DRAWING NO. 117C3346 CONT ON SHEET SH NO.

GENERAL ELECTRIC

117C3346 CONT ON SHEET SH NO.

UNLESS OTHERWISE SPECIFIED USE THE FOLLOWING:—

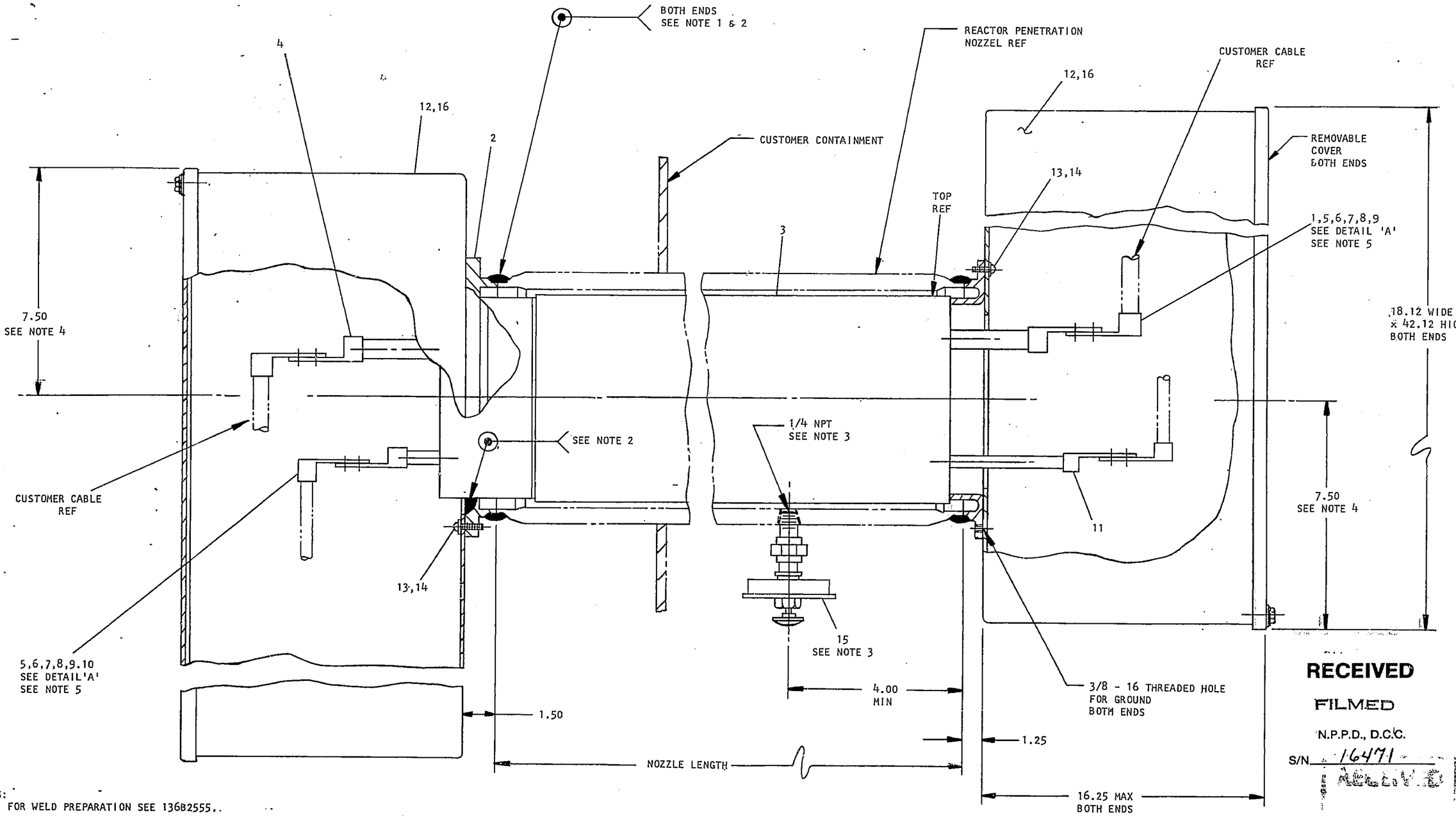
APPLIED PRACTICES	SURFACES	TOLERANCES ON MACHINED DIMENSIONS FRACTIONS	DECIMALS	ANGLES
	✓	±	±	±

TITLE INSTALLATION

PENETRATION SEAL-MEDIUM VOLTAGE POWER

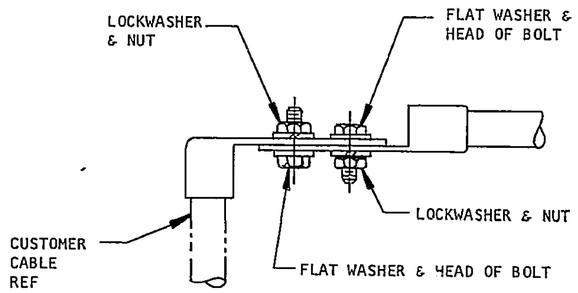
FIRST MADE FOR ELECTRICAL PENETRATION (COOPER STATION 1)

SEE 238X703NS FOR PART IDENTIFICATION



NOTES:

1. FOR WELD PREPARATION SEE 136B2555..
2. WELD & INSPECT IN ACCORDANCE WITH ASME BOILER & PRESSURE VESSEL CODE SECTION III CLASS B.
3. CUSTOMER TO LOCATE ITEM 15.
4. BOXES SHOWN IN OPPOSITE VERTICAL POSITONS. THEY MAY BE LOCATED IN ANY OF FOUR POSITIONS IF DESIRED.
5. CUSTOMER TO ARRANGE LOCATION OF SPLICES. BOLTS TO BE TORQUED TO 300-325 INCH LBS. (SEE DETAIL 'A' FOR ARRANGEMENT OF NUTS, BOLTS & WASHERS)
6. SEE INSTALLATION MANUAL FOR METHOD OF CALCULATING ELECTRICAL CAPACITY.
7. APPROX WEIGHT 450 LBS (LESS JCT BOXES)



DETAIL 'A'

238X703NS GROUP NO.	NOZZLE NO.	NOZZLE LENGTH
1	X1C1A	8'-0"
2	101C	8'-3"
2	101D	8'-3"
3	101F	8'-6"

NO.	REVISIONS	BY	CHK	APP	DATE
N01	INCORP TRANSFER REQUEST # 40	RLH	DLT	RWB	7-7-77

ALL FUTURE REVISIONS BY N.P.P.D.

REVISIONS	
N01	INCORP CHANGE TO ORIGINAL

PRINTS TO

A21	
3	
24	
73	
C	

RECEIVED
FILMED
N.P.P.D., D.C.C.
S/N 16471

DRAWING NO. 117C3346 CONT ON SHEET SH NO. REV NO. 0 N01

MADE BY		APPROVALS			
E. Margherone	apr 3, 70	OR Kimball	4-9-70	NID	DIV OR DEPT
ISSUED E. Margherone	Apr 9-70			SAN JOSE, CALIF.	LOCATION

117C3346 CONT ON SHEET SH NO.

FF-809-F (6-68) PRINTED IN U.S.A.

FEB 28 1977 NPPD

DRAWING NO. / CONT ON SHEET / SH NO.

GENERAL ELECTRIC

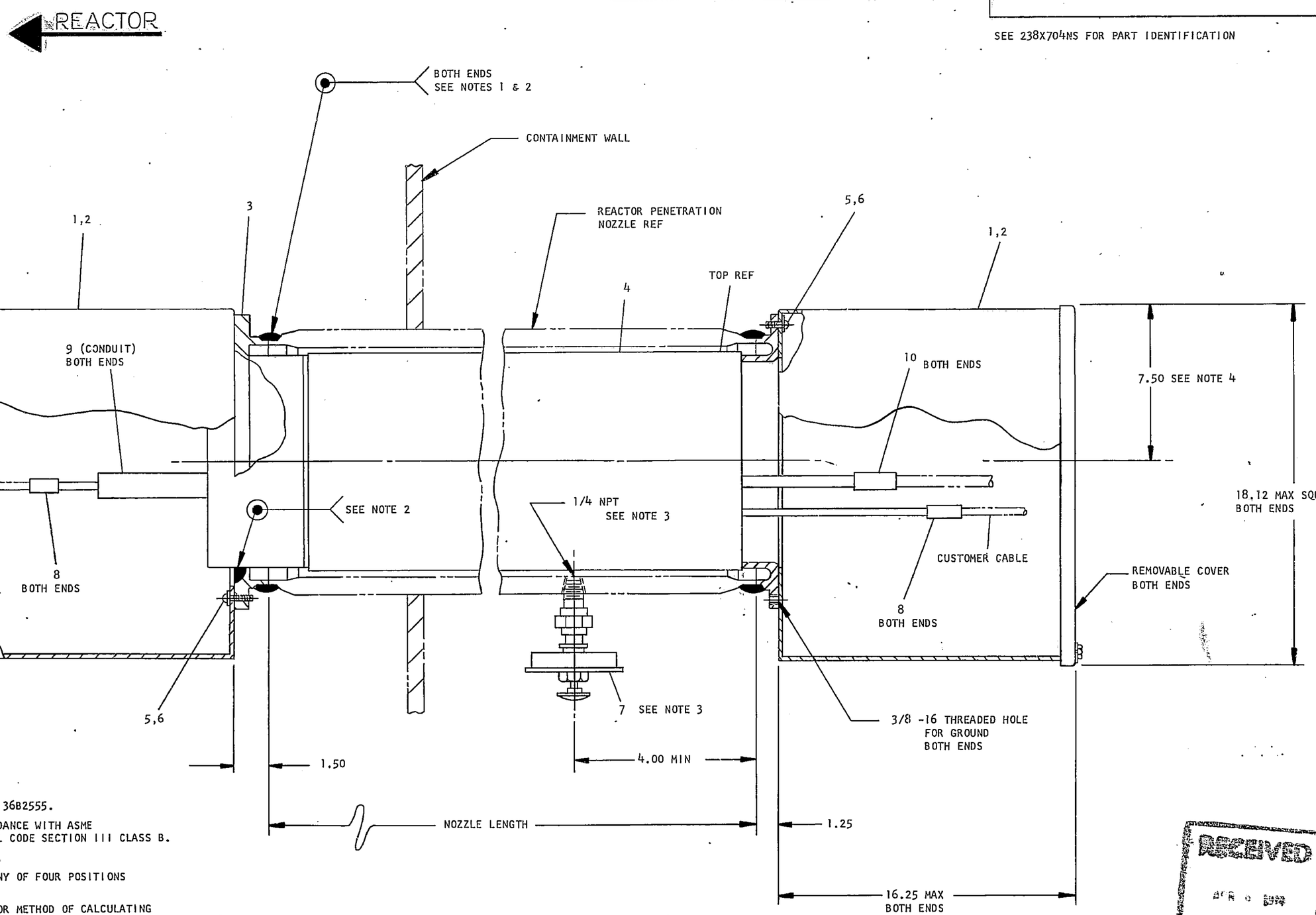
117C3349 CONT ON SHEET SH NO.

UNLESS OTHERWISE SPECIFIED USE THE FOLLOWING:—

APPLIED PRACTICES	SURFACES	TOLERANCES ON MACHINED DIMENSIONS		
		FRACTIONS	DECIMALS	ANGLES
	✓	±	±	±

TITLE INSTALLATION
PENETRATION SEAL-INDICATION AND CONTROL
FIRST MADE FOR ELECTRICAL PENETRATION (COOPER STATION 1)

SEE 238X704NS FOR PART IDENTIFICATION



NOTES:

1. FOR WELD PREPARATION SEE 136B2555.
2. WELD AND INSPECT IN ACCORDANCE WITH ASME BOILER AND PRESSURE VESSEL CODE SECTION III CLASS B.
3. CUSTOMER TO LOCATE ITEM 7.
4. BOXES MAY BE LOCATED IN ANY OF FOUR POSITIONS IF DESIRED.
5. SEE INSTALLATION MANUAL FOR METHOD OF CALCULATING ELECTRICAL CAPACITY.
6. APPROX. WEIGHT 500 LBS (LESS JCT BOXES)

238X704NS GROUP NO.	NOZZLE NO.	NOZZLE LENGTH
1	X100A	7' - 10"
1	X100H	7' - 10"
2	X100G	8' - 3"
2	X102	8' - 3"

RECEIVED
FILMED
N.P.P.D., D.C.C.
S/N 16467

RECEIVED
APR 6 '70
BURNS AND ROE
NEW YORK

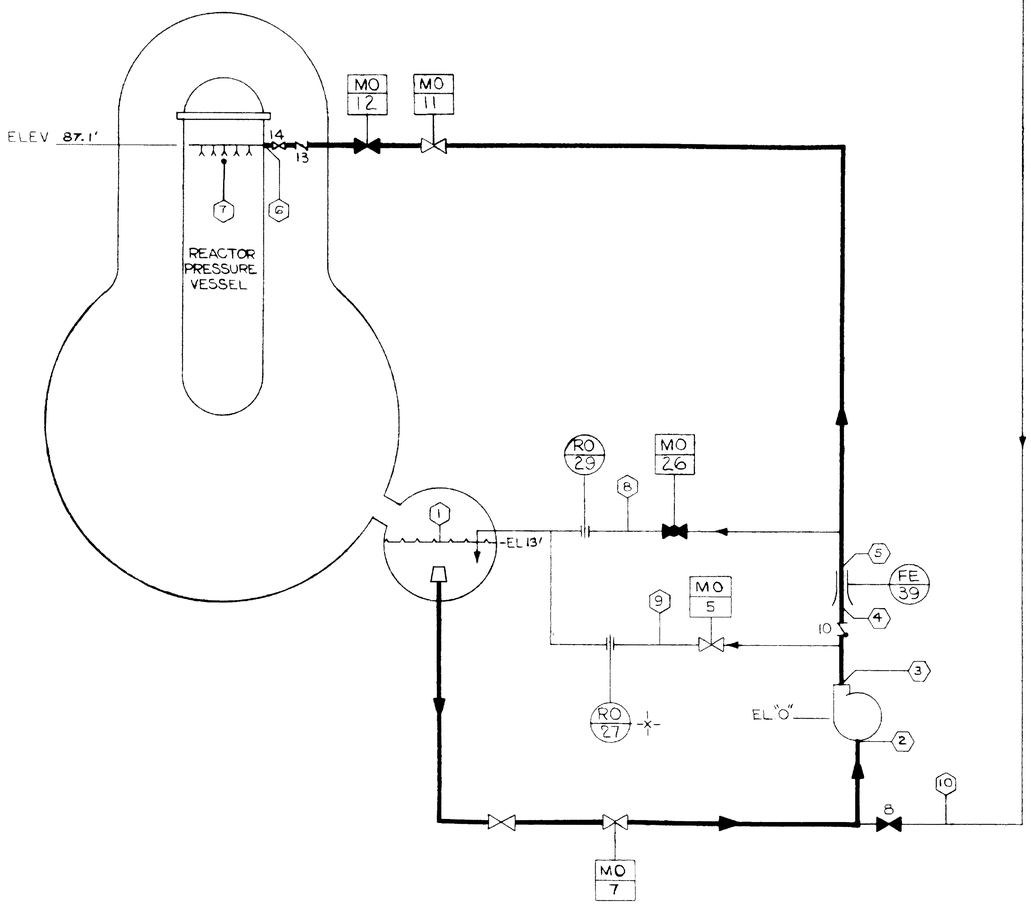
DRAWING NO. 117C3349 CONT ON SHEET SH NO.
REV NO. 01

REVISIONS	PRINTS TO	
1 E. Marghesone May 22,'70 ebm	A21	C
TITLE WAS	3	
Low VOLTAGE POWER ORK	24	
	73	

MADE BY E. Marghesone Apr 10, 70
ISSUED E. Marghesone May 13-70
APPROVALS ARK Kimball 4-10-70
NID DIV OR DEPT
SAN JOSE, CALIF LOCATION
117C3349 CONT ON SHEET SH NO.

FF-809-F (12-68) PRINTED IN U.S.A.

6 15



CONDITION I NORMAL SYSTEM TEST

LOCATION	1	2	3	4	5	6	7	8	9	10
FLOW - GPM	N/A	4720	←	→	4720	0	0	4720	0	0
PRESS - PSIA	14.7									
TEMP - °F	95	95	95	95	95			95		
NOTE		13	13	13	13			13		
ΔP - FT.		←10→	•625•		←8.34→					

←ΔP=606.7 FT (SEE NOTE 8)→

CONDITION II TEST USING CONDENSATE STORAGE TANK

LOCATION	1	2	3	4	5	6	7	8	9	10
FLOW - GPM	N/A	6000	←			→	6000	0	0	6000
PRESS - PSIA	14.7						14.7			
TEMP - °F		90	←			→	90			90
NOTE		6,14	←			→	6,14			6,14
ΔP - FT.		• 480 →		•13.5→		• 320 →				

←ΔP=84.7 FT. (SEE NOTE 8)→

CONDITION III PUMP OPERATING ON BYPASS (ISOLATION VALVES CLOSED)

LOCATION	1	2	3	4	5	6	7	8	9	10
FLOW - GPM	N/A	475	475	0	0	0	0	0	475	0
PRESS - PSIA	14.7									
TEMP - °F	140	140	140						140	
NOTE										
ΔP - FT.		←790→								

CONDITION IV CORE SPRAY INJECTING AT REACTOR PRESS

LOCATION	1	2	3	4	5	6	7	8	9	10
FLOW - GPM	N/A	4720	←			4720	4625	0	0	0
PRESS - PSIA	29.6						140.1			
TEMP - °F	208.7	←				→	208.7			
NOTE		10					11			
ΔP - FT.		← 625 →		← 8.34 •		← 198 →				

←ΔP=52.4 FT. (SEE NOTE 8)→

VALVE POSITIONS

CONDITION	VALVE NO.				
	5	7	8	12	26
I	C	O	C	C	P
II	C	C	O	O	C
III	O	O	C	C	C
IV	C	O	C	O	C

O - FULL OPEN
C - FULL CLOSED
P - PARTIALLY OPEN

NOTES:

1. ALL ELEVATIONS ARE WITH RESPECT TO PUMP & ELEVATION WHICH IS ASSUMED "0".
2. ALLOWANCE FOR SYSTEM PIPE FRICTION, VALVE & FITTING LOSSES ETC. ARE REFLECTED BY THE PRESSURES REPORTED IN THIS TABULATION. THIS ALLOWANCE IS BASED ON PRELIMINARY LAYOUTS & THE DATA & METHODS PRESENTED IN CRANE TECHNICAL PAPER 410 ASSUMING CLEAN PIPE EXCEPT FOR CARBON STEEL PIPE. FOR RUNS OF CARBON STEEL PIPE (NOT CARBON STEEL VALVES & FITTINGS) A MARGIN OF 20% ABOVE THE CLEAN FRICTION LOSS IS INCLUDED.
   PIPE FRICTION, VALVE & FITTING LOSSES ETC. MAY BE DISTRIBUTED THROUGHOUT SYSTEM AS REQUIRED BY FINAL SYSTEM LAYOUT CONSIDERATIONS AS LONG AS THE TOTAL DOES NOT EXCEED THAT INDICATED ON THIS DIAGRAM.
3. A.E. WILL BE RESPONSIBLE TO INSURE THAT THE PIPING LOSSES ARE WITH IN THE LIMITS SPECIFIED ON THIS DRAWING AND SHALL REPORT DEVATION TO A.P.E.D.
4. THE BY-PASS FLOW IS APPROXIMATE AND WILL BE SPECIFIED BY THE PUMP VENDOR.
5. ONLY ONE CORE SPRAY LOOP IS SHOWN. THE SECOND LOOP IS IDENTICAL. EXCEPT FOR S.W. INTERTIE.
6. IN CONDITION II THE NET POSITIVE SUCTION HEAD (NPSH) AVAILABLE AT THE PUMP INLET (LOCATION 2) MUST BE GREATER THAN OR EQUAL TO 32 FT OR PUMP MANUFACTURE SPECIFIED NPSH.
7. PARTS ARE NUMBERED AS PER CORE SPRAY P & ID MPL #14.
8. THIS ΔP DOES NOT INCLUDE ELEVATION LOSSES OR GE SUPPLIED EQUIPMENT ΔP.
9.
10. IN CONDITION IV THE NET POSITIVE SUCTION PRESSURE (NPSH) IS EVALUATED IN NEDC 97-044A.
11. 95 GPM THERMAL SLEEVE LEAKAGE.
12. THIS DRAWING REFLECTS THE AS BUILT CONFIGUATION PER BURNS & ROE CORE SPRAY SYSTEM P & ID, DRAWING #2045, REV 17.
13. TECHNICAL SPECIFICATION SURVEILLANCE REQUIRES A MINIMUM FLOW OF 4720 GPM AT 113 PSID. THIS ENSURES THAT THE ECCS ANALYSIS ASSUMED FLOW RATES ARE MET.
14. CONDITION II TESTS ARE NOT PERFORMED AS PART OF SURVEILLANCE TESTING PROGRAM.
15. CONDITION IV TEMPERATURE AND PRESSURE REFLECT DBA-LOCA CONDITIONS (NEDC 94-034C).

AS BUILT
454004929

FOR PREVIOUS REVISIONS, SEE SUPERSEDED CARDS.

REVISIONS BY N.P.P.D.

NO.	REVISIONS	DFT	CKD	APP	DATE
N06	EE 02-033 (DCN 02-0720)	RAC	RHG	KG	11-2-02

SCAN/CADD DWG
DO NOT REVISE MANUALLY
CADD FILE: C0046340

4510050 80

PIPING AND INSTRUMENT SYMBOLS

INSTRUMENT FUNCTION / MEASURED VARIABLE (FIRST LETTER)		CONTROLLING (SECOND AND THIRD LETTER)						HEASURING (SECOND AND THIRD LETTER)											SEE NOTE 3	
		RECORDING	INDICATING	NON-INDICATING	CONTROL VALVE	SUMMER	FUNCTION GENERATOR	RECORDER	INDICATOR	OBSERVATION GLASS	PRIMARY ELEMENT	TEST POINT	(TRANSMITTER OR PREAMP)	INTEGRATOR	AMPLIFIER	SAMPLER	INDICATING SWITCH	NON-INDICATING SWITCH	ALARMS	TRANSDUCER NON INDICATING	TRANSDUCER INDICATING
		-RC	-IC	-C	-CV	-Σ	-F	-R	-I	-G	-E	-X	-T	-Q	-Am	-Sm	-IS	-S	-A	-M	-IM
AIR	A	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ASm	-	-	-	-	-
CONDUCTIVITY	C	CRC	CIC	-	CCV	-	-	CR	CI	-	CE	CX	CT	-	-	CSm	CIS	CS	CA	-	-
DENSITY	D	DRC	DIC	DC	DCV	-	-	DR	DI	-	-	DX	DT	-	-	-	DIS	DS	DA	-	-
DIFF. PRESS.	dP	dPRC	dPIC	dPC	dPCV	-	-	dPR	dPI	-	-	-	dPT	-	-	-	dPIS	dPS	dPA	dPM	dPIM
FLOW	F	FRC	FIC	FC	FCV	FΣ	FI	FR	FI	FG	FE	FX	FT	FQ	-	-	FIS	FS	FA	FM	FIM
HYDROGEN	H_2	-	-	-	-	-	-	H_2R	H_2I	-	H_2E	-	-	-	-	-	-	-	-	-	-
HYDROGEN ION CONC.	pH	pHRC	pHIC	pHC	pHCV	-	-	pHR	pHI	-	pHE	pHX	-	-	pHAm	pHSm	-	-	-	-	-
LEVEL	L	LRC	LIC	LC	LCV	-	-	LR	LI	LG	-	-	LT	-	-	-	LIS	LS	LA	LM	LIM
MOISTURE	M	MRC	MIC	-	-	-	-	MR	MI	-	ME	-	MT	-	-	-	MIS	MS	-	-	-
NEUTRON FLUX	N	NRC	NIC	NC	-	-	-	NR	NI	-	NE	NX	NT	NQ	NAm	-	-	-	NA	-	-
OXYGEN	O_2	-	-	-	-	-	-	O_2R	O_2I	-	O_2E	-	-	-	-	-	-	-	-	-	-
PRESSURE	P	PRC	PIC	PC	PCV	-	-	PR	PI	-	-	PX	PT	-	-	-	PIS	PS	PA	PM	PIM
POSITION	Po	-	-	-	-	-	-	PoR	PoI	-	-	-	PoT	-	-	-	-	PoS	PoA	-	-
RADIATION	R	-	-	-	-	-	-	RR	RI	-	RE	RX	-	-	RAm	RSm	-	RS	RA	-	-
SPEED	S	SRC	SIC	SC	-	-	-	SR	SI	-	SE	-	-	-	-	-	-	-	-	-	-
TEMPERATURE	T	TRC	TIC	TC	TCV	-	-	TR	TI	-	TE	TX	TT	TQ	-	-	TIS	TS	TA	TM	TIM
TIME	t	-	-	tC	-	-	-	-	tI	-	-	-	-	tQ	-	-	tIS	tS	-	-	-
TURBIDITY	Tb	-	-	-	-	-	-	TbR	-	-	TbE	-	TbT	-	-	-	-	-	-	-	-
VIBRATION	Vb	-	-	-	-	-	-	VbR	VbI	-	-	-	-	-	-	-	-	VbS	VbA	-	-
WEIGHT FACTOR	WI	WRC	WIC	-	WIV	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

MISCELLANEOUS ABBREVIATIONS:

ADS	AUTOMATIC DEPRESSURIZATION
A/S	AIR SUPPLY
AW	ACID WASTE (CORROSIVE, CAUSTIC)
CIT	CONDUCTIVITY INDICATOR TRANSMITTER
CRD	CONTROL ROD DRIVE
CRDHS	CONTROL ROD DRIVE HYDRAULIC SYSTEM
CRS	CONDUCTIVITY RECORDING SWITCH
CRW	CLEAN RADWASTE
IC	CYCLE TIMER
DRW	DIRTY RADWASTE
dTS	DIFFERENTIAL TEMPERATURE SWITCH
E/P	CONVERTER (VOLTAGE/PNEUMATIC)
E/S	SPECIAL ELECTRIC POWER SUPPLY REQUIRED
F/D	FILTER DEMINERALIZER
FC	INDICATES CLOSES ON AIR OR ELECTRICAL FAILURE
FIT	FLOW INDICATOR TRANSMITTER
FO	INDICATES OPENS ON AIR OR ELECTRICAL FAILURE
FRCS	FLOW RECORDING CONTROLLER SWITCH
HCU	HYDRAULIC CONTROL UNIT
Hx	HEAT EXCHANGER
IP	CONVERTER (CURRENT/PNEUMATIC)
LC	LOCK CLOSED
L/DRS	LEVEL & DENSITY RECORDER SWITCH
LIM SW	LIMIT SWITCH
LIS	LIEVEL INDICATOR RECORDING SWITCH
LO	LOCK OPEN
LRS	LIEVEL RECORDING SWITCH
MSIV	MAIN STEAM ISOLATION VALVE
MV/I	MILLIVOLT TO CURRENT CONVERTER
NC	NORMALLY CLOSED
ND	NORMALLY DE-ENERGIZED
NE	NORMALLY ENERGIZED
NO	NORMALLY OPEN
NSSS	NUCLEAR STEAM SUPPLY SYSTEM
NW	NORMAL WASTE (CONVENTIONAL)

MISCELLANEOUS ABBREVIATIONS:

RBCCW	REACTOR BUILDING CLOSED COOLING WATER
RBEDT	REACTOR BUILDING EQUIPMENT DRAIN TANK
RM	REMOTE MANUAL
RMC	REMOTE MANUAL CONTROL
RMS	REMOTE MANUAL SWITCH
RPS	REACTOR PROTECTION SYSTEM
RPV	REACTOR PRESSURE VESSEL
SS	SELECTOR SWITCH
SSa	SELECTIVE SWITCH AUTOMATIC
SQ RT	
OR √	SQUARE ROOT CONVERTOR
TBCCW	TURBINE BUILDING CLOSED COOLING WATER
TbRS	TURBIDITY RECORDER SWITCH
tDS	TIME DELAY SWITCH
TQOS	TORQUE OVERLOAD SWITCH
TQRS	TORQUE RECORDER SWITCH
TQT	TORQUE TRANSMITTER
TRS	TEMPERATURE RECORDER SWITCH

FAI FAIL AS IS
HS HAND SWITCH } SEE NOTE 2

NOTES:

1. ALL SOLENOID VALVES SHOWN IN DE-ENERGIZED POSITION. "NE"-DENOTES SOLENOID IS NORMALLY ENERGIZED DURING PLANT OPERATION.
2. SYMBOLS INACTIVE FOR NEW DESIGN
3. FOR THE TYPE OF TRANSDUCER (SWITCH OR TRANSMITTER) REFER TO THE PARTICULAR SYSTEM MASTER PARTS LIST

VALVES

- GATE (NORMALLY OPEN)
- GATE (NORMALLY CLOSED)
- GLOBE (NORMALLY CLOSED)
- GLOBE (NORMALLY OPEN)
- GLOBE, STOP CHECK
- CHECK
- EXCESS FLOW CHECK
- TESTABLE CHECK
- PLUG OR BALL
- NEEDLE
- SQUIB ACTUATED SHEAR PLUG
- DE-ENERGIZED, NEXT PORT OF CLOSURE, ENERGIZED } THREE WAY SEE NOTE NO. 1
- FOUR WAY
- ANGLE
- ANGLE, STOP CHECK
- GLAND LEAK-OFF
- GLAND SEAL WATER
- SAUNDER'S TYPE (WEIR)
- SAFETY OR RELIEF
- 3 SPRING OPERATED CONTROL OPENS ON AIR FAILURE
- PINCH

VALVES

- DIAPHRAGM OPERATED CONTROL CLOSES ON AIR FAILURE
- GLOBE "Y" PATTERN
- BUTTERFLY
- VB — VACUUM BREAKER
- DAMPER
- SPECIAL ANGLE (SIPHON)

INSTRUMENTS

- I/P — CONVERTER (CURRENT/PNEUMATIC)
- R — MULTI POINT RECORDER (NUMBER OF POINTS)
- S — ELECTRONIC TRIP UNIT
- COMPUTER SYSTEM OR PERFORMANCE MONITORING SYSTEM INPUT SIGNAL
- DISPLAY CONTROL SYSTEM INPUT SIGNAL
- ALARM HIGH, ALARM LOW } USED WHEN SERVICE IS DEFINED
- T — TRANSMITTER
- OPEN, CLOSED — LIGHT
- LOCAL
- REMOTE OR LOCAL PANEL
- MAIN CONTROL ROOM, CR

OPERATORS

- MO — MOTOR OPERATED
- HO — HYDRAULIC OPERATED PISTON
- AO — AIR OPERATED PISTON
- SOLENOID
- MANUAL REMOTE
- DIAPHRAGM
- FLOAT
- MANUAL TRIP & RESET
- MANUAL TRIP & RESET
- PCV, FCV, FCV, LCV — SELF-CONTAINED CONTROL
- WITH POSITIONER
- QUICK OPENING
- AO — AIR OPERATED (WITH SOLENOID RMS ON REMOTE OR LOCAL PANEL)
- AC — AIR OPERATED (WITH SOLENOID RMS ON CONTROL ROOM PANEL)

MISCELLANEOUS

- HOSE CONNECTION
- ERAP
- IF — INSULATING FLANGE
- BLIND FLANGE
- SPECTACLE FLANGE
- BASKET STRAINER (DUPLEX)
- BASKET STRAINER (SIMPLEX)
- SAMPLE PROBE
- "Y" TYPE STRAINER
- FILTER
- FE — METERING ORIFICE PLATE
- FE — FLOW NOZZLE
- FG — SIGHT FLOW GLASS
- SC — SAMPLE COOLER
- FI — IN-LINE FLOW INDICATOR

MISCELLANEOUS

- RO — RESTRICTING ORIFICE
- INCREASER, REDUCER
- THREADED CAP
- QUICK DISCONNECT
- WELD CAP
- RUPTURE DISC
- EXPANSION JOINT
- FLEXIBLE CONNECTION
- SPOOL PIECE
- EDUCTOR
- AIR EJECTOR
- GRAB SAMPLE
- PROCESS FLOWS MEASURING POSITION
- AUXILIARY FLOWS MEASURING POSITION
- PENETRATION
- SX — SAMPLE TEST POINT
- FLOW METER (POSITIVE DISPLACEMENT)
- CRW — OPEN DRAIN FUNNEL DRAIN SYSTEM
- FURNISHED WITH ASSOCIATE EQUIPMENT
- DIAPHRAGM
- PIPING SPEC CHANGE (NOT TO BE USED ON EQUIPMENT)
- TEMPORARY STRAINER (SEE NOTE 2)

LINES

- PROCESS LINE MAIN
- PROCESS LINE AUXILIARY AND INSTRUMENT LINE
- INST QT SERVICE AIR
- INSTRUMENT ELECTRICAL LEADS
- INSTRUMENT CAPILLARY TUBING

ARROWS INDICATE DIRECTION OF FLOW

SH. 2-33 — SHEET AND ZONE NUMBER OF SAME DRAWING
REF 6 SH. 2 36 — REFERENCE DRAWING

FIPE CLASSIFICATION

20"-AA-C
- GROUP CLASSIFICATION
- STANDARD PRIMARY RATING LINE DESIGNATIONS
- NOMINAL PIPE SIZE

} SEE APPLICABLE DOCUMENT: A81/A62-4030 OR 22A1498

8"-S3-A-17-3
- PRESS-TEMP INDEX
- PRESS-TEMP RATING NO.
- PRESS-INTEGRITY CLASS
- MATERIAL TYPE
- PIPE SIZE

} SEE 22A1295

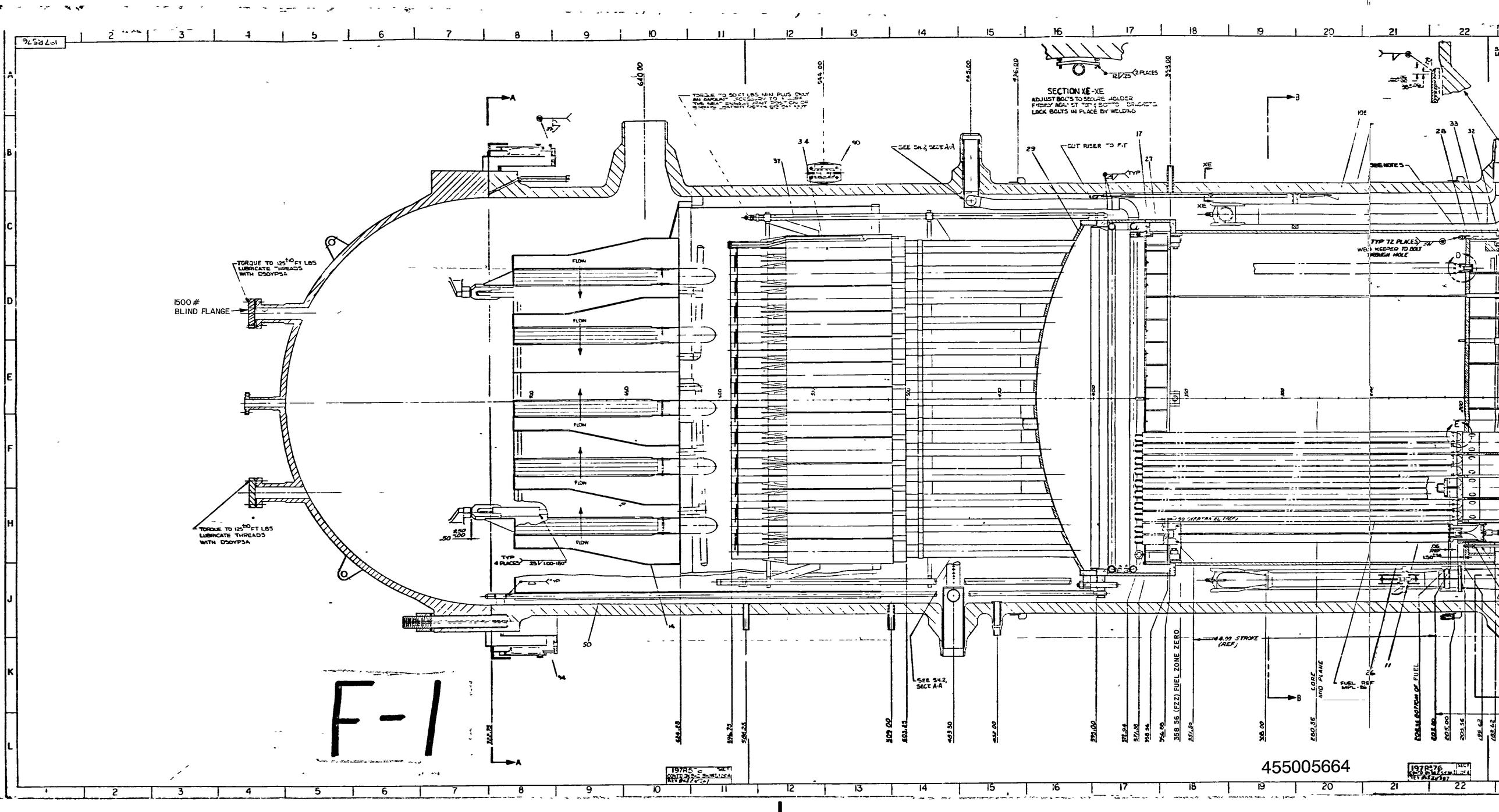
(SEE NOTE 2)

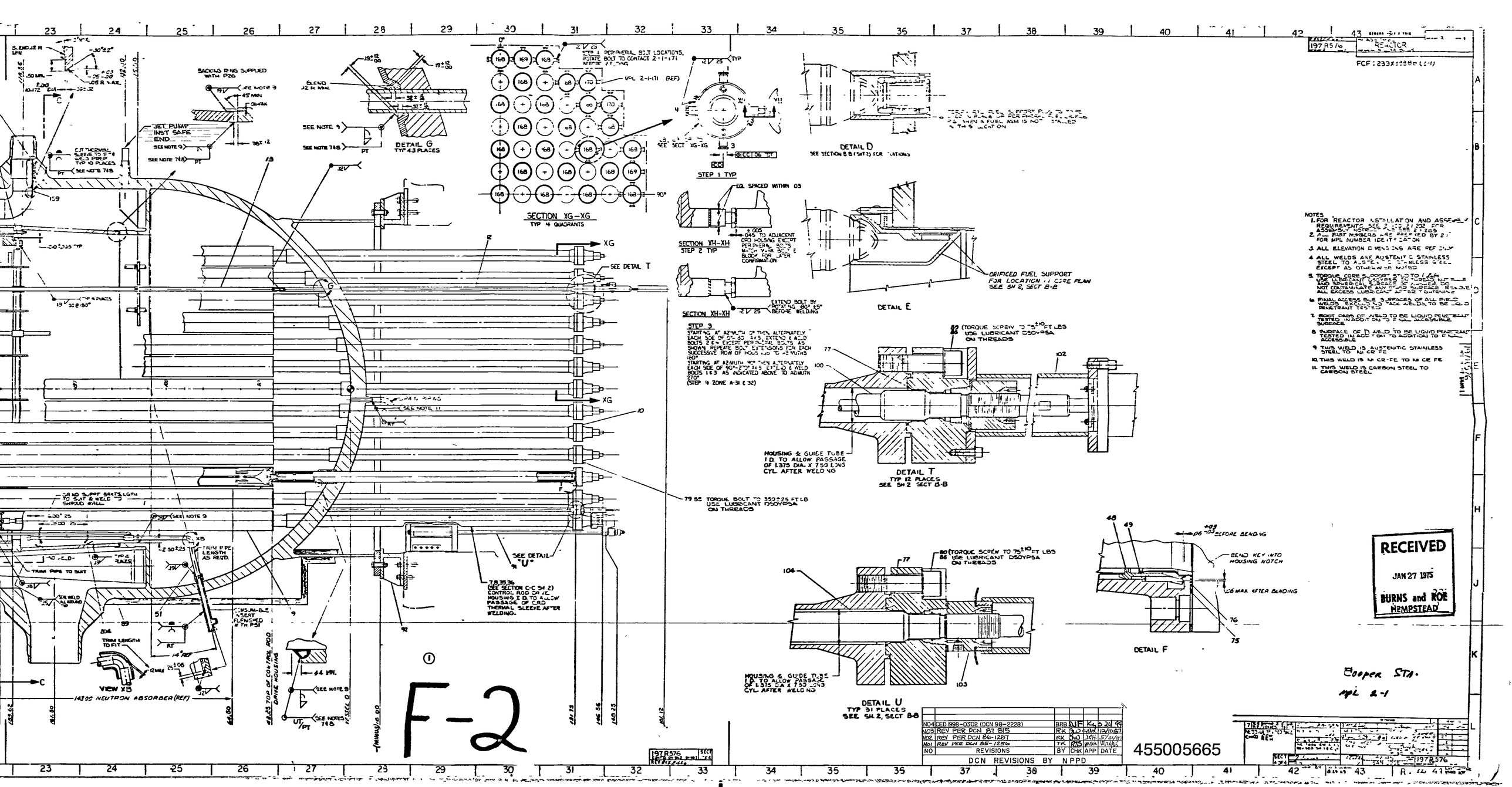
PIPING RESPONSIBILITY BY OTHERS INDICATE AS SHOWN BELOW:
8"-BY OTHERS
(SEE NOTE 2)

AS BUILT

2	RECRAWN PER NE 10770		
3	REVISED PER CHG ORD		

DRAWN SAN JOSE
197R567


SECTION XE-XE
ADJUST BOLTS TO SECURE HOLDER FIRMLY AGAINST TOP & BOTTOM BRACKETS
LOCK BOLTS IN PLACE BY WELDING
TORQUE TO 125 +10 FT LBS LUBRICATE THREADS WITH DSOYPSA
1500 # BLIND FLANGE
TORQUE TO 125 +10 FT LBS LUBRICATE THREADS WITH DSOYPSA
FLOW
TYP 4 PLACES
SEE SH 3 SECT A-A
CUT RISER TO FIT
TYP 12 PLACES
WELD KEEPED TO DO1 THROUGH HOLE
SEE NOTE 5
SEE SH 2, SECT A-A
40.00 STROKE (REF)
CORE MID PLANE
FUEL REF MPL-88
TOP OF FUEL
358.56 (FZ2) FUEL ZONE ZERO
F-1
455005664



NOTES
1. FOR REACTOR INSTALLATION AND ASSEMBLY REQUIREMENTS SEE 2-1-172, 2-1-302 FOR ASSEMBLY NOTES 25 AND 26, 2-1-259 FOR MPL NUMBER IDENTIFICATION
2. PART NUMBERS ARE PREFIXED BY 21
3. ALL ELEVATION DIMENSIONS ARE REF ONLY
4. ALL WELDS ARE AUSTENITIC STAINLESS STEEL TO AUSTENITIC STAINLESS STEEL EXCEPT AS OTHERWISE NOTED
5. TORQUE CORE SUPPORT STUD TO 1,450 USE LUBRICANT DSOYPSA ON STUDS, NUTS AND SPHERICAL WASHERS. DO NOT LUBRICATE BOTTOM SURFACE OF NUT OR CONTACT AREA OF SPHERICAL WASHER. REMOVE ALL EXCESS LUBRICANT AFTER TORQUING
6. FINAL ACCESS SIDE SURFACES OF ALL FILLET WELDS EXCEPT FACE WELDS, TO BE LIQUID PENETRANT TESTED
7. ROOT PASS OF WELD TO BE LIQUID PENETRANT TESTED IN ADDITION TO FINAL ACCESSIBLE SURFACE
8. SURFACE OF D WELD TO BE LIQUID PENETRANT TESTED IN ADDITION TO FINAL ACCESSIBLE
9. THIS WELD IS AUSTENITIC STAINLESS STEEL TO NI CR FE
10. THIS WELD IS NI CR-FE TO NI CR FE
11. THIS WELD IS CARBON STEEL TO CARBON STEEL

RECEIVED
JAN 27 1975
BURNS and ROE
HEMPSTEAD

Booper Sta.
mi 2-1

NO	REVISIONS	BY	CHK	APP	DATE
N04	CED 1998-0302 (DCN 98-2228)	BRB	DJF	KJS	2/24/99
N03	REV PER DCN 91 915	RK	DJO	KAM	12/10/97
N02	REV PER DCN 86-1291	RK	DJO	JCH	6/21/93
N01	REV PER DCN 85-1286	TR	RAS	MBA	11/4/85

DCN REVISIONS BY NPPD

455005665

197R576

197R576

VALVES

- GATE (NORMALLY OPEN) (SEE NOTE 4)
- GATE (NORMALLY CLOSED) (SHOWN WITH LOCK) — L.C.
- GLOBE (SHOWN LOCKED OPEN) — L.O.
- GLOBE, STOP CHECK
- GLOBE (NORMALLY CLOSED)
- CHECK — OR
- EXCESS FLOW CHECK
- BUTTERFLY
- PLUG OR BALL
- NEEDLE
- SQUIB ACTUATED SHEAR PLUG
- THREE WAY VALVE (FIG. A) SHOWN TO INDICATE EITHER: 1. PORT STATUS (OPEN OR CLOSED) NOT DETERMINED OR 2. MODULATING 3-WAY CONTROL VAVLE (SEE NOTE 3)
- THREE WAY VALVE (FIG. B) NEXT PORT OF CLOSURE NORMALLY CLOSED PORT NORMALLY OPEN PORT
- FOUR WAY
- ANGLE
- ANGLE, STOP CHECK
- GLAND LEAK-OFF
- GLAND SEAL WATER
- SAUNDER'S TYPE
- SAFETY OR RELIEF
- DIAPHRAGM OPERATED CONTROL OPENS ON AIR FAILURE
- DIAPHRAGM OPERATED CONTROL CLOSES ON AIR FAILURE

  } APPLIES TO ALL TYPES OF VALVES. USE TO DESIGNATE DIAPHRAGM ACTION

- REMOTE ELECT. SETTING RELIEF VALVE
- BLEEDER CHECK VALVE
- COMBINED BLEEDER CHECK AND STOP VALVE (ISO-CHECK) — MO
- FIRE HYDRANT
- HOSE VALVE
- SOLENOID VALVE WITH BUILT IN FLOW CONTROL
- FLOAT OPERATED AIR RELEASE VALVE
- SHUTTLE VALVE

OPERATORS

- MOTOR OPERATED — MO
- HYDRAULIC OPERATED PISTON — HO
- AIR OPERATED — AO
- SOLENOID — NE *(SEE NOTE 1)
- MANUAL REMOTE
- DIAPHRAGM
- FLOAT
- MANUAL TRIP AND RESET
- WITH MANUAL OVER-RIDE
- SELF-CONTAINED REGULATOR — PCV, TCV, FCV, LCV
- DIAPHRAGM WITH POSITIONER
- QUICK OPENING

SYMBOLS

- FURNISHED WITH ASSOCIATE EQUIPMENT
- EJECTOR
- REDUCER
- THREADED CAP OR PLUG
- QUICK DISCONNECT
- WELDED CAP
- HOSE CONNECTION
- BLIND FLANGE
- "Y" TYPE STRAINER
- TRAP — T
- FLEXIBLE CONNECTION
- OPEN DRAIN FUNNEL DRAIN SYSTEM — CRW
- FILTER
- TEMPORARY STRAINER
- RUPTURE DISC
- EXPANSION JOINT
- BASKET STRAINER (DUPLEX)
- BASKET STRAINER (SIMPLEX)
- SPECTACLE FLANGE
- METERING ORIFICE PLATE — FE
- FLOW NOZZLE — FE
- SIGHT FLOW GLASS — FG
- FLOW METER (POSITIVE DISPLACEMENT)
- IN-LINE FLOW INDICATOR TRANSMITTER, ETC. (SEE CODE) — FI
- RESTRICTING ORIFICE — RO
- INSULATING FLANGE (SEE NOTE 7) — IF
- INSTRUMENT AIR SUPPLY
- SAMPLE CONNECTION — SP
- FLOOR (AREA) DRAIN
- MULTIPLE ORIFICE — RO
- HIGH SIGNAL SELECTOR — >
- CATHODIC PROTECTION LEAD — CP
- FLEXIBLE HOSE
- CONE STRAINER
- SNUBBER — SN
- COMPRESSION GLAND

ELECTRICAL

- CONVERTER (MILLIVOLT/CURRENT) — MV/I
- CONVERTER (ELECTRIC/PNEUMATIC) — E/P
- CONVERTER (RESISTANCE/CURRENT) — R/I
- ELECTRONIC TRIP UNIT IN MAIN CONTROL ROOM — S
- COMPUTER INPUT — C
- NOT FULLY OPEN ALARM USED WHEN SERVICE IS NOT DEFINED (USE "L" FOR LOW & "H" FOR HIGH) NOT FULLY CLOSED
- ALARM — AH
- ALARM — AL

  } USED WHEN SERVICE IS DEFINED (SEE NOTE 2)

- TRANSMITTER — T
- OPEN / CLOSED } LIGHT
- MULTIPOINT RECORDER "X" = NO. OF POINTS — R "X"P
- LOCAL
- REMOTE PANEL OR RACK NO. — XX
- MAIN CONTROL ROOM PANEL OR RACK NO. — XX
- LOGIC
- PRIMARY CONTAINMENT PENETRATION — X
- SECONDARY CONTAINMENT PENETRATION — Y
- MOTOR (ELECTRIC) — M

HVAC SYMBOLS

- SIGHT TIGHT LOUVER
- DAMPER (PARALLEL)
- DAMPER (OPPOSED BLADE)
- ROOM THERMO — T
- TEMPERATURE CONTROLLER (SELF CONTAINED BULB TYPE) — TC
- FAN WITH INLET VANE CONTROL DAMPER
- MANUALLY OPERATED DAMPER
- AUTO. DIAPHRAGM OPERATED DAMPER
- AUTO. DIAPHRAGM OPERATED DAMPER WITH POSITIONER
- INCLINED DROP IN RESPECT TO AIR FLOW — D
- INCLINED RISE IN RESPECT TO AIR FLOW — R
- LOUVERED DOOR
- ROUGHING FILTER OR PRE-FILTER
- HI-EFFICIENCY FILTER
- MOTOR (ELECTRIC) — M
- PNEUMATIC RELAY — R
- WATER SEAL LEG
- SUPPLY DUCT
- EXAUST, RECIRCULATING OR RETURN DUCT
- OUTSIDE AIR DUCT — O/A
- ELBOW DUCT WITH TURNING VANES
- DUCT SIZE (FIRST NO. IS SIZE SHOWN) — 12x20
- INDICATES DUCT SIZE CHANGE — 18x24 / 8x24
- HUMIDISTAT — H
- SUPPLY AIR — S
- EXHAUST AIR — E
- RETURN AIR — R
- LEAKAGE AIR
- FLEXIBLE DUCT CONNECTION
- DUPLEX CONDENSATE UNIT
- VANED TURN
- SPLITTER DAMPER
- HUMIDIFIER
- UNIT HEATER — U.H.
- OUTSIDE AIR INTAKE LOUVER
- PROPELLOR TYPE FAN — M
- AIR FLOW REGULATOR

INSTRUMENTATION CODING (SEE NOTE 2)

INSTRUMENT FUNCTION / MEASURED VARIABLE (FIRST LETTER)		CONTROLLING (SECOND AND THIRD LETTER)						MEASURING (SECOND AND THIRD LETTER)											
		RECORDING	INDICATING	NON-INDICATING	CONTROL VALVE	SUMMER	FUNCTION GENERATOR	RECORDING	INDICATING	OBSERVATION GLASS	PRIMARY ELEMENT	TEST POINT	TRANSMITTER (OR PREAMP)	INTEGRATOR	AMPLIFIER	SAMPLER	INDICATING SWITCH, NOT-INDICATES TRANSMITTER	NON-INDICATING SWITCH	ALARMS
		-RC	-IC	-C	-CV	-Σ	-f	-R	-I	-G	-E	-X	-T	-Q	-Am	Sm	IS	-S	-A
AIR	A	–	–	–	–	–	–	–	–	–	–	–	–	–	–	ASm	–	–	–
CONDUCTIVITY	C	CRC	CIC	–	CCV	–	–	CR	CI	–	CE	CX	–	–	–	CSm	CIS	CS	CA
DENSITY	D	DRC	DIC	DC	DCV	–	–	DR	DI	–	–	DX	–	–	–	–	DIS	DS	DA
DIFF. PRESS.	dP	dPRC	dPIC	dPC	dPCV	–	–	dPR	dPI	–	–	–	dPT	–	–	–	dPIS	dPS	dPA
FLOW	F	FRC	FIC	FC	FCV	FΣ	Ff	FR	FI	FG	FE	FX	FT	FQ	–	–	FIS	FS	FA
MOISTURE	M	MRC	MIC	–	–	–	–	MR	MI	–	ME	–	–	–	–	–	–	–	–
NEUTRON FLUX	N	NRC	NIC	NC	–	–	–	NR	NI	–	NE	NX	NT	NQ	NAm	–	–	–	NA
HYDROGEN ION CONC.	pH	pHRC	pHIC	pHC	pHCV	–	–	pHR	pHI	–	pHE	pHX	–	–	pHAm	pHSm	–	–	–
LEVEL	L	LRC	LIC	LC	LCV	–	–	LR	LI	LG	–	–	LT	–	–	–	LIS	LS	LA
OXYGEN	O_2	–	–	–	–	–	–	O_2R	O_2I	–	O_2E	–	–	–	–	–	–	–	–
PRESSURE	P	PRC	PIC	PC	PCV	–	–	PR	PI	–	–	PX	PT	–	–	–	PIS	PS	PA
POSITION	Po	–	–	–	–	–	–	PoR	PoI	–	–	–	PoT	–	–	–	–	PoS	PoA
RADIATION	R	–	–	–	–	–	–	RR	RI	–	RE	RX	–	–	RAm	RSm	–	RS	RA
SPEED	S	SRC	SIC	SC	–	–	–	SR	SI	–	SE	–	–	–	–	–	–	–	–
TEMPERATURE	T	TRC	TIC	TC	TCV	–	–	TR	TI	–	TE	TX	TT	–	–	–	TIS	TS	TA
TIME	t	–	–	tC	–	–	–	–	tI	–	–	–	–	–	–	–	tIS	tS	–
VIBRATION	Vb	–	–	–	–	–	–	–	VbM	–	VbP	–	VbE	–	–	–	–	VbS	VbA
WEIGHT FACTOR	Wf	WfRC	WfIC	–	WfV	–	–	–	–	–	–	–	–	–	–	–	–	–	–

HVAC ABBREVIATIONS

A.D.	–	AUTOMATIC DAMPER
A.W.	–	WET CELL AIR WASHER
B.O.D.	–	BOTTOM OF DUCT
BR/BG	–	BOTTOM REGISTER OR GRILLE
C.C.	–	COOLING COIL
CR/CG	–	CEILING REGISTER OR GRILLE
E.F.	–	EXHAUST FAN
E.H.C.	–	ELECTRIC HEATING COIL
F	–	FILTER
F.B.	–	FLAT BOTTOM DUCT
F.D.	–	FIRE DAMPER
F.T.	–	FLAT TOP DUCT
FREG	–	FLOW REGULATOR
H.C.	–	HEATING COIL
T	–	THROAT
O.A.I.	–	OUTSIDE AIR INTAKE
R.A.R.	–	RETURN AIR REGISTER
R.F.	–	RECIRCULATING FAN
R.A.G.	–	RETURN AIR GRILLE
S.D.	–	SPLITTER DAMPER
S.F.	–	SUPPLY FAN
S.G.	–	SUPPLY GRILLE
S.R.	–	SUPPLY REGISTER
T.O.D.	–	TOP OF DUCT
TR/TG	–	TOP REGISTER OR GRILLE
TR.R/TR.G	–	TRANSFER REGISTER OR GRILLE
U.H.	–	UNIT HEATER
C.D.	–	CEILING DIFFUSER
CFM	–	CUBIC FEET PER MINUTE (STD AIR)
S.P.	–	STATIC PRESSURE
D.G.	–	DRAFT GAGE AIR TURNING DEVICE DIRECT EXPANSION COIL

MISC. ABBREVIATIONS

F.C.	–	INDICATES CLOSES ON AIR OR ELECTRICAL FAILURE
F.O.	–	INDICATES OPENS ON AIR OR ELECTRICAL FAILURE
L.C.	–	LOCK CLOSED
L.O.	–	LOCK OPEN
N.C.	–	NORMALLY CLOSED
N.O.	–	NORMALLY OPEN
R.M.C.	–	REMOTE MANUAL CONTROL
R.M.S.	–	REMOTE MANUAL SWITCH
H.S.	–	HAND SWITCH
F.A.I.	–	FAIL AS IS
H.C.U.	–	HYDRAULIC CONTROL UNIT
C.R.D.	–	CONTROL ROD DRIVE
SQ.RT.	–	SQUARE ROOT EXTRACTOR
A/S	–	AIR SUPPLY
E/S	–	SPECIAL ELECTRIC POWER SUPPLY REQUIRED
L.M.S.	–	LOCAL MANUAL SWITCH
S.O.	–	SEALED OPEN
S.C.	–	SEALED CLOSED

LINES

(SEE SHT. 2 FOR SYSTEM DESIGNATIONS)

- PROCESS MAIN LINE
- PROCESS LINE AUXILIARY AND INSTRUMENT LINE
- INSTRUMENT AIR LINE
- INSTRUMENT ELECT. LEADS
- INSTRUMENT CAPILLARY TUBING
- TYPICAL SUPPLY BREAK POINT (UNLESS STATED OTHERWISE, HEAVY PORTION BY PIPING CONTRACTOR) — BY (DESIGNATED MFG.)
- LINES DESIGNATED ON OTHER DIAGRAMS
- ISI BOUNDARY/CLASS BREAK REF. CCFMD-1 — 1 / 2

NOTES:

1. ALL SOLENOID VALVES SHOWN IN DE-ENERGIZED POSITION. "NE" DENOTES SOLENOID IS NORMALLY ENERGIZED DURING PLANT OPERATION. "ND" DENOTES NORMALLY DE-ENERGIZED.
2. TYPICAL INSTRUMENT DESIGNATION

   LEVEL SWITCH — ELEC. LINE — REMOTE HIGH/LOW LEVEL ALARM — DESIGNATES SPECIFIC LOCATION OF EQUIPMENT — INSTRUMENT NUMBER — SUPPLIER DESIGNATION AS FOLLOWS: W = WESTINGHOUSE XX = GENERAL ELECTRIC WITH SUB SYSTEM NUMBER (XX) NO DESIGNATION INDICATES A&E SPECIFIED.
3. WHERE THREE WAY VALVE OPERATIONS ARE NOT FINAL (FIG. A) IS USED WHERE VALVE OPERATION IS FINAL (FIG. B) IS USED.
4. "NORMALLY OPEN" SYMBOL (UNSHADED) APPLIES TO VALVES OPEN AT ANY TIME DURING NORMAL PLANT START UP, OPERATION AND SHUT DOWN.
5. VALVE POSITIONS (SHADED/UNSHADED VALVE SYMBOLS) DISPLAYED ON THESE DRAWINGS SHALL NOT BE RELIED UPON FOR SAFETY RELATED FUNCTIONS. THESE ARE FOR INFORMATION ONLY AND CANNOT SHOW ALL THE POSSIBLE SYSTEM OPERATING CONFIGURATIONS; THUS, ARE NOT REQUIRED TO BE AS-BUILT. FOR ACCURATE DEPICTION OF VALVE POSITIONS, REFER TO THE LATEST REVISION OF THE STATION OPERATING PROCEDURES.
6. REMOVABLE PIPE CAPS MAY OR MAY NOT BE INSTALLED.
7. ALL INSULATING FLANGES HAVE BEEN SHORT CIRCUITED IN ACCORDANCE WITH H.A.R.C.O. RECOMMENDATIONS (09024-1771).
8. CHICAGO FITTINGS, QUICK DISCONNECTS, HOSE CONNECTIONS AND OTHER EQUIVALENT FITTINGS ARE SHOWN FOR INFORMATION ONLY. THEY ARE NOT REQUIRED TO BE AS-BUILT OR SHOWN ON THE DRAWING, AND MAY OR MAY NOT BE INSTALLED.

AS BUILT

454003578

STATUS: Release
STATUS DATE: 10/14/2016
DS APPROVED: KKKUKER
VER: AD REV: 20 SIZE: F

FOR PREVIOUS REVISIONS, SEE SUPERSEDED CARDS.

VERSIONS/REVISIONS BY N.P.P.D.

NO.	DESCRIPTION	DFT	DATE	ENG
AB/18	DR-2014-0211	PAM	10/7/14	KKKUKER
AC/19	DR-2015-0257	DLR	5/5/15	JDMADDO
AD/20	DR-2015-0086	PAM	10/14/16	KKKUKER

SIGNIFICANT NUMBER / GROUP

DRAWN DATE
CHECKED DATE
APPROVED DATE SEE SUPERSEDED CARDS
FILMED

FLOW DIAGRAM
SYMBOLS AND ABBREVIATIONS
SHEET 1 OF 2
COOPER NUCLEAR STATION

BURNS & ROE

2001

CARD FILE:

PIPING AND SYSTEM DESIGNATIONS

SYSTEM	CODE	G.E. SYS NO	SYSTEM	CODE	G.E. SYS NO
AIR REMOVAL	AR	–	HEATER & MISC (NON–RADIOACTIVE) DRAINS	DR	–
AUXILIARY STEAM	AS	–	HIGH PRESS COOLANT INJECTION	HP	23
CARBON DIOXIDE	C	–	HYDROGEN	H	–
CHEMICAL ADDITION	CF	–	INSTRUMENTATION (PROCESS)	PI	–
CIRCULATING WATER	CW	–	LUBE OIL PURIFICATION & TRANSFER	LO	–
CLOSED COOLING (REACTOR BLDG)	RCC	–	MAIN STEAM	MS	2
CLOSED COOLING (TURBINE BLDG)	TCC	–	MISCELLANEOUS RADIOACTIVE WASTE	MW	–
COMPRESSED AIR (CONTROL)	CA	–	NITROGEN (ATOMS CONTROL)	N	16
COMPRESSED AIR (STATION)	SA	–	POTABLE WATER	PO	–
CONDENSATE	CH	–	PROCESS (RADIOACTIVE) VENTS	PV	1
CONTROL ROD DRIVE HYDRAULIC	HY	3	PROCESS SAMPLING	PS	–
CORE SPRAY	CS	14	RADIOACTIVE (EQUIPMENT) WASTE	PW	20
CONDENSATE POLISHING	CP	–	REACTOR CORE ISOLATION COOLING	RC	13
DEMINERALIZED WATER	DW	–	REACTOR FEEDWATER	RF	6
DIESEL OIL (CLASS I)	DO	–	REACTOR RECIRCULATION	RL	2
DIESEL STARTING AIR	STA	–	REACTOR WATER CLEAN UP	CU	12
EXTRACTION (BLEED) STEAM	BS	–	RESIDUAL HEAT REMOVAL	RH	10
EXHAUST STEAM	ES	–	ROOF DRAINS	RD	–
FILTERED WATER	FW	–	SCREEN WASH	WW	–
FIRE PROTECTION	FP	–	SERVICE (RIVER) WATER	SW	–
FLOOR DRAINS (NON–RADIOACTIVE)	FDN	–	STANDBY LIQUID CONTROL	LC	11
FLOOR DRAINS (RADIOACTIVE)	FDR	20	VENTS (NON–RADIOACTIVE) OPEN	V	–
FUEL OIL (TO HTG BLRS)	FO	–	VENTS (RADIOACTIVE) OPEN	VR	–
FUEL POOL COOLING	FC	19	WELL DISCHARGE	WD	–
FUEL GAS (TO HTG BLRS)	FG	–	RIVER WELL DISCHARGE	RWD	–
VENTILATION SYSTEM PIPING	–	–			

DESIGN CONDITIONS

CODE SUFFIX NO.*	–1		–2		–3		–4		–5		–6	
SYS CODE LETTERS	PRESS PSIG	TEMP °F	PRESS PSIG	TEMP °F	PRESS PSIG	TEMP °F	PRESS PSIG	TEMP °F	PRESS PSIG	TEMP °F	PRESS PSIG	TEMP °F
AR	SEE NOTE 1. BELOW	650	VAC–30	220								
AS	300	420	225	400	50	305	15	305				
C	(NOT IN CONTRACT E–69–4)											
CF	250	100	250	100								
CW	40	145	10	145								
RCC, TCC	150	200										
CA, SA	125	200										
CH			670	375	185	200	VAC–50	110				
DW, FW, PO, WD, WW	150	150										
DO	VAC–50	100										
BS	225	400	100	350	30"HG VAC–50	300						
ES	VAC–15	250										
FP	175	100										
FDN RD	150	150	50	150								
FO	150	220										
DR	300	400	225	400	100	350	VAC–50	300	15	220	15	220
H	2000	150	150	150								
PI	1250	575	100	300								
LO	75	150										
MS	1147	563	450	400								
PS	1250	575	500	350	150	325	50	150				
RF	1925	370										
SW	490	145	75	145								
V	15	220										
VR	625	495	15	220								
FG	150	150	150	150								
VENT SYS PIPE	75	300										
HY	1500	200	VAC–60	200	1500	400						
CS	1250	575	500	350	150	225						
FDR, PW, MW	150	150	50	150								
FC	200	150	200	150								
HP, RC			1500	400	500	400	150 ③	325	85	200		
N	50	100	25	100								
PV	15	220										
RL	1274	562	1146	575	150	300						
CU	1300	575	150	250	1300	150						
RH	1326	562	450	400	150	350	125	225				
LC	1375	575	1460	150	100	150						
CP	200	150										
STA			300	150								
RH–IS	1275	575										
RF–IS	1250	575										
RWD	150	100										

NOTE: WHERE CODE SUFFIX NUMBER IS FOLLOWED BY A LETTER (EXAMPLE: FC–1S) THE DESIGN CONDITIONS WILL BE THE SAME AS CODE NUMBER WITHOUT A LETTER EXCEPT RH–1S & RF–1S WHICH ARE LISTED IN TABLE SEPARATELY.

* LINE DESIGNATIONS SIGNIFY MATERIALS AS FOLLOWERS:
–1 NUMBER ONLY – STANDARD MATERIAL FOR THAT PRESSURE AND TEMPERATURE.
–1A ALUMINUM PIPING AND/OR VALVES FOR SPECIAL CONDITIONS.
–1C CHROME – MOLY ALLOY STEEL PIPING AND/OR VALVES FOR SPECIAL CONDITIONS.
–1S(a) STAINLESS STEEL PIPING AND/OR VALVES FOR SPECIAL CONDITIONS. "(a)" INDICATES CARPENTER "20" ALLOY.
–1D IMPACT TESTED (CARBON STEEL) ON CERTAIN SYSTEMS MEETING AEC CRITERIA 35.

EXAMPLES:

CH–2 CONDENSATE PIPING WITH DESIGN CONDITIONS 670 PSIG, 375°F, CARBON STEEL PIPE.
DR–2C HEATER DRAIN PIPING WITH DESIGN CONDITIONS OF 225 PSIG, 400°F, BUT WITH CHROME – MOLY ALLOY STEEL PIPE.

NOTES:

1. AR: 1 DESIGN PRESSURE (DUE TO IMPACT OF H2 EXPLOSION) VAC–350 PSIG FOR STRAIGHT PIPE, VAC–900 PSIG FOR ELBOWS, CAPS, TEES AND OTHER POINTS OF DIRECTIONAL CHANGE.
2. DESIGN CONDITIONS ARE FOR GENERAL REFERENCE ONLY. WHERE THERE IS A CONFLICT WITH PIPING CONTRACT SPECIFICATION, THE SPECIFICATION GOVERNS.
3. SEE B&R DWG 2044 NOTE 11.

VALVE NUMBERING CODE

TYPICAL NUMBER → 4"V243W(A)–3(4"–300#–ANGLE VALVE–ASTM A216 WCB–BUTT WELD ENDS)

- NOMINAL SIZE
- INSERT SPECIAL BODY FEATURE: ANGLE, (SC) STOP CHECK, (WC) WAFER CHECK, (S) SPHERICAL DISC BUTTERFLY, (TD) TILTING DISC, (PI) POST INDICATOR
- INDIVIDUAL VALVE OPERATOR'S IDENTIFYING NUMBER (USE ON STANDARD VALVES)
- INDIVIDUAL IDENTIFYING NUMBER FOR OPERATOR

PREFIX	
V	STANDARD VALVE WITH MANUAL HAND WHEEL OR LEVER; STANDARD LIFT OR SWING CHECK VALVE
EV	STD. VALVE W/EXTENSION STEM
CV	STANDARD VALVE WITH CHAIN WHEEL
LV	STANDARD VALVE WITH LOCK
GV	STANDARD VALVE WITH DOUBLE PACKING & GLAND FOR RADIOACTIVE FLUID SERVICE
*IMV	MOTOR OPERATED VALVE
*IAV	AIR OPERATED VALVE
*ISV	SPECIAL VALVE (AS DESCRIBED IN SPECIFICATION)

*LEAD NUMBER DESIGNATES EXACT VALVE FOR WIRING DIAGRAMS, ETC. THE FOLLOWING NUMBER RANGES ARE RESERVED FOR THE MOTOR OPERATED, AIR OPERATED & SPECIAL VALVES IN THE DESIGNATED SYSTEMS.

TYPICAL VALVE NO's	SYSTEMS
1MV–36MV	REAC FEED & COND
37MV–59MV	MN. & AUX. STM
60MV–99MV	HEATER DRAIN SYST & BLEED STM
100MV–129MV	CIRC WTR, SERVICE WTR, SCREEN WASH, FIRE PROTECTION
130MV–149MV	TURBINE BLDG CLOSED COOLING SYSTEM
150MV–169MV	AIR REMOVAL & OFF–GAS
170MV–229MV	MISC MECHANICAL SYSTEMS
230MV–299MV	HTG, VENTILATING AIR CONDITIONING SYST'S
300MV–399MV	OPEN
400MV–490MV	RADWASTE SYSTEMS
491MV–499MV	REACTOR BLDG STEAM
500MV–549MV	RESIDUAL HEAT REMOVAL SYSTEM
550MV–574MV	HIGH PRESS COOLANT INJECTION SYSTEM
575MV–590MV	REACTOR CORE ISOL COOLING SYSTEM
591MV–629MV	REACTOR WATER CLEAN–UP SYSTEM
630MV–640MV	FUEL POOL COOLING SYSTEM
641MV–674MV	MISC NUCLEAR SYSTEMS
675MV–693MV	CORE SPRAY SYSTEM
694MV–730MV	REACTOR BUILDING CLOSED COOLING SYSTEM
730MV–UPWARD	BALANCE OF NUCLEAR SYSTEMS

FIRST DIGIT TYPE	
1	GATE
2	GLOBE/ANGLE
3	CHECK
4	DIAPHRAGM (SAUNPERS TYPE)
5	PLUG/BALL
6	NEEDLE/ INSTRUMENT
7	THREE–WAY
8	BUTTERFLY
9	SPECIAL

SECOND DIGIT PRESSURE CLASS–LB	
1	125
2	150
3	200 (175)
4	300 (250)
5	600
6	900
7	1500
8	2500
9	SPECIAL

THIRD DIGIT – MATERIAL CLASS (ASTM)	
1	A 126 CL.B IRON BODY
2	B 61 BRONZE
3	A 216 WCB–2 1/2" AND LARGER A 105 GR.II–2" AND SMALLER CARBON STEEL
4	A 217 WC6–2 1/2" AND LARGER A 182 F11–2" AND SMALLER CHROME–MOLY ALLOY STEEL (1 1/4%CR.)
5	A 217 WC9–2 1/2" AND LARGER A 182 F–22–2" AND SMALLER CHROME–MOLY ALLOY STEEL (2 1/4%CR.)
6	A 351 CF8/CF8M (OR EQUIVALENT) 18–8 STAINLESS STEEL
7	B 26 GR.SG70A (OR EQUIVALENT) ALUMINUM ALLOY
8	A 352 GR.LCB 2 1/2" AND LARGER A 350 GR.LF1 2" AND SMALLER CARBON STEEL (IMPACT TESTED)
9	SPECIAL

ENDS	
W	BUTT WELD
X	SOCKET WELD
F	FLANGED
S	SCREWED
P	PLAIN END

EXAMPLE OF A SPECIAL VALVE

10" 685 SV166W

SPECIFIED AS A 10" GATE VALVE – 900 LB CLASS
MATERIAL A 351 CF8/CF 8M
BUTT WELD ENDS
WITH LIMIT SWITCHES

SPECIAL DESIGNATIONS: (NUMBERED CONSECUTIVELY & COVERED BY SEPARATE SPECIFICATIONS)

SAFETY OR RELIEF VALVES –(RV) ISOLATION VALVES (IV)(IMV) WITH MOTOR OPER.
SOLENOID VALVES –(SSV) BYPASS VALVES (BV)(BMV) WITH MOTOR OPEN NON–RETURN VALVES (AIR OPERATED, BLEEDER CHECK)–(NRV) DRAIN VALVE (DRV)
FIRE HOE VALVE –(HV) FIRE HYDRANT (HT) DUMP VALVE –(DV)
MISC SPECIALTIES (TRAPS, STRAINERS, EXPANSION JOINTS.....ETC)–(S)
CONTROL VALVES – SEE INSTRUMENT CODING (DWG 2001 SHT 1). CONTROL VALVES SHALL HAVE THE SAME NUMBER AS THE CONTROL LOOP OF WHICH THEY FORM A PART.

NOTES:

THE ABOVE IDENTIFICATION CODE IS FOR GUIDANCE ONLY AND DOES NOT COVER ALL VALVE TYPES PRESSURE RATINGS AND/OR MATERIALS. REFER TO THE SPECIFICATIONS FOR THE ASSIGNMENT OF NUMBERS TO SPECIAL VALVE CATEGORIES AND SPECIFIC MATERIALS.

AS BUILT
454003579
STATUS: Release
STATUS DATE: 10/20/2017
DS APPROVED: DTWALEN
VER: AB REV: 08 SIZE: F

FOR PREVIOUS REVISIONS, SEE SUPERSEDED CARDS.
VERSIONS/REVISIONS BY N.P.P.D.

NO.	DESCRIPTION	DFT	DATE	ENG
AB/08	DR–2017–0001	DLR	10/20/17	DTWALEN

SIGNIFICANT NUMBER							
GROUP	1	2	3	4	5	6	

FLOW DIAGRAM
SYMBOLS & ABBREVIATIONS
COOPER NUCLEAR STATION

DRAWN RGA 4/23/04
CHECKED
APPROVED SEE SUPERSEDED CARDS
FILMED

BURNS & ROE

2001 SH 2 OF 2

CARD TILE C0036675

STA NO	"A"	"B"	"C"	"D"	TRAP	"E"	"F"	"G"	"H"	"J"	"K"	"L"	"M"
1	CONT ON 2002 SH2 ZONE B-7	197AV	133	131	1"S-57	132	2"MS-1 CONT ON 2005 SH1 ZONE D-5	197	IA-AV14	116	NA	177	2"MS-1
2	CONT ON 2002 SH2 ZONE D-8	198AV	136	134	1"S-57	135	2"MS-1 CONT ON 2005 SH1 ZONE D-5	198	IA-AV15	40	663	NA	2"MS-1
3	CONT ON 2002 SH2 ZONE E-7	199AV	139	137	1"S-57	138	2"MS-1 CONT ON 2005 SH1 ZONE D-5	199	IA-AV16	36	872	NA	2"MS-1
4	CONT ON 2002 SH2 ZONE C-6	ES-200 AV	ES-63	ES-61	3/4"S-58	ES-62	2"CH-4 CONT ON 2005 SH1 ZONE H-11	ES-200	IA-AV17 SEE NOTE 10	NA	NA	NA	2"AS-2
5	CONT ON 2002 SH2 ZONE B-8	ES-201 AV	ES-66	ES-64	3/4"S-58	ES-65	2"CH-4 CONT ON 2005 SH1 ZONE H-11	ES-201	IA-AV18 SEE NOTE 10	NA	NA	NA	2"AS-2
6	CONT ON 2002 SH2 ZONE D-8	ES-202 AV	ES-69	ES-67	3/4"S-58	ES-68	2"CH-4 CONT ON 2005 SH1 ZONE H-11	ES-202	IA-AV19 SEE NOTE 10	NA	NA	NA	2"AS-2
5A	CONT ON 2002 SH2 ZONE C-7	ES-203 AV	ES-274	ES-272	3/4"S-58 -5A	ES-273	2"CH-4 CONT ON 2005 SH1 ZONE H-11	ES-201	IA-2009	NA	NA	NA	2"AS-2

TYPICAL FOR TRAP STATIONS 1,2 AND 3

TYPICAL FOR TRAP STATIONS 4,5 AND 6

TRAP STATION 5A

DETAIL "B"
REMOVABLE SPOOL SECTION INTEGRAL WITH ATMOSPHERIC TELL TALE TO BE INSTALLED FOR RFP TURBINE TESTING ZONE C-7 SH 2

ATMOSPHERIC TELL TALE

STEAM JET AIR EJECTOR

NOTES:

1. UNLESS OTHERWISE INDICATED ALL PRESSURE AND OR FLOW INSTRUMENT ROOT LINES SHALL BE 3/4" ROOT VALVES SHALL BE 3/4"V253X. LINE UP TO AND INCLUDING ROOT VALVE SHALL BE FURNISHED AND INSTALLED UNDER CONTRACT E-69-4.
2. MOISTURE SEPARATOR SAFETY VALVES FURNISHED BY WEST. ELEC. CORP. MOUNTED BY MECH. PIPING CONTRACTOR.
3. FOR REACTOR FEED PUMP TURBINE PIPING DRAINS SEE DWG 2005.
4. FOR DETAILS ON CONDENSER CONNECTION REFER TO CORRESPONDING DESIGNATIONS MS & DD. CO. DWG DC-93877 GA SH.3.
5. ALL MS-1, MS-1C, BS-2 & BS-2C PIPING SYSTEMS SHOWN HEREON SHALL BE CLASS IV-P POWER CLASSIFICATION.
6. UNLESS NOTED OTHERWISE ALL PIPING & EQUIPMENT FURNISHED BY WESTINGHOUSE (WITH TURBINE GEN.) SHALL BE INSTALLED BY TURBINE GENERATOR ERECTION CONTRACTOR.
7. AT SAMPLING POINTS, PROBES AND PIPING TO AND INCLUDING ROOT VALVES SHALL BE FURNISHED AND INSTALLED UNDER CONTRACT E-69-1. PROBES SHALL BE FURNISHED AND INSTALLED IN ACCORDANCE WITH CONTRACT PARA 34.2 AND DRAWING SP-07211 FIG. 1B. CONTINUATION OF SAMPLE PIPING BY E-70-3.
8. ALL VALVE NUMBERS IN PARENTHESIS ( ) ARE NUMBERS TO BE USED IN OPERATING PROCEDURES. THESE NUMBERS ARE ASSIGNED BY NPPD AND WILL NOT BE SHOWN ON PIPING DRAWINGS.
9. ALL ITEMS MARKED THUS ARE "AS-BUILT" ITEMS AND ARE NOT SHOWN PIPING DRAWINGS.
10. A SPEED CONTROL VALVE EXISTS BETWEEN THE ACTUATOR AND SOLENOID PILOT VALVE FOR THE INDICATED TRAP STATIONS:

TRAP STATION	SOLENOID	SPEED CONTROL VALVE
4	IA-AV17	IA-1657
5	IA-AV18	IA-1658
6	IA-AV19	IA-1659
11	MS-SPV194	IA-1660
12	MS-SPV191	IA-1661

11.
12. THE START UP POSITION FOR VALVES MS-V-60,61,62,63,65,66,67,68 ASSUMES RED SET IN SERVICE.
13. REF HONEYWELL DWG 1550-X301 FOR INSTR PIPING AND VALVE INSTALLATION AT INSTR RACK IR-1C.
14. REF HONEYWELL DWG 1550-X103 FOR INSTR PIPING AND VALVE INSTALLATION AT INSTR RACK IR-1E.
15. ALL VALVES ARE IN THE MS SYSTEM UNLESS OTHERWISE DESIGNATED.
16. WHERE LINES INTERCONNECT AND ARE CONTINUED ON OTHER DRAWINGS, ZONE NUMBERS ARE APPROXIMATE ONLY.
17. BOUNDARY VALVE - REF. TO CALC. NEDC 00-029, ENG. EVAL. EE 01-147 & DWG CNS-MS-43 FOR IDENTIFICATION OF THE MSIV LEAKAGE PATHWAY TO THE CONDENSER BOUNDARIES & SEISMIC QUALIFICATIONS.

REVISIONS TO THIS DRAWING REQUIRES A REVISION TO THE CORRESPONDING ISOKEY.

FOR PREVIOUS REVISIONS, SEE SUPERSEDED CARDS.

VERSIONS/REVISIONS BY N.P.P.D.

NO.	DESCRIPTION	DFT	DATE	ENG
AB/48	DR-2017-0273	DLR	10/30/18	DTWALEN

AS BUILT
454003580
STATUS: Release
STATUS DATE: 10/30/2018
DS APPROVED: DTWALEN
VER: AB REV: 48 SIZE: F

SIGNIFICANT NUMBER | GROUP | 1 | 2 | 3 | 4 | 5 | 6

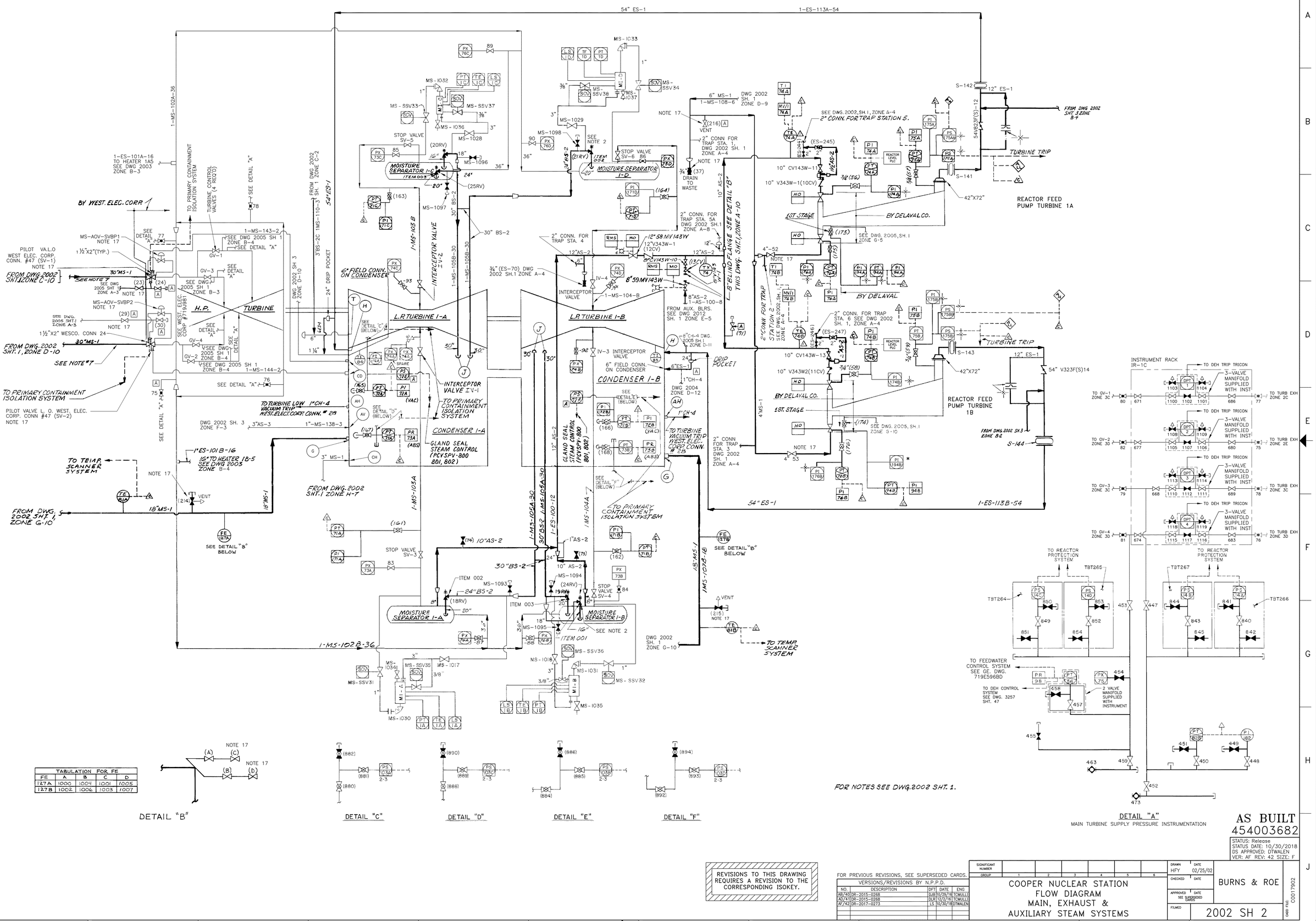
DRAWN HFY 06/28/01 | CHECKED | APPROVED | FILMED

FLOW DIAGRAM MAIN, EXHAUST & AUXILIARY STEAM SYSTEMS COOPER NUCLEAR STATION

BURNS & ROE

2002 SH 1

C0042650


54" ES-1
1-ES-113A-54
1-MS-102A-36
1-ES-101A-16 TO HEATER 1AS SEE DWG 2003 ZONE B-3
TO PRIMARY CONTAINMENT ISOLATION SYSTEM
TURBINE CONTROL VALVES (4 REQ'D)
SEE DETAIL "A"
BY WEST. ELEC. CORP
PILOT VA.L.O WEST ELEC. CORP. CONN. #47 (SV-1) NOTE 17
1½"X2"(TYP.)
30"MS-1
FROM DWG 2002 SHT 1 ZONE C-10
SEE NOTE 7
MS-AOV-SVBP1 NOTE 17
MS-AOV-SVBP2 NOTE 17
1½"X2" WESCO. CONN 24
30"MS-1
FROM DWG. 2002 SHT. 1, ZONE D-10
SEE NOTE "7"
TO PRIMARY CONTAINMENT ISOLATION SYSTEM
PILOT VALVE L. O. WEST. ELEC. CORP. CONN #47 (SV-2) NOTE 17
H.P. TURBINE
L.P. TURBINE 1-A
L.P. TURBINE 1-B
INTERCEPTOR VALVE IV-1
INTERCEPTOR VALVE IV-4
INTERCEPTOR VALVE IV-3
TO PRIMARY CONTAINMENT ISOLATION SYSTEM
CONDENSER 1-A
CONDENSER 1-B
GLAND SEAL STEAM CONTROL (PCVSPV-800 801, 802)
6" FIELD CONN. ON CONDENSER
TO TURBINE LOW 1"CH-4 VACUUM TRIP WEST. ELECT. CORP. CONN. # 28
DRIP POCKET
MOISTURE SEPARATOR 1-C
MOISTURE SEPARATOR 1-D
MOISTURE SEPARATOR 1-A
MOISTURE SEPARATOR 1-B
STOP VALVE SV-5
STOP VALVE SV-6
STOP VALVE SV-3
STOP VALVE SV-4
DRAIN TO WASTE
VENT
TO TEMP. SCANNER SYSTEM
TO TURBINE VACUUM TRIP WEST. ELEC. CORP. CONN. # 28
TO PRIMARY CONTAINMENT ISOLATION SYSTEM
FROM AUX. BLRS. SEE DWG 2012 SH. 1 ZONE E-5
8"HELIND FLANGE SEE DETAIL "B" THIS DWG. SHT. ZONE A-10
2" CONN. FOR TRAP STATION 2
2" CONN. FOR TRAP STA. 1 SEE DWG 2002 SH. 1, ZONE A-4
2" CONN. FOR TRAP STA. 3 DWG 2002 SH. 1 ZONE A-4
2" CONN. FOR TRAP STA. 4
2" CONN. FOR TRAP STA. 5A DWG 2002 SH.1 ZONE A-8
2" CONN. FOR TRAP STA. 5 DWG 2002 SH. 1 ZONE A-4
SEE DWG. 2002, SH. 1, ZONE A-4 2" CONN. FOR TRAP STATION 5.
REACTOR FEED PUMP TURBINE 1A
REACTOR FEED PUMP TURBINE 1B
BY DELAVAL CO.
BY DELAVAL
1ST STAGE
TURBINE TRIP
REACTOR LEVEL PLC
FROM DWG 2002 SHT 3 ZONE B-7
FROM DWG 2002 SHT 3 ZONE B-2
TO DRAIN TANK
TO FEEDWATER CONTROL SYSTEM SEE GE. DWG. 719E596BD
TO DEH CONTROL SYSTEM SEE DWG. 3257 SHT. 47
2 VALVE MANIFOLD SUPPLIED WITH INSTRUMENT
INSTRUMENT RACK 1R-1C
TO DEH TRIP TRICON
3-VALVE MANIFOLD SUPPLIED WITH INST
TO TURB EXH ZONE 2C
TO TURB EXH ZONE 2E
TO TURB EXH ZONE 3C
TO TURB EXH ZONE 3D
TO REACTOR PROTECTION SYSTEM
TBT264
TBT265
TBT266
TBT267
NOTE 17
(216)
(215)
(214)
(18RV)
(20RV)
(25RV)
(24RV)
(12RV)
(16RV)
(12CV)
(13CV)
(10CV)
(11CV)
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NOTES:

1. BYPASS VALVES SHALL BE PROVIDED FOR GLOBE & GATE VALVES AS FOLLOWS: FOR 8" & LARGER SIZES IN 300LB CLASS & HIGHER; FOR 12" & LARGER SIZES IN 150 LB CLASS.
2. UNLESS OTHERWISE INDICATED ALL PRESSURE AND/OR FLOW INSTRUMENT ROOT LINES SHALL BE ¾", ROOT VALVES SHALL BE ¾"V253X, EXCEPT THAT FOR RF SYSTEM ROOT VALVES SHALL BE ¾"V263X, LINE UP TO AND INCLUDING ROOT VALVES SHALL BE FURNISHED AND INSTALLED UNDER CONTRACT E-69-4.
3. ALL TEMPERATURE TEST AND PROTECTING WELL PENETRATIONS SHALL BE 1½" DIA. UNLESS OTHERWISE NOTED.
4. FOR DETAILS ON CONDENSER CONNS. REFER TO CORRESPONDING DESIGNATIONS MS & DD CO DWG DC 93877 GA SH3.
5. ALL VENT & DRAIN PIPING DOWNSTREAM OF THE LAST ROOT VALVE FROM THE MAIN PIPING SYSTEM OR EQUIPMENT, SHALL CONFORM TO "V-1" & "DR-5" RESPECTIVELY. STRONG BACK & OTHER INSTRUMENT PIPING ON THE CONDENSER & CONDENSATE TANK SHALL CONFORM TO "CH-4" PIPING.
6. AT SAMPLING POINTS, CONNECTIONS, PROBES AND ROOT VALVES SHALL BE FURNISHED & INSTALLED UNDER CONTRACT E-69-4. PROBES SHALL BE FURNISHED AND INSTALLED IN ACCORDANCE WITH CONTRACT PARA 3.4.2 & DWG SP-0721I FIG. NO. AS NOTED. CONTINUATION OF SAMPLING PIPING BY E-70-3.
7. ALL VENT AND DRAIN VALVE NUMBERS ARE CONDENSATE VALVE NUMBERS.
8. ALL VALVE NUMBERS IN PARENTHESIS ( ) ARE NUMBERS TO BE USED IN OPERATING PROCEDURES. THESE NUMBERS ARE ASSIGNED BY NPPD AND WILL NOT BE SHOWN ON PIPING DWGS.
9. △'S WHERE SHOWN WITH NUMBERS REPRESENT POINTS OF CONNECTION TO EXISTING SYSTEMS. E-73-58 SPECIFICATION DEFINES WORK FROM THIS POINT.

NOTE: WELD UP PIPING TO CONDENSER CONNS. X & Y AFTER FLUSHING LINES.

CONDENSATE PUMPS

STEAM JET AIR EJECTOR
(SEE NOTE 4)

A	B	C	D	E	F
MC-LT-1A	MC-V-864	MC-V-862	MC-V-865	MC-V-863	MC-V-866
MC-LT-1B	MC-V-869	MC-V-867	MC-V-870	MC-V-868	MC-V-871

DETAIL "A"

NOTE:
ALL ITEMS MARKED THUS [A] ARE "AS BUILT" ITEMS AND ARE NOT SHOWN ON PIPING DRAWINGS.

REVISIONS TO THIS DRAWING REQUIRES A REVISION TO THE CORRESPONDING ISOKEY.

AS BUILT
454003582
STATUS: Release
STATUS DATE: 11/01/2016
DS APPROVED: T2STEVE
VER: AB REV: 36 SIZE: F

FOR PREVIOUS REVISIONS, SEE SUPERSEDED CARDS.

VERSIONS/REVISIONS BY N.P.P.D.

NO.	DESCRIPTION	DFT	DATE	ENG
AB/36	DR-2016-0575	DLR	11/1/16	T2STEVE

SIGNIFICANT NUMBER	
GROUP	1 2 3 4 5 6
DRAWN	DJF 2/10/99
CHECKED	
APPROVED	SEE SUPERSEDED CARDS
FILMED	

FLOW DIAGRAM
CONDENSATE & FEED WATER SYSTEMS
COOPER NUCLEAR STATION

BURNS & ROE

2004 SH 1

CADD FILE: C0026515

NOTE:

FOR NOTES SEE THIS DWG SHT 1

*SEE EE 10-010 FOR CONTAINER/DRUM CONFIGURATION.

CONDENSATE BOOSTER PUMPS

CONDENSATE TRANSFER PUMP

AS BUILT
454003583

STATUS: Release
STATUS DATE: 05/10/2018
DS APPROVED: JEDAUEL
VER: AB REV: 51 SIZE: E

REVISIONS TO THIS DRAWING REQUIRES A REVISION TO THE CORRESPONDING ISOKEY.

FOR PREVIOUS REVISIONS, SEE SUPERSEDED CARDS.

VERSIONS/REVISIONS BY N.P.P.D.			
NO.	DESCRIPTION	DFT	DATE	ENG
AB/51	DR-2017-0167	DLR	5/10/18	JEDAUEL

SIGNIFICANT NUMBER | GROUP | 1 | 2 | 3 | 4 | 5 | 6

COOPER NUCLEAR STATION
FLOW DIAGRAM
CONDENSATE &
FEEDWATER SYSTEMS

DRAWN HFY DATE 10/10/01
CHECKED DATE
APPROVED DATE
SEE SUPERSEDED CARDS
FILMED

BURNS & ROE

2004 SH 2

C0017904

DWG 2004 SH 2 ZONE J-3

THIS DWG SHT 1 ZONE D-7

THIS DWG SHT 1 ZONE B-7

FROM NOBLE METAL INJECTION SKID DWG 2004 SH.5 ZONE J-3

NOTES:

1. FOR NOTES SEE THIS DWG SH. 1
2. CONNECTION FOR RADIO ACTIVE TRACER FEEDWATER FLOW MEASUREMENT, VALVES & INSTRUMENT PIPING (BY G.E.)
3. POT-26 IS A PART OF MC-MO-26MV

HEATER 1-A-1 (IN CONDENSER NECK)

HEATER 1-A-2

HEATER 1-A-3

HEATER 1-A-4

HEATER 1-A-5

HEATER 1-B-1 (IN CONDENSER NECK)

HEATER 1-B-2

HEATER 1-B-3

HEATER 1-B-4

HEATER 1-B-5

2-1" CONNS. FOR FUTURE FLOW TEST DEVICE

TO WASTE

FIG 2A, SEE NOTE 6

MINIMUM FLOW CONTROL SYSTEM SEE CNS-RFC-8 SH. 19 & 20

FLOW PIPE SECTION FURN. BY G.E.

FEEDWATER START-UP CONTROL SYSTEM SEE CNS-RFC-8 SH. 5

REACTOR FEED PUMPS

DWG 2005 SH 1, ZONE E-5

NOTE: FOR DETAIL OF B.J. INJECTION SEAL SYS. SEE DWG 2005 SH 1, ZONE E-3

NOTE: FOR DETAIL OF B.J. INJECTION SEAL SYS. SEE DWG 2005 SH 1, ZONE F-9

FROM TRICONEX CONTROL SYS. SEE DETAIL "A" DWG 2004 SH 4

SEE DETAIL "B" DWG 2004 SH 4

TO TRICONEX CONTROLLER

TO COMPUTER AND FEED WATER CONTROL SYSTEM SEE G.E. DWG # 791E-257

CONTROL SIGNALS TO REACTOR FEED PUMP TURBINE TRICONEX CONTROLLER

FLOW PIPE SECTION FURN. BY G.E.

REACTOR LEVEL PLC

OWC INJECTION SYS. REF. GE DWG. 105E2705 SH.5

TO OWC DZO SKID DWG 2004 SH5 ZONE F-2

FEEDWATER START-UP CONTROL SYSTEM SEE CNS-RFC-8 SH. 6

SEE DWG. 2044 ZONE A-9 (INLET B) TO REACTOR

TO REACTOR SEE DWG. 2043 ZONE A-9 (INLET A)

LEFM SYS

FROM OWC DZO SKID DWG 2004 SH 5, ZONE C-1

TO WASTE (SUMP)

PUMP INTERLOCK

SEAL LEAKOFF

TO HEATER 1-A-5

TO HEATER 1-B-5

CONTINUED THIS DWG SHT 1 ZONE J-7

8" RF-1 1-RF 103-8

REVISIONS TO THIS DRAWING REQUIRES A REVISION TO THE CORRESPONDING ISOKEY.

FOR PREVIOUS REVISIONS, SEE SUPERSEDED CARDS.

VERSIONS/REVISIONS BY N.P.P.D.

NO.	DESCRIPTION	DFT	DATE	ENG
AB/58	DR-2015-0555	DJB	11/07/15	AJF/SK
AC/59	DR-2016-0539	PAM	10/11/16	AJF/SK
AD/60	DR-2018-0252	DJB	11/15/18	KASCHIZ
AE/61	DR-2018-0230	DJB	11/15/18	KASCHIZ
AF/62	DR-2018-0231	DJB	11/15/18	KASCHIZ
AG/63	DR-2018-0253	DJB	11/15/18	KASCHIZ

SIGNIFICANT NUMBER | GROUP | 1 | 2 | 3 | 4 | 5 | 6

COOPER NUCLEAR STATION
FLOW DIAGRAM CONDENSATE & FEEDWATER SYSTEMS

DRAWN	HY	DATE 10/15/01
CHECKED		DATE
APPROVED SEE SUPERSEDED CARDS		DATE
FILMED		

BURNS & ROE

2004 SH 3

CARD FILE: 00017900

AS BUILT
454003584
STATUS: Release
STATUS DATE: 11/15/2018
DS APPROVED: KASCHIZ
VER: AG REV: 63 SIZE: F

SEE DWG. 2007 ZONE C-4

SEE DWG. 2007 ZONE B-4

1-TEC-103-2 2" COOLING WATER SUPPLY

1-TEC-104-2 2" COOLING WATER RETURN

INTAKE STRUCT. YARD

ICE CONTROL TUNNEL

927 BAY "A" 928 929 BAY "B" 930 SLUICE GATE (TYP.) 931 BAY "C" 932 936 BAY "D" 933 934 BAY "E"

84" CW-2

SHT. 3 THIS DWG. ZONE A-1

935 30" DIA. M.H. "D" TO "E" CROSSTIE

156" CW-1

C.W. SUPPLY TUNNEL

14"-10 14"-25CV

TEC-(318) VENT

2" TEC-1

1-CW-106-14 14" CW-1

1" TEC ½" TEC-239 1" TEC ½" TEC-238 1" TEC-100-84 84" CW-1

1" TEC ½" TEC-241 1" TEC ½" TEC-240 1" TEC-100-84 84" CW-1

1" TEC ½" TEC-243 1" TEC ½" TEC-242 1" TEC-100-84 84" CW-1

1" TEC ½" TEC-245 1" TEC ½" TEC-244 1" TEC-100-84 84" CW-1

RMS M MO PI 350A (104) 84"-112MV S-126 1-SW-110-1

PI 350B (105) 84"-113MV S-126 1-SW-110-1

PI 350C (106) 84"-114MV S-126 1-SW-110-1

PI 350D (107) 84"-115MV S-126 1-SW-110-1

PI 369 (671) PS 369 (138) (139) CAPPED VENT (614) (103) SCREEN WASH PUMP INTERLOCK

CW-V-1043 SEE NOTE 15 CW-V-1045

CW-V-1044 SEE NOTE 15 CW-V-1046

RIVERWELL SYS. DWG. 2006 SHT.5 ZONE G-2

RIVERWELL SYS. DWG. 2006 SHT.5 ZONE G-2

RIVERWELL SYS. DWG. 2006 SHT.5 ZONE G-3

RIVERWELL SYS. DWG. 2006 SHT.5 ZONE G-4

1-A BAY "A" 1-B BAY "B" 1-C BAY "C" 1-D BAY "D"

CIRCULATING WATER PUMPS

INTAKE STRUCT. PUMP ROOM

PI 370A 680 140 142 141 (98) 10 RV-4x6 RELIEF VALVE SET @ 180 PSIG TO WASTE

FOR FLUSHING SAND FROM VALVES WHEN ONE PUMP IS OFF [A] SEE DWG. 2006 SHT. 2 ZONE C-2

VENT ½"-13 M ¾"-(681) ¾"-682 8" (673) (672) 12" 10" 12"-11 (96) [A]

PS 372 729 152 153 154 102 10" WW-1 317 S-181 ("B" STRAINER) 1-CW-107-10 718 10" WW-1 (101) (100)

10"-12 10"-11CV SHT. 5 ZONE F-4 TO SCREEN WASH CONTROL SYSTEM

2"-21 2"-20 149 151 148 150 147 719 146 721 (DPIS 371) 720 C

PI 370B 691 143 145 144 11 RV-4x6 RELIEF VALVE SET @ 180 PSIG TO WASTE

10"-15 10"-12CV (99) VENT ½"-16 M 8" 10" (685) (684) 12" 12"-14 (97) SHT. 5 ZONE F-6

RIVERWELL SYS. THIS DWG. SHT. 5 ZONE E-4 CW-20CV 2"-783

MO RMS 12" 14" SW-2 PRIMING & EMERGENCY SCREEN WASH SUPPLY 1-SW-109-14 14"-116MV 1195 CW-1 SW-2 SEE NOTE 9

SEE DWG 2006 SHT. 2 ZONE B-2

SEE THIS DWG. SHT. 2 ZONE C-3 14" SW-2 18" SW 8"-39 8" B.F. (FUTURE CHLORINATION SYS.)

10"-696 2"-2419MV BACKWASH VALVE

A H RMS MO M S 10" WW-1 TO RIVER 2"-698 DRAIN VALVE N.C.

FOR FLUSHING SAND FROM VALVES WHEN ONE PUMP IS OFF [A]

SCREEN WASH PUMPS

UPSTREAM WATER LEVEL LT A1-1 DOWNSTREAM WATER LEVEL LT A1-2

C A L SCREEN CONTROL PANEL CW-PNL-A1 (TYP. FOR BGI SCREENS)

SW A1 BYPASS GATE SWITCH

¾"-CW-1 701 700 181A "A" STRAINER 842 717 703 714 712 702 704 706 839 709 708 DPIS 371A 715 716 713 711 841 705 707 710 840 ¾" (TYP.) DPIS 371B A

10"-697 ¾" VENT 857

BAY "A" BAY "B" BAY "C" BAY "D" BAY "E"

SCREEN A1 SCREEN A2 SCREEN B1 SCREEN B2 SCREEN C1 SCREEN C2 SCREEN D1 SCREEN D2 SCREEN E

2" 2" 1½" 991 992 993 994 995 996 997 998 999

PS A1 PI A1 PS A2 PI A2 PS B1 PI B1 PS B2 PI B2 PS C1 PI C1 PS C2 PI C2 PS D1 PI D1 PS D2 PI D2 PS E PI E

4" BY BGI (TYP) ½" 981 982 983 984 985 986 987 988 989

1000 NOTE 11 1001 NOTE 11 1002 NOTE 11 1003 NOTE 11 1004 NOTE 11 1005 NOTE 11 1006 NOTE 11 1007 NOTE 11 1008 NOTE 11

1009 1010 1011 1012 1013 1014 49 52 55

10" 10" CW-1 SEE THIS DWG, SHT. 2, ZONE C-2

INTAKE STRUCT. PUMP ROOM 10" FP-1 TO FIRE PUMP DISCH. HDR. SEE DWG. 2016 SHT. 1A ZONE B-7

PS 377 728 159 163 161 PI 377 162 IA-PRV77 IA-PRV76 PCV373 PIC 373 160 164 726 1-CW-109-10 10"-10CV 10"-22 10" WW-1 FP-1

10"-23 8" PCV-373 10"-24 118 10" WW-1 1-CW-107-10 1-CW-102-10 123 27 26 2½"-778 2½"-29

8"-25 86 8" PS 2200 (NOTE 12) 727 158 156 157

CS WW-1 SS WW-1S SYSTEM CHANGE

TRAVELING SCREENS

1-SW-100A-20 20" SW-2

20" SW-2 20"-13 20"(13-CV) (202) PI 360D ½" (TYP.) RMS M SEE NOTE 15 SW-V-1536 SW-V-1537 S-129 1-SW-108-1 1"-1256 1"-1254 FE 361D FIS 361D C A L 1255 1"-31 3 1-D BAY "E"

20"-11 20"(11-CV) (200) PI 360B 1"-1250 1"-1248 FE 361B FIS 361B 1"-1249 1"-30 1-B

20"-12 20"(12-CV) (201) PI 360C 1"-1253 1"-(1251) FE 361C FIS 361C 1"-(1252) 1-C

20"-10 20"(10-CV) (199) PI 360A ½" (TYP.) 1"-1247 1"-1245 FE 361A FIS 361A 1"-(1246) 1"-23 1-A

1" SW-2 1"-24 1-SW-108B-1" 1-SW-100B-24 20" SW-2 24" SW-2

DWG. 2010 SHT.1 ZONE E-11 NE SPV858 IF AV 1-SW-107B-4 4" SW-2 4"-1516 4"-858AV 4"SW-2S NC 3 2"-15 TO RIVER 2"SW-2 1"-1518 24" SW-2 24"-192 24"-17 S-192 DPR 361 (¾"-209) (¾"-205) dPT 361B ¾"-206 ¾"-210 362 363 364 365 366 335 336 333 331 337 332 334 (1187) dPS 362B (1188) 340 342 338 344 343 339 341 1234 1235 dPIS 363B 20"-194 20" SW-2 18" SW-2

VENT 345 6" SW-2 SEE THIS DWG. SHT.2 ZONE H-5

STATION SERVICE WATER PUMPS

PUMP ROOM INTAKE STRUCT. YARD

1079 PI 364B 347 1081 PI 365B 350 351 348 PS 364B 346 352 PS 365B 349 (213) (212) PUMP AUTO START

(1086) NOTE 13 88CV NOTE 14 89CV QUILL SWBD NOTE 13 90CV NOTE 14 QUILL SWNC (1527) 24" SW-2

24"-72 (1523) (1225) 24" SW-2 18" SW-2 ½" 1239 VENT 1080 (1226) NOTE 13 NOTE 14 86CV 87CV QUILL SWAC

317 PI 364A 1078 316 PS 364A 318 319 321 PI 365A 320 PS 365A 322 323 PUMP AUTO START 214 211 24"-1490 CLASS 1IS SEE NOTE 3 24"-37MV ¾" 3B VENT 24"-36MV 24"-71 (1519) (1181)

1½"-21 1½"-28 IF

DWG. 2010 SHT. 1 ZONE E-11 NE SPV857 IF AV 4"-1515 4"-857AV 4"SW-2S SW-2 4" SW-2 2"-14 TO RIVER 2"SW-2 1"-1517 24"-191 (¾"-207) (¾"-203) S-191 DPR 361 dPT 361A 355 356 357 358 360 305 306 303 301 307 302 304 1183 dPS 362A 1184 312 313 308 314 309 310 311 1231 dPIS 363A 1232 24"-16 24" SW-2 ¾"-208 204 24"-21 24"-28

FOR CONT. SEE THIS DWG, SHT. 3, ZONE H-7

(1178) 3 NC 1082 1385 PI 394 1478 1474 1475 PI 393 1465 1462 1461 ½" 1470 1457 1468 1469 1480 1479 1455 1456 1½" SW-2 1" SW-2

AUTOMATIC BACKWASH STRAINERS

20"-193 20" SW-2 6" SW-2 SEE THIS DWG SHT. 2 ZONE J-4 (315) VENT

1" SW-2 1476 1489

454003586

STATUS: Release
STATUS DATE: 10/27/2015
DS APPROVED: JDMADDO
VER: AN REV: 90 SIZE: F

AS BUILT

NOTE: ALL ITEMS MARKED THUS [A] ARE "AS BUILT" ITEMS AND ARE NOT SHOWN ON PIPING DRAWINGS.

SEE SHT.3 THIS DWG. ZONE G-1 & H-1

NOTES:

1. "C-P" INDICATES LOCATION OF CATHODIC PROTECTION LEADS TO BE INSTALLED IN ACCORDANCE WITH PARAGRAPH 1.4.14.2, CONTRACT E-69-4.
2. AT SAMPLING POINTS, CONNECTIONS, PROBES AND ROOT VALVES SHALL BE FURNISHED AND INSTALLED UNDER CONTRACT E-69-4. PROBES SHALL BE FURNISHED AND INSTALLED IN ACCORDANCE WITH CONTRACT PARA. 3.4.2 AND DWG. SP-07211, FIG. NUMBER AS NOTED. CONTINUATION OF SAMPLE PIPING BY E-70-3.
3. CLASS IIS SEISMIC REQUIREMENTS FOR THE "SW-2" & "CW-2" SYSTEMS SHALL APPLY TO THAT PORTION OF THE SYSTEM IDENTIFIED AS CLASS IIS SEISMIC HEREON. ALL SW-2 PIPING DOWNSTREAM OF 24"-1490 IS CL-IIS. (REF. E-10)
4. UNLESS OTHERWISE INDICATED ALL PRESSURE AND/OR FLOW INSTRUMENT ROOT LINES SHALL BE 3/4" ROOT VALVES SHALL BE 3/4"-V2325 EXCEPT AS NOTED, LINE UP TO AND INCLUDING ROOT VALVE SHALL BE FURNISHED AND INSTALLED UNDER CONTRACT E-69-4.
5. ALL TEMPERATURE, TEST AND PROTECTING WELL PENETRATIONS SHALL BE 1"NPT UNLESS OTHERWISE NOTED.
6. 156" CW-1, 108" CW-2, 84" CW-2 TEMPERING LINE AND PORTIONS OF THE CW-1, CW-2 AND SW-2 SYSTEMS ARE NOT IN CONTRACT E-69-4. FOR INTERFACES SEE COMPOSITE PIPING DWGS.
7. VENTS & DRAINS SHALL CONFORM (FULL LENGTH) TO THE SYSTEMS DESIGNATION FROM WHICH THEY ORIGINATE.
8. ALL VALVE NUMBERS IN PARENTHESIS ( ) ARE NUMBERS TO BE USED IN OPERATING PROCEDURES. THESE NUMBERS ARE ASSIGNED BY NPPD AND WILL NOT BE SHOWN ON PIPING DRAWINGS.
9. ALL VALVES DOWNSTREAM OF SW-116MV ARE IN THE CIRCULATING WATER SYSTEM (CW) UNLESS DESIGNATED OTHERWISE. ALL VALVES UPSTREAM AND INCLUDING SW-116MV ARE IN THE SERVICE WATER SYSTEM (SW) UNLESS DESIGNATED OTHERWISE.
10. WHERE LINES ARE INTERCONNECTED AND CONTINUED ON OTHER DRAWINGS, ZONE NUMBERS ARE APPROX. ONLY.
11. PRESSURE REGULATING VALVE FOR TWS SCREEN WASH SUPPLY IS MANUALLY ADJUSTABLE.
12. INSTRUMENT ABANDONED IN PLACE.
13. HOSE CONNECTION FOR CHEMICAL INJECTION LINE.
14. CHEMICAL INJECTION QUILL AND ASSOCIATED COMPRESSION GLAND, CHECK VALVE(S), AND HOSE CONNECTION MAY OR MAY NOT BE INSTALLED. IF NOT INSTALLED, ISI BOUNDARY/CLASS BREAK REVERTS TO NEAREST CLOSED VALVE (1519, 1523) FOR CLASS 3 BOUNDARIES.
15. CHEMICAL INJECTION LINES FROM SW/CW CHEMICAL TREATMENT SYSTEM TO SW/CW BAYS. THE SW/CW CHEMICAL TREATMENT SYSTEM, INCLUDING ISOLATION VALVES CW-V-1043, CS-V-1044, CW-V-1045, CW-V-1046, SW-V-1536 & SW-V-1537 IS A PROCEDURE 0.31 EXEMPT SYSTEM CONTROLLED BY THE CHEMISTRY DEPARTMENT. THESE INJECTION LINES TO THE SW/CW BAYS ARE PLASTIC TUBING AND ARE NOT PART OF CONTRACT E-69-4.

REVISIONS TO THIS DRAWING REQUIRES A REVISION TO THE CORRESPONDING ISOKEY.

FOR PREVIOUS REVISIONS, SEE SUPERSEDED CARDS.

VERSIONS/REVISIONS BY N.P.P.D.

NO.	DESCRIPTION	DFT	DATE	ENG
AM/89	DR-2015-0257	DLR	5/5/15	JDMADDO
AN/90	DR-2015-0287	DJB	10/27/15	JDMADDO

SIGNIFICANT NUMBER GROUP 1 2 3 4 5 6

DRAWN DATE CHECKED DATE APPROVED DATE SEE SUPERSEDED CARDS FILMED

FLOW DIAGRAM
CIRCULATING, SCREEN WASH & SERVICE WATER SYSTEMS
COOPER NUCLEAR STATION

BURNS & ROE

2006 SH 1

CARD FILE: C0017906

NOTES:

1. IN BAYS "A" THRU "D" JETS J-2 AND J-4 ARE MANUALLY OPERATED ONLY. J-2 AND J-4 JETS SHALL NORMALLY BE STANDBY.
2. J-4A JETS IN "E" BAY ARE REDUNDANT. ONE IS NORMALLY IN SERVICE, THE OTHER IS STANDBY.
3. J-4B JETS IN "E" BAY ARE REDUNDANT SUCH THAT ONE REMOVABLE JET IS NORMALLY IN SERVICE, THE OTHER REMOVABLE JET IS STANDBY. THE PERMANENT J-4B JET IS LAST DITCH BACK UP IN THE EVENT THAT BOTH REMOVABLE JETS ARE NOT OPERABLE AND SHALL NORMALLY BE IN STANDBY.
4. J-3 SPARGER JETS ARE LOCATED AT THE BOOT SECTIONS OF THE TRAVELING WATER SCREENS (REF BGI DWG D-J04-258-103).
5. ALL WW-1 INSTRUMENT PIPING AND ROOT VALVES (EXCEPT FX ITEMS) TO BE 3/4" SIZE V-232S.
6. ALL WW-1S PIPING INSTALLED IN THE TRAVELING WATER SCREENS SHALL CONFORM TO BRACKETT GREEN USA INC. SPECIFICATIONS.
7. ALL 2" SIZE AND SMALLER GLOBE VALVES IN WW-1, SW-1, CA-1, CW-1 TO BE V-232S TYPE VALVES, EXCEPT FOR TRAVELING WATER SCREENS.
8. CONNECTIONS ARE PROVIDED FOR POSSIBLE FUTURE VACUUM PRIMING SYSTEM.
9. DELETED
   RELOCATED BY DISTRICT TO ANY AVAILABLE (PX) CONNECTION
   AFTER PLANT IS IN OPERATION. EACH (PI) SHALL BE INSTALLED WITH A UNION.
10. ALL BUTTERFLY VALVES, EXCEPT THOSE COVERED BY NOTES 11, 12 & 16 ARE DUCTILE IRON ASTM A-395 WITH LUG TYPE BODY.
11. VALVES ARE CAST IRON WITH LUG TYPE ENDS.
12. VALVES ARE SPAN TYPE, CAST STEEL, CLASS IS RATED.
13. ALL VALVES NUMBERS SHOWN IN PARENTHESIS ( ) ARE NUMBERS TO BE USED IN OPERATING PROCEDURES. THESE NUMBERS ARE ASSIGNED BY NPPD AND WILL NOT BE SHOWN ON PIPING DRAWINGS.
14. FOR THE BRACKETT GREEN USA INC. TRAVELING SCREEN INSTALLATION, THE FOLLOWING IS APPLICABLE. SCREEN WASH SPARGER SOLENOID VALVE LOGIC OPERATION WILL ALLOW SPARGING WITH THE J-3 JETS WITH THE CORRESPONDING TRAVELING WATER SCREEN RUNNING OR OFF. THE SCREEN CAN RUN WITH THE JETS OFF.
15. WHERE LINES ARE INTERCONNECTED AND CONTINUED ON OTHER DRAWINGS, ZONE NUMBERS ARE APPROXIMATE ONLY.
16. SPARGER JET J-3 ISOLATION VALVES AOV-10AV, AOV-11AV, AOV-12AV, AOV-13AV, AOV-14AV, AOV-15AV, AOV-16AV, AOV-18AV AND AOV-17AV ARE A351 STEEL CASTING.

SCREEN WASH PUMPS

TRAVELING WATER SCREENS

DETAIL "A"

DETAIL B
ZONE J-7

REVISIONS TO THIS DRAWING REQUIRES A REVISION TO THE CORRESPONDING ISOKEY.

AS BUILT
454003587

STATUS: Release
STATUS DATE: 11/07/2016
DS APPROVED: BSSWOBO
VER: AF REV: 49 SIZE: F

FOR PREVIOUS REVISIONS, SEE SUPERSEDED CARDS.

VERSIONS/REVISIONS BY N.P.P.D.			
NO.	DESCRIPTION	DFT DATE	ENG
AB/46	DR-2013-0634 (DCN 13-0063)	DLR 8/19/13	ACHARRI
AD/47	DR-2013-0969	DLR 12/26/15	LDMADDO
AE/48	DR-2013-0969	DLR 6/27/16	LDMADDO
AF/49	DR-2016-0002	DJB 1/10/17	BEWERNE

SIGNIFICANT NUMBER | GROUP | 1 | 2 | 3 | 4 | 5 | 6

FLOW DIAGRAM
CIRCULATING, SCREEN WASH & SERVICE WATER SYSTEMS
COOPER NUCLEAR STATION

DRAWN RAC DATE 11/29/00
CHECKED DATE
APPROVED SEE SUPERSEDED CARDS DATE
FILMED

BURNS & ROE

2006 SH 2

CARD FILE C0017989

NOTE:
FOR NOTES SEE THIS DWG SHT. 1

FROM ZONE F-2 (THIS DWG.)
FROM ZONE F-3 (THIS DWG.)
2" CW-2
84" CW-2
8" CW-2
INTAKE STRUCT.
YARD
C.P.
CATHODIC PROTECTION JUMPER
DRESSER COUPLING
BLANK
SHT 1 THIS DWG, ZONE A,B-6
156" CW-1
CATHODIC PROTECTION JUMPER
T-G BLDG
96"100MV811F
96"
1-CW-101-96
S-127
CW-V-910
4" CW-2
4"V111F-59
4"V111F-61
dPI 353A
dPI 353A
84"108MV-811F
S-128
MO
RMS
SP 17A-1
3/4"V546X(B)(119)
(814) (197) (198) (813)
(110) 199 (111)
dPI 353B
TE 3544
202 203
84"
84"104MV811F
FIG. 2, NOTE 2
30" DIA. MANHOLE
HEATING BOILER ROOM FLOOR
(108)
IF
(819)
CONDENSER 1-A
1" NPT WELD COUPLING PLUGGED FOR FUTURE FLOW TEST DEVICE (TYP.)
CW-V-911
S-127
S-128
84"105MV811F
84"
3" BLIND FLG FOR TEMP. PROBE
30"DIA MANHOLE EAST OF CDSR 1-A NEAR WALL
C.W. DISCHARGE TUNNEL 1-A
(125) (35CV)
(126) (36CV)
T-G BLDG
YARD
108"CW-2
(304) 28CV (308)
(305) 29CV (310)
FE 13
FT 13
(172) (173) PI 352A
(174) SPARE
(175) PS 352-1
A H
1-CW-101-96
96"
IF
TE 353A
10"
CW-2
MO
RMS
FE 12
FT 12
96"101MV811F
(112) (206) (207) (113)
(815) 208 (812)
4"V111F-60
4"V11F-62
SP 17A-2
84"109MV-811F
84"CW-2
1-CW-103-84
24"SW-2
211 212
dPI 353C
dPI 353C
10"CW-2
C.W. SYSTEM FILL
1-SW-111-12
10"CW-2
84"110MV-811F
84"CW-2
1-CW-103-84
4"V111F-63
4"V111F-65
dPI 353B1
dPI 353B
(816) (215) (216) (811)
(114) 217 (115)
TE 3545
3/4"V546X(B) (121)
FIG 2, NOTE 2
96"102MV 811F
1-CW-101-96
96"
IF
CW-V-912
S-127
S-128
84"
84"106MV-811F
(220) (221)
CONDENSER 1-B
30" DIA M.H. EAST OF CDSR 1-B NEAR WALL
C.W. DISCHARGE TUNNEL 1-B
3" BLIND FLG FOR TEMP. PROBE
119MV
(306) 30CV (311)
(307) 33CV (312)
FE 11
FT 11
FT 10
FE 10
(818)
1-CW-101-96
96"
IF
10"CW-2
(183) (184) (189) (190)
(185) (186) (187) (188)
CW-V-913
S-127
S-128
84"107MV811F
96"103MV -811F
MO
RMS
SHIELD WALL
827
CAPPED
CW-1 CW-2
2½"
18RV
TO ZONE A-3
(116) (224) (225) (117)
(817) 226 (810)
4"V111F-64
4"V111F-66
3/4"V546(B)(122)
SP 17B-2
FIG. 2, NOTE 2
229 230
84"111MV-811F
84"CW-2
1-CW-103-84
dPI 353D
dPI 353D
10"CW-2
2" TO ZONE A-3
RV-2233 17RV
TURBINE BLDG HV ROOM FLOOR
BLIND FLG
3" CW-58
1-CW-110-3
3" VENT & STATIC TEST RISER
SHT. 1 THIS DWG. ZONE D,E-11
1-CW-101-156
156" CW-1
4" CW-2
24"CW-1
SW-2, CW-2
SW-V-1500
SW-V-1499
SW-V-1498
SW-V-1497
S-128
(836)
F.C.
SW-2, CW-1
VENT (1240)
FG 398A
FG 398B
FG 398C
FG 398D
4"SW-2
12"811F-860 LOCKED CLOSED
24"CV811F-54
24"SW-2 (BACKWASH)
1-SW-102A-24
PI 2728
T/G BLDG
1" VENT (TYP.)
1"V232S-59
TO WASTE
AIR REMOVAL
1"V232S-61
TO WASTE
PX 366A
391
187
TE 366A
1-A
TO WASTE
1"V232S-60
TO WASTE
1"V232S-62
PX 367A
188
393
1" DRAIN (TYP.)
TE 367A
1-SW-102A-24
24"CV811F-56
24" SW-2 (BACKWASH)
24"V811F-55
24"CV811F-57
DWG 2006 SHT 4, ZONE G-3
6" SW-2
PT 2728
278
VENT A (231)
3/4"V546(B)(295)
SP 57A
FIG 2, NOTE 2
24"CV811F-63
24"SW-2 (BACKWASH)
1-SW-102B-24
1" VENT (TYP.)
1"V232S-67
TO WASTE
AIR REMOVAL
1"V232S-69
TO WASTE
PX 366B
392
189
TE 366B
1-B
TO WASTE
1"V232S-68
TO WASTE
1"V232S-70
PX 367B
190
394
1" DRAIN (TYP.)
TE 367B
1-SW-102B-24
24"V811F-65
24" SW (BACKWASH)
24"V811F(64)
24"CV811F(66)
3/4"V546(B)(296)
SP 57B
FIG 2, NOTE 2
TURBINE BUILDING CLOSED COOLING WATER HEAT EXCHANGERS
INTAKE STRUCT.
YARD
C.P.
24"SW-2
4"V829F2373-(782)
4" SW-2
12"SW-2
24"SW-2
24" 811F-859
SW-2
CW-1
(58)
IP
(228)
A
RO 368
TE 368
1¼" V123X-53
(ANNUBAR TYP.)
1-SW-100B-24
1-SW-100A-24
24"SW-2
C.P.
C.P.
1-SW-100B-24
24"SW-2
1-SW-100A-24
24"SW-2
1-SW-102-24
1-CW-105-84
1-CW-104-108
C.W. DISCHARGE TUNNEL
YARD
BELOW MAT D-G BLDG

PRIMING VALVE (TYP. 8 PLACES)
CW-STNR-14PV
CW-STNR-10PV
1¼"V253X-71
10PV
2"V253X -67
1"V253X-538
1¼"V253X-72
11PV
2"V253X -68
1"V253X-539
A-1 INLET
A-2 INLET
CONDENSER 1-A
A-1 OUTLET
A-2 OUTLET
2"V253X -69
14PV
1¼"V253X-73
1"V253X(542)
2"V253X -70
15PV
1¼"V253X-74
1" V253X(543)
CW-2 (TYP.)
CW-1 (TYP.)
CW-STNR-11PV
CW-STNR-15PV
4" CW-2
1¼"V253X-79
12PV
2"V253X -75
1"V253X-540
1¼"V253X-80
13PV
2"V253X -76
1"V253X-541
B-1 INLET
B-2 INLET
CONDENSER 1-B
B-1 OUTLET
B-2 OUTLET
2"V253X -77
16PV
1¼"V253X-81
1"V253X(544)
2"V253X -78
17PV
1¼"V253X-82
1"V253X(545)
CW-STNR-12PV
CW-STNR-16PV
CW-STNR-13PV
CW-STNR-17PV
1"-CW-119-4
1"CW-2
SA-1 CW-1
(504)
(19RV)
FROM DWG. 2010, SH.3 ZONE G-8
(503) (PRV10) (129)
PRIMING PUMP CONTROL CKT.
8" CW-1
1"-CW-111-8
CW-2
CW-1
8"V123F-526
4"V211F -555
VACUUM TANK
(170) LS 373 (807)
(171) (809) (808)
(130)
(134)
2"
(83)
1½" CW-1
(128)
1½" PCV10
¾"CW-1
(136)
8" CW-1 1-CW-111-8
FROM DWG 2013 ZONE C-12
1" DW-IS
1-DW-108-1
½" DW-IS
½"V226S-185
TO ATMOSHERE (ROOM)
½"V526S-184
TO ATMOSPHERE (ROOM)
6" V-1
SEPARATOR
OVERFLOW
CW-924
LCV-704
1" VENT
CW-926
1"
(421)
TO DRAIN
(330)
1-CW-111-6
6"V111F-85
14CV
CW-2 CW-1
SS
RMS
VACUUM PRIMING PUMP 1-B
1-CW-111-6
6"V111F-84
13CV
CW-1 CW-2
LCV-703
CW-925
(329)
(420)
VACUUM PRIMING PUMP 1-A
TO DRAIN
NOTE:
FOR VACUUM PRIMARY PUMP COOLERS SEE DWG. 2007 ZONE D-10.
WATER BOX PRIMING DIAGRAM
*FURNISHED WITH VACUUM EQUIPMENT
PRIMING VALVE (TYP. 2 PLACES)
18PV
½" ½"V153X-530
¾"V253X-532
1"x ¾" INSERT
(823)
1"V253X-2404
(531)
EXISTING 1" VENT
1"V232S-59
(822)
TBCCWHX 1-A
S-411
19PV
½" ½"V153X-527
¾"V253X-528
1"x ¾" INSERT
(821)
1"V253X-2402
(529)
(820)
1"V2329-67
EXISTING 1" VENT
TBCCWHX 1-B
TURBINE BUILDING CLOSED COOLING WATER HEAT EXCHANGER AIR REMOVAL DIAGRAM
84"CW-2 (TEMPERING WATER SUPPLY) 1-CW-105-84
108"CW-2 1-CW-104-108
108"CW-2 1-CW-104-108
108"CW-2 1-CW-104-108
YARD D-G BLDG
1-SW-133A-10
1-SW-133B-10
10" SW-2 SUPPLY & RETURN TO DIESEL GENERATORS #1 & 2 FOR CONTINUATION SEE DWG 2077, ZONES D-1 & D-4.
1-SW-134A-10
1-SW-134B-10
SW-2, SW-2
D/G BLDG
YARD
C.W. DISCHARGE TUNNEL
FROM RM-17-352 DWG. 2031, SH.3 ZONE F-6
RR 353 17 9-2
RM 351A 17 9-10
RM 351B 17 9-10
RM 332A 17
RM 332B 17
AH
AL
C
EMERGENCY COOLING WATER FROM CONTROL ROOM A/C UNIT, SEE DWG 2007, ZONE H-1
3" 1-SW-113-3
3"V123W-109
1-SW-113A-3
3"V123W-110
1-SW-113B-3
EMERGENCY COOLING WATER FROM AIR COMPRESSORS, SEE DWG 2007, ZONE F-1, G-1
3" 1-SW-115A-3
3"V123W-113
3" 1SW-115B-3
3"V123W-114
2" FROM CONTROL BLDG BASEMENT VENTILATION SEE DWG 2006 SHT. 4, ZONE J-5
1-SW-117-2
IF
C.P.
C.P.
CONTROL BLDG
BELOW T/G BLDG MAT
YARD
10"CW-2
SW-2 CW-2
NC 3
FROM RHR-SW-B & REC-SW-B HEAT EXCHANGERS
TO RESIDUAL HEAT REMOVAL SERVICE WATER BOOSTER PUMPS, REACTOR BLDG HEAT EXCHANGERS AND CONTROL BLDG SERVICES, SEE DWG 2006 SHT. 4, ZONE A-2, E-2.
FROM REACTOR BLDG RESIDUAL HEAT REMOVAL & CLOSED HEAT EXCHANGERS, SEE DWG 2036 SHT. 1, ZONE E-12.
24"SW-2
1-SW-104A-24
24"SW-2
1-SW-104B-24
FROM RHR-SW-A & REC-SW-A HEAT EXCHANGERS
SW-2 CW-2
RE 332A
RE 332B
24"CW-2
24"CW-2
CONTROL BUILDING BASEMENT FLOODING WATER LEVEL SENSOR
LS 751
SEAL WELL LEVEL CONTROL SYSTEM
RMS
POI 376
POT 376
R/I 376
RTD 1234
LOCATED ON SEAL WELL WALL
Φ 1
Φ 2
Φ 3
Φ 4
WEST
DISCHARGE TO RIVER
SEAL WELL
TO 24"37MV823F-37 INTAKE STRUCTURE SEE SHT 1 THIS DWG, ZONE E-11
24"CW-2
1-SW-104A-24
24"CW-2
1-SW-104B-24

REVISIONS TO THIS DRAWING REQUIRES A REVISION TO THE CORRESPONDING ISOKEY.

AS BUILT
454003588
STATUS: Release
STATUS DATE: 06/23/2016
DS APPROVED: JDNEDDE
VER: AE REV: 56 SIZE: F

FOR PREVIOUS REVISIONS, SEE SUPERSEDED CARDS.

VERSIONS/REVISIONS BY N.P.P.D.

NO.	DESCRIPTION	DFT	DATE	ENG
AD/54	DR-2014-0496 (DCN 12-0917)	DLR	10/7/14	KKKUKER
AC/55	DR-2014-0496 (DCN 12-0889)	PAM	10/19/14	KKKUKER
AE/56	DR-2015-0002	DJB	06/23/16	JDNEDDE

SIGNIFICANT NUMBER
GROUP 1 2 3 4 5 6

DRAWN RAC 5/8/96
CHECKED
APPROVED
FILMED
DATE
SEE SUPERSEDED CARDS

FLOW DIAGRAM
CIRCULATING, SCREEN WASH & SERVICE WATER SYSTEMS
COOPER NUCLEAR STATION

BURNS & ROE

2006 SH 3

DOC. FILE: C0017990

NOTES:

1. AT SAMPLING POINTS CONNECTIONS, PROBES AND ROOT VALVES SHALL BE FURNISHED AND INSTALLED UNDER CONTRACT E-69-4, PROBES SHALL BE FURNISHED AND INSTALLED IN ACCORDANCE WITH CONTRACT PARA. 3.4.2 AND DWG. SP-07211 FIG. NO. AS NOTED. CONTINUATION OF SAMPLING PIPING BY E-70-3.
2. LINES DOWNSTREAM OF DRAIN VALVES SW-100, 86, 93, 79, 1179, 1180 AND 120 CONTINUE TO CONTROL BUILDING BASEMENT SUMP 1L.
3. ALL VALVES ARE IN THE SERVICE WATER (SW) SYSTEM UNLESS OTHERWISE NOTED.
4. RHR SERVICE WATER BOOSTER PUMPS CLASS IS INJECTION WATER SYSTEM IS INTENDED FOR BACKUP SERVICE ONLY.
5. REF. CED 6011141, CCN#1 FOR CONNECTION DETAIL.
6. STRAINER BASKET REMOVED PER MWR 88-2966, IEIN 85-96 AND IR 93-06.

RESIDUAL HEAT REMOVAL
SERVICE WATER BOOSTER PUMPS

DETAIL 1
(NOT USED)

DETAIL 2
ZONE H-12

DETAIL 3
ZONE H-12

DETAIL 4
ZONE G-5

DETAIL 5
ZONE G-8

REVISIONS TO THIS DRAWING REQUIRES A REVISION TO THE CORRESPONDING ISOKEY.

FOR PREVIOUS REVISIONS, SEE SUPERSEDED CARDS.

VERSIONS/REVISIONS BY N.P.P.D.

NO.	DESCRIPTION	DFT	DATE	ENG
AT/57	DR-2016-0117	DJB	11/17/16	JDWILSO
AQ/58	DR-2016-0117	DJB	12/06/16	JDWILSO
AR/59	DR-2016-0117	DJB	12/08/16	JDWILSO
AX/60	DR-2017-0001	DJB	06/02/17	RDCHAMP

SIGNIFICANT NUMBER | GROUP | 1 | 2 | 3 | 4 | 5 | 6

COOPER NUCLEAR STATION
FLOW DIAGRAM
CONTROL BUILDING
SERVICE WATER SYSTEM

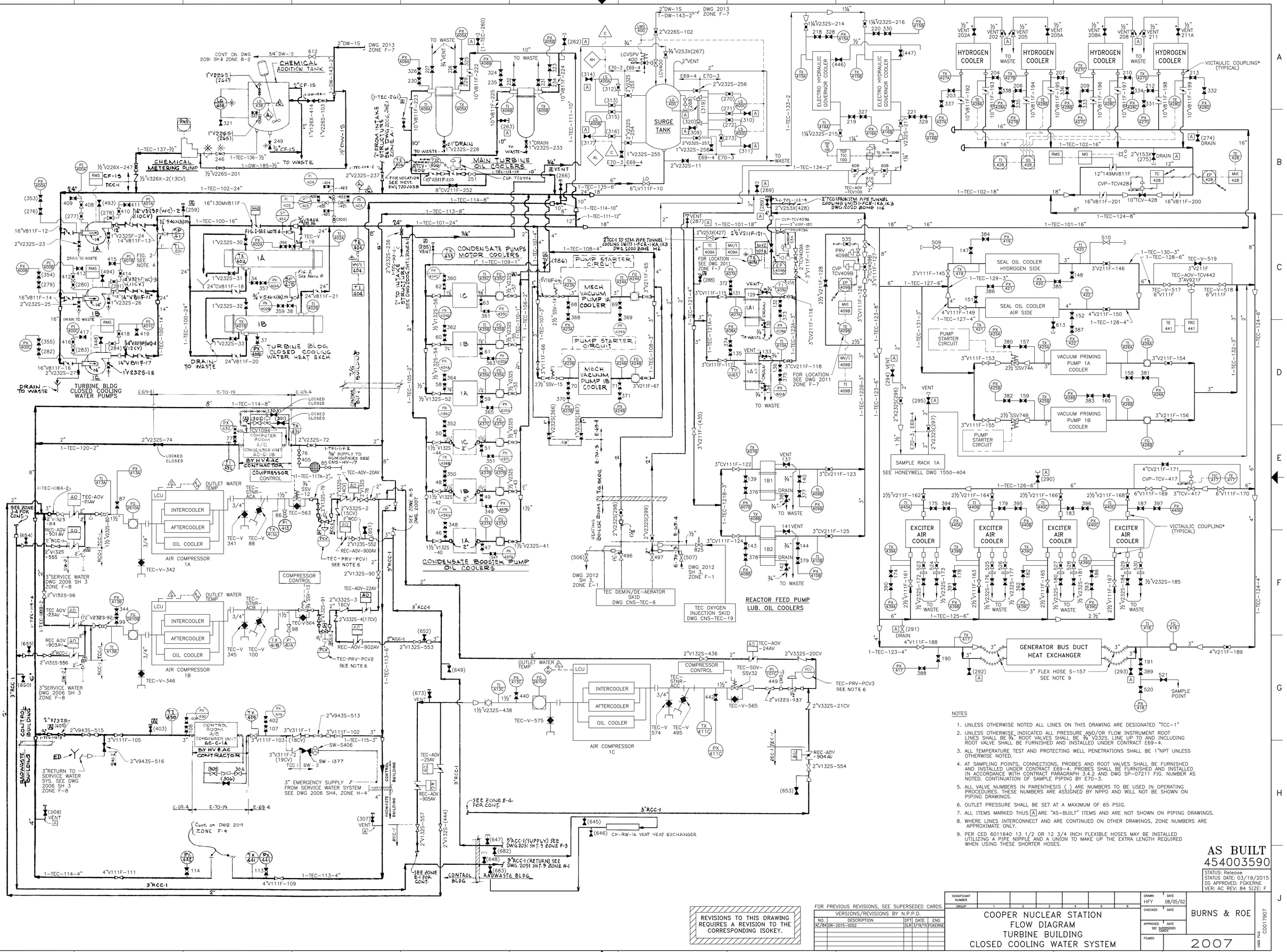
DRAWN SPB DATE 6-7-93
CHECKED DJF DATE 6-7-93
APPROVED BKW DATE 6-7-93
FILMED

BURNS & ROE

2006 SH 4

CARD FILE: C0009981

AS BUILT
454003589
STATUS: Release
STATUS DATE: 06/02/2017
DS APPROVED: RDCHAMP
VER: AX REV: 60 SIZE: F



NOTES

1. UNLESS OTHERWISE NOTED ALL LINES ON THIS DRAWING ARE DESIGNATED "TCC-1"
2. UNLESS OTHERWISE INDICATED ALL PRESSURE AND/OR FLOW INSTRUMENT ROOT LINES SHALL BE ¾". ROOT VALVES SHALL BE ¾" V232S. LINE UP TO AND INCLUDING ROOT VALVE SHALL BE FURNISHED AND INSTALLED UNDER CONTRACT E69-4.
3. ALL TEMPERATURE TEST AND PROTECTING WELL PENETRATIONS SHALL BE 1"NPT UNLESS OTHERWISE NOTED.
4. AT SAMPLING POINTS, CONNECTIONS, PROBES AND ROOT VALVES SHALL BE FURNISHED AND INSTALLED UNDER CONTRACT E69-4. PROBES SHALL BE FURNISHED AND INSTALLED IN ACCORDANCE WITH CONTRACT PARAGRAPH 3.4.2 AND DWG SP-07211 FIG. NUMBER AS NOTED. CONTINUATION OF SAMPLE PIPING BY E70-3.
5. ALL VALVE NUMBERS IN PARENTHESIS ( ) ARE NUMBERS TO BE USED IN OPERATING PROCEDURES. THESE NUMBERS ARE ASSIGNED BY NPPD AND WILL NOT BE SHOWN ON PIPING DRAWINGS.
6. OUTLET PRESSURE SHALL BE SET AT A MAXIMUM OF 65 PSIG.
7. ALL ITEMS MARKED THUS A ARE "AS-BUILT" ITEMS AND ARE NOT SHOWN ON PIPING DRAWINGS.
8. WHERE LINES INTERCONNECT AND ARE CONTINUED ON OTHER DRAWINGS, ZONE NUMBERS ARE APPROXIMATE ONLY.
9. PER CED 6011640 13 1/2 OR 12 3/4 INCH FLEXIBLE HOSES MAY BE INSTALLED UTILIZING A PIPE NIPPLE AND A UNION TO MAKE UP THE EXTRA LENGTH REQUIRED WHEN USING THESE SHORTER HOSES.

AS BUILT
454003590

STATUS: Release
STATUS DATE: 03/19/2015
DS APPROVED: FGKERNE
VER: AC REV: 84 SIZE: F

REVISIONS TO THIS DRAWING REQUIRES A REVISION TO THE CORRESPONDING ISOKEY.

FOR PREVIOUS REVISIONS, SEE SUPERSEDED CARDS.

VERSIONS/REVISIONS BY N.P.P.D.

NO.	DESCRIPTION	DFT	DATE	ENG
AC/84	DR-2015-0002	DLR	3/19/15	FGKERNE

SIGNIFICANT NUMBER						
GROUP	1	2	3	4	5	6

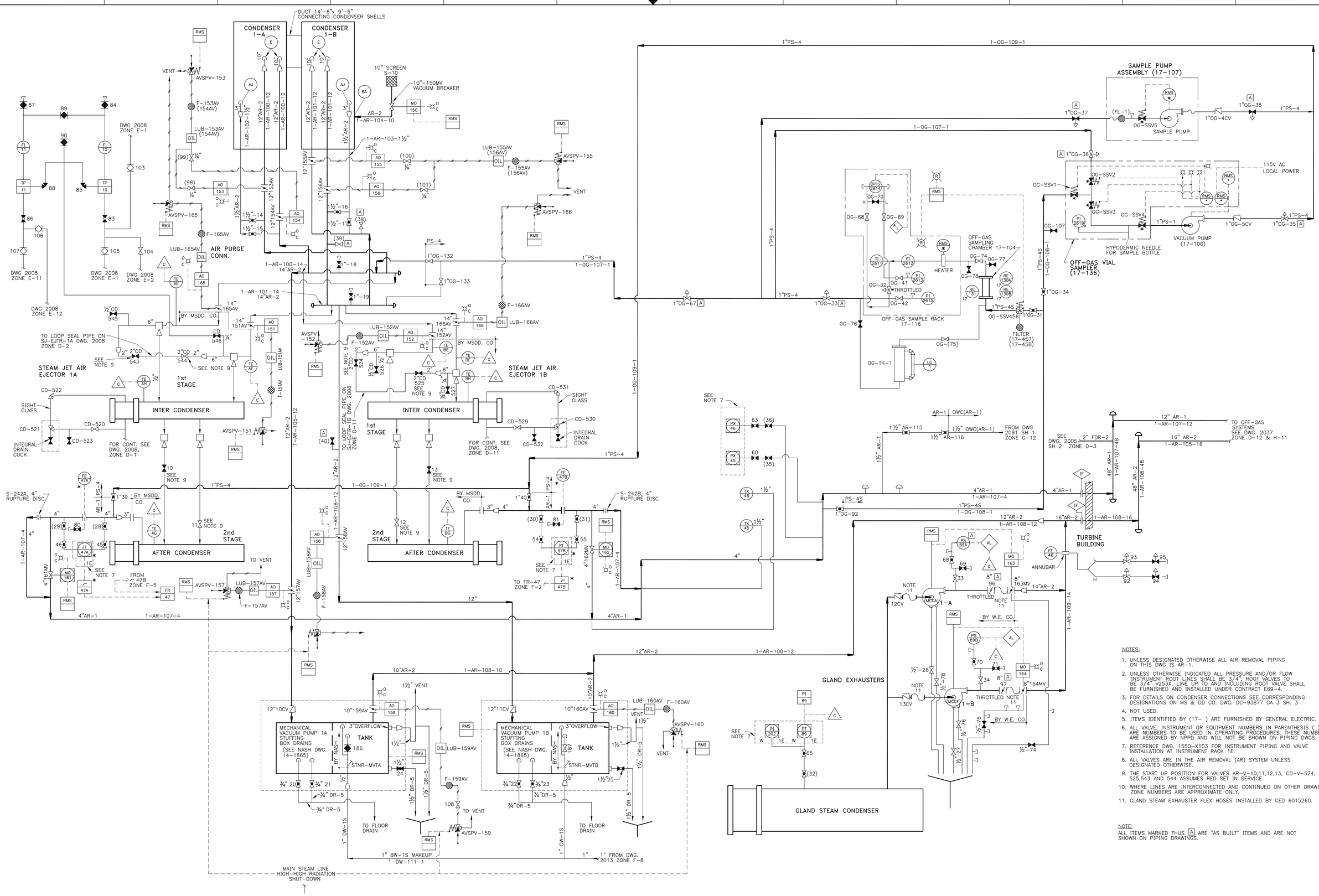
COOPER NUCLEAR STATION
FLOW DIAGRAM
TURBINE BUILDING
CLOSED COOLING WATER SYSTEM

DRAWN HFY DATE 08/05/02
CHECKED DATE
APPROVED DATE SEE SUPERSEDED CARDS
FILMED

BURNS & ROE

2007

CADD FILE: C0017907



NOTES:

1. UNLESS DESIGNATED OTHERWISE ALL AIR REMOVAL PIPING ON THIS DWG IS AR-1.
2. UNLESS OTHERWISE INDICATED ALL PRESSURE AND/OR FLOW INSTRUMENT ROOT LINES SHALL BE 3/4", ROOT VALVES TO BE 3/4" V253X. LINE UP TO AND INCLUDING ROOT VALVE SHALL BE FURNISHED AND INSTALLED UNDER CONTRACT E69-4.
3. FOR DETAILS ON CONDENSER CONNECTIONS SEE CORRESPONDING DESIGNATIONS ON MS & DD CO. DWG. DC-93877 GA 3 SH. 3
4. NOT USED.
5. ITEMS IDENTIFIED BY (17-) ARE FURNISHED BY GENERAL ELECTRIC.
6. ALL VALVE, INSTRUMENT OR EQUIPMENT NUMBERS IN PARENTHESIS ( ) ARE NUMBERS TO BE USED IN OPERATING PROCEDURES. THESE NUMBERS ARE ASSIGNED BY NPPD AND WILL NOT BE SHOWN ON PIPING DWGS.
7. REFERENCE DWG. 1550-X103 FOR INSTRUMENT PIPING AND VALVE INSTALLATION AT INSTRUMENT RACK 1E.
8. ALL VALVES ARE IN THE AIR REMOVAL (AR) SYSTEM UNLESS DESIGNATED OTHERWISE.
9. THE START UP POSITION FOR VALVES AR-V-10,11,12,13, CD-V-524, 525,543 AND 544 ASSUMES RED SET IN SERVICE.
10. WHERE LINES ARE INTERCONNECTED AND CONTINUED ON OTHER DRAWINGS, ZONE NUMBERS ARE APPROXIMATE ONLY.
11. GLAND STEAM EXHAUSTER FLEX HOSES INSTALLED BY CED 6015260.

NOTE:
ALL ITEMS MARKED THUS [A] ARE "AS BUILT" ITEMS AND ARE NOT SHOWN ON PIPING DRAWINGS.

AS BUILT
454003592

REVISIONS TO THIS DRAWING REQUIRES A REVISION TO THE CORRESPONDING ISOKEY.

FOR PREVIOUS REVISIONS, SEE SUPERSEDED CARDS.

REVISIONS BY N.P.P.D.

NO.	REVISIONS	DFT	CKD	APP	DATE
N28	CED 6015260 (DCN 04-1046)	KG	KG	RGA	9/30/05
N30	CED 6015260 (DCN 04-1085)	JGA	DLR	DJB	11/14/06
N31	CED 6018240 (DCN 07-0205)	DJB	DJB	PAM	04/26/08
N32	CR 2009-03730 (DCN 09-0605)	KG	KG	DLR	05/18/09

SIGNIFICANT NUMBER								
GROUP	1	2	3	4	5	6		

COOPER NUCLEAR STATION
FLOW DIAGRAM
AIR REMOVAL SYSTEM

DRAWN	DATE 1/21/02	BURNS & ROE	CARD FILE 00017909
RRT			
CHECKED	DATE		
APPROVED	DATE		
SEE SUPERSEDED CARDS			
FILMED		2009	REVISION N32

ASB-POS-100D DWG 2012 SH 3, ZONE G-2
ASB-POS-100C DWG 2012 SH 3, ZONE D-2
BOILER 1D CONTROL CABINET ABS-PNL-1D (2012 SHT. 3)
BOILER 1C CONTROL CABINET ABS-PNL-1C (2012 SHT. 3)
RMV-RM-20B
RMV-RM-20A
SEE HONEYWELL DWG. 932-71212PI SHT. 4T
SEE HONEYWELL DWG 932-71212PI SHT. 1T
SEE HONEYWELL DWG 932-71212PI SHT. 2T
TO CHEMICAL ADDITION PUMP "E" CONTOLLER AC-P-CFE
HV-AD1408
HV-AD1407
HV-AD1406
HV-AD1405
FP SYS 5 ACCUM
SEE DWG 2016 SH. 1B ZONE C-3
INSTRUMENT SHOP AIR SUPPLY
DW-LCV-400
HV-AD-1033
IR-1C
SEE DWG. 1550-X301
SEE DWG 2016 SH. 1 ZONE F-2
FP SYS 14 ACCUM
TURBINE CONTROL FLUID AIR PILOT VALVE
IA SUPPLY FOR TURBINE FRONT STAND. TRIP INSTR. TEST
HV-AD-1038A & 1038B
TURNING GEAR
AS-CVP800
AS-PCV804
AS-PCV800
CONT ON DWG 2091 SH 1 ZONE H-6
TO TEC-ADV-TCV100
YD TO INTAKE FOR CONT. SEE ZONE E-9 THIS SHEET
MC-PC-9A
MC-PC-9B
MC-EP-19A
MC-EP-19B
TEC-TCV-406
TEC-TC-406
MC-FCV-12
MC-FCV-8
MC-FCV-10
MC-LCV-2A
MC-FCV-17
CM-LCV-2C
CM-LCV-2B
MC-LCV-2D
F-LCV2D
FP SYS 8 ACCUM #4
SEE DWG. 2016 SHT. 1 ZONE B-2
2½" (TG RING HEADER)
RF-CVP-760A
TEC-TCV 442
TEC-TRC-441
TEC-TCV-428
TEC-TC-428
TEC-E/P-428
LR-105
SEE DWG 2016 SHT. 1 ZONE D-6
FP SYS 1A & 7 ACCUM
FP SYS 19 & 20 ACCUMULATORS SEE DWG. 2016 SHT 1, ZONE B-10
FP SYS 11 ACCUM
SEE DWG 2016 SHT. 1 ZONE B-6
OILER STATION (TYP.) SEE 2010 SHT. 5 FOR DETAIL
LR-111 SEE B & R DWG. ILE70-3 SHT. 140
SEE HONEYWELL DWG. 932-71212PI SHT. 3C
HV-TC-1033
LIR-AC-C-1B
LOCKED CLOSED
LIR-HV-OG-F
SEE HONEYWELL DWG. 932-71212PI SHT. 1 OG
AOG-902AV
OG-254AV
AOG-901AV
SEE HONEYWELL DWG 932-71212PI SHT. IMS
HV-TC-1057
HV-TC-1110
HV-TC-1111
EF-MS-IF
EF-MS-1G
PLUGGED
PUMP ROOM
INTAKE STRUCTURE
FOR CONT SEE ZONE D-2 THIS SHEET
INTAKE STRUCTURE PUMP ROOM
SCREEN WASH CONTROL PANEL
CW-PCV373
CW-PIC373
CW-PCV351
SW-857AV
SW-858AV
AS-PCV 805
TO HV-IS-1A & 1B CONT ON DWG 932-71212PI SH 1 IS ZONE C-7.
FOR CONT. SEE DWG. 2010 SHT. 1A ZONE A-7
SEE HONEYWELL DWG. 932-71212PI SHT. 2C
LIR AC-C-1A
FC-CH-1A
IA-ACC-271AV
HV-271AV
HV-270AV
HV-272AV
CW-874
BAY E
BAY D
BAY C
BAY B
BAY A
PRV53
REF. BURNS & ROE DWG. 2004 SHT. 4 FOR CONTINUATION
RF-CBX-1A
RF-CVP-1A
RF-CBX-1B
RF-CVP-1B
IR-1D SEE DWG. 1550-X102 ZONE J-1
SEE DWG. 1550-X103 SHT. 1 ZONE K-1
MC-PC-2604A
MC-DPC-2601A
MC-PC-2604B
MC-DPC-2601B
RFP A TURNING GEAR
RFP B TURNING GEAR
SEE DWG 2016 SHT. 1 ZONE B-5
SEE DWG 2016 SHT. 1 ZONE D-5
RF-CVP-FCV11AA
RF-CVP-FCV11BB
MS-198AV
MS-199AV
ES-200AV
ES-201AV
ES-202AV
INSTR. MAINT. AREA
AIR TO DETECTOR (SA-M-CO)
H.C. AT COL. J.3-16.2 BASEMENT
TO 2010 SHT. 3 ZONE H-1
FOR CONT. SEE DWG. 2010, SHT. 1A ZONE J-1
TO 2010 SHT. 5 ZONE E-5
TO 2010 SHT. 5 ZONE G-5
AIR COMPRESSOR #1C
AIR COMPRESSOR #1A
AIR COMPRESSOR #1B
LCU
AIR INTAKE
MOISTURE SEPARATOR
TROUBLE
EQUIP. DRAIN
SA-V-427
SA-V-47
SA-V-48
SEISMIC CLASS IIS/I PIPING NOT REQUIRED SEE NOTE 4
SEISMIC CLASS I PIPING REQUIRED SEE NOTE 4
FOR PREVIOUS REVISIONS, SEE SUPERSEDED CARDS.

NOTES:

1. UNLESS OTHERWISE INDICATED, ALL PRESSURE AND/OR FLOW INSTRUMENT ROOT VALVES SHALL BE ¾". ROOT VAVLES SHALL BE ¾" V2325. LINE UP TO AND INCLUDING ROOT VALVE SHALL BE FURNISHED AND INSTALLED UNDER CONTRACT E-69-4.
2. "CP" INDICATED LOCATION OF CATHODIC PROTECTION LEADS TO BE INSTALLED IN ACCORDANCE WITH PARAGRAPH 1.4.14.2, CONTRACT E-69-4.
3. ALL VALVE NUMBERS IN PARENTHESIS ( ) ARE TO BE USED IN OPERATING PROCEDURES. THESE NUMBERS ARE ASSIGNED BY NPPD AND WILL NOT BE SHOWN ON PIPING DRAWINGS. *FURNISHED WITH ASSOCIATED EQUIPMENT.
4. SA-1 AND CA-1 SYSTEMS, PIPING AND EQUIPMENT SUPPORTED AND RESTRAINED TO SEISMIC CLASS I S CRITERIA SYSTEM IS SEISMIC CLASS II S EXCEPT AS REPORTED BY FSAR AMENDMENT 13 #7.11.
5. NOT USED.
6. HEAVY LINES DENOTE MAIN FLOW PATHS DURING NORMAL OPERATION WHICH ARE 2" AND LARGER.
7. WHERE LINES ARE INTERCONNECTED AND CONTINUED ON OTHER DRAWINGS, ZONE NUMBERS ARE APPROXIMATE ONLY.
8. OILER/FILTER STATIONS MAY NOT BE SHOWN. INSTALLATION OF OILER/FILTER STATIONS HAS BEEN EVALUATED BY EE03-080.

REVISIONS TO THIS DRAWING REQUIRES A REVISION TO THE CORRESPONDING ISOKEY.

AS BUILT
454003593
STATUS: Release
STATUS DATE: 10/18/2018
DS APPROVED: RSCULLI
VER: AJ REV: B2 SIZE: F

VERSIONS/REVISIONS BY N.P.P.D.			
NO.	DESCRIPTION	DFT DATE	ENG
AJ/B2	DR-2018-0001	DLR 10/18/18	RSCULLI

SIGNIFICANT NUMBER | GROUP 1 2 3 4 5 6
DRAWN RAC DATE 9/10/96
CHECKED DATE
APPROVED SEE SUPERSEDED CARDS DATE
FILMED

COOPER NUCLEAR STATION
FLOW DIAGRAM
INSTRUMENT AIR
CONTROL & TURBINE BUILDING

BURNS & ROE

2010 SH 1

CAD FILE: C0017910

CONTINUED ON 2010 SHEET 1 ZONE E-9

SEE HONEYWELL DWG. 932-73077FL, SH.2, ZONE H-2
LIR CT-C-1A

TO SA-PCV 609 ON DWG. 2010, SH.1 ZONE F-7

PRESSURE REDUCING STATION (TYP.) SEE 2010 SH. 5 FOR DETAIL

FC-C-1A

VENT 27

DRAIN 28

REACTOR BLDG. RELIABLE AIR SUPPLY CONT. ON 2010 SH.2 ZONE C-12

RADWASTE BLDG. SUPPLY CONT. ON 2010 SH. 4 ZONE G-1

REACTOR BLDG. NON-CRITICAL SUPPLY CONT. ON 2010 SH.2 ZONE E-9

IA HEADER A & B OUTLET

TB-C110 TB-C103 TB-C109

CHAMBER 1A CHAMBER 2B

HEATER 1A-HTR-1A HEATER 1A-HTR-1B

AIR DRYER A IA-DRY-A AIR DRYER B IA-DRY-B

TO DRAIN HEADER

REC-SPV900 REC-SPV901 REC-SPV902 REC-SPV903 REC-SPV904 REC-SPV905 TEC-SPV20 TEC-SPV21 TEC-SPV22 TEC-SPV23 TEC-SPV24 TEC-SPV25

CONTINUED ON 2010 SHEET 1 ZONE J-8

NOTE:
1. * = DRYER CONTROL VALVES ARE SHOWN FOR "A" CHAMBER REGEN AND "B" CHAMBER DRYING.
2. OILER/FILTER STATIONS MAY NOT BE SHOWN. INSTALLATION OF OILER/FILTER STATIONS HAS BEEN EVALUATED BY EE 03-880.

REVISIONS TO THIS DRAWING REQUIRES A REVISION TO THE CORRESPONDING ISOKEY.

AS BUILT
454239099

STATUS: Release
STATUS DATE: 08/02/2018
DS APPROVED: LJJENSE
VER: AC REV: 15 SIZE: F

* THIS DRAWING GENERATED BY NPPD

FOR PREVIOUS REVISIONS, SEE SUPERSEDED CARDS.

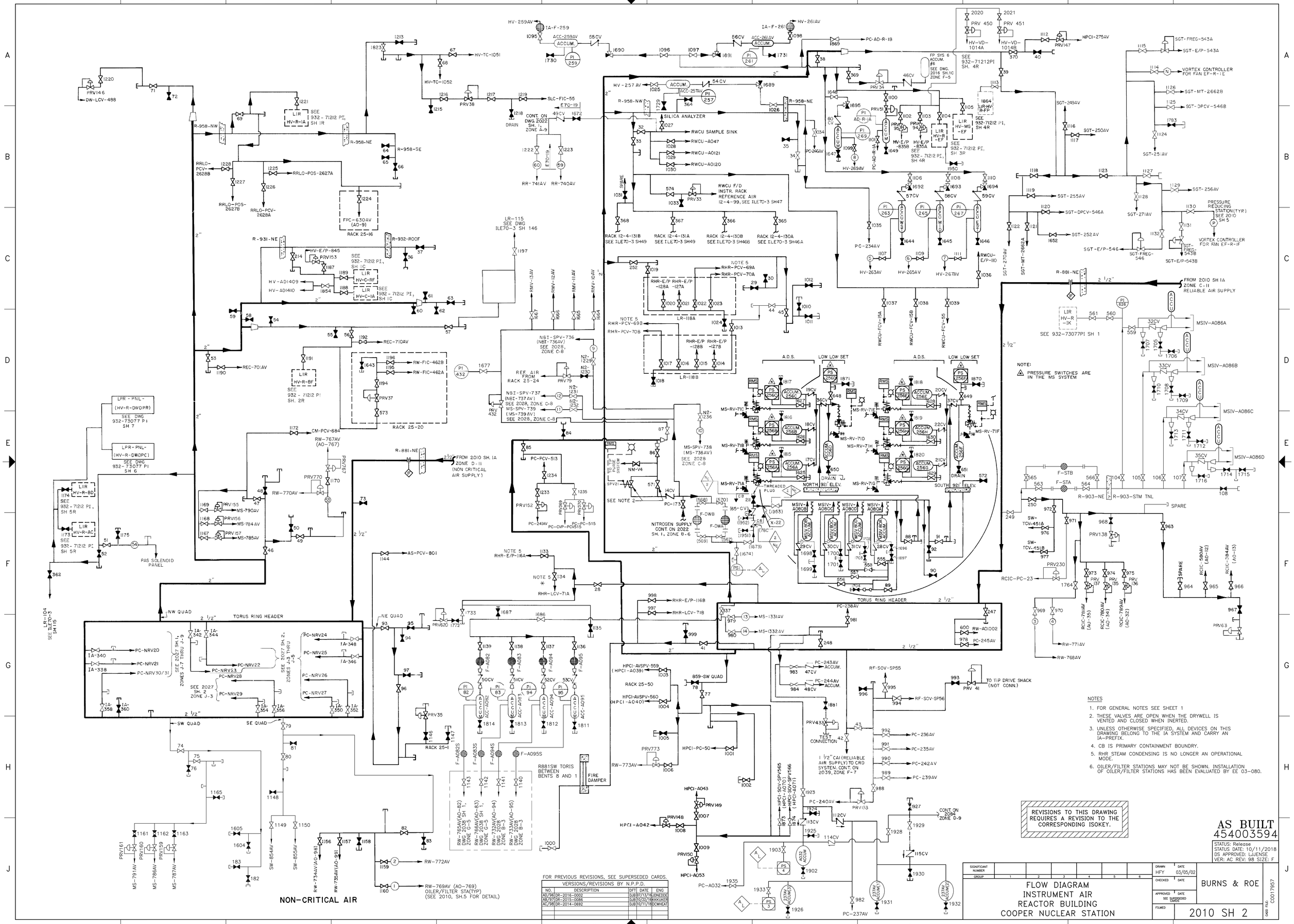
VERSIONS/REVISIONS BY N.P.P.D.			
NO. DESCRIPTION	DFT	DATE	ENG
AB/14 DR-2017-0001	DJB	12/21/17	LJJENSE
AC/15 DR-2018-0001	DJB	08/02/18	JDNEDDE

SIGNIFICANT NUMBER | GROUP 1 2 3 4 5 6

COOPER NUCLEAR STATION
FLOW DIAGRAM
INSTRUMENT AIR
CONTROL & TURBINE BUILDINGS

DRAWN JGA	DATE 1-24-92	* BURNS & ROE
CHECKED JWillis	DATE 1-31-92	
APPROVED MParr	DATE 2-3-92	
FILMED		2010 SH 1A

doc no. 0006271


HV-259AV
IA-F-259
ACC-259AV
ACCUM.
55CV
1095
1730
PI 259
1690
1096
1097
1691
PI 261
IA-F-26
HV-261AV
ACC-261AV
56CV
1098
1731
1869
PC-AD-R-1B
2020
2021
PRV 450
PRV 451
HV-VD-1014A
HV-VD-1014B
1112
PRV147
HPCI-275AV
370
40
SEE 932-71212PI SH. 4R
FP SYS 6 ACCUM. #6
SEE DWG. 2016 SH.1C ZONE F-5
1213
1823
67
HV-TC-1051
68
HV-TC-1052
1216
1215
PRV38
1217
1219
SLC-FIC-55
E70-19
1218
DRAIN
CONT. ON DWG 2022 SH. 1, ZONE A-9
49CV
1672
1222
1223
60
59
E70-19
RR-741AV
RR-740AV
HV-257 AV
ACCUM.
1025
ACC-257AV
54CV
PI 257
1689
R-958-NW
1729
364
SILICA ANALYZER
R-958-NE
1026
32
1027
RWCU SAMPLE SINK
33
1028
RWCU-A047
1029
RWCU-A0121
1030
RWCU-A0120
SPARE
1031
574
PRV33
1033
RWCU F/D INSTR. RACK REFERENCE AIR 12-4-99, SEE ILE70-3 SH47
368
367
366
365
RACK 12-4-131B SEE ILE70-3 SH49
RACK 12-4-131A SEE ILE70-3 SH49
RACK 12-4-130B SEE ILE70-3 SH46B
RACK 12-4-130A SEE ILE70-3 SH46A
1034
PC-246AV
35
1648
1695
PI AD-R-1A
1647
1099
8
HV-269AV
PRV51
1100
1101
PC-AD-R-1A
60 CV
ACCUM.
PRV93
PRV94
1102
1103
1104
1105
HV-E/P-835B
HV-E/P-835A
LIR HV-MG-EF
LIR HV-R-EF
1864 LIR-HV-R-FP
SEE 932-71212 PI, SH 4R
SEE 932-71212 PI, SH 3R
1649
1950
1106
1692
57CV
1108
1693
58CV
1110
1694
59CV
PI 263
PI 265
PI 267
1035
PC-234AV
1644
1645
1646
1107
1109
111
RWCU-E/P-110
1036
HV-263AV
HV-265AV
HV-267AV
1037
1038
1039
RWCU-FCV-15A
RWCU-FCV-15B
RWCU-FCV-55
SGT-FREG-543A
SGT-E/P-543A
1115
1114
VORTEX CONTROLLER FOR FAN EF-R-1E
1126
SGT-MT-2662B
1125
SGT-DPCV-546B
1783
1124
SGT-251AV
SGT-249AV
1116
1117
SGT-250AV
1118
1123
1127
1129
SGT-256AV
1119
SGT-255AV
1128
1120
SGT-DPCV-546A
1130
PRESSURE REDUCING STATION(TYP) SEE 2010 SH 5
SGT-271AV
1122
1121
SGT-MT-2662A
1652
SGT-252AV
1131
1132
VORTEX CONTROLLER FOR FAN EF-R-1F
SGT-E/P-546
SGT-FREG-546
SGT-FREG-543B
SGT-E/P-543B
SGT-270AV
R-931-NE
HV-E/P-845
214
PRV153
187
1189
HV-C-RF
SEE 932-71212 PI, SH 1C
LIR
HV-ADI409
HV-ADI410
1854
1188
HV-C-1A
R-932-ROOF
36
37
61
63
60
62
59
58
54
57
2"
LR-115 SEE DWG ILE70-3 SH 146
1197
RMV-13AV
RMV-12AV
RMV-11AV
RMV-10AV
1667
1666
1665
1664
55
56
1192
REC-710AV
53
1190
REC-701AV
1191
LIR HV-R-BF
SEE 932-71212 PI SH. 2R
1196
1643
1195
RW-FIC-462B
RW-FIC-462A
1194
PRV37
573
RACK 25-20
NBI-SPV-736 (NBI-736AV) SEE 2028, ZONE C-8
N2-1229
N2-1230
PI 432
1677
REF AIR FROM RACK 25-24
PRV79
NBI-SPV-737 (NBI-737AV) SEE 2028, ZONE C-8
MS-SPV-739 (MS-739AV) SEE 2028, ZONE C-8
N2-1231
N2-1232
N2-1236
84
85
PC-PCV-513
1234
1233
1235
PRV152
PRV269
PRV270
PC-241AV
PC-PC-515
PC-CVP-PCV515
NITROGEN SUPPLY CONT. ON 2022 SH. 1, ZONE B-6
1172
CM-PCV-684
RW-767AV (AO-767)
PRV767
PRV770
1170
48
RW-770AV
47
50
49
46
1169
PRV155
MS-790AV
1168
PRV156
MS-784AV
1167
PRV157
MS-785AV
R-881-NE
2 1/2"
FROM 2010 SH.1A ZONE D-11 (NON CRITICAL AIR SUPPLY)
LPR-PNL- (HV-R-DWDPR)
SEE DWG 932-73077 PI SH 7
LPR-PNL- (HV-R-DWDPC)
SEE DWG 932-73077 PI SH 6
LIR HV-R-BD
1174
SEE 932-71212 PI, SH 5R
LIR HV-R-AC
1173
SEE 932-71212 PI SH 5R
51
1175
52
PAS SOLENOID PANEL
362
LR-104 SEE ILE70-3 SH115
2"
73
2 1/2"
AS-PCV-801
1144
NOTE 5 RHR-E/P-116A
1133
NOTE 5
1134
RHR-LCV-71A
28
NW QUAD
TORUS RING HEADER
2 1/2"
NE QUAD
93
95
94
97
96
PRV620
1772
1733
1687
1686
1135
PRV35
1146
1147
RACK 25-1
SW QUAD
SE QUAD
79
81
80
74
75
76
1165
1148
1149
1150
1605
1604
183
182
SW-854AV
SW-855AV
PRV161
PRV160
PRV159
PRV158
1161
1162
1163
MS-791AV
MS-786AV
MS-787AV
1156
1157
1158
RW-734AV(AO-98)
RW-735AV(AO-98)
82
83
2
1159
RW-772AV
1
1160
RW-769AV (AO-769) OILER/FILTER STA(TYP) (SEE 2010, SH.5 FOR DETAIL)
NON-CRITICAL AIR
1139
1138
1137
1136
F-A082
F-A083
F-A084
F-A095
50CV
51CV
52CV
53CV
PI 82
PI 83
PI 84
PI 95
ACC-A082
ACC-A083
ACC-A094
ACC-A095
1814
1813
1812
1811
F-A082S
F-A083S
F-A094S
F-A095S
1143
1142
1141
1140
RW-756AV(AO-82) DWG 2038 SH 1, ZONE G-5
RW-766AV(AO-83) DWG 2038 SH 1, ZONE G-5
RW-732AV(AO-94) DWG 2028 ZONE B-3
RW-733AV(AO-95) DWG 2028 ZONE B-3
R881SW TORIS BETWEEN BENTS 8 AND 1
FIRE DAMPER
1000
NOTE 5 RHR-E/P-116B
998
997
RHR-E/P-116B
RHR-LCV-71B
999
41
2"
337
979
13
MS-1331AV
980
14
MS-1332AV
PC-238AV
981
248
247
600 RW-401002
978
PC-245AV
2 1/2"
969
970
RW-771AV
RW-768AV
RHR-E/P RHR-E/P -128A -127A
LR-118A
RHR-E/P RHR-E/P -128B -127B
LR-118B
NOTE 5 RHR-PCV-69A
RHR-PCV-70A
RHR-PCV-69B
RHR-PCV-70B
252
1019
30
29
1012
1010
1011
44
45
1024
1013
1020
1021
1022
1023
1017
1016
1015
1014
1018
HPCI-AVSPV-559 (HPCI-A039)
1003
HPCI-AVSPV-560 (HPCI-A040)
1004
RACK 25-50
859-SW QUAD
78
77
1005
HPCI-PC-50
1001
PRV773
RW-773AV
1006
1002
HPCI-A043
PRV149
1007
HPCI-A042
1008
PRV148
PRV150
1009
HPCI-A053
1000
HPCI-SOV-SPV565 (HPCI-A070)
HPCI-SOV-SPV566 (HPCI-A071)
1873
1874
1923
PC-240AV
1924
112CV
1925
114CV
1927
CONT. ON 2084 ZONE D-9
1928
1929
115CV
1930
1931
1932
1933
1934
1935
PC-A032
PC-237AV
982
1926
1902
1903
A032 ACCUM
237W (ACCUM.)
PS 3
PS 4
A
AL
A.D.S.
LOW LOW SET
PS 256C
PS 256A
PS 256B
PS 256D
ACCUM 256C
ACCUM 256A
ACCUM 256B
ACCUM 256D
RMS
1817
1871
1818
1870
1816
1819
1815
1820
19CV
20CV
18CV
21CV
17CV
22CV
627
626
625
630
629
648
649
650
MS-RV-71C
MS-RV-71E
MS-RV-71D
MS-RV-71H
MS-RV-71B
MS-RV-71A
MS-RV-71G
MS-RV-71F
THREADED PLUG
NORTH 921' ELEV. DRAIN
SOUTH 921' ELEV. DRAIN
572
65
MS-SPV-738 (MS-738AV) SEE 2028 ZONE C-8
NM-V4
SPV27
PURGE SYSTEM
86
57
14CV
PC-173
SEE NOTE 2
CB 21
(681)
(570)
(65-CV)
F-DWB
(952)
(569)
(567)
(1673)
(1674)
X-22
178C
(1953)
(1951)
PS 1
MSIV-A080B
MSIV-A080D
MSIV-A080C
MSIV-A080A
MSIV-A080B ACCUM.
MSIV-A080D ACCUM.
MSIV-A080C ACCUM.
MSIV-A080A ACCUM.
29CV
30CV
31CV
28CV
1698
1700
1702
1696
1699
1701
1703
1697
557
558
556
87
88
91
92
90
89
TORUS RING HEADER
2 1/2"
PC-243AV ACCUM.
PC-244AV ACCUM.
983
984
47CV
48CV
RF-SOV-SP55
RF-SOV-SP56
996
995
994
993
PRV 41
TO TIP DRIVE SHACK (NOT CONN.)
1881
PRV43
TEST CONNECTION
43
42
1" CAI (RELIABLE AIR SUPPLY) TO CRD SYSTEM, CONT. ON 2039, ZONE F-7
992
991
990
989
988
PC-236AV
PC-235AV
PC-242AV
PC-239AV
PRV153
2 1/2"
FROM 2010 SH 1A ZONE C-11 RELIABLE AIR SUPPLY
LIR HV-R-1K
SEE 932-73077PI SH 1
561
560
559
PI 226
32CV
1707
1705
1706
MSIV-A086A
33CV
1710
1708
1709
MSIV-A086B
34CV
1713
1711
1712
MSIV-A086C
35CV
1716
1714
1715
MSIV-A086D
F-STB
F-STA
565
563
564
104
105
106
107
108
R-903-NE
R-903-STM TNL
SPARE
250
249
972
971
968
963
SW-TCV-451A
976
SW-TCV-451B
977
PRV138
PRV230
RCIC-PC-23
1764
973
974
975
PRV 137
PRV 135
PRV 136
969
970
3
4
RW-771AV
RW-768AV
RCIC-781AV (AU-35)
RCIC-780AV (401-34)
RCIC-789AV (AO-32)
SPARE
964
965
966
967
PRV63
RCIC-590AV (AO-12)
RCIC-384AV (AO-13)
NOTES
1. FOR GENERAL NOTES SEE SHEET 1
2. THESE VALVES ARE OPEN WHEN THE DRYWELL IS VENTED AND CLOSED WHEN INERTED.
3. UNLESS OTHERWISE SPECIFIED, ALL DEVICES ON THIS DRAWING BELONG TO THE IA SYSTEM AND CARRY AN IA- PREFIX.
4. CB IS PRIMARY CONTAINMENT BOUNDRY.
5. RHR STEAM CONDENSING IS NO LONGER AN OPERATIONAL MODE.
6. OILER/FILTER STATIONS MAY NOT BE SHOWN. INSTALLATION OF OILER/FILTER STATIONS HAS BEEN EVALUATED BY EE 03-080.
NOTE:
PRESSURE SWITCHES ARE IN THE MS SYSTEM
REVISIONS TO THIS DRAWING REQUIRES A REVISION TO THE CORRESPONDING ISOKEY.
FOR PREVIOUS REVISIONS, SEE SUPERSEDED CARDS.
VERSIONS/REVISIONS BY N.P.P.D.
NO. | DESCRIPTION | DFT | DATE | ENG
AD/98 | DR-2016-0002 | DJB | 07/13/16 | JDNEDDE
AB/97 | DR-2015-0086 | DJB | 10/22/15 | KKKUCKER
AC/98 | DR-2014-0692 | DJB | 10/11/18 | DDWHEAT
AS BUILT 454003594
STATUS: Release
STATUS DATE: 10/11/2018
DS APPROVED: LJJENSE
VER: AC REV: 98 SIZE: F
SIGNIFICANT NUMBER
GROUP
FLOW DIAGRAM
INSTRUMENT AIR
REACTOR BUILDING
COOPER NUCLEAR STATION
DRAWN HPY 03/05/02
CHECKED
APPROVED
SEE SUPERSEDED CARDS
FILMED
BURNS & ROE
2010 SH 2
CARD FILE C0017957

RADWASTE BUILDING

REACTOR BUILDING

PRIMARY CONTAINMENT

TURBINE BUILDING

SERVICE AIR
AUGMENTED RADWASTE BLDG.

MACHINE SHOP

TYPICAL SERVICE AIR HOSE STATION

MACHINE SHOP HOSE STATIONS
MACHINE SHOP COMPONENTS ARE CONSIDERED BEYOND THE SCOPE OF THE DRAWING.

NOTES:
1. BOLD LINES DENOTE TRUNK–LINES 2" AND LARGER
2. CB IS PRIMARY CONTAINMENT BOUNDRY
3. WHERE LINES INTERCONNECT AND ARE CONTINUED ON OTHER DRAWINGS, ZONE NUMBERS ARE APPROXIMATE ONLY.

REVISIONS TO THIS DRAWING REQUIRES A REVISION TO THE CORRESPONDING ISOKEY.

FOR PREVIOUS REVISIONS, SEE SUPERSEDED CARDS.

VERSIONS/REVISIONS BY N.P.P.D.

NO.	DESCRIPTION	DFT	DATE	ENG
AB/48	DR-2018-0001	DJB	03/06/18	RDCHAMP

AS BUILT
454003595
STATUS: Release
STATUS DATE: 03/06/2018
DS APPROVED: RDCHAMP
VER: AB REV: 48 SIZE: F

SIGNIFICANT NUMBER | GROUP | 1 | 2 | 3 | 4 | 5 | 6

DRAWN HFY DATE 04/08/02
CHECKED DATE
APPROVED DATE
SEE SUPERSEDED CARDS
FILMED

FLOW DIAGRAM
SERVICE AIR

COOPER NUCLEAR STATION

BURNS & ROE

2010 SH 3

CARD FILE: C0017958

HV-AD-1100B

CONT. ON DWG. 932-71212 PI SH 1 OF

LIR AC-OF-1A

1536 1535 1537 1538

LIR HV-CH-1A

CONT. ON DWG. 932-71212 PI SH 1 CH

1" 1534 PRV-453 1"x1/4"RED RM B308

160 165 161

MC-SPV-B2 (MC-B2) MC-B2 CF-DPT-2000 1510 1511 1512

1" 150 241 OFFICE BLDG. TEMP. CONTROL SUPPLY

MC-B3 MC-SPV-B3 (MC-B3) 1514 1515 167 1513 CF-SPV-943AV (CF-943AV) MC-SPV-B6 (MC-B6)

1516 MC-SPV-B1 (MC-B1) 1517 MC-B1 ACCUM.

1559 1" 1"x1/4"RED 1560 CM-1869AV 1541 1"x1/4"RED NON-RAD LAB 1561 LR-136 SEE DWG. ILE 70-3 SH.172E

1" 164 1539 1540 I & C HOT SHOP I & C HOT SHOP

LIR HV-RW-EF-1A & 1B 1545

LIR HV-RW-EF-1C & 1D 1544

163 162

CONT. ON DWG. 932-71212 PI SH 2 RW

239 240

CONT. ON DWG. 932-71212 PI SH 1 RW

LIR HV-RW-1A 1577 156

LIR OFFICE 1578 157 158 159 1768 50 RMV-RM-30A & 30B

CONT. ON DWG. 932-71212 PI SH 20F

CONT. ON DWG. 932-71212 PI SH 5 RW CONTRACT E70-19

1-1/4" 155 1-1/4"x 1/4"RED 1575 DWG. 2024 SH. 5 1576

PI 619 390 389 224 1579

MIXING STATION HOSE REEL

226 EXHAUST RW-SSV-5046 227 PI 2358 391

MIXING STATION CLAMP

EXHAUST RW-SSV-5047

MIXING STATION ARM

153 419 535 431 LIR HV-AR-1A

CONT. ON DWG. 932-75020 PI, SH 1AR

434 H_2 ANALYZER CONT. ON DELPHI DWG. 6000272

417 418 3/4" 432 433 PI 615 AOG CONTROL RM. TEMP. CONTROL & HUMIDITY CONTROL

CONT'D ON DWG. 932-75020 PI SH. 3AR ZONE B-2

409

CM-FC-FCV13 CM-FC-FCV14 CM-FC-FCV15 1769

RADIOCHEM LAB

PRV188 462 RW-A0977 416 461 LIR HV-AR-EF

CONT. ON DWG. 932-75020 PI, SH 2 AR

415 414 49 449

CHARCOAL BED SOLENOID RACK 2 SEE DWG. 6000355

1592 CM-A0794 CM-PCV-1932 442 RW-A0790 448 RW-PCV-978 447

RW-A0726 48 1590 413 412 RW-A01004 1650 RW-A01005 1651

410 2" 47 RW-A0883 446 435 RW-A0763 437 436 RW-A0779 RW-A0808

1591 1872 ARW CONTROL RM.TEMP CONT. & HUMIDITY CONT CONT'D ON DWG. 932-75020 PI SH. 4R ZONE B-2

411 441 C 439 RW-FIC-826 440 CM-PCV-2471 RW-TS-2470

FUME HOOD CONTROL SAMPLE RACK 1G CONT'D ON DWG. 932-75020 PI SH. 5AR ZONE F-3

PRV195 444 46 RW-A0793 RW-FCV-792 445 443 RW-FCV-816 PRV189

ARW TRUCK BAY UNIT HEATER SEE DWG 932-75020 PI SH. 5AR ZONE B-3

406 407 514 45 RW-A0828 CM-PCV-1452 1588 1589 RW-A0923 AS-TCV-597 513

509 44 RW-A0819 507 RW-A01006 508 RW-A0600 511 RW-A0920 430 RW-LT-540 BUBBLER 510 RW-LT-599 BUBBLER 512 RW-A0919

408

CF-SID 312 CF-AID CF-EID CF-AIE 1311 1313 1314 CF-AIF CF-SIF 321 1322 CF-EIF 1323 CF-SIE 1356 1355 149

RW-A0171 1315 RW-A0213 RW-A0602 1316 1317 1318 PRV182 RW-FCV-200 1319 RW-A0201 1320 RW-A0211 RW-A0119 1328 RW-A0113 329 RW-A0124 1330 331 RW-A0118 RW-A0216 1324 1325 RW-A0210

RW-A0121 1776 RW-A0129 1775 RW-A0125 1774 332 RW-A0114 RW-A0206 1326 1327 RW-A0205 1333 FPC-A0188

FPC-A0-FCV-15B (FPC-FCV-15B) 1773

228 148 147 CONN

RW-416AV (AO-332) 1334 RW-415AV (AO-330) 1335 RW-419AV (AO-338) 1336 146 RW-A0209 RW-A0122 1338 1339 1337 FPC-A012B 1340 FPC-A012A

CF-SIA CF-AIA CF-SIB CF-EIC CF-AIC 1341 1343 1345 1347 1349 1342 1344 1346 1348 1350 CF-EIA CF-EIB CF-AIB CF-SIC RW-812AV (AO-159)

FPC-FCV-15A 1351 1352 1353 1354 PRV181 RW-FCV-112 RW-A0126 FPC-A018A

2" 375 SLUDGE/ SPENT RESIN TK RACK 25-65 DWG. 1176327 SH.2 376 COND PHASE SEP RACK 25-31 DWG. 1176331 SH.2

LR-114 SEE DWG ILE 70-3 SH. 144

LR-125A SEE DWG. ILE 70-3 SH. 48 & DWG. FD302201

LR-125B SEE DWG. ILE 70-3 SH. 48 & DWG. FD302201

386 387 1608 1606 PRV40 PRV39 1609 1607 371 372 FQ 2003G FIC-2003G 1610 PI 621 CF-FQ-2003F 1611 CF-FIC-2003F 1612 CF-FQ-2003E 1613 CF-FIC-2003E 1614 CF-FQ-2003D 1615 CF-FIC-2003D 1616 CF-FQ-2003C 1617 CF-FIC-2003C 1618 CF-FQ-2003B 1619 CF-FIC-2003B 1620 CF-FQ-2003A 1621 CF-FIC-2003A 1622 1623 1675 CF-PIC-2008 1676 CF-DPC-2000 1624

CONDENSATE F/D CONTROL PANEL

1969 PRV434 1971 1746 1521 1522 152

FPC RACK 19-4-71 SEE DWG. ILE70-3 SH. 30 1520

RW-A0155 1525 RW-FIC-398 1526 CM-PIC-60 1527 CF-Z 1529 CF-Y 1528 CF-X 1530 RW-FIC-489 1532 RW-A0959 1533

RW-A0165 1624 1765 CF-A0944 RW-A0958 1531

PRESSURE REDUCING STATION (TYP) SEE 2010 SH. 5 FOR DET. 1519 D HV-E/P-1112

242 243 2" 388

RW-A0959 1533

1" 1534 PRV-453 RM B308

238 1451 A 539 HV-E/P-1130 PC-247AV PC-248AV AS-TCV-1130A HV-TCV-1130B

236 452 1467 237 235 LR-135 SEE DWG. ILE 70-3 SH.171B LR-110 SEE DWG. ILE 70-3 SH.134 LR-113 SEE DWG. ILE 70-3 SH.142

229 380 379 381 LR-106A SEE DWG. ILE 70-3 SH. 119 LR-106B & C SEE DWG. ILE 70-3 SH.119 382 LR-106D SEE DWG. ILE 70-3 SH.119 232 1402 CF-DPT-2001C 1400 CF-DPT-2001B 401 CF-FT-2003C 1399 CF-FT-2003B 233 1421 CF-FT-2005E 1420 CF-DPT-2001E 1419 CF-DPT-2001F 1418 CF-FT-2005F 453 LR-135 SEE DWG. ILE 70-3 SH.171B 1468 LR-110 SEE DWG. ILE 70-3 SH.134 385 LR-113 SEE DWG. ILE 70-3 SH.142

383 LR-106 E & F SEE DWG. ILE-70-3 SH. 119 1425 1424 1423 CF-N CF-NS CF-SPV-NS (CF-NS) 1422 CF-SPV-N (CF-N)

2" 1975 CF-AIG 1974 CF-SIG 1973 CF-EIG 1972

RW-FCV-200 PRV182 1318 RW-A0213 RW-A0602 1319 RW-A0201 1320 RW-A0211 RW-A0119 1328 RW-A0113 329 RW-A0124 1330 331 RW-A0118 RW-A0216 1324 1325 RW-A0210 RW-A0171 1315 1316 317

RW-A0121 1776 RW-A0129 1775 RW-A0125 1774 332 RW-A0114 CF-EIF 1322 1323 CF-SIF CF-AIF 321 1356 CF-EIE 1355 RW-A0206 1326 1327 RW-A0205 1333 FPC-A0188

149 2" 228 148 147 CONN

RW-416AV (AO-332) 1334 RW-415AV (AO-330) 1335 RW-419AV (AO-338) 1336 146 RW-A0209 RW-A0122 1338 1339 1337 FPC-A012B 1340 FPC-A012A

CF-SIA CF-AIA CF-SIB CF-EIC CF-AIC 1341 1343 1345 1347 1349 1342 1344 1346 1348 1350 CF-EIA CF-EIB CF-AIB CF-SIC RW-812AV (AO-159)

FPC-FCV-15A 1351 1352 1353 1354 PRV181 RW-FCV-112 RW-A0126 FPC-A018A

RW-671AV (AO-280) 28 1238 1237 RW-1534 AV (AO-563) RW-E/P-317 1239 1240 R 1241 PRV198 RW-414 AV (AO-315) 1242 RW-482 AV (AO-279) RW-FCV-317 1243 RW-490AV (AO-237)

RW-655AV (AO-254) 27 1759 1763 RW-A01003 1762 RW-481AV (AO-304)

RW-474AV (AO-242A) 1749 RW-475AV (AO-292A) 1760 RW-483AV (AO-248A) 1755 RW-479AV (AO-242B) 1750 RW-478AV (AO-292B) 1761 RW-480AV (AO-248B) 1756

RW-487AV (AO-245A) 1751 RW-484AV (AO-251) 1758 RW-486AV (AO-245B) 1752 RW-484AV (AO-250) 1757 RW-488AV (AO-246A) 1753 RW-489AV (AO-246B) 1754

RW-400AV (AO-104) 1269 RW-401AV (AO-105) 1270 141 2 1/2" 377 DRAIN

RW-446 AV (AO-184B) 1277 RW-445AV (AO-184A) 1278 RW-444AV (AO-183B) 1280 279 RW-447AV (AO-189) 1309 RW-443AV (AO-183A) 1298 RW-449AV (AO-218) 297 RW-448AV (AO-225) 1310 RW-462 AV (AO-230) RW-FCV 232 PRV180 RW-FCV-287 1299 1300 1308 PRV179 145 144 1307 SA-PC-616

RW-452 AV (AO-231) 1281 RW-841AV(AO-841) 1282 RW-842AV(AO-842) 1283 RW-840AV(AO-840) 1284

RW-450AV (AO-676) 296 RW-408AV (AO-142B) 1292 RW-406AV (AO-141B) 1293 RW-404AV (AO-139B) 1294 RW-451AV(AO-227) 1295 CM-PC-1218 1293 RW-FIC-704 1294 CM-422AV 34 1306 1302 1305 2 1/2" CM-PC-683 35 1303 CF-FT-2004 1304 CM-424AV

RW-405AV (AO-141A) 36 1289 RW-407 AV (AO-142A) 1288 1781 CM-FCV-13 1778 CM-FCV-14 1779 CM-FCV-15 1780 CM-421AV 1301 142 1287 CM-423AV 143

RW-877 COLL. TK. RM. ARW-877-PIPE GALLERY

2" 395 403 404

RW-LC-2414 396 1581 AS-PCV-2400 RW-PCV-402 UNFIRED STEAM GEN. PANEL RW-E/P-2404 PI 622 420 PRV617 423 422 424 CONN.

RW-A0644 502 RW-SPV-2407 (RW-LCV-2407) RW-A0655 506 RW-A0649 504 503 RW-A0645 402 RW-A0653 505 AOG-PCV-1675 501 400

RECOMBINER SOL. RACK 1B (LR 162) SEE DWG. 6001848 SH.1 397 398 1580 2 FOR CONT. SEE DWG. 2010 SH. 3 ZONE D-7 RECOMBINER SOL. RACK 1A (LR 163) SEE DWG. 6000358 SH.1

OILER/FILTER STATION (TYP) SEE 2010 SH. 5 FOR DETAILS

RW-409AV (AO-860) 1825 41 1663 42 RW-410AV (AO-342) 1824 RW-420AV (AO-135) 1822 43 RW-403AV (AO-139A) 399 AOG-FCV-2019B1 478 477 AOG-FCV-2019B2 474 480 AOG-TCV-2010B CF-TCV-2038B MS-959AV 463 PRV193 1742 490 491 AOG-FCV-2019A1 AOG-FCV-2019A2 985 AOG-LCV-2015B PRV194 401 473 CF-TCV-2038A 500 AOG-FCV-2001 PRV192 496 1586 495 AOG-LCV-2015A AOG-TCV-2010A

RW-441AV (AO-150) 39 1285 RW-412AV (AO-152) 40 1286

RW-841AV(AO-841) 1282 RW-842AV(AO-842) 1283 RW-840AV(AO-840) 1284

RW-1509AV (AO-412) RW-976AV (AO-764) 393 DRAIN 394 RW-1339 AV (AO-1779) PRV187 RW-1512AV (AO-500) 1276 CONN 1275 37 1273 RW-402AV (AO-111) 38 PRV186 RW-1330AV (AO-1774) 1737 1272 1271

FROM DWG. 2010 SH. 1A ZONE C-11 IF 1743 157 39 138 RW-LT-369 RW-LT-473 RW-LT-437 RW-LT-388B RW-LT-395 RW-LT-420 RW-LT-388A 264 1245 1246 247 248 249 1250 1250A 373 (BUBBLER RACK) 140 1251 1252 29 CM-642AV 30 CM-643AV

NOTES

1. FOR NOTES SEE THIS DRAWING, SHEET 1.
2. △'S WHERE SHOWN WITH NUMBERS REPRESENT POINTS OF CONNECTION TO EXISTING SYSTEMS, E73-58 SPECIFICATION DEFINES WORK FROM THIS POINT.
3. HEAVY LINES DENOTE TRUNK-LINES 2" & LARGER.
4. OILER/FILTER STATIONS MAY NOT BE SHOWN. INSTALLATION OF OILER/FILTER STATIONS HAS BEEN EVALUATED BY EE03-080.

454003666

AS BUILT

STATUS: Release
STATUS DATE: 08/05/2015
DS APPROVED: GEHORN
VER: AB REV: 28 SIZE: F

REVISIONS TO THIS DRAWING REQUIRES A REVISION TO THE CORRESPONDING ISOKEY.

FOR PREVIOUS REVISIONS, SEE SUPERSEDED CARDS.

VERSIONS/REVISIONS BY N.P.P.D.

NO.	DESCRIPTION	DFT	DATE	ENG
AB/28	DR-2013-0599 (DCN 13-2089)	DJB	08/05/15	GEHORN

SIGNIFICANT NUMBER | GROUP 1 2 3 4 5 6

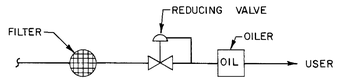
DRAWN HFY DATE 03/08/02
CHECKED DATE
APPROVED DATE SEE SUPERSEDED CARDS
FILMED

FLOW DIAGRAM
INSTRUMENT AIR
RADWASTE & AUGMENTED RADWASTE
COOPER NUCLEAR STATION

BURNS & ROE

2010 SH 4

CARD FILE: C0017959

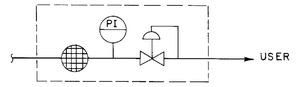


TYPICAL OILER / FILTER STATION

STATION #	FILTER	PRV	OILER	2010 SHT.	NOTES
1	F-769AV	PRV769	N/A	2	
2	N/A	PRV772	N/A		
3	F-768AV	PRV768	N/A		
4	N/A	PRV771	N/A		
5	F-263	N/A	LUB-263AV		
6	F-265		LUB-265AV		
7	F-267		LUB-267AV		
8	F-269	N/A	LUB-269AV		
9	F-736AV	PRV84	N/A		
10	F-738AV	PRV85			
11	F-739	PRV62			
12	F-737	PRV61	N/A		
13		PRV151			
14	F-1332AV	PRV165	LUB-1332AV	2	
15	F-10	PRV2690	LUB-11	3	A
16	F-11	PRV2691	LUB-12		
17	F-7	N/A	LUB-6		
18	F-8		LUB-7		
19	F-6		LUB-9		
20	F-5		LUB-8		
21	F-4		LUB-3		
22	F-3		LUB-2		
23	F-2	N/A	LUB-1	3	A
24	DELETED				
25	F-45	PRV131	N/A	1	
26	F-LMC	N/A	LUB-LMC	4	
27	F-655AV		LUB-655AV	1	
28	F-671AV		LUB-671AV		
29	F-642AV		LUB-642AV		
30	F-643AV		LUB-643AV		
31	F-408AV		LUB-408AV		
32	F-406AV		LUB-406AV		
33	F-404AV		LUB-404AV		
34	F-422AV		LUB-422AV		
35	F-424AV		LUB-424AV		
36	F-405AV		LUB-405AV		
37	F-402AV		LUB-402AV		
38	F-1330AV		LUB-1330AV		
39	F-411AV		LUB-411AV		
40	F-412AV		LUB-412AV		
41	F-409AV		LUB-409AV		
42	F-410AV		LUB-410AV		
43	F-403AV	N/A	LUB-403AV		
44	F-978AV	PRV81	LUB-A0819		
45	F-966AV	PRV83	LUB-A0828		
46	F-980AV	PRV82	LUB-A0793		
47	F-740	PRV619	N/A		
48	F-984AV	PRV80	LUB-A0726		
49	N/A	N/A	LUB-SR2		
50	F-30AB	PRV618	N/A	1	
51	F-56	N/A	N/A	3	A
52	F-9	N/A	N/A	3	A
53	F-767/770AV	N/A	N/A	2	
54	F-PAS	PRV36	N/A	2	
56	F-NHR	PRVNHR	N/A	1	
57	F-31	PRV113	N/A	1	
58	F-9	PRV2689	N/A	3	A
59	F-740AV	PRV740	N/A	2	C,D
60	F-741AV	PRV741	N/A	2	C,D
61	F-68	FREG 19	LUB-55	3	A
62	F-69	FREG 20	LUB-56	3	A

THIS TABLE DOES NOT INCLUDE ALL OILER/FILTER STATIONS. INSTALLATION OF OILER/FILTER STATIONS HAS BEEN EVALUATED BY EE 03-080.

REVISION 1 TO ENGINEER EVALUATION EE 03-080 AUTHORIZES SECURING, DRAINING AND MAINTAINING EMPTY ALL CNS AOV OILERS.



PRESSURE REDUCING STATION

STATION #	CIC NUMBER	2010 SHT.
A	HV-PC-(AC-RW-1B)	4
C	HV-PC-(EF-AR-1C)	4
D	HV-PC-ARW	4
E	HV-PC-(FC-C-1A)	1A
F	HV-PC-(FC-CH-1A)	1
G	HV-PC-(AC-CCL-1A)	
H	HV-PC-(EF-MS-1F)	
I	HV-PC-(EF-MS-1G)	
K	HV-PC-(AC-T-1A)	
L	HV-PC-(EF-T-1E)	
M	HV-PC-(RF-T-1A/1B)	1
N	HV-PC-(EF-R-1E)	2
P	HV-PC-(EF-R-1F)	2
R	1A-PC-317	4

NOTES

A. DEVICES ASSOCIATED WITH THIS STATION BELONG TO THE SA SYSTEM.

B. REF. DWG. INGERSOL RAND 10750K✱ F-28389-D.

C. LOCATIONS OF FILTER & REDUCING VALVE ARE REVERSED.

D. E70-19 BOUNDARY IS AT THE REDUCING VALVE'S OUTLET.

AS BUILT

454237341

STATUS: Release
STATUS DATE: 01/31/2018
DS APPROVED: JAFORBE
VER: AD REV: 25 SIZE: F

REVISIONS

NO.	DESCRIPTION	DFT	DATE	ENG
AB/23	DR 2013-0591, 454237341	DLR	10/22/13	JECASS
AC/24	DR 2015-0002	DLR	12/4/15	LJUENSE
AD/25	DR-2017-0462	DLR	1/31/18	JAFORBE

FOR PREVIOUS REVISIONS, SEE SUPERSEDED CARDS.

SIGNIFICANT NUMBER | GROUP | 1 | 2 | 3 | 4 | 5 | 6

COOPER NUCLEAR STATION
FLOW DIAGRAM
INSTRUMENT & SERVICE AIR
MISCELLANEOUS DETAILS

DRAWN HFY 03/08/02
CHECKED
APPROVED SEE SUPERSEDED CARDS
FILMED

BURNS & ROE

2010 SH 5

DWG NO. C0017960

(FROM DWG 2010 SH 1 ZONE A-4) 65 PSI

ASB-IP-100C
IA-633
ASB-IP-101C
IA-639
ASB-PNL-1C

DETAIL A

(FROM DWG 2010 SH 1 ZONE A-2) 65 PSI

ASB-IP-100D
IA-635
ASB-IP-101D
IA-640
ASB-PNL-1D

DETAIL B

GENERAL NOTES

1. PIPING FOR DEAERATOR, DEAERATOR PUMPS, MAIN CONDENSATE PUMPS, BLOWDOWN TANK, AND STEAM HEADER EXISTS PER B&R DRAWING 2012 SHT2.
2. FOR ADDITIONAL SYMBOLS SEE DRAWING 2001.
3. FOR STEAM & CONDENSATE PIPING TO AND FROM H&V EQUIPMENT, SEE H&V FLOW DIAGRAM.
4. ALL VALVE NUMBERS ARE NUMBERS TO BE USED IN OPERATING PROCEDURES. THESE NUMBERS ARE ASSIGNED BY NPPD AND WILL NOT BE SHOWN ON PIPING DRAWINGS.
5. LINES DESIGNATED AS CH-3 AND CH-4 ON THIS FLOW DIAGRAM SHALL CONFORM TO THE CONTRACT E-69-4 MATERIAL SPECIFICATION REQUIREMENTS FOR CH-3 AND CH-4 CLASS IV P PIPING. HOWEVER, OPERATING CONDITIONS ARE DIFFERENT FROM THOSE LISTED IN THE CONTRACT E-69-4 SPECIFICATIONS. PIPING FOR THESE SERVICES FABRICATED TO CH-3 AND CH-4 MATERIAL SPECIFICATIONS WILL MEET CODE REQUIREMENTS FOR THE OPERATING CONDITIONS ENCOUNTERED. FOR THE TERMAL (I.E. EXPANSION, HANGER AND INSULATION) REQUIREMENTS, OPERATING TEMPERATURES SHALL BE TAKEN AS FOLLOWS: BOILER FEEDWATER AND CONDENSATE PUMPS DISCHARGES – 200°F. BOILER BLOWDOWN AND AS-2 SYSTEM TRAPS DISCHARGES-330°F. AS-3 AND AS-4 SYSTEM TRAP DISCHARGES-280°F.
6. PIPING & TUBING TO BOILERS, CONTROL CABINETS, NITROGEN HEADER & CHEMICAL FEED SYSTEM INSTALLED TO CONNECTIONS SHOWN ON DRAWINGS: HB40507, HB30497, SK2220-4, SK2252 & SK285-3 SUPPLIED BY HYDRO STEAM UNDER CONTRACT 81-7.

(FROM 2010 SHT 1, ZONE A-4) 65 PSI
ASB-PNL-1C (SEE DETAIL A)
CONTROL CABINET FOR BOILER 1C (SEE DWG HB30497) (SEE DWG CNS-ASB-1)
FROM DEMIN WATER SEE SHT 2 THIS DWG ZONE F-1
DW-458
CHEMICAL ADDITION TANK #3
AC-12RV
AC-13RV
AC-95
ACD-365
TO DRAIN
AC-75
AC-76
PMP 1C
PMP 1D
AC-P-CFC
AC-P-CFD
AC-77
AC-18CV
½"CF-1
6"AS-2
AS-633
AS-639
1"VENT
AC-19CV
AC-85
AC-78
ACD-363
ACD-HB-BR-1C
VENT THRU ROOF
AS-26RV
AS-25RV
ELECTRIC BOILER 1C
ASB-PS-F22C
ASB-PS-F23C
ASB-PS-F25C
ASB-PT-101C
AS-685
AS-652
AS-653
AS-650
AS-684
AS-686
TEST CONNECTION ¼ NPT
AS-651
ASB-LT-100C
AS-669
AS-659
AS-645
AS-668
AS-663
AS-641
ACD-370
1"x½" N2-54
AS-643
TO DRAIN
NORMAL WATER LEVEL
ACB-POS-100C
SEE DWG 2010 SH 1, ZONE A-4
AC-FCV-2306
AC-72
AC-71
AS-660
AS-646
BLOWDOWN (TYP)
ACD-371
ACD-358
ACD-354
ACD-356
ACD-360
ASB-LS-100C
AC-20CV
AC-69
AC-67
AC-FCV-2304
AC-65
AC-90
AC-81
½"CH-4
¾" CH-4
½"N-1
½"x1 ½"
2½"CH-3
2½"x1½"
AC-64
MECH SEAL FLUSH
AC-P-CC
ACD-348
ACD-350
ACD-352
ACD-105SV
SOL
1½"CH-4
ACD-71CV
¾" CH-4
½"x½"
¾"x1 ½"
½"CH-3
AC-83
1"x2"
AC-86
6"AS-2
1" CH-4
1½"CH-4
1½" CH-3
4"CH-4
½"CF-1
3"CH-4
6"CH-4
MAIN CONDENSATE PUMP SET
AC-92
AC-15
AC-30
AC-P-FWA & AC-P-FWB
DEAERATOR UNIT PUMPS
ONE OPERATING-ONE STANBY
AC-31
AC-14
TO DRAIN
N2-58
N2-57
ATM
N2-62
N2-56
N2-59
N2-60
N2-61
N2-63
N2-64
N2-65
DEAERATOR
SEE 2012 SHEET 2 ZONE F-9
AC-29
AC-28
AC-47
AC-16
AC-94
AC-22CV
1"x½"
AC-2315A
AC-2315B
AC-11
AC-48
AC-12CV
AC-13
AC-13CV
AC-49
AC-10
AC-12
4"CH-4
1A
1B
FROM DEMIN WATER SEE SHT 2 THIS DWG ZONE F-2
DW-461
AC-14RV
CHEMICAL ADDITION TANK #4
IA-1632
ACD-376
DRAIN
AC-93
PUMP 1-E
AC-P-CFE
(FROM 2010 SH 1, ZONE A-2) 65 PSI
ASB-PNL-1D (SEE DETAIL B)
CONTROL CABINET FOR BOILER 1D (SEE DWG HB30497) (SEE DWG CNS-ASB-1)
SEE 2007 ZONE F-6
SEE 2007 ZONE F-7
2" TCC SUPPLY
2" TCC RETURN
2"x1"
1"x½"
TEC-507
TEC-506
1" TCC SUPPLY
1" TCC RETURN
½" TCC RETURN
½" TCC SUPPLY
SEAL FLUSH COOLER
SAMPLE COOLER
TEC-604
TEC-601
TEC-502
TEC-499
TEC-503
TEC-498
TEC-605
TEC-600
AC-79
SAMPLE TAP
ACD-367
ACD-374
ASB-PT-101D
VENTS THRU ROOF
AS-28RV
AS-27RV
ELECTRIC BOILER 1D
ASB-PS-F23D
AS-687
AS-654
AS-686
AS-658
AS-656
AS-657
AS-655
ASB-PS-F22D
ASB-PI-F25D
ASB-POS-100D
SEE DWG 2010 SH 1, ZONE A-2
AC-FCV-2307
ASB-PI-F24D
ASB-PS-F24D
AC-74
AC-73
AC-89
AC-P-CD
MECH SEAL FL
TEC-606
TEC-504
TEC-505
TEC-607
AC-80
TEC-603
TEC-501
TEC-500
TEC-602
SAMPLE COOLER
ACD-368
ACD-369 SAMPLE TAP
ACD-375
ACD-387
ACD-386
FI 1D
FI 1C
AS-636
AS-634
AS-PCV-811
AS-640
AS-638
ACD-364
ACD-HB-BR-1D
AS-642
AS-671
AS-661
AS-647
AS-664
ASB-LT-100D
ACD-372
N2-55
AS-644
ACD-373
ACD-359
ACD-361
ACD-355
ACD-357
AC-68
AC-66
AC-70
AC-21CV
AC-91
AC-82
AC-FCV-2305
AS-662
AS-648
ACD-349
ACD-351
ACD-72CV
ACD-115SV
AC-84
AC-87
½"CF-1 SEE SHT 2 THIS DWG ZONE G3
¼"
⅜"
ACD-362
2"CH-4 COND. RETURN
SEE 2012 SHT 2 ZONE E-11
1½"CH-4
ACD-57CV
ACD-99
BLOWDOWN TANK
SEE 2012 SHT2 ZONE H-7
½"V153X N2-66
1"CH-4 SYPHON BREAKER
NITROGEN HEADER
3"CH-3
2"
1¼" OVERFLOW
1¼"CH-3 VENT
BLOWDOWN TANK PIT
BOILER BLOWDOWN TRANSFER UNIT TANK 14 GAL
HH
LRP-PNL-BBT
LS BTT
SW BTS
TO LRP-PNL-BBT
FROM LRP-PNL-BBT
¾" CH-3
ACD-P-BTP1A
ACD-P-BTP1B
ACD-73CV
ACD-74CV
ACD-384
ACD-385
VENT
ACD-388
¾"
MAIN WATER TREATMENT SUMP
TO SLUDGE POND
AS-632
10" AS-2 HEADER
SEE 2012 SHT2 ZONE F-5
ISO: SWEC 15798.25-DP-1C

AS BUILT
454204639
STATUS: Release
STATUS DATE: 09/29/2015
DS APPROVED: AJF1SK
VER: AB REV: 23 SIZE: F

FOR PREVIOUS REVISIONS, SEE SUPERSEDED CARDS.

VERSIONS/REVISIONS BY N.P.P.D.

NO.	DESCRIPTION	DFT	DATE	ENG
AB/23	DR-2015-0267	DJB	09/29/15	JAFORBE

SIGNIFICANT NUMBER | GROUP | 1 | 2 | 3 | 4 | 5 | 6

DRAWN RGA DATE 8/3/04
CHECKED DATE
APPROVED SEE SUPERSEDED CARDS DATE
FILMED

FLOW DIAGRAM
ELECTRIC HEATING BOILER SYSTEM
COOPER NUCLEAR STATION

BURNS & ROE

2012 SH 3

DWG NO. C0036737

DIESEL GENERATOR BUILDING

WATER TREATMENT AREA

CONT. ON 2016 SH.1A ZONE F-2

CONT. ON 2016 SH.1A ZONE F-9

CONT. ON 2010 SH.1 ZONE E-6

CONT. ON 2016 SH.1A ZONE F-9

CONT. ON 2016 SH.1A ZONE F-9

CONT. ON 2016 SH.1B ZONE A-4

CONT. ON 2016 SH.1A ZONE G-9

MACHINE SHOP

CONTROL BUILDING

TURBINE GENERATOR BUILDING

TURBINE GENERATOR OIL PIPING SPRAY SYSTEM NO.13

TURBINE GENERATOR OIL PIPING SPRAY SYSTEM NO.12

LUBE OIL PURIFIER AREA SPRAY SYSTEM NO.8

TURBINE LUBE OIL RESERVOIR AREA SPRAY SYSTEM NO.14

TURBINE GEN. BLDG. NORTH BASEMENT SPRINKLER SYSTEM NO.1B

REACTOR FEED PUMP 1A SPRAY SYSTEM NO.9

REACTOR FEED PUMP 1B SPRAY SYSTEM NO.10

H2 SEAL OIL UNIT SPRAY SYSTEM NO.11

LUBE OIL STORAGE AREA SPRAY SYSTEM NO.7

TURBINE GEN. BLDG. SOUTH BASEMENT SPRINKLER SYSTEM NO.1A

MAIN POWER TRANSFORMER B SPRAY SYSTEM NO.16

MAIN POWER TRANSFORMER C SPRAY SYSTEM NO.17

NORMAL STATION SERVICE TRANSFORMER SPRAY SYSTEM NO.21

MAIN POWER TRANSFORMER D SPRAY SYSTEM NO.18

MAIN POWER TRANSFORMER A SPRAY SYSTEM NO.15

EMERGENCY STATION SERVICE TRANSFORMER SPRAY SYSTEM NO.20

STARTUP STATION SERVICE TRANSFORMER SPRAY SYSTEM NO.19

DOC STORAGE VAULT SPRINKLER SYSTEM NO.33

TURBINE GEN. BLDG. CABLE CHASE SPRINKLER SYSTEM NO.32

REFERENCE DWGS BY ASCOA SPRINKLER & SPRAY SYSTEMS	
SYSTEM NO	ASCOA DWG NUMBER
1A	34-1243SH - SHT 1,2
1B	34-1243SH - SHT 3
2	34-1243SH - SHT 6
3	34-1243SH - SHT 6
4	34-1243SH - SHT 12
5	34-1243SH - SHT 13
6	34-1243SH - SHT 13
7	34-1243SH - SHT 1,4
8	34-1243SH - SHT 2,3,4
9	34-1243SH - SHT 2
10	34-1243SH - SHT 2
11	34-1243SH - SHT 1,4
12	34-1243SH - SHT 5,12
13	34-1243SH - SHT 6,12
14	34-1243SH - SHT 5,7
15	34-1243SH - SHT 8,9,10
16	34-1243SH - SHT 8,9,10
17	34-1243SH - SHT 8,9,10
18	34-1243SH - SHT 8,9,10
19	F.E. MORAN DWGS. 1958FP-101, 1958FP-102
20	34-1243SH - SHT 8,10,11
21	34-1243SH - SHT 8,11
22	34-1243SH - SHT 18
23	34-1243SH - SHT 18

NOTES:

1. UNLESS OTHERWISE SHOWN, ALL PIPING ON THIS DIAGRAM IS DESIGNATED "FP-1".
2. ALL PIPING SYSTEM FABRICATION SHALL BE PER THE CLASSIFICATION SHOWN ON THE MATERIAL SPECIFICATION SHEETS AND SPECIFICATION E-69-4.
3. ALL VALVES IN FP-1 SHALL BE 175# F.U. SPECIAL.
4. SUFFIX (PI) DESIGNATES POST INDICATOR VALVE.
5. AUTOMATIC SPRINKLER CORPORATION OF AMERICA ABBREVIATED AS ASCOA WHEN IDENTIFYING SPRINKLER AND SPRAY SYSTEMS DRAWING NUMBERS.
6. REACTOR BUILDING AND CONTROL BUILDING FIRE PROTECTION PIPING SYSTEM AND SPRINKLERS ARE SUPPORTED FOR CLASS IS RESTRAINED CRITERIA. INTAKE STRUCTURE FIRE PROTECTION PIPING SYSTEMS ARE SUPPORTED FOR BARGE IMPACT CRITERIA.
7. ALL VALVE NUMBERS IN PARENTHESIS( ) ARE NUMBERS TO BE USED IN OPERATING PROCEDURES. THESE NUMBERS ARE ASSIGNED BY NPPD AND WILL NOT BE SHOWN ON PIPING DRAWINGS.
8. VALVES ARE UNDERWRITERS APPROVED.
9. △'S WHERE SHOWN WITH NUMBERS REPRESENT POINTS OF CONNECTION TO EXISTING SYSTEMS E-73-58 SPECIFICATION DEFINES WORK FROM THIS POINT.
10. ALL VALVES ARE IN THE FIRE PROTECTION (FP) SYSTEM UNLESS DESIGNATED OTHERWISE.
11. △ INDICATES ONE OR MORE SPRINKLER HEADS IN LINE.
12. WHERE LINES ARE INTERCONNECTED AND CONTINUED ON OTHER DRAWINGS, ZONE NUMBERS ARE APPROXIMATE ONLY.

REVISIONS TO THIS DRAWING REQUIRES A REVISION TO THE CORRESPONDING ISOKEY.

FOR PREVIOUS REVISIONS, SEE SUPERSEDED CARDS.

VERSIONS/REVISIONS BY N.P.P.D.

NO.	DESCRIPTION	DFT	DATE	ENG
AB/70	DR-2014-0592	DJB	10/16/16	MBNIENA

AS BUILT
454003604
STATUS: Release
STATUS DATE: 10/16/2016
DS APPROVED: MBNIENA
VER: AB REV: 70 SIZE: F

SIGNIFICANT NUMBER | GROUP | 1 | 2 | 3 | 4 | 5 | 6

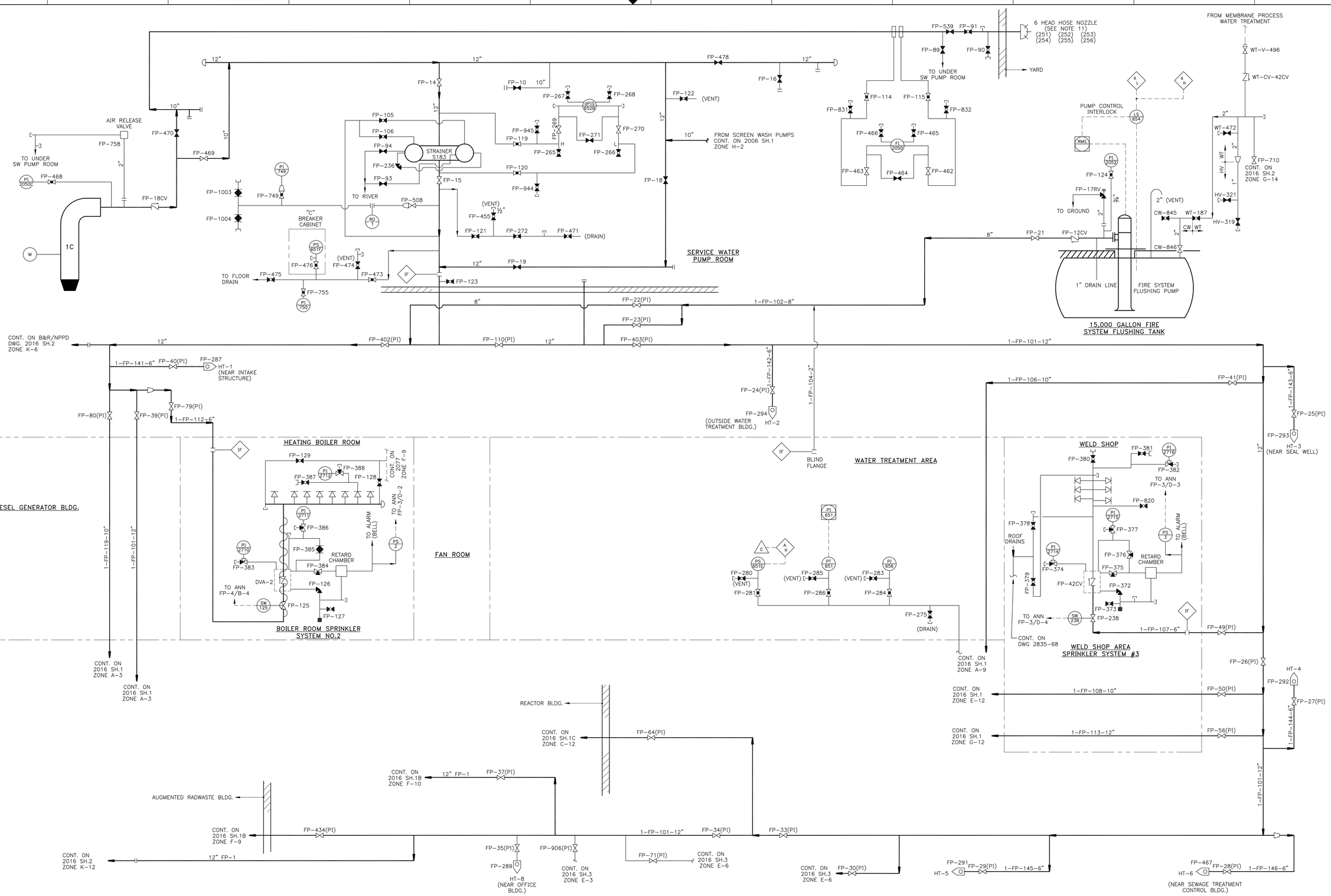
FLOW DIAGRAM
FIRE PROTECTION
TURBINE GENERATOR BUILDING
COOPER NUCLEAR STATION

DRAWN | DATE
CHECKED | DATE
APPROVED | DATE
SEE SUPERSEDED CARDS
FILMED

BURNS & ROE

2016 SH 1

CARD FILE: C0018087



NOTES:

1. UNLESS OTHERWISE SHOWN, ALL PIPING ON THIS DIAGRAM IS DESIGNATED "FP-1".
2. ALL PIPING SYSTEM FABRICATION SHALL BE PER THE CLASSIFICATION SHOWN ON THE MATERIAL SPECIFICATION SHEETS AND SPECIFICATION E-69-4.
3. ALL VALVES IN FP-1 SHALL BE 175# F.U. SPECIAL.
4. SUFFIX (PI) DESIGNATES POST INDICATOR VALVE.
5. AUTOMATIC SPRINKLER CORPORATION OF AMERICA ABREVIATED AS ASCOA WHEN IDENTIFYING SPRINKLER AND SPRAY SYSTEMS DRAWING NUMBERS.
6. REACTOR BUILDING AND CONTROL BUILDING FIRE PROTECTION PIPING SYSTEM AND SPRINKLERS ARE SUPPORTED FOR CLASS IS RESTRAINED CRITERIA. INTAKE STRUCTURE FIRE PROTECTION PIPING SYSTEMS ARE SUPPORTED FOR BARGE IMPACT CRITERIA.
7. ALL VALVE NUMBERS IN PARENTHESIS( ) ARE NUMBERS TO BE USED IN OPERATING PROCEDURES. THESE NUMBERS ARE ASSIGNED BY NPPD AND WILL NOT BE SHOWN ON PIPING DRAWINGS.
8. VALVES ARE UNDERWRITERS APPROVED.
9. △'S WHERE SHOWN WITH NUMBERS REPRESENT POINTS OF CONNECTION TO EXISTING SYSTEMS E-73-58 SPECIFICATION DEFINES WORK FROM THIS POINT.
10. ALL VALVES ARE IN THE FIRE PROTECTION (FP) SYSTEM UNLESS DESIGNATED OTHERWISE.
11. ALL VALVES ON THE 6 HEADED HOSE NOZZLE ARE CLOSED.
12. △ INDICATES ONE OR MORE SPRINKLER HEADS IN LINE.
13. WHERE LINES ARE INTERCONNECTED AND CONTINUED ON OTHER DRAWINGS, ZONE NUMBERS ARE APPROXIMATE ONLY.
14. ⌒ HEAT TRACE

REVISIONS TO THIS DRAWING REQUIRES A REVISION TO THE CORRESPONDING ISOKEY.

AS BUILT
454243820
STATUS: Release
STATUS DATE: 04/20/2016
DS APPROVED: NEWERNE
VER: AB REV: 09 SIZE: F

VERSIONS/REVISIONS BY N.P.P.D.

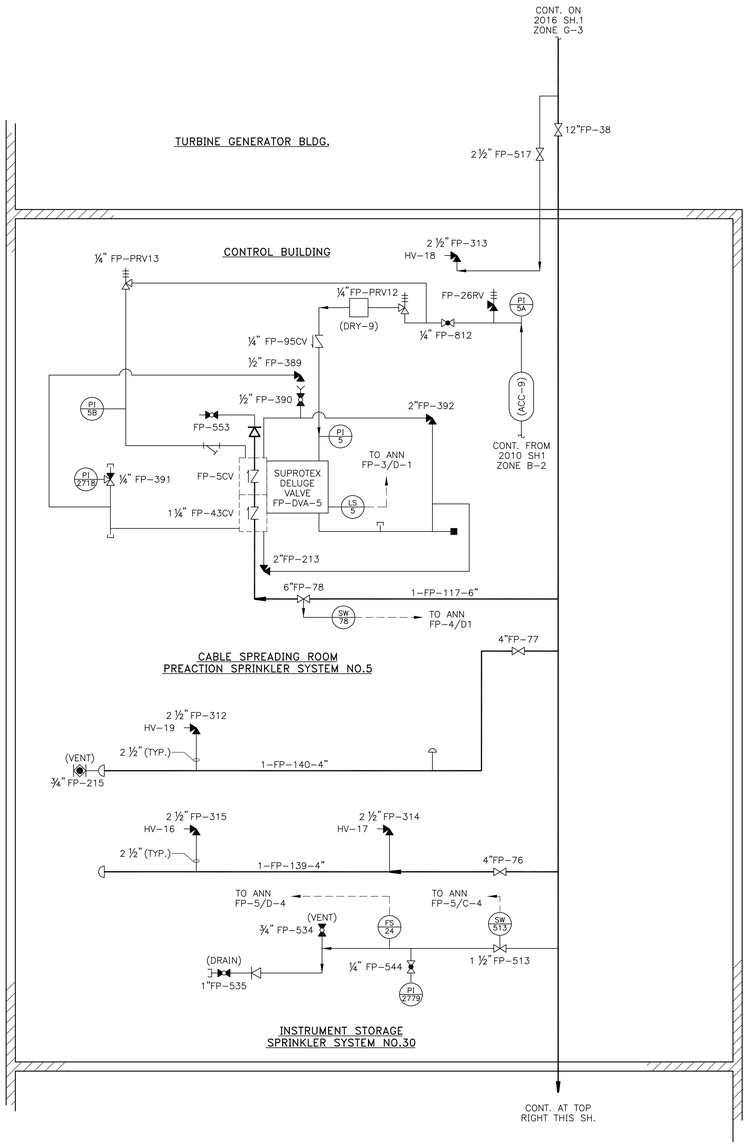
NO.	DESCRIPTION	DFT	DATE	ENG
AB/09	DR-2016-0002	DJB	04/20/16	NEWERNE

SIGNIFICANT NUMBER							
GROUP	1	2	3	4	5	6	

FLOW DIAGRAM
FIRE PROTECTION
SERVICE BLDG'S & YARD
COOPER NUCLEAR STATION

DRAWN RGA	DATE 6-7-95	BURNS & ROE
CHECKED KG	DATE 5-28-99	
APPROVED DDK	DATE 6-3-99	
FILMED		2016 SH. 1A

CARD FILE: C0018088



NOTES:

1. UNLESS OTHERWISE SHOWN, ALL PIPING ON THIS DIAGRAM IS DESIGNATED "FP-1".
2. ALL PIPING SYSTEM FABRICATION SHALL BE PER THE CLASSIFICATION SHOWN ON THE MATERIAL SPECIFICATION SHEETS AND SPECIFICATION E-69-4.
3. ALL VALVES IN FP-1 SHALL BE 175# F.U. SPECIAL.
4. SUFFIX (PI) DESIGNATES POST INDICATOR VALVE.
5. AUTOMATIC SPRINKLER CORPORATION OF AMERICA ABREVIATED AS ASCOA WHEN IDENTIFYING SPRINKLER AND SPRAY SYSTEMS DRAWING NUMBERS.
6. REACTOR BUILDING AND CONTROL BUILDING FIRE PROTECTION PIPING SYSTEM AND SPRINKLERS ARE SUPPORTED FOR CLASS IS RESTRAINED CRITERIA. INTAKE STRUCTURE FIRE PROTECTION PIPING SYSTEMS ARE SUPPORTED FOR BARGE IMPACT CRITERIA.
7. ALL VALVE NUMBERS IN PARENTHESIS( ) ARE NUMBERS TO BE USED IN OPERATING PROCEDURES. THESE NUMBERS ARE ASSIGNED BY NPPD AND WILL NOT BE SHOWN ON PIPING DRAWINGS.
8. VALVES ARE UNDERWRITERS APPROVED.
9. △'S WHERE SHOWN WITH NUMBERS REPRESENT POINTS OF CONNECTION TO EXISTING SYSTEMS E-73-58 SPECIFICATION DEFINES WORK FROM THIS POINT.
10. ALL VALVES ARE IN THE FIRE PROTECTION (FP) SYSTEM UNLESS DESIGNATED OTHERWISE.
11. △ INDICATES ONE OR MORE SPRINKLER HEADS IN LINE.
12. WHERE LINES ARE INTERCONNECTED AND CONTINUED ON OTHER DRAWINGS, ZONE NUMBERS ARE APPROXIMATE ONLY.

REVISIONS TO THIS DRAWING REQUIRES A REVISION TO THE CORRESPONDING ISOKEY.

AS BUILT
454243821

STATUS: Release
STATUS DATE: 05/08/2018
DS APPROVED: DCWHEAT
VER: AC REV: 05 SIZE: F

FOR PREVIOUS REVISIONS, SEE SUPERSEDED CARDS.

VERSIONS/REVISIONS BY N.P.P.D.

NO.	DESCRIPTION	DFT	DATE	ENG
AB/04	DR-2013-0599 (DCN 13-2034)	DLR	4/22/15	GEHORN
AC/05	DR-2018-0001	DJB	05/08/18	JLCHAMP

SIGNIFICANT NUMBER						
GROUP	1	2	3	4	5	6

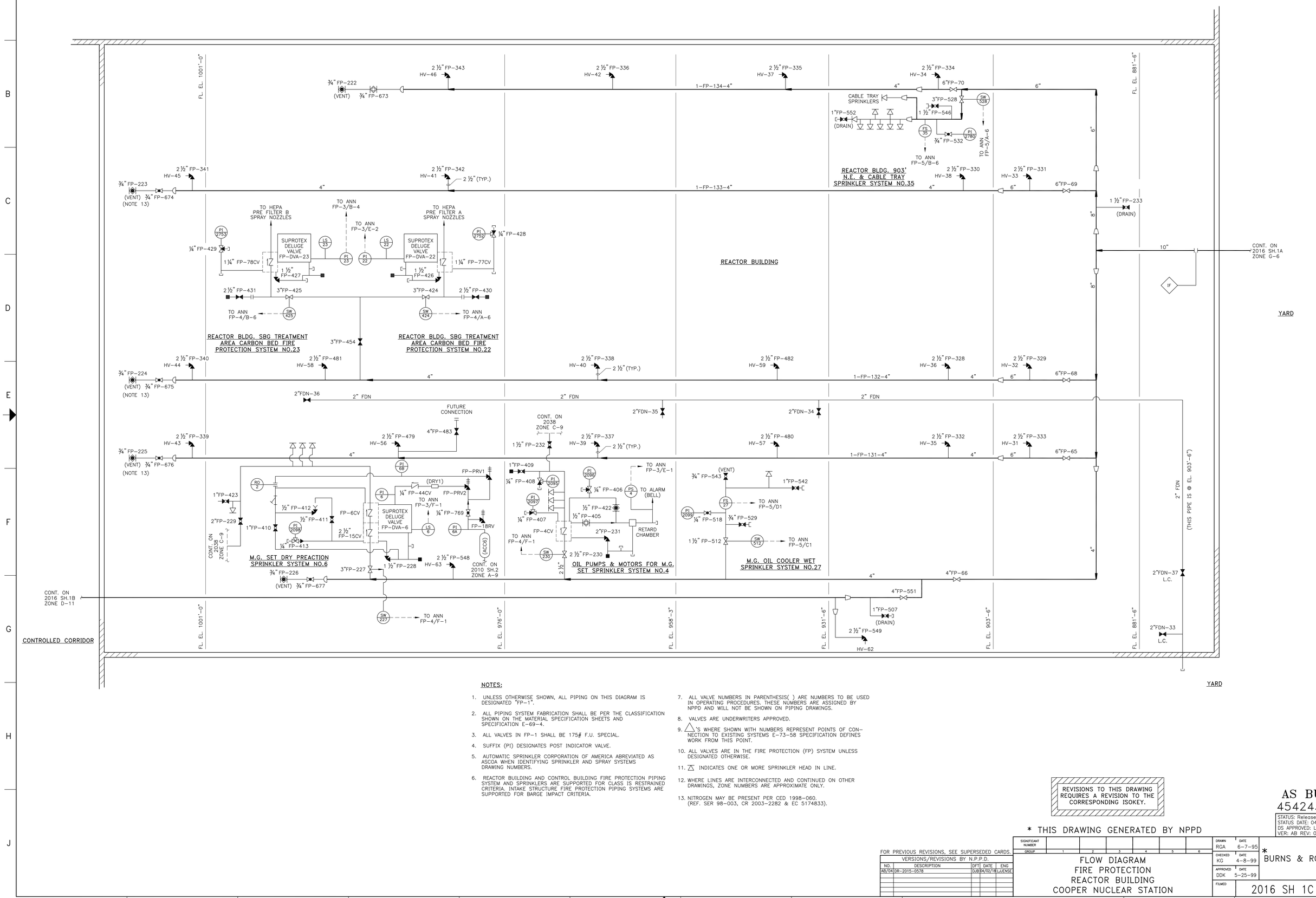
COOPER NUCLEAR STATION
FLOW DIAGRAM
FIRE PROTECTION
CONT. RDW & ARDW BLDG.'S

DRAWN	RGA	6-7-95
CHECKED	KG	4-8-99
APPROVED	DDK	5-25-99
FILMED		

BURNS & ROE

2016 SH 1B

CARD REC. C0016089



YARD

NOTES:

1. UNLESS OTHERWISE SHOWN, ALL PIPING ON THIS DIAGRAM IS DESIGNATED "FP-1".
2. ALL PIPING SYSTEM FABRICATION SHALL BE PER THE CLASSIFICATION SHOWN ON THE MATERIAL SPECIFICATION SHEETS AND SPECIFICATION E-69-4.
3. ALL VALVES IN FP-1 SHALL BE 175# F.U. SPECIAL.
4. SUFFIX (PI) DESIGNATES POST INDICATOR VALVE.
5. AUTOMATIC SPRINKLER CORPORATION OF AMERICA ABREVIATED AS ASCOA WHEN IDENTIFYING SPRINKLER AND SPRAY SYSTEMS DRAWING NUMBERS.
6. REACTOR BUILDING AND CONTROL BUILDING FIRE PROTECTION PIPING SYSTEM AND SPRINKLERS ARE SUPPORTED FOR CLASS IS RESTRAINED CRITERIA. INTAKE STRUCTURE FIRE PROTECTION PIPING SYSTEMS ARE SUPPORTED FOR BARGE IMPACT CRITERIA.
7. ALL VALVE NUMBERS IN PARENTHESIS( ) ARE NUMBERS TO BE USED IN OPERATING PROCEDURES. THESE NUMBERS ARE ASSIGNED BY NPPD AND WILL NOT BE SHOWN ON PIPING DRAWINGS.
8. VALVES ARE UNDERWRITERS APPROVED.
9. △'S WHERE SHOWN WITH NUMBERS REPRESENT POINTS OF CONNECTION TO EXISTING SYSTEMS E-73-58 SPECIFICATION DEFINES WORK FROM THIS POINT.
10. ALL VALVES ARE IN THE FIRE PROTECTION (FP) SYSTEM UNLESS DESIGNATED OTHERWISE.
11. △ INDICATES ONE OR MORE SPRINKLER HEAD IN LINE.
12. WHERE LINES ARE INTERCONNECTED AND CONTINUED ON OTHER DRAWINGS, ZONE NUMBERS ARE APPROXIMATE ONLY.
13. NITROGEN MAY BE PRESENT PER CED 1998-060. (REF. SER 98-003, CR 2003-2282 & EC 5174833).

REVISIONS TO THIS DRAWING REQUIRES A REVISION TO THE CORRESPONDING ISOKEY.

AS BUILT
454243822

STATUS: Release
STATUS DATE: 04/02/2018
DS APPROVED: LJUENSE
VER: AB REV: 04 SIZE: F

* THIS DRAWING GENERATED BY NPPD

FOR PREVIOUS REVISIONS, SEE SUPERSEDED CARDS.

VERSIONS/REVISIONS BY N.P.P.D.

NO.	DESCRIPTION	DFT	DATE	ENG
AB/04	DR-2015-0578	DJB	04/02/18	LJUENSE

SIGNIFICANT NUMBER							
GROUP	1	2	3	4	5	6	

FLOW DIAGRAM
FIRE PROTECTION
REACTOR BUILDING
COOPER NUCLEAR STATION

DRAWN	RCA	6-7-95
CHECKED	KG	4-8-99
APPROVED	DDK	5-25-99
FILMED		

* BURNS & ROE

2016 SH 1C

DOC. FILE: C0018090

TURBINE BUILDING

RADWASTE BUILDING

SHIELDED FLOOR DRAIN SUMP 1K & PUMPS

UNSHIELDED FLOOR DRAIN SUMP 1H & PUMPS

NOTE:

1. UNLESS OTHERWISE SPECIFIED ALL PIPE SHALL BE FDR-2
2. ALL VALVE NUMBERS IN PARENTHESIS ( ) ARE NUMBERS TO BE USED IN OPERATING PROCEDURES. THESE NUMBERS ARE ASSIGNED BY NPPD AND WILL NOT APPEAR ON PIPING DRAWINGS.
3. △ WHERE SHOWN WITH NUMBERS REPRESENT POINTS OF CONNECTION TO EXISTING SYSTEMS. E73-58 SPECIFICATION DEFINES WORK FROM THIS POINT.
4. WHERE LINES INTERCONNECT AND ARE CONTINUED ON OTHER DRAWINGS, ZONE NUMBERS ARE APPROXIMATE ONLY.
5. FLOOR DRAIN SEALED WITH GROUT PER CED 6014761.
6. EQUIPMENT ABANDONED IN PLACE.

AS BUILT

REVISIONS TO THIS DRAWING REQUIRES A REVISION TO THE CORRESPONDING ISOKEY.

FOR PREVIOUS REVISIONS, SEE SUPERSEDED CARDS.

VERSIONS/REVISIONS BY N.P.P.D.

NO.	DESCRIPTION	DFT	DATE	ENG
AC/16	DR-2013-0599 (DCN 13-2081)	DLR	8/6/15	GEHORN

454003605

STATUS: Release
STATUS DATE: 08/06/2015
DS APPROVED: GEHORN
VER: AC REV: 16 SIZE: F

SIGNIFICANT NUMBER							
GROUP	1	2	3	4	5	6	

DRAWN HFY 5/13/02
CHECKED
APPROVED SEE SUPERSEDED CARDS
FILMED

COOPER NUCLEAR STATION
FLOW DIAGRAM
TURB. & RADWASTE BLDG. CONTAMINATED FL. DRAIN & RADWASTE ROOF DRAIN SYS.

BURNS & ROE

2017

CARD FILE: C0017917

TURBINE BUILDING HEATING & VENT. UNIT 1-HV-T1C (CONTRACT E-69-18)

TURBINE BUILDING HEATING & VENT. UNIT 1-HV-T1D (CONTRACT E69-18)

TURBINE BUILDING HEATING & VENT. UNIT 1-HV-T1A (CONTRACT E-69-18)

CONTROL BUILDING HEATING & VENT. UNIT 1-HV-C1A (CONTRACT E-69-18.)

FROM CONTROLLED CORRIDOR D104 SYS 1-HV-CH-1A DWG 2024 SH 3

NOTES

1. FOR GENERAL NOTES REFER TO DWG 2014, SH. 2.
2. FOR ELECTRIC SHOP & NON-CRIT SWGR RM SEE SARGENT & LUNDY DWG. M-111.
3. FLOW QUANTITIES ARE DESIGN FLOW QUANTITIES.
4. SEE BURNS & ROE H&V DUCT LAYOUT DRAWINGS FOR FIRE DAMPER CIC NOS.
5. ESSENTIAL CONTROL BLDG. VENTILATION DUCTWORK SUPPORT LOCATIONS ARE DEPICTED ON DWG. CNS-HV-47, 48 & 49.

NOTE:
ALL ITEMS MARKED THUS [A] ARE "AS BUILT" ITEMS AND ARE NOT SHOWN ON PIPING DRAWINGS.

A	B	C	D	E	F
FT-4002A	HV-529	HV-530	HV-531	HV-532	HV-533
FT-4002B	HV-534	HV-535	HV-536	HV-537	HV-538
FT-4002C	HV-539	HV-540	HV-541	HV-542	HV-543
FT-4002D	HV-544	HV-545	HV-546	HV-547	HV-548

DETAIL "A"

AS BUILT
454003606

STATUS: Release
STATUS DATE: 10/22/2018
DS APPROVED: DCWHEAT
VER: AE REV: 41 SIZE: F

FOR PREVIOUS REVISIONS, SEE SUPERSEDED CARDS.

NO.	DESCRIPTION	DFT	DATE	ENG
AB/39	DR-2013-0968	DJB	12/03/13	RKRAUSE
AD/40	DR-2014-0008	DJB	08/06/14	RKRAUSE
AE/41	DR-2018-0001	LS	10/22/18	DCWHEAT

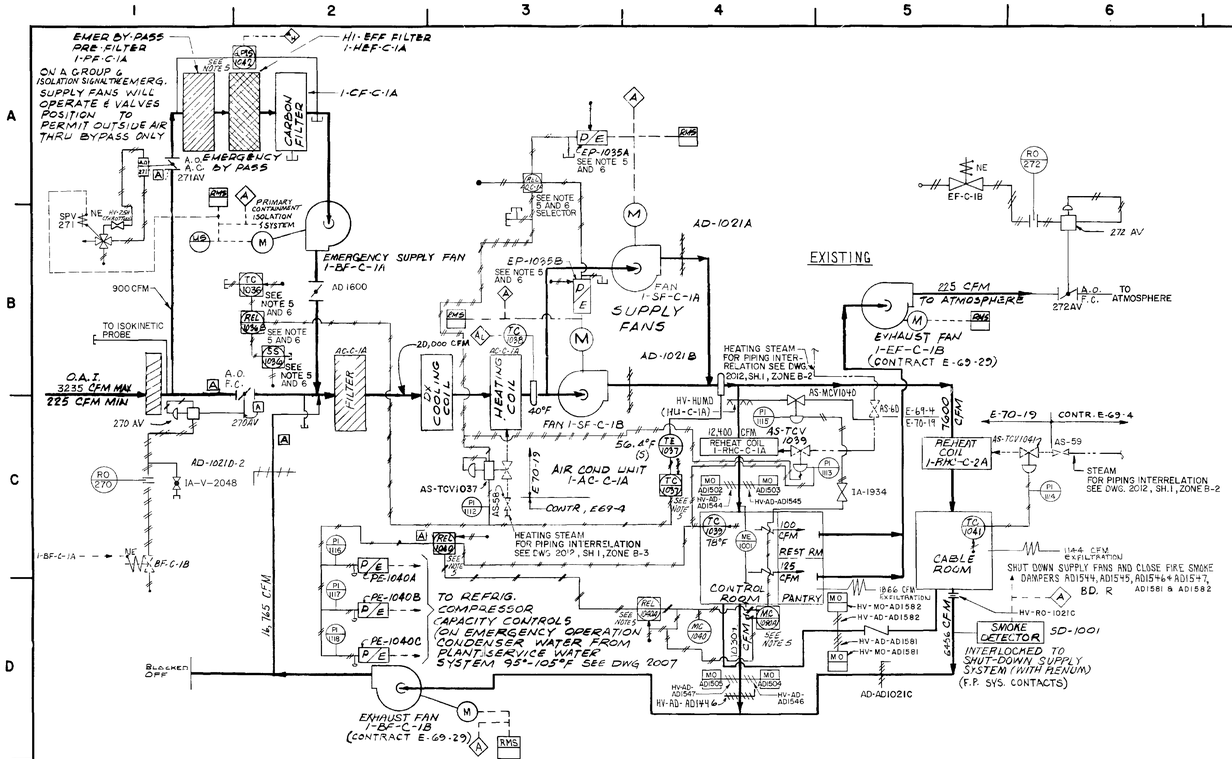
SIGNIFICANT NUMBER | GROUP 1 2 3 4 5 6

FLOW DIAGRAM
TURBINE GENERATOR BLDG & CONTROL BLDG HEATING & VENTILATING
COOPER NUCLEAR STATION

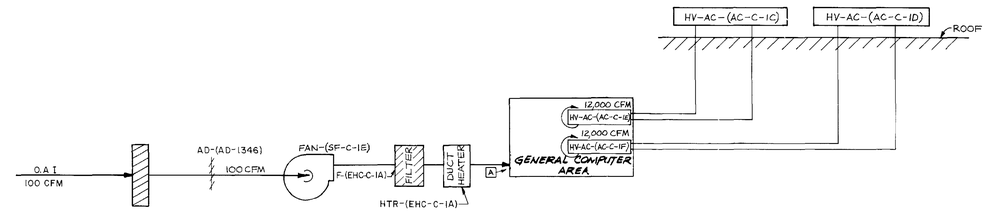
DRAWN RGA 3/27/03 | CHECKED | APPROVED | FILMED 2018

BURNS & ROE

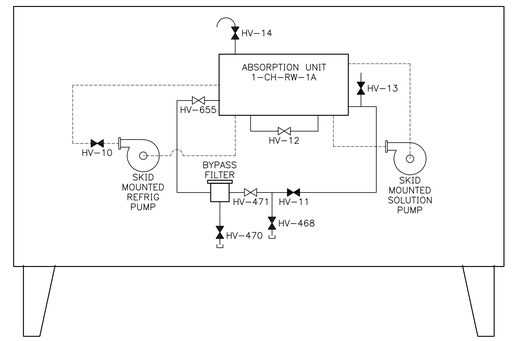
CARD FILE: C00336417



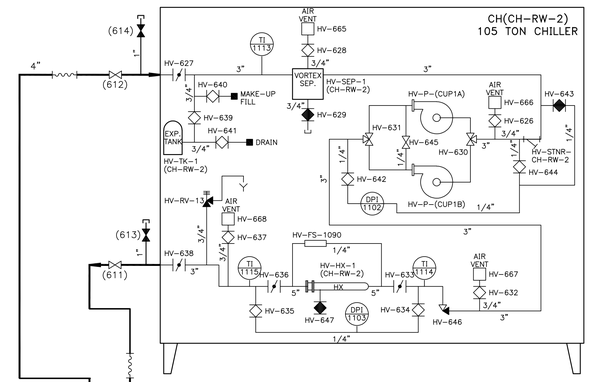
MAIN CONTROL ROOM AND CABLE ROOM
AIR CONDITIONING UNIT
1-AC-C-1A



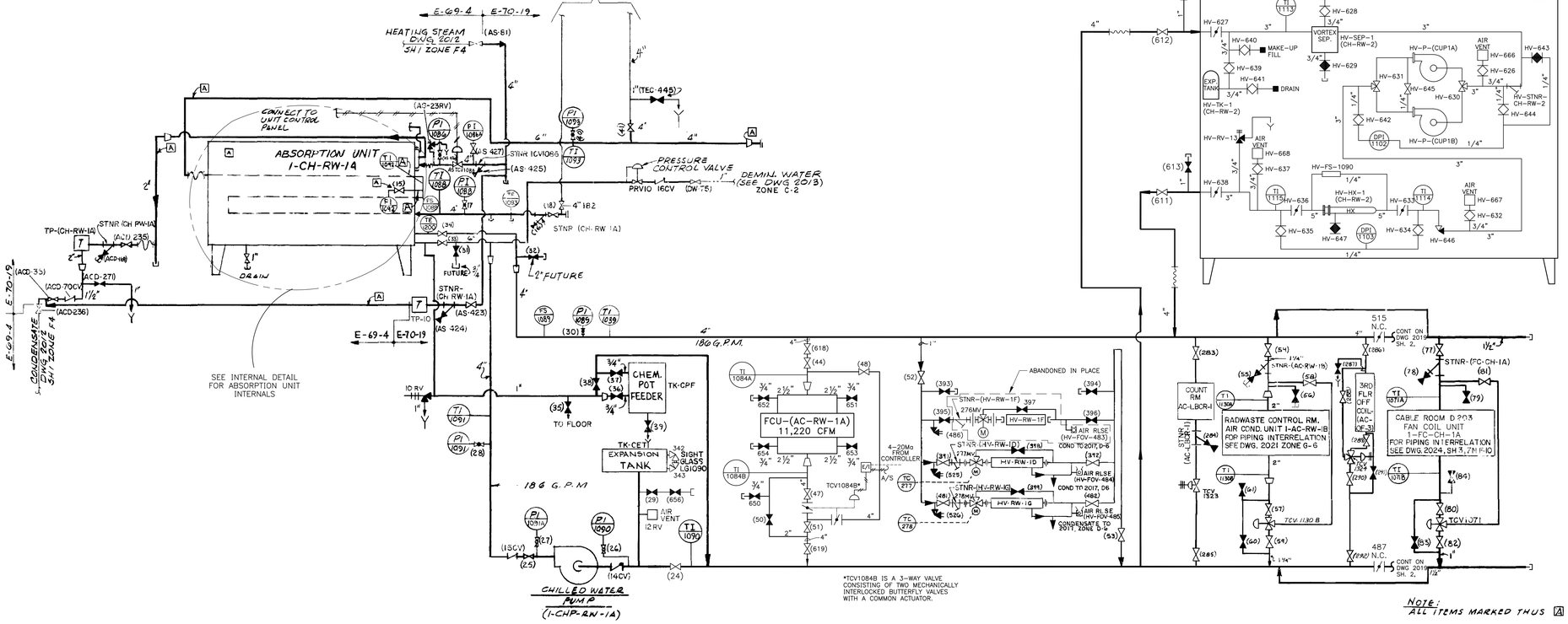
COMPUTER ROOM
AIR CONDITIONING UNITS



INTERNAL DETAIL
(NOT TO SCALE)



CHILLED WATER FLOW DIAGRAM



*TCV1084B IS A 3-WAY VALVE CONSISTING OF TWO MECHANICALLY INTERLOCKED BUTTERFLY VALVES WITH A COMMON ACTUATOR.

NOTE:
ALL ITEMS MARKED THUS ▲ ARE "AS BUILT" ITEMS

NOTE
1. FOR GENERAL NOTES REFER TO DWG. 2014 SH 2.
2. 3-WAY VALVES FOR FLOW CONTROL THRU EACH CHILLED WATER COIL MAY BE USED IN LIEU OF PRESSURE BY-PASS.
3. FLOW QUANTITIES ARE DESIGN FLOW QUANTITIES.
4. ALL VALVES ARE IN THE HV SYSTEM UNLESS OTHERWISE DESIGNATED.
5. THE DEVICES FOR AC-C-1A ARE LOCATED IN LRP-RACK-(LIR-AC-C-A) REF. HONEYWELL DWG. 932-71212 PI, SH. 2C.
6. TC-1036, REL-1036B, SS-1036, REL-AC-C-1A, EP-1035A, AND EP-1035B DEVICES SERVE NO CONTROL FUNCTION.

AS BUILT
454003607
STATUS: Release
STATUS DATE: 07/16/2015
DS APPROVED: GEHORN
VER: AC REV: 50 SIZE: F
CADD FILE: C0036642

FOR PREVIOUS REVISIONS, SEE SUPERSEDED CARDS.

VERSIONS/REVISIONS BY N.P.P.D.

NO.	DESCRIPTION	DFT	DATE	ENG
AB/49	DR-2013-0599 (DCN 13-2038)	DJB	7/22/15	GEHORN
AC/50	DR-2013-0599 (CR-CNS-2015-04254)	DJB	7/16/15	AJALDAN

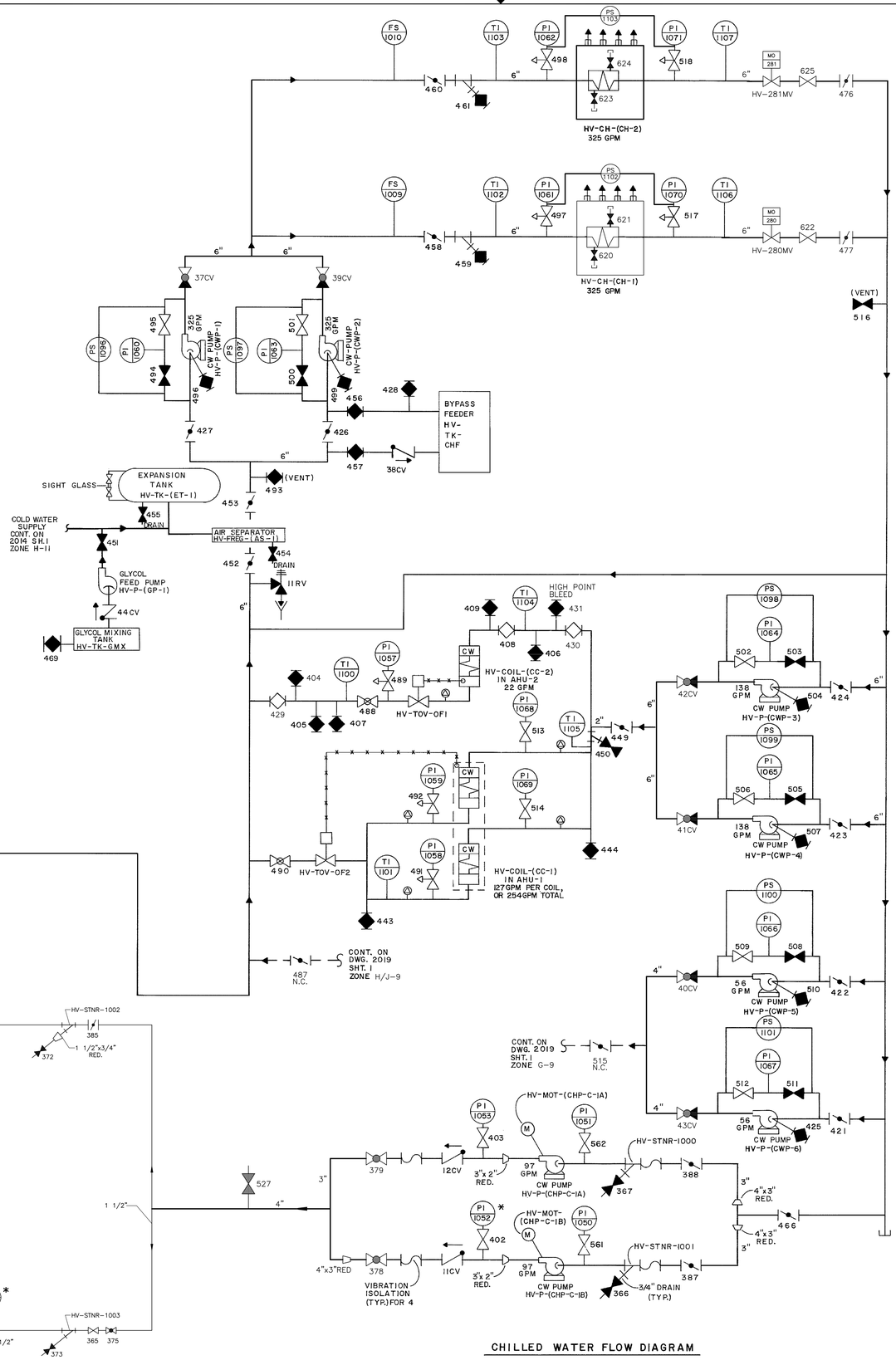
BURNS AND ROE, INC.
ENGINEERS AND CONSTRUCTORS
NEW YORK, N. Y.

FLOW DIAGRAM
MAIN CONTROL RM.
CABLE RM. & COMPUTER RM.
HEATING, VENTILATING & AIRCOND.

CONSUMERS PUBLIC POWER DISTRICT
COOPER NUCLEAR STATION

DRAWN BY NARELL
TRACED BY
CHECKED BY WRT
APPROVED
R. Edwards Jacobs
CHIEF MECHANICAL ENGINEER
SQUAD LEADER
DATE 4/5/62
NONE

W.O. 2520
DWG. 2019 SH 1



CHILLED WATER FLOW DIAGRAM

REFERENCES:

1) FOR CONTROLS FOR CONTROL BLDG. H&V UNIT 1-HV-C-1A. SEE HONEYWELL DWG. 932-89003, SHT. 1.
2) FOR CONTROLS FOR ELECT. SHOP AHU HV-FCU-AHU5 SEE HONEYWELL DWG. 932-89003, SHT. 2.
3) BURNS & ROE DWG. 2018.

NOTES:

1) * FURNISHED WITH PUMPS OR CW COIL UNITS.
2) △ — AIR BLEED

* THIS DRAWING GENERATED BY NPPD

FOR PREVIOUS REVISIONS, SEE SUPERSEDED CARDS.

REVISIONS BY N.P.P.D.					
NO.	REVISIONS	DFT	CKD	APP	DATE
N10	CED 6014761 (DCN 09-0145)	PAM	KG	DLR	6/2/09
N11	CR 2010-06859 (DCN 11-0711)	KZ	DLR	PAM	4/8/11

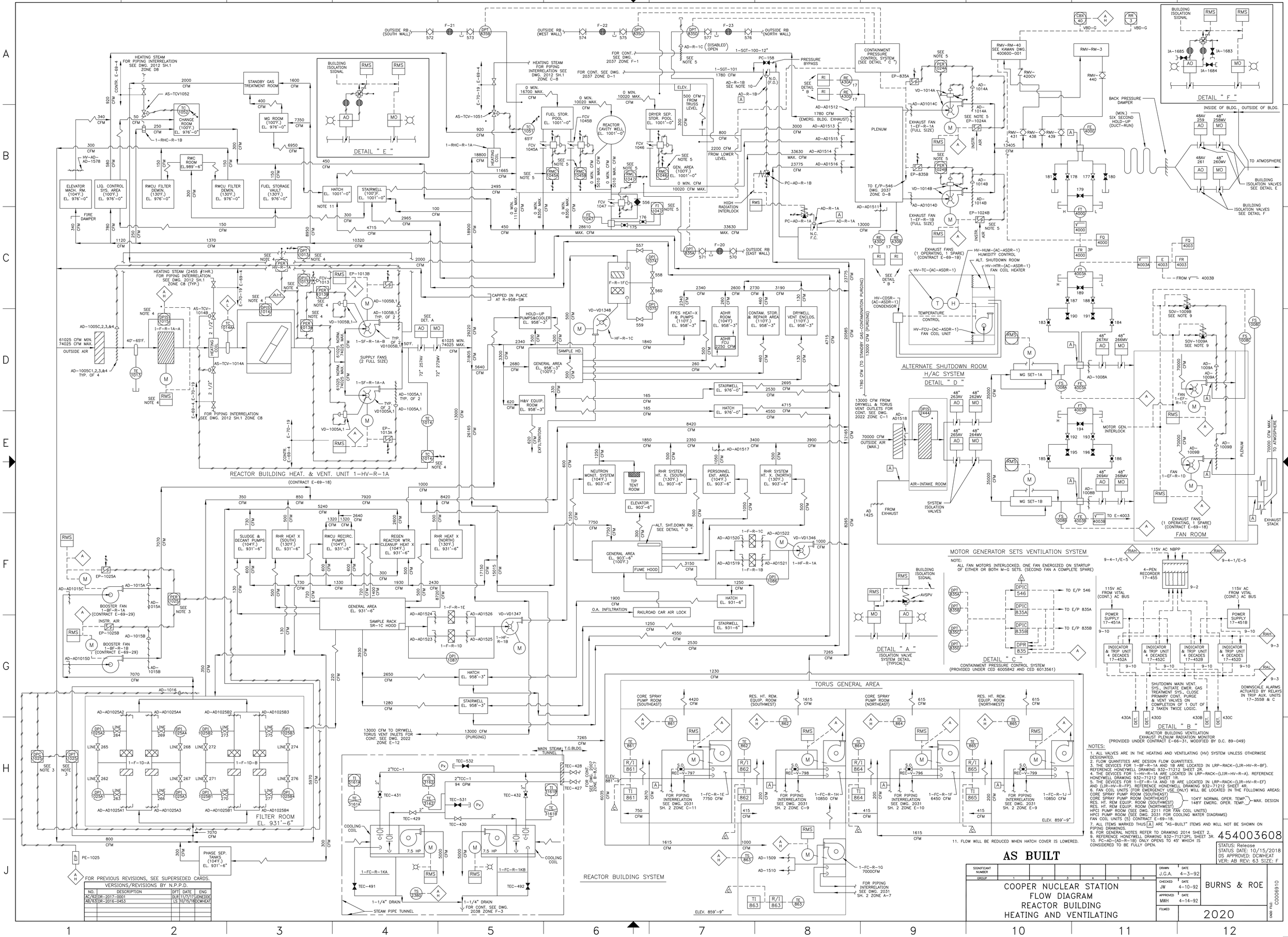
SIGNIFICANT NUMBER							
GROUP	1	2	3	4	5	6	

COOPER NUCLEAR STATION
FLOW DIAGRAM CHILLED WATER SYSTEM ELECTRICAL SHOP, NON-CRITICAL SWITCHGEAR, CONTROL & OFFICE BLDG.

DRAWN DJF	DATE 10/15/90	* BURNS & ROE	
CHECKED JW	DATE 10/15/90		
APPROVED JRH	DATE 10/16/90		
FILMED	2019 SH 2	REVISION N11	CODE IDENT NO. 00053029

AS BUILT
454236406
SCAN/CADD DWG
DO NOT REVISE MANUALLY

REVISIONS
NO.



NOTES:
1. ALL VALVES ARE IN THE HEATING AND VENTILATING (HV) SYSTEM UNLESS OTHERWISE DESIGNATED.
2. FLOW QUANTITIES ARE DESIGN FLOW QUANTITIES.
3. THE DEVICES FOR 1-BF-R-1A AND 1B ARE LOCATED IN LRP-RACK-(LIR-HV-R-BF). REFERENCE HONEYWELL DRAWING 932-71212 SHEET 2R.
4. THE DEVICES FOR 1-HV-R-1A ARE LOCATED IN LRP-RACK-(LIR-HV-R-A). REFERENCE HONEYWELL DRAWING 932-71212 SHEET 1R.
5. THE DEVICES FOR 1-EF-R-1A AND 1B ARE LOCATED IN LRP-RACK-(LIR-HV-R-EF) AND (LIR-HV-R-FP). REFERENCE HONEYWELL DRAWING 932-71212 SHEET 4R.
6. FAN COIL UNITS (FOR EMERGENCY USE ONLY) WILL BE LOCATED IN THE FOLLOWING AREAS:
CORE SPRAY PUMP ROOM (SOUTHEAST)
CORE SPRAY PUMP ROOM (NORTHEAST) } 104°F NORMAL OPER. TEMP.
RES. HT. REM EQUIP. ROOM (SOUTHWEST)
RES. HT. REM EQUIP. ROOM (NORTHWEST) } 148°F EMERG. OPER. TEMP. } MAX. DESIGN
HPCI PUMP ROOM (SEE DWG. 2211 FOR FAN COIL UNITS)
HPCI PUMP ROOM (SEE DWG. 2031 FOR COOLING WATER DIAGRAMS)
FAN COIL UNITS (5) CONTRACT E-69-18.
7. ALL ITEMS MARKED THUS [A] ARE "AS-BUILT" ITEMS AND WILL NOT BE SHOWN ON PIPING DRAWINGS.
8. FOR GENERAL NOTES REFER TO DRAWING 2014 SHEET 2.
9. REFERENCE HONEYWELL DRAWING 932-71212P1, SHEET 3R.
10. PC-AD-(AD-R-1B) ONLY OPENS TO 45° WHICH IS CONSIDERED TO BE FULLY OPEN.
11. FLOW WILL BE REDUCED WHEN HATCH COVER IS LOWERED.

454003608

FOR PREVIOUS REVISIONS, SEE SUPERSEDED CARDS.

VERSIONS/REVISIONS BY N.P.P.D.

NO.	DESCRIPTION	DFT	DATE	ENG
AC/62	DR-2017-0001	DLR	11/7/17	JDNEDDE
AB/63	DR-2016-0453	LS	10/15/18	DCWHEAT

STATUS: Release
STATUS DATE: 10/15/2018
BS APPROVED: DCWHEAT
VER: AB REV: 63 SIZE: F

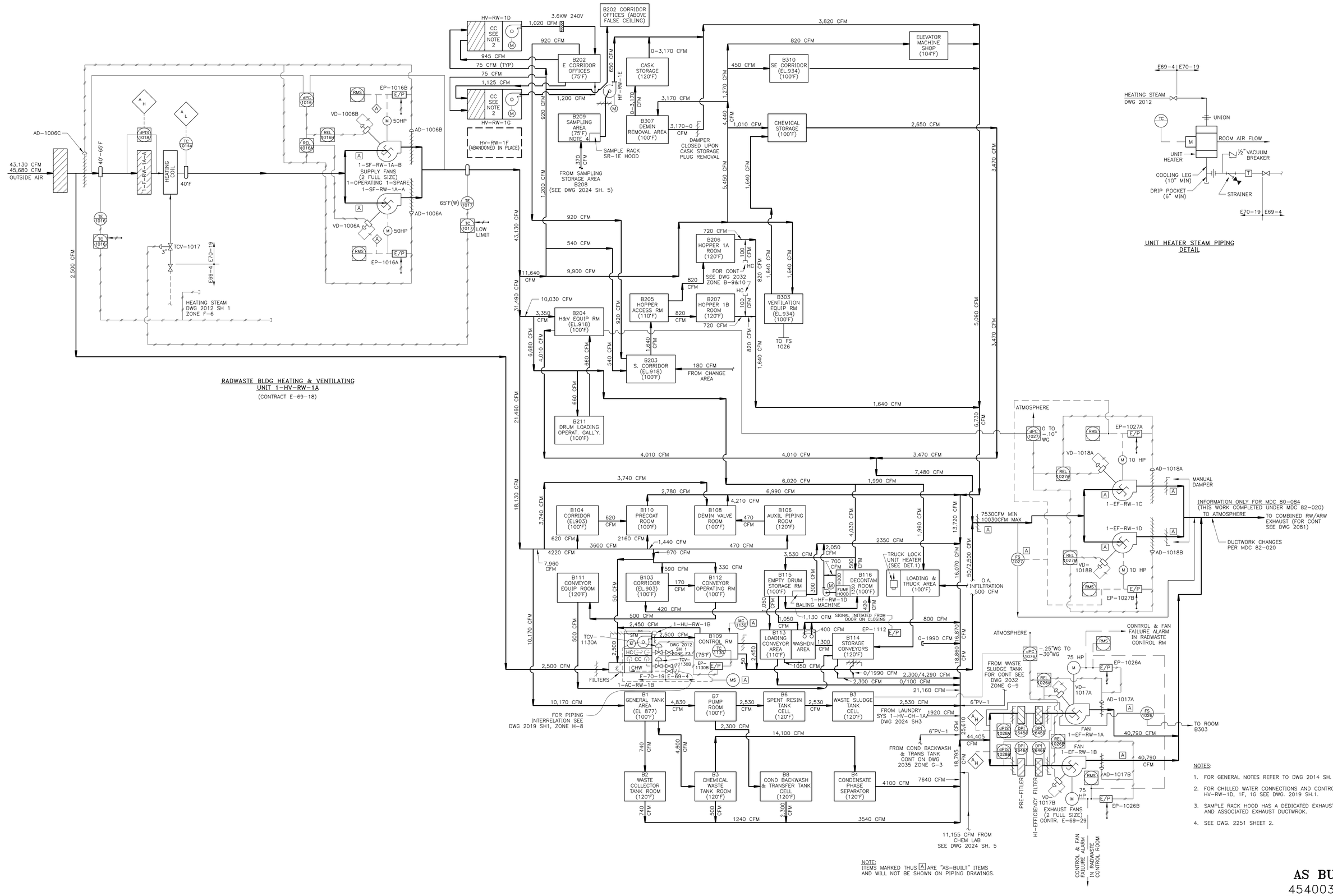
AS BUILT

SIGNIFICANT NUMBER						
GROUP	1	2	3	4	5	6

COOPER NUCLEAR STATION
FLOW DIAGRAM
REACTOR BUILDING
HEATING AND VENTILATING

DRAWN J.G.A.	DATE 4-3-92	BURNS & ROE
CHECKED JW	DATE 4-10-92	
APPROVED MWH	DATE 4-14-92	
FILMED		2020

CARD FILE C0006910



RADWASTE BLDG HEATING & VENTILATING
UNIT 1-HV-RW-1A
(CONTRACT E-69-18)

UNIT HEATER STEAM PIPING DETAIL

NOTES:

1. FOR GENERAL NOTES REFER TO DWG 2014 SH. 2.
2. FOR CHILLED WATER CONNECTIONS AND CONTROLS OF HV-RW-1D, 1F, 1G SEE DWG. 2019 SH.1.
3. SAMPLE RACK HOOD HAS A DEDICATED EXHAUST FAN AND ASSOCIATED EXHAUST DUCTWROK.
4. SEE DWG. 2251 SHEET 2.

NOTE:
ITEMS MARKED THUS [A] ARE "AS-BUILT" ITEMS AND WILL NOT BE SHOWN ON PIPING DRAWINGS.

AS BUILT
454003609
STATUS: Release
STATUS DATE: 11/24/2014
DS APPROVED: RWKRAUS
VER: AB REV: 18 SIZE: F

FOR PREVIOUS REVISIONS, SEE SUPERSEDED CARDS

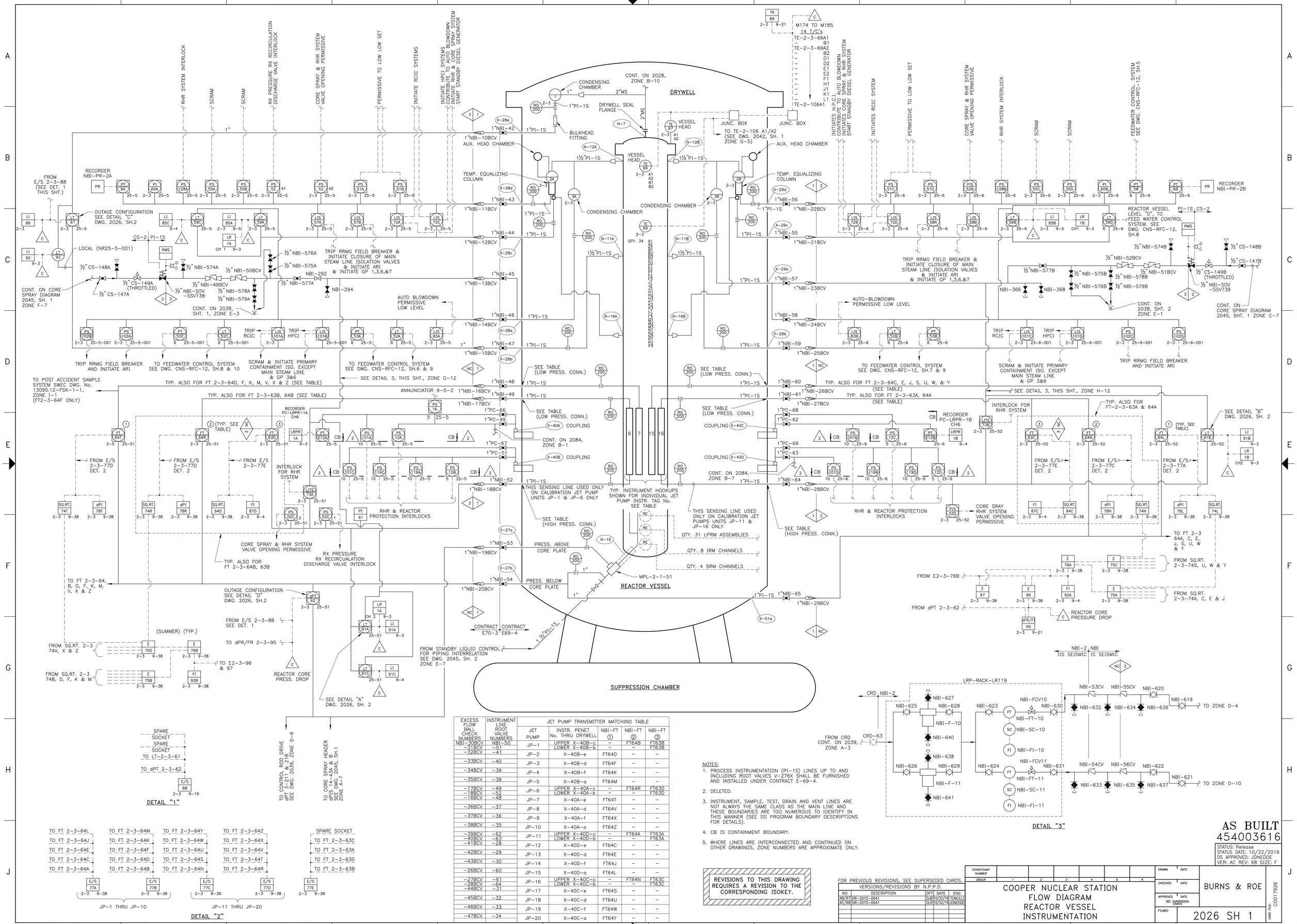
VERSIONS/REVISIONS BY N.P.P.D.			
NO.	DESCRIPTION	DFT	DATE	ENG
AB/18	DR-2014-0008	DLR	11/24/14	BDSEIDL

SIGNIFICANT NUMBER							
GROUP	1	2	3	4	5	6	

FLOW DIAGRAM
RADWASTE BUILDING
HEATING & VENTILATION
COOPER NUCLEAR STATION

DRAWN RGA	DATE 11/16/04	BURNS & ROE
CHECKED	DATE	
APPROVED SEE SUPERSEDED CARDS	DATE	
FILMED		2021

CARD FILE: C0036884



EXCESS FLOW BALL CHECK NUMBERS	INSTRUMENT LINE ROOT VALVE NUMBERS
NBI-30BCV	NBI-50
-31BCV	-51
-32BCV	-41
-33BCV	-40
-34BCV	-39
-35BCV	-38
-17BCV	-49
-18BCV	-52
-16BCV	-48
-36BCV	-37
-37BCV	-36
-38BCV	-35
-39BCV	-62
-40BCV	-63
-41BCV	-28
-42BCV	-29
-43BCV	-30
-26BCV	-60
-27BCV	-61
-28BCV	-64
-44BCV	-31
-45BCV	-32
-46BCV	-33
-47BCV	-34

JET PUMP	INSTR. PENET. No. THRU DRYWELL	NBI-FT ①	NBI-FT ②	NBI-FT ③
JP-1	UPPER X-40B-c	–	FT64B	FT63B
	LOWER X-40B-b	–	–	FT63B
JP-2	X-40B-e	FT64D	–	–
JP-3	X-40B-d	FT64F	–	–
JP-4	X-40B-f	FT64K	–	–
JP-5	X-40B-a	FT64M	–	–
JP-6	UPPER X-40A-c	–	FT64R	FT63D
	LOWER X-40A-b	–	–	FT63D
JP-7	X-40A-e	FT64T	–	–
JP-8	X-40A-d	FT64V	–	–
JP-9	X-40A-f	FT64X	–	–
JP-10	X-40A-a	FT64Z	–	–
JP-11	UPPER X-40D-c	–	FT64A	FT63A
	LOWER X-40D-b	–	–	FT63A
JP-12	X-40D-e	FT64C	–	–
JP-13	X-40D-d	FT64E	–	–
JP-14	X-40D-f	FT64J	–	–
JP-15	X-40D-a	FT64L	–	–
JP-16	UPPER X-40C-c	–	FT64N	FT63C
	LOWER X-40C-b	–	–	FT63C
JP-17	X-40C-e	FT64S	–	–
JP-18	X-40C-d	FT64U	–	–
JP-19	X-40C-f	FT64W	–	–
JP-20	X-40C-a	FT64Y	–	–

NOTES:
1. PROCESS INSTRUMENTATION (PI-1S) LINES UP TO AND INCLUDING ROOT VALVES V-276X SHALL BE FURNISHED AND INSTALLED UNDER CONTRACT E-69-4.
2. DELETED.
3. INSTRUMENT, SAMPLE, TEST, DRAIN AND VENT LINES ARE NOT ALWAYS THE SAME CLASS AS THE MAIN LINE AND THESE BOUNDARIES ARE TOO NUMEROUS TO IDENTIFY IN THIS MANNER (SEE ISI PROGRAM BOUNDARY DESCRIPTIONS FOR DETAILS).
4. CB IS CONTAINMENT BOUNDARY.
5. WHERE LINES ARE INTERCONNECTED AND CONTINUED ON OTHER DRAWINGS, ZONE NUMBERS ARE APPROXIMATE ONLY.

REVISIONS TO THIS DRAWING REQUIRES A REVISION TO THE CORRESPONDING ISOKEY.

FOR PREVIOUS REVISIONS, SEE SUPERSEDED CARDS.

VERSIONS/REVISIONS BY N.P.P.D.

NO.	DESCRIPTION	DFT	DATE	ENG
AB/67	DR-2015-0641	DJB	10/22/16	TCMULLI
AC/68	DR-2015-0641	DLR	10/22/16	JDNEDDE

AS BUILT
454003616
STATUS: Release
STATUS DATE: 10/22/2016
DS APPROVED: JDNEDDE
VER: AC REV: 68 SIZE: F

SIGNIFICANT NUMBER | GROUP | 1 | 2 | 3 | 4 | 5 | 6

COOPER NUCLEAR STATION FLOW DIAGRAM REACTOR VESSEL INSTRUMENTATION

DRAWN | DATE
CHECKED | DATE
APPROVED | DATE
SEE SUPERSEDED CARDS
FILMED

BURNS & ROE

2026 SH 1

CADD FILE: 00017926

NOTES:
1. FOR PRESSURE SENSING LINES, LINE UP TO AND INCLUDING ROOT VALVE SHALL BE FURNISHED & INSTALLED UNDER CONTRACT E-69-4.
2. SAMPLING POINT SP-1 LINE UP TO AND INCLUDING 3/4" 740AV976P SHALL BE BE FURNISHED AND INSTALLED UNDER CONTRACT E-69-4. CONTINUATION OF SAMPLING PIPING BY E-70-3.
3. REPLACEMENT PIPING FOR THE REACTOR RECIRCULATION LINES WAS FURNISHED BY NIAC UNDER CONTRACT 83-41 AND INSTALLED BY CBI UNDER CONTRACT 84-2. SEE MDC 84-150 FOR DETAILS.
4. HIGH POINT VENTS AND LOW POINT DRAINS NOT SHOWN.
5. DELETED.
6. 2" VALVE 276X (PC-V-65) IS DISCONNECTED FROM TORUS DRAIN PENT X-213B.
7. PIPING WAS NO LONGER REQUIRED AS A RESULT OF DC 76-2. PIPING WAS REMOVED AND PIPE CAPS INSTALLED PER CONTRACT 84-2. SEE MDC 84-150A AND MDC 84-150A AMENDMENT 1 FOR DETAILS.
8. DELETED.
9. REF. GE DWG. 115D6009, SH. 2 FOR INSTRUMENT PIPING AND VALVE INSTALLATION AT INSTRUMENT RACK 25-5. INSTRUMENT TUBING IS CAPPED AT RACK 25-5 DOWN STREAM OF RACK ISOLATION VALVE RR-V-210.
10. REF. GE DWG. 115D6010, SH. 2 FOR INSTRUMENT PIPING AND VALVE INSTALLATION AT INSTRUMENT RACK 25-6. INSTRUMENT TUBING IS CAPPED AT RACK 25-6 DOWN STREAM OF RACK ISOLATION VALVE RR-V-212.
11. REF. GE DWG. 921D172, SH. 2 FOR INSTRUMENT PIPING AND VALVE INSTALLATION AT INSTRUMENT RACK 25-7.
12. TESTABLE FLANGE.
13. INSTRUMENT, SAMPLE, TEST, DRAIN AND VENT LINES ARE NOT ALWAYS THE SAME CLASS AS THE MAIN LINE AND THESE BOUNDARIES ARE TOO NUMEROUS TO IDENTIFY IN THIS MANNER (SEE ISI PROGRAM BOUNDARY DESCRIPTIONS FOR DETAILS).
14. PENETRATIONS X-209A & C ARE TESTABLE ELEC./MECH FLANGE ASSEMBLIES. PENETRATIONS X-209B & D ARE SPARES AND ARE CAPPED. VALVES PC-V-366, 367, 368 & 369 ARE REMOVED PER DC 94-212A.
15. PENETRATIONS X-202A, X-202B, X-202C, X-202D, X-202E, X-202F, X-202G, X-202H, X-202J, X-202K, X-202L, X-202M, X-207A, X-207B, X-207C, X-207D, X-207E, X-207F, X-207G, X-207H, X-208A, X-208B, X-208C, X-208D, X-208E, X-208F, X-208G AND X-208H ARE NOT CONSIDERED PRIMARY CONTAINMENT PENETRATIONS.
16. ALL PIPING OPEN TO PENETRATIONS X-206C, X-206D AND X-215 ON THIS DRAWING IS A PART OF THE PRIMARY CONTAINMENT BOUNDARY.
17. CB IS PRIMARY CONTAINMENT BOUNDARY.
18. SAMPLE PT 1 RX RECIRC. HEADER.
19. SAMPLE PT 2 RWCU F/D INLET.
20. WHERE LINES ARE INTERCONNECTED AND CONTINUED ON OTHER DRAWINGS, ZONE NUMBERS ARE APPROXIMATE ONLY.
21. PENETRATIONS X-209A & C ARE TESTABLE. PENETRATIONS X-209B & D ARE SPARES AND CAPPED. THERMOCOUPLES TE-20B-1 & TE-20D ARE REMOVED. DC94-212A.

FOR PREVIOUS REVISIONS, SEE SUPERSEDED CARDS.

VERSIONS/REVISIONS BY N.P.P.D.				
NO.	DESCRIPTION	DFT	DATE	ENG
AC/71	DR-2014-0494	DLR	3/27/15	GLHADLE
AF/72	DR-2013-0598 (FROM VERSION AB)	DLR	10/27/16	KKKUKER
AG/73	DR-2015-0641	DJB	10/22/16	TCMULLI
AE/74	DR-2015-0641	DLR	10/22/16	JJNEDDE
AG/75	DR-2018-0292	LS	10/24/18	RSCULLI

REVISIONS TO THIS DRAWING REQUIRES A REVISION TO THE CORRESPONDING ISOKEY.

AS BUILT
454003617

STATUS: Release
STATUS DATE: 10/24/2018
DS APPROVED: RSCULLI
VER: AG REV: 75 SIZE: F

SIGNIFICANT NUMBER							
GROUP	1	2	3	4	5	6	

COOPER NUCLEAR STATION
FLOW DIAGRAM – LOOP "A"
REACTOR RECIRCULATION & SUPPRESSION CHAMBER VENT SYSTEMS & CONNECTIONS

DRAWN | DATE
CHECKED | DATE
APPROVED | DATE
SEE SUPERSEDED CARDS
FILMED

BURNS & ROE

2027 SH 1

DWG FILE: C0017927

NOTES:
1. FOR PRESSURE SENSING LINES, LINE UP TO AND INCLUDING ROOT VALVE SHALL BE FURNISHED & INSTALLED UNDER CONTRACT E-69-4.
2. SAMPLING POINT SP-1 LINE UP TO AND INCLUDING 3/4" 740AV976P SHALL BE FURNISHED AND INSTALLED UNDER CONTRACT E-69-4. CONTINUATION OF SAMPLING PIPING BY E-70-3.
3. REPLACEMENT PIPING FOR THE REACTOR RECIRCULATION LINES WAS FURNISHED BY NIAC UNDER CONTRACT 83-41 AND INSTALLED BY CBI UNDER CONTRACT 84-2. SEE MDC 84-150 FOR DETAILS.
4. HIGH POINT VENTS AND LOW POINT DRAINS NOT SHOWN.
5. DELETED.
6. 2" VALVE 276X (PC-V-65) IS DISCONNECTED FROM TORUS DRAIN PENT X-213B.
7. PIPING WAS NO LONGER REQUIRED AS A RESULT OF DC 76-2. PIPING WAS REMOVED AND PIPE CAPS INSTALLED PER CONTRACT 84-2. SEE MDC 84-150A AND MDC 84-150A AMENDMENT 1 FOR DETAILS.
8. DELETED.
9. REF. GE DWG. 115D6009, SH. 2 FOR INSTRUMENT PIPING AND VALVE INSTALLATION AT INSTRUMENT RACK 25-5.
10. REF. GE DWG. 115D6010, SH. 2 FOR INSTRUMENT PIPING AND VALVE INSTALLATION AT INSTRUMENT RACK 25-6.
11. REF. GE DWG. 921D172, SH. 2 FOR INSTRUMENT PIPING AND VALVE INSTALLATION AT INSTRUMENT RACK 25-7.
12. TESTABLE FLANGE.
13. INSTRUMENT, SAMPLE, TEST, DRAIN AND VENT LINES ARE NOT ALWAYS THE SAME CLASS AS THE MAIN LINE AND THESE BOUNDARIES ARE TOO NUMEROUS TO IDENTIFY IN THIS MANNER (SEE ISI PROGRAM BOUNDARY DESCRIPTIONS FOR DETAILS).
14. PENETRATIONS X-209A & C ARE TESTABLE ELEC/MECH FLANGE ASSEMBLIES. PENETRATIONS X-209B & D ARE SPARES AND ARE CAPPED. VALVES PC-V-366, 367, 368 & 369 ARE REMOVED PER DC 94-212A.
15. PENETRATIONS X-202A, X-202B, X-202C, X-202D, X-202E, X-202F, X-202G, X-202H, X-202J, X-202K, X-202L, X-202M, X-207A, X-207B, X-207C, X-207D, X-207E, X-207F, X-207G, X-207H, X-208A, X-208B, X-208C, X-208D, X-208E, X-208F, X-208G AND X-208H ARE NOT CONSIDERED PRIMARY CONTAINMENT PENETRATIONS.
16. ALL PIPING OPEN TO PENETRATIONS X-206C, X-206D AND X-215 ON THIS DRAWING IS A PART OF THE PRIMARY CONTAINMENT BOUNDARY.
17. CB IS PRIMARY CONTAINMENT BOUNDARY.
18. SAMPLE PT 1 RX RECIRC. HEADER.
19. SAMPLE PT 2 RWCU F/D INLET.
20. WHERE LINES ARE INTERCONNECTED AND CONTINUED ON OTHER DRAWINGS, ZONE NUMBERS ARE APPROXIMATE ONLY.

REVISIONS TO THIS DRAWING REQUIRES A REVISION TO THE CORRESPONDING ISOKEY.

AS BUILT
454242941
STATUS: Release
STATUS DATE: 10/15/2014
DS APPROVED: NEWERNE
VER: AC REV: 15 SIZE: F

FOR PREVIOUS REVISIONS, SEE SUPERSEDED CARDS.

VERSIONS/REVISIONS BY N.P.P.D.			
NO.	DESCRIPTION	DFT DATE	ENG
AC/15	DR-2013-0598 (FROM VERSION AB)	DJB 10/15/14	KKUKER

SIGNIFICANT NUMBER							
GROUP	1	2	3	4	5	6	

FLOW DIAGRAM – LOOP "B"
REACTOR RECIRCULATION & SUPPRESSION CHAMBER VENT SYSTEMS & CONNECTIONS
COOPER NUCLEAR STATION

DRAWN PAM	DATE 7-12-95	BURNS & ROE
CHECKED DJF	DATE 9-14-95	
APPROVED BNK	DATE 9-14-95	
FILMED		2027 SH 2

CODE IDENT NO. C0017986

"A"	"B"	"C"	"D"	"E"	"F"	"G"	"H"
MS-71ARV	MS-SPV71A	IA-1625	PS-256A	IA-1815	ACC-256A	IA-17CV	NONE
MS-71BRV	MS-SPV71B	IA-1626	PS-256B	IA-1816	ACC-256B	IA-18CV	NONE
MS-71CRV	MS-SPV71C	IA-1627	PS-256C	IA-1817	ACC-256C	IA-19CV	NONE
MS-71DRV	MS-SPV71D	IA-648	PS-256D	IA-1871	ACC-256D	IA-36CV	IA-650
MS-71ERV	MS-SPV71E	IA-1628	PS-256E	IA-1818	ACC-256E	IA-20CV	NONE
MS-71FRV	MS-SPV71F	IA-649	PS-256F	IA-1870	ACC-256F	IA-37CV	IA-651
MS-71GRV	MS-SPV71G	IA-1629	PS-256G	IA-1820	ACC-256G	IA-21CV	NONE
MS-71HRV	MS-SPV71H	IA-1630	PS-256H	IA-1819	ACC-256H	IA-22CV	NONE

ACCUMULATORS ARE IN THE IA SYSTEM
PRESSURE SWITCHES ARE IN THE MS SYSTEM

DETAIL "B"
INSTRUMENT AIR FOR RW-A094 & RW-A095

DETAIL "A"
INSTRUMENT AIR FOR SAFETY RELIEF VALVES

DETAIL "C"

REACTOR BLDG EQUIP DRAIN SUMP 1E & PUMPS

DRYWELL EQUIP SUMP 1G & PUMPS

SUPPRESSION CHAMBER

NOTE: ALL ITEMS MARKED THUS [A] ARE "AS BUILT" ITEMS AND ARE NOT SHOWN ON PIPING DRAWINGS.

NOTES:

1. INSTRUMENT SENSING LINES UP TO AND INCLUDING THE ROOT VALVES SHALL BE FURNISHED AND INSTALLED UNDER CONTRACT E69-4.
2. FLOOR AND EQUIPMENT DRAIN FITTINGS AND PORTIONS OF EMBEDDED PIPING FURNISHED AND INSTALLED BY OTHERS AS SHOWN ON DRAWINGS 2183, 2184, 2185, 2186 AND 2187.
3. DIFFUSER PIPE IN SUMPS TO BE 2" DIA. ENCIRCLING SUMP. DIFFUSER HOLES TO BE ¼" DIA. APPROXIMATELY 1"O.C.
4. ALL "MS-1" PIPING SYSTEMS SHOWN HEREON SHALL BE CLASS "1N" NUCLEAR CLASSIFICATION.
5. ALL EQUIPMENT DRAINS EXTERIOR TO DRYWELL TO BE FURNISHED WITH LOOP SEALS.
6. ALL VR-1 SYSTEM PIPING INSIDE OF THE DRYWELL IS SUPPORTED TO CLASS IS RESTRAINED CRITERIA.
7. ALL VALVE NUMBERS IN PARENTHESIS ( ) ARE NUMBERS USED IN OPERATING PROCEDURES. THESE NUMBERS ARE ASSIGNED BY NPPD AND WILL NOT BE SHOWN ON PIPING DRAWINGS.
8. 1" PI-1S REACTOR VESSEL FLANGE LOW PRESSURE SEAL LEAK OFF PIPING CONFORMS TO CLASS "1N" REQUIREMENTS FOR MATERIALS, EXPLANATION AND FABRICATION (EXCEPT THAT THREADED JOINTS ARE PERMISSIBLE WITHOUT SEAL WELDING). THIS LINE IS ATMOSPHERIC DRAIN LINE, AND NO HYDROSTATIC TESTING IS REQUIRED.
9. TYPICAL VALVE NUMBERING CODE FOR 10" VACUMN BREAKERS (LOCATED DOWNSTREAM FROM RV 71A THROUGH H) IS 10"V359F.
10. FOR 1A CONNECTION, SEE DETAIL A. TYPICAL FOR MS-71, ARV, 71BRV, 71CRV, 71DRV, 71ERV, 71FRV, 71GRV, 71HRV.
11. INSTRUMENT, SAMPLE, TEST, DRAIN AND VENT LINES ARE NOT ALWAYS THE SAME CLASS AS THE MAIN LINE AND THESE BOUNDARIES ARE TOO NUMEROUS TO IDENTIFY IN THIS MANNER (SEE ISI PROGRAM BOUNDARY DESCRIPTIONS FOR DETAILS).
12. CB IS PRIMARY CONTAINMENT BOUNDARY.
13. WHERE LINES INTERCONNECT AND ARE CONTINUED ON OTHER DRAWINGS, ZONE NUMBERS ARE APPROXIMATE ONLY.

REVISIONS TO THIS DRAWING REQUIRES A REVISION TO THE CORRESPONDING ISOKEY.

FOR PREVIOUS REVISIONS, SEE SUPERSEDED CARDS.

VERSIONS/REVISIONS BY N.P.P.D.

NO.	DESCRIPTION	DFT	DATE	ENG
AB/53	DR-2017-0001	DLR	2/17/17	NEWERNE

454003618
STATUS: Release
STATUS DATE: 02/07/2017
DS APPROVED: NEWERNE
VER: AB REV: 53 SIZE: F

AS BUILT

SIGNIFICANT NUMBER | GROUP | 1 | 2 | 3 | 4 | 5 | 6

DRAWN HFY 9/17/02 | CHECKED | APPROVED | FILMED

COOPER NUCLEAR STATION
FLOW DIAGRAM
REACTOR BUILDING & DRYWELL
EQUIPMENT DRAIN SYSTEM

BURNS & ROE

2028

CARD FILE C0017928

IMBEDDED WEIR PIPE (NOT IN CONTRACT E-69-4)

TO TRS-10-131 ZONE F-8, THIS DRAWING

DRYER SEPARATOR STORAGE POOL

LINER

REACTOR WELL

REACTOR PRESSURE VESSEL

DRYWELL

SUPPRESSION CHAMBER

BELLOWS SEAL

SEE NOTE 4

FUEL STORAGE POOL

SEE NOTE 10

SEE NOTE 4

LINER DRAIN

CONT. ON 2038, ZONE D-10

DIFFUSER CONTROL VALVE

6"V526F-32

6"V526F-31

6"V326F (WC)-1(18CV)

6"V326F (WC)-2(19CV)

SKIMMER DRAINS

SKIMMER SURGE TANK 1A

SKIMMER SURGE TANK 1B

REMOVABLE SPOOL

EQUIPMENT DRAIN CONT. ON 2028, ZONE C-6

CONT. ON 2042, SH.3, ZONE A-3

4"V526F-307

FROM CONDENSATE SUPPLY CONT. ON 2049

TO FUEL POOL CIRC. PUMP 1A ZONE G-3, THIS SHT.

TO FUEL POOL CIRC. PUMP 1B ZONE H-3, THIS SHT.

FOR CONTINUATION SEE THIS SHEET ZONE J-2

FOR CONTINUATION SEE THIS SHEET ZONE H-2

REACTOR WELL DRAIN

DRYWELL TO REACTOR WELL SEAL DRAIN

2" LINER DRAIN

10" SEAL RUPTURE DRAIN

TO EQUIPMENT DRAIN CONT. ON 2028, ZONE C-1

CONT. ON 2038, ZONE D-4

2"V253X-34

4"V123W-35

3"V123W-37

8"V123W-39

8"V323W-1(21-CV)

2"V683XP(135)

8"V423F-38

REACTOR WELL DRAIN VALVE

8"V323W-2 (22CV)

2"V683XP (134)

¾" V686XP VENTS

2" ALTERNATE SUPPLY FOR REACTOR WELL WALL WETTING SYSTEM

2"V253X-40

8"V326F(WC)-1 20CV

8"V126W-30 FUEL STORAGE POOL RECIRC. VALVE

6"V126W-33

REACTOR WELL RECIRC. VALVE

8"V326W-1 (17-CV)

16RV RV-49

(FROM RHR SYSTEM)

(TO RHR SYSTEM)

CONT. ON 2040 SHT. 2 ZONE D-11

AVSPV630

TO EQUIPMENT DRAIN CONT. ON 2028 ZONE C-4

TO EQUIPMENT DRAIN CONT. ON 2028, ZONE C-1

10" FC-2 (TO WASTE SURGE TANK)

CONT. ON 2033 SHT. 1 ZONE A-1

FROM R.W.C.U. SYSTEM CONT. ON 2042 SHT. 3, ZONE B-10

6"630AV 423F

6"V323W-7 (23-CV)

6"CV123W-41

(TO CONDENSER HOTWELL) (VIA TUNNEL)

CONT. ON 2005, SHT. 1 ZONE D-3

FROM TORUS DRAIN CONT. ON 2027, SHT. 1 ZONE G-2

6"V323W-2 (81-CV)

FROM COND. PHASE SEPARATOR CONT. ON 2035 SHT. 4, ZONE G-11

FROM TE-10-94C CONT. ON 2040, SHT. 1 ZONE D-3

FROM LIT-1 ZONE A-6, THIS DRAWING

FROM TE-10-93A CONT. ON 2040, SHT. 1 ZONE G-3

FROM TE-10-94D CONT. ON 2040, SHT. 2 ZONE E-11

FROM TE-10-93B CONT. ON 2040, SHT. 2 ZONE G-11

FROM TE-10-94A CONT. ON 2036, SHT. 1 ZONE B-6

FROM TE-10-94B CONT. ON 2036, SHT. 1 ZONE B-10

REACTOR BLDG. RADWASTE BLDG.

FUEL POOL CIRCULATING PUMP 1A (19-2)

FUEL POOL CIRCULATING PUMP 1B (19-2)

FUEL POOL CIRCULATING PUMP 1D

FUEL POOL CIRCULATING PUMP 1C

FUEL POOL HEAT EXCHANGER 1A

FUEL POOL HEAT EXCHANGER 1B

FUEL POOL HEAT EXCHANGER 1C

RCC CONT. ON 2031 SHT. 3

FROM LSLL 67A ZONE B-10, THIS SHT.

FROM LSLL 67B ZONE B-10, THIS SHT.

FOR CONTINUATION SEE THIS SHEET ZONE B-11

FOR CONTINUATION SEE THIS SHEET ZONE C-11

TO EQUIPMENT DRAIN

CONT. ON 2030 SHT. 2 ZONE B-10

FIG. 2 SEE NOTE 2

NOTES:

1. UNLESS OTHERWISE INDICATED, ALL PRESSURE AND/OR FLOW INSTRUMENT ROOT LINES SHALL BE ¾"; ROOT VALVES SHALL BE ¾"V253X EXCEPT WHERE NOTED. LINE UP TO AND INCLUDING ROOT VALVE SHALL BE FURNISHED & INSTALLED UNDER CONTRACT E-69-4.
2. AT SAMPLING POINTS, CONNECTIONS, PROBES & ROOT VALVES SHALL BE FURNISHED & INSTALLED UNDER CONTRACT E-69-4. PROBES SHALL BE FURNISHED & INSTALLED IN ACCORDANCE WITH CONTRACT PARA. 3.4.2 & DWG. SP-07211 FIG. NUMBER AS NOTED. CONTINUATION OF SAMPLE PIPING BY E-70-3.
3. FOR PORTIONS OF PIPING EMBEDDED AND NOT IN CONTRACT E-69-4, SEE DWG. 2158, 2159 & 2160.
4. DIFFUSER PIPES IN REACTOR WELL AND FUEL STORAGE POOL SHALL EACH BE 6'-0" LONG WITH THREE (3) ½" DIA. DRILLED HOLES AT 45 DEGREES AND 2" O.C.
5. REFUELING DRAINS ARE DESIGNATED AS FOLLOWS:
   A= 2" LINER DRAIN
   B= 4" SEAL RUPTURE DRAIN
   C= 2" DRYWELL TO REACTOR WELL SEAL DRAIN
   D= 6" REACTOR WELL DRAIN
   E= 3" GATE DRAIN
   F= 2" FUEL POOL SUMP DRAIN
   G= 2" DRYER SEPARATOR STORAGE POOL LINER DRAIN
   H= 4" DRYER SEPARATOR STORAGE POOL DRAIN
6. LOCATE CONTINOUS DRAIN CONNECTION FROM LINE 10"FC-2 AT LEAST 8 FEET ABOVE FIS-64-SIMILAR ARR'GT REQ'D FOR FIS-63.
7. HIGH POINT VENTS AND LOW POINT DRAINS ARE NOT SHOWN. CONNECTIONS, VALVES AND PIPING SHALL BE FURNISHED UNDER CONTRACT E-69-4.
8. ARRANGE PIPE BREAK FLANGES ON FUEL POOL F/D TO PERMIT REMOVAL FROM FLOOR ABOVE WITHOUT ENTERING CELL.
9. ALL VALVE NUMBERS IN PARENTHESIS ( ) ARE NUMBERS TO BE USED IN OPERATING PROCEDURES. THESE NUMBERS ARE ASSIGNED BY NPPD AND WILL NOT BE SHOWN ON PIPING DRAWINGS.
10. SYPHON BREAKERS AT EL. 996'-10" – (3) 7/16" HOLES AT 45°.
11. WHERE LINES ARE INTERCONNECTED AND CONTINUED ON OTHER DRAWINGS, ZONE NUMBERS ARE APPROXIMATE ONLY.

NOTE: ALL ITEMS MARKED [A] ARE "AS BUILT" ITEMS AND ARE NOT SHOWN ON PIPING DRAWINGS.

REVISIONS TO THIS DRAWING REQUIRES A REVISION TO THE CORRESPONDING ISOKEY.

AS BUILT
454003620
STATUS: Release
STATUS DATE: 10/28/2015
DS APPROVED: DJBUTLE
VER: AB REV: 33 SIZE: E

FOR PREVIOUS REVISIONS, SEE SUPERSEDED CARDS.

VERSIONS/REVISIONS BY N.P.P.D.			
NO.	DESCRIPTION	DFT DATE	ENG
AB/33	DIR-2014-0213	DLR 10/28/15	RDCHAMP

SIGNIFICANT NUMBER							
GROUP	1	2	3	4	5	6	

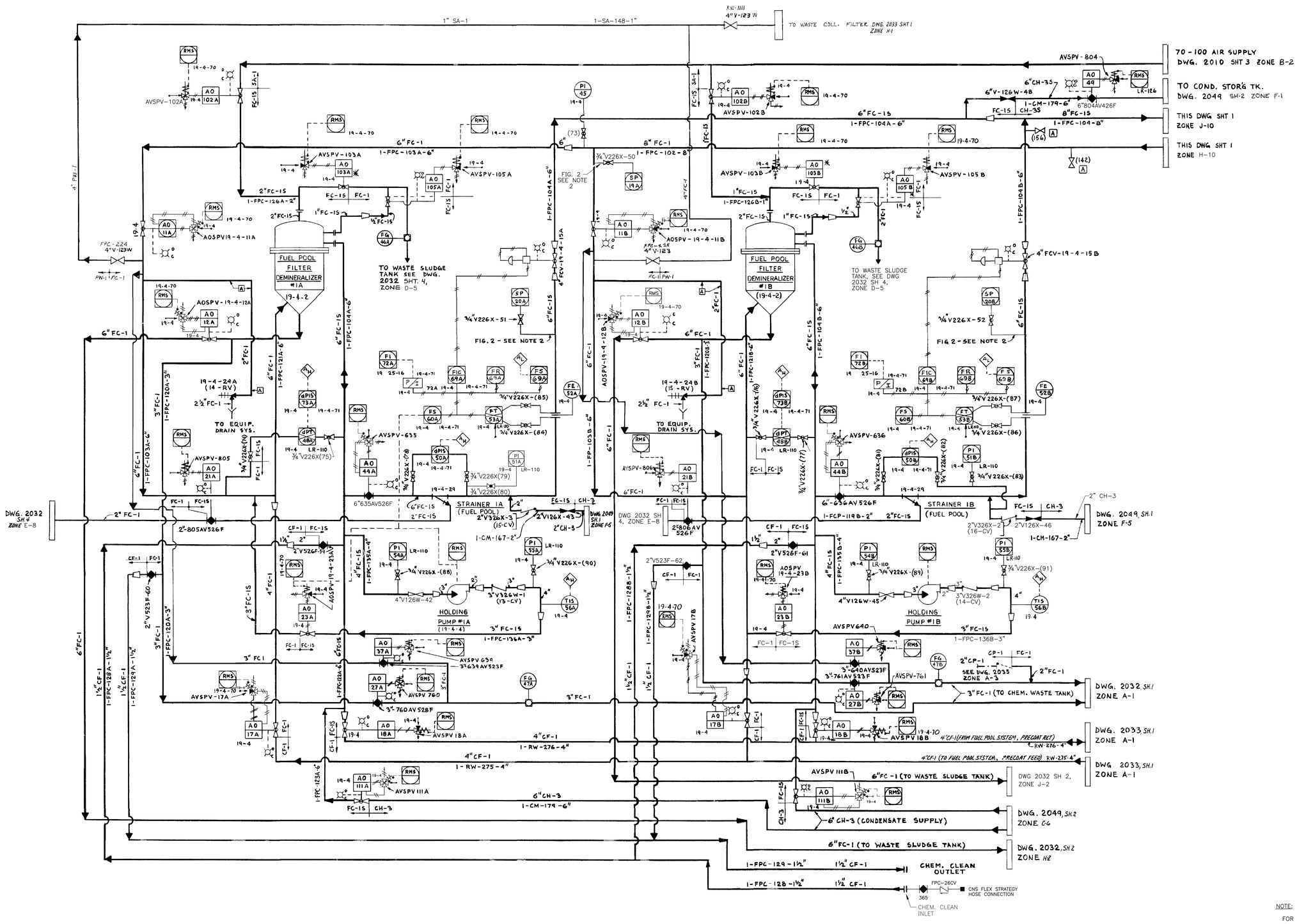
DRAWN	RAC	DATE 1/15/01
CHECKED		DATE
APPROVED SEE SUPERSEDED CARDS		DATE
FILMED		

COOPER NUCLEAR STATION
FLOW DIAGRAM
FUEL POOL COOLING AND CLEAN-UP SYSTEM

BURNS & ROE

2030 SH 1

CARD FILE C0017930



NOTE:

FOR NOTES SEE THIS DWG. SHT. 1.

AS BUILT
454003621

STATUS: Release
STATUS DATE: 01/11/2016
DS APPROVED: KKKUKER
VER: AB REV: 16 SIZE: F

REVISIONS TO THIS DRAWING REQUIRES A REVISION TO THE CORRESPONDING ISOKEY.

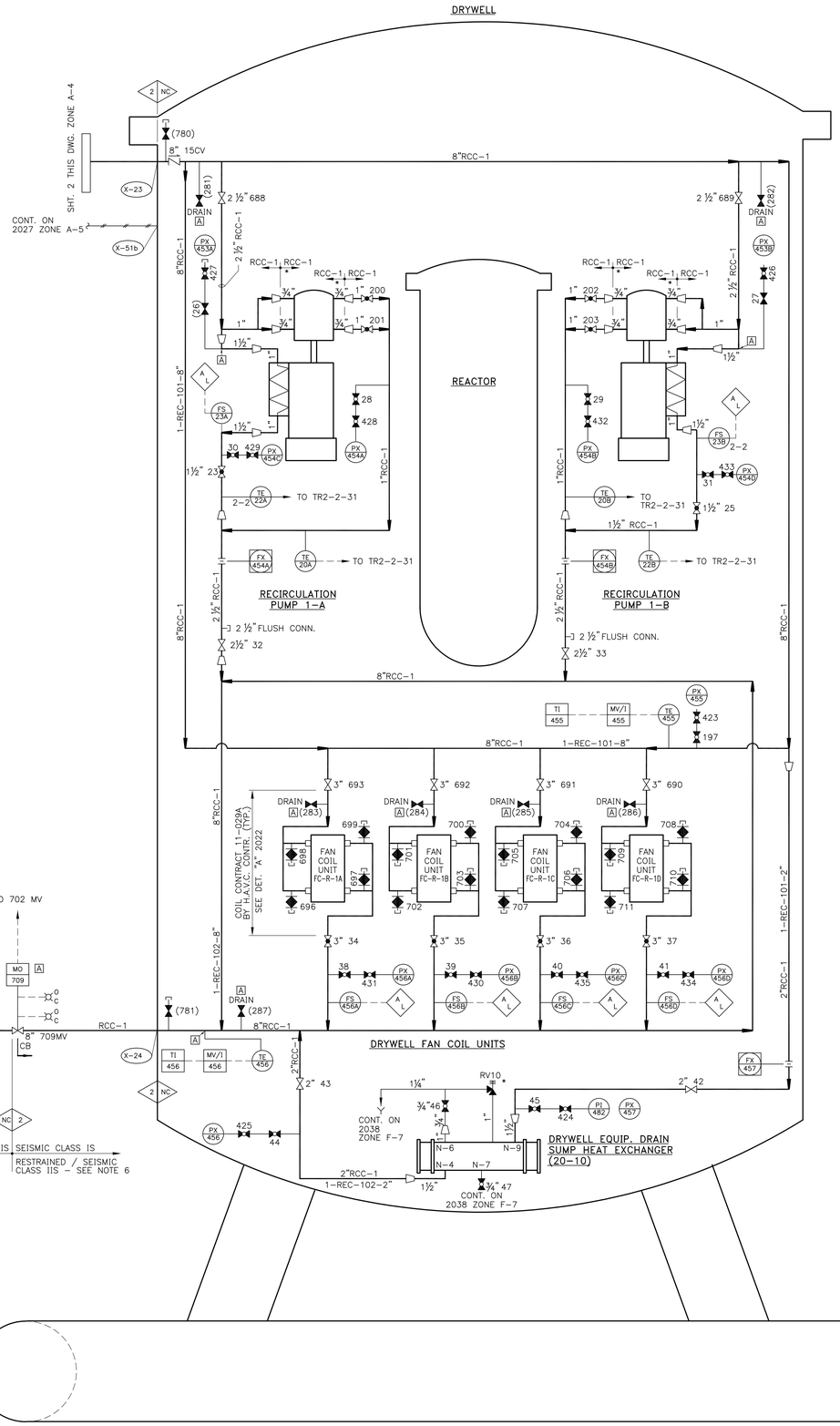
FOR PREVIOUS REVISIONS, SEE SUPERSEDED CARDS.

VERSIONS/REVISIONS BY N.P.P.D.

NO.	DESCRIPTION	DFT	DATE	ENG
AB/16	DR-2015-0141	DJB	01/11/16	KKKUKER

SIGNIFICANT NUMBER							
GROUP	1	2	3	4	5	6	

DRAWN DJF	DATE 5/30/02	COOPER NUCLEAR STATION FLOW DIAGRAM FUEL POOL COOLING AND CLEAN-UP SYSTEM	BURNS & ROE
CHECKED	DATE		
APPROVED SEE SUPERSEDED CARDS	DATE		
FILMED		2030 SH 2	CARD FILE: C0017916



NOTES:

1. UNLESS OTHERWISE INDICATED ALL PRESSURE AND/OR FLOW INSTRUMENT ROOT VALVES SHALL BE 3/4"; ROOT VALVES FOR CARBON STEEL SYSTEMS SHALL BE 3/4"V253X. ROOT VALVES FOR STAINLESS STEEL SYSTEMS SHALL BE 3/4"V226X. LINE UP TO AND INCLUDING ROOT VALVES SHALL BE FURNISHED AND INSTALLED UNDER CONTRACT E-69-4.
2. ALL TEMPERATURE TEST AND PROTECTING WELL PENETRATIONS SHALL BE 1"NPT UNLESS OTHERWISE NOTED.
3. AT SAMPLE POINTS, CONNECTIONS, PROBES AND ROOT VALVES SHALL BE FURNISTHED AND INSTALLED UNDER CONTRACT E-69-4. PROBES SHALL BE FURNISHED AND INSTALLED IN ACCORDANCE WITH CONTRACT PARA. 3.4.2 AND DWG. SP-07211, FIG. NUMBER AS NOTED. CONTINUATION OF SAMPLE PIPING BY E-70-3.
4. HIGH POINT VENTS AND LOW POINT DRAINS NOT SHOWN AND SHALL BE SUPPLIED BY CONTRACT E-69-4.
5. * INDICATES SUPPLIED BY EQUIPMENT VENDOR.
6. RCC-1 SYSTEM PIPING 8" SIZE AND LARGER INSIDE OF THE DRYWELL ARE SUPPORTED FOR CLASS IS RESTRAINED CRITERIA.
7. ALL VALVE NUMBERS IN PARENTHESIS ( ) ARE NUMBERS TO BE USED IN OPERATING PROCEDURES. THESE NUMBERS ARE ASSIGNED BY NPPD AND WILL NOT BE SHOWN ON PIPING DRAWINGS.
8. ALL VALVES ARE IN THE REC SYSTEM UNLESS OTHERWISE DESIGNATED.
9. INSTRUMENT, SAMPLE, TEST, DRAIN AND VENT LINES ARE NOT ALWAYS THE SAME CLASS AS THE MAIN LINE AND THESE BOUNDARIES ARE TOO NUMEROUS TO IDENTIFY IN THIS MANNER. (SEE ISI PROGRAM BOUNDARY DESCRIPTIONS FOR DETAILS)
10. CB IS PRIMARY CONTAINMENT BOUNDRY.
11. WHERE LINES ARE INTERCONNECTED AND CONTINUED ON OTHER DRAWINGS, ZONE NUMBERS ARE APPROXIMATE ONLY.

NOTE: ALL ITEMS MARKED THUS [A] ARE "AS-BUILT" ITEMS AND ARE NOT SHOWN ON PIPING DRAWINGS.

REVISIONS TO THIS DRAWING REQUIRES A REVISION TO THE CORRESPONDING ISOKEY.

AS BUILT
454003622
STATUS: Release
STATUS DATE: 10/21/2016
DS APPROVED: KKKUKER
VER: AE REV: 24 SIZE: F

FOR PREVIOUS REVISIONS, SEE SUPERSEDED CARDS.

VERSIONS/REVISIONS BY N.P.P.D.

NO.	DESCRIPTION	DFT	DATE	ENG
AD/23	DR-2013-0598 (FROM VERSION AB)	DJB	10/18/14	KKKUKER
AE/24	DR-2013-0598 (FROM VERSION AC)	PAM	10/21/16	KKKUKER

SIGNIFICANT NUMBER | GROUP | 1 | 2 | 3 | 4 | 5 | 6

COOPER NUCLEAR STATION
FLOW DIAGRAM
REACTOR BUILDING
CLOSED COOLING WATER SYSTEM

DRAWN | DATE
CHECKED | DATE
APPROVED SEE SUPERSEDED CARDS | DATE
FILMED

BURNS & ROE

2031 SH 1

CADD FILE: C0017931

DRYWELL SUPPLY HEADER

REACTOR BLDG. CLOSED COOLING WATER HEAT EXCHANGER HX-B

REACTOR BLDG. CLOSED COOLING WATER HEAT EXCHANGER HX-A

REACTOR BLDG. CLOSED COOLING WATER PUMPS

RESIDUAL HEAT REMOVAL PUMPS

CLOSED COOLING WATER SURGE TANK TK-ST

FAN COIL UNITS N.I.C. E-69-4

FAN COIL UNITS N.I.C. E-69-4

CRITICAL SERVICE RETURN HEADERS

SAMPLE RACK 1-C DETAIL III

NOTES:

1. FOR NOTES SEE THIS DWG. SH. 1
2. △'S WHERE SHOWN WITH NUMBERS REPRESENT POINTS OF CONNECTION TO EXISTING SYSTEMS. E-73-58 SPECIFICATION DEFINES WORK FROM THIS POINT.
3. ALL VALVES ARE IN THE REACTOR EQUIPMENT COOLING SYSTEM (REC) UNLESS DESIGNATED OTHERWISE.
4. REFERENCE BURNS AND ROE DWG. M151 SH.15 FOR SAMPLE PIPING AND VALVE INSTALLATION AT SAMPLE RACK SR-1C.
5. REC-V-19 AND REC-V-21 SHALL BE CLOSED WHEN BOTH REC HEAT EXCHANGERS ARE IN SERVICE AND OPEN OTHERWISE.
6. INSTRUMENT, SAMPLE TEST, DRIAN, AND VENT LINES ARE NOT ALWAYS THE SAME CLASS AS THE MAIN LINE AND THESE BOUNDRIES ARE TOO NUMEROUS TO INDENTIFY IN THIS MANNER (SEE ISI PROGRAM BOUNDRY DESCRIPTIONS FOR DETAILS).
7. CB IS PRIMARY CONTAINMENT BOUNDRY.
8. RHR MECHANICAL SEAL COOLERS WITH MECHANICAL CYCLONE SEPERATORS. CIC'S AS FOLLOWS:

PUMP:	SEAL COOLER:	CYCLONE:
A	RHR-HX-PA	RHR-CYLN-PA
B	RHR-HX-PB	RHR-CYLN-PB
C	RHR-HX-PC	RHR-CYLN-PC
D	RHR-HX-PD	RHR-CYLN-PD

9. WHERE LINES ARE INTERCONNECTED AND CONTINUED ON OTHER DRAWINGS, ZONE NUMBERS ARE APPROXIMATE ONLY.

AS BUILT
454003623
CADD DRAWING
DO NOT REVISE MANUALLY

REVISIONS TO THIS DRAWING REQUIRES A REVISION TO THE CORRESPONDING ISOKEY.

FOR PREVIOUS REVISIONS, SEE SUPERSEDED CARDS.

REVISIONS BY N.P.P.D.

NO.	REVISIONS	DFT	CKD	APP	DATE
N63	CED 6008243 (DCN 02-0298)	DLR	DLR	KG	7/7/03
N64	CED 6018821 (DCN 05-0666)	RQA	DLR	KG	8/26/05
N65	CED 6028000 (DCN 08-1437)	KG	DJB	DLR	7/13/09

SIGNIFICANT NUMBER | GROUP

DRAWN | DATE
CHECKED | DATE
APPROVED | DATE
SEE SUPERSEDED CARDS
FILMED

FLOW DIAGRAM
REACTOR BUILDING – CLOSED COOLING WATER SYSTEM
COOPER NUCLEAR STATION

BURNS & ROE

2031 SH 2 | REVISION N65

CARD FILE C0017987

CLOSED COOLING WATER SURGE TANK
TK-ST

FUEL POOL HEAT EXCHANGER 1C

FCU ADHR

CONDENSATE PAN DRAIN

INS TUBING FC-1S

INS TUBING FC-1S

TO EQUIPMENT DRAIN

FROM FPC-17RV DWG 2030, SH.3

CONT. ON SHT. 2 THIS DWG. ZONE B-2

TO SAMPLE RACK 1-C SEE DETAIL III SHT. 2 ZONE B-8

NON-CRITICAL SERVICE SUPPLY HEADER

10"RCC-1

1-REC-103-10"

1-REC-127-6"

6"RCC-1

REACTOR WATER CLEAN-UP RECIRCULATING PUMPS

P-A

P-B

PUMP 1-A INTERLOCK

PUMP 1-B INTERLOCK

BEARING COOLER

STUFFING BOX JACKET COOLER

TO FLOOR DRAINS

PUMP HEAT EXCHANGER

PUMP, RCC-1 MFR.

1-REC-105-8"

8"RCC-1

1-REC-125-1¼"

1-REC-131-1½"

1-REC-123-1¼"

1¼"RCC-1

1½"RCC-1

NON-REGENERATIVE HEAT EXCHANGER

NON-REGENERATIVE HEAT EXCHANGER

SEE DWG. 2028 ZONE D-5

SEE NOTE 3 FIG. 2

TEMPORARY LINE TO CHEM. CLEANING TK.

2" CAP AFTER PRE-OPER FLUSH

NOT IN CONTRACT E-69-4 WITHIN RWCU SAMPLE RACK 25-32

SCLR-(25-32) SAMPLE COOLER

FIG. 2 SEE NOTE 3

DRYWELL RETURN HDR.

SHT. 1 THIS DWG. ZONE G-3

AVSPV-710

RWCW PUMP INTERLOCK

DRAIN (362)

1-REC-102-8"

1-REC-104-8"

1-REC-106-8"

1-REC-102-12"

12"RCC-1

1½" FUTURE CONN.

FUEL POOL HEAT EXCHANGER 1-A

FUEL POOL HEAT EXCHANGER 1-B

DRAIN SEE DWG. 2028 ZONE C-1

THROTTLED

SEE NOTE 6

SEE NOTE 4

AVSPV701

8" 701AV

FROM M-G SET STARTERS

MG SET 1-A (OIL SYS.) HEAT EXCHANGER

MG SET 1-B (OIL SYS.) HEAT EXCHANGER

FLOOR DRAIN SEE DWG 2038, SHT 1, ZONE E-3

CHEMICAL METERING PUMP

R.B.C.C. CHEMICAL ADDITION TANK TK-CAT

1"DW-IS SUPPLY CONT. ON 2029 ZONE E-4

½"-DW SUPPLY CONT. ON 2029 ZONE E-4 DW-156

½"CF-IS 1-DW-125-½"

P-CMP

STNR-CMP

CONT. ON 2038 ZONE D-9

1-REC-138-½"

½"CF-IS

1"CF-IS

CONDENSATE HOLDING PUMPS

P-HA P-HB P-HC P-HD P-HE P-HF

STNR-CHPA STNR-CHPB STNR-CHPC STNR-CHPD STNR-CHPE STNR-CHPF

SSV5039 SSV5040 SSV5041 SSV5042 SSV5043 SSV5044

CONT. ON 2007 ZONE J-5

1-REC-120-3"

1-REC-121-2"

2"RCC-1 SUPPLY

2"RCC-1 RETURN

1-REC-122-2"

REACTOR BLDG. WALL

PAS SAMPLE COOLERS

SCLR-1 SCLR-2 SCLR-3

REC-681

REC-711AV

NOTE 3 (THIS DWG.)

REC-674

CP-R-A1 CP-R-A2

1-REC-119-4"

1-REC-134-1"

1-REC-134-2½"

1-REC-136-2"

2"RCC-1

2½"RCC-1

REACTOR BLDG. EQUIP. DRAIN SUMP HEAT EXCHANGER (2C-B)

TO SUMP 1E

TO SUMP 1E

SEE NOTE 2

8"FLGD. FLUSHING CONNECTION

DWG 2031, SHEET 2 ZONE H-2

FROM SAMPLE RACK 1-C SEE DETAIL III SHT. 2 ZONE A-9

CONTROL ROD DRIVE HYDRAULIC PUMPS

PIPING BY PUMP MFR.

THROTTLED

1" TO DRAIN SEE DWG. 2028 ZONE G-6

TO DRAIN SEE DWG. 2038 ZONE G-8

1"-DW-IS CONT. ON 2029 ZONE H-1

SAMPLE PUMP

P-RECEM

TO RR-353 DWG. 2006, SH.3 ZONE F-11

1-REC-133-2½" 2½"RCC-1

1-REC-135-2"

2"RCC-1

DW-IS RCC

NON-CRITICAL SERVICE RETURN HEADER

NOTES:

1. FOR NOTES SEE THIS DWG. SHT. 1.
   △'s WHERE SHOWN WITH NUMBERS REPRESENTS POINTS OF CONNECTION TO EXISTING SYSTEMS. E-73-58 SPECIFICATION DEFINES WORK FROM THIS POINT.
3. SAMPLE COOLER DETAIL SEE S & W DWG. NO. 13095-12-FSK-1.
4. REF. BURNS AND ROE DWG. M151, SHT. 15 FOR SAMPLE PIPING AND VALVE INSTALLATION AT SAMPLE RACK SRI-C.
5. WHERE LINES ARE INTERCONNECTED AND CONTINUED ON OTHER DRAWINGS, ZONE NUMBERS ARE APPROXIMATE ONLY.
6. ABANDONED IN PLACE.

REVISIONS TO THIS DRAWING REQUIRES A REVISION TO THE CORRESPONDING ISOKEY.

AS BUILT

454003624

STATUS: Release
STATUS DATE: 09/14/2017
DS APPROVED: TCMULLI
VER: AB REV: 34 SIZE: E

FOR PREVIOUS REVISIONS, SEE SUPERSEDED CARDS.

VERSIONS/REVISIONS BY N.P.P.D.			
NO.	DESCRIPTION	DFT DATE	ENG
AC/32	DR-2013-0813	DLR12/22/14	KKKUCER
AD/33	DR-2015-0412	DLR1/9/16	TJSUNDLE
AB/34	DR-2014-0692	DJB09/14/17	TCMULLI

SIGNIFICANT NUMBER | GROUP 1 2 3 4 5 6

COOPER NUCLEAR STATION
FLOW DIAGRAM
REACTOR BUILDING – CLOSED COOLING WATER SYSTEM

DRAWN | DATE
CHECKED | DATE
APPROVED | DATE
SEE SUPERSEDED CARDS

BURNS & ROE

FILMED

2031 SH 3

CARD FILE: C00017988

DWG. 2035 SHT.4 ZONE F-11 — 1"CP-1 (FROM CONDENSATE PHASE SEPARATORS)
DWG. 2030 SHT.2 ZONE F-9 — 3"FC-1 (FROM FUEL POOL FILTER/DEM — 1-FPC-120A-3", 1-FPC-120B-3"
DWG. 2017
DWG. 2038 ZONE G-1 — 1½"MW-2S (SAMPLE RACK 1E SINK B & PHE-16A)
DWG. 2042 SHT.3 ZONE H-10 — 3"MW-2S (REACTOR BLDG. DECONT. STATION DRAINS) 1-RW-155-3"
DWG. 2035 SHT.4 ZONE H-11 — 3"CU-2 (DRAINS FROM RWCU PRECOAT TK.) 1-RWCU-110-3"
DWG. 2033 SHT.3 ZONE C-5 — 2"CF-1 (FROM COND. PRECOAT TK.) 1-CF-114-2"
2"CF-1 (FROM WASTE PRECOAT TK.) 1-RW-166-2"

1-CF-130-1" 1"CP-1 2"PW-1 1-RW-239-2" 1-RW-198-4" 3"CU-2 FROM UNIT 2 DRAINS FROM RWCU PRECOAT TK. FROM UNIT 2 REACTOR BLDG. DECON STATION 3"MW-1S FROM CHEMICAL WASTE SUMP DWG. 2080 ZONE B-6 SEE NOTE 8 FLG'D SPOOL PIECE 1-RW-195-4" 4"PV-1 3"MW-2S 4"CF-1 3"FC-1 FROM FUTURE COND. & FUEL POOL F/D SYSTEM

AVSPV-441 VENT RMS AO 285 RO 472 A VENT (188) 2"441AV126X

CONT. ON 2017 ZONE G-7 3"MW-2S DRAINS FROM RADWASTE DECON. STATION NOT IN CONTRACT E-69-4 FIC 473 IA-V-2003 IA-V-1992 3"MW-1 FROM CONCEN. FEED TK. DWG. 2079 SHT. 2 ZONE C-1

SEE NOTE B 10 LT 473 20 ES 20-545J A H LRS 474 20 25-17 1-RW-193-2" TANK RECIRCULATION

CHEMICAL WASTE TK. DIFFUSER F K JO/D F C 2" H RO G BR 1C 6" 6" 1-DW-154-2" 2"DW-1S CONT. ON 2013 4"MW-2

2"V126X-(140) 1-RW-201-2" 2"MW-2 MW-1S MW-2 3"MW-1S 1-RW-191-3" 3"V126W-(141) (186) (422) PX 496A S-115 1¼"V126S-(142) 2½" CHEMICAL WASTE PUMP

2"V226S-(145) 2"MW-1S 2"V326X-1(10CV) 1" FIG.3 SEE NOTE 4 ¾" ¾"V226X-(144) PX 496B (423) (187) SP 16A 1-RW-192-¾" ¾"MW-1S ¾"V126X-(143) MW-1S MW-2 1-RW-190-4" 1-RW-195-4" TO RADWASTE FLOOR DRAIN SUMP

VENT AVSPV440 AO 865 2"440AV126X MW-1 MW-1S PHE 16A PHA 16 PHR 16 FROM PHE 16B SHT.2 ZONE D-9 THIS DWG. RMS 1-RW-193-2"

EDUCTOR 1"CF-1 TO CONDENSATE F/D PRECOAT TANK. SEE DWG. 2035 SHT.2 ZONE C-4 FILTER AID DUST EVACUATOR 20-65 FILTER AID AGITATOR (20-70) MS MS TO TDS-20-397 DWG. 2033 SHT.1 ZONE C-7 TO FLOOR DRAIN COLLECTOR PUMP

COND. SUPPLY CONT. ON 2049 ZONE F-7 WASTE FILTER AID TANK (20-20) A H LIS 399 RW-V-1249 IA-1744 FIC 398 TDS 400 20 25-10 RMS FROM LS-20-421 SHT. 2, ZONE F-3 TO FRC-20-432 &AVSPV-20-211 ZONE D-10 THIS SHT.

2"CF-1 1-RW-183-2" 2"CF-1 2"V153X(132) 1-RW-178-2" TO RADWASTE EQUIP. DRAIN SUMP 1"CF-1 TO WASTE FILTER AID PUMP SEE DWG. 2033 SHT.1 ZONE C-8. FOR ALTERNATE DRUM FILL 1½" MW-1 1½" V253X-(170) TO CONCENTRATOR FEED TK. DWG. 2079 SHT. 2, ZONE B-1 2" V153X-1447 (595) 2"MW-1 70 SEE NOTE 8 2"V153X(169) 1-RW-193-2"

1"V526F(130) ½" V326X-(2) (11CV) TMR 402 20 25-11 CYCLE TIMER AO 165 VENT ½"CF-1S 1-RW-181-½" ¼" CONT. ON 2049 SHT.1 ZONE G-7 ½"CH-3 CF-1S CH-3 FLOOR DRAIN FILTER AID PUMP (20-22) ¼" CF-1S FDR-1 1-RW-182-½" ½" V526F-(131) (10RV) *

CONT. ON SHT.2 ZONE G-2 THIS DWG. FROM FRC-20-432 ZONE E-10 THIS SHT. (CHEMICAL DRAIN) 2"FDR-1 1-RW-185-2" 4"FDR-1 1-RW-171-4" 1-RW-195-4" 1"FDR-2 RV-30 11RV TO FLOOR DRAIN SYSTEM

PI 423 20 25-11 (190) 3" 1-RW-188-2½" 2½" FDR-1 2½" V123W-(121) FLOOR DRAIN FILTER HOLDING PUMP (20-31) 1½" 1-RW-189-2 2"V353X-57(13CV) RMS X AOSPV-20-206 VENT AO 206 20 PI 427 20 25-11 (191) 2"FDR-1 1"FDR-1 1-RW-186-1" FG 429 SEE NOTE 8 37 1" 1"V523X(B) 1518(602) 2"V153X-(122) TO RADWASTE FLOOR DRAIN SUMP 1"V353X-1520(14CV) HTG. STM 1"AS-4 DWG 2012 SHT 1 ZONE E-1 AS-4 FDR-1 SA-1 FDR-1 1" SEE NOTE 8 38 1"V523X(B) 1519(601) FILTERED AIR 1"SA-1 DWG 2010 SHT 3 ZONE B-5

AOSPV-20-202 VENT RMS X AO 202 20 (189) AO 201 20 ½"V353X 1" RMS X AOSPV-20-201 VENT (214) DPT 425 20 25-11 PI 509 20 25-11 dPIS 466 A H E/S 20-545D 3"FDR-1

MATCH LINE SEE DWG.2032 SHT.2

1"CP-1 3"CF-1 2"PW-1 1½"MW-1 3"PV-1 2"PV-1 1-RW-203-1½" 3"MW-2 3"CF-1 2"DW-1S 3"MW-2 4"CF-1 1-RW-205B-3" MATCH LINE DWG.2032 SHT.3

SEE NOTE 10 UNIT 2 CASK CLEANING AREA (1119) BLIND FLANGE 3"MW-2, 1-RW-318-3", FROM HOT TOOL STORAGE ROOM, CONT. ON 2017 ZONE J-7

VENT AVSPV-445 AO 184A RMS 1½"445AV153x 1-RW-203-1½" VENT AVSPV-446 AO 184B RMS 1½"446AV153X

VENT AVSPV-443 AO 183A RMS 3"443AV123W NOT IN CONTRACT E-69-4 VENT AVSPV-444 AO 183B RMS 3"444AV-123W 2"PV-1 NOT IN CONTRACT E-69-4

CONT. ON 2013 ZONE G-10 2"DW-1S C C DIFFUSER B B LAUNDRY DRAIN TANK No. 1A (206) LT 413A 20 A H LRS 415 20 25-17 A L E/S-20-545E E/B-20-545E LT 413B 20 (207) CONT. ON 2013 ZONE G-10 2"DW-1S C C DIFFUSER B B LAUNDRY DRAIN TANK No. 1B

3"V153X(146) 1½"V153X(147) 2" 2"MW-1 1-RW-288A-1½" 1-RW-205A-3" 1-RW-288B-1½" 2"V153X(151) 3"MW-2 MW-2 MW-1 1-RW-202A-2 PX 497A (193) DUPLEX STRAINER (194) PI 416A (195) ½"MW-1 2"V153X-(152) (196) PX 498A (197) PI 416B (198) ½"MW-1 2 ½" 1" 1½"V323F(14CV) LAUNDRY DRAIN PUMP No. 1A LAUNDRY DRAIN PUMP No. 1B

1-RW-206A-¾" ¾" V153X(149) TO RADWASTE FLR. DRAIN SUMP 1-RW-201B-¾" ¾" V153X(154) 1½"V153X(150) 1½"V153X(155) 1½" MW-1 1-RW-203A-1 ½" 1-RW-203B-1½"

AOSPV-20-211 VENT RMS X FROM TDS 20-400 ZONE G-4 THIS SHT. E/P-20-200 P/E FRC 432 20 A L 25-17 E/S-20-545D FT 431 20 AO 211 20 ECV 200 20 TO AOSPV-20-201 ZONE G-5 SP 25 ¾"V226X(116) FIG. 3 SEE NOTE 4 4"FDR-1 2" 3" 1-RW-172-3" 3"V323W-12(17CV) FE 430 20 RW-V-185 16 SEE NOTE 8 2"V153X-1552(603) FROM DISTILLATE TK. DWG. 2079 SHT.1 ZONE H-5 1-RW-172-4"

2"V153X-1334(599) 2"FDR-1 TO CONCENTRATOR FEED TANK DWG 2079 SHT 2 ZONE A-1 2"V153X-1333(598) 2"FDR-1 TO FLOOR DRAIN DEMINERALIZER DWG 2079 SHT. 1 ZONE F-1 74 SEE NOTE 8 74 SEE NOTE 8 3"V123W-1548(600) FDR-1 PW-1 3"V123W-118

VENT AOSPV-20-205 AO 205 RMS X FG 426 2"PV-1 2"V153(117) (205) A VENT

1"RW-1 1"332-1-(76CV) AO 210 VENT AVSPV-20-210 RMS FOR CONT OF 100 PSI AIR SUPPLY SEE DWG 2010, SHT.3 ZONE B-4 FG 508 (215) FLOOR DRAIN FILTER (20-30) 2"V153X-1340(597) 2" FLANGED FLUSH CONN. 2"FDR-1 75 SEE NOTE 8 FROM FLOOR DRAIN DEMINERALIZER DWG. 2079 SHT.1, ZONE G-1

VENT AOSPV-20-171 AO 171 20 RMS X 3"CF-1 3"V323W-11 (16CV) FDR-1 CF-1 VENT AOSPV-20-209 AO 209 20 RMS X 2"FDR-1

CONT. ON DWG.2033 SHT1 ZONE F-1 4"FDR-1 34 SEE NOTE 8 43 SEE NOTE 8 4"V123W-1721(596) 1-RW-184-6" 6"FDR-1

NOTES:

1. SYMBOL ------ X DENOTES BACKWASH TIMER CONTROL
2. UNLESS OTHERWISE INDICATED ALL PRESSURE AND/OR FLOW INSTRUMENT ROOT VALVES SHALL BE 3/4", ROOT VALVES FOR CARBON STEEL SYSTEMS SHALL BE 3/4"V253X, ROOT VALVES FOR STAINLESS STEEL SYSTEMS SHALL BE 3/4" V226X LINE UP TO AND INCLUDING ROOT VALVES SHALL BE FURNISHED AND IN-STALLED UNDER CONTRACT E-69-4.
3. ALL TEMPERATURE TEST & PROTECTION WELL PENETRATIONS SHALL BE 1" NPT UNLESS THERWISE NOTED.
4. AT SAMPLING POINTS, CONNECTIONS, PROBES AND ROOT VALVES SHALL BE FURNISHED AND INSTALLED UNDER CONTRACT E-69-4. PROBES SHALL BE FURNISHED AND INSTALLED IN ACCORDANCE WITH CONTRACT PARA 3.4.2 AND DWG. SP-07211, FIG. NUMBER AS NOTED. CONTINUATION OF SAMPLE PIPING BY E-70-3
5. HIGH POINT VENTS AND LOW POINT DRAINS NOT SHOWN.
6. ALL PIPING FROM SHIELDED TANKS TO FIRST SHUT OFF VALVE SHALL BE SUITABLY SUPPORTED TO WITH-STAND A CLASS I SEISMIC EARTH-QUAKE.
7. ALL VALVE NUMBERS IN PARENTHESIS ( ) ARE NUMBERS TO BE USED IN OPERATING PROCEDURES, THESE NUMBERS ARE ASSIGNED BY NPPD AND WILL NOT BE SHOWN ON PIPING DRAWINGS.
8. △ 'S WHERE SHOWN WITH NUMBERS REPRESENT POINTS OF CONNECTION TO EXISTING SYSTEMS. E-73-58 SPECIFI-CATION DEFINES WORK FROM THIS POINT.
9. WHERE LINES ARE INTERCONNECTED AND CONTINUED ON OTHER DRAWINGS, ZONE NUMBERS ARE APPROXIMATE ONLY.
10. EQUIPMENT ABANDONED IN PLACE.

REVISIONS TO THIS DRAWING REQUIRES A REVISION TO THE CORRESPONDING ISOKEY.

NOTE: ALL ITEMS MARKED THUS A ARE "AS-BUILT" ITEMS AND ARE NOT SHOWN ON PIPING DRAWINGS.

AS BUILT

454003625

STATUS: Release
STATUS DATE: 08/04/2015
DS APPROVED: GEHORN
VER: AB REV: 32 SIZE: F

FOR PREVIOUS REVISIONS, SEE SUPERSEDED CARDS.

VERSIONS/REVISIONS BY N.P.P.D.

NO.	DESCRIPTION	DFT	DATE	ENG
AB/32	DR-2013-0599 (DCN 13-2083)	DLR	8/4/15	GEHORN

SIGNIFICANT NUMBER | GROUP 1 2 3 4 5 6

DRAWN DATE | CHECKED DATE | APPROVED DATE SEE SUPERSEDED CARDS | FILMED

COOPER NUCLEAR STATION
FLOW DIAGRAM
HIGH CONDUCTIVITY (FLOOR DRAINS CHEMICAL AND LAUNDRY WASTE) PROCESS

BURNS & ROE

2032 SH 1

CODE NO. C0017932

MATCH LINE
SEE DWG.2032 SHT.1

AVSPV-1339
AO 177A
RMS
1-RW-193-2
2"MW-1
2"1330AV153X
AVSPV-1330
AO 177B
MW-1 FDR-1
87 SEE NOTE 8
2"1339AV153X

VENT A (160)
DWG. 2033 SHT. 2 ZONE C-1
4"RH-3
1-RHR-113-4
DWG. 2038 SHT. 1 ZONE G-1
4"FDR-1 (REAC. BLDG. FLR. DRAIN SUMP 1C & 1D) 1-RW-139-4
DWG. 2038 SHT. 1 ZONE H-1
4"FDR-1 (REAC. BLDG. FLR. DRAIN SUMP 1A & 1B) 1-RW-150-4
REACTOR BLDG 4"FDR-1 UNIT 2
435
REACTOR BLDG 4"FDR-1 UNIT 2
436
DWG. 2032 SHT. 4 ZONE C-12
3"PW-1 CENTRIFUGE EFFLUENT 1-RW-215-3
434
DRYWELL 3"FDR-1 UNIT 2
DWG. 2038 SHT. 1 ZONE G-1
3"FDR-1 (REAC. DRYWELL FLR. DRAIN SUMP) 1-RW-152-3
DWG. 2005 SHT. 2 ZONE H-4
4"FDR-1 (TURB. BLDG. FLR. DRAIN SUMP) 1-RW-164-4
DWG. 2038 SHT. 1 ZONE J-1
3"FDR-1 (ELEV. RELEASE POINT SUMP) 1-RW-163-3
RW-V-1308
CONT. ON DWG. 2033 SHT. 2 ZONE C-5
1½"PS-4 (FROM SAMPLE RACK 1E SINK C)
DWG. 2017 ZONE G-12
3"FDR-1 (FROM RADWASTE SUMP 1K) 1-RW-316-3
DWG. 2017 ZONE G-12
3"FDR-1 (FROM RADWASTE SUMP 111) 1-RW-302-3

C A C C E B H B B B P P P P B B E Q H D F

3"FDR-1
1-RW-319-3
FROM FLOOR DRAIN SUMP "A-A" DWG. 2080 ZONE G-1
FIC 420
1A-V-1996
SEE NOTE 8
21
1A-V-1999
E/S 20-545D
A L
A H
LRS 419
20 25-17
LT 420
20
LS 421
20 25-17
RMS
TO TDS-20-400
DWG 2032, SHT. 1
ZONE G-4

FLOOR DRAIN
COLLECTION TANK
L K
2"FDR-1S
4"FDR-2
FDR-2 FDR-1
3"
2"
RW-V-1118
RW-V-111
(117)
2"
DWG 2033, SHT. 2
ZONE F-7
1-RW-169-3"
3"V123W(112)
PX 495A (210)
S-110
1¼" V153S(113)
SEE NOTE 8
31
CF-1 FDR-1
FLOC ADDITION
DWG. 2035
SHT. 2
ZONE G-10
1½"
1½"V523X(B)1513 (985)
2½"
1"
PI 422
20
(212)
2"V353X-37(18CV)
FLOOR DRAIN
COLLECTOR PUMP
(211)
PX 495B
DWG 2032, SHT.1
ZONE G-5
1-RW-168-2
¾"V226X-(115)
FIG.3 SEE NOTE 4
PS FDR
SP 15
¾" V153X-(114) FDR-1
FDR-2
¾" FDR-2
1-RW-170-¾
TO RADWASTE FLR.
DRAIN SUMP

DWG.2004 SHT.2
ZONE B-12
UNIT 2 RADWASTE BLDG. SUMP
DWG. 2033 SHT. 2
ZONE C-7
SEE NOTE 8
47
2"FDR-1 DWG 2032 SHT. 4
ZONE F-4
4"FDR-1
1102
35
FDR-1S FDR-1
2"FDR-2
SEE NOTE 8
(161) VENT A
6"PV-1
87 SEE NOTE 8
2"DW-1S DWG. 2013
1-DW-155-2" ZONE H-9
SEE NOTE 8

4"FDR-1
1-RW-171-4
1-RW-195-4
3"FDR-1
6"FDR-1
1-RW-184-6
6"FDR-1
1-RW-200-1½
1½"MW-1
DWG. 2079
SHT. 2 ZONE C-1
3"FDR-1 3"V123W-(120)
FDR-1 PW-1
3"V523W(B)-1517(604)
34 SEE NOTE 8
3"PV-1
3"1514AV823F
3"FDR-1
FG 471
AO 487
AVSPV-1514
1C 486
RMS
3"V123W-1556(605)
6 SEE NOTE 8
6"PV-1 VENT TO WASTE SLUDGE TANK
1-RW-196-6
6"PV-1
1-RW-227-3
3"PW-1
1½" V153X-(216)
1½" V253X-(217)
1½"MW-1
TO CONC. FEED
TK. DWG. 2079
SHT. 2 ZONE B-1
72 SEE NOTE 8
MATCH LINE
DWG.2032 SHT.4

2"FDR-1 NORMALLY CLOSED 2"V153X-1444(609)
TO CONCEN. FEED TANK
DWG. 2079 SHT. 2 ZONE B-1
73 SEE NOTE 8
CONT. ON DWG.
2017 ZONE E-6
FIG. 3 WITH ALLOY 20
MATL. SEE NOTE 4.
TO pHA-16
DWG 2032, SHT. 1
ZONE E-2
PHE 16B
SP 16B
MW-15(o) MW-1
¾" 467SV229X-(133)
AO 1000
AVSPV-469
1½"469AV-529X(B)
(AO-1000)

1½"MW-1S(o)
1-RW-200-1½
1½" 466SV229X-(134)
2"MW-2S(o)
1-RW-306-2"
TO SSV-93
DWG. 2017
TO SSV-94
DWG. 2017
AVSPV-438
AO 970A
1½"438AV529X(B)
AVSPV-464
AO 971A
AVSPV-465
AO 971B
AVSPV-439
AO 970B
1½"439AV529X(B)
2"464AV-529X(B)
2"465AV-529X(B)
1½"MW-1S(o)
¾"CF-1S 3"
LI 523A
LT 523A
FIC 523A
LS 523AL
LS 523AH
A H L
A H
LAB DRAIN
TANK 1A
TO LAB DRAIN
PUMP TRIP
ZONE G-10
VENT
LAB DRAIN
TANK 1B
LT 523B
LI 523B
FIC 523B
LS 523BL
LS 523BH
TO LAB DRAIN
PUMP TRIP
ZONE G-7
1½"470SV229X(218)
1½"468SV329X(19CV)
(1020) PI 524
20 LR-114
¾"467SV229X(219)
AVSPV-436
AO 913A
2"436AV529X(B)
AVSPV-437
AO 913B
2"437AV529X(B)
1½"470SV229X(220)
2"MW-2S(o)
1-RW-199-2
2½"
1"
LAB DRAIN
PUMP
LOW LEVEL SHUT-OFF

DWG.2030 SHT.2 ZONE G-9 (6"FC-1 (FROM FUEL POOL DEMINERALIZER 1B)) 1-FPC-118B-6
DWG.2030 SHT.2 ZONE H-9 (6"FC-1 (FROM FUEL POOL DEMINERALIZER 1A)) 1-FPC-113A-6
DWG.2042 SHT.3 ZONE J-10 (1"CU-2 (FROM CLEAN-UP PHASE SEPARATOR SLUDGE PUMP)) 1-RWCU-132-1
DWG.2035 SHT.4 ZONE C-11 (6"FDR-1 (TO CONDENSATE PHASE SEPARATORS)) 1-RW-282-6

NOTE:
ALL ITEMS MARKED THUS A ARE "AS BUILT" ITEMS AND ARE NOT SHOWN ON PIPING DRAWINGS.

FOR NOTES SEE SHT. 1

AS BUILT
454003672
CADD DRAWING
DO NOT REVISE MANUALLY

REVISIONS TO THIS DRAWING REQUIRES A REVISION TO THE CORRESPONDING ISOKEY.

FOR PREVIOUS REVISIONS, SEE SUPERSEDED CARDS.

REVISIONS BY N.P.P.D.

NO.	REVISIONS	DFT	CKD	APP	DATE
N21	REDRAWN, DCR 3-40217 (DCN 01-0070).	PAM	HFY	RGA	4/24/01
N22	DCN 01-0877	RGA	TGT	DLR	7/18/01

SIGNIFICANT NUMBER | GROUP 1 2 3 4 5 6

FLOW DIAGRAM
HIGH CONDUCTIVITY (FLOOR DRAINS, CHEMICAL AND LAUNDRY WASTE) PROCESS
COOPER NUCLEAR STATION

DRAWN DATE
CHECKED DATE
APPROVED DATE
SEE SUPERSEDED CARDS
FILMED

BURNS & ROE

2032 SH 2 REVISION N22

CADD FILE: C0017992

1"CP-1
3"CF-1
2"PW-1
1-RW-277-3 (FLOOR DRAIN FILTER PRECOAT RETURN) 3"CF-1
DWG. 2033 SHT.1 ZONE A-1
1-RW-239-2 (DRAIN FROM WASTE COLLECTOR FILTER) 2"PW-1
DWG. 2033 SHT.1 ZONE A-1
CP-1 CU-2
1"CU-2
AO 1016
VENT
RW-V-1209
AO 1017
NOTE 10
1"CP-1
1-CF-130-1
1½"MW-1
3"PV-1
SEE NOTE 10
MATCH LINE DWG.2032 SHT.1
TO DRUM FEED VALVE
TO HOPPER DISCHARGE VALVE
RW-PRV-PRV302
RW-PRV-PRV301
3"MW-2
E/S 20-545H
dPIS 417 20 25-17
dPT 418 20
A H
¾"V153X -(199)
½"V153X -(159)
¾"V253X-(200)
1-RW-287-½
1½"MW-1
(203)
LAUNDRY DRAIN FILTER (20-27)
FIG.3 SEE NOTE 4
(204)
¾"V226X (156)
SP 29A
1½"V153X-(198)
1-RW-203-1½
1-RW-208-1
1½"V153 X-(160)
1½"MW-2
½"MW-2
1½"V153X-(161)
TO RADWASTE FLOOR DRAIN SUMP
1-RW-209-1½
1½"MW-1
3"PW-1
FIG.3 SEE NOTE 4
¾"V226X-(201)
SP 30
2"PV-1
RO 414
½"V253X157
1-RW-236-3
1-RW-207-3
RMS
AVSPV-447
AO 189
3"CF-1
2"FDR-1
3"CF-1
3"PW-1
3"PV-1
2"PV-1
1½" MW-1
MATCH LINE SEE DWG.2032 SHT.5
LS 480A 20
WASTE HOPPER No.1A (20-51)
SEE DWG. 2010 SHT.3 ZONE A-1
AIR CANNON
NOTE 10
VENT
8"FILL PIPE
AOSPV-20-302A
AO 302A 20
¾" 1"CH-3 SEE DWG. 2049 SHT.1 ZONE D-6
¼"
S-166
RMC 481A
AO 303A 20
½"SA-1
AOSPV-20-303A
(136CV)
A
RMS
WASHOUT DRUM (20-54)
(1138)
FROM DRUM CONVEYOR INTERLOCK
TDS 483A
(SSV86A)
PI 488A 20
RW-PRV-PRV300
SA-F-13
(PCV346A)
SA-LUB-13
RADWASTE SOURCE AIR
(301)
1"SA-1
CONT. ON ZONE H-9 THIS DWG.
DWG 2010 SHT.3 ZONE B-1
1½"MW-1
FROM WASH DOWN COLLECTION TANK DWG. 2079 SHT.1 ZONE G-5
LS 480B 20
77 SEE NOTE 8
WASTE HOPPER No.1B (20-51)
NOTE 10
VENT
8"FILL PIPING
AOSPV-20-302B
AO 302B 20
SEE DWG. 2049 SHT.1 ZONE D-7
1"CH-3
¾"
¼"
S-166
AO 303B 20
RMC 481B
A
(137CV)
⅛"
AOSPV-20-303B
RMS
PI 488B
(1139)
½" SSV-86B
TDS 483B
FROM DRUM CONVEYOR INTERLOCK
RW-PRV-PRV303 20
SA-F-17
(PCV346B)
SA-LUB-14
RW
SA
SA-STNR-10
SA-V-308
1"SA-1
DWG 2010 SHT.3 ZONE B-1
2"V153X-1555
2"PV-1
FOR CONT. DWG.2079 SHT.1 ZONE C-4
TO HOPPER DISCHARGE VALVE
TO DRUM FEED VALVE
RW-PRV-PRV305
RW-PRV-PRV304
DWG. 2032 SH. 5 ZONE E-10
DWG. 2032 SH. 5 ZONE C-11
DWG. 2032 SH. 5 ZONE B-12
SA DW
SA-V-501
DW-SOV-SPV13
SA-PRV-PRV2697
CONT. ON B5700 * 2013
(DW-AO-13AV)
SA-V-502
DW-SOV-SPV14
SA-PRV-PRV2698
(DW-AO-14AV)
SA-V-499
DW-SOV-SPV11
SA-PRV-PRV2695
(DW-AO-11AV)
SA-V-498
DW-SOV-SPV10
SA-PRV-PRV2694
(DW-AO-10AV)
SA-V-500
DW-SOV-SPV12
SA-PRV-PRV2696
(DW-AO-12AV)
TO 1B DRUM UNCLAMP
TO 1B DRUM CLAMP
SA-V-314
SA-V-313
SA-V-312
SA-V-311
SA-LUB-16
SA-PRV-PRV2682B
SA-SOV-SSV5037
½"V153S(309)
SA-F-18
SA-PRV-PRV2683B
SA-SOV-SSV5038
SA-LUB-18
DRUM VIBRATOR PANELS
½"SA-1
½"SA-1
3"PW-1
½"V153S(302)
SA-F-14
SA-LUB-17
SA-PRV-PRV2683A
SA-SOV-SSV5036
SA-V-303
SA-PRV-PRV2682A
SA-V-307
SA-V-306
SA-V-305
SA-V-304
SA-SOV-SSV5035
TO 1A DRUM UNCLAMP
TO 1A DRUM CLAMP
SEE NOTE 8
39
NOTE 10
AVSPV-1516
AO 535 A
3"1516AV523W(B)
FDR-1
PW-1
NOTE 10
AO 535 B
AVSPV-1515
3"1515AV523W(B)
3"FDR-1
3"PW-1
1"CU-2
1"PW-1
1"FDR-1
CONT. ON THIS DWG. ZONE F-5
SA-V-609
SA-F-16
SA-LUB-15
SA-PRV-PRV2693
AIR GUN CONTROL PANEL
FOR NOTES SEE SHT. 1
NOTE:
ALL ITEMS MARKED THUS [A] ARE "AS BUILT" ITEMS AND ARE NOT SHOWN ON PIPING DRAWINGS.

REVISIONS TO THIS DRAWING REQUIRES A REVISION TO THE CORRESPONDING ISOKEY.

FOR PREVIOUS REVISIONS, SEE SUPERSEDED CARDS.
VERSIONS/REVISIONS BY N.P.P.D.

NO.	DESCRIPTION	DFT	DATE	ENG
AB/15	DR-2013-0599 (DCN 13-2063)	DJB	08/04/15	GEHORN

454003673

AS BUILT

STATUS: Release
STATUS DATE: 08/04/2015
DS APPROVED: GEHORN
VER: AB REV: 15 SIZE: F

SIGNIFICANT NUMBER
GROUP 1 2 3 4 5 6

DRAWN PAM DATE 3/29/01
CHECKED DATE
APPROVED DATE
SEE SUPERSEDED CARDS
FILMED

FLOW DIAGRAM
HIGH CONDUCTIVITY (FLOOR DRAINS CHEMICAL AND LAUNDRY WASTE) PROCESS
COOPER NUCLEAR STATION

BURNS & ROE

2032 SH 3

CARD FILE: C0017993

MATCH LINE SEE DWG 2032 SHT. 5

MATCH LINE SEE DWG 2032 SHT.2

6"FDR-1
1-RW-184-6

3"PW-1
1-RW-227-3

2"FDR-1

3"FC-1

3"PW-1

3"PV-1

2"PV-1

1½"MW-1

SEE NOTE 10

1"FDR-1

1"CU-2

1"PW-1

1-RW-274-3

(WASTE COLLECTOR FILTER BYPASS LINE)

(BACKWASH FROM FLOOR DRAIN FILTER)

CE 433 20

CIT 492 20 25-11

E/S-20-545E

CRS 434 20 25-17

RMS

FROM WASHDOWN COLLECTION TANK DWG. 2079 SHT. 1 ZONE C-4

1-RW-187-2

CONT. DWG 2032 SHT. 5 ZONE B-11

AO 1022

AO 1021

1"CU-2

1"CP-2

UNIT 2

AO 1023

1"CP-1

CONT. DWG 2032 SHT. 5 ZONE B-11

AO 1024

1"CU-2

1"CP-1

UNIT 2

1-RW-238-6

1-RW-212-1 4"FC-1 (UNIT 2)

ANION-CATION FLOC CONT. DWG 2035 SHT. 2 ZONE H-10

1-CF-139-1½

(230) A DRAIN

(229) VENT

(228) DRAIN

(233) DRAIN

(232) VENT

(231) DRAIN

FDR-2 FDR-1

DWG 2017 ZONE G-6

1-RW-269-1

(VENT FROM FLOOR DRAIN FILTER)

(WASTE COLLECTOR FILTER BY PASS LINE) 1-RW-227-3

2"PV-1

RW(586)

6"PV-1

1-RW-237-2

1-RW-196-6

39

SEE NOTE 8

1-FPC-118B-6

1-FPC-113A-6

6"FC-1

(BACK WASH FROM FUEL POOL FILTER/DEM)

3"PW-1 2"450AV153X

2"V353X40(24CV)

AVSPV-449

VENT

2"449AV153X

AO 218

AO 676

CONT. DWG 2030 SHT. 2 ZONE C-4, C-8

2"FC-1

2"FC-1

SEE NOTE 8

78

3"FLANGED FLUSHING CONN.

ALT. FLOOR DEMIN. BACK-WASH CONT. DWG 2079 SHT.1 ZONE G-2

3"V123W-1549

3"FDR-1

CONT. DWG 2021 ZONE G-10

1-RW-213-1½

6"PV-1

FC-1 PV-1

1-RWCU-122-1
1"CU-2

RMS

AVSPV-459

VENT

AO 283

1½"459AV523F

(ALT. WASTE DEMIN. BACKWASH) 3"PW-1

DWG 2033 SHT.1 ZONE H-1

1-RW-236-3 3"PW-1

DWG 2033 SHT.1 ZONE H-1

(PRECOAT FEED TO FLOOR DR. FILTER) 3"CF-1

DWG 2033 SHT.1 ZONE H-1

(OFF STD RECYCLE) 2"PW-1

DWG 2033 SHT.2 ZONE A-1

BACKWASH FROM WASTE COLLECTOR FILTER 6"PW-1

DWG 2033 SHT.2 ZONE A-1

VENT FROM WASTE COLLECTOR FILTER 2"PV-1

VENT FROM TANKS 6"PV-1

DWG. 2033 SHT.2 ZONE B-1

DWG. 2033 SHT.2 ZONE B-1

(SPENT RESIN DISCH) 1"PW-1

DWG. 2033 SHT.2 ZONE B-1

1-RW-215-3 (CENTRIFUGE EFFLUENT) 3"PW-1

DWG. 2032 SHT.2 ZONE C-1

CONDENSATE STORAGE TK. 2"FDR-1S

DWG. 2049 SHT.2 ZONE H-2 & H-3

FROM WASTE SLUDGE TANK 6"FDR-1

DWG. 2033 SHT.2 ZONE B-8

(FL & EQUIP. DR. CROSS CONN.) 3"PW-1

DWG. 2033 SHT.2 ZONE C-1

(UNIT 2) 2"CU-2

DWG. 2042 ZONE (LATER)

RO 438

2"V353X41(20CV)

NOT IN CONTRACT E-69-4

(221) A VENT

CONT. ON DWG. 2013 ZONE H-5

AO 225

2"V556X (AO225)

AVSPV-448

RMS

FIC 437

IA-V-1993

IA-V-2002

2"V253X-136

SD 18

LT 437 20

¾"V226X-135

¾"

¾"

FIG. 3 SEE NOTE 4

E/S 20-545E

A H

LRS 435 20 25-17

A L

LSL 435 20 25-17

1-RW-176-2

3"FDR-1

1-RW-175-3

3"V123W-123

PX 499A (222)

S-110

PI 439 20

1¼"V153S-124

(224)

2½"

1"

2"V353X-42 (21CV)

PX 499B (223)

(TANK RECIRCULATION)

DWG 2035 SHT.4 ZONE G-7

2"

1-FPC-118B-6

1-FPC-113A-6

FLOOR DRAIN SAMPLE TANK

FLOOR DRAIN SAMPLE PUMP

MIXING EQUCTOR

2"FDR-2
1-RW-173-2

FDR-1 FDR-2

TO RADWASTE FLOOR DRAIN SUMP

2"V153X-126

SEE NOTE 8

47

2"V153X-127

2"V353X-43(23CV)

4"FDR-2
1-RW-174-4

1-RW-183-2

CONT. ON 2032 SHT. 2 ZONE C-5

1"V683XP (V259)

F.D.

1½"MW-1

1-RW-209-1½

FDR-1 MW-1

1½"V353X-13(26CV)

SEE NOTE 8

88

2"V326X1382(124)

2"V153X1379(1032)

2"FDR-1S

2"451AV153X

2"V353X-38(22CV)

(125)

AO 227

F.D.

AVSPV-451

VENT

RMS

2"FDR-1

8"FDR-1

2"PV-1

1½"CF-1

6"PV-1

DRAIN

1½"FDR-1

4"FDR-2

B I J DEM. A L I H

WASTE SLUDGE TANK

4"

6"323W-5(27CV)

WASTE SLUDGE PUMP

FROM WASTE COLLECTOR FILTER CONT. DWG 2033 SHT. 1 ZONE G-1

A H

CONT. DWG 2033 SHT. 2 ZONE E-8

4" HOSE

LIS 469 20 25-17

FIC 467 20 25-65

LT 468 20 25-65

E/S 20-545-J

AVSPV-454

AO 276

VENT

NOT IN CONT. E-69-4

6"454AV523F

TO AVSPV-455 ZONE E-9

1-RW-211-6

4"FDR 1-CM-128-4

COND SUPPLY DWG 2049 SHT.2 ZONE E-3

¾"V253X(1056)

RMS

TDS 470 20 25-17

TO AVSPV-671 DWG 2049 SHT. 2 ZONE E-3

RMS

6"FDR-1

2"V123X-1280

2"FDR-1

1-RW-204-2

2"V523F-129

FDR-1 FDR-2

TO RADWASTE EQUIP DRAIN SUMP

NOT IN CONT. E-69-4

6"FDR-2
1-RW-210-6

FROM TDS 20-470 ZONE G-5

RMS

AVSPV-455

VENT

AO 277

6"455AV523F

6"

FDR-1

1-RW-212-6

¾"V253X(226)

PI 812

TO FUTURE UNIT 2

1-RW-214-¾

¾"V153X-128

TO EQUIP DRAIN SUMP

FDR-2 FDR-1

(FUTURE UNIT 2)

6"FDR-1

1-RW-179-2

1-RW-212-1½

RMS

AVSPV-1534

SEE NOTE 8

41

AO 563

FG 584

6" V523W (B)-1533

6" 1534 AV523W

A VENT

(227)

ATMOS LOOP

(1156)

(1157)

TO LIQUID RW RADIATION MONITOR RMP-RM-354 (SEE KAMAN DWG. 400846-001)

3"FDR-1
1-RW-176-3

DWG. 2038 SHT. 1 ZONE J-1

2"FDR-1S

(1036)

FCV 232 20

20-232 P/E

RMC 440 20 25-17

2"452AV153X

AVSPV-452

AO 231

SEE NOTE 8

18

2"V153X1380 (569)

2"V353X1381 (125CV)

DEMINERALIZED WATER FOR FLUSHING DWG. 2013 ZONE H-5

2"FLANGED FLUSHING CONNECTION

FROM CHEM. WASTE SAMPLE TK. DWG. 2079 SHT.1 ZONE J-5

RMS

CLOSES VALVE ON HI RAD SIGNAL FROM RMP-RM-354, ZONE G-12 THIS DWG.

FIT 442 20

E/S 20-545D

FR 441 20 25-17

1-RW-176-1

1-RWCU-122-1
1"CU 2

1-RW-259-2

3"FDR-1

1-RW-176-2

1-RWCU-122-1
1"CU-2

1-RW-282-6

1-RWCU-132-1

AVSPV-462

AO 230

FCV 287 20

20-287 P/E

¾"

1"462AV153X

E/S 20-545G

1"FDR-1

FIT 485 20

2"V353X-39(25CV)

FDR-1 PW-1

(225) A VENT

6"FDR-1

1-RW-282-6

FOR ADDITIONAL NOTES SEE SHT. 1

NOTE:
ALL ITEMS MARKED THUS A ARE "AS BUILT" ITEMS AND ARE NOT SHOWN ON PIPING DRAWINGS.

REVISIONS TO THIS DRAWING REQUIRES A REVISION TO THE CORRESPONDING ISOKEY.

AS BUILT
454003674

STATUS: Release
STATUS DATE: 08/04/2015
DS APPROVED: GEHORN
VER: AB REV: 26 SIZE: F

FOR PREVIOUS REVISIONS, SEE SUPERSEDED CARDS.

VERSIONS/REVISIONS BY N.P.P.D.

NO.	DESCRIPTION	DFT	DATE	ENG
AB/26	DR-2013-0599 (DCN 13-2068)	DLR	8/4/15	GEHORN

SIGNIFICANT NUMBER | GROUP 1 2 3 4 5 6

DRAWN RRT DATE 3/28/01
CHECKED DATE
APPROVED DATE SEE SUPERSEDED CARDS
FILMED

FLOW DIAGRAM
HIGH CONDUCTIVITY (FLOOR DRAINS, CHEMICAL AND LAUNDRY WASTES) PROCESS
COOPER NUCLEAR STATION

BURNS & ROE

2032 SH 4

CADD FILE: C0017998

MATCH LINE SEE 2032 SH 3

2"FDR-1
3"CF-1
3"PW-1
3"PV-1
2"PV-1
1½" MW-1
1"FDR-1
1"CU-2
1"PW-1
3"FDR-1
3"PW-1
1"CU-2

3/4"DEMIN FLUSH WATER

TIC 612 | A H | TE 612 | (RW-V-1206) | 1½" | 1½" | RW-TVM-DSF 1" | TO LINER TV MONITOR

A HH | LIC 563 | LS 838 | LE | POSI | S CPS | A H | PS DSF | RW-TVC-DSF

LEVEL 4 FILTER
LEVEL 3 FILTER
LEVEL 2 FILTER
LEVEL 1 FILTER

POWDERED RESIN TYPE CONTAINER

RMS | AO 1020 | 3/8" SA-1 | RW-SOV-SPV10 | DWG 2010 SH 3 ZONE B-12

1½" | (RW-V-1223) | 1" RESIN SAMPLE POINT | 1½" | 1"CU-2

DWG 2032 SH 4 ZONE A-6&7

DWG. 2032 SH. 3 ZONE A-10 | (RW-V-1208) | NOTE 10 | AO 1015 | AO 1014 | CU-2 | PW-1

DWG. 2032 SH. 3 ZONE A-10 | (RW-V-1210) | NOTE 10 | AO 1019 | AO 1018

DWG. 2032 SH. 3 ZONE A-10 | (RW-V-1207) | NOTE 10 | AO 1013 | AO 1012 | CU-2 | FDR-1

(RW-V-1216) | ¾" | DEMIN. FLUSH WATER | MI 901

THERMAL ENCLOSURE | ME 902 | FI 545

(RW-F-H1S) | ¼" | PI | TE 615 | (RW-V-1214) | (RW-V-1215) | 4" | ¼" | RW-P-DSSP

PJ 821 | 1½" | (RW-V-1218)
PJ 822 | 1½" | (RW-V-1219)
PJ 823 | 1½" | (RW-V-1220)
PJ 824 | 1½" | (RW-V-1221)

MESH | LS 837 | A H | TS 670

2" | (RW-V-1217) | ½" | (RW-V-1222)

ENTRAINMENT SEPARATOR

PJ | ½" | FI 506 | COALESCING FILTER SA-F-FCC | ½"SA-1 | ¾"SA-1 | DWG 2010 SH 3 ZONE B-11

PORT FOR USE W/ BEAD TYPE RESIN CONTAINER | 4"

FREON

CHILLER RW-CH-DS

RMS | ½" | RW-SOV-SPV610 | SA-607

FG 544 | QUICK COUPLING | ¾" | (RW-V-1307) | 2" | (RW-V-1224) | 3" | 2"

FILL STATION SUMP PIT | 4" FDR DWG. 2017 ZONE E-4

DEWATERING PUMP RW-P-DSDP

PI 825 | TE 613 | TIC 613 | A H | TE 614 | TIC 614 | PI 820 | (RW-V-1226) | (RW-V-1225) | PI 819

4" | (RW-V-1211) | 2" | (RW-F-BDCA) | (RW-F-BDPFA) | 3" | 3" | 4"

(RW-V-1213) | 3" | 2" | (RW-V-1212)

DEWATERING SYS. BLOWER RW-BLWR-DSB

RW-F-BDCB | RW-F-BDPFB

COALESCING FILTER | PREFILTER

HEPA FILTER RW-F-DSHF | 3" | TO ARW BUILDING ATM.

1"FDR-1 | 1"CU-2 | 1"PW-1 | 3"FDR-1 | 3"PW-1

2"FDR-1 | 3"CF-1 | 3"PW-1 | 3"PV-1 | 2"PV-1 | 1½" MW-1

3"FDR-1 | 3"PW-1

MATCH LINE SEE 2032 SH 4

1. WHERE LINES ARE INTERCONNECTED AND CONTINUED ON OTHER DRAWINGS, ZONE NUMBERS ARE APPROXIMATE ONLY.

454223017

STATUS: Release
STATUS DATE: 08/04/2015
DS APPROVED: GEHORN
VER: AB REV: 09 SIZE: F

AS BUILT

REVISIONS TO THIS DRAWING REQUIRES A REVISION TO THE CORRESPONDING ISOKEY.

FOR PREVIOUS REVISIONS, SEE SUPERSEDED CARDS.

VERSIONS/REVISIONS BY N.P.P.D.

NO.	DESCRIPTION	DFT	DATE	ENG
AB/09	DR-2013-0599 (DCN 13-2061)	DJB	08/04/15	GEHORN

SIGNIFICANT NUMBER | GROUP 1 2 3 4 5 6

DRAWN HFY DATE 10/1/01
CHECKED DATE
APPROVED SEE SUPERSEDED CARDS DATE
FILMED

FLOW DIAGRAM
HIGH CONDUCTIVITY (FLOOR DRAINS, CHEMICAL & LAUNDRY WASTE) PROCESS
COOPER NUCLEAR STATION

BURNS & ROE

2032 SH 5

CARD FILE: C0017997

DWG. 2030 SHT. 1 ZONE D–9 — 10" CF–2 (FUEL POOL RUPTURE SEAL DRAIN) — 1–FPC–114–10 — 10" CF–2
DWG. 2032 SHT. 3 ZONE A–6 — 3" CF–1 (FLOOR DRAIN FILTER PRECOAT RETURN) — 1–RW–277–3
DWG. 2030 SHT. 2 ZONE G–9 — 4" CF–1 (FROM FUEL POOL SYSTEM PRECOAT RETURN) — 1–RW–276–4
DWG. 2032 SHT. 3 ZONE A–6 — 2" PW–1 (DRAIN TO CHEMICAL WASTE TANK) — 1–RW–239–2
DWG. 2030 SHT. 2 ZONE G–9 — 4" CF–1 (TO FUEL POOL SYSTEM) (PRECOAT FEED) — 1–RW–236–3

MATCH LINE (SEE DWG. 2033 SHT. 3)

FROM TDS–20–397 ZONE B–6
FROM FT–382 ZONE B–4
TO AOSPV–20–126 ZONE B–6
FROM PUMP (20–14) ZONE C–3
TO AOSPV 20–114 ZONE F–3
TO AOSPV20–113 ZONE G–3
ADDITION TANK AGITATOR
DWG. 2049 SHT. 2, ZONE C–7
RESIN ADDITION TANK
TO FRC–20–383 ZONE A–8
FROM FRC–20–383 ZONE B–8
FROM FRC20–383 ZONE A–9
WASTE COLL FILTER HOLD UP PUMP (20–14)
COND. SUPPLY DWG. 2049 SHT. 2 ZONE A–5
WASTE COLLECTOR FILTERS (20–13)
WASTE COLLECTOR PRECOAT RETURN
EDUCTOR
1"CF–1 TO CONDENSATE F/D PRECOAT TANK SEE DWG. 2035 SHT. 2, ZONE C–4
WASTE FILTER AID TANK SEE DWG. 2032 SHT. 1 ZONE G–2
TO FRC–20–383 ZONE A–9
FROM LIS–20–399 DWG. 2032 SHT. 1 ZONE F–3
CONDENSATE DWG. 2049, SHT. 1 ZONE E–7
WASTE FILTER AID DUMP (20–21)
WASTE DEMINERALIZER (20–49)
RESIN LEVEL
4" FLANGED FLUSHING CONN.
1" FLANGED FLUSHING CONNS.
TO FLOOR DRAIN DEMINERALIZER DWG. 2079 SHT. 1 ZONE A–1
TO FLOOR DRAIN SUMP
FROM DWG. 2049 SHT. 2 ZONE D–6
E/S–20 545B
S–121 SCREENED STRAINER
FIG. 2 SEE NOTE 4
FOR COND. SUPPLY FOR CONT. SEE DWG. 2049 SHT. 2 ZONE C–7
HEATING STEAM DWG. 2012 SHT. 1 ZONE F–1
FILTERED AIR DWG. 2012 SHT. 3 ZONE A–5
TO RADWASTE EQUIPMENT DRAIN SUMP
SEE NOTE 8
AVSPV 415
VENT TO EQUIPMENT DRAIN
FOR CONT. SEE DWG. 2010 SHT. 3 ZONE C–6
AVSPV417
AVSPV418
AVSPV416
AVSPV419
AVSPV812
TO EQUIPMENT DRAIN SUMP
AVSPV425
AOSPV 20–114
AOSPV 20–122
AOSPV20–121
AOSPV20–113
AOSPV20–124
AOSPV20–126
AOSPV 20–125
AOSPV 20–119
AOSPV20–118
AOSPV 20–155
CONT. ON DWG. 2010 SHT. 3 ZONE B–3
FROM FRC–20–383 ZONE B–9
SEE DWG. 2032 SHT. 1 ZONE H–8
AVSPV1507
TO WASTE SLUDGE TANK LIS–469 DWG. 2032 SHT. 4, ZONE E–4
TO WASTE COLLECTOR TANK PUMP SWITCH DWG. 2035 SHT. 2, ZONE G–6
TO WASTE SURGE TANK PUMP SWITCH DWG. 2033 SHT. 3, ZONE E–9
TO EQUIPMENT DRAINS
FROM FLOOR DRAIN DEMIN. BACKWASH DWG. 2079, SHT. 1 ZONE G–2
FOR CONT. SEE DWG. 2030 SHT. 2, ZONE A–7
FOR CONT. SEE DWG. 2032 SHT. 4, ZONE A–12
FOR CONT. SEE DWG. 2032 SHT. 4, ZONE B–12
FOR CONT. SEE DWG. 2032 SHT. 4, ZONE B–12
(ALTERNATE WASTE DEMIN. BACKWASH TO WASTE SLUDGE TANK)
(WASTE COLLECTION FILTER BY–PASS)
(PRE–COAT FEED)
3"CF–1 (PRECOAT FEED TO FLOOR DR FILTER)
MATCH LINE (SEE DWG. 2033, SHT. 2 ZONES A–6–7–10–11)
MATCH LINE (SEE DWG. 2033 SHT. 3)

NOTES:

1. SYMBOL ——x—— DENOTES BACKWASH TIMER CONTROL.
2. UNLESS OTHERWISE INDICATED, ALL PRESSURE AND/OR FLOW INSTRUMENT ROOT VALVES SHALL BE ¾", ROOT VALVES FOR CARBON STEEL SYSTEMS SHALL BE ¾"V253X; ROOT VALVES FOR STAINLESS STEEL SYSTEMS SHALL BE ¾"V226X. LINE UP TO AND INCLUDING ROOT VALVE SHALL BE FURNISHED AND INSTALLED UNDER CONTRACT E–69–4.
3. ALL TEMPERATURE TEST AND PROTECTING WELL PENETRATIONS SHALL BE 1" NPT UNLESS OTHERWISE NOTED.
4. AT SAMPLING POINTS, CONNECTIONS, PROBES AND ROOT VALVES SHALL BE FURNISHED AND INSTALLED UNDER CONTRACT E–69–4. PROBES SHALL BE FURNISHED AND INSTALLED IN ACCORDANCE WITH CONTRACT PARA. 3, 4, 2 AND DWG. SP–07211, FIG. No. AS NOTED, CONTINUATION OF SAMPLE PIPING BY E–70–3.
5. HIGH POINT VENTS AND LOW POINT DRAINS NOT SHOWN.
6. ALL PIPING FROM SHIELDED TANKS TO FIRST SHUTOFF VALVES SHALL BE SUITABLY SUPPORTED TO WITHSTAND A CLASS I SEISMIC EARTHQUAKE.
7. ALL VALVE NUMBERS IN PARENTHESIS ( ) ARE NUMBERS TO BE USED IN OPERATING PROCEDURES. THESE NUMBERS ARE ASSIGNED BY NPPD AND WILL NOT BE SHOWN ON PIPING DRAWINGS.
8. △'S WHERE SHOWN WITH NUMBERS REPRESENT POINTS OF CONNECTION TO EXISTING SYSTEMS. E–73–58 SPECIFICATION DEFINES WORK FROM THIS POINT.
9. ALL ITEMS MARKED THUS [A] ARE "AS BUILT" ITEMS AND ARE NOT SHOWN ON PIPE DRAWINGS.
10. WHERE LINES ARE INTERCONNECTED AND CONTINUED ON OTHER DRAWINGS, ZONE NUMBERS ARE APPROXIMATE ONLY.

AS BUILT
454003626
STATUS: Release
STATUS DATE: 01/18/2018
DS APPROVED: RSCULLI
VER: AB REV: 21 SIZE: F

REVISIONS TO THIS DRAWING REQUIRES A REVISION TO THE CORRESPONDING ISOKEY.

FOR PREVIOUS REVISIONS, SEE SUPERSEDED CARDS.

VERSIONS/REVISIONS BY N.P.P.D.			
NO.	DESCRIPTION	DFTI DATE	ENG
AB/21	DR–2018–0001	DJB 01/16/18	RSCULLI

SIGNIFICANT NUMBER | GROUP 1 2 3 4 5 6

COOPER NUCLEAR STATION
FLOW DIAGRAM
LOW CONDUCTIVITY
(EQUIPMENT DRAINS) PROCESSING

DRAWN DATE | CHECKED DATE | APPROVED DATE SEE SUPERSEDED CARDS | FILMED

BURNS & ROE

2033 SH 1

CARD FILE C0017933

MATCH LINE (SEE DWG. 2033 SHT. 1, ZONE J6-7-10-11)

DWG. 2032, SHT. 4 ZONE B-12 — 2"PW-1 (OFF STANDARD RECYCLE TO FLOOR DRAIN SYSTEM)
DWG. 2032, SHT. 4 ZONE B-12 — 6"PW-1 (BACKWASH FROM WASTE COLLECTOR FILTER TO WASTE SLUDGE TANK) — 1-RW-238-6
DWG. 2032, SHT. 4 ZONE C-12 — 2"PV-1 (VENT FROM WASTE COLLECTOR FILTER TO WASTE SLUDGE TANK) — 1-RW-237-2
DWG. 2032, SHT. 4 ZONE C-12 — 6"PV-1 (VENT FROM TANKS TO WASTE SLUDGE TANK) — 1-RW-196-6
DWG. 2032, SHT. 4 ZONE C-12 — 1"PW-1 (SPENT RESIN DISCHARGE TO CENTRIFUGE) — 1-RW-269-1
DWG. 2028 ZONE G-12 — (263) A — 1"PW-1 (REACTOR BUILDING EQUIPMENT DRAINS) — 3-RW-115-3
DRAIN (262) A
DWG. 2028 ZONE G-12 — 3"PW-1 (DRYWELL EQUIPMENT DRAINS) — 1-RW-128-3
DWG. 2042, SHT. 3 ZONE H-10 — 2"CU-2 (RWCU PHASE SEPARATOR DECANT PUMP) — 1-RWCU-125-2
DWG. 2035, SHT. 4 ZONE F-11 — 6"CP-1 (CONDENSATE PHASE SEPARATOR DECANT PUMP)
DWG. 2035, SHT. 4 ZONE G-9 — 4"CP-1 — 4"V323W(126CV) — 4"V123W-(1040) — (1068) — (1069) — REMOVABLE SPOOL PIECE
DWG. 2040, SHT. 2 ZONE H-1 — 4"RH-3 (RHR SYSTEM DRAINS)
DWG. 2032, SHT. 4 ZONE D-12 — 3"PW-1 (FROM EQUIPMENT DRAIN SUMP "B-B")
DWG. 2032, SHT. 4 ZONE D-12 — 3"PW-1 (FLOOR & EQUIPMENT DRAIN CROSS CONNECTION) — 1-RW-227-3
DWG. 2032, SHT. 2 ZONE C-1 — 4"RH-3 — 1-RHB-113-4
DWG. 2005, SHT. 2 ZONE H-1 — 3"PW-1 (TURBINE BUILDING EQUIPMENT DRAINS) — 1-RW-217-3
DWG. 2025 ZONE G-10 — 3"PW-1 (RADWASTE BUILDING EQUIPMENT DRAINS) — 1-RW-226-3
3"PW-1 (RADWASTE BUILDING EQUIPMENT DRAINS UNIT 2)

DWG. 2032 SHT. 2 ZONE D-3 — RW-V-1308 — DWG. 2032 SHT. 2 ZONE D-3
A (156)
FLANGED SPOOL PIECE FOR FLUSHING
SEE NOTE 8 (29)
4"V123W-109
(157) A
(158) A
4"RH-3
4"V123-107
3"DR-1
SECTION "A"
SECTION "A"
1-RW-115-3
4"PV-1
1-RW-216-41
FROM WASTE SLUDGE TANK (DWG. 2032 SHT. 4, ZONE D-12)
6"V821-1092 — DWG. 2032 SHT. 2 ZONE B-3
6"V821-1091
3"PW-1 TURBINE BLDG. EQUIP. DRAINS — 265 — 264
3"PW-1 REACTOR BLDG. EQUIP. DRAINS — 266 — 267
3"PW-1 DRYWELL EQUIP. DRAINS — 268 — 269
UNIT 2
2"CU-2 CU DECANT
6"CP-1 CP DECANT
1½"PW-2 — FROM SAMPLE RACKS IE SINK D (DWG. 2017 ZONE E-5)
PW-1S PW-1
S R U E I J Y F B G H A U Q P O N M V X
SEE NOTE 8 (41)
6"
2" — 1-DW-156-2 — FOR CONT. SEE DWG. 2013 ZONE H-9
SEE NOTE 8 (42)
4"PW-1S
CONT. ON DWG. 2032 SHT. 4 ZONE E-5
4"PW-1 (OVERFLOW) — 1-RW-228-4
4"V123W-108
6"PV-1
1"PW-1
3"PW-1
4"PW-1
4"RH-3
4"CU-2
1-RW-232-4
1-RW-230-4
4"V123W-85
3"PV-1
4"CU-2
MATCH LINE (SEE DWG. 2033 SHT. 4)
RMS — TO AVSPV412 DWG. 2033 SHT. 3 ZONE C-6
TO AVSPV411 DWG. 2033 SHT. 3 ZONE C-6
RW-SOVSPV111 — AO 111 — 4"402AV123W
VENT
RMS — AO 412 — AVSPV1509
4"1509AV523W(B)
RQ 411
SEE NOTE 8 (42)
4"V223W-1508-RW-590
PI 373 (20)
TO DRAIN
RW-589
(273)
4"V323W-7
¾"V153X(65)
¾"V226X (66)
FIGURE 2 SEE NOTE 4
SP 14
1-RW-231-¾
PW-1
3"PV-1
3"PV-1
4"CU-2
1"PW-1
3"PW-1
1½"PV-1

(274) A DRAIN

WASTE COLLECTOR TANK

FIC 369 — IA-V-1991 — IA-V-2004 — LT 369 (20)
(261)
4"
(260) A
(259) A
3"PW-1 (RADWASTE BUILDING EQUIPMENT DRAINS UNIT 2)
(261) A
(158) A
(157) A
3"DR-1
4"RH-3
1-RW-165-4
1-RWCU-165-4
4"CU-2

TO LRS 20-392 (SURGE TANK) DWG 2033 SHT. 3 ZONE B-9
TO LSL 20-393 (SURGE TANK) DWG 2033 SHT. 3 ZONE C-9
E/S-20-545B

CONT. ON DWG. 2013 ZONE G-8
DW RW ½" — RW-V-1303 — 3" — 2" — RW-V-1282 — 3" — RW-V-1281 — 1½" — RW-P-TST SLUDGE TRANSFER PUMP
PI 826
DW RW — RW-V-1283 — 2"V153X-62 — RW-V-1140
2"PW-1(DRAIN) — 1-RW-289-2 — RW-V-1284 — TO RADWASTE FLOOR DRAIN SUMP
CONT. ON DWG. 2032 SHT. 2 ZONE F-3
RMS
1-RW-229-6
FROM LS-20-393 DWG. 2033 SHT. 3 ZONE D-9
PX 491A — (271)
PX 491B — (272)
S-108
6"V123W-63
1 ½" V153S-64
4"
2"
WASTE COLLECTOR PUMP
FROM A0113 SWITCH SHT. 1, ZONE G-2

¾" HOSE
4" HOSE
PI 826
Z Y
6"PW-1

SECTION "A"
TO 1085 RWCU PHASE SEP. DECANT PUMP LINE DWG. 2042, ZONE H-9
1082
TO 1099 CONDENSATE PHASE SEP. DECANT 1B TANK DWG. 2035 SHT. 4, ZONE D-8
TO 1096 CONDENSATE PHASE SEP. DECANT 1A TANK DWG. 2035 SHT. 4, ZONE D-4
5049 — 5050 — 5048
RW-1122
BUBBLE TUBE
SURFACE SCATTER TURBIDIMETER
1095 — 1094 — 1093
TO "H" SUMP

VENT — AO 104 — 4"400AV123W — AVSPV400 — RMS
VENT — AVSPV401 — AO 105
4"401AV123W
(270)
(1037)
4"CU-2
FUTURE UNIT 2

FLOCK ADDITION DWG. 2035 SHT. 2 ZONE G-10
CF-1, PW-1
1½"PW-1
1 ½"V523X(B) 1525(986)
33 SEE NOTE 8

DWG. 2042, SHT. 3 ZONE B-10 — 4"CU-2 (CLEAN UP SYSTEM DRAIN TO WASTE SURGE TANK) — 1-RWCV-107-4
DWG. 2035, SHT. 4 ZONE B-11 — 3"PV-1 (FROM CONDENSATE PHASE SEPARATOR) — 1-CF-138A-3
DWG. 2035, SHT. 4 ZONE C-11 — 3"PV-1 (FROM CONDENSATE PHASE SEPARATOR) — 1-CF-138B-3

FOR NOTES SEE SHEET 1.

NOTE:
ALL ITEMS MARKED THUS A ARE "AS BUILT" ITEMS AND ARE NOT SHOWN ON PIPING DRAWINGS.

AS BUILT
454003679

REVISIONS TO THIS DRAWING REQUIRES A REVISION TO THE CORRESPONDING ISOKEY.

FOR PREVIOUS REVISIONS, SEE SUPERSEDED CARDS.

REVISIONS BY N.P.P.D.

NO.	REVISIONS	DFT	CKD	APP	DATE
N22	REDRAWN, DCR 3-40217 (DCN 01-0495).	DLR	RGA	KG	4/24/01
N23	NOT. 10244841 (DCN 03-0831)	KG	KG	DLR	7/1/03
N24	RCR 2002-1478 (DCN 04-0591)	KG	KG	RGA	3/26/04
N25	(DCN 10-1716)	DJB	DJB	DLR	09/08/10

SIGNIFICANT NUMBER							
GROUP	1	2	3	4	5	6	

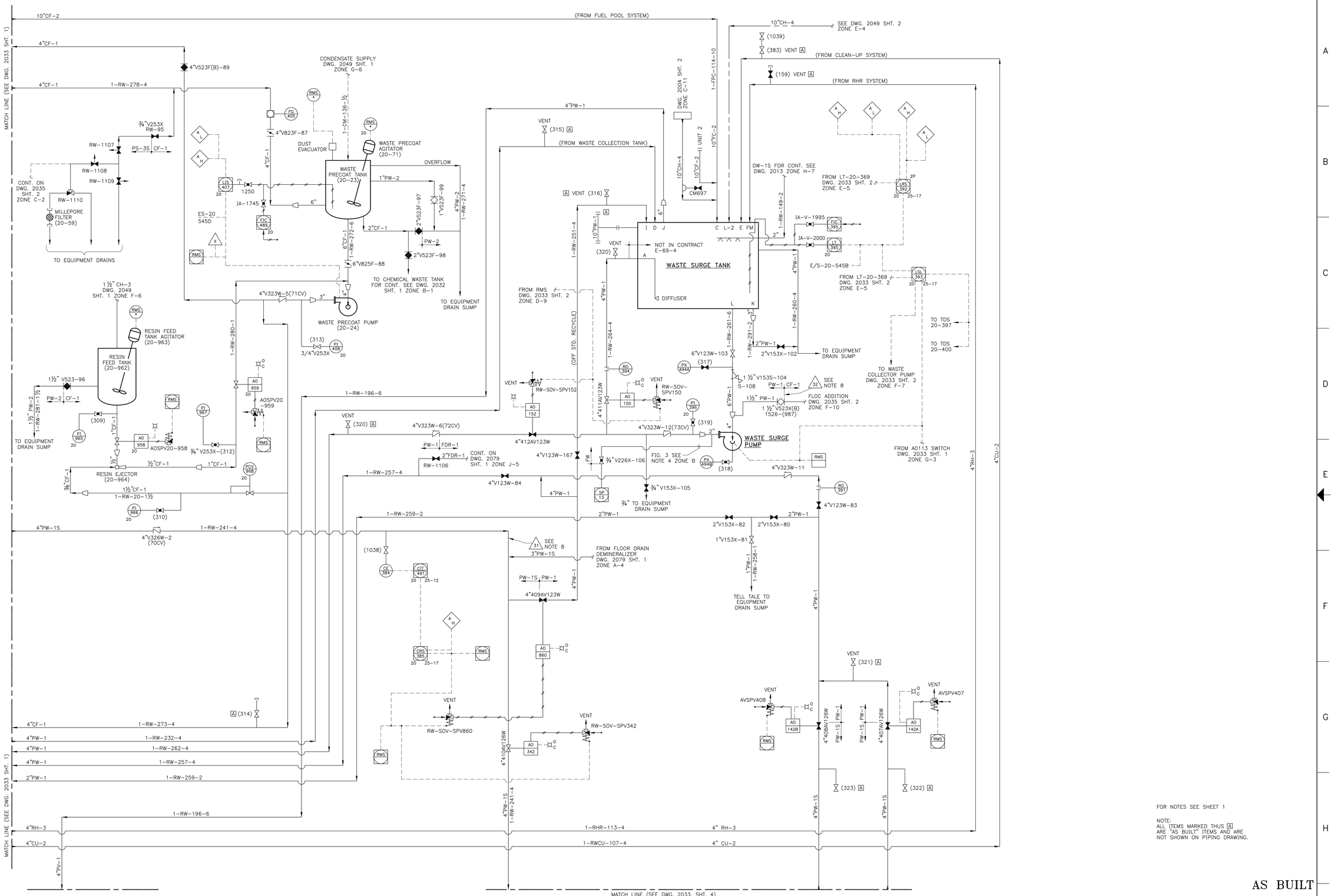
FLOW DIAGRAM
LOW CONDUCTIVITY
(EQUIPMENT DRAINS) PROCESSING
COOPER NUCLEAR STATION

DRAWN	RAC	DATE	10/22/96
CHECKED		DATE	
APPROVED		DATE	
SEE SUPERSEDED CARDS			
FILMED			

BURNS & ROE

2033 SH 2 — REVISION N25

CARD FILE C0017994



AS BUILT
454003680

STATUS: Release
STATUS DATE: 07/25/2017
DS APPROVED: JLCHAMP
VER: AB REV: 16 SIZE: E

REVISIONS TO THIS DRAWING REQUIRES A REVISION TO THE CORRESPONDING ISOKEY.

FOR PREVIOUS REVISIONS, SEE SUPERSEDED CARDS.

VERSIONS/REVISIONS BY N.P.D.				
NO.	DESCRIPTION	DFT	DATE	ENG
AB/16	DR-2017-0001	DLR	7/25/17	JLCHAMP

SIGNIFICANT NUMBER / GROUP: 1 2 3 4 5 6

FLOW DIAGRAM LOW CONDUCTIVITY (EQUIPMENT DRAINS PROCESSING) COOPER NUCLEAR STATION

DRAWN RAC 10/15/96
CHECKED
APPROVED SEE SUPERSEDED CARD
FILMED

BURNS & ROE

2033 SH 3

CARD REC C0017995

MATCH LINE (SEE DWG 2033 SH 3)

MATCH LINE (SEE DWG 2033 SH 2)

4"PV-1

1-CM-164-3

1-CM-160A-10

DWG 2013 ZONE H-8

2"DW-1S 4-DW-149-2

AVSPV-424

3"424AV126W

4"PW-1S 1-RW-241-4

4"PW-1S 1-RW-241A-4

4"PW-1S 1-RW-241B-4

AVSPV-422

3"422AV126W

4"PV

VENT A (324)

VENT A (326)

4"420AV726F

VENT A (325)

VENT A (280)

RMS

AVSPV-423

DWG 2010 SH.4 ZONE J-7

FIC 388A

IA-V-1997

IA-V-1998

LT 388A 20

AO

10"423AV123W

CH-4 CH-4S

10"CH-4S

A1

WASTE SAMPLE TANK 1A

NOT IN CONTRACT E69-4

MIXING EDUCTOR

RO 389A

4"PW-1S

4"PW-1 1-RW-252A-4

3" PW-1S PW-1

2" 1-RW-255A-2

2"V126X-74

TO EQUIP DRAIN SUMP

1-RW-253A-6

VENT A (275)

1-CM-160A-10

¾"V226X(276)

6"V126W-70

S-109

1½"V126S-71

RW-SOV-SPV139A

VENT

AO 139A

SP 12A

¾"V226X-73

4"403AV126W

PW-1S

PI 390D 20

PS 390A

(278)

4"V326W-3(61CV)

2"

¾"V226X-277

PX 492B

WASTE SAMPLE PUMP 1A

(279) DRAIN A FIG 2 SEE NOTE 4

(281) A

(282) A PW-1S CH-3S

1-RW-254-4

4"405AV126W

¾"V126X-72

1-RW-256A-¾

¾" TO EQUIP DRAIN SUMP

E/S-20-545C

DUAL TRIP

LSS 387 20 25-17

LSL 387 20 25-17

TO WASTE SAMPLE PUMP 1B THIS SHEET ZONE D-7

FROM LT-20-388B ZONE C-7 THIS SHEET

A H

A L

RW-SOV-SPV141A

VENT

AO 141A

(289)

NOT IN CONT. E69-4

FIC 388B

IA-V-1994

IA-V-2001

LT 388B 20

E/S 20-543C

TO LRS-20-386 & LRS-20-387, ZONE E-3 THIS SHEET

RO 389B

WASTE SAMPLE TANK 1B

MIXING EDUCTOR

4"PW-1 1-RW-252B-4

2"DW-1S 1-DW-150-2

DWG 2013 ZONE H-5

4"PW-1S

1-RW-257A-4

1-RW-257B-4

10"CH-4S

DWG 2010 SH.4 ZONE H-6

AVSPV-421

10"421AV123W

CH-4S CH-4

(283)

6"PW-1S

1-RW-253B-6

6"V126W-75

PX 493A

¾"V226X (285)

S-109

1½"V126S-76

PS 390B

PI 390B 20

(287)

1-RW-254-4 (62CV)

4"PW-1S

4"V386W4

1"

(284) DRAIN

¾"V126X-77

RW-SOV-SPV141B

VENT

AO 141-B

4"406- AV126W

(291) DRAIN A PW- CH- 1S 3S

VENT (290)

RW-SOV-SPV139B

AO 139B

PX 493B

(286) A ¾"V226X

FROM LSL-20-387 ZONE D-3 THIS SHEET

WASTE SAMPLE PUMP 1B

FIG 2-SEE NOTE 4

4"PW-1S

4"404AV126W

4"CH-3S

(288) DRAIN A

¾"V226X-79

SP 12B

¾"V126X-256B-¾

¾" TO EQUIP DRAIN SUMP

VENT A ¾" (596)

4"CH-3S

DWG 2035 SH 4, ZONE G-7

10"CH-4 1-CM-160B-10

1"PW-1

1"PW-1

1-RW-268-1

3"PW-1

3"PW-1

1-RW-242-3

COND. FILL SEE DWG 2049 SH 2, ZONE B-3

1½"CH-3 1-CM-194-1½

CH-3 PW-1S

1½"V326X-1814

E5-20-545J

1½"PV-1

1½"PV-1

1-RW-265-1½

LI 456 20

FIC 454

LT 455 20 25-65

LRS 457 20 25-17

A H

3" 4" 2"

B C

40 MESH SCREEN S-9

SPENT RESIN TANK

SPARE

SPRAY WASH DOWN DWG 2013 ZONE H-3

2"DW-1S 1-DW-152-2

LOW LEVEL

TDS 476 20 25-17

PI 476 A

(1160)

(1159)

(1158)

4"PW-2 1-RW-266-4

CONNECTION TO DEMIN WATER

(983) 1"V153X

(984) 2"PW-2

2"V153X-107

2"V153X

FROM 1 ¼" SER AIR DWG 2010 SH 3 ZONE C-3

TO FCVSPV-317 DWG 2049 SH 2 ZONE B-2

3"PW-2

3"414AV523F

1-RW-268-3

AO 315

AVSPV-414

RMS

TO EQUIP DRAIN SUMP

1½"

CONDENSATE SUPPLY DWG 2049 SH 2, ZONE D-3

1½"CH-3

S-22

SPENT RESIN TANK EDUCTOR

1½"PW-1

2½"

SPENT RESIN PUMP

1"

1"V353X-14 (63-CV)

1"PW-1

¾"V153X-108

PW-1 1-RW-270-¾

TO EQUIP DRAIN SUMP

1"PW-1

1"V253X-1532

CH-3 PW-1

44 SEE NOTE 8

4"V326W-1961 (33CV) A

TO CONDENSATE STORAGE TANK 1CM-180-4

4"CH-3S

(TO CONDENSATE DEMINERALIZER BACKWASH PUMP)

DWG 2049 SH 2, ZONE H-1

10"CH-4

1-CM-160A-10

10"CH-4

1-CM-160-10

DWG 2049 SH 2, ZONE F-1

3"CH-3S

1-CM-164-3

3"CH-3S

(RADWASTE BUILDING AUX COND. BOOSTER PUMP MIN. FLOW)

DWG 2049 SH 2, ZONE J-1

NOTE:
ALL ITEMS MARKED THUS A ARE "AS BUILT" ITEMS AND ARE NOT SHOWN ON PIPING DRAWINGS.
FOR NOTES SEE SHEET 1

REVISIONS TO THIS DRAWING REQUIRES A REVISION TO THE CORRESPONDING ISOKEY.

AS BUILT
454003681
CADD DRAWING
DO NOT REVISE MANUALLY

FOR PREVIOUS REVISIONS, SEE SUPERSEDED CARDS.

REVISIONS BY N.P.P.D.

NO.	REVISIONS	DFT	CKD	APP	DATE
N13	REDRAWN, DCR 3-40217 (DCN 02-0196)	RAC	HFY	KG	3/27/02
N14	NOT. 10244841 (DCN 03-0830)	KG	KG	DLR	7/1/03
N15	CED 6013680 (DCN 03-1765)	DLR	DLR	JDN	2/10/04
N16	CED 6013680 (DCN 03-1766)	DLR	DLR	JDN	2/10/04
N17	CED 6014761 (DCN 05-1459)	DJB	DJB	RLE	11/14/12

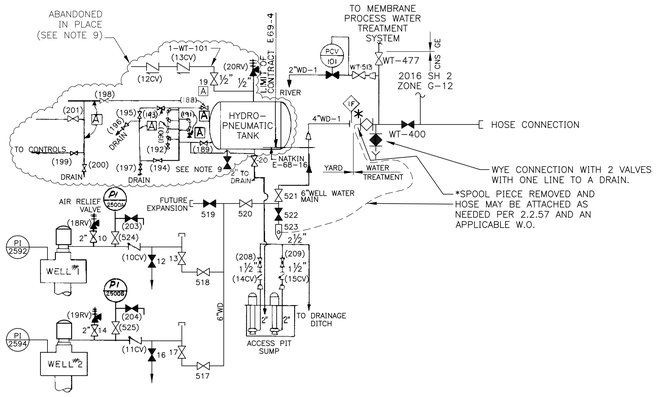
SIGNIFICANT NUMBER | GROUP 1 2 3 4 5 6

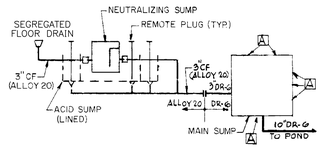
DRAWN RAC 02/27/02 | CHECKED | APPROVED SEE SUPERSEDED CARDS | FILMED

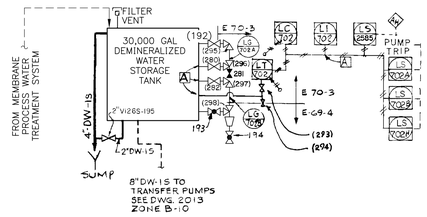
FLOW DIAGRAM
LOW CONDUCTIVITY
(EQUIPMENT DRAINS) PROCESSING
COOPER NUCLEAR STATION

BURNS & ROE

2033 SH 4 | REVISION N17 | DCD FILE C0017996







NOTES:

1. DELETED
2. HEAVY LINES INDICATE EQUIPMENT & PIPING FURNISHED AND INSTALLED UNDER CONTRACT E69-4.
3. LIGHT LINES INDICATE EQUIPMENT & PIPING FURNISHED BY OTHERS AND INSTALLED UNDER CONTRACT E69-4.
4. UNLESS OTHERWISE INDICATED ALL PRESSURE AND FLOW INSTRUMENT ROOT VALVES SHALL BE ¾" LINES UP TO AND INCLUDING ROOT VALVES SHALL BE FURNISHED AND INSTALLED UNDER CONTRACT E69-4.
5. DELETED
6. DELETED
7. AT SAMPLING POINTS SP-32 & SP-52, CONNECTIONS, PROBES AND ROOT VALVES SHALL BE FURNISHED AND INSTALLED UNDER CONTRACT E69-4. PROBES SHALL BE FURNISHED AND INSTALLED IN ACCORDANCE WITH CONTRACT PARAGRAPH 3.4.2 AND DWG. SP-07211. FIGURE NUMBER AS NOTED. ALL OTHER SAMPLING POINTS ARE SUPPLIED BY DEGREMONT-COTTRELL AS INDICATED ON D.C. DWGS. CONTINUATION OF SAMPLE PIPING BY E70-3.
8. WHERE LINES INTERCONNECT AND ARE CONTINUED ON OTHER DRAWINGS, ZONE NUMBERS ARE APPROXIMATE ONLY.
9. HYDRA-PNEUMATIC PRESSURE MAINTENANCE SYSTEM NO LONGER USED AND ABANDONED IN PLACE.

NOTE: ALL ITEMS MARKED THUS [A] ARE "AS BUILT" ITEMS AND ARE NOT SHOWN ON PIPING DRAWINGS.

AS BUILT
454003627

STATUS: Release
STATUS DATE: 01/03/2014
DS APPROVED: JECASS
VER: AC REV: 70 SIZE: F

REVISIONS TO THIS DRAWING REQUIRES A REVISION TO THE CORRESPONDING ISOKEY.

FOR PREVIOUS REVISIONS, SEE SUPERSEDED CARDS.

VERSIONS/REVISIONS BY N.P.P.D.

NO.	DESCRIPTION	DFT	DATE	ENG
AB/69	DR-2013-0591	KPB	10/9/13	ALABLE
AC/70	DR-2013-0975	DJB	12/20/13	JECASS

SIGNIFICANT NUMBER							
GROUP	1	2	3	4	5	6	

COOPER NUCLEAR STATION
FLOW DIAGRAM
PLANT MAKE UP WATER TREATMENT SYSTEM

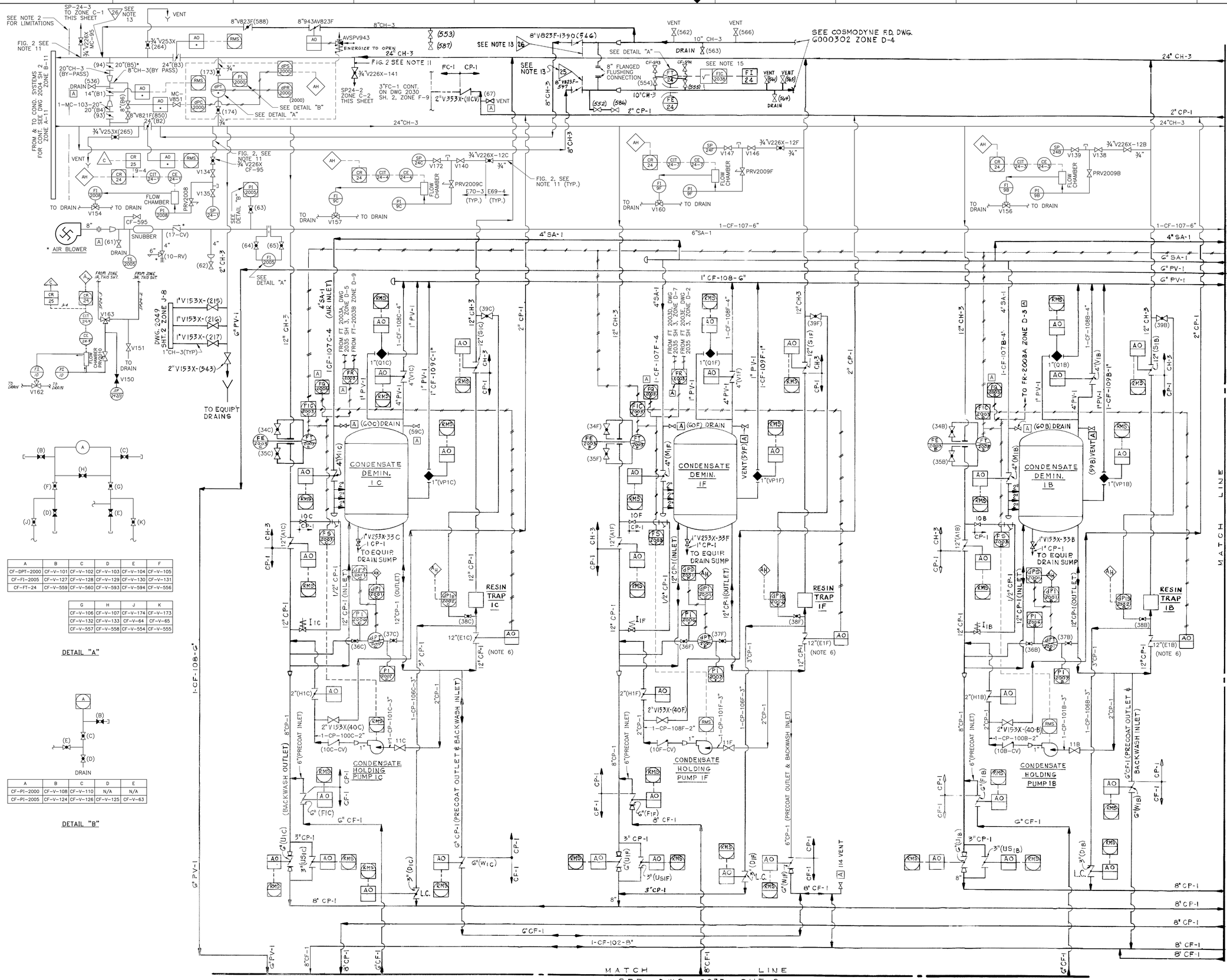
DRAWN	HFY	DATE 06/28/02
CHECKED		DATE
APPROVED		DATE
SEE SUPERSEDED CARDS		
FILMED		

BURNS & ROE

2034

C0017934

VERSIONS/REVISIONS NO.



A	B	C	D	E	F
CF-DPT-2000	CF-V-101	CF-V-102	CF-V-103	CF-V-104	CF-V-105
CF-FI-2005	CF-V-127	CF-V-128	CF-V-129	CF-V-130	CF-V-131
CF-FT-24	CF-V-559	CF-V-560	CF-V-593	CF-V-594	CF-V-556

G	H	J	K
CF-V-106	CF-V-107	CF-V-174	CF-V-173
CF-V-132	CF-V-133	CF-V-64	CF-V-65
CF-V-557	CF-V-558	CF-V-554	CF-V-555

DETAIL "A"

A	B	C	D	E
CF-PI-2000	CF-V-108	CF-V-110	N/A	N/A
CF-PI-2005	CF-V-124	CF-V-126	CF-V-125	CF-V-63

DETAIL "B"

NOTES:

1. ALL PIPING SHALL BE FURNISHED AND INSTALLED UNDER CONTRACT E-69-4.
2. ALL VALVES AND SPECIALTIES UPSTREAM OF CONDENSATE BACKWASH TRANSFER TANK WILL BE FURNISHED UNDER CONTRACT E-68-52, EXCEPT WHERE NOTED, AND INSTALLED UNDER CONTRACT E-69-4.
3. ALL VALVES AND SPECIALTIES DOWNSTREAM OF CONDENSATE BACKWASH TRANSFER TANK SHALL BE FURNISHED AND INSTALLED UNDER CONTRACT E-69-4.
4. VALVES AND EQUIPMENT MARKED WITH AN ASTERISK (*) SHALL BE INSTALLED OUTSIDE THE DEMINERALIZER VALVE ROOM (UPSTREAM OF BACKWASH RECEIVING TANK)
5. UNLESS OTHERWISE INDICATED ALL PRESSURE AND/OR FLOW INSTRUMENT ROOT VALVES SHALL BE 3/4" ROOT VALVES SHALL BE 3/4" V253X. LINE UP TO AND INCLUDING ROOT VALVE SHALL BE FURNISHED AND INSTALLED UNDER CONTRACT E-69-4.
6. OPERATING AND CONTROL AIR ISOLATION VALVES SHOWN ON DWG. 2010, SH. 4.
7. SEE GRAVER DRAWING Y-4547B FOR INSTRUMENTATION HOOK UP
8. HIGH POINT VENTS AND LOW POINT DRAINS ARE NOT SHOWN AND SHALL BE FURNISHED AND INSTALLED UNDER CONTRACT E-69-4.
9. SEE GRAVER BILL OF MATERIALS FOR ITEMS FURNISHED BY GRAVER. ALL VESSEL INTERNALS TO BE INSTALLLED BY E-69-4
10. ALL PIPING FROM SHIELDED TANK TO FIRST SHUT-OFF VALVE SHALL BE SUITABLY SUPPORTED TO WITHSTAND A CLASS I SEISMIC EARTHQUAKE.
11. AT SAMPLING POINTS, CONNECTIONS, PROBES AND ROOT VALVES SHALL BE FURNISHED AND INSTALLED UNDER CONTRACT E-69-4. PROBES SHALL BE FURNISHED AND INSTALLED IN ACCORDANCE WITH CONTRACT PARA. 3,4,2 AND DWG. SP-07211 FIG. NUMBER AS NOTED. CONTINUATION OF SAMPLE PIPING BY E-70-3.
12. ALL VALVE NUMBERS IN PARENTHESIS( ) ARE NUMBERS TO BE USED IN OPERATING PROCEDURES. THESE NUMBERS ARE ASSIGNED BY NPPD AND WILL NOT BE SHOWN ON PIPING DRAWINGS
** ANION FLOC EQUIPMENT WILL BE INSTALLED BUT NOT NORMALLY USED.
13. △'S WHERE SHOWN WITH NUMBERS REPRESENT POINTS OF CONNECTION TO EXISTING SYSTEMS E-73-58 SPECIFICATION DEFINES WORK FROM THIS POINT.
14. WHERE LINES INTERCONNECT AND ARE CONTINUED ON OTHER DRAWINGS, ZONE NUMBERS ARE APPROXIMATE ONLY.
15. FIC-2038 CONTROL FUNCTION SHOWN ON DWG. 6000302 SH1.

NOTE
ALL ITEMS MARKED THUS [A] ARE "AS BUILT" ITEMS, AND ARE NOT SHOWN ON PIPING DRAWINGS.

AS BUILT
454003628
SCAN/CADD DWG
DO NOT REVISE MANUALLY

REVISIONS TO THIS DRAWING REQUIRES A REVISION TO THE CORRESPONDING ISOKEY.

FOR PREVIOUS REVISIONS, SEE SUPERSEDED CARDS.

REVISIONS BY N.P.P.D.

NO.	REVISIONS	DFT	CKD	APP	DATE
N16	CR 2010-09154 (DCN 10-2275)	KZ	KZ	DLR	12/23/10
N17	(DCN 13-1845)	DJB	DJB	DLR	05/01/13

SIGNIFICANT NUMBER							
GROUP	1	2	3	4	5	6	

FLOW DIAGRAM
CONDENSATE FILTER
DEMINERALIZER SYSTEM
COOPER NUCLEAR STATION

DRAWN	DATE	BURNS & ROE
HFY	6/14/02	
CHECKED	DATE	
APPROVED SEE SUPERSEDED CARDS	DATE	
FILMED	2035 SH 1	REVISION N17

CODE IDENT NO. 06535 C0017935

SEE DWG. 2035 SHT. 1
MATCH LINE

CONDENSATE DEMINERALIZER BACKWASH PUMP *
VENT (115) A
(15-CV)
6"
(116) A DRAIN
(42)
FE 2004
8" CH-3
6"(N)
3" CH-5
3" (N5)
(43)
(44)
FT 2004
SEE DETAIL "A" ZONE B-4
(112)
(113)
(111)
PI 2004
10" CH4
FOR CONT. SEE DWG. 2049 SHT. 2 ZONE F-8
VENT (68) A
RMS 2004
AO *
CH-3 CF-1
6"PV-1
8" CF-1
8" CP-1
6" CF-1
5" CF-1
G" CF-1
1" CH-5
PV-1 CH-5
(19)
4"(R)
6" PV-1
DWG 2033 SH. 3 ZONE B-7
MILLEPORE FILTER (20-59)
(RW-1100)
TO EQUIP DRAINS
CF-(590)
CF-(591)
¾" V153X CF-(585)
CF-(589)
6"(X)
6" PV-1 1-CF-111-6"
6" CH4 (PRECOAT RETURN)
AGITATOR *
CONDENSATE PRECOAT TANK *
A VENT (66)
(OVERFLOW)
(BATCH LEVEL)
8" CF-1
2" CF-1
1-CF-114-2
2" CF-1 (CP-112-2)
8" (2)
1-CF-115-8
(31)
(32)
1-CF-104-8"
(DRAIN)
8" CF-1
2" CF-1
A
8"CF-1
RMS
G" CF-1
CONDENSATE PRECOAT PUMP *
FOR FUTURE UNIT 2
6"CF-1
A
8"V343W(23CV)
8"
6"
6" PV-1
8" CP-1
CONT ON DWG 2021 ZONE G-9 (HFV)
FIC 447 20 25-31
1½" DW-15
LT 447 20 25-31
FROM E/S 20-545 F
LIS 447 20 25-17
4h
4L
E G F DEMISTER B
CONDENSATE BACKWASH & TRANSFER TANK
D A
V V V V V V E
SERVICE AIR, FOR CONT. SEE DWG. 2010 SH. 3 ZONE C-5
6" CP-1
2" CP-1
2" V523 F(360)
TO EQUIPMENT DRAIN SUMP
AVSPV-490
TS 447 20 25-17
6" 490 AV323F
AO 237
O C
CP-1
CH-3
1½" CP-1
1-CM-130-4"
CONDENSATE SUPPLY SEE DWG. 2049 SHT. 1 ZONE H-3
4"
DRAIN A (382)
5"
4"
6" CP-1
CONDENSATE BACKWASH TRANSFER PUMP
6" V123F-(361)
6" V323F-1 (78 CV)
PI 691 20
(374)
6" CP-1
3/4" V 253X-(362)
TO EQUIPMENT DRAIN
1½" CF-1
1-CF-105-8"
(SEE NOTE 2 FOR LIMITATIONS)
(SEE NOTE 3)
1½" CF-1
FOR CONT. SEE DWG. 2035 SH. 3, ZONE C-10
(100)
PI 690
(544)
(99)
*(15)
(41)
(12-CV) DRAIN
4" (V)
CF-ADV-(V)
SPRAY WASHDOWN FOR CONT. SEE DWG 2013 ZONE H-1
1" CF-1
AVSPV-944
AO 944
¾" V151X CF-592
¾" CF-1
CF-AD-944, ¾" AV551X
VENT (47) A
8" CF-1
1-CF-105-8"
1" EDUCTOR
SOLUTION A TANK
CF-602
½" CF-1
WASTE FILTER AID TANK
(117)
(118)
FT 2004
(121)
(122)
HIGH
(123)
LOW
(119)
(120)
DETAIL "A"
8" CF-1
1-CF-105-8"
6" CP-1
1½" CF-1
CATION FLOC. MEASURING TANK (1 GAL)
AGITATOR
CATION FLOC. MIXING TANK (5 GAL)
MS *
1" CF-1
1" V153X-(363)
** ANION FLOC. MEASURING TANK (15 GAL.)
** ANION FLOC. MIXING TANK (150 GAL.)
AGITATOR
MS *
1" CF-1
1" V153X-(364)
1" V153X-(365)
1" V153X-(366)
1-CM-134-1½"
DWG 2049 SH 2 ZONE E-6
CONDENSATE SUPPLY 1½" CH-3
1"
1½" CF-1
3/4
EDUCTOR (S-20)
11/2" CF-1
1½" V153X-(375)
1½" CF-1
1½"V153X-1529(606) TO WASTE SURGE PUMP. DWG 2033 SH 3, ZONE D-8
32 SEE NOTE 13
33 SEE NOTE 13
1½"V153X-1530(607) TO WASTE COLLECTOR PUMP. DWG 2033 SH 2, ZONE G-7
1½"V153X-1531(608) TO F.D. COLLECTOR PUMP. DWG 2032 SH 2, ZONE G-4
31 SEE NOTE 13
1¼" V-153X-(367)
TO WASTE SLUDGE TANK DWG 2032 SH 4, ZONE C-5
MATCH LINE SEE DWG 2035 SH 4
2" CF-1
2" CF-1

NOTE:
ALL ITEMS MARKED THUS A ARE "AS BUILT" ITEMS, AND ARE NOT SHOWN ON PIPING DRAWINGS.

FOR NOTES SEE SHT. 1

AS BUILT
454003669
SCAN/CADD DWG
DO NOT REVISE MANUALLY

REVISIONS TO THIS DRAWING REQUIRES A REVISION TO THE CORRESPONDING ISOKEY.

FOR PREVIOUS REVISIONS, SEE SUPERSEDED CARDS.

REVISIONS BY N.P.P.D.					
NO.	REVISIONS	DFT	CKD	APP	DATE
N13	DCR 3-40217 (DCN 02-0657)	HFY	DJF	RGA	7/10/02

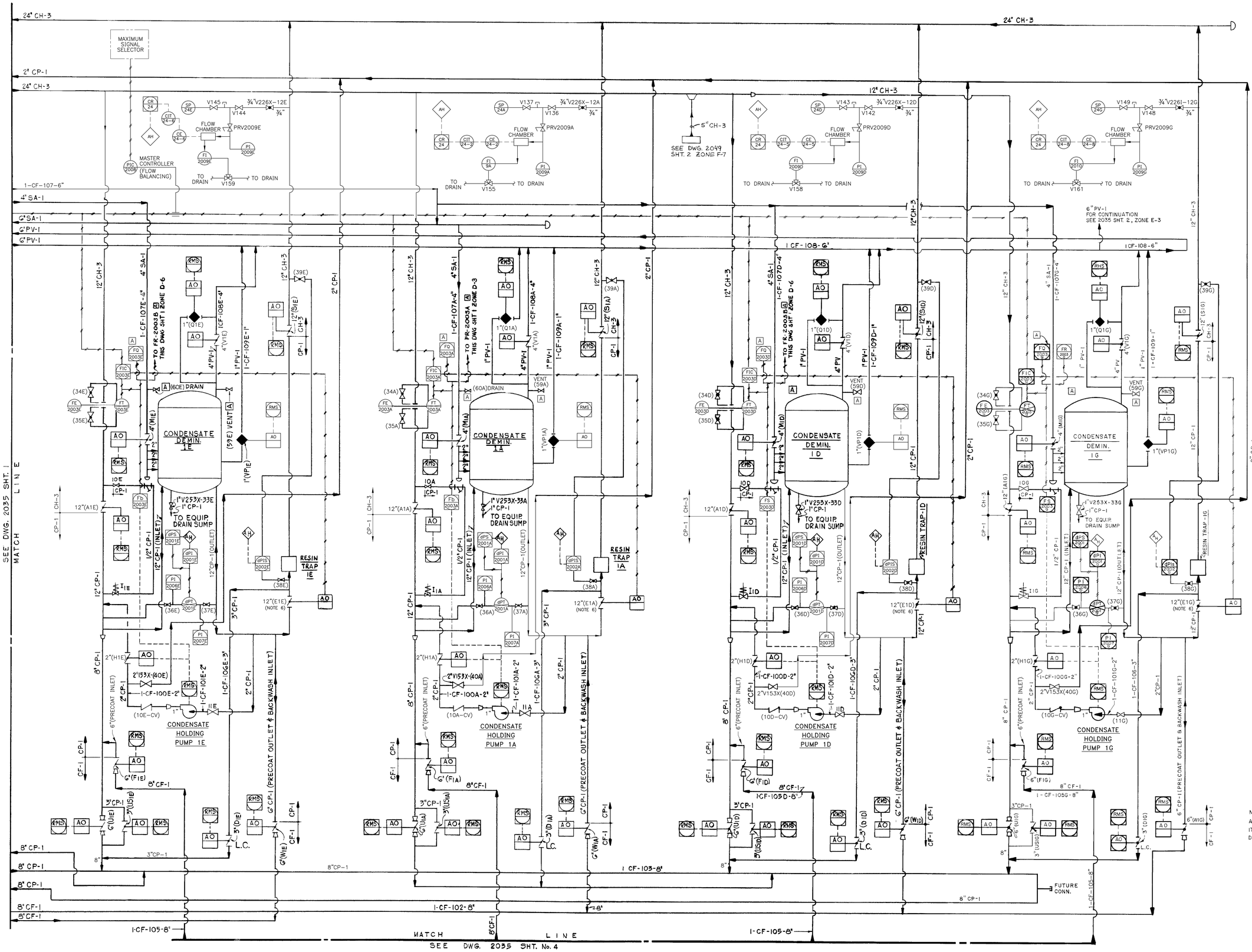
SIGNIFICANT NUMBER | GROUP | 1 | 2 | 3 | 4 | 5 | 6

COOPER NUCLEAR STATION
FLOW DIAGRAM
CONDENSATE FILTER DEMINERALIZER SYSTEM

DRAWN HFY DATE 06/14/02
CHECKED DATE
APPROVED SEE SUPERSEDED CARDS DATE
FILMED

BURNS & ROE

2035 SH 2
REVISION N13
CARD REC C0017953



AS BUILT
454003670
SCAN/CADD DWG
DO NOT REVISE MANUALLY

REVISIONS TO THIS DRAWING REQUIRES A REVISION TO THE CORRESPONDING ISOKEY.

FOR PREVIOUS REVISIONS, SEE SUPERSEDED CARDS.

REVISIONS BY N.P.P.D.

NO.	REVISIONS	DFT	CKD	APP	DATE
N10	DCR 3-40217 (DCN 02-0659)	HFY	RGA	KG	7/10/02
N11	CR-2006-10452 (DCN 06-1700)	OJB	DLR	KG	12/20/06
N12	DC86-00BA, CR2010-02893 (DCN 10-1105)	OJB	DJB	DLR	05/19/10
N13	CR 2010-09154 (DCN 10-2276)	DLR	DLR	KZ	12/23/10

SIGNIFICANT NUMBER							
GROUP	1	2	3	4	5	6	

COOPER NUCLEAR STATION
FLOW DIAGRAM
CONDENSATE FILTER
DEMINERALIZER SYSTEM

DRAWN	DATE	BURNS & ROE	
HFY	6/14/02		
CHECKED	DATE		
APPROVED SEE SUPERSEDED CARDS	DATE		
FILMED		2035 SH 3	REVISION N13

DOC. TITLE C0017954

SEE DWG. 2035 SHT. No. 3 MATCH LINE

6" CF-1

1-CF-105-8"

6" CF-1

8" CF-1

A (48) VENT

1-CF-105-8"

1-CF-105-8"

A (57) DRAIN

1-CF-105-8"

6"CP-1

6"CP-1

3"PV-1

DWG 2033 SH 2 ZONE H-1

AVSPV474

RMS

AO 242A

AVSPV482

AO 279

RMS

6"482AV523F

1-RW-282-6"

6"FDR-1 (FROM WASTE SLUDGE TANK)

DWG 2032 SH 2 ZONE J-2

1/2" CF-1

11/2" CF-1

11/2" CF-1

FROM E/S 20-545

AVSPV479

AO 242B

FIC 450B 20 25-13

FROM L/520 545F

TO AVSPV486 ZONE D-6

AH

AL

LT 449B 20 25-13

LIS 448B 20 25-17

TO AVSPV487 ZONE D-4

AH

AL

FIC 450A 25-13

LIS 448A 20 25-17

LT 449A 20 25-17

6"474AV523F

6"479AV523F

6"CP-1

3"PV-1

1-CF-138B

3"PV-1 (TO WASTE SLUDGE TANK)

DWG 2033 SH 2 ZONE H-1

CF-1 CP-1

TO COND. DECANT PUMP ZONE G-6

LS 424A 20

LS 451A 20

1½"V153X(368)

1½"V153X(369)

FROM LIS 20-448 B ZONE C-10

LS 451B 20

LS 424B

TO SS-20-481 ZONE G-4

TO SS-20-481 ZONE G-4

N-10

N-5 N-9 N-8

1098

1097

1096 TO TURBIDIMETER DWG 2033 SH 2 SECTION A

FROM LIS 20-448A ZONE C-1

AVSPV487

AO 245A

AVSPV486

AO 245B

1101

1100

1099 TO TURBIDIMETER DWG 2033 SH 2 SECTION A

N-6 N-9 N-5

N-10

N-6 N-9 N-5 N-8

8" N-7

6" N-7

TO COND. DECANT PUMP, ZONE G-6

6"487AV523F

6"486AV523F

6"CP-1

6"CP-1

4"CP-1

4"CP-1

4"PW-1 (OVERFLOW)

N-4 N-3 N-2 N-1

6"

4"475AV523F

4"488AV523F

4"489AV523F

4"478A523F

N-4 N-3 N-2 N-1

CONDENSATE PHASE SEPARATOR 1B (20-37)

4"PW-1 (OVERFLOW)

2"V523F(370)

2"PW-1

CONDENSATE PHASE SEPARATOR 1A (20-37)

AO 248A

AVSPV483

AO 292A

AVSPV475

4AVSPV488

AO 246A

AO 246B

AVSPV489

AVSPV

AO 292B

2"V523F(371)

2"PW-1

AO 248B

AVSPV480

6"483AV523F

6"480AV523F

FROM TDS 20-453 ZONE E-5

TO AVSPV-483 ZONE E-2

TO AVSPV-480 ZONE E-9

6"CP-1

VENT 380 A

EL. 927'-0" (94 FT. HIGH LOOP SEAL)

FROM TDS 20-453 ZONE E-5

TO EQUIP'T DRAIN

TO EQUIP'T DRAIN

CH-3 CP-1

CONDENSATE SUPPLY SEE DWG. 2049 SHT. 1 ZONE E-3

4"CP-1

TO 4"655AV123W DWG 2049 SH 1, ZONE E-2

SS 575 20 25-17

TDS 453 20 25-17

RMS

PS 452

PI 694

(381)

AO 204

AVSPV481

CONDENSATE SUPPLY 3/4" CP-1 SEE DWG 2049 SH 1 ZONE G-2

588

3"

4"V323F-1 (80CV)

1½"481AV523F

1" CP-1(TO CENTRIFUGE)

DWG 2032 SH 1 ZONE A-1

PI 692 20

COND. SLUDGE PUMP

(376)

AO 251

AVSPV485

6" CP-1 (TO WASTE COLLECTOR TANK)

A VENT (378)

DWG 2033 SH 2 ZONE B-1

5"

6"V323F-2 (79CV)

CONDENSATE DECANT PUMP

6"485AV523F

(379) DRAIN A

¾"V253X(372)

¾"V253X(373)

(377)

AO 250

AVSPV484

PI 693 20

6" CP-1 (TO HOT WELL)

DWG 2030 SH 1 ZONE F-10

TO EQUIP'T DRAINS

FROM LS-20-424A ZONE D-1

FROM LS-20-424B ZONE D-10

6"484AV523F

4"V323W (34CV)

2"V323W(127CV)

1¼" (RW1309)

1¼"V223W(RW1035)

RADWASTE BLDG.

REACTOR BLDG.

CH-3S CP-1

4"V123W (667)

FDR-1 CP-1

2"V123W(1066)

3"V123W-1389 (567)

DWG. 2033 SHT. 2 ZONE C-1

DWG 2049 SH 2 ZONE H-7

3"CH-3

3"V323W-1388

3" FLGD. FLUSHING CONNECTION

A VENT (56)

FUTURE CONNECTION TO UNIT 2 PHASE SEPARATOR 4 CD-1

N. WALL

(55) DRAIN A

FROM CONDENSATE SUMP, DWG 2080 ZONE G-7

2"CF-1

DWG 2032 SH 1 ZONE A-1

LL. CUT OFF

FROM AVSPV487 RMS ZONE D-5

FROM AVSPV486 RMS ZONE C-7

2"CF-1

2"CF-1

SEE DWG. 2035 SHT. 2 MATCH LINE

NOTE:
ALL ITEMS MARKED THUS A ARE 'AS BUILT' ITEMS, AND ARE NOT SHOWN ON PIPING DRAWINGS.

FOR NOTES SEE SHT. 1

REVISIONS TO THIS DRAWING REQUIRES A REVISION TO THE CORRESPONDING ISOKEY.

AS BUILT
454003671
STATUS: Release
STATUS DATE: 02/07/2017
DS APPROVED: NEWERNE
VER: AB REV: 16 SIZE: F

FOR PREVIOUS REVISIONS, SEE SUPERSEDED CARDS.

VERSIONS/REVISIONS BY N.P.P.D.

NO.	DESCRIPTION	DFT	DATE	ENG
AB/16	DR-2017-0001	DJB	02/07/17	NEWERNE

SIGNIFICANT NUMBER | GROUP 1 2 3 4 5 6

FLOW DIAGRAM
CONDENSATE FILTER DEMINERALIZER SYSTEM
COOPER NUCLEAR STATION

DRAWN HFY DATE 06/17/02
CHECKED DATE
APPROVED SEE SUPERSEDED CARDS DATE
FILMED

BURNS & ROE

2035 SH 4

CADD FILE: C0017955

NOTES:

1. UNLESS OTHERWISE INDICATED ALL PRESSURE AND/OR FLOW INSTRUMENT ROOT LINES SHALL BE 3/4". ROOT VALVES SHALL BE 3/4"V253x. LINE UP TO AND INCLUDING ROOT VALVE SHALL BE FURNISHED AND INSTALLED UNDER CONTRACT E-69-4.
2. ALL TEMPERATURE TEST AND PROTECTING WELL PENETRATIONS SHALL BE 1" NPT. UNLESS OTHERWISE NOTED.
3. ALL "SW-1" & "SW-2" PIPING SYSTEMS SHOWN HEREON SHALL BE CLASS IS SEISMIC CLASSIFICATION, EXCEPT FOR LOW POINT DRAINS.
4. ALL SERVICE WATER LOW POINT DRAINS TO BE ROUTED TO 4 FOOT HIGH COLLECTION STAND PIPE IN SOUTH EAST CORNER OF REACTOR BUILDING TO MINIMIZE CONTAMINATION OF RADWASTE FACILITIES.
5. "CP" INDICATES LOCATION OF CATHODIC PROTECTION LEADS TO BE INSTALLED IN ACCORDANCE WITH PARAGRAPH 1.4.14.2, CONTRACT E-69-4.
6. DELETED
7. AT SAMPLING POINTS CONNECTIONS, PROBES AND ROOT VALVES SHALL BE FURNISHED AND INSTALLED UNDER CONTRACT E-69-4. PROBES SHALL BE FURNISHED AND INSTALLED IN ACCORDANCE WITH CONTRACT PARA. 3.4.2 AND DWG. SP-07211 FIG. NO. AS NOTED. CONTINUATION OF SAMPLING PIPING BY E-70-3.
8. MANUAL OVERIDE TO CLOSE VALVE ONLY AFTER VALVE HAS OPENED AUTOMATICALLY ON START OF BOOSTER PUMP-TYP. MV-122, 123,124,125,ON ALL SW BOOSTER PUMPS.
9. △'S WHERE SHOWN DENOTES WORK LISTED IN PART IIA, PARA. 2.2.3.1 OF SPEC. E-73-58.
11. ALL VALVES ARE SERVICE WATER (SW) UNLESS DENOTED OTHERWISE.
12. REFERENCE GE DRAWING 117C3324, SH.2 FOR INSTRUMENT PIPING AND VALVE INSTALLATION AT INSTRUMENT RACK 25-59.
13. REFERENCE GE DRAWING 117C3326, SH.2 FOR INSTRUMENT PIPING AND VALVE INSTALLATION AT INSTRUMENT RACK 25-62.
14. FOR LINE DESIGNATION, EXAMPLE 1-SW-104B-18", THE A OR B DOES NOT NECESSARILY DENOTE LOOP A OR B.
15. WHERE LINES ARE INTERCONNECTED AND CONTINUED ON OTHER DRAWINGS, ZONE NUMBERS ARE APPROXIMATE ONLY.
16. COUPON HOLDER AND ASSOCIATED COMPRESSION GLAND MAY OR MAY NOT BE INSTALLED. IF NOT INSTALLED, ISI BOUNDARY/CLASS BREAK REVERTS TO NEAREST CLOSED VALVE (1524).

REACTOR BUILDING CLOSED COOLING WATER HEAT EXCH. # 1B

REACTOR BUILDING CLOSED COOLING WATER HEAT EXCH. # 1A

RESIDUAL HEAT REMOVAL HEAT EXCHANGER # 1A

RESIDUAL HEAT REMOVAL HEAT EXCHANGER # 1B

REVISIONS TO THIS DRAWING REQUIRES A REVISION TO THE CORRESPONDING ISOKEY.

NOTE:
ALL ITEMS MARKED THUS [A] ARE "AS BUILT" ITEMS AND ARE NOT SHOWN ON PIPING DRAWINGS.

FOR PREVIOUS REVISIONS, SEE SUPERSEDED CARDS.

VERSIONS/REVISIONS BY N.P.P.D.

NO.	DESCRIPTION	DFT| DATE	ENG
AF/A0	DR-2013-0625 (FROM VERSION AC)	DJB|11/20/14	RDCHAMP
AG/A1	DR-2013-0600 (FROM VERSION AB)	DLR|12/4/14	RDCHAMP
AH/A2	DR-2013-0969 (FROM VERSION AE)	DJB|04/01/15	LDMADDO
AI/A3	DR-2015-0257	DLR| 5/5/15	LDMADDO
AM/A4	DR-2018-0057 (TCC 5231919)	DJB|01/29/18	JAFORBE
AN/A5	DR-2018-0057 (REMOVE TCC)	DJB|01/17/18	JAFORBE

SIGNIFICANT NUMBER | GROUP | 1 | 2 | 3 | 4 | 5 | 6

FLOW DIAGRAM
REACTOR BUILDING
SERVICE WATER SYSTEM

DRAWN K.P.B.	DATE 12/15/93	BURNS & ROE
CHECKED DJF	DATE 12/15/93	
APPROVED BKW	DATE 12-18-93	
FILMED		2036 SH 1

CARD FILE: C0012182

AS BUILT
454003629
STATUS: Release
STATUS DATE: 10/11/2018
DS APPROVED: JAFORBE
VER: AN REV: AS SIZE: F

STANDBY GAS TREATMENT UNITS

(ONE OPERATING – ONE STANDBY)(E-69-3)

NOTES:

1. PORTIONS OF PIPING AT THE ELEVATED RELEASE POINT NOT IN CONTRACT E69-4 SEE DWG. 2192 & 2193.
2. UNLESS OTHERWISE INDICATED ALL PRESSURE INSTRUMENT ROOT LINES SHALL BE 3/4"; ROOT VALVES SHALL BE 3/4" V253X. LINE UP TO AND INCLUDING ROOT VALVE SHALL BE FURNISHED AND INSTALLED UNDER CONTRACT E69-4.
3. FOR SYMBOLS SEE DWG. 2001.
4. "CP" INDICATES LOCATION OF CATHODIC PROTECTION LEADS TO BE INSTALLED IN ACCORDANCE WITH PARA. 1.4.14.2, CONTRACT E69-4.
5. ALL INSTRUMENTATION PROVIDED BY OTHERS THAN CONTRACTOR E70-19.
6. ALL VALVE NUMBERS IN PARENTHESIS ( ) ARE NUMBERS USED IN OPERATING PROCEDURES. THESE NUMBERS ARE ASSIGNED BY NPPD AND WILL NOT BE SHOWN ON PIPING DRAWINGS.
7. △'S WHERE SHOWN WITH NUMBERS REPRESENT POINTS OF CONNECTION TO EXISTING SYSTEMS. E73-58 SPECIFICATION DEFINES WORK FROM THIS POINT. FOR QUALITY GROUP CLASSIFICATIONS AND QUALITY ASSURANCE PROVISIONS REFER TO MDC83-34.
8. 4 1/2"ø STEEL TANK 0'-8" LONG.
9. SEE DETAIL #1
10. SEE DETAIL #2
11. OIL FILTERS FOR OG SAMPLE RACK ARE SHOWN IN DETAIL #1 & #2
12. TEST PORTS FOR AIR PROBES INTO ROUND DUCT. ONE IS LOCATED ON THE EAST SIDE AND ONE IS ON THE BOTTOM APPROXIMATELY 16' SOUTH OF SBGT-V-49.
13. WHERE LINES ARE INTERCONNECTED AND CONTINUED ON OTHER DRAWINGS, ZONE NUMBERS ARE APPROXIMATE ONLY.

NOTE:
ALL ITEMS MARKED THUS [A] ARE "AS BUILT" ITEMS AND ARE NOT SHOWN ON PIPING DRAWINGS.

AS BUILT
454003630
STATUS: Release
STATUS DATE: 03/15/2018
DS APPROVED: DRKIEKE
VER: AM REV: 71 SIZE: F

FOR PREVIOUS REVISIONS, SEE SUPERSEDED CARDS.

VERSIONS/REVISIONS BY N.P.P.D.

NO.	DESCRIPTION	DFT	DATE	ENG
AJ/69	DR-2015-0086	DLR	10/14/16	KKUKER
AL/70	DR-2017-0443	DJB	10/20/17	DRKIEKE
AM/71	DR-2017-0443	DLR	3/15/18	DRKIEKE

REVISIONS TO THIS DRAWING REQUIRES A REVISION TO THE CORRESPONDING ISOKEY.

SIGNIFICANT NUMBER							
GROUP	1	2	3	4	5	6	

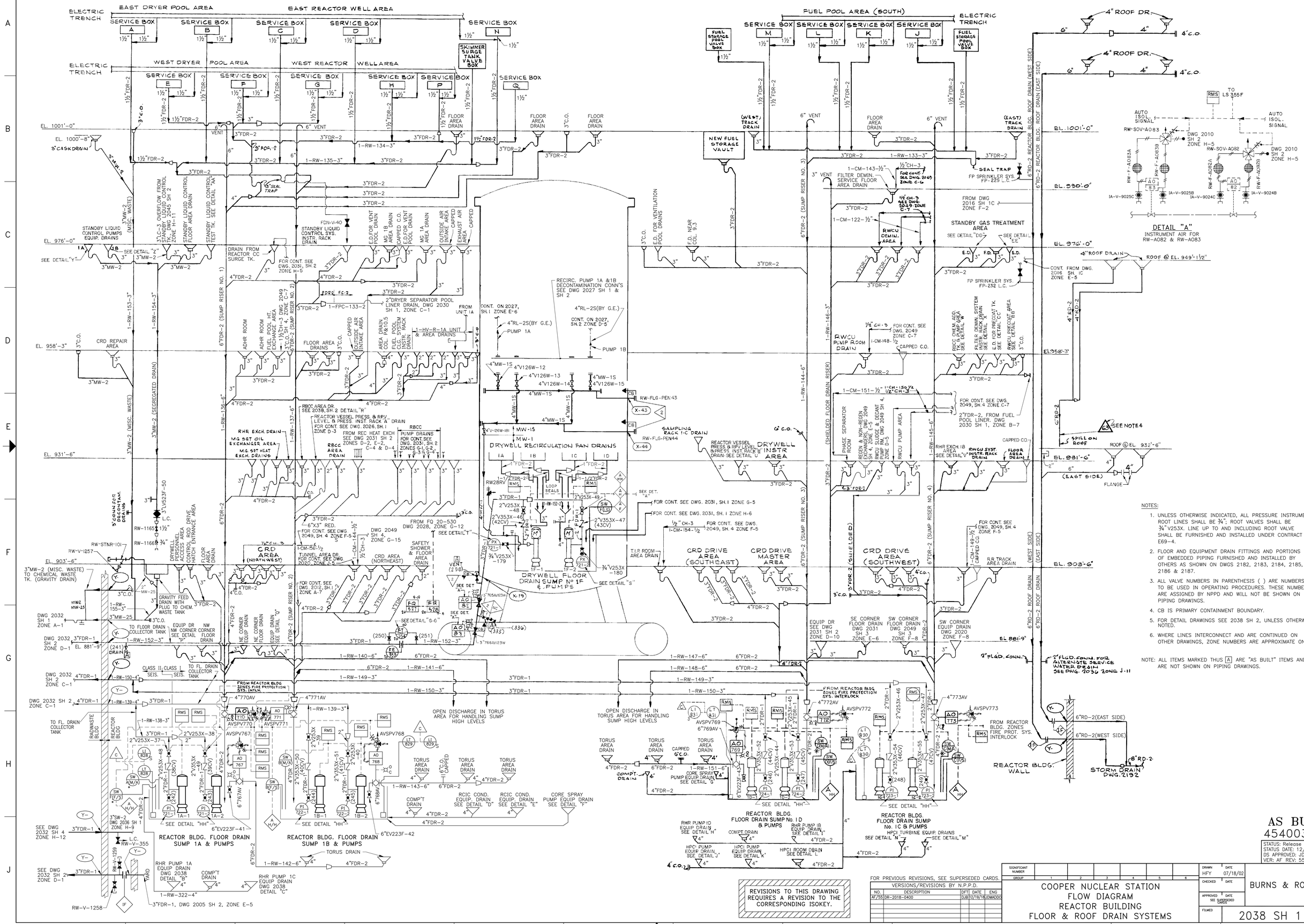
COOPER NUCLEAR STATION
FLOW DIAGRAM
H&V STANDBY GAS TREATMENT & OFF GAS FILTERS

DRAWN	HFY	DATE 7/10/01
CHECKED		DATE
APPROVED SEE SUPERSEDED CARDS		DATE
FILMED		

BURNS & ROE

2037

DMS FILE: C0017937



NOTES:

1. UNLESS OTHERWISE INDICATED, ALL PRESSURE INSTRUMENT ROOT LINES SHALL BE ¾"; ROOT VALVES SHALL BE ¾" V253X. LINE UP TO AND INCLUDING ROOT VALVE SHALL BE FURNISHED AND INSTALLED UNDER CONTRACT E69-4.
2. FLOOR AND EQUIPMENT DRAIN FITTINGS AND PORTIONS OF EMBEDDED PIPING FURNISHED AND INSTALLED BY OTHERS AS SHOWN ON DWGS 2182, 2183, 2184, 2185, 2186 & 2187.
3. ALL VALVE NUMBERS IN PARENTHESIS ( ) ARE NUMBERS TO BE USED IN OPERATING PROCEDURES. THESE NUMBERS ARE ASSIGNED BY NPPD AND WILL NOT BE SHOWN ON PIPING DRAWINGS.
4. CB IS PRIMARY CONTAINMENT BOUNDARY.
5. FOR DETAIL DRAWINGS SEE 2038 SH 2, UNLESS OTHERWISE NOTED.
6. WHERE LINES INTERCONNECT AND ARE CONTINUED ON OTHER DRAWINGS, ZONE NUMBERS ARE APPROXIMATE ONLY.

NOTE: ALL ITEMS MARKED THUS [A] ARE "AS BUILT" ITEMS AND ARE NOT SHOWN ON PIPING DRAWINGS.

AS BUILT
454003631

STATUS: Release
STATUS DATE: 12/19/2018
DS APPROVED: JDMADDO
VER: AF REV: 55 SIZE: F

REVISIONS TO THIS DRAWING REQUIRES A REVISION TO THE CORRESPONDING ISOKEY.

FOR PREVIOUS REVISIONS, SEE SUPERSEDED CARDS.

VERSIONS/REVISIONS BY N.P.P.D.

NO.	DESCRIPTION	DFT	DATE	ENG
AF/55	DR-2018-0400	DJB	12/19/18	JDMADDO

SIGNIFICANT NUMBER | GROUP

DRAWN	DATE
HFY	07/18/02
CHECKED	DATE
APPROVED SEE SUPERSEDED CARDS	DATE
FILMED	

COOPER NUCLEAR STATION
FLOW DIAGRAM
REACTOR BUILDING
FLOOR & ROOF DRAIN SYSTEMS

BURNS & ROE

2038 SH 1

DMS FILE: C0017938

NOTES
1) UNLESS OTHERWISE INDICATED ALL PRESSURE AND/OR FLOW INSTRUMENT ROOT LINES SHALL BE ¾" ROOT VALVES IN CARBON STEEL SYSTEMS SHALL BE ¾" V 263 X EXCEPT AS NOTED; IN STAINLESS STEEL SYSTEMS ¾" V 396 X.
2) FOR SIZE AND NO. OF INSTRUMENT VALVES DOWNSTREAM OF ROOT VALVES, SEE E69-11 SPECIFICATION SKETCHES SK-082069 FOR INSTRUMENTS DOWNSTREAM OF CRD PUMPS.
3) ITEMS MARKED WITH A PREFIX OF "3" ARE FURNISHED BY ENSCO.
4) VALVE NO'S IN (XX) CORRESPOND TO NO'S REFERENCED ON ICE DWGS.
5) ITEMS MARKED WITH ▲ ARE SUPPLIED WITH EDUM.
6) HIGH POINT VENTS & LOW POINT DRAINS, NOT SHOWN, TO BE SUPPLIED BY CONTR. TCK AND RUN TO NEAREST EQUIPMENT DRAIN.
7) ALL VALVE NUMBERS IN PARENTHESIS ( ) ARE NUMBERS TO BE USED IN OPERATING PROCEDURES. THESE NUMBERS ARE ASSIGNED BY NPPD AND WILL NOT BE SHOWN ON PIPING DRAWINGS.
8. REFERENCE DRAWING 115D6013 SH. 1, 2 AND 3 FOR INSTRUMENT RACK 25-52.
9. ALL VALVES ARE IN THE CONTROL ROD DRIVE (CRD) SYSTEM UNLESS DESIGNATED OTHERWISE.
10. THE START UP POSITION ASSUMES CRD-F-A IN SERVICE AND CRD-F-B IN STANDBY.
11. DEVICES 3-134, 3-135, 3-136 AND 3-137 ARE INTERNAL TO THE HCU MANIFOLD CRD-HCU-M (XX-XX).
** 12. DEVICE SHOWN THUS ⊙ (xxx) DENOTES INSTRUMENT LINE SNUBBER.
13. CONFIGURATION IS EITHER 2 ASCO VALVES OR 1 AVCO VALVE

NOTES: (cont.)
13. INSTRUMENT, SAMPLE, TEST, DRAIN AND VENT LINES ARE NOT ALWAYS THE SAME CLASS AS THE MAIN LINE AND THESE BOUNDARIES ARE TOO NUMEROUS TO IDENTIFY IN THIS MANNER (SEE ISI PROGRAM BOUNDARY DESCRIPTIONS FOR DETAILS).
14. THE REDUNDANT SEALS AND RESTRICTIVE FLOW AREAS THAT ARE INHERENT TO THE CRD'S PROVIDE THE REQUIRED REDUNDANT REACTOR COOLANT PRESSURE BOUNDARY ISOLATION.
15. VALVES 25CV & 26CV ARE ESSENTIAL, CLASS IS. (REFERENCE DC 89-285) AND THE CHECK VALVE ASSEMBLY IS RESTRAINED TO SEISMIC CLASS IS CRITERIA.
16. SIGHT GLASS ASSEMBLY MOUNTED ON EACH INSTRUMENT VOLUME, AND ONLY CONNECTED DURING TESTING.

NOTE: LEAVE WELDS OPEN TILL AFTER FLUSHING AS INDICATED

HYDRAULIC CONTROL UNIT (3-13) (TYP.) 137 UNITS

SCRAM DISCHARGE VOLUMES

U + V = SOUTH
W + X = NORTH

NOTE:
ALL ITEMS MARKED THUS A ARE "AS-BUILT" INTEMS AND ARE NOT SHOWN ON PIPING DRAWINGS.

REVISIONS TO THIS DRAWING REQUIRES A REVISION TO THE CORRESPONDING ISOKEY.

AS BUILT
454003632
STATUS: Release
STATUS DATE: 10/21/2016
DS APPROVED: KKKUKER
VER: AE REV: 62 SIZE: F

FOR PREVIOUS REVISIONS, SEE SUPERSEDED CARDS.

VERSIONS/REVISIONS BY N.P.P.D.

NO.	DESCRIPTION	DFT	DATE	ENG
AD/61	DR-2013-0598 (FROM VERSION AB)	DJB	10/18/16	KKKUKER
AE/62	DR-2013-0598 (FROM VERSION AC)	PAM	10/21/16	KKKUKER

SIGNIFICANT NUMBER | GROUP 1 2 3 4 5 6

FLOW DIAGRAM
CONTROL ROD DRIVE
HYDRAULIC SYSTEM
COOPER NUCLEAR STATION

DRAWN | DATE
CHECKED | DATE
APPROVED | DATE
SEE SUPERSEDED
FILMED

BURNS & ROE

2039

CARD FILE: C0022355

11. TESTABLE FLANGES.
12. INFORMATION CONTAINED IN THE LONG RECTANGULAR BOXES (E.G. SEC XI–CLS II) INDICATES AN AN ASME SECTION XI CODE CLASSIFICATION (I.E. CLASS I, II OR III). INSTRUMENT, SAMPLE, TEST, DRAIN AND VENT LINES ARE NOT ALWAYS THE SAME CLASS AS THE MAIN LINE AND THESE BOUNDARIES ARE TOO NUMEROUS TO IDENTIFY IN THIS MANNER (SEE ISI PROGRAM BOUNDARY DESCRIPTIONS
13. CB IS PRIMARY CONTAINMENT BOUNDARY WHICH IS CLASS IIN OR IN CONSTRUCTION.
14. TO RHR MECHANICAL SEAL COOLERS AND MECHANICAL CYCLONE SEPARATORS FOR RHR PUMPS A, B, C & D SHOWN ON BURNS & ROE DRAWING 2031 SH. 2 AND B2600*FD280005/8.
15. WHERE LINES ARE INTERCONNECTED AND CONTINUED ON OTHER DRAWINGS, ZONE NUMBERS ARE APPROXIMATE ONLY.
16. RHR STEAM CONDENSING IS NO LONGER AN OPERATIONAL MODE.

REVISIONS TO THIS DRAWING REQUIRES A REVISION TO THE CORRESPONDING ISOKEY.

AS BUILT
454003633

NOTES:

1. UNLESS OTHERWISE INDICATED, ALL PRESSURE AND/OR FLOW INSTRUMENT ROOT LINES SHALL BE 3/4", ROOT VALVES SHALL BE 3/4"V253X. LINES UP TO AND INCLUDING ROOT VALVES SHALL BE FURNISHED AND INSTALLED UNDER CONTRACT E–69–4.
2. AT SAMPLING POINTS, CONNECTIONS, PROBES AND ROOT VALVES SHALL BE FURNISHED AND INSTALLED UNDER CONTRACT E–69–4. PROBES SHALL BE FURNISHED AND INSTALLED IN ACCORDANCE WITH CONTRACT PARA. 3.4.2 AND DWG. SP–07211, FIG. NO. AS NOTED. CONTINUATION OF SAMPLE PIPING BY E–70–3.
3. ⊗ ALL RH–4 PIPING SHALL BE PER CLASS IIN CLASSIFICATION EXCEPT THAT ⊗ RH–4 PIPING 2" NOMINAL SIZE AND SMALLER WHICH CONNECTS TO/OR DRAINS INTO FLOOR DRAIN SUMPS OR EQUIPMENT DRAIN SUMPS SHALL BE CLASS IVP CLASSIFICATON WITH MATERIALS AND JOINTS AS SPECIFIED FOR "RH–4" SYSTEM.
4. HIGH POINT VENTS & LOW POINT DRAINS ARE NOT SHOWN.
5. VALVES IDENTIFIED AS V268X SHALL CONFORM TO THE REQUIREMENTS OF CONTRACT E–69–4 SPECIFICATION PARA. 3.2.8.8, GROUP A–7 VALVES. WHERE STAINLESS STEEL VALVES ARE FURNISHED BY THE CONTRACTOR UNDER PARA. 3.2.8.8, THE STAINLESS STEEL INTERCONNECTING PIPING SHALL CONFORM TO CONTRACT E–69–4 SPECIFICATION REQUIREMENTS FOR CLASS IN, RF–1S SYSTEM PIPING.
6. DELETED
7. △'s WHERE SHOWN WITH NUMBERS, REPRESENT POINTS OF CONNECTION TO EXISTING SYSTEMS. E–73–58 SPECIFICATION DEFINES WORK FROM THIS POINT.
8. REF. G.E. DRAWING 117C3326 SH. 2 FOR INSRUMENT PIPING AND VALVE INSTALLATION AT INSTRUMENT RACK 25–62.
9. REF. G.E. DRAWING 117C3324 SH. 2 FOR INSTRUMENT PIPING AND VALVE INSTALLATION AT INSTRUMENT RACK 25–59.
10. DELETED

REVISIONS	NO.

FOR PREVIOUS REVISIONS, SEE SUPERSEDED CARDS.

REVISIONS BY N.P.P.D.

NO.	REVISIONS	DFT	CKD	APP	DATE
N78	CR 2008–05736 (DCN 09–0941)	KG	DJB	DLR	8/5/09
N79	CED 6029200 (DCN 09–0420)	DJB	DJB	KG	10/17/09
N80	DCN 09–1636	DLR	DLR	KZ	1/22/10
N81	CED 6032580 (DCN 10–1602)	KZ	DJB	DLR	11/10/11
N82	CED 6029200 (DCN 12–0330)	KZ	KZ	DJB	3/8/12

SIGNIFICANT NUMBER						
GROUP	1	2	3	4	5	6

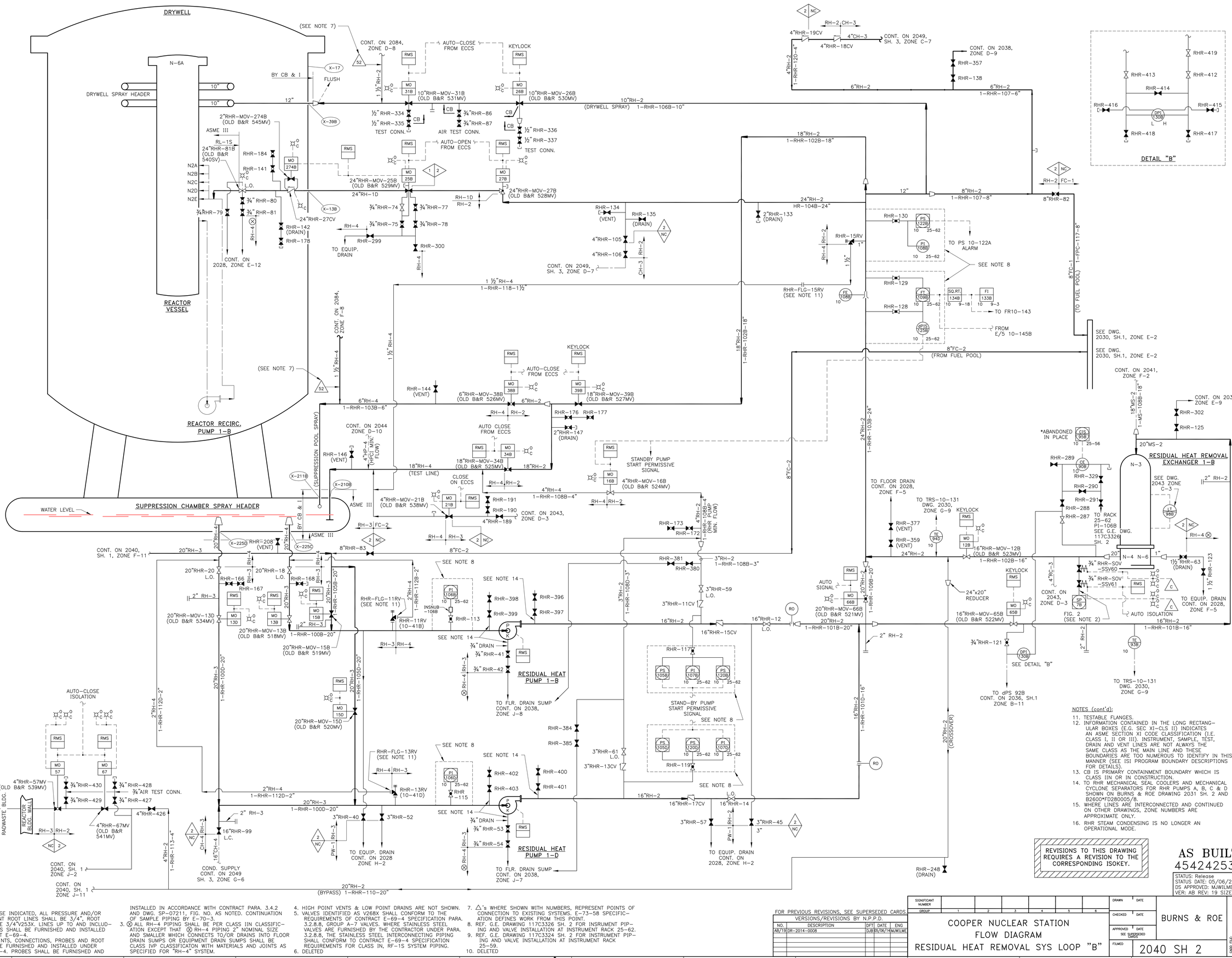
COOPER NUCLEAR STATION
FLOW DIAGRAM
RESIDUAL HEAT REMOVAL SYSTEM

DRAWN DATE
CHECKED DATE
APPROVED DATE
SEE SUPERSEDED CARDS
FILMED

BURNS & ROE

2040 SH 1
REVISION N82

CADD FILE: C0017940



NOTES:

1. UNLESS OTHERWISE INDICATED, ALL PRESSURE AND/OR FLOW INSTRUMENT ROOT LINES SHALL BE 3/4", ROOT VALVES SHALL BE 3/4"V253X. LINES UP TO AND INCLUDING ROOT VALVES SHALL BE FURNISHED AND INSTALLED UNDER CONTRACT E-69-4.
2. AT SAMPLING POINTS, CONNECTIONS, PROBES AND ROOT VALVES SHALL BE FURNISHED AND INSTALLED UNDER CONTRACT E-69-4. PROBES SHALL BE FURNISHED AND INSTALLED IN ACCORDANCE WITH CONTRACT PARA. 3.4.2 AND DWG. SP-07211, FIG. NO. AS NOTED. CONTINUATION OF SAMPLE PIPING BY E-70-3.
3. ⊗ ALL RH-4 PIPING SHALL BE PER CLASS IIN CLASSIFICATION EXCEPT THAT ⊗ RH-4 PIPING 2" NOMINAL SIZE AND SMALLER WHICH CONNECTS TO/OR DRAINS INTO FLOOR DRAIN SUMPS OR EQUIPMENT DRAIN SUMPS SHALL BE CLASS IVP CLASSIFICATON WITH MATERIALS AND JOINTS AS SPECIFIED FOR "RH-4" SYSTEM.
4. HIGH POINT VENTS & LOW POINT DRAINS ARE NOT SHOWN.
5. VALVES IDENTIFIED AS V268X SHALL CONFORM TO THE REQUIREMENTS OF CONTRACT E-69-4 SPECIFICATION PARA. 3.2.8.8, GROUP A-7 VALVES. WHERE STAINLESS STEEL VALVES ARE FURNISHED BY THE CONTRACTOR UNDER PARA. 3.2.8.8, THE STAINLESS STEEL INTERCONNECTING PIPING SHALL CONFORM TO CONTRACT E-69-4 SPECIFICATION REQUIREMENTS FOR CLASS IN, RF-1S SYSTEM PIPING.
6. DELETED
7. △'s WHERE SHOWN WITH NUMBERS, REPRESENT POINTS OF CONNECTION TO EXISTING SYSTEMS. E-73-58 SPECIFICATION DEFINES WORK FROM THIS POINT.
8. REF. G.E. DRAWING 117C3326 SH. 2 FOR INSRUMENT PIPING AND VALVE INSTALLATION AT INSTRUMENT RACK 25-62.
9. REF. G.E. DRAWING 117C3324 SH. 2 FOR INSTRUMENT PIPING AND VALVE INSTALLATION AT INSTRUMENT RACK 25-59.
10. DELETED

NOTES (cont'd):

11. TESTABLE FLANGES.
12. INFORMATION CONTAINED IN THE LONG RECTANGULAR BOXES (E.G. SEC XI-CLS II) INDICATES AN ASME SECTION XI CODE CLASSIFICATION (I.E. CLASS I, II OR III). INSTRUMENT, SAMPLE, TEST, DRAIN AND VENT LINES ARE NOT ALWAYS THE SAME CLASS AS THE MAIN LINE AND THESE BOUNDARIES ARE TOO NUMEROUS TO IDENTIFY IN THIS MANNER (SEE ISI PROGRAM BOUNDARY DESCRIPTIONS FOR DETAILS).
13. CB IS PRIMARY CONTAINMENT BOUNDARY WHICH IS CLASS IIN OR IN CONSTRUCTION.
14. TO RHR MECHANICAL SEAL COOLERS AND MECHANICAL CYCLONE SEPARATORS FOR RHR PUMPS A, B, C & D SHOWN ON BURNS & ROE DRAWING 2031 SH. 2 AND B2600*FD280005/8.
15. WHERE LINES ARE INTERCONNECTED AND CONTINUED ON OTHER DRAWINGS, ZONE NUMBERS ARE APPROXIMATE ONLY.
16. RHR STEAM CONDENSING IS NO LONGER AN OPERATIONAL MODE.

REVISIONS TO THIS DRAWING REQUIRES A REVISION TO THE CORRESPONDING ISOKEY.

AS BUILT
454242533

STATUS: Release
STATUS DATE: 05/06/2014
DS APPROVED: MJWILME
VER: AB REV: 19 SIZE: F

FOR PREVIOUS REVISIONS, SEE SUPERSEDED CARDS.

VERSIONS/REVISIONS BY N.P.P.D.

NO.	DESCRIPTION	DFT	DATE	ENG
AB/19	DR-2014-0008	DJB	05/06/14	MJWILME

SIGNIFICANT NUMBER						
GROUP	1	2	3	4	5	6

COOPER NUCLEAR STATION
FLOW DIAGRAM
RESIDUAL HEAT REMOVAL SYS LOOP "B"

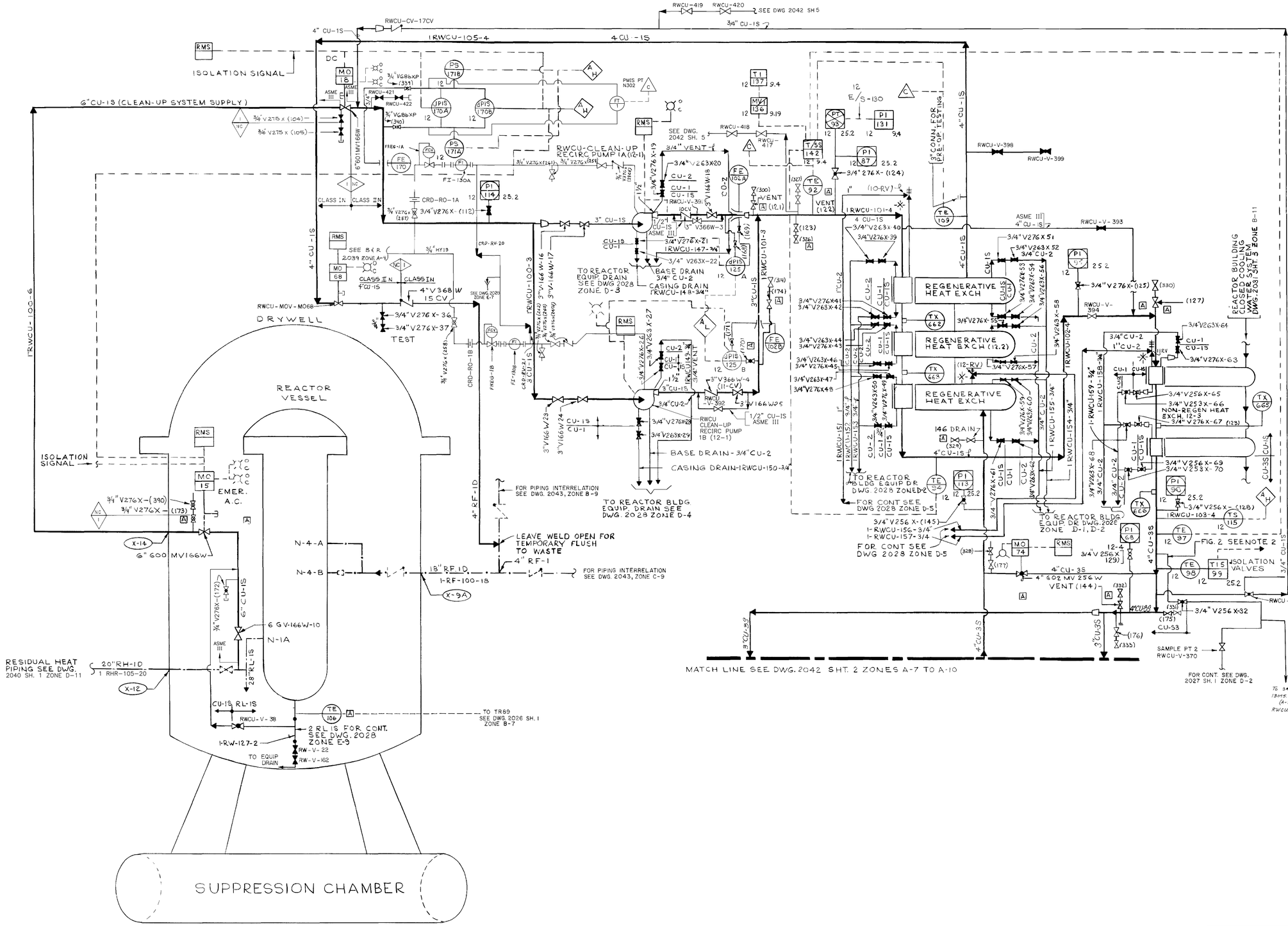
DRAWN DATE
CHECKED DATE
APPROVED DATE
SEE SUPERSEDED CARDS
FILMED

BURNS & ROE

2040 SH 2

CADD FILE: C0015897

REVISIONS
NO.



NOTES:

1. UNLESS OTHERWISE INDICATED ALL PRESSURE AND/OR INSTRUMENT ROOT LINES SHALL BE 3/4" LINE UP TO AND INCLUDING ROOT VALVE SHALL BE FURNISHED AND INSTALLED UNDER CONTRACT E-69-4.

2. AT SAMPLING POINTS CONNECTIONS, PROBES AND ROOT VALVES SHALL BE FURNISHED AND INSTALLED UNDER CONTRACT E-69-4 PROBES SHALL BE FURNISHED AND INSTALLED IN ACCORDANCE WITH CONTRACT PARA. 3.4.2 AND DWG. SP-07211 FIG. NUMBER AS NOTED CONTINUATION OF SAMPLE PIPING BY E-70-3.

3. ALL "CU-1S" PIPING SHALL BE PER CLASSIFICATION I-N NUCLEAR OR II-N NUCLEAR WITHIN THE LIMITS SHOWN HEREON.

4. TYPICAL DESIGNATION CHANGE FOR "CU" SYSTEM VENT DRAINS WITH DOUBLE VALVING SHALL BE AS SHOWN BELOW:

CU-1S | CU-1 → TO DRAIN OR SUMP → CU-2

ALL "CU-2" DRAIN PIPING TO DRAIN SUMPS SHALL BE FABRICATED PER CLASS IV P CLASSIFICATION WITH MATERIALS AND JOINTS PER CLASS II-N REQUIREMENTS FOR "CU-2" SYSTEM.

5. FLANGES FOR REMOTE REMOVAL TO BE FURNISHED ON F/D PIPING.

6. HIGH POINT VENTS & LOW POINT DRAINS NOT SHOWN.

7. ALL VALVE NUMBERS IN PARENTHESIS ( ) ARE NUMBERS USED IN OPERATING PROCEDURES. THESE NUMBERS ARE ASSIGNED BY N.P.P.D. AND WILL NOT BE SHOWN ON PIPING DRAWINGS.

8. INSTRUMENT, SAMPLE, TEST, DRAIN, AND VENT LINES ARE NOT ALWAYS THE SAME CLASS AS THE MAIN LINE AND THESE BOUNDARIES ARE TOO NUMEROUS TO IDENTIFY IN THIS MANNER (SEE ISI PROGRAM BOUNDARY DESCRIPTIONS FOR DETAILS).

9. WHERE LINES ARE INTERCONNECTED AND CONTINUED ON OTHER DRAWINGS, ZONE NUMBERS ARE APPROXIMATE ONLY.

NOTE:

ALL ITEMS MARKED THUS [A] ARE "AS BUILT" ITEMS ARE NOT SHOWN ON PIPING DWGS.

REVISIONS TO THIS DRAWING REQUIRES A REVISION TO THE CORRESPONDING ISOKEY.

AS BUILT
454003635

STATUS: Release
STATUS DATE: 10/23/2018
DS APPROVED: RDCHAMP
VER: AC REV: 37 SIZE: F

FOR PREVIOUS REVISIONS, SEE SUPERSEDED CARDS.

VERSIONS/REVISIONS BY N.P.P.D.

NO.	DESCRIPTION	DFT	DATE	ENG
AB/36	DR-2017-0342	DJB	09/19/17	GLHADLE
AC/37	DR-2018-0043	DJB	10/23/18	RDCHAMP

SIGNIFICANT NUMBER							
GROUP	1	2	3	4	5	6	

DRAWN BMR 11-20-00
CHECKED
APPROVED
FILMED

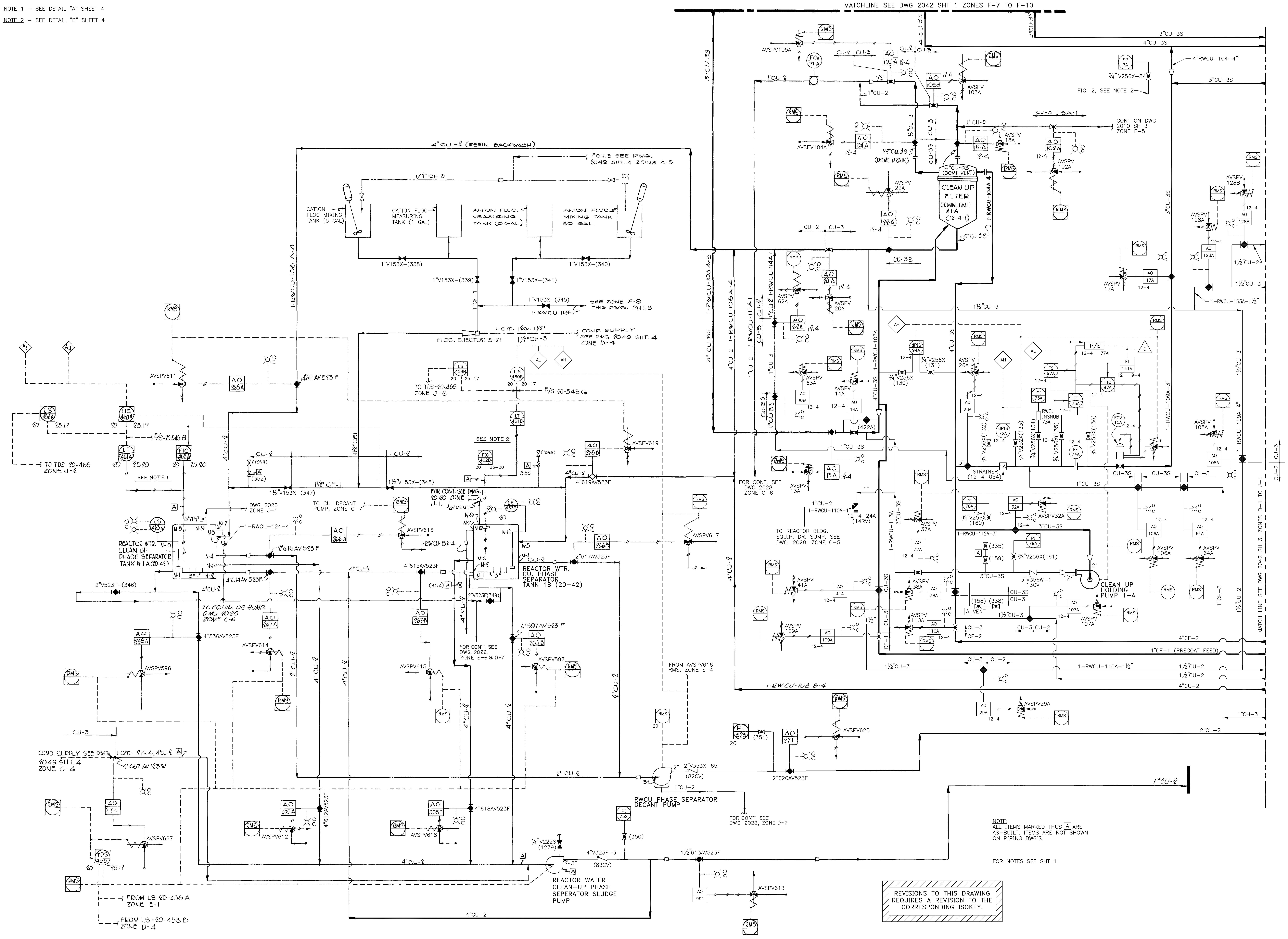
COOPER NUCLEAR STATION
FLOW DIAGRAM
REACTOR WATER CLEAN-UP SYSTEM

BURNS & ROE

2042 SH 1

DRD FILE: C0040942

NOTE 1 – SEE DETAIL "A" SHEET 4
NOTE 2 – SEE DETAIL "B" SHEET 4



NOTE:
ALL ITEMS MARKED THUS [A] ARE AS-BUILT, ITEMS ARE NOT SHOWN ON PIPING DWG'S.

FOR NOTES SEE SHT 1

REVISIONS TO THIS DRAWING REQUIRES A REVISION TO THE CORRESPONDING ISOKEY.

AS BUILT
454003683
SCAN/CADD DWG
DO NOT REVISE MANUALLY

FOR PREVIOUS REVISIONS, SEE SUPERSEDED CARDS.

REVISIONS BY N.P.P.D.

NO.	REVISIONS	DFT	CKD	APP	DATE
N10	DCR 3-40217 (DCN 02-0757)	HFY	RGA	KG	9/20/02
N11	DCN 03-1389	RGA	RGA	KG	10/2/03
N12	CED 6017860 (DCN 05-0782)	RGA	KG	DLR	2/24/06
N13	GE 21A1515 (DCN 07-1247)	DJB	KG	DLR	06/15/07
N14	CR 2009-06941 (DCN 09-1273)	DLR	KG	KPB	11/4/09
N15	CED 6014761 (DCN 05-1468)	DJB	DJB	RLE	11/14/12

SIGNIFICANT NUMBER						
GROUP	1	2	3	4	5	6

COOPER NUCLEAR STATION
FLOW DIAGRAM
REACTOR WATER
CLEAN UP SYSTEM

DRAWN HFY DATE 07/25/02
CHECKED DATE
APPROVED DATE
SEE SUPERSEDED CARDS
FILMED

BURNS & ROE

2042 SH 2
REVISION N15
CADD FILE: C0017942

NO.
REVISIONS

CONT. ON 2030 SH.1
4" FC-1S
CU-2 | CU-3
CU-3 | CU-3S
FC-1S
CU-3S
¾"CU-2
¾"V263X-14
¾"V276X-13
4"V156W-12
TO EQUIPMENT DRAIN CONT. ON 2028 ZONE
SP 36
4"CU-3S
4"V156W-11
CU-3S | CU-3
¾"V253X(147)
FE 104
¾"V253X(148)
RO 106
¾"V253X(149)
FI 134 12 9-4
FI 90 12 25.2
E/S-12-130
FT 105 12 25.2
PS 107 L 12 25.2
FCV 55 12
MO 56 RMS
CU-2 FC-2
RWCU-V-400
PS 108B H 12
SEE NOTE 1
(150) A VENT
(MAIN COND. RET.)
(VIA TUNNEL)
FOR CONT. SEE DWG. 2030 SHT. 1 ZONE F-10
4"V605MV153W
4" CU-2
4" FC-2
4"V323W-19 (12CV)
3" FC-2
1- RWCU-164-3
(364)
150 PSIG RV-16 13-RV
MO 57 RMS
4"V606MV153W
PS 108A H 12
SEE NOTE 2
(179) A
(4" CU-2 TO WASTE SURGE TANK)
1- RWCU-107-4
FOR CONT. SEE DWG. 2033 SHT. 2 ZONE H-1
Y
REACTOR BLDG. WALL
CU-3 CU-2
¾"V253X(151)
3"CU-3S
4"CU-3S
1-RWCU-106-4"
4"CU-3S (START-UP)
4"V156W-93
CU-3S | CU-3
4"CU-3
4"604MV253W
PCVSPV 12.47
NO
EP 110
RMC 143 12 9.4
MO 53 RMS
AH 12
CU-2 CU-3
FIG. 2- SEE NOTE 2
AVSP -103B
AVSPV105B
12-4 AO 105B
1"CU-2
1½"CU-2
1"CU-3
1- SA- 111-8-1"
1"SA-1
CONT. ON DWG 2010 SH 3 ZONE E-5
CU-3 SA-1
12-4 AO 104B
AVSPV18B
12-4 AO 18B
12-4 AO 102B
AVSPV102B
DOME DRAIN
(DOME VENT)
CLEAN-UP FILTER DEMIN-UNIT 1-B (12-4-11)
FG 71B
1-RWCU-103B-3S
1-RWCU-111B-1
1-RWCU-104B-4
AVSPV17B
12-4 AO 17B
AVSPV20B
12-4 AO 20B
AVSPV22B
12-4 AO 22B
1½"CU-2
1½"CU-3
4"CU-2
CU-2 CU-3
4"CU-3S
AH
dPIS 94B
¾"V256X(137)
¾"V256X(138)
1"CU-2
1-RWCU-114B
AVSPV108B
12-4 AO 108B
AVSPV62B
12-4 AO 62B
1"CU-3
CU-3S
AVSPV14B
12-4 AO 14B
AVSPV63B
12-4 AO 63B
1"CU-3S
(422B)
1"CU-3S
AVSPV26B
AO 26B 12-4
RWCU INSNUB 73B
1B
dPIS 72B
¾"V256X(139)
¾"V256X(140)
¾"V256X(141)
¾"V256X(142)
¾"V256X(143)
STRAINER (12-4-054)
FT 75B
291
270
FIC 97B
FCV 155
FS 97B
PI 73B
P/E 77B
AL
FI 141B 12 9-4
3"CU-3S
1-RWCU-104B-3"
1"CU-3S
1"CU-2
1-RWCU-110B-1"
TO REACTOR BLDG EQUIP DRAIN DWG 2028 ZONE C-7
AVSPV13B
12-4 AO 13B
(15RV) 12-4-48
CONT. ON DWG 2028 ZONE C-5
1-RWCU-113B-3
4"CU-3S
AVSPV 37B
12-4 AO 37B
A VENT (162) (336)
AVSPV 38B
12-4 AO 38B
(337)
¾"V256X-5 (134)
PI 79B 12-4
1½"CU-3
1-RWCU-112B-3"
3"CU-3S
3"V356W-2 (14CV)
1½" 2"
CLEAN-UP HOLDING PUMP 1B (12-4-2)
AVSPV32B
12-4 AO 32B
AVSPV106B
12-4 AO 106B
AVSPV64B
12-4 AO 64B
CU-3S CU-3S CH-3
1"CU-3S
PI 78B 12-4
¾"V256X(163)
FT 74B
AVSPV29B
12-4 AO 29B
AVSPV41B
12-4 AO 41B
1-RWCU-110B-2
AVSPV109B
12-4 AO 109B
AVSPV110B
12-4 AO 110B
AVSPV107B
12-4 AO 107B
CU-2 CU-3
CF-1
4"CU-2 (BACKWASH OR PRECOAT RETURN)
4"CF-1 (PRECOAT FEED)
1"CH-3
1-RWCU-132-4"
MATCH LINE SEE DWG. 2042 SHT. 2 ZONES FROM A-11 TO H-11
3"CU-3S
1½"CU-2
1-RWCU-103B-3S
1-RWCU-108B-4
4"CU-2 (RESIN BACKWASH)
1"CU-2
1-RWCU-163-1½"
1½"CU-2
1-RWCU-111B-1
1"CU-3
1½"CU-3
4"CU-2
1½"CU-2
4"CF-2
4"CF-1
1½"CU-2
1½"CU-2
4"CU-2
1"CH-3
2"CU-2
1½"CU-3
1"CU-2
FG 76A
FG 76B
1½"CU-2
3"CU-2
1½"CU-2
1½"CU-2
2"CF-1
12-4-36 (17RV)
12-4-35 (16RV)
CHEMICAL CLEANING CONN. (1N)
1"CH-3
1"CH-3
1"CH-3
2"CU-2
CHEMICAL CLEANING
2"PW-2
2"PW-2
1"CU-2
1-RWCU-161-1
1-RWCU-162-1
FOR CONT. SEE DWG. 2028, ZONE C-5 & C-6
(TO CHEMICAL WASTE TANK) GRAVITY DRAIN
(TO WASTE COLLECTOR TANK)
(TO CENTRIFUGES)
FOR CONT. SEE DWG 2032 SH 1, ZONE A-1
TO TURBIDIMETER
(1085)
(1286) VENT
(1285) DECANT SOLUTION
FOR CONT. SEE DWG. 2038 SHT. 2 ZONE B-1.
(1287)
(1288)
SLUDGE WASTE
FOR CONT. SEE DWG 2032 SH 2, ZONE J-2
REACTOR BLDG. WALL
1"CU-2
1"CH-3
1-CM-123-1"
COND. FOR STRAINER BACKWASH FOR CONT. SEE DWG.2049 SHT. 3 ZONE G-1
1"CH-3
1-CM-124-1"
AVSP-111
SEE DWG 2038 SH 1 ZONE D-10
12-4-112 (19-RV)
2"
PI 96 12-4
3/4"V253X-94
CF-1 | CF-2
VENT (152) A
AO 111 12-4
3/4"V253X-(153)
4"V323 F-2 (21-CV)
COND SUPPY
FOR CONT. SEE DWG. 2049 SHT. 4 ZONE A-2
4"CF-2
4"CF-1
4"CH-3
1-CM-125-4
1-RWCU-134-4"
1-RWCU-132-4"
4"CF-1
4"V523F-95
CF-2 CH-3
1-RWCU-141-1¼"
¼"V126X-106
¼"V126X-107
PS-2S ¼"
QUICK DISCONNECT
MILLIPORE FILTER HOLDER (12-4-5 0)
TO SINK DRAIN SEE DWG. 2028
(134) A
SEE DWG 2038 SH 1 ZONE D-10
A DRAIN (157)
PI 89 12-4
3/4"V253X(183)
FG 88
SOV-47
FSOK#4
CONT. G-9 ZONE
AO 47
4"V823F-96
4"V323W-18 (16CV)
CLEAN-UP PRECOAT PUMP (12-4-7)
AGITATOR (12-4-8)
AGITATOR (12-4-11 0)
1½"CH-3
1-CH-193-1½"
1½"V253X-133
12-4-126(154)
1"CH-3
RMS
AH
LS 80 12-4
4"CF-2
6"CF-1
1-RWCU-131-6
3"CF-2
1"CF-2
1"V523F-101
1-RWCU-137-3
2"CF-2
1-RWCU-136-1½"
1½"CF-2
2"V523 F-99
2"V523 F-100
3"CF-2
6"V823F-97
CLEAN-UP PRECOAT TANK (12-4-6)
CLEAN UP RESIN FEED TANK (12-4-115)
12-4-127 (153)
CF-1 CF-2
FROM CHEM FLOCK TANK ZONE C-6 SHT. 2
1"CF-1
A
1-RWCU-138-2
TO FLOOR DRAIN SUMP DWG 2038 SH 1, ZONE D-9
1-RWCU-135-1
1"CF-2
¾"V253X(154)
PI 124 12-4
VSPV 120
AO 120 12-4
PI 123 12-4
¾"V253X (155)
PCV 118 12-4
3/8"
½"
1"CF-1
1-RWCU-140-2"
1"CF-2
1"V153X-98
¾"V253X (156)
CLEAN UP RESIN FEED TANK EDUCTOR 12-4-117
AO 121 12-4
PI 125 12-4
CONT. ZONE E-9
AVSPV121
2"CF-2
1"CF-1
1-RWCV-133-1

FOR NOTES SEE SHT. 1

NOTE:
ALL ITEMS MARKED THUS [A] ARE "AS BUILT" ITEMS AND ARE NOT SHOWN ON PIPING DWGS.

NOTE 1 – SEE DETAIL "C" SHEET 4
NOTE 2 – SEE DETAIL "D" SHEET 4

REVISIONS TO THIS DRAWING REQUIRES A REVISION TO THE CORRESPONDING ISOKEY.

FOR PREVIOUS REVISIONS, SEE SUPERSEDED CARDS.

VERSIONS/REVISIONS BY N.P.P.D.

NO.	DESCRIPTION	DFT	DATE	ENG
AB/22-DR-2017-0001		DJB	04/03/18	KASCHIZ

AS BUILT
454003684
STATUS: Release
STATUS DATE: 04/03/2018
DS APPROVED: KASCHIZ
VER: AB REV: 22 SIZE: F

SIGNIFICANT NUMBER
GROUP 1 2 3 4 5 6

COOPER NUCLEAR STATION
FLOW DIAGRAM
REACTOR WATER
CLEAN UP SYSTEM

DRAWN PAM 08/21/02
CHECKED
APPROVED SEE SUPERSEDED CARDS
FILMED

BURNS & ROE

2042 SH 3

CARD FILE: C0017936

NOTES:

1. UNLESS OTHERWISE INDICATED ALL PRESSURE AND/OR FLOW INSTRUMENT ROOT LINES SHALL BE 3/4"; ROOT VALVES SHALL BE 3/4" V253X EXCEPT AS NOTED. LINE UP TO AND INCLUDING ROOT VALVES SHALL BE FURNISHED AND INSTALLED UNDER CONTRACT E-69-4.
2. AT SAMPLING POINTS, CONNECTORS, PROBES AND ROOT VALVES SHALL BE FURNISHED AND INSTALLED UNDER CONTRACT E-69-4. PROBES SHALL BE FURNISHED AND INSTALLED IN ACCORDANCE WITH CONTRACT PARA. 3.4.2 AND DWG. SP-07211, FIG. NUMBER AS NOTED. CONTINUATION OF SAMPLE PIPING BY E-70-3.
3. ALL "RF-1" PIPING SHOWN HERE ON SHALL BE CLASS IIN NUCLEAR AND CLASS IVP POWER CLASSIFICATIONS WITHIN THE LIMITS SHOWN HEREON. ALL "BS-2" PIPING SHOWN HEREON IS CLASS IIN PIPING CLASSIFICATION.
4. HIGH POINT VENTS AND LOW POINT DRAINS NOT SHOWN.
5. VALVES IDENTIFIED AS V268X SHALL CONFORM TO THE REQUIREMENTS OF CONTRACT E-69-4 SPECIFICATION PARA. 3.2.8.8, GROUP A-7 VALVES. WHERE STAINLESS STEEL VALVES ARE FURNISHED BY THE CONTRACTOR UNDER PARA. 3.2.8.8, THE STAINLESS STEEL INTERCONNECTING PIPING SHALL CONFORM TO CONTRACT E-69-4 SPECIFICATION REQUIREMENTS FOR CLASS IN, RF-1S SYSTEM PIPING.
6. INSTALL ORIFICE FLANGE ONLY WITH SPACER.
7. DELETED.
8. DELETED.
9. REFERENCE DRAWING 115D6015 SH. 3 FOR INSTRUMENT PIPING AND VALVE INSTALLATION AT INSTRUMENT RACK 25-58 - SECTION B.
10. REFERENCE DRAWING 115D6015 SH. 2 FOR INSTRUMENT PIPING AND VALVE INSTALLATION AT INSTRUMENT RACK 25-58 - SECTION A.
11. REFERENCE DRAWING M151 SH. 15 FOR SAMPLE PIPING AND VALVE INSTALLATION AT SAMPLE RACK SR-1C.
12. INSTRUMENT, SAMPLE, TEST, DRAIN AND VENT LINES ARE NOT ALWAYS THE SAME CLASS AS THE MAIN LINE AND THESE BOUNDARIES ARE TOO NUMEROUS TO IDENTIFY IN THIS MANNER (SEE ISI PROGRAM BOUNDARY DESCRIPTIONS FOR DETAILS).
13. WHERE LINES ARE INTERCONNECTED AND CONTINUED ON OTHER DRAWINGS, ZONE NUMBERS ARE APPROXIMATE ONLY.
14. RHR STEAM CONDENSING MODE IS NO LONGER AN OPERATIONAL MODE.

AS BUILT
454003636

STATUS: Release
STATUS DATE: 10/10/2018
DS APPROVED: M1UNRUH
VER: AB REV: 57 SIZE: F

REVISIONS TO THIS DRAWING REQUIRES A REVISION TO THE CORRESPONDING ISOKEY.

FOR PREVIOUS REVISIONS, SEE SUPERSEDED CARDS.

VERSIONS/REVISIONS BY N.P.P.D.

NO.	DESCRIPTION	DFT	DATE	ENG
AC/56	DR-2015-0002	DJB	01/05/16	GLHADLE
AB/57	DR-2014-0692	DJB	10/10/18	DEWHEAT

SIGNIFICANT NUMBER						
GROUP	1	2	3	4	5	6

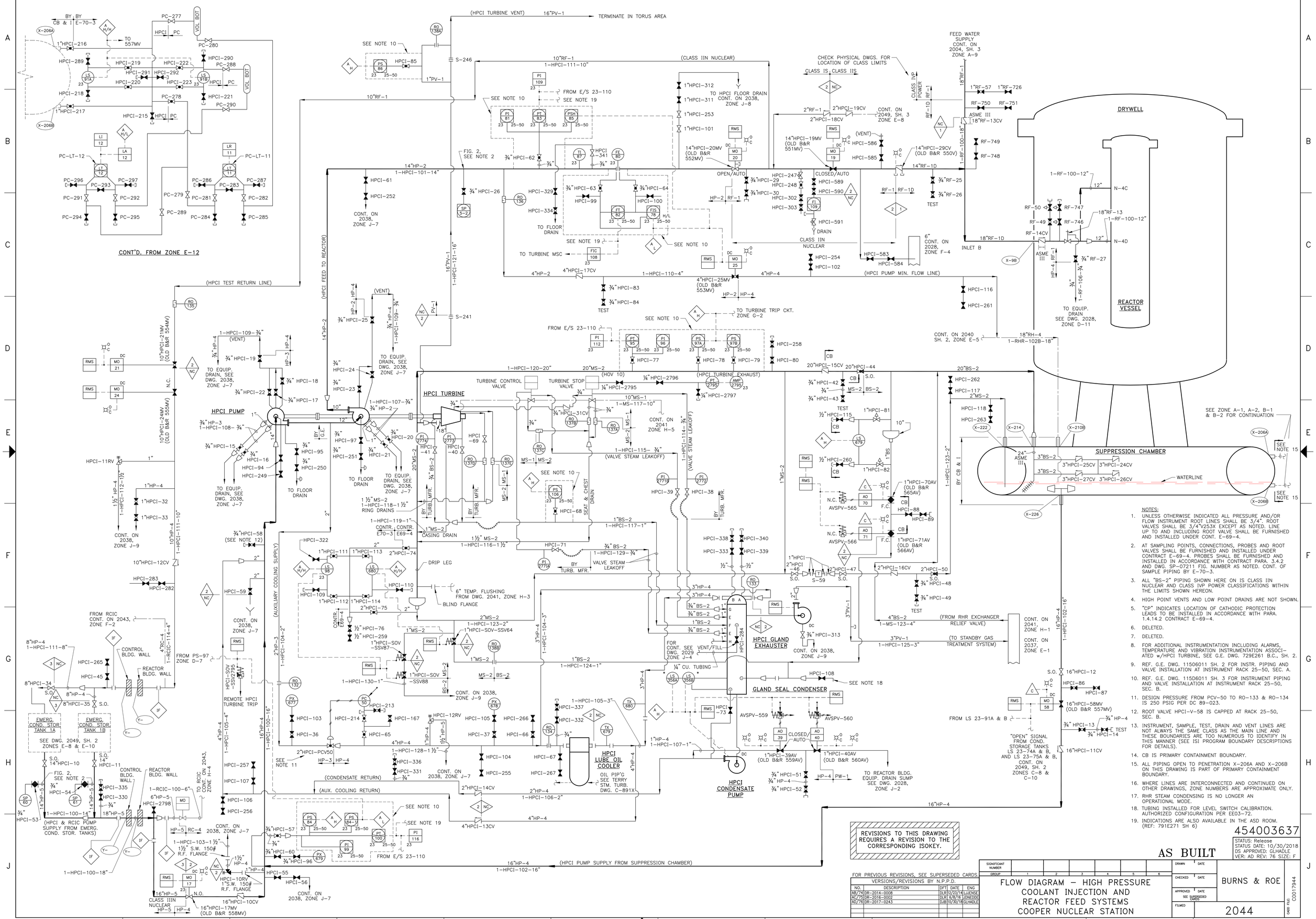
COOPER NUCLEAR STATION
FLOW DIAGRAM
REACTOR CORE ISOLATION COOLANT
AND REACTOR FEED SYSTEMS

DRAWN DATE
CHECKED DATE
APPROVED DATE
SEE SUPERSEDED CARDS
FILMED

BURNS & ROE

2043

CADD FILE: C0017943



NOTES:

1. UNLESS OTHERWISE INDICATED ALL PRESSURE AND/OR FLOW INSTRUMENT ROOT LINES SHALL BE 3/4". ROOT VALVES SHALL BE 3/4"V253X EXCEPT AS NOTED. LINE UP TO AND INCLUDING ROOT VALVE SHALL BE FURNISHED AND INSTALLED UNDER CONT. E-69-4.
2. AT SAMPLING POINTS, CONNECTIONS, PROBES AND ROOT VALVES SHALL BE FURNISHED AND INSTALLED UNDER CONTRACT E-69-4. PROBES SHALL BE FURNISHED AND INSTALLED IN ACCORDANCE WITH CONTRACT PARA. 3.4.2 AND DWG. SP-07211 FIG. NUMBER AS NOTED. CONT. OF SAMPLE PIPING BY E-70-3.
3. ALL "BS-2" PIPING SHOWN HERE ON IS CLASS IIN NUCLEAR AND CLASS IVP POWER CLASSIFICATIONS WITHIN THE LIMITS SHOWN HEREON.
4. HIGH POINT VENTS AND LOW POINT DRAINS ARE NOT SHOWN.
5. "CP" INDICATES LOCATION OF CATHODIC PROTECTION LEADS TO BE INSTALLED IN ACCORDANCE WITH PARA. 1.4.14.2 CONTRACT E-69-4.
6. DELETED.
7. DELETED.
8. FOR ADDITIONAL INSTRUMENTATION INCLUDING ALARMS, TEMPERATURE AND VIBRATION INSTRUMENTATION ASSOCIATED WITH HPCI TURBINE, SEE ISI DWG. 729E261 B.C. SH. 2.
9. REF. G.E. DWG. 11L06011 SH. 2 FOR INSTR. PIPING AND VALVE INSTALLATION AT INSTRUMENT RACK 25-50, SEC. A.
10. REF. G.E. DWG. 11L06011 SH. 3 FOR INSTRUMENT PIPING AND VALVE INSTALLATION AT INSTRUMENT RACK 25-50, SEC. B.
11. DESIGN PRESSURE FROM PCV-50 TO RO-133 & RO-134 IS 250 PSIG PER DC 89-023.
12. ROOT VALVE HPCI-V-58 IS CAPPED AT RACK 25-50, SEC. B.
13. INSTRUMENT, SAMPLE, TEST, DRAIN AND VENT LINES ARE NOT ALWAYS THE SAME CLASS AS THE MAIN LINE AND THESE BOUNDARIES ARE TOO NUMEROUS TO IDENTIFY IN THIS MANNER (SEE ISI PROGRAM BOUNDARY DESCRIPTIONS FOR DETAILS).
14. CB IS PRIMARY CONTAINMENT BOUNDARY.
15. ALL PIPING OPEN TO PENETRATION X-206A AND X-206B ON THIS DRAWING IS PART OF PRIMARY CONTAINMENT BOUNDARY.
16. WHERE LINES ARE INTERCONNECTED AND CONTINUED ON OTHER DRAWINGS, ZONE NUMBERS ARE APPROXIMATE ONLY.
17. RHR STEAM CONDENSING IS NO LONGER AN OPERATIONAL MODE.
18. TUBING INSTALLED FOR LEVEL SWITCH CALIBRATION. AUTHORIZED CONFIGURATION PER EE03-72.
19. INDICATIONS ARE ALSO AVAILABLE IN THE ASD ROOM. (REF: 791E271 SH 6)

REVISIONS TO THIS DRAWING REQUIRES A REVISION TO THE CORRESPONDING ISOKEY.

FOR PREVIOUS REVISIONS, SEE SUPERSEDED CARDS.

VERSIONS/REVISIONS BY N.P.P.D.

NO.	DESCRIPTION	DFT	DATE	ENG
AB/74	DR-2014-0008	DLR	12/23/14	LJENSE
AC/75	DR-2016-0002	DLR	6/8/16	JDNEDOE
AD/76	DR-2017-0243	DJB	10/30/18	GLHADLE

454003637

STATUS: Release
STATUS DATE: 10/30/2018
DS APPROVED: GLHADLE
VER: AD REV: 76 SIZE: F

AS BUILT

SIGNIFICANT NUMBER							
GROUP	1	2	3	4	5	6	

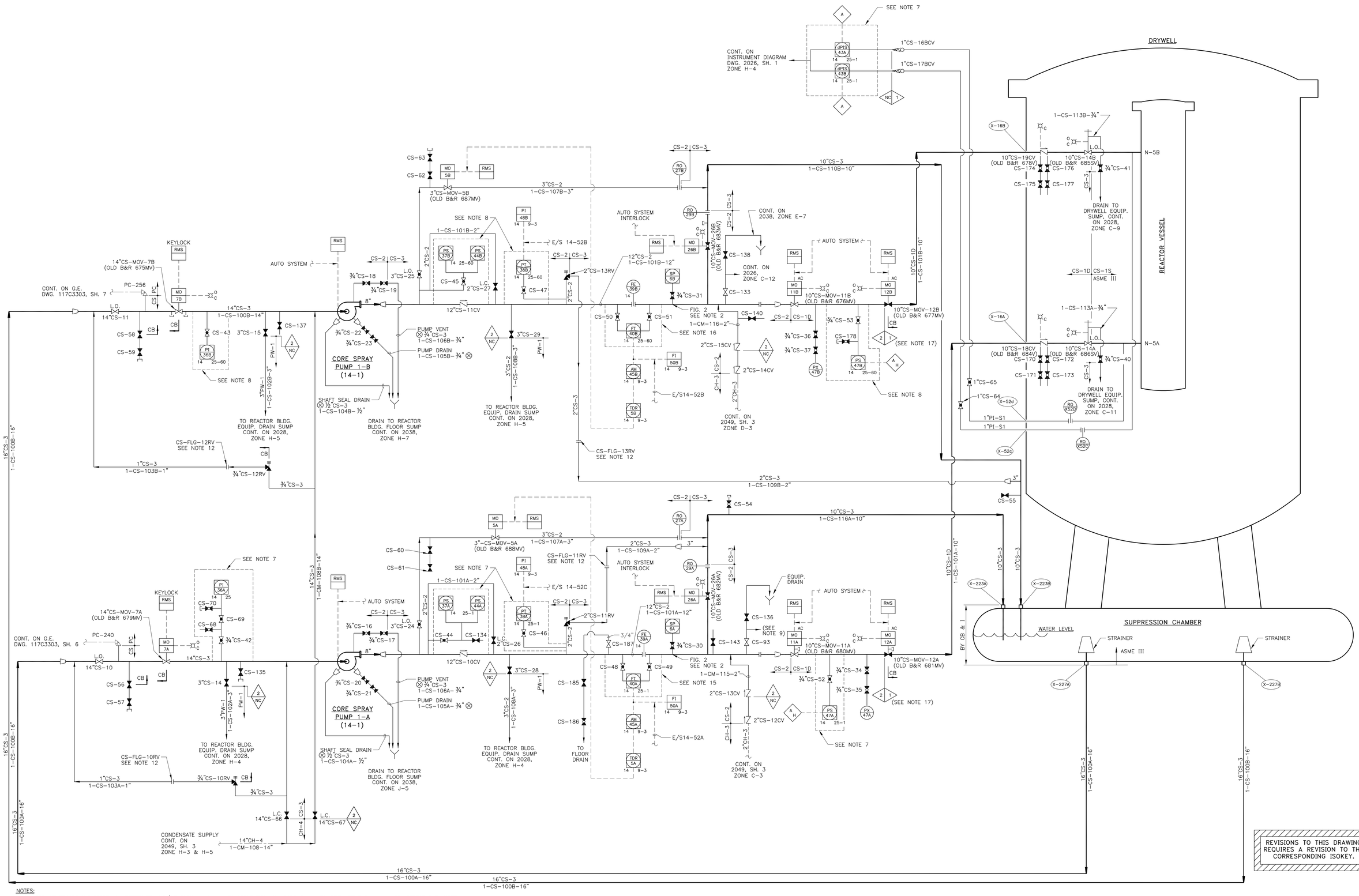
DRAWN DATE
CHECKED DATE
APPROVED DATE
SEE SUPERSEDED CARDS
FILMED

BURNS & ROE

FLOW DIAGRAM – HIGH PRESSURE COOLANT INJECTION AND REACTOR FEED SYSTEMS COOPER NUCLEAR STATION

2044

DMD FILE: C0017944



NOTES:

1. UNLESS OTHERWISE INDICATED ALL PRESSURE AND/OR FLOW INSTRUMENT ROOT VALVES SHALL BE 3/4". ROOT VALVES SHALL BE 3/4" V253X LINE UP TO AND INCLUDING ROOT VALVE SHALL BE FURNISHED AND INSTALLED UNDER CONTRACT E-69-4.
2. AT SAMPLING POINTS, CONNECTIONS, PROBES AND ROOT VALVES SHALL BE FURNISHED AND INSTALLED UNDER CONTRACT E-69-4. PROBES SHALL BE FURNISHED AND INSTALLED IN ACCORDANCE WITH CONTRACT PARA. 3.42 AND DRAWING SP-07211, FIG. NUMBER AS NOTED. CONTINUATION OF SAMPLE PIPING BY E-70-3.
3. ALL CS-3" PIPING SYSTEMS SHALL BE CLASS IIN CLASSIFICATION, EXCEPT THAT "⊗ "CS-3 PIPING 2" NOMINAL SIZE AND SMALLER WHICH CONNECTS TO/OR DRAINS INTO FLOOR DRAIN OR EQUIPMENT DRAIN SUMPS SHALL BE CLASS IVP CLASSIFICATION WITH MATERIALS AND JOINTS AS SPECIFIED FOR "CS-3" CLASS IIN CLASSIFICATION.
4. HIGH POINT VENTS & LOW POINT DRAINS ARE NOT SHOWN.
5. VALVES IDENTIFIED AS V268X SHALL CONFORM TO THE REQUIREMENTS OF CONTRACT E-69-4 SPECIFICATION PARA. 3.2.8.8, GROUP A-7 VALVES WHERE STAINLESS STEEL VALVES ARE FURNISHED BY THE CONTRACTOR UNDER PARA. 3.2.8.8, THE STAINLESS STEEL INTERCONNECTING PIPING SHALL CONFORM TO CONTRACT E-69-4 SPECIFICATION REQUIREMENTS FOR CLASS IN, RF-IS SYSTEM PIPING.
6. DELETED
7. REFERENCE G.E. DRAWING 117C3303, SH. 2 FOR INSTRUMENT PIPING AND VALVE INSTALLATION AT INSTRUMENT RACK 25-1.
8. REFERENCE G.E. DRAWING 117C3325, SH. 2 FOR INSTRUMENT PIPING AND VALVE INSTALLATION AT INSTRUMENT RACK 25-60.
9. FOR CONTINUATION SEE INSTRUMENT DIAGRAM DRAWING 2026, SH. 1, C-1.
10. DELETED
11. FOR STANDBY LIQUID CONTROL SYSTEM FLOW DIAGRAM SEE FLOW DRAWINGS 2045, SH. 2.
12. TESTABLE FLANGES.
13. INSTRUMENT, SAMPLE, TEST, DRAIN AND VENT LINES ARE NOT ALWAYS THE SAME CLASS AS THE MAIN LINE AND THESE BOUNDARIES ARE TOO NUMEROUS TO INDENTIFY IN THIS MANNER (SEE ISI PROGRAM BOUNDARY DESCRIPTIONS FOR DETAILS).
14. CB IS PRIMARY CONTAINMENT BOUNDARY.
15. REFERENCE DRAWING 2045, SH. 3, DETAIL "A" FOR INSTRUMENT PIPING AND VALVE INSTALLATION AT INSTRUMENT RACK 25-1.
16. REFERENCE DRAWING 2045, SH. 3, DETAIL "B" FOR INSTRUMENT PIPING AND VALVE INSTALLATION AT INSTRUMENT RACK 25-60.
17. PER DC 94-330, PIPING BETWEEN MO-11A(B) AND MO-12A(B) IS RECLASSIFIED AS IIN. HOWEVER, EXISTING CS-1D PIPING IN THIS ZONE IS FABRICATED AND DESIGNED TO CLASS IN REQUIREMENTS.
18. WHERE LINES ARE INTERCONNECTED AND CONTINUED ON OTHER DRAWINGS, ZONE NUMBERS ARE APPROXIMATE.

AS BUILT
454003638

FOR PREVIOUS REVISIONS, SEE SUPERSEDED CARDS.

REVISIONS BY N.P.P.D.

NO.	REVISIONS	DFT	CKD	APP	DATE
N53	DCR3-401217 (DCN99-1064)	RGA	DLR	AJH	12-14-99
N54	UCR BINDER 22A (DCN 00-0646)	DLR	RGA	KG	8-21-02
N55	CR 2007-07475 (DCN 07-1985)	KG	DJB	DLR	11/29/07
N56	(DCN 09-0436)	KG	DJB	DLR	3/25/09
N57	CR 2008-5736 (DCN 09-0936)	KG	KG	DJB	8/5/09
N58	CED 6029200 (DCN 09-0423)	DJB	DJB	KG	10/17/09

SIGNIFICANT NUMBER | GROUP 1 2 3 4 5 6

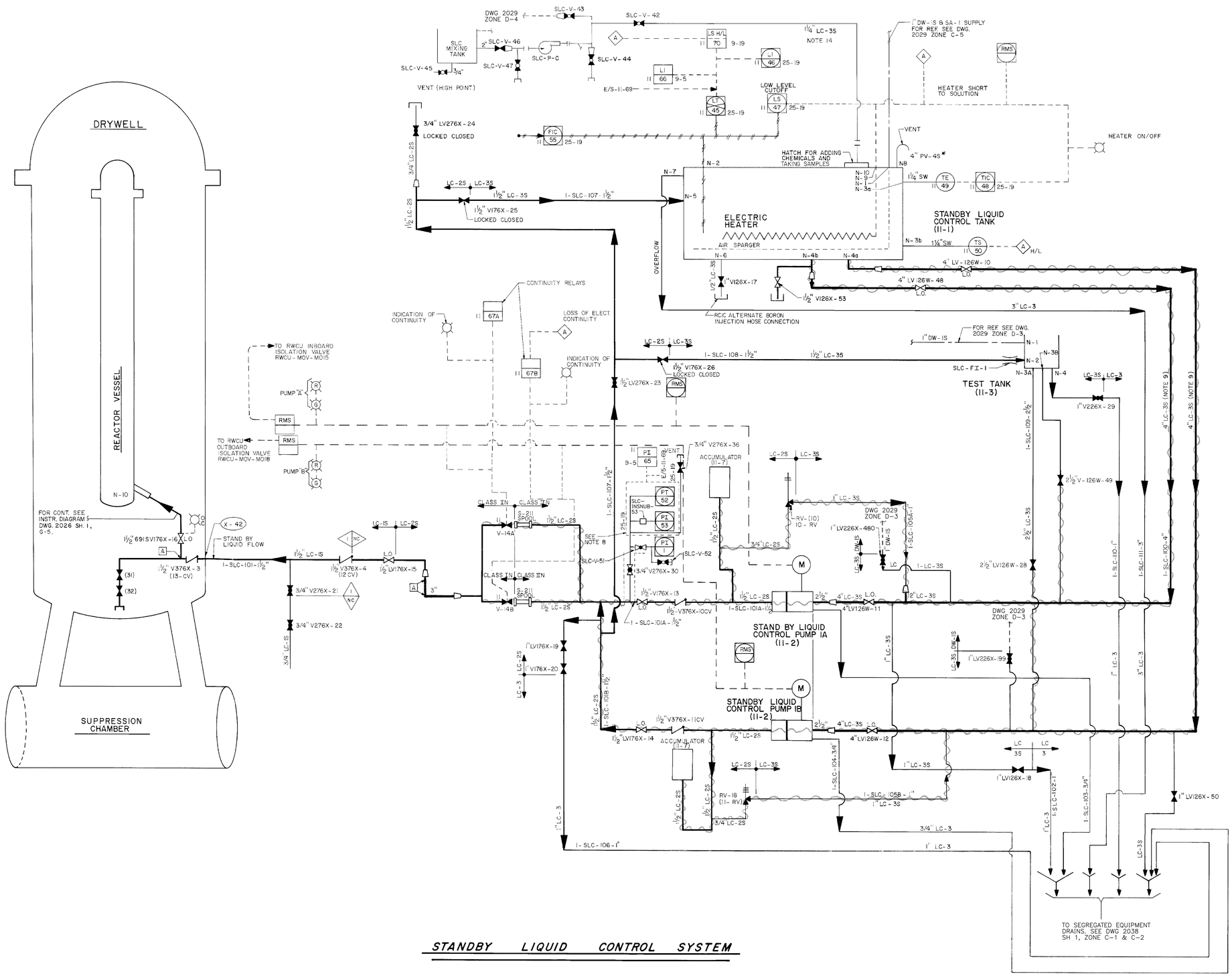
COOPER NUCLEAR STATION
FLOW DIAGRAM
CORE SPRAY SYSTEM

DRAWN | DATE
CHECKED | DATE
APPROVED | DATE
FILMED

BURNS & ROE

2045 SH 1 | REVISION N58

CARD FILE C0017945



NOTES

1. UNLESS OTHERWISE INDICATED ALL PRESSURE AND/OR FLOW INSTRUMENT ROOT VALVES SHALL BE 3/4" ROOT VALVES SHALL BE 3/4 V253X. LINE UP TO AND INCLUDING ROOT VALVE SHALL BE FURNISHED AND INSTALLED UNDER CONTRACT E-69-4.
2. AT SAMPLING POINTS, CONNECTIONS, PROBES AND ROOT VALVES SHALL BE FURNISHED AND INSTALLED UNDER CONTRACT E-69-4. PROBES SHALL BE FURNISHED AND INSTALLED IN ACCORDANCE WITH CONTRACT PARAGRAPH 3.4.2 AND DRAWING SP-0721 FIGURE NUMBER AS NOTED. CONTINUATION OF SAMPLE PIPING BY E-70-3.
3. "LC-2" PIPING SYSTEMS SHALL BE PER CLASS IN AND CLASS IIN CLASSIFICATION WITHIN THE LIMITS SHOWN HEREON.
4. ACCUMULATOR PRELOAD PRESSURE 775 PSIG.
5. "LC-3S" PIPING SYSTEMS SHALL BE SEISMIC CLASS IS.
6. VALVES IDENTIFIED AS V268X SHALL CONFORM TO THE REQUIREMENTS OF CONTRACT E-69-4 SPECIFICATION PARAGRAPH 3.2.8.8, GROUP A-7 VALVES. WHERE STAINLESS STEEL VALVES ARE FURNISHED BY THE CONTRACTOR UNDER PARAGRAPH 3.2.8.8, THE STAINLESS STEEL INTERCONNECTING PIPING SHALL CONFORM TO CONTRACT E-69-4 SPECIFICATION REQUIREMENTS FOR CLASS IN, RF-1S SYSTEM PIPING.
7. ALL VALVE NUMBERS IN PARENTHESIS ( ) ARE NUMBERS USED IN OPERATING PROCEDURES. THESE NUMBERS ARE ASSIGNED BY N.P.P.D. AND WILL NOT BE SHOWN ON PIPING DRAWINGS.
8. REFERENCE G.E. DRAWING 11C33I4 SHEET 2 FOR INSTRUMENT PIPING AND VALVE INSTALLATION AT INSTRUMENT RACK 25-19.
9. REFER TO PIPING ISOMETRICS FOR MATERIAL SPECIFICATIONS REVISED PER DESIGN CHANGE 86-344.
10. ALL ITEM MARKED [A] ARE "AS BUILT" ITEMS AND ARE NOT SHOWN ON PIPING DRAWINGS.
11. FOR CORE SPRAY SYSTEM FLOW DIAGRAM SEE FLOW DRAWING 2045 SHEET 1
12. INSTRUMENT, SAMPLE, TEST, DRAIN AND VENT LINES ARE NOT ALWAYS THE SAME CLASS AS THE MAIN LINE AND THESE BOUNDARIES ARE TOO NUMEROUS TO IDENTIFY IN THIS MANNER (SEE ISI PROGRAM BOUNDARY DESCRIPTIONS FOR DETAILS).
13. ~~~ HEAT TRACE (REFERENCE DC 94-288).
14. "LC-3S" PIPING FROM MIXING TANK TO STORAGE TANK SHALL BE SEISMIC CLASS IIS.
15. WHERE LINES INTERCONNECT AND ARE CONTINUED ON OTHER DRAWINGS, ZONE NUMBERS ARE APPROXIMATE ONLY.

STANDBY LIQUID CONTROL SYSTEM

REVISIONS TO THIS DRAWING REQUIRES A REVISION TO THE CORRESPONDING ISOKEY.

AS BUILT
454224291
SCAN/CADD DWG
DO NOT REVISE MANUALLY

FOR PREVIOUS REVISIONS, SEE SUPERSEDED CARDS.

REVISIONS BY N.P.P.D.

NO.	REVISIONS	DFT	CKD	APP	DATE
N18	DCR 3-40217 (DCN 02-0856)	HFY	RGA	KG	10/29/02
N19	EE 03-070 (DCN 03-1365)	DLR	DLR	KG	1/20/04
N20	NOTIF 10139172 (DCN 05-0021)	RGA	RGA	DLR	1/6/05
N21	CA 2004-07001 (DCN 04-2998)	KZ	KZ	DLR	12/14/70

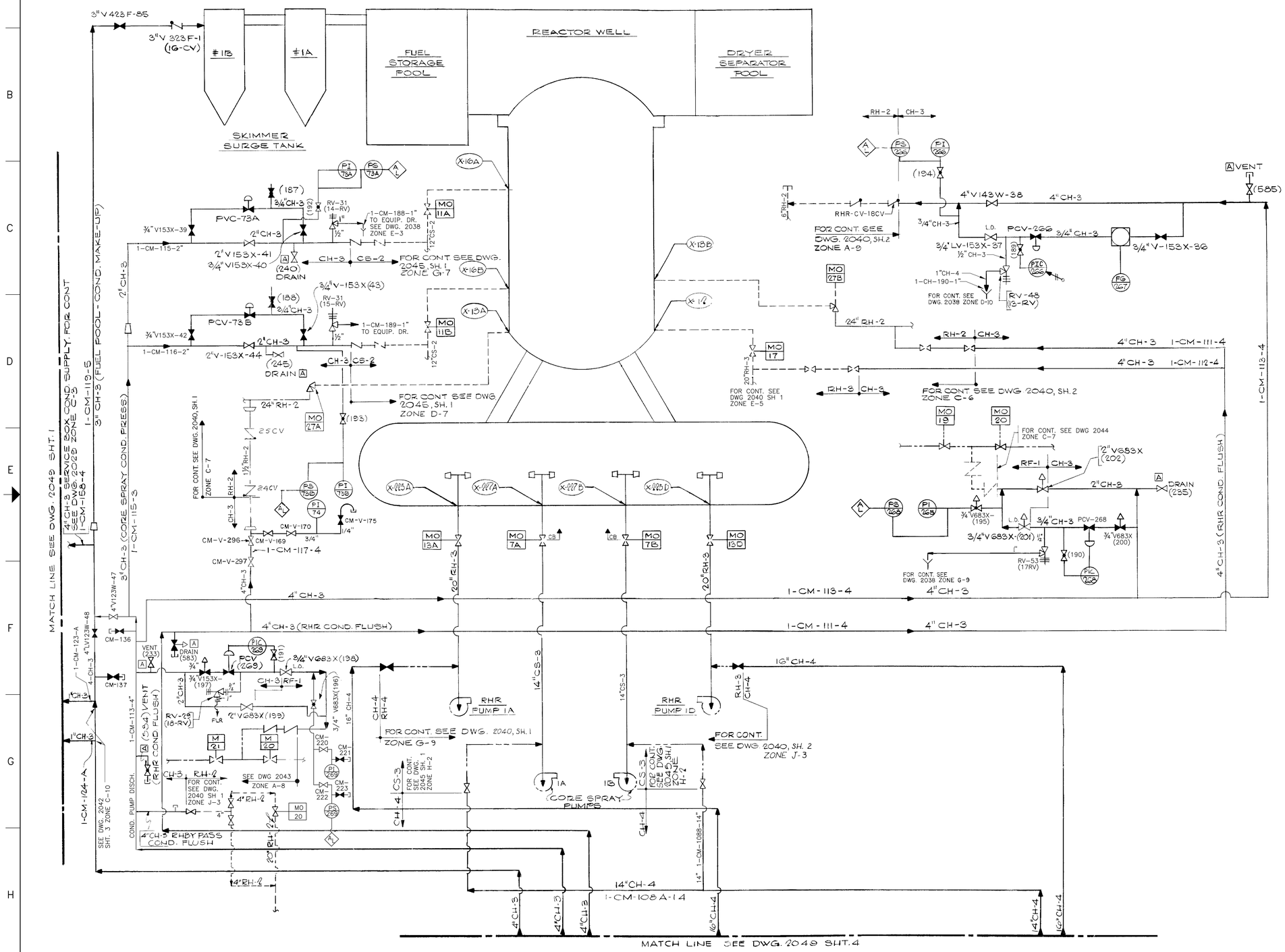
SIGNIFICANT NUMBER | GROUP 1 2 3 4 5 6

DRAWN HFY DATE 08/22/02
CHECKED DATE
APPROVED DATE
SEE SUPERSEDED CARDS
FILMED

COOPER NUCLEAR STATION
FLOW DIAGRAM
STANDBY LIQUID
CONTROL SYSTEM

BURNS & ROE

2045 SH 2 | REVISION N21 | DWG TITLE C0017939



FOR NOTES SEE SHEET 1

NOTE:

1. ALL ITEMS MARKED THUS [A] ARE "AS BUILT" ITEMS AND ARE NOT SHOWN ON PIPING DRAWINGS.
2. CB IS PRIMARY CONTAINMENT BOUNDRY.

REVISIONS TO THIS DRAWING REQUIRES A REVISION TO THE CORRESPONDING ISOKEY.

FOR PREVIOUS REVISIONS, SEE SUPERSEDED CARDS.

REVISIONS BY N.P.P.D.

NO.	REVISIONS	DFT	CKD	APP	DATE
N19	DCR 3-40217 (DCN 02-0788)	DJF	RGA	KG	10/29/02
N20	NOTIF. 10152075 (DCN 04-0542)	KG	KG	DLR	3/17/04

AS BUILT
454003677
SCAN/CADD DWG
DO NOT REVISE MANUALLY

SIGNIFICANT NUMBER | GROUP | 1 | 2 | 3 | 4 | 5 | 6

COOPER NUCLEAR STATION
FLOW DIAGRAM
CONDENSATE SUPPLY SYSTEM

DRAWN	DATE
DJF	08/09/02
CHECKED	DATE
APPROVED	DATE
SEE SUPERSEDED CARDS	
FILMED	

BURNS & ROE

2049 SH 3

REVISION N20

CARD FILE: C00017951

SECURITY-RELATED INFORMATION -
WITHHOLD UNDER 10 CFR 2.390

DRAWING 2050
GENERAL ARRANGEMENT, TURBINE BUILDING,
BASEMENT FLOOR PLAN

SECURITY-RELATED INFORMATION -
WITHHOLD UNDER 10 CFR 2.390

DRAWING 2051
GENERAL ARRANGEMENT, TURBINE BUILDING, MEZZANINE FLOOR PLAN

SECURITY-RELATED INFORMATION -
WITHHOLD UNDER 10 CFR 2.390

DRAWING 2052
GENERAL ARRANGEMENT, TURBINE BUILDING, OPERATING FLOOR PLAN

SECURITY-RELATED INFORMATION -
WITHHOLD UNDER 10 CFR 2.390

DRAWING 2053
GENERAL ARRANGEMENT, TURBINE BUILDING,
SECTION A-A

SECURITY-RELATED INFORMATION -
WITHHOLD UNDER 10 CFR 2.390

DRAWING 2054
GENERAL ARRANGEMENT, TURBINE BUILDING, SECTION B-B

SECURITY-RELATED INFORMATION -
WITHHOLD UNDER 10 CFR 2.390

DRAWING 2056
GENERAL ARRANGEMENT,
INTAKE STRUCTURE PLAN AND SECTIONS

SECURITY-RELATED INFORMATION -
WITHHOLD UNDER 10 CFR 2.390

DRAWING 2059
GENERAL ARRANGEMENT, REACTOR BUILDING, PLAN BELOW GRADE

SECURITY-RELATED INFORMATION -
WITHHOLD UNDER 10 CFR 2.390

DRAWING 2060
GENERAL ARRANGEMENT, REACTOR BUILDING,
PLAN AT ELEVATION 903'-6"

SECURITY-RELATED INFORMATION -
WITHHOLD UNDER 10 CFR 2.390

DRAWING 2061
GENERAL ARRANGEMENT, REACTOR BUILDING,
PLAN AT ELEVATION 931'-6"

SECURITY-RELATED INFORMATION -
WITHHOLD UNDER 10 CFR 2.390

DRAWING 2062
GENERAL ARRANGEMENT, REACTOR BUILDING,
PLAN AT ELEVATION 958'-3"

SECURITY-RELATED INFORMATION -
WITHHOLD UNDER 10 CFR 2.390

DRAWING 2063
GENERAL ARRANGEMENT, REACTOR BUILDING, PLAN AT ELEVATION 976'-0"

SECURITY-RELATED INFORMATION -
WITHHOLD UNDER 10 CFR 2.390

DRAWING 2064
GENERAL ARRANGEMENT, REACTOR BUILDING,
PLAN AT ELEVATION 1001'-0"

SECURITY-RELATED INFORMATION -
WITHHOLD UNDER 10 CFR 2.390

DRAWING 2065
GENERAL ARRANGEMENT, REACTOR BUILDING,
SECTION A-A

SECURITY-RELATED INFORMATION -
WITHHOLD UNDER 10 CFR 2.390

DRAWING 2066
GENERAL ARRANGEMENT, REACTOR BUILDING,
SECTION B-B

SECURITY-RELATED INFORMATION -
WITHHOLD UNDER 10 CFR 2.390

DRAWING 2067
GENERAL ARRANGEMENT, RADWASTE BUILDING, PLANS AT ELEVATIONS 877'-6" AND 903'-6"

SECURITY-RELATED INFORMATION -
WITHHOLD UNDER 10 CFR 2.390

DRAWING 2068
GENERAL ARRANGEMENT, RADWASTE BUILDING,
PLANS AT ELEVATIONS 918'-0" AND 934'-0"

SECURITY-RELATED INFORMATION -
WITHHOLD UNDER 10 CFR 2.390

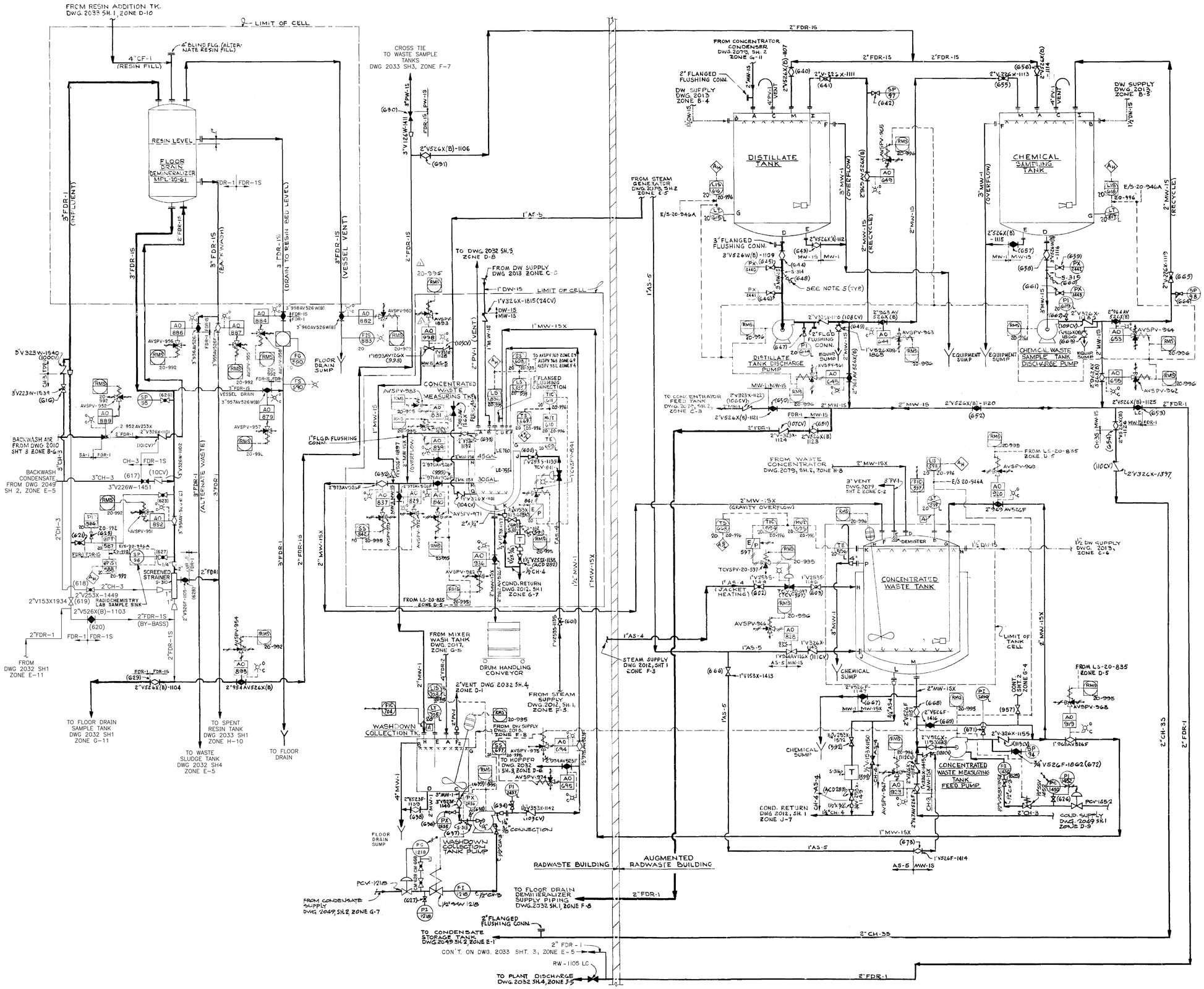
DRAWING 2069
GENERAL ARRANGEMENT,
RADWASTE BUILDING SECTIONS

SECURITY-RELATED INFORMATION -
WITHHOLD UNDER 10 CFR 2.390

DRAWING 2072
GENERAL ARRANGEMENT,
AUGMENTED RADWASTE BUILDING PLANS

SECURITY-RELATED INFORMATION -
WITHHOLD UNDER 10 CFR 2.390

DRAWING 2073
GENERAL ARRANGEMENT,
AUGMENTED RADWASTE BUILDING SECTIONS



NOTES:

1. UNLESS OTHERWISE INDICATED ALL PRESSURE AND/OR FLOW INSTRUMENT ROOT VALVES SHALL BE ¾"V253X. ROOT VALVES FOR STAINLESS STEEL SYSTEMS SHALL BE ¾"V226X LINE UP TO AND INCLUDING ROOT VALVE SHALL BE FURNISHED AND INSTALLED UNDER CONTRACT E-73-58.
2. ALL TEMPERATURE TEST AND PROTECTING WELL PENETRATIONS SHALL BE 1" NPT UNLESS OTHERWISE NOTED.
3. ALL SAMPLING POINTS, CONNECTIONS, PROBES AND ROOT VALVES SHALL BE FURNISHED AND INSTALLED UNDER CONTRACT E-73-58. PROBES SHALL BE FURNISHED AND INSTALLED IN ACCORDANCE WITH CONTRACT PARA. 3.4.2 AND DRAWINGS SP-07211, FIG NO AS NOTED. CONTINUATION OF SAMPLE PIPING BY E-70-3.
4. LINE DESIGNATION SUFFIX (X) I.E. 1"MW-1SX INDICATES LINE IS HEAT TRACED (ELECTRICALLY).
5. ALL STRAINER BLOWDOWN VALVES SHALL BE THE SAME SIZE AS THE STRAINER BLOWDOWN PORT AND SHALL BE TYPE 2525 FOR CARBON STEEL TRAPS AND TYPE 2226 FOR STAINLESS STEEL TRAPS.

AS BUILT
454003659
STATUS: Release
STATUS DATE: 09/07/2018
DS APPROVED: JAFORBE
VER: AB REV: 14 SIZE: F

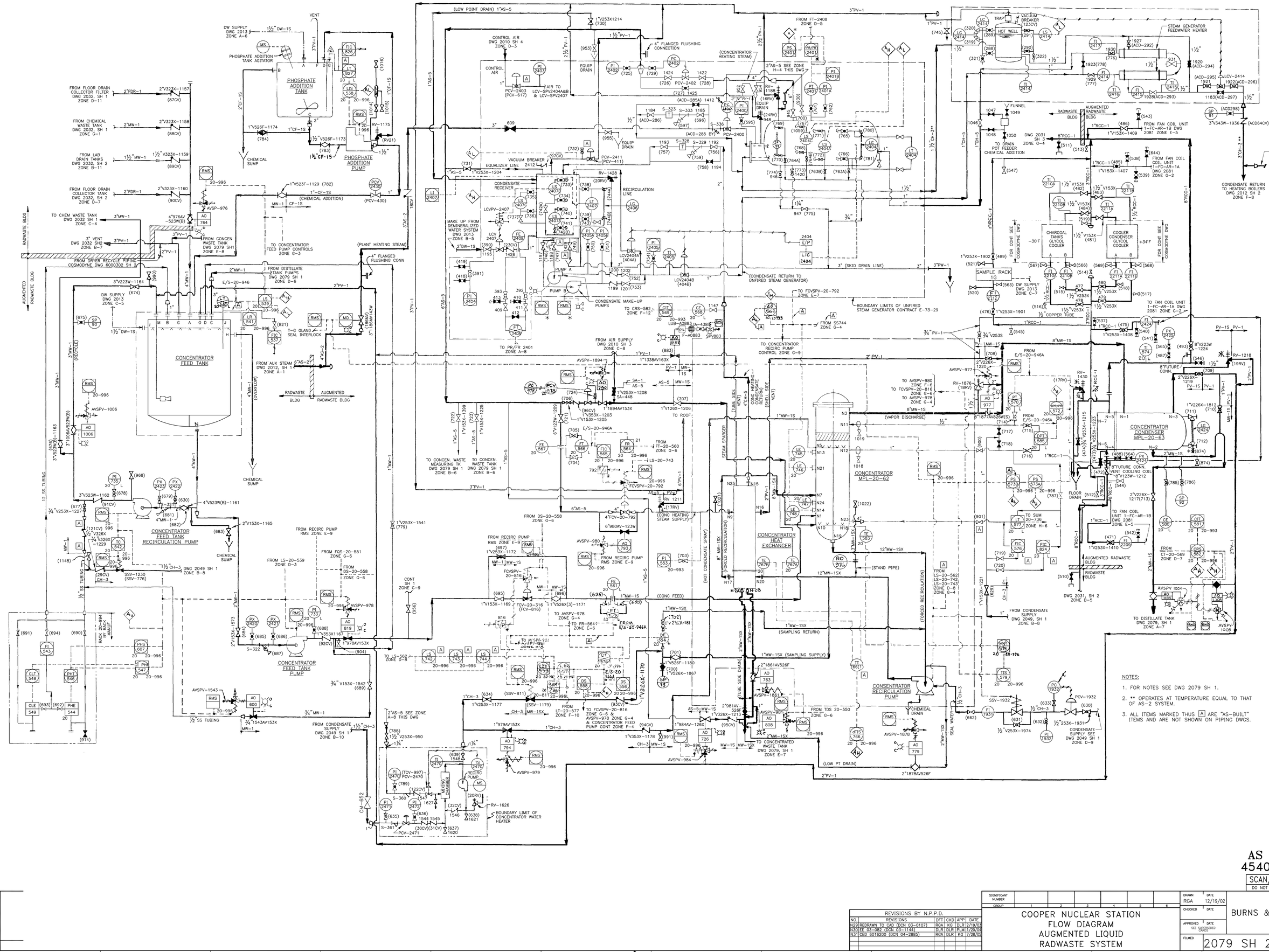
FOR PREVIOUS REVISIONS, SEE SUPERSEDED CARDS

VERSIONS/REVISIONS BY N.P.P.D.			
NO.	DESCRIPTION	DFT/ DATE	ENG
AB/14	DR-2018-0001	DJB 09/07/18	JLD/RR

SIGNIFICANT NUMBER | GROUP 1 2 3 4 5 6

DRAWN RGA	DATE 2/13/04	BURNS & ROE	
CHECKED	DATE		
APPROVED SEE SUPERSEDED CARDS	DATE		
FILMED		2079 SH 1	CARD REF. C00336601

COOPER NUCLEAR STATION
FLOW DIAGRAM
AUGMENTED LIQUID
RADWASTE SYSTEM



NOTES:

1. FOR NOTES SEE DWG 2079 SH 1.
2. ** OPERATES AT TEMPERATURE EQUAL TO THAT OF AS-2 SYSTEM.
3. ALL ITEMS MARKED THUS [A] ARE "AS-BUILT" ITEMS AND ARE NOT SHOWN ON PIPING DWGS.

AS BUILT
454003660

SCAN/CADD DWG
DO NOT REVISE MANUALLY

REVISIONS BY N.P.P.D.

NO.	REVISIONS	DFT	CKD	APP	DATE
N29	REDRAWN TO CAD (DCN 03-0107)	RGA	KG	DLR	2/19/03
N30	EE 03-082 (DCN 03-1144)	DLR	DLR	PLM	1/20/04
N31	CED 6016200 (DCN 04-2885)	RGA	DLR	KG	7/28/05

SIGNIFICANT NUMBER						
GROUP	1	2	3	4	5	6

COOPER NUCLEAR STATION
FLOW DIAGRAM
AUGMENTED LIQUID
RADWASTE SYSTEM

DRAWN RGA DATE 12/19/02
CHECKED DATE
APPROVED DATE
SEE SUPERSEDED CARDS
FILMED

BURNS & ROE

2079 SH 2
REVISION N31

CADD FILE: C0036337

NOTES:

1. ALL PIPING SYSTEMS SUFFIXED BY AN "S" ARE STAINLESS STEEL (i.e. MW-2S, CH-4S).
2. FOR CONNECTED PIPE SYSTEMS AT CLEAN-OUTS FABRICATED OF BOTH STAINLESS STEEL AND CARBON STEEL SEE PHYSICAL DWGS FOR TYPICAL BREAK POINT.
3. FOR LEGEND SEE DWG 2001 SHT 1.
4. FURNISHED UNDER CONTRACT E-68-34.
5. F(WC) IS CODING FOR FLANGE MOUNTED WAFER CHECK.

EQUIPMENT DRAINS

CHEMICAL DRAINS

ROOF DRAINS

FLOOR DRAINS

CONDENSATE DRAINS

DETAIL "A"

A	B	C
RW-PI-2450	RW-V-841	RW-V-842
RW-PI-2451	RW-V-835	RW-V-836
RW-PI-2452	RW-V-838	RW-V-839
RW-PI-2453	RW-V-844	RW-V-845
CF-PI-2454	CF-V-575	CF-V-574
CF-PI-2455	CF-V-572	CF-V-571

AS BUILT
454003675
CADD DRAWING
DO NOT REVISE MANUALLY

FOR PREVIOUS REVISIONS, SEE SUPERSEDED CARDS

REVISIONS BY N.P.P.D.

NO.	REVISIONS	DFT	CKD	APP	DATE
N13	CED 1999-0063 (DCN 99-0617)	RGA	TMB	KG	3/31/00
N14	DCN 05-0450	RGA	KG	DLR	4/5/05
N15	EE 09-021 (DCN 09-0672)	DJB	DJB	DLR	09/01/09

SIGNIFICANT NUMBER | GROUP 1 2 3 4 5 6

DRAWN RGA DATE 3/10/05
CHECKED DATE
APPROVED DATE
FILMED

FLOW DIAGRAM
AUGMENTED RADWASTE BUILDING
EQUIPMENT, CHEMICAL & FLOOR DRAINS
COOPER NUCLEAR STATION

BURNS & ROE

2080

REVISION N15

CADD FILE C0053040

DRYWELL

SUPPRESSION CHAMBER

PI 2104A
CB
PT 2104A
PI 2104C
PC-555
PC-556
PC-417
PC-418
PC-419
PC-420
PC-416
PC-415
PC-49
SEE DWG. 2026 SH. 1, ZONE E-5
X-40A

SEE DWG. 2022 SH. 1 ZONE C-2
20"
X-26
MO 231
MO
2"PC-510
PC-306MV
24"
PC-39
AO 246
24" TO STANDBY GAS TREATMENT UNITS
½"PC-508
½"PC-509
RMS
AUTO ISOLATION SYSTEM
1"FLG'D FLUSHING CONNECTION
PC-410
MO 1310
DC
1"PV-1S
1"PC-1310MV
CB
PC-426
PC-63
SEE DWG. 2026, SH. 1 ZONE E-8
X-40D
2 NC
SPACER PLATE

AUTO ISOLATION SYSTEM
RMS
TEST CONN.
VENT
½"PC-520
½"PC-524
½"PC-525
MO 1305
MO 1306
1½"
SBNI-16CV
1"PC-1305MV
1"PC-1306MV
SBNI-103
PC-483
1½" FLG'D FLUSHING CONNECTION
NC 2
1½"
SBNI-1S
PC-482
PV-1
SEE DWG. 2022, SH. 1, ZONE E-7
AO
MO
24"
PC-238AV
PC-232MV
X-25

AUTO ISOLATION SYSTEM
RMS
TEST CONN.
½"PC-515
½"PC-514
CB
MO 1311
MO 1312
DC
AC
VENT
½"PC-518
1"PC-1311MV
1"PC-1312MV
1½"
SBNI-17CV
SBNI-2
SBNI-1
PC-435
1½" FLG'D FLUSHING CONNECTION
CONT ON 2022, SH. 1 ZONE D-9
1½"PC-406
RH-2, SBNI-2, SEISMIC IS
PC-442
10"RH-2
SEE DWG. 2040, SH. 2 ZONE A-5
X-39B

AUTO ISOLATION SYSTEM
RMS
TEST CONN.
VENT
½"PC-523
½"PC-521
½"PC-522
MO 1303
MO 1304
1½"
SBNI-14CV
1"PC-1303MV
1"
1"PC-1304MV
SBNI-101
PC-485
1 ½" FLG'D FLUSHING CONNECTION
NC 2
PC-484
PV-1
SBNI-1S
AO
MO
SEE DWG. 2022 SH. 1, ZONE F-7
24"PV-1
PC-237AV
PC-233MV
X-205

AUTO ISOLATION SYSTEM
RMS
CONT ON 2010 SH.2 ZONE J-9
ND
SBNI-SOV-50
VENT
½"PC-519
MO 1302
MO 1301
DC
AC
½"PC-517
TEST CONN.
½"PC-516
1"
1"PC-1302MV
1"PC-1301MV
SBNI-15CV
SBNI-102
PC-486
SBNI-1, SEISMIC IS
2 NC
X-220
16"
PC-400
RH-4
CONT ON 2022, SH. 1 ZONE D-9
1½"PC-407
6"RH-4
SEE DWG. 2040, SH. 2 ZONE D-4
X-218

PS 18
PS 19
PC-203
PC-204
PC-202
PC-209
PC-210
CONT ON DWG 2027 SH 2 ZONE G-10
2"PC-187
2"PC-212
PC-16CV
PC-17CV
SURGE CHAMBER
SURGE CHAMBER
PC-14RV
PC-15RV
SUTORBILT COMPRESSOR 1-A
SUTORBILT COMPRESSOR 1-B
½"
½"
2"
CONT ON ZONE E-8
PC-186
2"PC-211
24"

X-215
PC-58
PC-471
PC-472
CB
1½"SBNI-1S
½" O.D. S.S. TUBING
TO PI -20 DPT-20 SEE DWG. 2027, SH. 2 ZONE F-9
REACTOR BLDG. WALL
TRAIN "A"
1"
PC-499
SEE DWG. 2027, SH. 2, ZONE H-7
PI 2104B
PI 2104C
PC-558
PC-557
PC-432
PC-434
PC-431
PC-433
X-206D
PC-59
MO 230
MO
24"
2"PC-511
PC-305MV
½"PC-512
½"PC-513
TEST CONN.
AO 245
PURGE & VENT LINE
PC-41
PC-489
RMS
AUTO ISOLATION SYSTEM
MO 1308
DC
1"PV-1S
1"PC-1308MV
SPACER PLATE
1½"SBNI-1S
SEISMIC-1S
1"SBNI-1S

IA-PI-100
IA-PI-101
IA-PRV-PRV101
PCV
PI
IA-546
IA-547
L.C.
IA-545
CONT. ON 2022 SH 1 ZONE F-9 TO PC-AOV-237AV
IA-PCV-100
IA-550
IA-551
IA-543
CONT. ON 2022 SH 1 ZONE F-11 TO PC-AOV-A032
IA-544
N2
HCVS MECHANICAL REMOTE OPERATING STATION CYLINDER STORAGE RACK
(9 BOTTLES REQ'D)
(OPERATE 9 AT A TIME)
NOTE: GENERAL NOTES ON THIS DRAWING DO NOT APPLY TO THIS STORAGE RACK.

SBNI-PI-1
PI
SBNI-15
FI
SBNI-FI-1
SBNI-5
SBNI-1CV
TRAIN "A" CONTROL STATION IN SOUTH VESTIBULE
B31.1.0 SBNI-3, SEISMIC IS
ASME III, CL2 SBNI-1, SEISMIC IS
SBNI-4

SBNI-PI-2
SBNI-1RV
PCV
SBNI-6
TO N_2 SYSTEM CONT ON 2022, SH. 1 ZONE A-9
SBNI-14
SBNI-PCV-PRV3
SBNI-2CV
FI
SBNI-FI-2
SBNI-10
SBNI-3CV
(PRIMARY N_2 SOURCE)
TRAIN "B" CONTROL STATION
B31.1.0 SBNI-3, SEISMIC IS
ASME III, CL2 SBNI-1, SEISMIC IS
SBNI-8
REACTOR BLDG. WALL
TRAIN "B"

INTERNAL RELIEF
VALVES NORMALLY CLOSED FOR STORAGE, NORMALLY OPEN FOR OPERATION.
SBNI-PI-11 (SBNI-PI-21)
SBNI-PI-12 (SBNI-PI-22)
SBNI-PCV-PRV1 (SBNI-PCV-PRV2)
SBNI-1 (SBNI-2)
SBNI-11 (SBNI-12)
PRESSURE REGULATOR ASSEMBLY
(1 REQUIRED FOR OPERATION)
(2 SPARE)
PORTABLE CYLINDER STORAGE RACK
(14 RACKS REQ'D)
(OPERATE 1 AT A TIME)
FLEXIBLE HOSE ROUTING CONFIGURATIONS
(1 REQUIRED IF PRIMARY N_2 UNAVAILABLE)
SBNI-9

NOTES:

1. UNLESS OTHERWISE INDICATED ALL PRESSURE AND/OR FLOW INSTRUMENT ROOT VALVES SHALL BE 3/4" ROOT VALVES SHALL BE 3/4"V226X.
2. ALL TEMPERATURE TEST AND PROTECTING WELL PENETRATIONS SHALL BE 1" NPT UNLESS OTHERWISE NOTED.
3. MATERIAL DESIGNATION -1S STAINLESS STEEL.
4. LOW POINT DRAINS WITH VALVES SHALL BE PIPED TO RHR PUMP ROOMS AND ARE NOT SHOWN.
5. FOR PIPING SPECIFICATIONS AND SEISMIC QUALIFICATION SEE SPECIFICATION E-73-58 AND DC89-272.
6. PART NO'S ARE INTERCHANGED ON FOLLOWING VALVES:
   1303MV INTERCHANGED WITH 1305MV
   1306MV INTERCHANGED WITH 1304MV
   POWER & CONTROLS ASSIGNMENTS REMAIN UNCHANGED.
7. REFERENCE DWGS. BECKMAN 13370, BENDIX 203636R, B&R IL-E-70-3 SH.111 FOR HYDROGEN SAMPLE SYSTEM.
8. INSTRUMENT, SAMPLE, TEST, DRAIN AND VENT LINES ARE NOT ALWAYS THE SAME CLASS AS THE MAIN LINE AND THESE BOUNDARIES ARE TOO NUMEROUS TO IDENTIFY IN THIS MANNER (SEE ISI PROGRAM BOUNDRY DESCRIPTIONS FOR DETAILS).
9. CB IS PRIMARY CONTAINMENT BOUNDRY.
10. WHERE LINES ARE INTERCONNECTED AND CONTINUED ON OTHER DRAWINGS, ZONE NUMBERS ARE APPROXIMATE ONLY.

AS BUILT
454035514
STATUS: Release
STATUS DATE: 05/14/2018
DS APPROVED: KASCHIZ
VER: AE REV: 30 SIZE: F

FOR PREVIOUS REVISIONS, SEE SUPERSEDED CARDS.

VERSIONS/REVISIONS BY N.P.P.D.

NO.	DESCRIPTION	DFT	DATE	ENG
AB/28	DR-2015-0086	DJB	10/22/18	KKKUKER
AD/29	DR-2017-0001	DJB	08/15/17	MTMCCAN
AE/30	DR-2018-0001	DJB	05/14/18	KASCHIZ

SIGNIFICANT NUMBER
GROUP 1 2 3 4 5 6

FLOW DIAGRAM
STAND BY NITROGEN
INJECTION SYSTEM
COOPER NUCLEAR STATION

DRAWN DATE
CHECKED DATE
APPROVED DATE
SEE SUPERSEDED CARDS
FILMED

BURNS & ROE

2084

CO017984

SECURITY-RELATED INFORMATION -
WITHHOLD UNDER 10 CFR 2.390

DRAWING 2298
RADWASTE BUILDING,
CONVEYOR OPERATING AREAS
PLANS AND SECTIONS

TO 345KV BUS

300KV LA

TO 345KV SWYD TO LINE DIFF RELAY AT PCB 3310 & 3312

TO SWYD

207KV–115/69V

TRIPS PCB 3310 & 3312

TRIPS PCB 3310 & 3312

TELEMETERING TO 345KV SWYD

1200–5 MR

MAIN POWER TRANSFORMER BANK

3–287/410MVA 1ø 60HZ FOA
345KV–20.9KV
1175KV BIL 12.90% Z
(1–SPARE RATED SAME AS ABOVE)

ISOLATED PHASE BUS DELTA CONNECTION 17000A 110KV BIL FORCED AIR COOLED

20000:5A

20000:5A

1200A ISOLATED PHASE BUS 22KV FORCED AIR COOLED

ALARM

SURGE PROTECTION

24KV 3 LA

3 CAP .125µfd

60A BLOCKS 21

60B TRIPS VOLT REG

1200A TAP

24KV–120V

24KV–120V

ISOLATED PHASE BUS 28000A 3ø 110KV BIL FORCED AIR COOLED

#A #B #C

BRUSHLESS MAIN EXCITER

FUNCT. OF MAIN GEN. VOLT. REG.

VOLT ADJUSTER

VOLT REG

REG BALANCE

PERM MAGNETIC PILOT EXCITER

REG CONTROL

BASE ADJUSTER

64T

ALARM

41a

64T

VECTOR ROTATION

RTD

TR

MAIN GENERATOR
983MVA @ 60 PSIG H2 0.85pf
22KV 3ø 60HZ
1800 RPM

TRIPS PCB 3310 & 3312

TRIPS PCB 3310 & 3312

TRIPS PCB 3310 & 3312

TO 345KV SWYD (TO OUTER CT'S @ PCB 3310 & 3312)

TO 4160V CTS

GROUNDING RESISTOR 0.445Ω 475A CONTINUOUS

NEUTRAL GROUNDING TRANSFORMER
100KVA 14.4KV–240V
1ø 60HZ

52/X

PHASE SHIFTING XFMR

TS–1

TS–2

TLC–2

TLC–1

TEST SW

TLC

TRD VAR

TRD W

WT–1

MVAR

MW

MWH

TS–TEST SWITCH
TLC–XFMR LOSS COMPENSATOR
TOT–PULSE TOTALIZER
TO–TELEMETERING OSCILLATOR
IG–IMPULSE GENERATOR

TO 345KV SWYD

DISCONNECT LINKS

NORMAL STATION SERVICE TRANSFORMER
30/33.6MVA 3ø 60HZ FOA
21KV–4160–4160V

30MVA

18MVA/20.16 X WINDING Z_{H-X} =11.4% ON 18MVA

12MVA/13.44 Y WINDING Z_{H-Y} =9.1% ON 12MVA

LOCATED IN 4160V SWGR BUS 1B

LOCATED IN 4160V SWGR BUS 1D

GROUNDING RESISTOR 192Ω 12.5A CONTINUOUS

3000A BUS DUCT

2000A BUS DUCT

TO 4160V CT'S

TRIPS PCB 3310 & 3312

DEH 01

DEH 01

ALARM

PHASE SHIFTING XFMR

DC TS

DC TS

40–23

40–27

40–25

40–25

40–25

40–25

40–27

5–0.2 AUX CT

WT–6

TELEM (FUTURE)

TELEM (FUTURE)

161KV LINE TO SWYD START–UP

ST–D1

GANG OPERATED AIR BREAKER SWITCH 3P 161KV 600A

92KV–65.7/115V

92KV–65.7/115V

TRIP 161KV SWYD BREAKERS 1604 & 1606

SSST OPEN PHASE PROTECTION CABINET #2 EE–PNL–SOPP2

SSST OPEN PHASE PROTECTION CABINET #1 EE–PNL–SOPP1

START–UP STATION SERVICE TRANSFORMER
21.7/28.8/36MVA 3ø 60HZ
OA/FA/FA
161KV–4160–4160V

NOTE 8

24MVA X WINDING Z_{H-X} =15.4% @24MVA

12MVA Y WINDING Z_{H-Y} =12.2% @ 12MVA

LOCATED IN 4160V SWGR BUS 1A

LOCATED IN 4160V SWGR BUS 1D

GROUNDING RESISTOR 192Ω 12.5A CONTINUOUS

3000A BUS DUCT

2000A BUS DUCT

TO 4160V CT'S

MUX 9–87

MUX 9–91

TRIP 161KV BREAKERS 1604 & 1606

69KV LINE TO SWYD EMERGENCY

5298

GANG OPERATED AIR BREAKER SWITCH 3P 69KV 600A

40.25KV–67.08/115V

40.25KV–67.08/115V

ESST OPEN PHASE PROTECTION CABINET #2 EE–PNL–EOPP2

ESST OPEN PHASE PROTECTION CABINET #1 EE–PNL–EOPP1

EMERGENCY STATION SERVICE TRANSFORMER
9/10.08/12.6MVA 3ø 60HZ
OA/FA 67KV–4160V
55/65°C Z=7.0% ON 9MVA

600–5 MR

600–5

TRIP BREAKERS 1FS & 1GS SEE DWG 3002

4160V SDG SWGR (1S)

1SS

SP

SG1

SS1S

2000A BUS DUCT

MODS

TO 4160V SWGR BUSES 1F & 1G FOR CONTINUATION SEE DWG 3002

2–1/C 350KCMIL PER ø

SPARE

SUPPLEMENTAL DIESEL GENERATOR

4160–480/277V TRANSFORMER 225KVA 3ø

480V SDG BUS 1S

GENERAL NOTES:

1. FOR SYMBOL LIST SEE DWG'S 3032 & 3070.
2. ALL CONTROLS, RELAYS, METERS & ASSOCIATED DEVICES SHOWN ON 4160V SWGR BUSES, MAIN BREAKERS & FEEDER BREAKERS SHALL BE LOCATED IN 4160V SWGR UNLESS OTHERWISE NOTED BY SYMBOL ⊡C. FOR LEGEND OF REMOTE EQUIPMENT LOCATIONS ⊡C, SEE DWG 3032.
3. ALL 4160V SWITCHGEAR BREAKERS ARE RATED 1200A CONTINUOUS UNLESS OTHERWISE INDICATED.
4. ALL MOTOR CONTROL CENTERS BRANCH FEEDERS (OTHER THAN MOTOR FEEDERS) SHALL HAVE FUSES SIZED SAME AS SWITCH SIZE UNLESS OTHERWISE INDICATED.
5. H121 (3022) — H121 INDICATES CABLE NUMBER. SEE SCHEDULES DWG 3050. (3022) INDICATES DWG # OF ASSOCIATED CONTROL ELEMENTARY DIAGRAM.
6. AN INTERLOCK EXISTS ON THE DOOR OF THE CABINET THAT IS HOUSING THIS PT. OPENING OF THIS DOOR WILL ISOLATE THE PT FROM THE BUS.
7. THESE ARE CABLES ON BOTH SIDES OF A DRYWELL ELECTRICAL PENETRATION ASSEMBLY.
8. SHORTED AND GROUNDED IN CABINET.

(DIV II) 4160V SWGR BUS 1B 3ø 3W 2000A BUS

(TURBINE BLDG OPERATING FLOOR)

TO SYN SW

TO CIRC WTR PUMP CKT

4200–120V NOTE 6

1BE

CWP1C

CWP1D

CBP1B

CP1B

SS1B

1BG

SS1D

2000AF 1BS NO

1BN 2000AF NC

TO RELAY 87LGT

TO RELAY 87NT

TO RELAY 87ST

TO BUS PT'S

DENOTES FEEDER CABLE NUMBER–TYPICAL SEE NOTE 5

H161A H161B (3017)

CIRCULATING WATER PUMP 1C

CIRCULATING WATER PUMP 1D

CONDENSATE BOOSTER PUMP 1B

CONDENSATE PUMP 1B

480V STA SERV SUBSTATION 1B

4160V CRITICAL BUS 1D

STATION SERVICE TRANSFORMER 30/40/53MVA OA/FA/FOA (BACK–UP)

2000A BUS DUCTS

1200A BUS DUCTS

(DIV II) 4160V SWGR 1D 3ø 3W 1200A BUS

(TURBINE BLDG OPERATING FLOOR)

TO RELAY 87NT

TO RELAY 87ST

1DS

1DN

TO RELAY 87LGT

H281A H281B H281C (3018)

RRM1B

COMPT # ONLY

VAR SPEED CONVERTER

REACTOR RECIRC MG SET 1B MOTOR

AC BRUSHLESS EXCITER 50KW 400A 125V

MG SET GENERATOR 5100KW 0.90pf 1120RPM 56CY 1200/5 3920V

GEN FLD ACB

VOLT REG

H282D H282E H282F NOTE 7

H282A H282B H282C NOTE 7

5500

7000

PUMP MOTOR

40–25

(DIV I) 4160V SWGR BUS 1E 3ø 3W 1200A BUS

(TURBINE BLDG OPERATING FLOOR)

4200–120V NOTE 6

CBP1C

CP1C

SS1E

SCNPC

SCNPD

1EA

1EB

COMPT # ONLY

CKT. BREAKER IDENTIFICATION NUMBER–TYPICAL

1AE

H41A H41B (3017)

TO BUS PT'S

CONDENSATE BOOSTER PUMP 1C

CONDENSATE PUMP 1C

INTAKE STRUCTURE 480V SUBSTA 1E

SCREEN WASH PUMP 1C

SCREEN WASH PUMP 1D

* CONTROL PANEL

(DIV I) 4160V SWGR BUS 1A 3ø 3W 2000A BUS

(TURBINE BLDG OPERATING FLOOR)

TO SYN SW

TO CIRC WTR PUMP CKT

4200–120V NOTE 6

CWP1A

CWP1B

CBP1A

CP1A

SS1A

1AF

SS1C

2000AF 1AS NO

1AN 2000AF NC

TO RELAY 87LGT

TO RELAY 87NT

TO RELAY 87ST

TO BUS PT'S

CIRCULATING WATER PUMP 1A

CIRCULATING WATER PUMP 1B

CONDENSATE BOOSTER PUMP 1A

CONDENSATE PUMP 1A

480V STA SERV SUBSTATION 1A

4160V CRITICAL BUS 1F

STATION SERVICE TRANSFORMER 30/40/53MVA OA/FA/FOA (NORMAL FED)

2000A BUS DUCTS

(DIV I) 4160V SWGR BUS 1C 3ø 3W 1200A BUS

(TURBINE BLDG OPERATING FLOOR)

4200–120V NOTE 6

TO RELAY 87NT

TO RELAY 87ST

1CS

1CN

TO RELAY 87LGT

H241A H241B H241C (3018)

RRM1A

VAR SPEED CONVERTER

REACTOR RECIRC MG SET 1A MOTOR

AC BRUSHLESS EXCITER 50KW 400A 125V

MG SET GENERATOR 5100KW 0.90pf 1120RPM 56CY 1200/5 3920V

GEN FLD ACB

VOLT REG

H242D H242E H242F NOTE 7

H242A H242B H242C NOTE 7

5500

7000

PUMP MOTOR

40–25

▲ – INDICATES EQUIPMENT LOCATED AT LOCAL MG SET OR IN GENERAL ELECTRIC CONTROL CABINETS. TYPICAL FOR MG SET 1A & 1B.

1200A BUS DUCTS

4200–120V

TO BRKRS 1CS, 1CN, 1DS, & 1DN. CONT SW'S @ C14. SEE BUS 1C & 1D SYNCHRO CHECK DIAG DWG 3018.

(LOCATED IN 1DS)

AS BUILT
454003876

STATUS: Release
STATUS DATE: 11/03/2018
DS APPROVED: MJDICKE
VER: AI REV: 30 SIZE: F

FOR PREVIOUS REVISIONS, SEE SUPERSEDED CARDS.

VERSIONS/REVISIONS BY N.P.P.D.

NO.	DESCRIPTION	DFT	DATE	ENG
AH/29	DR–2017–0128	DLR	10/17/18	JDW1L50
AJ/30	DR–2017–0406	DJB	11/03/18	KJHAGGE

SIGNIFICANT NUMBER | GROUP 1 2 3 4 5 6

COOPER NUCLEAR STATION
MAIN ONE LINE DIAGRAM

DRAWN DR DATE 7–11–94
CHECKED DATE
APPROVED DATE
FILMED

BURNS & ROE

3001

CARD FILL C0015091

(DIV I) 4160V SWGR CRITICAL BUS 1F 3ø 3W 1200A BUS

(REACTOR BLDG OPER FLOOR)

(DIV II) 4160V SWGR CRITICAL BUS 1G 3ø 3W 1200A BUS

(REACTOR BLDG OPER FLOOR)

STATION SERVICE TRANSFORMER 1F

2000 KVA 3ø 60HZ
DRY TYPE
4160–480Y/277V
Z=6.11%

STATION SERVICE TRANSFORMER 1G

2000 KVA 3ø 60HZ
DRY TYPE
4160–480Y/277V
Z=6.07%

DIESEL GENERATOR #1

4160V, 3ø, 60HZ
5000 KVA, 0.8PF

DIESEL GENERATOR #2

4160V 3ø 60HZ
5000 KVA 0.8PF

MCC DG1 XFMR

250KVA 3ø
60 HZ DRY TYPE
4160–480/277V

MCC DG2 XFMR

250KVA 3ø
60 HZ DRY TYPE
4160–480/277V

(DIV I) 480V SWGR CRITICAL BUS 1F 3ø 3W 2500A BUS

(REACTOR BLDG OPER FLOOR)

(DIV II) 480V SWGR CRITICAL BUS 1G 3ø 3W 2500A BUS

(REACTOR BLDG OPER FLOOR)

STATION SERVICE TRANSFORMER 1A

1500 KVA 3ø 60HZ
DRY TYPE
4160–480Y/277V
Z=6.07%

STATION SERVICE TRANSFORMER 1B

1500 KVA 3ø 60HZ
DRY TYPE
4160–480Y/277V
Z=6.03%

(DIV II) 480V SWGR BUS 1B 3ø 3W 2000A BUS

(TURBINE BLDG OPER FLOOR)

(DIV I) 480V SWGR BUS 1A 3ø 3W 2000A BUS

(TURBINE BLDG OPER FLOOR)

STATION SERVICE TRANSFORMER 1E

750 KVA 3ø 60HZ
DRY TYPE
4160–480Y/277V
Z=5.63%

480V SWGR BUS 1E 3ø 3W 1000A BUS

(INTAKE STRUCTURE)

460V 3ø 3W MCC–Z 600A BUS

(INTAKE STRUCTURE)

NOTE: (REFER MCC Z) FOR MOTOR CONTROLS & THEIR OPERATIONAL FUNCTION, SEE RELATED ELEMENTARY DIAGRAMS.

EQUIPMENT DEVICE LEGEND

▲ – INDICATES EQUIPMENT LOCATED ON LOCAL GENERATOR RELAY PANEL (FURNISHED WITH DIESEL GENERATOR)

△ – INDICATES EQUIPMENT LOCATED ON GENERATOR CONTROL PANEL

FUSE LEGEND

G1 – GOULD TYPE TRS FUSE.
B1 – BUSSMANN TYPE FRS FUSE.

NOTES:

1. FOR GENERAL NOTES SEE DRAWING 3001.
2. FOR SYMBOL LIST SEE DRAWING 3070 & 3032.
3. THIS BREAKER EQUIPPED WITH INSTANTANEOUS TRIP ELEMENTS ONLY.
4. REMOVED.
5. AN INTERLOCK EXISTS ON THE DOOR OF THE CABINET HOUSING THIS PT OPENING OF THIS DOOR WILL ISOLATE THE PT FROM THE BUS.

AS BUILT
454003877
STATUS: Release
STATUS DATE: 10/04/2018
DS APPROVED: MJDICKE
VER: AJ REV: 56 SIZE: F

FOR PREVIOUS REVISIONS, SEE SUPERSEDED CARDS.

VERSIONS/REVISIONS BY N.P.P.D.			
NO.	DESCRIPTION	DFT	DATE	ENG
AG/55	DR-2018-0001	DLR	07/13/18	DRKIEKE
AJ/56	DR-2018-0335	DJB	10/04/18	MJDICKE

SIGNIFICANT NUMBER | GROUP 1 2 3 4 5 6

COOPER NUCLEAR STATION AUXILIARY ONE LINE DIAGRAM MCC Z, SWGR BUS 1A, 1B, 1E, & CRITICAL SWGR BUS 1F 1G

DRAWN	C.A.	DATE 8/9/94
CHECKED	JAC	DATE 8–22–94
APPROVED	WCF	DATE 9–9–94
FILMED		

BURNS & ROE

3002 SH 1

CARD FILE: C0014553

NOTES

1. FOR SYMBOL LIST SEE DWG 3070.
2. FOR MOTOR CONTROLS & THEIR OPERATIONAL FUNCTION SEE RELATED ELEMENTARY DIAGRAMS.
3. ITEMS MARKED WITH ASTERISK ** & CIRCLED SHALL BE FURNISHED, INSTALLED, AND CONNECTED BY CONTRACT E69–17.
4. INTERCHANGE WHERE NOTED (2) SPARE SIZE 1 STARTERS IN MCC A & MCC F WITH (2) SPARE SIZE 2 STARTERS IN MCC B & MCC G.
5. RELOCATE SIZE 1 FVNR STARTERS AS FOLLOWS: TO MCC A UNIT 5A FROM MCC D1 UNIT 1B TO MCC A UNIT 5E FROM MCC D UNIT 6F FROM MCC A UNIT 5D TO MCC H UNIT 6A FROM MCC F UNIT 4D TO MCC H UNIT 9A
6. SWITCH FUSE UNIT 6DL ON MCC B SHALL BE FURNISHED BY DISTRICT. CONTRACTOR E69–17 SHALL INSTALL & CONNECT.
7. SWITCH FUSE UNIT 2FR ON MCC F SHALL BE FURNISHED BY DISTRICT. CONTRACTOR E69–17 SHALL INSTALL & CONNECT.
8. STARTER UNITS 8C & 8D ON MCC F SHALL BE FURNISHED BY DISTRICT. CONTRACTOR E69–17 SHALL INSTALL & CONNECT.
9. EACH SOG INCLUDES A GROUND FAULT RELAY, A 480–120V XFMR, A TERMINAL STRIP & TWO FUSES. THESE DEVICES ARE LOCATED IN A RELAY COMPARTMENT SEPARATE FROM THE STARTER. REFER TO DWG 3042, 3253 & ITE DWG 85B70008.
10. POWER FOR HYDROGEN PURITY BLOWER AND CONTROL RELAYS SEE DRAWINGS 688J212, 3055 SH3 AND 2314J78.
11. PRIOR TO CHANGING THIS FUSE SIZE, REVIEW PROCEDURES 5.4POST–FIRE AND 5.4FIRE–S/D TO EVALUATE EFFECTS ON REPAIR ACTIVITIES.

FUSE LEGEND:
G1–GOULD TYPE TRS FUSE
B1–BUSSMANN TYPE FRS FUSE

AS BUILT
454003878
STATUS: Release
STATUS DATE: 01/21/2019
DS APPROVED: JDWILSO
VER: AI REV: 55 SIZE: F

FOR PREVIOUS REVISIONS, SEE SUPERSEDED CARDS.

VERSIONS/REVISIONS BY N.P.P.D.

NO.	DESCRIPTION	DFT	DATE	ENG
AI/55	DR–2018–0379	DLR	1/21/19	JDWILSO

SIGNIFICANT NUMBER							
GROUP	1	2	3	4	5	6	

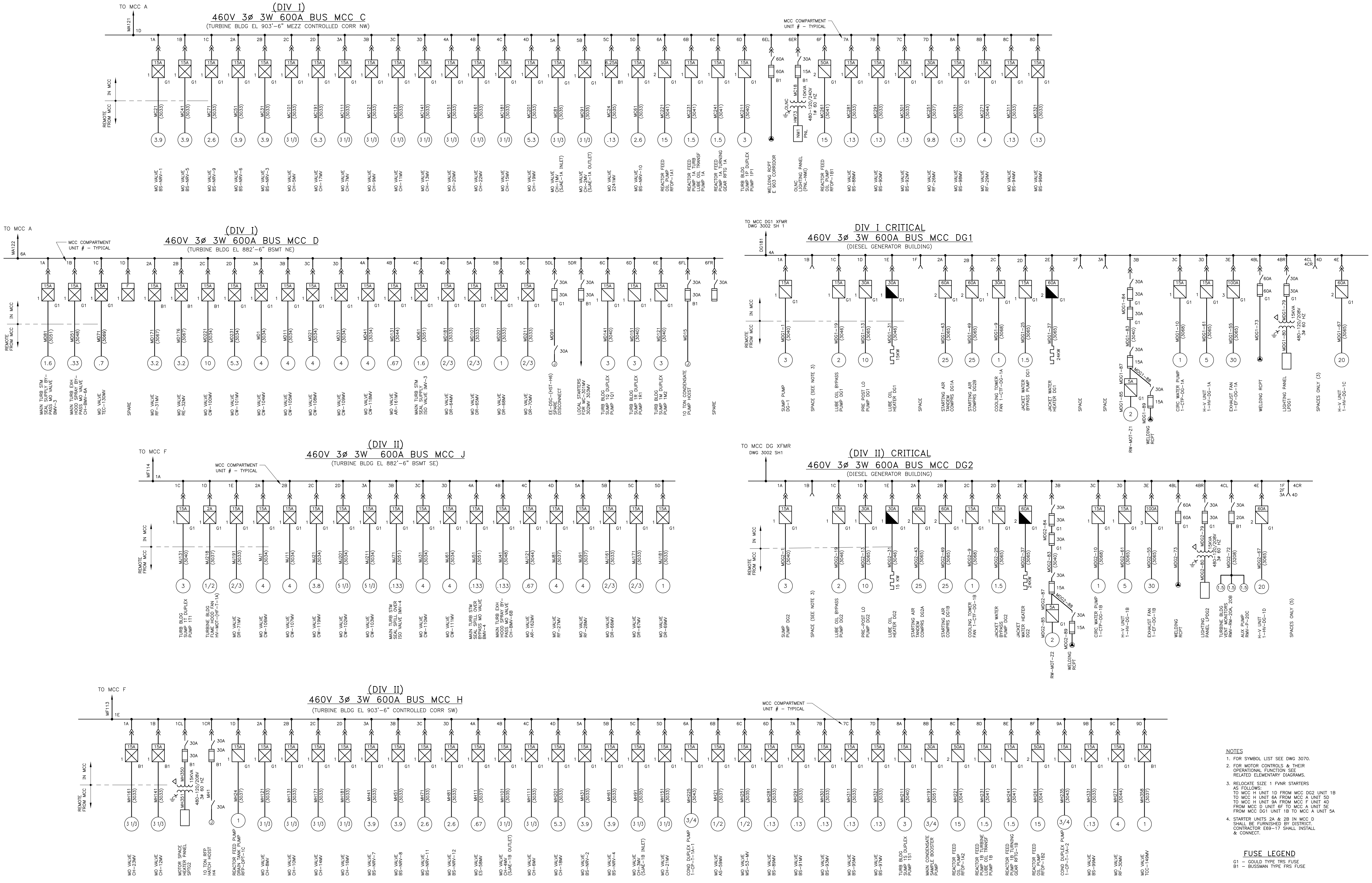
COOPER NUCLEAR STATION
AUXILIARY ONE LINE DIAGRAM
MOTOR CONTROL CENTERS
A, B, F, & G

DRAWN	DR	DATE 5–11–94
CHECKED	JAC	DATE 11–9–94
APPROVED	WCF	DATE 11–11–94
FILMED		

BURNS & ROE

3003 SH 2

CARD FILE: C0014554



NOTES

1. FOR SYMBOL LIST SEE DWG 3070.
2. FOR MOTOR CONTROLS & THEIR OPERATIONAL FUNCTION SEE RELATED ELEMENTARY DIAGRAMS.
3. RELOCATE SIZE 1 FVNR STARTERS AS FOLLOWS:
   TO MCC H UNIT 1D FROM MCC DG2 UNIT 1B
   TO MCC H UNIT 6A FROM MCC A UNIT 5D
   TO MCC H UNIT 9A FROM MCC F UNIT 4D
   FROM MCC D UNIT 6F TO MCC A UNIT 5E
   FROM MCC DG1 UNIT 1B TO MCC A UNIT 5A
4. STARTER UNITS 2A & 2B IN MCC D SHALL BE FURNISHED BY DISTRICT. CONTRACTOR E69-17 SHALL INSTALL & CONNECT.

FUSE LEGEND

G1 - GOULD TYPE TRS FUSE
B1 - BUSSMAN TYPE FRS FUSE

AS BUILT
454003879

STATUS: Release
STATUS DATE: 05/18/2018
DS APPROVED: REJENSE
VER: AD REV: 25 SIZE: F

FOR PREVIOUS REVISIONS SEE SUPERSEDED CARDS

VERSIONS/REVISIONS BY N.P.P.D.

NO.	DESCRIPTION	DFT	DATE	ENG
AB/23	DR-2017-0303	DJB	01/31/18	MJDICKE
AC/24	DR-2017-0271	DJB	02/15/18	REJENSE
AD/25	DR-2018-0001	DJB	05/18/18	REJENSE

SIGNIFICANT NUMBER						
GROUP	1	2	3	4	5	6

COOPER NUCLEAR STATION
AUXILIARY ONE LINE DIAGRAM
MCC C, D, H, J, DG1 & DG2

DRAWN	TRU	DATE 6/10-94
CHECKED	JAC	DATE 10-17-94
APPROVED	WCF	DATE 11-5-94
FILMED		

BURNS & ROE

3004 SH 3

CADD FILE: C0014555