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MANGAN,C.V. Niagara Mohawk Power Corp.
RECIP.NAME RECIPIENT AFFILIATION
BUTLER,W. Licensing Branch 2

SUBJECT: Forwards FSAR changes which address SER Confirmatory Item 25 re LPCI & LPCS valve interlocks. One P&ID drawing also encl.

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	ELD/HDS3		1	0	IE FILE		1	1
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	NRR/DE/SAB	24	1	1	NRR/DE/SGEB	25	1	1
	NRR/DHFS/HFEB	40	1	1	NRR/DHFS/LQB	32	1	1
	NRR/DHFS/PSRB		1	1	NRR/DL/SSPB		1	0
	NRR/DSI/AEB	26	1	1	NRR/DSI/ASB		1	1
	NRR/DSI/CPB	10	1	1	NRR/DSI/CSB	09	1	1
	NRR/DSI/ICSB	16	1	1	NRR/DSI/METB	12	1	1
	NRR/DSI/PSB	19	1	1	NRR/DSI/RAB	22	1	1
	NRR/DSI/RSB	23	1	1	REG FILE	04	1	1
	RGN1		3	3	RM/DDAMI/MIB		1	0
EXTERNAL:	24X		1	1	BNL(AMDTS ONLY)		1	1
	DMB/DSS (AMDTS)		1	1	LPDR	03	1	1
	NRC PDR	02	1	1	NSIC	05	1	1
	PNL GRUEL,R		1	1				

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NIAGARA MOHAWK

NIAGARA MOHAWK POWER CORPORATION/300 ERIE BOULEVARD WEST, SYRACUSE, N.Y. 13202/TELEPHONE (315) 474-1511

October 30, 1985
(NMP2L 0523)

Dr. Walter Butler, Chief
Licensing Branch No. 2
U.S. Nuclear Regulatory Commission
Washington, DC 20555

Dear Dr. Butler:

Re: Nine Mile Point Unit 2
Docket No. 50-410

Enclosed are changes to the Final Safety Analysis Report which address Safety Evaluation Report Confirmatory Item Number 25, Low Pressure Coolant Injection and Lower Pressure Core Spray valve interlocks. Also attached are Piping & Instrumentation Diagrams of the Low Pressure Coolant Injection and Low Pressure Core Spray which will be incorporated into the Final Safety Analysis Report. These changes will be included in FSAR Amendment 23.

Very truly yours,

C. V. Mangan
Senior Vice President

BB/rla
Enclosure
1015G

xc: R. A. Gramm, NRC Resident Inspector
Project File (2)

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After receipt of the initiation signals and after a delay provided by timers, each of the two solenoid pilot air valves are energized. This allows pneumatic pressure from the accumulator to act on the air cylinder operator. Each ADS trip system timer can be reset manually to delay system initiation. If reactor vessel water level is restored by the HPCS prior to the end of the time delay, ADS initiation will be prevented.

The ADS trip system A actuates the A solenoid pilot valve on each ADS relief valve. Similarly, the ADS trip system B actuates the B solenoid pilot valve on each ADS relief valve. Actuation of either solenoid pilot valve causes the associated ADS valves to open to provide depressurization.

Once initiated, the ADS logic seals in and can be reset by the control room operator only when either drywell pressure or vessel water level returns to normal. The ADS actuation logic is further discussed in Section 1.10, Task II.K.3.18.

The control switches (one for each trip system solenoid) are located in the main control room for each SRV associated with the ADS. Each switch controls one of the two solenoid pilot valves.

Testability

Refer to Section 7.3.2.1.3, Conformance to Regulatory Guide 1.22.

7.3.1.1.1.3 Low Pressure Core Spray - Instrumentation and Controls

System Function

The purpose of the LPCS is to provide low-pressure reactor vessel core spray following a LOCA when the vessel has been depressurized and vessel water level has not been restored by the HPCS. The LPCS is functionally diverse from the LPCI mode of the RHR system.

System Operation

Schematic arrangements of system mechanical equipment are shown on Figure 6.3-4. LPCS components control logic is shown on Figure 7.3-5. Instrument specifications and channel requirements are listed in Table 7.3-3. Operator information displays are shown on Figures 6.3.4 and 7.3.5.

The LPCS is initiated automatically by reactor vessel low water level and/or high drywell pressure. The system is designed to operate automatically for at least 10 min without any action required by the control room operator. Once initiated, the LPCS logic seals in and can be reset by the control room operator only when the water level and drywell pressure return to normal. Refer to Figure 7.3-5 for a schematic representation of the LPCS system initiation logic.

Reactor vessel water level (Trip Level 1) is monitored by two redundant level transmitters. Drywell pressure is monitored by two redundant pressure transmitters. The vessel level trip unit relay contacts and the drywell pressure trip unit relay contacts are connected in a one-out-of-two-twice logic arrangement so that no single instrument failure can prevent initiation of the LPCS.

The LPCS components respond to an automatic initiation signal simultaneously (or sequentially as noted) as follows:

1. The Division I diesel generator is signaled to start.

2. The normally closed test return line to the suppression pool valve MO F012 (MOV105) is signaled closed.

3. When power (offsite or onsite) is available at the LPCS pump motor bus, the LPCS pump is signaled to start. If offsite power is available, the LPCS pump starts after a 10-sec delay. If offsite power is not available and the Division I diesel generator is providing power, the LPCS pump starts after a 6-sec delay.

4. A differential pressure transmitter senses the pressure differential between the low pressure side of LPCS injection valve MO F005 (MOV104) and reactor vessel pressure. When the pressure differential is low enough to protect the LPCS from overpressure and power is available to the pump motor bus, the injection valve is signaled to open.

The LPCS pump discharge flow is monitored by a differential pressure transmitter. When the pump is running and discharge flow is low enough to cause pump overheating, the minimum flow return line valve MO F011 (MOV107) is opened. The valve is automatically closed if flow is normal.

The LPCS pump suction from the suppression pool valve MO F001 (MOV112) is normally open, and the control switch is keylocked in the open position and thus requires no automatic open signal for system initiation.

The LPCS pump and injection valve have manual override controls that permit the operator to manually control the system subsequent to automatic initiation.

Testability

Refer to Section 7.3.2.1.3, Conformance to Regulatory Guide 1.22.

7.3.1.1.1.4 RHR Low Pressure Coolant Injection Mode - Instrumentation and Controls

System Function

The LPCI is an operating mode of the RHR system. The purpose of the LPCI mode is to provide low pressure reactor vessel coolant makeup following a LOCA when the vessel has been depressurized and vessel water level is not maintained by the HPCS.

System Operation

Schematic arrangements of system mechanical equipment are shown on Figure 5.4-13. LPCI component control logic is shown on Figure 7.3-6. Instrument specifications are listed in Table 7.3-4 and Chapter 16. Elementary diagrams are identified in Section 1.7. Operator information displays are shown on Figures 5.4-13 and 7.3-6.

The LPCI system is initiated automatically by reactor vessel low water level and/or by high drywell pressure. The system is designed to operate automatically for at least 10 min without any action required by the control room operator. Once initiated the LPCI logic seals in and can be reset by the control room operator when initial conditions return to normal. Refer to Figures 5.4-13 and 7.3-6 for a schematic representation of the LPCI A and the LPCI B/C initiation logic, respectively.

Reactor vessel water level (Trip Level 1) is monitored by two redundant differential pressure transmitters. To provide diversity, drywell pressure is monitored by two redundant pressure transmitters.

To initiate the Division II LPCI (Loops B and C), the vessel level transmitter contacts and the two drywell pressure transmitter contacts are connected in a one-out-of-two twice arrangement so that no single instrument failure can prevent initiation of LPCI.

The Division I LPCI (Loop A) receives its initiation signal from the LPCS logic. The LPCI system components respond to an automatic initiation signal simultaneously (or sequentially as noted) as follows (the Loop A components are controlled from the Division I logic; the Loop B and C components are controlled from the Division II logic):

1. The Division I and II diesel generators are signaled to start.

2. If offsite power is available at the pump motor buses, the LPCI pumps A and B start after a 5 sec time delay; LPCI pump C and the LPCS pump start after a 10 sec time delay. If offsite power is not available and diesel generators are providing power to the pump motor buses, sequential loading of the diesel generators is required. This is accomplished by starting LPCI pumps A and B after a 1 sec time delay; LPCI pump C and the LPCS pump start after a 6 sec time delay.

3. Differential pressure transmitters monitor the pressure difference between the low pressure side of each LPCI injection valve MO F042A (MOV24A), F042B (MOV24B), F042C (MOV24C) and reactor pressure. When the differential is low enough and power is available at the associated pump motor bus, the injection valve is signaled to open.

4. The following normally closed valves are signaled closed to ensure proper system lineup:

   a. RHR heat exchanger discharge to RCIC valves MO F026A (MOV32A), F026B (MOV32B) and AO F065A (LV17A), F065B (LV17B).

   b. RHR heat exchanger flush to suppression pool valves MO F011A (MOV37A), F011B (MOV37B).

   c. RHR heat exchanger steam pressure reducing valves AO F051A (PV21A), F051B (PV21B).

   d. RHR heat exchagner steam inlet isolation valves MO F052A (MOV22A), F052B (MOV22B) and F087A (MOV23A), F087B (MOV23B).

   e. Test return line to the suppression pool valves MO F024A (FV38A), F024B (FV38B) and F021 (FV38C).

f. Containment spray to suppression pool valves MO F027A (MOV33A), F027B (MOV33B).

g. Steam condensing mode drain line valves F106A, B (SOV70A, B) and F107A, B (SOV71A, B).

h. RHR sample valves F060A, B (SOV36A, B) and F075A, B (SOV35A, B).

nals whenever the primary system pressure exceeds subsystem design pressure will close MOVs F053 (one-out-of-two logic), isolating the line. Valve position indication for these valves is provided in the control room.

In the RHR head spray line, testable check valves E51-F065 and E51-F066 are in series with MOV E12-F023. Two low pressure permissive signals (two-out-of-two logic) are required for MOV F023 to open. Removal of either signal will close the valve (one-out-of-two logic). Valve position indication for all three valves is provided in the control room.

Because LPCI injection valves E12-F042A, B, and C are part of the emergency core coolant system (ECCS), only a LOCA signal and low differential pressure permissive signal are provided to open valves F042 as is required. Testable check valves E12-F041A, B, and C are downstream of valves F042.

LPCS injection valve E21-F005 is part of the ECCS and includes only a LOCA signal and a low differential pressure permissive signal to open as is required. Testable check valve E21-F006 is downstream of valve F005.

In the RHR steam condensing mode lines, valves E12-F052A and B are in series with valves E12-F087A and B and E12-F051A and B. A LOCA signal will prevent all three valves in each line from opening and will close all three if they were open. Valves F087 have a high pressure interlock that will not allow valves F087 to open and will also close valves F087 on high steam line pressure. Valves F051 are electropneumatic converter-controlled air-operated throttle valves. These valves will begin to close at a set heat exchanger shell pressure. The valves will be completely closed before the line's design pressure is exceeded. Operating power to valves F051 are supplied from an essential power source.

IEEE 279 is applied at the system level to the protection system containing high pressure/low pressure interlocks.

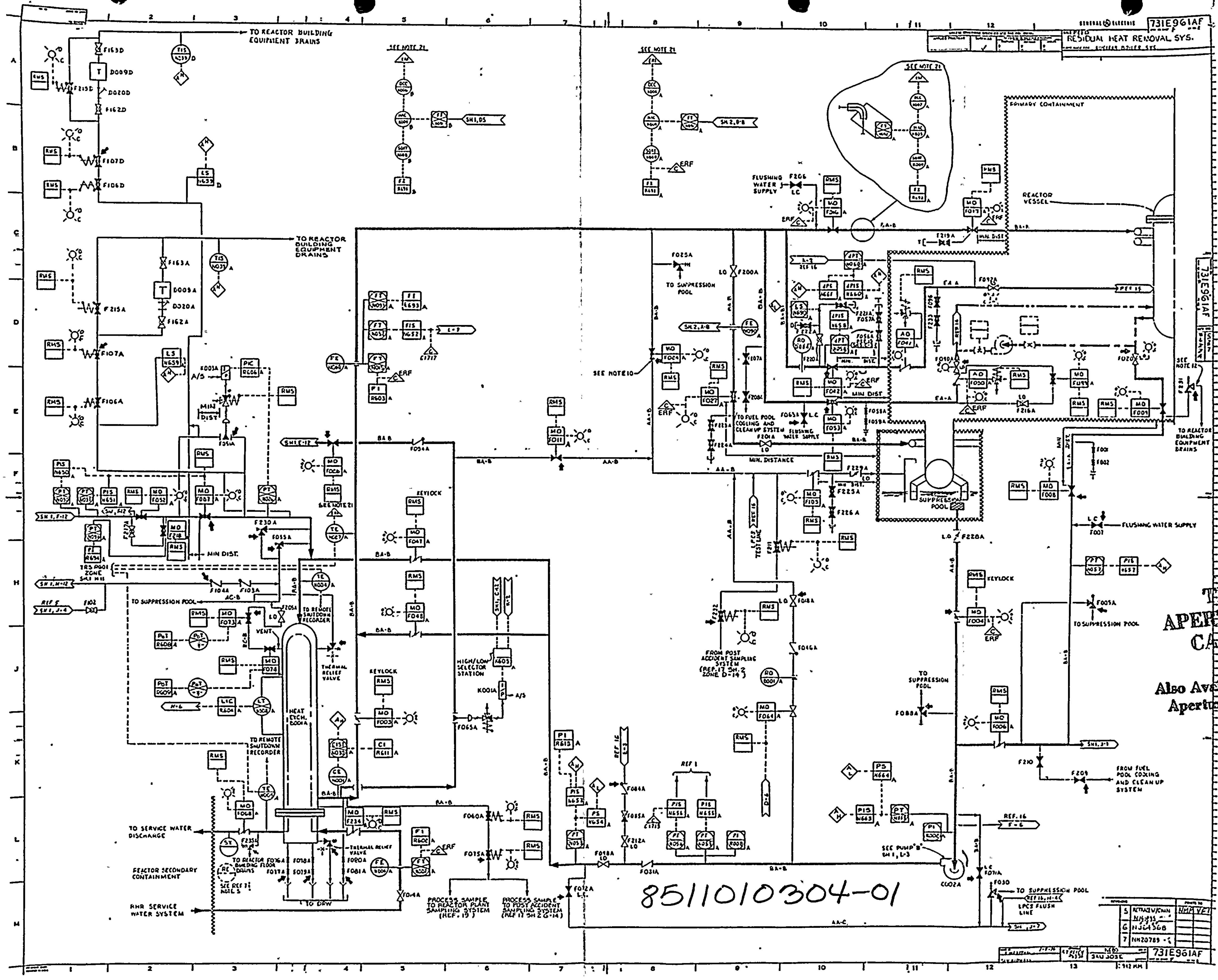
7.6.1.3 Leak Detection System - Instrumentation and Controls

The safety-related portions of the LDS are as follows:

1. Main steam line leak detection (7.3.1, 7.2.1.2.2).

2. RCIC system leak detection.

3. RHR system leak detection (7.3.1).



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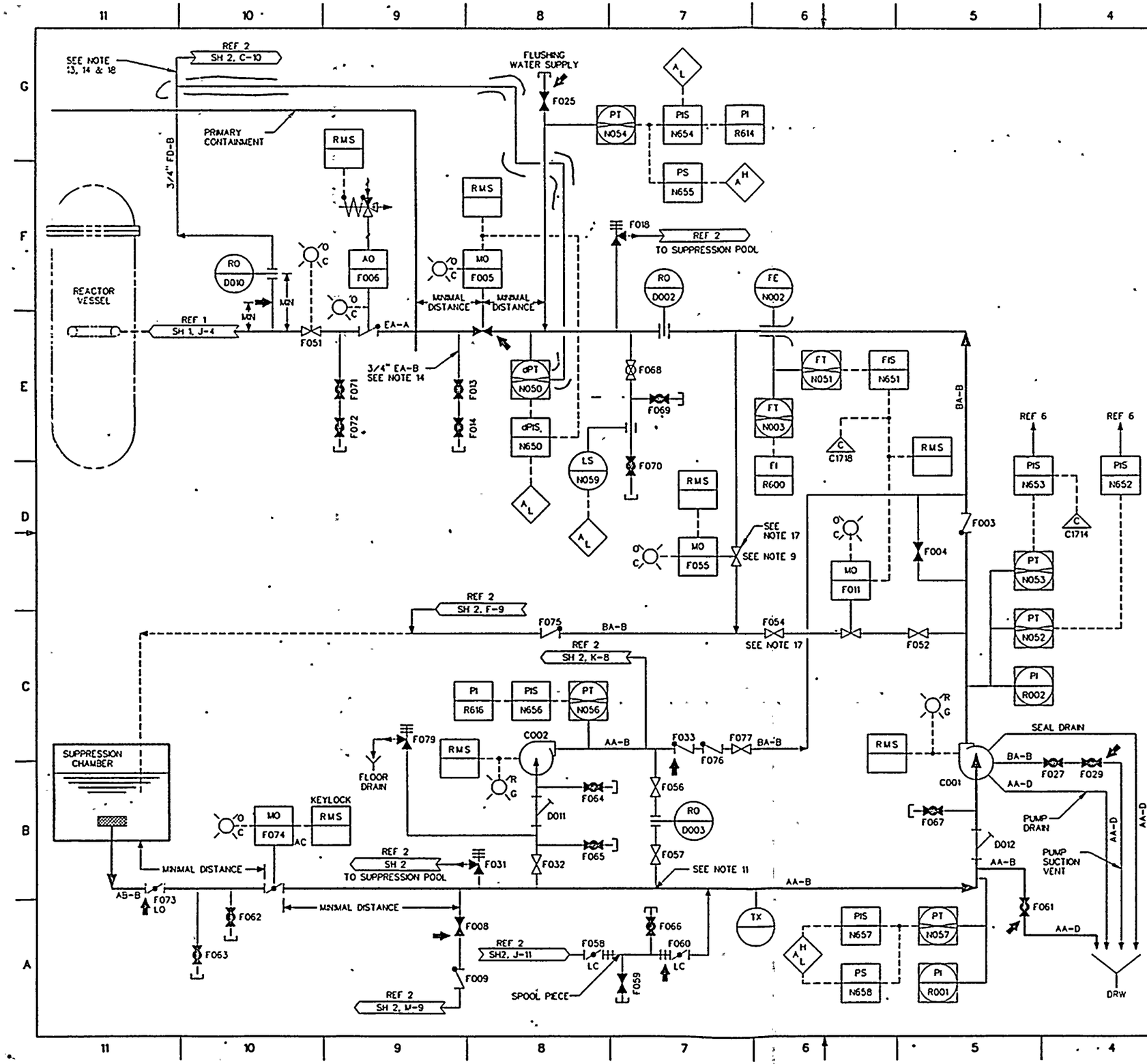

NOTES:

1. PIPING HIGH POINT VENTS AND LOW POINT DRAINS ARE TO BE ADDED AS NECESSARY.
2. CHEMICAL CLEANING CONNECTIONS, VALVES, ETC., IF REQUIRED, ARE TO BE PROVIDED AS NECESSARY.
3. INSTRUMENT LINE DESIGN AND VALVING SHALL BE IN ACCORDANCE WITH INSTRUMENT PIPING SPECIFICATION, SEE REF 4.
4. THE METHOD OF MOUNTING LOCAL INSTRUMENTS IS TO BE DETERMINED BY THE PIPING DESIGNER.
5. DELETED
6. VENT DRAIN AND RELIEF VALVE DISCHARGE SYSTEM TO CRW AND DRW OR SUPPRESSION POOL ARE BY THE PIPING DESIGNER.
7. FOR LOCATION AND IDENTIFICATION OF INSTRUMENTS SEE REF 10.
8. FLUSHING CONNECTIONS SHALL BE PROVIDED IN ACCORDANCE WITH REF 11. TEMPORARY STRAINER SCREENS SHALL BE PROVIDED ON THE SUCTION SIDE OF ALL PUMPS IN ACCORDANCE WITH REF 11.
9. THE PACKING GLAND OF VALVE F055 SHALL BE LOCATED ON THE UPSTREAM SIDE OF VALVE DISC.
10. DELETED
11. ALLOW ADEQUATE PIPING SURFACE AREA FOR COOLING OF PUMP C002.
12. FOR ADDITIONAL CONTROL ROOM LIGHTS, SYSTEM ALARMS, AND REMOTE MANUAL SWITCHES, SEE REF 3.
13. PROVISIONS FOR CONTAINMENT ISOLATION SHALL BE IN ACCORDANCE WITH CURRENT LICENSING REQUIREMENTS.
14. THIS LINE MAY BE CLASS "B" IF IT IS 3/4 INCH OR LESS IN DIAMETER, IF LARGER THAN 3/4 INCH THE LINE SHALL BE CLASS "A".
15. EXCEPT AT POINTS OF CONNECTION WITH NEBO SUPPLIED EQUIPMENT OR PIPING, THE PIPING DESIGNER SHALL SIZE PIPES IN CONFORMANCE WITH THE SYSTEM DESIGN SPECIFICATION AND PROCESS DIAGRAM.
16. ALL EQUIPMENT AND INSTRUMENTS ARE PREFIXED BY SYSTEM NUMBER (E21) UNLESS OTHERWISE NOTED.
17. ANTI CAVITATION VALVE.
18. INSTRUMENT PIPING IS SA312, TP316L.

LEGEND.
EECWS - EMERGENCY EQUIPMENT COOLING WATER SYSTEM

NOTE:
SYSTEM SELECTION OPTIONS ARE INDICATED BY MULTIPLE MPL ITEM NUMBERS:

REFERENCE DOCUMENTS:	MPL ITEM NO.
1. NUCLEAR BOILER P&ID	B21/B22-1010
2. RHR SYSTEM P&ID	E12-1010
3. LPCS SYSTEM FCD	E21-1030
4. PROCESS INSTRUMENT PIPING AND TUBING INSTALLATION SPECIFICATION	A62-4070
5. DELETED	
6. NUCLEAR BOILER SYSTEM FCD	B21/B22-1030
7. LPCS SYSTEM PROCESS DIAGRAM	E21-1020
8. LPCS SYSTEM DESIGN SPECIFICATION	E21-4010
9. DELETED	
10. LPCS SYSTEM EDDL	E21-3050
11. CLEANING OF PIPING AND EQUIPMENT	A62-4140

SUPPORTING DOCUMENTS:	MPL ITEM NO.
1. PIPING AND INSTRUMENT SYMBOLS	A42-1010
2. PRESSURE INTEGRITY OF PIPING AND EQUIPMENT PRESSURE PARTS	A62-4030

EQUIPMENT CLASS CODE ____ MPL E21-1010

	SAFETY RELATED: THIS ITEM IS OR CONTAINS A SAFETY RELATED ITEM ☐ YES ☐ NO	IEEE CLASS 1E NUCLEAR SAFETY RELATED ☐ YES ☐ NO

SIGNATURES	DAY	MO	YR
DRAWN K.WESTPHAL	9	1	176
CHECKED J.V. GARCIA	25	2	176
APPD J.V.KOWELL	4	3	176
ISSUED R.W.HOWARD	25	2	176

APPLIED PRACTICES ____ SURF
UNLESS OTHERWISE SPECIFIED
TOLERANCES ON -
2 PLACE DECIMALS ± FRACTIONS ±
3 PLACE DECIMALS ± ANGLES ±

GENERAL ELECTRIC
NEBO ___ DEPT ___ LOC SAN JOSE
P&ID
LOW PRESSURE CORE SPRAY SYS
FOR NUCLEAR BOILER SYS 238X173AF
SCALE NONE DATE 3-4-76 DWG NO 921D868AF SHT NO 5
FORM AVA214 SIZE C CODE IDENT 1 CAGE CODE F

921D868AF REVISIONS
5 15 SEP 1976 P.C. FEW
CHANGE PER N-64448 AND RATEDAY IT CHANGE ADD CONTROL TRANSFER AND SWITCHING PANEL 0 DELETE NOTE 19 ADD NOTE 18 CHK BY: J.V. GARCIA RT PECH

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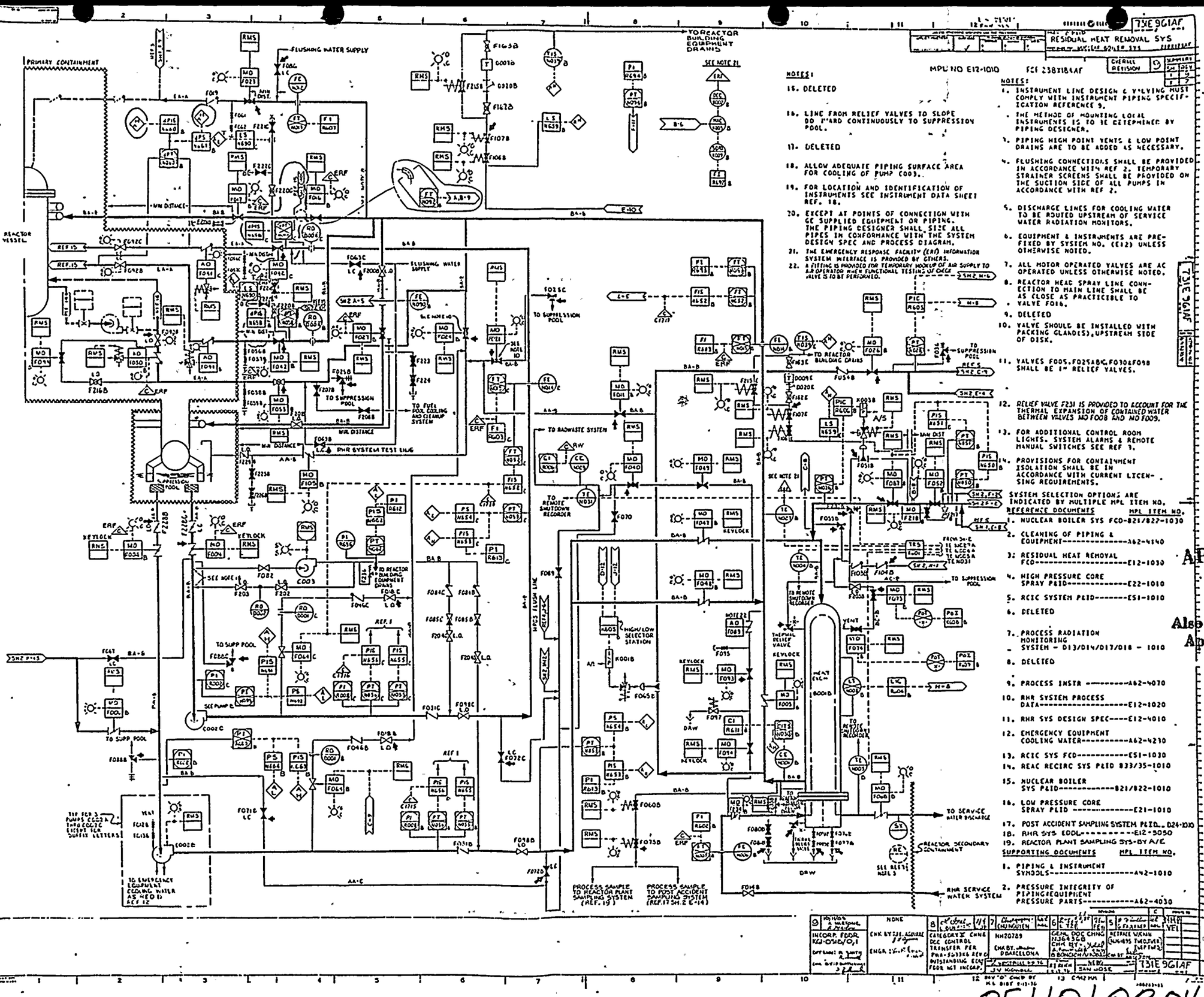

MPL NO E12-1010 FCD 238X184AF

RESIDUAL HEAT REMOVAL SYS

NOTES:

15. DELETED

16. LINE FROM RELIEF VALVES TO SLOPE DD I"ARD CONTINUOUSLY TO SUPPRESSION POOL.

17. DELETED

18. ALLOW ADEQUATE PIPING SURFACE AREA FOR COOLING OF PUMP COOL.

19. FOR LOCATION AND IDENTIFICATION OF INSTRUMENTS SEE INSTRUMENT DATA SHEET REF. 18.

20. EXCEPT AT POINTS OF CONNECTION WITH GE SUPPLIED EQUIPMENT OR PIPING. THE PIPING DESIGNER SHALL SIZE ALL PIPES IN CONFORMANCE WITH THE SYSTEM DESIGN SPEC AND PROCESS DIAGRAM.

21. THE EMERGENCY RESPONSE FACILITY (ERF) INFORMATION SYSTEM INTERFACE IS PROVIDED BY OTHERS.

22. A FITTING IS PROVIDED FOR TEMPORARY HOOKUP OF AIR SUPPLY TO AIR OPERATOR WHEN FUNCTIONAL TESTING OF CHECK VALVE IS TO BE PERFORMED.

NOTES:

1. INSTRUMENT LINE DESIGN & VALVING MUST COMPLY WITH INSTRUMENT PIPING SPECIFICATION REFERENCE 9.
   . THE METHOD OF MOUNTING LOCAL INSTRUMENTS IS TO BE DETERMINED BY PIPING DESIGNER.
3. PIPING HIGH POINT VENTS & LOW POINT DRAINS ARE TO BE ADDED AS NECESSARY.
4. FLUSHING CONNECTIONS SHALL BE PROVIDED IN ACCORDANCE WITH REF 2. TEMPORARY STRAINER SCREENS SHALL BE PROVIDED ON THE SUCTION SIDE OF ALL PUMPS IN ACCORDANCE WITH REF 2.
5. DISCHARGE LINES FOR COOLING WATER TO BE ROUTED UPSTREAM OF SERVICE WATER RADIATION MONITORS.
6. EQUIPMENT & INSTRUMENTS ARE PREFIXED BY SYSTEM NO. (E12) UNLESS OTHERWISE NOTED.
7. ALL MOTOR OPERATED VALVES ARE AC OPERATED UNLESS OTHERWISE NOTED.
8. REACTOR HEAD SPRAY LINE CONNECTION TO MAIN LINE SHALL BE AS CLOSE AS PRACTICABLE TO VALVE F016.
9. DELETED
10. VALVE SHOULD BE INSTALLED WITH PACKING GLAND(S), UPSTREAM SIDE OF DISK.
11. VALVES F005, F025A&C, F030 & F098 SHALL BE 1" RELIEF VALVES.
12. RELIEF VALVE F231 IS PROVIDED TO ACCOUNT FOR THE THERMAL EXPANSION OF CONTAINED WATER BETWEEN VALVES MO F008 AND MO F009.
13. FOR ADDITIONAL CONTROL ROOM LIGHTS, SYSTEM ALARMS & REMOTE MANUAL SWITCHES SEE REF 1.
14. PROVISIONS FOR CONTAINMENT ISOLATION SHALL BE IN ACCORDANCE WITH CURRENT LICENSING REQUIREMENTS.

SYSTEM SELECTION OPTIONS ARE INDICATED BY MULTIPLE MPL ITEM NO.

REFERENCE DOCUMENTS — MPL ITEM NO.

1. NUCLEAR BOILER SYS FCD-821/822-1030
2. CLEANING OF PIPING & EQUIPMENT----------A62-4140
3. RESIDUAL HEAT REMOVAL FCD----------E12-1030
4. HIGH PRESSURE CORE SPRAY P&ID----------E22-1010
5. RCIC SYSTEM P&ID--------ES1-1010
6. DELETED
7. PROCESS RADIATION MONITORING SYSTEM - D13/D14/D17/D18 - 1010
8. DELETED
9. PROCESS INSTR ----------A62-4070
10. RHR SYSTEM PROCESS DATA----------E12-1020
11. RHR SYS DESIGN SPEC-----E12-4010
12. EMERGENCY EQUIPMENT COOLING WATER----------A62-4230
13. RCIC SYS FCD----------ES1-1030
14. REAC RECIRC SYS P&ID 833/35-1010
15. NUCLEAR BOILER SYS P&ID----------821/822-1010
16. LOW PRESSURE CORE SPRAY P&ID ----------E21-1010
17. POST ACCIDENT SAMPLING SYSTEM P&ID - D24-1010
18. RHR SYS EDDL----------E12-5050
19. REACTOR PLANT SAMPLING SYS-BY A/E

SUPPORTING DOCUMENTS — MPL ITEM NO.

1. PIPING & INSTRUMENT SYMBOLS----------A42-1010
2. PRESSURE INTEGRITY OF PIPING EQUIPMENT PRESSURE PARTS----------A62-4030

OVERALL REVISION 9

SYMBOL	ZONE	REVISION
8		
9		

INCORP. FCDR KG-0516/0,1

NONE

CHK BY/DES. ACHIEVE

ENGR.

CATEGORY X CHNG DOC CONTROL TRANSFER PER PWR-GS-1166 REV 0 OUTSTANDING ECN FOR NOT INCORP.

NH20789

CHK BY D BARCELONA

GEN. DOC CHNG 22643-GB

CHK BY D BONGIOVANNI

REPLACE V/RMN (NUREG-1195 THROUGH SUPPS.)

J V KENDALL — NEBR — SAN JOSE

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