).

42.1.2 Unit Heaters (UH-05T-711 and 712)

Unit Heaters (UH-05T-711 and 712) provide heating for the Zone I Exhaust Fan Room (Room 210). Local temperature indicating controllers TIC-05T-207 and 208 control Unit Heaters (UH-05T-711 and 712) respectively.

42.1.3 Air Handling Units (AH-05T-721 and 722), Return/Exhaust Fan (BL-05U-741 and 742), Air Cooled Condensing Units (CU-05T-721 and 722).

Two (2) 100% capacity (one is operating and the other is standby and emergency) Air Handling Units (AH-05T-721 and 722) supply conditioned air to the Zone IV Electrical Rooms (Rooms 108 and 110), Field Operating Station 07 (Room 104), Sample Station/ Instrument Rack (Room 204), HVAC Equipment Room (Room 206), Battery Room (Room 106), Storage Room (Room 117) and HVAC Equipment Room (Room 220). Each Air Handling Unit has its respective Return/Exhaust Fans (BL-05U-741 and BL-05U-742). Air Handling Unit (AH-05T-721), Return/Exhaust Fan (BL-05U-741), Air Cooled Condensing Unit (CU-05T-721) and their associated controls are described below. The operation of AH-05T-722, BL-05U-742 and CU-05T-722 is similar. The corresponding associated controls are shown on HVAC Flow and Control Diagram H-2-129892, Sheets 1 and 2.

AHU Supply Fan Logic Controller (YIC-05T-005) provides START/STOP control for Supply Fan (BL-05T-721) in the MANUAL mode. In the AUTO mode, BL-05T-721 is started and stopped with a signal from the AHU Select Control Program (YCP-05T-010).

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1) Upon a start signal from YCP-05T-010, YIC-05T-005 activates the AHU Mixed Air Temperature Indicating Controller (TIC-05T-002), and enables control dampers DN-05T-721A, DN-05U-721B, and DN-05U-721C.

2) Starts Motor (MT-05T-721).

3) After a set period of time, if flow signal is not established from FSL-05T-008, or pressure differential from PDI-05T-006 is not established, YIC-05T-005 stops Motor (MT-05T-721), deactivates CU-05T-721, deactivates the control dampers DN-05T-721A, DN-05U-721B, and DN-05U-721C, sends a signal to YIC-05U-004 to stop BL-05U-741, and sends a signal to YCP-05T-010 to start the standby AHU fans BL-05T-722 and BL-05U-742. Low flow is alarmed (FAL).

Return/Exhaust Fan Logic Controller (YIC-05U-004) provides START/STOP control for Return/Exhaust Fan (BL-05U-741) in the MANUAL mode. In the AUTO mode, BL-05U-741 is started and stopped with a signal from the AHU Select Control Program (YCP-05T-010).

1) Upon a start signal from YCP-05T-010, YIC-05U-004 starts Motor (MT-05U-741).

2) After a set period of time if pressure differential from PDI-05U-001 is not established, YIC-05U-004 stops Motor (MT-05U-741) and sends a signal to YCP-05T-010 to start the standby AHU fans BL-05T-722 and BL-05U-742.

Pressure differential indicator PDI-05U-001 indicates the Return/Exhaust Fan (BL-05U-741) pressure differential. Low pressure differential is alarmed (PDAL-05U-001) and is interlocked with YIC-05U-004.

Motor current indicator II-05T-019A indicates Motor (MT-05T-721) current.
Motor current indicator II-05U-009A indicates Motor (MT-05U-741) current.

Motor running time indicator KQI-05T-005 indicates running time for Motor (MT-05T-721).

AHU Supply Temperature Indicating Controller (TIC-05T-007) controls cooling of supply air at a set temperature of (TBD)°F. Air Cooled Condensing Unit (CU-05T-721) is started automatically and the refrigerant liquid line solenoid valve TV-05T-007 is controlled. High supply duct average temperature of (TBD)°F is alarmed (TAH) and high-high temperature of (TBD)°F (TAHH-05T-007) is interlocked with YIC-05T-005 to stop Supply Fan (BL-05T-721).

Temperature indicating controller TIC-05T-002 controls the AHU mixed air temperature at a setpoint of (TBD)°F by modulating the Outside Air Control Damper (DN-05T-721A), Return Air Control Damper (DN-05U-721B), and Exhaust Air Control Damper (DN-05U-721C). Low temperature of (TBD)°F is alarmed (TAL) and low-low temperature of (TBD)°F (TALL-05T-002) is interlocked with YIC-05T-005 to stop BL-05T-721. Mechanical stops are installed on DN-05T-721A and DN-05U-721C to provide for (TBD) percent minimum outside/exhaust air for room pressurization.

Pressure differential indicator PDI-05T-020 indicates the Pre-filter pressure drop. High pressure differential is alarmed (PDAH).

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Pressure differential indicator PDI-05T-003 indicates the High Efficiency Filter pressure drop. High pressure differential is alarmed (PDAH).

Pressure differential indicator PDI-05T-006 indicates the Supply Fan (BL-05T-721) pressure differential. Low pressure differential is alarmed (PDAL-05T-006) and is interlocked to stop the Supply Fan (BL-05T-721).

Pressure differential indicator PDI-05U-001 indicates the Return/Exhaust Fan (BL-05U-741) pressure differential. Low pressure differential is alarmed (PDAL-05U-001) and is interlocked to stop the Return/Exhaust Fan (BL-05U-741).

42.1.4 Unit Heater (UH-05T-713 and 714)

Unit Heater (UH-05T-713 and 714) provide heating for HVAC Rooms (Rooms 220 and 222). Local temperature indicating controllers TIC-05T-009 and 019 control Unit Heaters (UH-05T-713 and 714) respectively.

42.1.5 Electric Duct Heaters (EH-05T-002 through 006)

Electric Duct Heaters provide zone temperature control for the areas served. Electric Duct Heater (EH-05T-002) and its associated controls are described below. The operation of EH-05T-003 through EH-05T-006 is similar. The corresponding associated controls and areas served are shown on HVAC Flow and Control Diagram H-2-129892, Sheet 3.

Local temperature indicating controller TIC-05T-202 maintains the set temperature of (TBD)°F in the Electrical Room (Room 110) by modulating the power controller JC-05T-202 for the Electric Duct Heater (EH-05T-002). High temperature is alarmed (TAH). The multistep electric heater power controller JC-05T-202 is furnished with Electric Duct Heater (EH-05T-002) and includes a multistage step controller and a modulating Silicon Controlled Rectifier (SCR) to provide modulating control between each successive stage. Low airflow and high heater temperature cutouts are also included.

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42.1.6 Battery Room Exhaust Fan (BL-05U-751)

Battery Room Exhaust Fan (BL-05U-751) exhausts air from the Battery Room (Room 106). Exhaust Fan (BL-05U-751) and its associated controls are described below. The corresponding associated controls are shown on the HVAC Flow and Control Diagram H-2-129892, Sheet 3.

Pressure differential indicator PDI-05U-207 indicates the Exhaust Fan pressure differential. Low pressure differential is alarmed (PDAL).

Hand indicating switch HIS-05U-206 provides START/STOP control for Exhaust Fan (BL-05U-751).

42.1.7 Unit Heaters (UH-05T-715 and 716)

Unit Heaters (UH-05T-715 and 716) provide heating for HVAC Equipment Room (Room 206). Local temperature indicating controllers TIC-05T-208 and 209 control Unit Heaters (UH-05T-715 and 716) respectively.

42.1.8 Exhaust Filter Plenum (PF-05U-731 and 732)

The following description is for Exhaust Filter Plenum (PF-05U-731). The description for the other Exhaust Filter Plenum is similar. The corresponding associated controls are shown on HVAC Flow and Control Diagram H-2-129891, Sheet 2.

Pressure differential indicator PDI-05U-151 indicates pressure drop across the HEPA filter. High/low pressure drop across the filter is alarmed (PDAH/PDAL).

42.2 INFREQUENT NORMAL OPERATIONS

42.2.1 System Start-Up

(TBD in Detailed Design)

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42.3 ABNORMAL CONDITIONS

The HVAC Safety Class Design is summarized in this HVAC Safety Class Matrix. Normal data is also referenced when it is associated with the Safety application.

HVAC SAFETY CLASS MATRIX

EQUIPMENT/ COMPONENTS	NUMBER	P & I D	SAFETY CLASS	TRAIN	SYSTEM ACTUATION	SAFETY SYSTEM ACTUATION POSITION	PROCESS NORMAL POSITION	IAS FAIL POSITION NORMAL
FAN HOUSE								
SUPPLY AHU TO ELECT. ROOMS	AH-05T-721 AH-05T-722	H-2-129892-1 H-2-129892-2	1 1	A B	1 1	ON ON	ON OFF	N/A N/A
RETURN FAN	BL-05U-741 BL-05U-742	H-2-129892-1 H-2-129892-2	1 1	A B	1 1	ON ON	ON OFF	N/A N/A
OUTSIDE AIR INTAKE DAMPER	DN-05T-721A DN-05T-722A	H-2-129892-1 H-2-129892-2	1 1	A B	1 1	CLOSED CLOSED	MODULATING CLOSED	CLOSE CLOSE
RETURN AIR DAMPER	DN-05U-721B DN-05U-722B	H-2-129892-1 H-2-129892-2	1 1	A B	1 1	OPEN OPEN	MODULATING OPEN	OPEN OPEN
EXHAUST AIR DAMPER	DN-05U-721C DN-05U-722C	H-2-129892-1 H-2-129892-2	1 1	A B	1 1	CLOSED CLOSED	MODULATING CLOSED	CLOSE CLOSE
CONDENSING UNIT	CU-05T-721 CU-05T-722	H-2-129892-1 H-2-129892-2	1 1	A B	1 1	ON ON	ON OFF	N/A N/A
CONDENSING UNIT EXPANSION VALVE	TV-05T-007 TV-05T-016	H-2-129892-1 H-2-129892-2	1 1	A B	1 1	OPEN OPEN	OPEN CLOSED	N/A N/A
EMERGENCY AHU FOR ZONE I FAN ROOM Note 1	AH-05T-761 AH-05T-762	H-2-129891-2 H-2-129891-2	1 1	A B	1 1	ON ON	OFF OFF	N/A N/A

SYSTEM ACTUATION - Safety System Actuation Status is provided to DCS for each Train, i.e., A and B
1) Loss of Normal Power

NOTES -
1) Local START/STOP for both

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43.0 CONTROL PROGRAM SPECIFICATIONS

Control Program Specifications are documented in the DCS Specification. Tag Numbers and Control Program names only are listed below:

43.1 YCP-05T-010 AHU Select Control Program

44.0 LOGIC CONTROLLER SPECIFICATIONS

Logic Controller Specifications are documented in the DCS Specification. Tag Numbers and Logic Controller program names are listed below:

44.1 YIC-05T-005 AHU Supply Fan Logic Controller.
(Logic for AHU Supply Fan Logic Controller YIC-05T-014 is similar).

44.2 YIC-05U-102 Return/Exhaust Fan Logic Controller.
(Logic for Return/Exhaust Fan Logic Controller YIC-05U-112 is similar).

44.3 YIC-05T-103 Fan Room AHU Supply Fan Logic Controller.
(Logic for Fan Room AHU Supply Fan Logic Controller YIC-05T-114 is similar).

44.4 YIC-05T-105 Fan Room AHU Evaporative Cooler Logic Controller.
(Logic for Fan Room AHU Evaporative Cooler Logic Controller YIC-05T-116 is similar).

44.5 YIC-05U-004 Return/Exhaust Fan Logic Controller.
(Logic for Return/Exhaust Fan Logic Controller YIC-05U-013 is similar).

45.0 SPECIAL ANALOG FUNCTIONS

Not Applicable to System 05T and 05T.

46.0 ACRONYMS

ACRONYM	TERM
AHU	Air Handling Unit
HVAC	Heating, Ventilating and Air Conditioning
SCR	Silicon Controlled Rectifier

47.0 GLOSSARY

47.1 SYSTEM SPECIFIC TERMS

TAG NUMBER	TERM
TIC-05T-002	AHU Mixed Air Temperature Indicating Controller
TIC-05T-011	AHU Mixed Air Temperature Indicating Controller
TIC-05T-016	AHU Supply Temperature Indicating Controller
TIC-05T-205	Fan Room Temperature Indicating Controller
YIC-05T-005	AHU Supply Fan Logic Controller
TIC-05T-007	AHU Supply Temperature Indicating Controller
YIC-05T-014	AHU Supply Fan Logic Controller
YIC-05T-103	Fan Room AHU Supply Fan Logic Controller

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TAG NUMBER	TERM
YIC-05T-105	Fan Room AHU Evaporative Cooler Logic Controller
YIC-05T-114	Fan Room AHU Supply Fan Logic Controller
YIC-05T-116	Fan Room AHU Evaporative Cooler Logic Controller
YIC-05U-004	Return/Exhaust Fan Logic Controller
YIC-05U-013	Return/Exhaust Fan Logic Controller
YIC-05U-102	Return/Exhaust Fan Logic Controller
YIC-05U-112	Return/Exhaust Fan Logic Controller

48.0 REFERENCE LIST

48.1 DOCUMENTS AND EQUIPMENT COVERED BY THIS PCD

SYS NO.	DESCRIPTION	EQUIPMENT NUMBER	P&ID H-2-XXXXXX-XX
05T	Electric Duct Heater	EH-05T-002	129892-3
05T	Electric Duct Heater	EH-05T-003	129892-3
05T	Electric Duct Heater	EH-05T-004	129892-3
05T	Electric Duct Heater	EH-05T-005	129892-3
05T	Electric Duct Heater	EH-05T-006	129892-3
05T	Air Handling Unit	AH-05T-711	129891-1
05T	Supply Fan	BL-05T-711	129891-1
05T	Evaporative Cooler	EC-05T-711	129891-1
05T	Unit Heater	UH-05T-711	129891-2
05T	Control Damper	DN-05T-711A	129891-1
05T	Motor	MT-05T-711A	129891-1
05T	Motor	MT-05T-711B	129891-1
O5T	Air Handling Unit	AH-05T-712	129891-1
05T	Supply Fan	BL-05T-712	129891-1
05T	Evaporative Cooler	EC-05T-712	129891-1
05T	Unit Heater	UH-05T-712	129891-2
05T	Control Damper	DN-05T-712A	129891-1
05T	Motor	MT-05T-712A	129891-1
05T	Motor	MT-05T-712B	129891-1
05T	Unit Heater	UH-05T-713	129892-1
05T	Unit Heater	UH-05T-714	129892-2
05T	Unit Heater	UH-05T-715	129892-3
05T	Unit Heater	UH-05T-716	129892-3
05T	Air Handling Unit	AH-05T-721	129892-1
05T	Supply Fan	BL-05T-721	129892-1
05T	Cooling Coil	CO-05T-721	129892-1
05T	Air Cooled Condensing Unit	CU-05T-721	129892-1
05T	Motor	MT-05T-721	129892-1
05T	Control Damper	DN-05T-721A	129892-1
05T	Air Handling Unit	AH-05T-722	129892-2
05T	Supply Fan	BL-05T-722	129892-2
05T	Cooling Coil	CO-05T-722	129892-2
05T	Air Cooled Condensing Unit	CU-05T-722	129892-2
05T	Motor	MT-05T-722	129892-2
05T	Control Damper	DN-05T-722A	129892-2
05T	Air Handling Unit	AH-05T-761	129891-2
05T	Blower	BL-05T-761	129891-2
05T	Motor	MT-05T-761	129891-2
05T	Air Handling Unit	AH-05T-762	129891-2

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48.1 DOCUMENTS AND EQUIPMENT COVERED BY THIS PCD (Continued)

SYS NO.	DESCRIPTION	EQUIPMENT NUMBER	P&ID H-2-XXXXXX-XX
05T	Blower	BL-05T-762	129891-2
05T	Motor	MT-05T-762	129891-2
05U	Control Damper	DN-05U-721B	129892-1
05U	Control Damper	DN-05U-721C	129892-1
05U	Control Damper	DN-05U-722B	129892-2
05U	Control Damper	DN-05U-722C	129892-2
05U	Return/Exhaust Fan	BL-05U-731	129891-1
05U	Motor	MT-05U-731	129891-1
05U	Filter Plenum	PF-05U-73	129891-2
05U	Variable Inlet Vane	VV-05U-731	129891-1
05U	Filter Plenum	PF-05U-732	129891-2
05U	Variable Inlet Vane	VV-05U-732	129891-1
05U	Return/Exhaust Fan	BL-05U-732	129891-1
05U	Motor	MT-05U-732	129891-1
05U	Return/Exhaust Fan	BL-05U-741	129892-1
05U	Motor	MT-05U-741	129892-1
05U	Return/Exhaust Fan	BL-05U-742	129892-2
05U	Motor	MT-05U-742	129892-2
05U	Exhaust Fan	BL-05U-751	129892-3
05U	Motor	MT-05U-751	129892-3

49.0

(Not applicable to System)

50.0

(This section not used)

51.0

(This section not used)

52.0 OPERATING DESCRIPTION NARRATIVE
WASTE HOLD TANK (WHT) ZONE IIIA HVAC SUPPLY SYSTEM 05V
WASTE HOLD TANK (WHT) ZONE IIIA HVAC EXHAUST SYSTEM 05W

52.1 ROUTINE OPERATIONS

The WHT Building Zone IIIA HVAC system operates continuously. Standby equipment is designated on the HVAC flow and control diagrams and in this description. In general, other units may also be selected as a standby unit.

52.1.1 Zone IIIA Supply Air Handling Units (AH-05V-101 and 102)

Air Handling Unit (AH-05V-101 or AH-05V-102) supply conditioned outside air to the WHT Building Zone IIIA. Air Handling Unit (AH-05V-101) and its associated controls are described below. The description of AH-05V-102 is similar. The corresponding

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associated controls are shown on HVAC Flow and Control Diagram H-2-129761, Sheets 1 and 2.

Zone IIIA AHU Logic Controller (YIC-05V-301) provides ON/OFF control for Air Handling Unit (AH-05V-101) in the MANUAL or AUTO mode. In the AUTO mode, AH-05V-101 is turned ON and OFF by YIC-05V-301 with a signal from the HVAC Zone IIIA AHU Control Program (YCP-05V-302).

An ON signal from Zone IIIA AHU Logic Controller (YIC-05V-301) initiates the following actions:

1) Opens the Automatic Isolation Damper (DI-05V-101).

2) Activates the chilled water temperature control valve TV-05V-306A.

An OFF signal from Zone IIIA AHU Logic Controller (YIC-05V-301) initiates the following actions:

1) Deactivates the Electric Preheat Coil (PH-05V-101) via TIC-05V-306 when Automatic Isolation Damper (DI-05V-101) is closed.

2) Closes chilled water temperature control valve TV-05V-306A.

Zone IIIA AHU Logic Controller (YIC-05V-301) is interlocked with low-low temperature alarm (TALL-05V-307) to close Outside Air Damper (DI-05V-101) and send a signal to Control Program (YCP-05V-302) to bring the standby Air Handling Unit (AH-05V-102) on line and to deactivate AH-05V-101. OPEN/CLOSE position of Outside Air Damper (DI-05V-101) is indicated (ZIH/ZIL) and CLOSE position is alarmed (ZAL).

The Zone IIIA Supply Air Plenum Temperature Indicating Controller (TIC-05V-306) controls heating or cooling of the AHU based on the signal from the median select relay TY-05V-306C. TY-05V-306C receives signals from temperature indicating transmitters TIT-05V-306A, 306B and 306C, located in the Zone IIIA Supply Air Plenum.

Median select temperature relay TY-05V-306C rejects the high and low signals and transmits the median signal to TIC-05V-306. TIC-05V-306 operates to maintain a set Zone IIIA Supply Air Plenum temperature of (TBD)°F.

Above the set point, chilled water temperature control valve TV-05V-306A is modulated. Below the set point, Power Controller JC-05V-306A is modulated. High and low temperatures are alarmed (TAH/TAL). The multistep Electric Heater Power Controller JC-05V-306A is furnished with Electric Preheat Coil (PH-05V-101) and includes a multistage step controller and a modulating silicon controlled rectifier (SCR) to provide modulating control between each successive stage. Low airflow and high heater temperature cutouts are also included.

Pressure differential indicator PDI-05V-303 indicates the pressure differential across the Pre-filter and High Efficiency Filter. High pressure differential is alarmed (PDAH).

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Local pressure differential indicators PDI-05V-304 and PDI-05V-305 indicate the pressure differential across the Pre-filter and High Efficiency Filters respectively.

Temperature indicator TI-05V-307 indicates the AHU outlet temperature. High/Low temperatures are alarmed (TAH/TAL). Low-low temperature (TALL) is also alarmed and interlocked with YIC-05V-301.

52.1.2 Zone IIIA Supply Fans (BL-05V-121 and 122)

Supply Fans (BL-05V-121 and 122) supply conditioned outside air to the Zone IIIA areas. Supply Fan (BL-05V-121) and its associated controls are described below. The description of BL-05V-122 is similar. The corresponding associated controls are shown on HVAC Flow and Control Diagram H-2-129763, Sheet 1 and H-2-129761, Sheets 1 and 2.

HVAC Zone IIIA Supply Fan Logic Controller (YIC-05V-313) provides START/STOP control for Supply Fan (BL-05V-121) in the MANUAL mode. In the AUTO mode, BL-05V-121 is started and stopped with a signal from the HVAC Zone IIIA Supply Fan Control Program (YCP-05V-315) as initiated by the HVAC Zone IIIA Exhaust Fan Control Program (YCP-05W-527).

A START signal from YIC-05V-313 initiates the following actions:

1) Activates Variable Inlet Vane (VV-05V-121) through solenoid valve YY-05V-313A.

2) Opens Automatic Isolation Damper (DI-05V-121) through solenoid valve YY-05V-313B.

3) Starts Motor (MT-05V-121) upon receipt of permissive from pressure indicating controller PIC-05W-511 through YCP-05V-315.

If VV-05V-121 or DI-05V-121 do not open by a preset period of time, the condition is alarmed (ZAL) at YIC-05V-313 and a signal is sent to YCP-05V-315 to start standby Supply Fan (BL-05V-122) through YIC-05V-330 and activates its appropriate vane and damper as defined above. Open and close positions of VV-05V-121 are indicated (ZIH/ZIL). CLOSE position is alarmed (ZAL).

After a set period of time, if flow is not established (FAL-05V-312), YIC-05V-313 stops Motor (MT-05V-121), closes VV-05V-121 through YY-05V-313A and closes DI-05V-121 through YY-05V-313B. YIC-05V-313 sends a signal to YCP-05V-315 to start standby Supply Fan (BL-05V-122) through YIC-05V-330.

Pressure indicating controller PIC-05V-310 modulates Variable Inlet Vane of Supply Fans (VV-05V-121 and 122) based upon the signal from median select relay PY-05V-310C which receives signals from pressure indicating transmitters PIT-05V-310A, 310B and 310C located in the Zone IIIA Supply Air Plenum. Median select pressure relay PY-05V-310C rejects the high and low signals and transmits the median signal to pressure indicating controller PIC-05V-310 which alarms high/low pressures (PAH/PAL).

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Pressure indicator PI-05V-308 indicates pressure at the inlet section common to the Supply Fans.

Motor current indicator II-05V-309A indicates Motor (MT-05V-121) current.

Motor running time indicator KQI-05V-313 indicates Motor (MT-05V-121) running time.

Pressure differential indicator PDI-05V-311 indicates pressure differential across the Supply Fan. High/low differential pressures are alarmed (PDAH/PDAL).

Flow indicator FI-05V-312 measures flow in discharge duct of the fan. Low flow is alarmed FAL-05V-312 and interlocks with YIC-05V-313.

52.1.3 Zone IIIA Areas (Rooms 102 and 108)

The following operating description is for duct equipment and associated controls supplying conditioned air to SOP and Change Rooms (Rooms 102 and 108). The corresponding associated controls are shown on HVAC Flow and Control Diagram H-2-129762, Sheet 1.

Temperature indicating controller TIC-05V-336 controls the temperature in the SOP and Change Rooms (Rooms 102 and 108) by modulating Power Controller JC-05V-336 for Electric Duct Heater (EH-05V-101). High/low temperatures are alarmed (TAH/TAL). The multistep Electric Heater Power Controller is furnished with Electric Duct Heater and includes a multistage step controller and a modulating silicon controlled rectifier (SCR) to provide modulating control between each successive stage. Low airflow and high heater temperature cutouts are also included.

Pressure indicating controller PIC-05V-337 modulates Control Damper (DN-05V-101) to maintain set pressure in the SOP and Change Rooms (Rooms 102 and 108), based on signal from pressure indicating transmitter PIT-05V-337. High and low pressures are alarmed (PAH/PAL).

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52.1.4 Zone IIIA Area (Room 104)

The following operating description is for duct equipment and associated controls supplying conditioned air to Office and FOS 6 (Room 104). The corresponding associated controls are shown on HVAC Flow and Control Diagram H-2-129762, Sheet 1.

Air Conditioning Units (AC-05V-201 and 202) for Office and FOS 6 (Room 104) are air cooled units and utilize local controls. Malfunction of each air conditioning unit is alarmed (XA-05V-341 and 343) respectively. Switchover to the alternate unit is manual and performed locally.

Hand indicating switch HIS-05V-340 and 344 controls START/STOP of Air Conditioning Units (AC-05V-201 and 202) respectively.

Temperature indicator TI-05V-338 indicates Room 104 temperature. High/low temperatures are alarmed (TAH/TAL).

Pressure indicating controller PIC-05V-339 controls Room 104 pressure by modulating Control Damper (DN-05V-104). High/low pressures are alarmed (PAH/PAL).

Humidity indicator MI-05V-342 indicates Room 104 humidity. High/low humidity is alarmed (MAH/MAL).

52.1.5 Zone IIIA Areas (Rooms 101 and 103)

The following operating description is for duct equipment and associated controls supplying conditioned air to Maintenance Room and HVAC Equipment Room (Rooms 101 and 103), respectively. The controls for Room 103 are described below. The description of Room 101 controls is similar. The corresponding associated controls are shown on HVAC Flow and Control Diagram H-2-129762, Sheet 2.

Temperature indicating controller TIC-05V-346 controls the temperature in HVAC Equipment Room (Room 103) by modulating Power Controller JC-05V-346 for Electric Duct Heater (EH-05V-102). High/low temperatures are alarmed (TAH/TAL). The multistep Electric Heater Power Controller is furnished with Electric Duct Heater (EH-05V-102) and includes multistage step controller and a modulating silicon-controlled rectifier (SCR) to provide modulating control between each successive stage. Low airflow and high heater temperature cutouts are also included.

Pressure indicating controller PIC-05V-347 modulates Control Damper (DN-05V-102) to maintain set pressure in HVAC Equipment Room (Room 103) based on signal from pressure indicating transmitter PIT-05V-347. High/low pressures are alarmed (PAH/PAL).

52.1.6 Zone IIIA Exhaust Filter Plenums (PF-05W-101 and 102)

The following description is for PF-05W-101. The description of PF-05W-102 controls is similar. The corresponding associated controls are shown on HVAC Flow and Control Diagram H-2-129763, Sheet 1.

Local pressure differential indicator PDI-05W-513 indicates pressure drop across the Mist Eliminator.

Local pressure differential indicators PDI-05W-514 and 515 indicates pressure drop across the first and second bank of HEPA filters, respectively.

Pressure differential indicator PDI-05W-512 indicates pressure drop across all banks of filters and Mist Eliminator. High/low filter pressure drops are alarmed (PDAH/PDAL).

Pressure indicating controller PIC-05W-511 controls the negative pressure in the Zone IIIA Exhaust Plenum by modulating the Variable Inlet Vane (VV-05W-121). Median select pressure relay PY-05W-511C rejects the high and low signals and transmits the median signal to PIC-05W-511.

High and low pressures are alarmed (PAH/PAL). Low-low pressure (PALL) is a start permissive signal to YCP-05V-315 for Supply Fan (BL-05V-121).

52.1.7 Zone IIIA Exhaust Fans (BL-05W-121 and 122)

Exhaust Fans (BL-05W-121 and 122) are provided to exhaust air from the exhaust filter plenums to the Zone II and III Exhaust Stack. The operation of BL-05W-121 is described below. The operation of standby Exhaust Fan (BL-05W-122) is similar. The

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corresponding associated controls are shown on HVAC Flow and Control Diagram H-2-129764, Sheets 1 and 2.

HVAC Zone IIIA Exhaust Fan Logic Controller (YIC-05W-528) provides START/STOP control for Exhaust Fan (BL-05W-121) in the MANUAL and AUTO modes. In the AUTO mode, BL-05W-121 is started and stopped by YIC-05W-528 with a signal from the HVAC Zone IIIA Exhaust Fan Control Program (YCP-05W-527), which initiates the HVAC Zone IIIA Supply Fan Control Program (YCP-05V-315).

A START signal from YIC-05W-528 initiates the following actions:

1) Activate Variable Inlet Vane (VV-05W-121) through solenoid valve YY-05W-528A.

2) Open Automatic Isolation Damper (DI-05W-121) through solenoid valve YY-05W-528B.

3) Start Motor (MT-05W-121).

After a preset period of time if VV-05W-121 or DI-05W-121 have not opened, then YIC-05W-528 sends a signal to YCP-05W-527 to start the standby Exhaust Fan (BL-05W-122) through YIC-05W-537.

Opened and closed positions of DI-05W-121 and VV-05W-121 are indicated at YIC-05W-528 (ZIH/ZIL) and alarmed (ZAH/ZAL).

After a preset period of time, if flow is not established (FAL-05W-530) YIC-05W-528 stops Motor (MT-05W-121), closes VV-05W-121 and DI-05W-121. YIC-05W-528 also signals YCP-05W-527 to start standby Exhaust Fan (BL-05W-122) through YIC-05W-537.

Current indicator II-05W-526A monitors Motor (MT-05W-121) current.

Motor running time indicator KQI-05W-528 monitors Motor (MT-05W-121) running time.

Pressure differential across the Exhaust Fan is indicated by PDI-05W-529. Low differential pressure is alarmed (PDAL) after a preset period of time of starting Motor (MT-05W-121). High differential pressure is also alarmed (PDAH).

Pressure indicating controller PIC-05W-511 modulates the Variable Inlet Vanes of the on-line Exhaust Fan to control the negative pressure in the Zone IIIA Exhaust Plenum.

Flow indicator FI-05W-530 indicates flow in discharge duct of the fan. Low flow is alarmed (FAL) after a preset period of time of starting Motor (MT-05W-121).

Flow indicator FI-05W-531 indicates total exhaust flow to the Zone II and III Exhaust Stack.

Pressure indicator PI-05W-532 indicates pressure at the discharge section common to the Zone IIIA Exhaust Fans.

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52.2 INFREQUENT NORMAL OPERATIONS

52.2.1 System Start-up

(TBD in Detailed Design)

52.3 ABNORMAL CONDITIONS

(TBD in Detailed Design)

53.0 CONTROL PROGRAM SPECIFICATIONS

Control Program Specifications are to be documented in Detailed Design. Tag Numbers and Control Program names are listed below:

53.1	YCP-05V-302	HVAC Zone IIIA AHU Control Program
53.2	YCP-05V-315	HVAC Zone IIIA Supply Fan Control Program
53.3	YCP-05W-527	HVAC Zone IIIA Exhaust Fan Control Program

54.0 LOGIC CONTROLLER SPECIFICATIONS

Logic Controller Specifications are documented in the DCS Specification. Tag Numbers and Logic Controller Program names only are listed below:

54.1	YIC-05V-301	Zone IIIA AHU Logic Controller (Logic for YIC-05V-321 is similar)
54.2	YIC-05V-313	HVAC Zone IIIA Supply Fan Logic Controller (Logic for YIC-05V-330 is similar)
54.3	YIC-05W-528	HVAC Zone IIIA Exhaust Fan Logic Controller (Logic for YIC-05W-537 is similar)

55.0 SPECIAL ANALOG FUNCTIONS

(Not Applicable)

56.0 ACRONYMS

ACRONYM	TERM
AHU	Air Handling Unit
HEPA	High Efficiency Particulate Air
HVAC	Heating, Ventilating and Air Conditioning
FOS	Field Operating Station
SCR	Silicon Controlled Rectifier
SOP	Step Off Pad
WHT	Waste Hold Tank

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57.0 GLOSSARY

57.1 SYSTEM SPECIFIC TERMS

TAG NUMBER	TERM
YIC-05V-330	HVAC Zone IIIA Supply Fan Logic Controller
YIC-05V-313	HVAC Zone IIIA Supply Fan Logic Controller
TIC-05V-306	Zone IIIA Supply Air Plenum Temperature Indicating Controller
YIC-05V-301	Zone IIIA AHU Logic Controller
YIC-05V-321	Zone IIIA AHU Logic Controller
YIC-05W-528	HVAC Zone IIIA Exhaust Fan Logic Controller
YIC-05W-537	HVAC Zone IIIA Exhaust Fan Logic Controller

58.0 REFERENCE LIST

58.1 DOCUMENTS AND EQUIPMENT COVERED BY THIS PCD

SYS NO.	DESCRIPTION	EQUIPMENT NUMBER	P&ID H-2-XXXXXX-XX
05V	Air Conditioning Unit	AC-05V-201	129762-1
05V	Air Conditioning Unit	AC-05V-202	129762-1
05V	Air Handling Unit	AH-05V-101	129761-1
05V	Air Handling Unit	AH-05V-102	129761-2
05V	Automatic Isolation Damper	DI-05V-101	129761-1
05V	Automatic Isolation Damper	DI-05V-102	129761-2
05V	Automatic Isolation Damper	DI-05V-121	129761-1
05V	Automatic Isolation Damper	DI-05V-122	129761-2
05V	Control Damper	DN-05V-101	129762-1
05V	Control Damper	DN-05V-102	129762-1
05V	Control Damper	DN-05V-103	129762-2
05V	Control Damper	DN-05V-104	129762-1
05V	Cooling Coil	CO-05V-101	129761-1
05V	Cooling Coil	CO-05V-102	129761-2
05V	Electric Duct Heater	EH-05V-101	129762-1
05V	Electric Duct Heater	EH-05V-102	129762-1
05V	Electric Duct Heater	EH-05V-103	129762-2
05V	Motor, Fan	MT-05V-121	129761-1
05V	Motor, Fan	MT-05V-122	129761-2
05V	Preheat Coil	PH-05V-101	129761-1
05V	Preheat Coil	PH-05V-102	129761-2
05V	Supply Fan	BL-05V-121	129761-1
05V	Supply Fan	BL-05V-122	129761-2
05V	Variable Inlet Vane	VV-05V-121	129761-1
05V	Variable Inlet Vane	VV-05V-122	129761-2
05W	Automatic Isolation Damper	DI-05W-121	129764-1
05W	Automatic Isolation Damper	DI-05W-122	129764-2
05W	Exhaust Fan	BL-05W-121	129764-1
05W	Exhaust Fan	BL-05W-122	129764-2
05W	Exhaust Filter Plenum	PF-05W-101	129763-1
05W	Exhaust Filter Plenum	PF-05W-102	129763-1

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58.1 DOCUMENTS AND EQUIPMENT COVERED BY THIS PCD (Continued)

SYS NO.	DESCRIPTION	EQUIPMENT NUMBER	P&ID H-2-XXXXXX-XX
05W	Motor, Fan	MT-05W-121	129764-1
05W	Motor, Fan	MT-05W-122	129764-2
05W	Variable Inlet Vane	VV-05W-121	129764-1
05W	Variable Inlet Vane	VV-05W-122	129764-2

59.0

(This section not used)

60.0

(This section not used)

61.0

(This section not used)

62.0 OPERATING DESCRIPTION NARRATIVE
SWITCHGEAR/GENERATOR BUILDING HVAC SUPPLY SYSTEM 05X
SWITCHGEAR/GENERATOR BUILDING HVAC EXHAUST SYSTEM 05Y

62.1 ROUTINE OPERATIONS

62.1.1 Air Handling Units (AH-05X-711 and 712)

Air Handling Units (AH-05X-711 and 712) supply air to Normal and Standby Switchgear Rooms (Rooms 110, 102, and 104), Gas Turbine Generator Rooms (Rooms 106 and 114), Mechanical Equipment Rooms (Rooms 204 and 206), Field Operating Station No. 8 (Room 120), and Cable Rooms (Rooms 002, 004 and 006),

Air Handling Unit (AH-05X-711) and its associated controls are described below. The operation of AH-05X-712 is similar. The corresponding associated controls are shown on HVAC Flow and Control Diagram H-2-129901, Sheets 1 and 2.

Air Handling Unit (AHU) Supply Fan Logic Controller (YIC-05X-005) provides START/STOP control for Supply Fan (BL-05X-711) in the MANUAL mode. In the AUTO mode BL-05X-711 is started and stopped with a signal from the Air Handling Unit (AHU) Supply Fan Control Program (YCP-05X-010).

1) Upon a START signal from YCP-05X-010, YIC-05X-005 starts Motor (MT-05X-711B).

2) After a set period of time, if low pressure differential alarm signal from PDAL-05X-006 is not established, YIC-05X-005 stops Motor (MT-05X-711B). YIC-05X-005 sends a signal to YCP-05X-010 to start standby Supply Fan (BL-05X-712) through YIC-05X-010. Low pressure differential is alarmed (PDAL).

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AHU mixed air low-low temperature TALL-05X-001 is interlocked with YIC-05X-005 to stop MT-05X-711B.

AHU Evaporative Cooler Logic Controller (YIC-05X-004) provides START/STOP control for Evaporative Cooler (EC-05X-711) in the MANUAL mode. In the AUTO mode, EC-05X-711 is started by the high temperature alarm (TAH-05X-003A) and reset (stopped) by low temperature alarm (TAL-05X-003A) from temperature indicating controller TIC-05X-003A.

The Normal and Standby Switchgear Room Temperature Indicating Controller (TIC-05X-003A) controls heating and cooling of the Normal and Standby Switchgear rooms. Temperature relay TY-05X-003 receives signals from temperature indicators TI-05X-003C, 003D, and 003E and sends the average signal to TIC-05X-003A. High temperature is alarmed (TAH-05X-003A) and interlocked with YIC-05X-004 to start the Evaporative Cooler (EC-05X-711). Low temperature is alarmed (TAL-05X-003A) and interlocked with YIC-05X-004 to stop EC-05X-711. When the temperature is between 85°F and 60°F, cooling or heating is not provided. Heating is controlled to maintain a minimum room temperature with a set point of 60°F. TIC-05X-003A controls power controller JC-05X-003A. The multistep electric heater power controller JC-05X-003A is furnished with the Heating Coil (HG-05X-711), and includes a multistage step controller and a modulating Silicon Controlled Rectifier (SCR) to provide modulating control between each successive stage. Low airflow and high heater temperature cutouts are also included.

Temperature indicating controller TIC-05X-001 controls the AHU mixed air temperature at a setpoint of (TBD)°F by modulating the outside air Control Damper (DN-05X-711) and return air Control Damper (DN-05Y-711). Low temperature is alarmed (TAL) and low-low temperature (TALL-05X-001) is interlocked with YIC-05X-005 to stop BL-05X-711.

Pressure differential indicator PDI-05X-002 indicates pressure differential across the Pre-filter. High pressure differential is alarmed (PDAH).

Pressure differential indicator PDI-05X-013 indicates pressure differential across the High Efficiency filter. High pressure differential is alarmed (PDAH).

Pressure differential indicator PDI-05X-006 indicates pressure differential across the Supply Fan (BL-05X-711). Low pressure differential is alarmed (PDAL-05X-006) and is interlocked with YIC-05X-005.

Temperature indicator TI-05X-007 indicates the AHU discharge air temperature. High/low temperatures are alarmed (TAH/TAL).

Motor current indicator II-05X-015A indicates Motor (MT-05X-711B) current.

Motor running time indicator KQI-05X-004 indicates Motor (MT-05X-711A) running time.

62.1.2 Air Handling Units (AH-05X-715 and 716)

Air Handling Units (AH-05X-715 and 716) supply conditioned air to Battery Rooms under normal operation. Air Handling Unit (AH-05X-715) and its associated controls are described below. The operation of AH-05X-716 is similar. The corresponding associated controls are shown on HVAC Flow and Control Diagram H-2-129902.

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AHU Supply Fan Logic Controller (YIC-05X-201) provides START/STOP control for Supply Fan (BL-05X-715) and Air Cooled Condensing Unit (CU-05X-715).

Temperature indicating controller (TIC-05X-203) controls cooling of the Battery Room (Room 108). It energizes the solenoid valve TV-05X-203 for Cooling Coil (CO-05X-715). High-high temperature is alarmed (TAHH). High or low temperature alarm (TAH/TAL-05X-203) from room temperature indicating controller TIC-05X-203 is interlocked with YIC-05X-201 to start or stop the Air Cooled Condensing Unit compressor and condenser fans.

Motor running time indicator KQI-05X-201 indicates Motor (MT-05X-715) running time.

Pressure differential indicator PDI-05X-202 indicates the pressure differential across the Supply Fan (BL-05X-715). Low pressure differential is alarmed (PDAL).

62.1.3 Exhaust Fans (BL-05Y-711 and 712)

Exhaust Fans (BL-05Y-711 and 712) exhaust Battery Room air during normal conditions. The Exhaust Fan (BL-05Y-711) and its associated controls are described below. The operation of BL-05Y-712 is similar. The corresponding associated controls are shown on HVAC Flow and Control Diagram H-2-129902.

Exhaust Fan Logic Controller (YIC-05Y-204) provides START/STOP control for Exhaust Fan (BL-05Y-711). YIC-05Y-204 automatically starts BL-05Y-711 whenever the Supply Fan BL-05X-715 is running.

Pressure differential indicator PDI-05Y-205 indicates the pressure differential across the Exhaust Fan (BL-05Y-711). Low pressure differential is alarmed (PDAL).

62.1.4 Unit Heaters (UH-05X-711 and 712)

Unit Heaters (UH-05X-711 and 712) provide heating for the Gas Turbine Generator Rooms. Unit Heater (UH-05X-711) and its associated control are described below. The operation of UH-05X-712 is similar. The corresponding associated controls are shown on HVAC Flow and Control Diagram H-2-129903.

Local temperature indicating controller TIC-05X-304 controls the Unit Heater and is furnished with Unit Heater (UH-05X-711).

Temperature indicator TI-05X-303 indicates temperature in the Gas Turbine Generator Room (Room 106). High/low/low-low temperatures are alarmed (TAH/TAL/TALL).

62.2 INFREQUENT NORMAL OPERATIONS

62.2.1 System Startup

(TBD in Detailed Design)

62.3 ABNORMAL CONDITIONS

The HVAC Safety Class design is summarized in this HVAC Safety Class Matrix. Normal data is also referenced when it is associated with the Safety application.

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HVAC SAFETY CLASS MATRIX

EQUIPMENT/ COMPONENTS	NUMBER	P & I D	SAFETY CLASS	TRAIN	SYSTEM ACTUATION	SAFETY SYSTEM ACTUATION POSITION	PROCESS NORMAL POSITION	IAS FAIL POSITION NORMAL
SWITCHGEAR/GENERATOR BUILDING								
STANDBY SWITCHGEAR EMERGENCY AHU Note 1	AH-05X-713 AH-05X-714	H-2-19901-2 H-2-19901-2	1 1	A B	1 1	ON ON	OFF OFF	N/A N/A
GENERATOR ROOM EMERGENCY SUPPLY FAN Note 2	BL-05X-717 BL-05X-718	H-2-19903-1 H-2-19903-1	1 1	A B	1 1	ON ON	OFF OFF	N/A N/A

SYSTEM ACTUATION - Safety System Actuation Status is provided to DCS for each Train, i.e., A and B
1) Loss of Normal Power

NOTES -

1) AH-05X-713 is interlocked with TSL-05X-101 & Local START and STOP is provided
AH-05X-714 is interlocked with TSL-05X-105 & Local START and STOP is provided
2) BL-05X-717 is interlocked with TSL-05X-311 & Local START and STOP is provided
BL-05X-718 is interlocked with TSL-05X-312 & Local START and STOP is provided

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63.0 CONTROL PROGRAM SPECIFICATIONS

Control Program Specifications are to be documented in Detailed Design. Tag Numbers and Control Program names are listed below:

63.1 YCP-05X-010 AHU Supply Fan Control Program

64.0 LOGIC CONTROLLER SPECIFICATIONS

Logic Controller Specifications are to be documented during Detailed Design. Tag Numbers and Logic Controller Program names only are listed below:

64.1	YIC-05X-004	AHU Evaporative Cooler Logic Controller (Logic for YIC-05X-009 is similar).
64.2	YIC-05X-005	AHU Supply Fan Logic Controller (Logic for YIC-05X-010 is similar).
64.3	YIC-05X-201	AHU Supply Fan Logic Controller (Logic for YIC-05X-206 is similar).
64.4	YIC-05Y-204	Exhaust Fan Logic Controller (Logic for YIC-05X-209 is similar).

65.0 SPECIAL ANALOG FUNCTIONS

(Not Applicable)

66.0 ACRONYMS

ACRONYM	TERM
LOP	Loss of Power
SCR	Silicon Controlled Rectifier

67.0 GLOSSARY

67.1 SYSTEM SPECIFIC TERMS

TAG NUMBER	TERM
TIC-05X-003A	Normal and Standby Switchgear Room Temperature Indicating Controller
TIC-05X-003B	Normal and Standby Switchgear Room Temperature Indicating Controller
YIC-05X-004	AHU Evaporative Cooler Logic Controller
YIC-05X-009	AHU Evaporative Cooler Logic Controller
YIC-05X-005	AHU Supply Fan Logic Controller
YIC-05X-010	AHU Supply Fan Logic Controller
YIC-05X-201	AHU Supply Fan Logic Controller
YIC-05X-206	AHU Supply Fan Logic Controller
YIC-05Y-204	Exhaust Fan Logic Controller
YIC-05Y-209	Exhaust Fan Logic Controller

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68.0 REFERENCE LIST

68.1 DOCUMENTS AND EQUIPMENT COVERED BY THIS PCD

SYS NO.	DESCRIPTION	EQUIPMENT NUMBER	P&ID H-2-XXXXXX-XX
05X	Air Handling Unit	AH-05X-711	129901-1
05X	Supply Fan	BL-05X-711	129901-1
05Y	Control Damper	DN-05X-711	129901-1
05X	Evaporative Cooler	EC-05X-711	129901-1
05X	Heating Coil	HG-05X-711	129901-1
05X	Unit Heater	UH-05X-711	129903-1
05X	Motor	MT-05X-711A	129901-1
05X	Motor	MT-05X-711B	129901-1
05X	Air Handling Unit	AH-05X-712	129901-1
05X	Supply Fan	BL-05X-712	129901-1
05X	Evaporative Cooler	EC-05X-712	129901-1
05X	Heating Coil	HG-05X-712	129901-1
05X	Unit Heater	UH-05X-712	129903-1
05X	Air Handling Unit	AH-05X-713	129901-2
05X	Supply Fan	BL-05X-713	129901-2
05X	Motor	MT-05X-713	129901-2
05X	Air Handling Unit	AH-05X-714	129901-2
05X	Supply Fan	BL-05X-714	129901-2
05X	Motor	MT-05X-714	129901-2
05X	Air Handling Unit	AH-05X-715	129902-1
05X	Cooling Coil	CO-05X-715	129902-1
05X	Supply Fan	BL-05X-715	129902-1
05X	Air Cooled Condensing Unit	CU-05X-715	129902-1
05X	Motor	MT-05X-715	129902-1
05X	Air Handling Unit	AH-05X-716	129902-1
05X	Supply Fan	BL-05X-716	129902-1
05X	Cooling Coil	CO-05X-716	129902-1
05X	Air Cooled Condensing Unit	CU-05X-716	129902-1
05X	Motor	MT-05X-716	129902-1
05X	Supply Fan	BL-05X-717	129903-1
05X	Supply Fan	BL-05X-718	129903-1
05Y	Exhaust Fan	BL-05Y-711	129902-1
05Y	Control Damper	DN-05Y-711	129901-1
05Y	Motor	MT-05Y-711	129902-1
05Y	Exhaust Fan	BL-05Y-712	129902-1
05Y	Motor	MT-05Y-712	129902-1

69.0

(Not Applicable)

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