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SCALING RULES

SIZE E

RESIDUAL HEAT REMOVAL LEAK DETECTION SYSTEM

LOCAL COMPARTMENTS — TE 2082 A/B — TS 2082 A/B — (A,7) TO TSS 2745 MAIN STEAM TUNNEL LEAK DETECTION SYSTEM PANEL — (A,6) M-127

AIR INLET — TE 2083 A/B — TDS 2085 B

VENT OUTLET — TE 2084 A/B

FROM M-119 (G-6)

IC-03 H A L — IC-129A FS 2040 B — IC-129A PS 2049 B

F C-8504 — PDIS 1971A — (B,4)

1" C.S. — PSV 2057 — FC 1½"-JBD — ORW

18"-GBB-4 — 20"-GBB-4

(F,2) M-119 RHR SYSTEM — TO FR-1971

IC-03 FI 1971A — IC-19 FY 1971A — IC-19 FT 1971A — FE 1971A — FI 1974A LOCAL

¾"-JBD — ORW — CS — V-20-55 — ¾"-GBB-16 — 4"-GBB-16 — V-20-54 — IC-18

RHR INITIATION SIGNAL — IC-03 HS 2038 — MO 2038

FROM PIC 1969 M-119 (F,2) — KY 2037 — LOW SIG. SELECT — IC-03 E/P 2037 — A/S — IND — TE 1965

LPCI INITIATION SIGNAL (NOTE 1) — IC-04 HS 2036 — MO 2036 — 4"-HBB-21 — M-119 (E-2) — TO RCIC SYSTEM VIA RHR SHT 1

TO TRS-1945 M-119 RHR SYSTEM P & I.D. SHT. 1

S — SV 2037 — CV 2037 — FC — 4"-GBB-16 — V-20-5 — CS

LPCI INITIATION SIGNAL (NOTE 1) — IC-04 HS 2035 — IC-04 PIC 2032 — IC-9 E/S 2032 — IC-129A PT 2032 — 12"-GBB-9

FROM HPCI SYSTEM M-119 (D-2) — 6"-EBB-16 — A/S — E/P 2034 — SV 2034 — CV 2034 — FC — ACCUMULATOR — IC-03 PS 2050 — SX 2054 — V-20-80 — CS — ¾"-JBD — 10" — N 219 — TO SUPPRESSION POOL

IC-03 SV 2052 — IC-03 HS 2052 — IC-03 HS 2051 — IC-03 SV 2051 — 1"-GBB-25 — S — S — IC-03 PS 2051 — V-20-73 — 6"-HBB-30

KEYLOCK OVERRIDE — IC-03 HS 2050 — KEYLOCK OVERRIDE — IC-03 HS 2057 A

RHR SAMPLE M-167 (B,6) — TO RCIC SYSTEM M-124 (A,4)

RHR ISOLATION SIGNAL (NOTE 2) — 1A

A/S — E/P 2033 — SV 2033 — CV 2033 — ACCUMULATOR

TE 1965 — TS-6881 — ¾"-JBD — V-20-76 — V-20-75 — CS — ORW — PSV 2042 — THERMAL RELIEF VALVE — 4"-GBB-9

TE 2055 — CIS 2055 — PSV 2045 — 4"-GBB-7 — 12"-GBB-7 — 12"-GBB-9

IC-03 FT 2044 A — VENT — V-20-77 — ¾"-JBD — V-20-78 — ORW — IC-03 HS 2044 A — MO 2044 A — IC-03 HS 2044 B — MO 2044 B — IC-03 FT 2044 B — IC-03 LT 2044 A — IC-03 LT 2044 B — IC-03 PDS 2045 — IC-129A PDT 2045 — PD C-8500 — IC-03 PDI 2045 — (C,5) M-113 — MO 2046 NOT FULLY CLOSED — IC-129A X 2046 — TO ZM 2046

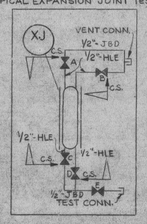
IC-03 LIC 2041 — IC-04 LT 2041 — E/S 2041 — RHR HEAT EXCHANGER 1E-201 A — 16" — 1½"-GBB-9 — V-20-31 — V-20-32 — C.S. — 1½"-HBC-114 — C.R.W.

FROM RHR SERVICE WATER SYSTEM — M-113 (C,6) — M-113 (C,7)

TABLE A. EXPANSION JOINT TEST VALVES

EXPANSION JOINT	VALVE NO. A	VALVE NO. B	VALVE NO. C	VALVE NO. D	VALVE NO. E
XJ-2002	V-20-64	V-20-65	V-20-66	V-20-67	V-20-68

DETAIL 1 (TYPICAL EXPANSION JOINT TEST CONNECTIONS)



DETAIL 1

RHR SERVICE WATER SYSTEM (E,6) — RHR SERVICE WATER SYSTEM (E,5)

SHROUD WATER LEVEL M-115 (E,2 E,7) — (F,5)

LPCI INITIATION SIGNAL (NOTE 1.)

DRYWELL PRESSURE M-143 (E,7)

(F,6) M-119 — KEYLOCK OVERRIDE — IC-03 HS 2001 — KEYLOCK — IC-03 HS 2000 — (D,7 E,8) DRYWELL HVAC SHUTDOWN

AIR TEST CONNECTION — ¾"-JBD — V-20-56 — V-20-33 — ¾"-GLE-1 — 10"-GLE-7 — 10" — ORW — V-20-34 — V-20-35 — ¾"-GLE-1 — MO 2001 — MO 2000 — IC-03 — 10"-HLE-17 — 2"-HLE-17 — CAD SYSTEM (C,2) M-143

LPCI INITIATION SIGNAL (NOTE 1.)

REACTOR VESSEL IR-200

LOCAL HS 2005 A KEYLOCK — IC-03 HS 2005 KEYLOCK — MO 2005 — 12"-GBB-4 — 20"-GBB-4 — CONDENSATE SERVICE SYSTEM (FILL SYSTEM) M-136 (B,5) — V-20-17 — GBE — V-20-18 — 2"-GBB-4

(H,2) — LPCI INITIATION SIGNAL (NOTE 1.) — IC-03 HS 2006 — MO 2006 — 12"-GLE-6 — IC-03 HS 2007 — MO 2007 — 12"-HLE-14 — 4"-HLE-13 — M-119 RHR SYSTEM — (E-4) M-119 RHR SYSTEM — 4"-HLE-14

RHR ISOLATION SIGNAL (NOTE 2) — MANUAL RESET — IC-03 HS 2003 B — IC-03 HS 2003 — (E,8) M-119 — IC-03 HS 2004 — MO 2004 — V-20-37 — ¾"-JBD — ORW — MO 2003 — V-20-36 — ¾"-DBB-1 — 2"-DBB-1 — V-20-38 — ¾"-DLA-3 — CS — V-20-39 — ¾"-JBD — TEST VALVE LEAKAGE

REACTOR VESSEL PRESSURE M-116 (E,6) — 20"-DLA-5 DETAIL 1

IC-03 HS 2002 B — ¾"-JBD — ND — S — SV 2002 — V-20-74 — CV 2002 — ZS 2002 B — ZS 2002 A — 20"-DLA-5 — 20"-DCA-2 — REACTOR RECIRC. SYSTEM M-116 (E,3) — REACTOR RECIRCULATION PUMP 1P-201A

XJ 2002 — V-20-61 — V-20-62 — ¾"-JBD — V-20-63 — ¾"-DBA — DRAIN TEST — CAD SYSTEM M-143 (B-2) — 2"-HLE-11 — 4"-HLE-11 — INSIDE OF DRYWELL

RHR TEST LINE — 12"-HLE-14 — 2"-HLE-16 — CORE SPRAY TEST (D-4) M-121 — 2"CONN. (CAPPED) — 3"-HLE-14 — 2"CONN. (CAPPED) — FROM CORE SPRAY SYSTEM M-121

REACTOR VESSEL PRESSURE M-115 (D,3 D,6 G,3 G,7) — SUPPRESSION POOL — RECIRC RISER ΔP M-116 (G,3)

RHR LOOP SELECTION SIGNAL (NOTE 3) — IC-03 HS 2050 RESET — TO NG SET MOTOR BREAKER — ΔP ACROSS RECIRC PUMPS A & B M-116 (A,2 A,8)

REACTOR RECIRCULATION SYSTEM M-116 (C,3 C,7) — LOCATE AT 20"-GBB-4 — IC-03 MO 2010 — LOCAL L — IC-03 KEYLOCK HS 2010 A — IC-03 KEYLOCK HS 2010 — 2"-GBB-22 — V-20-10 — TESTABLE — TEST — M-113 (G-3) FROM RHR SERVICE WATER SYSTEM — 1¼"CONN. (CAPPED) — MO 2029 — 12"-GBB-7

KEYLOCK HS 2064 — MO 2061 — RHR SYSTEM M-119 (G,4) — REACTOR VESSEL PRESSURE M-115 (E,2 F,7)

18"-GBB-5 — CROSS TIE — 18"-GBB-5 — (D-8) M-119 — TO RHR SYSTEM P & I.D. SHEET 1.

1"-GBB-5 — V-20-42 — V-20-41 — ¾"-CBA — ORW — 2"-GBB-5 — V-20-43 — V-20-44 — C.S. — WALL PENETRATION R-32 — XJ 2069 — 18"-HBB-24

PSV 2019 — PSV 2020 — 18"-HBB-24 — 1"-JBD — ORW — IC-03 HS 2011 — MO 2011 — IC-03 HS 2012 — MO 2012 — IC-03 HS 2015 — MO 2015 — IC-03 HS 2016 — MO 2016 — 14"-HBB-24 — ¾" CAP — 1"-HBB-24

CONDENSATE SERVICE SYSTEM (FLUSH SUPPLY) M-136 (B,5) — 3"-HLE-13 — 2"-HLE-15 — 3"-GBB-16 — ¾"-JBD — V-20-53 — V-20-52 — 3"-GBB-16 — IC-03 KY 2009 — MO 2009 — HS 2009 — 10 SEC. DELAY — INTERLOCK: RHR PUMPS A&C (A,2 A,4)

RHR SYS. M-119 (F,8) — INTERLOCK MO 2015 MO 2016, 1908 & 1909 (C,2) — IC-129A PI 2013 — PP 2071 A — FO 2027 — FO 2028 — V-20-9 — INTERLOCK MO 2012 MO 2011, 1909 & 1908 (C,1) M-119 (F,8) — LPCI INITIATION SIGNAL (NOTE 1.) — IC-129A PI 2017 — PP 2070 B — IC-129A PI 2018 — PP 2070 A — (F,7) — PP 2071 B — 12"-GBB-4

4"-HBB-24 — (D,2) M-121 — (F4 B,4 F6 B,6) M-114 AUTO DEPRESSURIZATION — V-20-7 — V-20-6 — M-121 (C,2) — V-20-11 — 2"CONN. (PLUGGED) — ¾"-JBD — ORW — V-20-48 — ¾"-CBA — IC-129A PS 2023 B — IC-129A PS 2023 A — PI 2023 — 12"-GBB-4 — V-20-3 — V-20-12 — 4"-GBB-17 — 1"-JBB-4 — V-20-50 — 4"-GBB-4 — C.S. — ¾"-JBD — ORW — V-20-51

AUTO DEPRESSURIZATION SYS. M-114 (F4 B,4 F6 B,6) — M-121 (C,2) — IC-129A PS 2024 A — IC-129A PS 2024 B — PI 2024 — VENT ¾"-JBD — V-20-14 — V-20-13 — V-20-8 — V-20-19 — 14"-HBB-24 — 10" — 12"-GBB-4 — V-20-1 — 4"-GBB-4 — V-20-2 — V-20-16 — 4"-GBB-17 — V-20-15 — IC-03 HS 2014 — MANUAL OVERRIDE — IC-03 HS 2018 — MANUAL OVERRIDE — IC-03 MOTOR OVERLOAD

R.H.R. SYSTEM PUMP 1P-229A — BREAKER SPRING CHARGED — K-03 (C,4) — IC-03 TRIP — M-113 EMER. EQUIP. SERV. WTR. (G,3) — DRAIN — ¾"-HBD — ORW — SEAL DRAIN — 2"-GBB-18 — (A,3) M-121 — FROM CORE SPRAY SYSTEM

R.H.R. SYSTEM PUMP 1P-229C — BREAKER SPRING CHARGED — K-03 (C,4) — IC-03 TRIP — M-113 EMER. EQUIP. SERV. WTR. (G,3) — DRAIN — ¾"-HBD — ORW — SEAL DRAIN — 1"-GBB-4 — V-20-23 — DRAIN — ¾"-JBD — ORW — SEAL DRAIN — TO RHR SYSTEM P&ID SHEET 1.

RHR SYSTEM M-119 (G,4) — REACTOR VESSEL PRESSURE M-115 (E,2 F,7)

TE 2074 A/B — IP-229A — T A — WD78 WD79

TE 2075 A/B — IP-229C — T A — WD82 WD83

RHR SYSTEM PUMPS BEARING THERMOCOUPLES

NOTES:

1. LPCI INITIATION SIGNAL - DRYWELL HIGH PRESSURE FROM PS 4310B, 4311B, 4312B, 4313B, M-143 (E,7) AND/OR REACTOR LOW WATER LEVEL FROM LIS 4531, 4532, 4533, 4534, M-115 (F,2 F,7). SIGNAL MAY BE RESET WITH PUSHBUTTON HS 2061 LOCATED ON PANEL 1C-03
2. RHR LOOP SELECTION SIGNAL - DRYWELL HIGH PRESSURE FROM PS 4315A,B,C,D, M-143 (E,7) AND/OR REACTOR LOW WATER LEVEL FROM LIS 4535, 4536, 4537, 4538, M-115 (G,2 G,7)
3. RHR SELECTION SIGNAL - RECEIVED FROM SAME SENSING DEVICES THAT SEND LPCI INITIATION SIGNALS (NOTE 1) HOWEVER REACTOR LOW WATER LEVEL SET POINTS ARE DIFFERENT
4. FOR RHR SYSTEM LOGIC, SEE G.E. RHR FUNCTIONAL CONTROL DIAGRAM 729E630CA

TI APERTURE CARD

No.	DATE	REVISIONS	BY	CHKD	DESIGN SUPV	ENGR	PROJ ENGR	APPD
4	3/4/81	REVISED PER PDC 625	LWH	JE	TM	GA	RWM	
3	11/4/79	REVISED PER DCC-385	LWH	JE			RWM	
2	5/25/79	REVISED PER DDC-38	RM	MH			RWM	
1	9/5/78	DELETED S.U.'S - 2070 & 2071 PER DCR #176; CO-ORD: (C-2) X(B-3)	RM	CWH	JC		RWM	
10	5/10/78	REVISED AS SHOWN ON REVISION SHEET.	MH	RLG	GS		RWM	
9	3/14/78	REVISED AS NOTED ON REV. SHEET. LAST VALVE NO IS V-20-79.	RM	RLG	GS		RWM	
8	3/1/78	REVISED AS NOTED ON REV. SHEET. LAST VALVE NO ON SYSTEM IS NOW V-20-72.	FL	MH	GS		RWM	
7	5/23/77	REVISED AS NOTED ON REV. SHEET. LAST VALVE NO ON SYSTEM IS NOW V-20-72	FL	MH	GS		RWM	
6	11/1/76	FINAL DESIGN REVIEW AND REVISED AS NOTED ON REVISION SHEET. ADDED VALVE NOS. ON SYSTEM. UP TO V-20-68	RM	RLG	GS		RWM	
5	9/13/76	ADDED VALVE NOS. ON SYSTEM UP TO V-20-54. REVISED AS NOTED ON REVISION SHEET	RM	RLG	GS		RWM	
4	10/6/75	REVISED AS INDICATED ON REV. SHEET. ISSUED FOR CONSTRUCTION	MH	SR	GS		RWM	
3	7/22/75	REVISED AS NOTED ON REV. SHEET AND RE-ISSUED FOR PIPE SIZE & FABRICATION	MH	SR	GS		RWM	
2	6/21/71	REVISED AS SHOWN ON REV. SHEET. REISSUED FOR PIPE SIZE & FABRICATION	MH	SR	GS		RWM	
1	12/5/72	REVISED AS SHOWN ON REVISION SHEET.	CS	SR	GS		RWM	
A	10/6/72	ISSUED FOR PIPE SIZES AND FABRICATION	MH	SR	GS		RWM	
A	7/31/70	ISSUED FOR APPROVAL	MH	SR	GS		RWM	
A	1/6/69	REV PER DCR 932A	JC			RS		
A	7/22/68	REV PER DCC-1029	JW					
A	9/13/68	REVISED PER DCR 1178	JC					

SCALE NONE — DESIGNED — DRAWN E. SZABO 6/1 — CHIEF ENGR

BECHTEL SAN FRANCISCO

DUANE ARNOLD ENERGY CENTER — UNIT No 1

IOWA ELECTRIC LIGHT AND POWER COMPANY

CEDAR RAPIDS, IOWA

P. & I. D.

RESIDUAL HEAT REMOVAL SYSTEM SHEET 2.

JOB No. 7884 — DRAWING No. M-120 — REV. 17

Docket # 50-331
Control # 640 81040135
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