REGULATORY INFORMATION DISTRIBUTION SYSTEM (RIDS)

ACCESSION NBR:8507050306 DOC.DATE: 85/07/01 NOTARIZED: NO DOCKET #
FACIL:50-331 Duane Arnold Energy Center, Iowa Electric Light & Pow 05000331
AUTH.NAME AUTHOR AFFILIATION
MCGAUGHY,R.W. Iowa Electric Light & Power Co.
RECIP.NAME RECIPIENT AFFILIATION
DENTON,H. Office of Nuclear Reactor Regulation, Director

SUBJECT: Forwards requests for relief from requirements of ASME Code Section XI,1974 Edition-1975 Summer Addenda due to impracticality of performing functions during inservice insp sys hydrostatic pressure tests.P&IDs also encl.Fee paid.

DISTRIBUTION CODE: A047D COPIES RECEIVED:LTR 1 ENCL 4 SIZE: 45
TITLE: OR Submittal: Inservice Inspection/Testing

NOTES: 05000331
OL:02/22/74

	RECIPIENT ID CODE/NAME		COPIES LTTR	COPIES ENCL	RECIPIENT ID CODE/NAME		COPIES LTTR	COPIES ENCL
	NRR ORB2 BC	01	7	7				
INTERNAL:	ACRS	16	10	10	ADM/LFMB		1	0
	ELD/HDS2		1	0	NRR/DE/MEB	15	1	1
	NRR/DE/MTEB	14	1	1	NRR/DL/TAPMG		1	1
	REG FILE	04	1	1	RGN3		1	1
EXTERNAL:	24X		1	1	LPDR	03	1	1
	NRC PDR	02	1	1	NSIC	05	1	1

w/check $150.00
#068279
Aperture Card Dist
Drawings To: Reg File-1
M. Thadani-3

TOTAL NUMBER OF COPIES REQUIRED: LTTR 28 ENCL ~~26~~ 27

M/A 4

Iowa Electric Light and Power Company
July 1, 1985
NG-85-2258

Mr. Harold Denton, Director
Office of Nuclear Reactor Regulation
U.S. Nuclear Regulatory Commission
Washington, DC 20555

Subject: Duane Arnold Energy Center
Docket No: 50-331
Op. License No: DPR-49
ASME Section XI Relief Requests
Reference: Letter, R.W. McGaughy (Iowa Electric) to H.R. Denton, dated February 28, 1985 (NG-85-0820)
File: A-286

Dear Mr. Denton:

Pursuant to 10 CFR 50.55a(g)(5)(iii) and 10 CFR 50.12, Iowa Electric Light and Power Company requests relief from requirements of the ASME Boiler and Pressure Vessel Code, Section XI, 1974 Edition through the 1975 Summer Addenda.

During the performance of Duane Arnold Energy Center's (DAEC) Inservice Inspection system hydrostatic pressure tests, it was found to be impractical to perform certain Code requirements. We therefore request relief from these requirements for the various systems and components during the performance of the DAEC inservice inspection plan. The attachments to this letter provide the bases for the relief sought and describe alternate testing methodologies.

Our February 28, 1985, submittal included requests for relief numbers 8 through 12. Subsequent to this, we successfully hydrotested the Stand-by Liquid Control System (SBLC) which was listed in relief request number 9. Therefore, we have revised the previous request to delete references to the SBLC System and request that relief request number 9, Rev. 1, supersede the original.

To aid in your review of these requests for relief, four sets of Piping and Instrumentation Diagrams (P&IDs) are included for your information.

W/check #1500 #068279
Aperture Card Dist
A047 1/1
Drawings to: Reg File-1 M. Thadani-3

In accordance with the requirements of 10 CFR 170, we are enclosing the required application fee of $150.

Should you have any questions, please contact this office.

Very truly yours,

R. W. McGaughy

Richard W. McGaughy
Manager, Nuclear Division

RWM/SAR/ta*

Attachments: Relief Requests Nos. 9, Rev. 1, and 13 through 25 from ASME B&PV Code Section XI

cc: S. Reith
K. Howard
L. Liu
S. Tuthill
M. Thadani
NRC Resident Office
W. Larson (Iowa Bureau of Boiler Inspection)

IOWA ELECTRIC LIGHT AND POWER COMPANY
DUANE ARNOLD ENERGY CENTER
Docket No: 50-331
Op. License No: DPR-49

ASME SECTION XI REQUEST FOR RELIEF

RELIEF REQUEST NO. 9, REV. 1

SYSTEMS:

Control Rod Drive (CRD)
Residual Heat Removal (RHR)
Reactor Core Isolation Cooling (RCIC)
High-Pressure Coolant Injection (HPCI)
Core Spray (CS)

COMPONENTS:

CRD Pump and discharge piping to first isolation valve
RHR System Pumps and discharge piping to first isolation valve
RCIC System Pump and discharge piping to first isolation valve
HPCI System Pump and discharge piping to first isolation valve
Core Spray System Pumps and discharge piping to first isolation valve

CODE CLASS: 2

CODE TEST REQUIREMENT:

ASME Section XI 1974 through Summer 1975 addenda, paragraph IWC-5220(a) states:

> "The system hydrostatic test pressure shall be at least 1.25 times the system design pressure (Pd) and conducted at a test temperature not less than 100°F except as may be required to meet the test temperature requirements of IWA-5230."

BASIS FOR RELIEF:

The subject pumps are centrifugal pumps, thus the portions of the pump discharge lines up to the first isolation valve cannot be isolated from the pump suction. Therefore, if the discharge piping were pressurized to the full required test pressure the suction piping would be subjected to a pressure far in excess of its design with the potential for permanent damage to piping and components.

In support of this position, ASME Section XI, paragraph IWA-5224(d) (1980 Ed.) provides relief for this specific case. This paragraph states:

> "Where the respective system primary pressure ratings on the suction and discharge side of the system pumps differ, the

system test boundary shall be divided into two separate boundaries (such as suction side and discharge side test boundaries). In the case of positive displacement pumps, the boundary interface shall be considered as the pump. In the case of centrifugal pumps, the boundary interface shall be the first shutoff valve on the discharge side of the pump."

The 1980 Edition of ASME Section XI is the latest code approved by the NRC. Therefore, Iowa Electric's proposed testing provides a degree of operability that is currently prescribed by the ASME and the NRC.

ALTERNATE TESTING:

For centrifugal pumps, the test pressure for the pump discharge and associated piping extending to the first shutoff valve on the discharge side of the pump shall be the same as that required for the piping and components on the suction side of the pump. The system test boundary for the pump suction piping shall likewise extend to the first shutoff valve on the discharge side of the pump. In addition, the pump discharge piping and components will be routinely inspected for leaks during system functional testing which is done at or near normal operating pressures.

CONCLUSION:

Based upon the foregoing information, in conjunction with the alternative testing methodology, and as precedence has been established in IWA-5224(d) (1980 Edition), Iowa Electric believes the proposed relief request should be granted.

IOWA ELECTRIC LIGHT AND POWER COMPANY
DUANE ARNOLD ENERGY CENTER
Docket No: 50-331
Op. License No: DPR-49

ASME SECTION XI REQUEST FOR RELIEF

RELIEF REQUEST NO. 13

SYSTEMS: Various

COMPONENTS: Unisolable portions of the nuclear steam supply system that are classified as Class 2. Refer to P&IDs No. M-114, M-115, M-116, M-121, M-122, and M-124

CODE CLASS: 2

CODE TEST REQUIREMENT:

The system hydrostatic test pressure shall be at least 1.25 times the system design pressure for systems with design temperature above 200°F.

BASIS FOR RELIEF:

In several instances there are class breaks between Class 1 and Class 2 piping without any means for isolation between the two. Testing the Class 2 piping and components at a test pressure of 1.25 times their respective design pressures would require the pressure in the reactor vessel to exceed the maximum allowable.

ALTERNATE EXAMINATION:

Class 2 piping that cannot be isolated from the Class 1 piping to which it is connected, will be tested in conjunction with the Class 1 test.

IOWA ELECTRIC LIGHT AND POWER COMPANY
DUANE ARNOLD ENERGY CENTER
Docket No: 50-331
Op. License No: DPR-49

ASME SECTION XI REQUEST FOR RELIEF

RELIEF REQUEST NO. 14

SYSTEM: Various

COMPONENTS: Piping and components included in the system hydrostatic test boundary.

CODE CLASS: 2

CODE TEST REQUIREMENT:

The system hydrostatic test pressure shall be at least 1.25 times the system design pressure. (IWC-5220)

BASIS FOR RELIEF:

Unisolable portions of the various systems within the system hydrostatic test boundary are located throughout the plant such that there are potential variations in elevation within the boundaries that would result in test pressure variations in excess of six (6) percent of the test pressure. It is an Iowa Electric policy to limit the test pressure imposed on system components to 106% of the specified test pressure (as required by Paragraph IWA-5265(b) of the 1980 Code). Thus, due to the effects of static head, portions of piping at higher elevations will be subjected to a test pressure lower than that specified. There is no practical method for isolating the piping segments to achieve the required test pressure at all elevations.

ALTERNATE EXAMINATION:

Hydrostatic testing of Class 2 system piping and associated components will be conducted at a nominal minimum pressure equivalent to 1.25 times the system design pressure at the lowest point in the hydrotest boundary.

IOWA ELECTRIC LIGHT AND POWER COMPANY
DUANE ARNOLD ENERGY CENTER
Docket No: 50-331
Op. License No: DPR-49

ASME SECTION XI REQUEST FOR RELIEF

RELIEF REQUEST NO. 15

SYSTEM: Various

COMPONENTS: Piping and components included in the system hydrostatic test boundary.

CODE CLASS: 3

CODE TEST REQUIREMENT:

The system test pressure shall be at least 1.10 times the system design pressure. (IWD-5200)

BASIS FOR RELIEF:

Unisolable portions of the various systems within the system hydrostatic test boundary are located throughout the plant such that there are potential variations in elevation within the boundaries that would result in test pressure variations in excess of six (6) percent of the test pressure. It is an Iowa Electric policy to limit the test pressure imposed on system components to 106% of the specified test pressure (as required by Paragraph IWA-5265(b) of the 1980 Edition of the ASME Section XI Code). Thus, due to the effects of static head, portions of piping at higher elevations will be subjected to a test pressure lower than that specified. There is no practical method for isolating the piping segments to achieve the required test pressure at all elevations.

ALTERNATE EXAMINATION:

Hydrostatic testing of Class 3 system piping and associated components will be conducted at a nominal minimum pressure equivalent to 1.10 times the system design pressure at the lowest point in the hydrotest boundary.

IOWA ELECTRIC LIGHT AND POWER COMPANY
DUANE ARNOLD ENERGY CENTER
Docket No: 50-331
Op. License No: DPR-49

ASME SECTION XI REQUEST FOR RELIEF

RELIEF REQUEST NO. 16

SYSTEMS: Emergency Service Water (ESW)
RHR Service Water

COMPONENTS: Piping and components downstream of PSE 2079A and PSE 2079B. Refer to P&IDs M-113 and M-142

CODE CLASS: 3

CODE TEST REQUIREMENT:

The pressure-retaining components within the boundary of each system shall be visually examined while the system is under the hydrostatic test pressure. (IWA-5210)

In the case of buried components (e.g., underground piping), valves shall be provided to permit isolation of the buried portions of piping for the purpose of conducting a system pressure test in lieu of the visual examination. A loss of system pressure during the test shall constitute evidence of component leakage.

BASIS FOR RELIEF:

Much of the piping identified above is buried underground and is bounded by large (24-inch) butterfly valves that were not originally specified to be leak-tight. Additionally, since the leak-tight integrity of these valves is not important from operational or safety viewpoints, it is highly unlikely that they could hold hydrostatic pressure to a sufficient extent to permit performance of a hydrotest and certainly not for the pressure drop test required for underground piping.

ALTERNATE EXAMINATION:

During system functional testing, operation will be observed to verify that return flow is not impaired through this section of piping. This agrees with the requirements as stated in ASME B&PV Code, Section XI, 1980 Edition, Winter 1981 Addenda, Paragraph IWA-5244(c).

IOWA ELECTRIC LIGHT AND POWER COMPANY
DUANE ARNOLD ENERGY CENTER
Docket No: 50-331
Op. License No: DPR-49

ASME SECTION XI REQUEST FOR RELIEF

RELIEF REQUEST NO. 17

SYSTEM: Reactor Recirculation

COMPONENTS: Recirculation pump seal leak detection sensing line.
Refer to P&ID M-116

CODE CLASS: 3

CODE TEST REQUIREMENT:

The pressure-retaining components within the boundary of each system shall be visually examined while the system is under the hydrostatic test pressure. (IWA-5210)

BASIS FOR RELIEF:

This piping is a pressure sensing instrument line leading from the recirculation pump backup seal and there are no isolation valves between the seal and the piping; thus, there is no practical method of testing this piping. These sections of piping are pressurized only in the event of a failure of a Number 1 recirc pump seal which would be indicated by an alarm in the Control Room. If this did occur, it is likely that the plant would be promptly shut down and cooled down to effect repairs to the seal.

ALTERNATE EXAMINATION:

None

IOWA ELECTRIC LIGHT AND POWER COMPANY
DUANE ARNOLD ENERGY CENTER
Docket No: 50-331
Op. License No: DPR-49

ASME SECTION XI REQUEST FOR RELIEF

RELIEF REQUEST NO. 18

SYSTEM: Control Rod Drive (CRD)

COMPONENTS: Insert and withdrawal lines to the control rod drive mechanisms. Refer to P&IDs M-117 and M-118

CODE CLASS: 2

CODE TEST REQUIREMENT:

The system hydrostatic test pressure shall be at least 1.25 times the system design pressure. (IWC-5220)

BASIS FOR RELIEF:

The CRD insert and withdrawal piping is not isolable from the reactor vessel by way of designed leakage through the CRD mechanism. Testing at a test pressure of 1.25 times the system design pressure for the CRD insert and withdrawal lines would require the pressure in the reactor vessel to exceed the maximum allowable.

ALTERNATE EXAMINATION:

The CRD insert and withdrawal piping will be inspected while the Class 1 hydrostatic test is being conducted at the pressure designated for the Class 1 test.

IOWA ELECTRIC LIGHT AND POWER COMPANY
DUANE ARNOLD ENERGY CENTER
Docket No: 50-331
Op. License No: DPR-49

ASME SECTION XI REQUEST FOR RELIEF

RELIEF REQUEST NO. 19

SYSTEM: Control Rod Drive (CRD)

COMPONENTS: Piping and components associated with the CRD hydraulic control units between valves CV-1850 and V-18-1453 through V-18-1541. Refer to P&IDs M-117 and M-118

CODE CLASS: 2

CODE TEST REQUIREMENT:

The pressure-retaining components within the boundary of each system shall be visually examined while the system is under the hydrostatic test pressure. (IWA-5210)

BASIS FOR RELIEF:

There are no connection points or taps between these valves; thus, there is no practical method for pressure testing the section of piping between these valves on each hydraulic control unit.

ALTERNATE EXAMINATION:

None

IOWA ELECTRIC LIGHT AND POWER COMPANY
DUANE ARNOLD ENERGY CENTER
Docket No: 50-331
Op. License No: DPR-49

ASME SECTION XI REQUEST FOR RELIEF

RELIEF REQUEST NO. 20

SYSTEM: River Water Supply

COMPONENTS: Piping and components between the check valves and the stop valves at the discharge of each river water supply pump.

V-29-1 and V-29-2
V-29-3 and V-29-4
V-29-5 and V-29-6
V-29-7 and V-29-8

Refer to P&ID M-129

CODE CLASS: 3

CODE TEST REQUIREMENT:

The pressure-retaining components within the boundary of each system shall be visually examined while the system is under the hydrostatic test pressure. (IWA-5210)

BASIS FOR RELIEF:

There are no connection points or pressure taps between each of these pairs of valves; thus, there is no practical method of pressurizing the section of piping and components between these valves to conduct the required hydrostatic pressure test.

ALTERNATE EXAMINATION:

None

IOWA ELECTRIC LIGHT AND POWER COMPANY
DUANE ARNOLD ENERGY CENTER
Docket No: 50-331
Op. License No: DPR-49

ASME SECTION XI REQUEST FOR RELIEF

RELIEF REQUEST NO. 21

SYSTEM: High Pressure Coolant Injection (HPCI)

COMPONENTS: Piping and components between check valve V-23-4 and MO-2300. Refer to P&ID M-123

CODE CLASS: 2

CODE TEST REQUIREMENT:

The pressure-retaining components within the boundary of each system shall be visually examined while the system is under the hydrostatic test pressure. (IWA-5210)

BASIS FOR RELIEF:

There are no connection points or pressure taps between these valves; thus, there is no practical method for pressurizing the section of piping between these two valves to the required test pressure.

ALTERNATE EXAMINATION:

None

IOWA ELECTRIC LIGHT AND POWER COMPANY
DUANE ARNOLD ENERGY CENTER
Docket No: 50-331
Op. License No: DPR-49

ASME SECTION XI REQUEST FOR RELIEF

RELIEF REQUEST NO. 22

SYSTEM: Core Spray

COMPONENTS: Underground piping and components associated with the core spray suction from the condensate storage tanks between valves V-21-1, V-21-2, V-09-25, V-09-26, and MO-2500. Refer to P&IDs M-109, M-121, and M-125

CODE CLASS: 3

CODE TEST REQUIREMENT:

The pressure-retaining components within the boundary of each system shall be visually examined while the system is under the hydrostatic test pressure. (IWA-5210)

In the case of buried components (e.g., underground piping), valves shall be provided to permit isolation of the buried portions of piping for the purpose of conducting a system pressure test in lieu of the visual examination. A loss of system pressure during the test shall constitute evidence of component leakage.

BASIS FOR RELIEF:

Portions of the piping identified above are underground and are bounded by two large (14-inch) butterfly valves that were not originally specified to be leak-tight. Additionally, since the leak-tight integrity of these valves' seats is not important from operational or safety viewpoints, it is highly unlikely that they could hold hydrostatic pressure to a sufficient extent to permit performance of the pressure drop test required for underground piping.

ALTERNATE EXAMINATION:

None

IOWA ELECTRIC LIGHT AND POWER COMPANY
DUANE ARNOLD ENERGY CENTER
Docket No: 50-331
Op. License No: DPR-49

ASME SECTION XI REQUEST FOR RELIEF

RELIEF REQUEST NO. 23

SYSTEM: High Pressure Coolant Injection (HPCI)

COMPONENTS: Piping and components associated with the HPCI suction from the condensate storage tanks between valves MO-2300, V-09-27, and V-09-28. Refer to P&IDs M-109 and M-123

CODE CLASS: 3

CODE TEST REQUIREMENT:

The pressure-retaining components within the boundary of each system shall be visually examined while the system is under the hydrostatic test pressure. (IWA-5210)

BASIS FOR RELIEF:

There are no connection points or pressure taps between these valves; thus, there is no practical method for pressure testing this section of piping between the valves and condensate storage tanks.

ALTERNATE EXAMINATION:

Accessible portions of the subject piping will be visually inspected while it is pressurized to the pressure imposed by the static head of the condensate storage tank(s) at the maximum tank level.

IOWA ELECTRIC LIGHT AND POWER COMPANY
DUANE ARNOLD ENERGY CENTER
Docket No: 50-331
Op. License No: DPR-49

ASME SECTION XI REQUEST FOR RELIEF

RELIEF REQUEST NO. 24

SYSTEM: Control Rod Drive - Scram Discharge

COMPONENTS: Piping and components in the scram discharge flowpath downstream of the scram discharge manual isolation valves (V-18-1542 through V-18-1630). Refer to P&ID 118

CODE CLASS: 2

CODE TEST REQUIREMENT:

The system hydrostatic test pressure shall be at least 1.25 times the system design pressure for systems with design temperature above 200°F.

BASIS FOR RELIEF:

Design pressure for the scram discharge piping and components is 1146 psig; thus, the required test pressure is 1433 psig. The scram discharge volume is provided with float-type level switches that have a failure mode of collapsed or leaking ball floats. As a result, the General Electric Co. has issued an advisory letter recommending that the maximum hydrostatic test pressure for the switches be limited to a maximum of 1250 psig. Due to the arrangement of the DAEC scram discharge piping, it is not practical to isolate all of the switches during the hydrostatic test because each of the points available for introducing test pressure is unisolable from a switch.

Note also that a reduced test pressure is acceptable since the maximum expected pressure within the CRD scram discharge volume during a scram is only 65 psig.

ALTERNATE EXAMINATION:

The scram discharge piping and components will be subjected to a hydrostatic test at a nominal test pressure of 1225 psig, at the system low point. This pressure allows for a tolerance needed to permit proper pressure control in order to remain below 1250 psig at the pressure switches.

IOWA ELECTRIC LIGHT AND POWER COMPANY
DUANE ARNOLD ENERGY CENTER
Docket No: 50-331
Op. License No: DPR-49

ASME SECTION XI REQUEST FOR RELIEF

RELIEF REQUEST NO. 25

SYSTEM: Residual Heat Removal

COMPONENTS: A piping segment (8-HBB-25) approximately 51 feet in length downstream of fuel pool cooling cross-connect valve V-34-1 that is embedded within a concrete wall.

CODE CLASS: 2

CODE TEST REQUIREMENT:

The pressure-retaining components within the boundary of each system shall be visually examined while the system is under the hydrostatic test pressure. (IWA-5210)

BASIS FOR RELIEF:

There is no practical means of inspecting the embedded portion of piping.

ALTERNATE EXAMINATION:

The outer extremities of the pipe segment will be inspected for any indication of leakage within the wall.

FROM EMERGENCY SERVICE WATER PUMP 1P-89A

FROM EMERGENCY SERVICE WATER PUMP 1P-89B

FROM RHR SERVICE WATER PUMPS 1P-22A&C

FROM RHR SERVICE WATER PUMPS 1P-22B&D

DEMINERALIZED WATER (FLUSH)

RHR HEAT EXCHANGER 1E-201B

RHR HEAT EXCHANGER 1E-201A

EMERGENCY DIESEL GENERATOR COOLERS

TO STORM SEWER

TO RESIDUAL HEAT REMOVAL SYSTEM

TO TR 1945

TO RHR HEAT EXCHANGER (PDS-1945)

FROM PDIC 1947

FROM SW PUMPS 1P 89 B&D

TO TR 1945

TO RHR HEAT EXCHANGER (PDS-2045)

FROM PDIC 2046

FROM SW PUMPS 1P 89 A&C

TO COOLING TOWER VIA C.W. DISCH. LINE

TO RADWASTE EFFLUENT SYSTEMS

FROM WELL WATER SYSTEM

PSE-2078-B RUPTURE DISCS WERE REMOVED BUT DISC ASSEMBLIES REMAIN IN PIPING. SEE VEND. DWG. M163-B.

P&ID M-144 & M-169
CONTROL BUILDING CHILLER IV-CH-1A

P&ID M-173
N&V INST. AIR COMP. IR-9 (A,B)

P&ID M-120
RHR PUMP IP-229A SEAL COOLER

RHR PUMP IP-229C SEAL COOLER

P&ID M-121

P&ID M-172
RHR & CORE SPRAY PUMP RM. COOLING UNIT IV-AC-12

HPCI ROOM COOLING UNIT IV-AC-14A

RCIC ROOM COOLING UNIT IV-AC-15A

P&ID M-144 & M-169
CONTROL BLDG CHILLER 2 (A or B) IV-CH-1B

P&ID M-173
N&V INST. AIR COMP. IR-6 (A or B)

P&ID M-120
RHR PUMP IP-229B SEAL COOLER

RHR PUMP IP-229D SEAL COOLER

P&ID M-121

P&ID M-171
RHR & CORE SPRAY PUMP RM. COOLING UNIT IV-AC-11

HPCI ROOM COOLING UNIT IV-AC-14B

RCIC ROOM COOLING UNIT IV-AC-15B

EMERGENCY MAKE-UP TO FUEL POOL

6"-HBD-28

6"-HBD-29

8"-HBD-29

3"-HBD-29

16"-HBD-30

24"-HBD-32

16"-HBD-31

16"-HBD-32

24"-HBD-33

24"-HBD-17

24"-HBD-01

8507050306-01

REVISED AS NOTED ON REVISION SHEET. LAST VALUE WAS M-113-14
REVISED AS NOTED ON REV SHEET. LAST VALUE WAS M-113-15
REVISED AS NOTED ON REV SHEET. LAST VALUE WAS M-113-16
FINAL DESIGN REVIEW & REVISED AS INDICATED ON REV SHEET
ISSUED MANUAL VALVE NOS. 1B-V13-150 THRU 153 REV SHT
ADDED VALVE NOS ON SYSTEM & TO M-113-16 REV SHEET
REVISED AS INDICATED ON REV SHEET & ISSUED FOR CONSTRUCTION
REVISED AS INDICATED ON REV SHEET & ISSUED FOR CONSTRUCTION
REV PER DCR-777
REV. PER DCR-1029
REV PER DCR-1068
ISSUED FOR PIPE STRESS AND INSULATION
ISSUED FOR APPROVAL

REVISED PER DCR-334
REVISED PER DCR-742B
REVISED PER DCR-813
REVISED PER DCR-1068

BECHTEL
SAN FRANCISCO

DUANE ARNOLD ENERGY CENTER—UNIT NO 1
IOWA ELECTRIC LIGHT AND POWER COMPANY
CEDAR RAPIDS, IOWA

P&I.D.
RHR SERVICE WATER & EMERGENCY SERVICE WATER SYSTEMS

JOB NO.	DRAWING NO.	REV.
7884	M-113	22

INSTRUMENTATION — MAIN STEAM ISOLATION VALVES

CV	MS	VALVE NO. V-16-		SV	LOC
4412	4412 A	97	98	4413 A	16-03
4412	4412 B	99	100	4413 B	03
4412				4413 C	
4413	4413 A	88	80	4413 A	04
4413	4413 B	31	32	4413 B	04
4413				4413 C	
4416	4416 A	101	102	4413 A	02
4416	4416 B	103	104	4413 B	02
4416				4413 C	
4416	4416 A	105	106	4416 A	04
4416	4416 B	107	108	4416 B	04
4416				4416 C	
4416	4416 A	109	110	4416 A	05
4416	4416 B	111	112	4416 B	05
4416				4416 C	
4419	4419 A	113	114	4419 A	04
4419	4419 B	115	116	4419 B	04
4419				4419 C	
4420	4420 A	117	118	4490 A	05
4420	4420 B	119	120	4490 B	06
4420				4420 C	
4421	4421 A	121	122	4421 A	04
4421	4421 B	123	124	4421 B	04
4421				4421 C	

MAIN STEAM LINE ISOLATION VALVE CLOSURES

TRIP LOGIC	COMPUTER NO.	CONTROL VALVE NUMBER			
A1	C-D 506	4415	4415	4413	4416
B1	C-D 509	4415	4418	4413	4419
A2	C-D 510	4418	4420	4419	4421
B2	C-D 511	4415	4420	4416	4421

MAIN STEAM LINE HIGH FLOW

TRIP LOGIC	COMPUTER NO.	DTIS			
A	C-A 500	4435 A	4434 A	4436 A	4438 A
B	C-A 501	4431 B	4434 B	4436 B	4438 B
C	C-A 502	4432 C	4434 C	4436 C	4438 C
D	C-A 503	4432 D	4434 D	4436 D	4438 D

TUNNEL ZONE	1	2	3	4	TEMP. MONIT. LOCATION
MAIN STEAM LINE 'D'	TE-4446 A	TE-4446 B	TE-4446 C	TE-4446 D	TIS-4446 C 193 D
MAIN STEAM LINE 'C'	TE-4445 A	TE-4445 B	TE-4445 C	TE-4445 D	TIS-4445 C 193 C
MAIN STEAM LINE 'B'	TE-4444 A	TE-4444 B	TE-4444 C	TE-4444 D	TIS-4444 C 193 B
MAIN STEAM LINE 'A'					

1. MAIN STEAM LINE HIGH TEMPERATURE, STEAM TUNNEL

2. MAIN STEAM TUNNEL HIGH AMBIENT TEMPERATURE

3. MAIN STEAM TUNNEL HIGH VENT W/OUT DIFF. TEMPERATURE

MAIN STEAM LINE LEAK DETECTION SYSTEM

DETAIL 3

DETAIL-1

TYPICAL OF INBOARD MSIVS

TYPICAL OF OUTBOARD MSIVS

TABLE A EXPANSION JOINT TEST VALVES

DETAIL 2 (TYPICAL EXPANSION JOINT TEST CONNECTIONS)

13	REV. PER DCR-765		
12	REVISED PER DCR-HTB		
11	REVISED PER DCR-1181		
10	REVISED PER DCC 606		
9	REV. PER DCR-710		

BECHTEL SAN FRANCISCO

DUANE ARNOLD ENERGY CENTER — UNIT NO 1
IOWA ELECTRIC LIGHT AND POWER COMPANY
CEDAR RAPIDS, IOWA

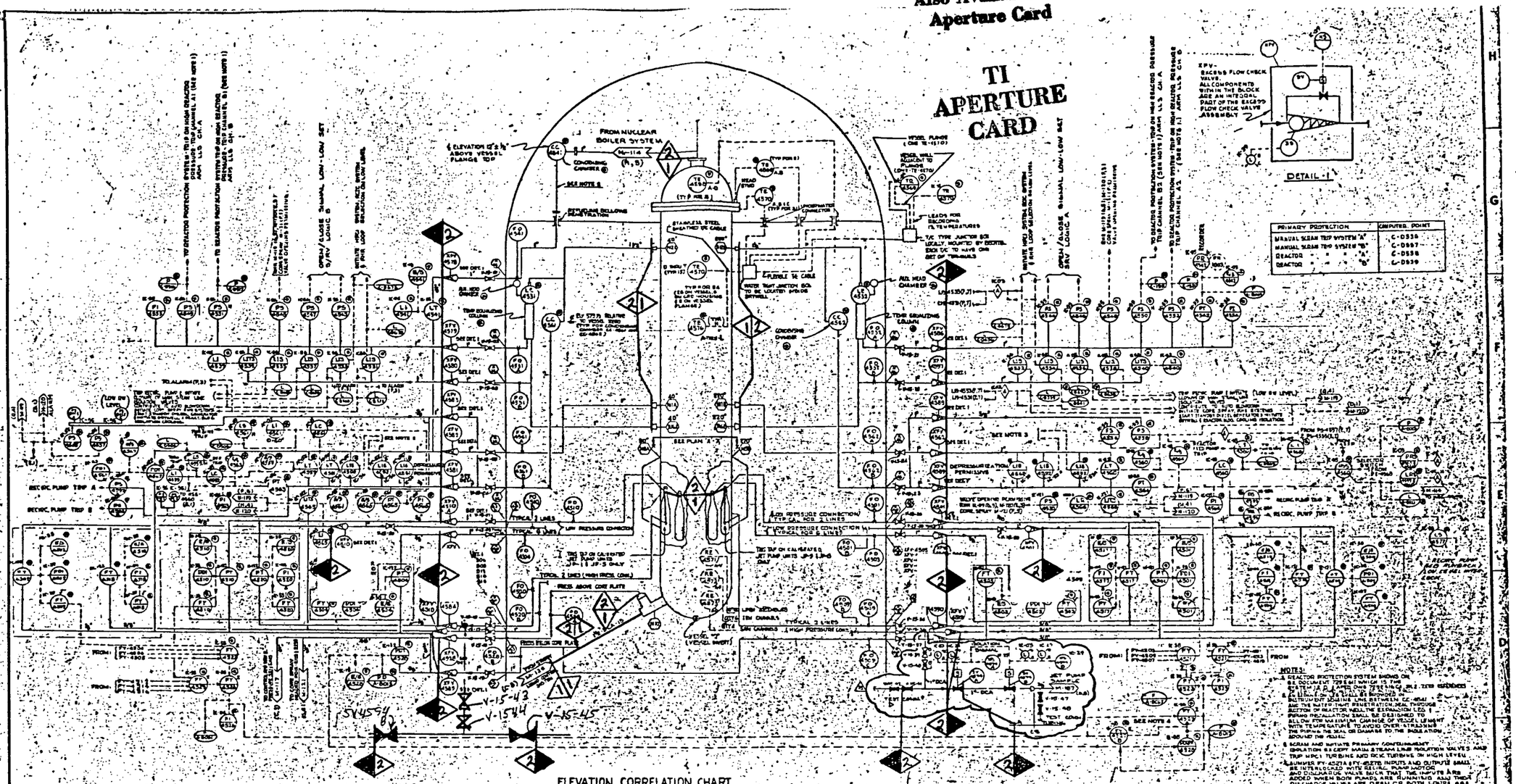
P & I.D.
NUCLEAR BOILER SYSTEM

7884 M-114 20

8507050306-02

Also Available On Aperture Card

TI APERTURE CARD



ELEVATION CORRELATION CHART

REFERENCE	(COLD VESSEL) INCHES ABOVE VESSEL ZERO	TRIPS DESCRIPTION	INSTRUMENT(S) PROVIDING TRIP	REACTOR VESSEL LEVELS (547.39) (83"-4020)	INDICATED LEVEL TRIP SETTINGS (NOTE 1)	
					APPROXIMATE INCHES ABOVE TAF	INCHES ABOVE VESSEL ZERO
NOZZLE N5 A,B,C,D	620.9					
NOZZLE N1B A,B	672					
FEEDWATER SYSTEM & REACTOR PROTECTION SYSTEM	862.5				218	218
	555.5	TRIP REACTOR FEED PUMPS CLOSE MAIN TURBINE STOP VALVES TRIP RCIC & HPCI TURBINES	ALARM UNIT LS-4558 LOW LS-4592 A,B,C,D	8	211	211
	574.5	HIGH LEVEL ALARM	LDS-4558 / 4560	7		195
		NORMAL WATER LEVEL	FEEDWATER LEVEL CONTROL SYSTEM	6.6		
	530.5	LOW LEVEL ALARM	LRD-4558 / 4559	4		184
	814.8	SCRAM & CLOSE PRIMARY SYS ISOLATION VALVES EXCEPT MAIN STEAM LINE	LIS-4592 A,B,C,D	8	170 IN. W.C.	+211 IN. W.C.
		AUTO DEPRESSURIZATION PERMISSIVE	LIS-4548, 4564		170 IN. W.C.	
FEEDWATER SYSTEM & REACTOR PROTECTION SYSTEM	802.8				158	158.6
INSTRUMENT ZERO TOP OF ACTIVE FUEL						
NOZZLE N11A,B	493					
	414	INITIATE RCIC, HPCI & SELECT RHR LOOP FOR INJECTION (TRIP RECIRCULATION PUMPS	LIS-4539,553,554 LIS-4538, 4557 LIS-4536, 4558	8	119.6 SEC.	
	363	INITIATE RHR & CORE SPRAY SYSTEMS, SIGNAL OUTER TIC AUTO SEQUENCE TIMER SYSTEM, START EMERGENCY DIESELS	LIS-4539,553,554 LIS-4538, 4557 LIS-4536, 4558	9	18.5 SEC.	
REACTOR PROTECTION SYSTEM	352.5			8		
NOZZLE N16A,B TOP OF ACTIVE FUEL	360					
	344.5					
	308.3	CONTAINMENT SPRAY PERMISSIVE	LIT3-4560 / LIT3-4559	0		
LOWER JET PUMP TAP	187					
NOZZLE N6A,B	168.8					

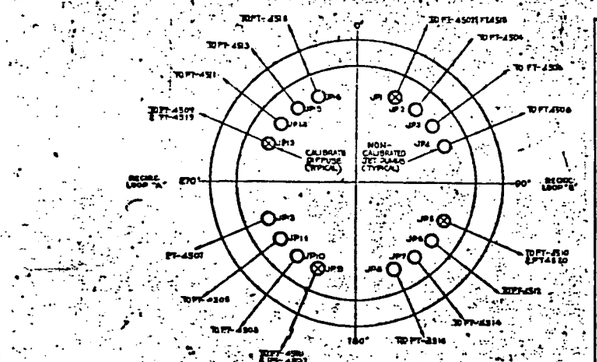


TABLE - A

FT	PENETRATION	RACK NO.	E/S	PDT	PT	HS	ZS	SV	XPV	FO
4505	X-40B	16-121	4505							
4506	-40A	-122	4506							
4507	-40B	-121	4507							
4508	-40A	-121	4508							
4511	-40D	-121	4511							
4512	-40C	-122	4512							
4513	-40D	-121	4513							
4514	-40C	-122	4514							
4515	-40D	-121	4515							
4516	-40C	-122	4516							

ADDITIONAL INSTRUMENTATION - REF. PLAN-XX

T.I.P. RADIATION MONITOR

INSTRUMENT TAG NO.	LOCATION
RM-4576	IC-13
RR-4577	IC-15
RE-4576 A	S.E. CORNER OF RB ADJAC. TO CONTAIN'M.
RR-4576 B	
RR-4576 C	

NOTES:
1. REACTOR PROTECTION SYSTEM SHOWN ON GE DOCUMENT 729E681 WHICH IS THE BASIS FOR P&I DWG. M-115 (SH. 1). REFERENCES ON M-115 (SH. 1) ARE TO GE DOCUMENT 729E681 (SH. 1) UNLESS OTHERWISE NOTED.
2. PENETRATION SLEEVE IS DESIGNED TO ALLOW FOR MAXIMUM CHANGE OF VESSEL LENGTH WITH TEMPERATURE TO AVOID OVER-STRESSING OF THE PIPING, THE SEAL OR DAMAGE TO THE INSULATION AROUND THE NOZZLE.
3. SCRAM AND INITIATE PRIMARY CONTAINMENT ISOLATION & EMERGENCY CORE COOLING SYSTEMS AND TRIP HPCI TURBINE AND RCIC TURBINE ON HIGH LEVEL.
4. SUMMER FY-4537A &FY-4537B INPUTS AND OUTPUTS SHALL BE INTERLOCKED WITH RELIEF, PUMP MOTOR AND DISCHARGE VALVE SUCH THAT THE INPUTS ARE ADDED WHEN BOTH PUMPS ARE RUNNING AND THAT DISCHARGE VALVES ARE OPEN OR BOTH LOOPS ARE SHUTDOWN. THE SIGNALS ARE TO BE SUBTRACTED WHEN ONE JET PUMP LOOP IS IN OPERATION.

REV.	DESCRIPTION	BY	CK	APP'D
1/16/85	REV. PER DCR-694 (E-T)	DK	[illegible]	[illegible]
11/16/84	REVISED PER DCR 684	[illegible]	[illegible]	[illegible]
11/16/84	REV. PER DCR 674	[illegible]	[illegible]	[illegible]
7/19/84	REV. PER DCR-616	DK	[illegible]	[illegible]
1/17/84	REV. PER DCR-440	[illegible]	[illegible]	[illegible]
7/7/83	AS BUILT PER DCR-159 & TO REFLECT	DK	[illegible]	[illegible]
4/19/83	REVISED PER DCR-73	[illegible]	[illegible]	[illegible]
4/19/83	REVISED AS NOTED ON REV. SHEET	AB	[illegible]	[illegible]
2/16/83	REVISED AS NOTED ON REV. SHEET	[illegible]	[illegible]	[illegible]
1/14/83	FIRST DESIGN REVIEW. ADDED TESTS OF REACTOR PROTECTION SYSTEM AND CHANGED AS INDICATED	[illegible]	[illegible]	[illegible]
11/11/82	REVISED AS NOTED ON REV. SHEET & MINOR PIPE CONFIGURATION	DK	[illegible]	[illegible]
9/23/82	REVISED PER DCR 73 E.A.	DK	[illegible]	[illegible]
8/9/82	REV. PER DCR-104B	DK	[illegible]	[illegible]
4/16/82	REVISED PER DCR-87B	DK	[illegible]	[illegible]
2/19/82	REVISED PER DCR #1182	[illegible]	[illegible]	[illegible]

BECHTEL
SAN FRANCISCO

DUANE ARNOLD ENERGY CENTER — UNIT NO 1
IOWA ELECTRIC LIGHT AND POWER COMPANY
CEDAR RAPIDS, IOWA

P. & I.D.
REACTOR VESSEL INSTRUMENTATION

JOB NO.	DRAWING NO.	REV.
7884	M-115	15

THERMOCOUPLE SERVICE	RECIRC. PUMP IP-201A	RECIRC. PUMP IP-201B
THRUST BRG. UPPER PADS	TE-4600-A	TE-4600-M
THRUST BRG. LOWER PADS	" " B	" " N
UPPER GUIDE BRG.	" " C	" " P
MOTOR WINDING "A"	" " D	" " Q
MOTOR WINDING "B"	" " E	" " R
MOTOR WINDING "C"	" " F	" " S
LOWER GUIDE BRG.	" " G	" " T
UPPER SEAL CAVITY	" " H	" " U
LOWER SEAL CAVITY	" " J	" " V
MOTOR PRI. OIL COOLING WTR.	" " K	" " W
SEAL CAVITY COOLING WTR.	" " L	" " X

REACTOR VESSEL
IT-201

REACTOR RECIRCULATION PUMP IP-201B

REACTOR RECIRCULATION PUMP IP-201A

XFV - EXCESS FLOW CHECK VALVE

DETAIL-1
TYPICAL FOR ALL XFVs (34) SHOWN ON THIS P.I.D.
ALL COMPONENTS WITHIN THE BLOCK ARE AN INTEGRAL PART OF THE XFV ASSEMBLY

REACTOR RECIRCULATION M/G SET 1G-201A
(INSTRUMENT AND EQUIPMENT NUMBERS WILL BE INDENTICAL TO ABOVE FOR 1G-201B WITH SUFFIX B, ANY EXCEPTIONS ARE SHOWN IN PARENTHESIS)

M.G SET BEARING & OIL TEMPS

1G-201A MG SET MOTOR & GEN WINDING TEMPS

1G-201B

NOTE: THESE TEMP SWITCH CAPILLARIES ARE CONNECTED TO FLUID DRIVE CIRCUIT OIL LEAK-OFF BOXES

REGTELY

BRAIDWOOD STATION

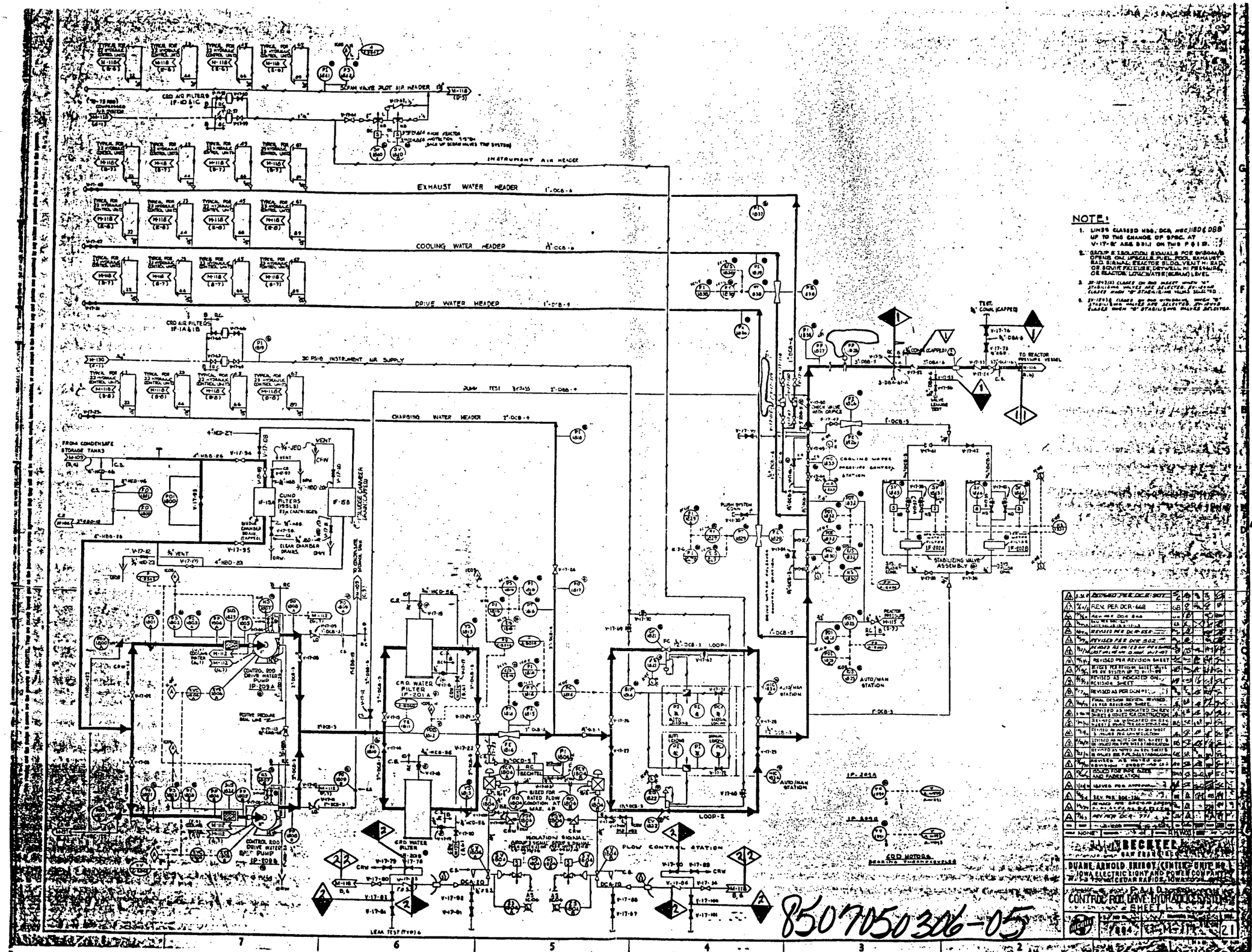
BRAIDWOOD ENTRY CENTER - UNIT NO. 1

IOWA ELECTRIC LIGHT AND POWER COMPANY
CEDAR RAPIDS, IOWA

PAID

REACTOR RECIRC. AND SAMPLING

M-116



NOTE:

1. LINES CLASSED NBB, DCB, NEC, IIBD & DBB UP TO THE CHANGE OF SPEC. AT V-17-5" ARE 331.1 ON THIS P & I D.
2. GROUP 6 ISOLATION SIGNALS ARE BYPASSED OPENING ONE SPECIAL FUEL POOL EXHAUST RAD. SIGNAL, REACTOR BLDG. VENT HI RAD. OR SOLID PARTICLES, DRYWELL HI PRESSURE, OR REACTOR LOW LOW WATER (SCRAM) LEVEL.
3. SV-1843(A) CLOSES ON RHR DIVERT WHEN "A" STABILIZING VALVE ARE SELECTED. SV-1843 CLOSES WHEN "B" STABILIZING VALVE SELECTED.
4. SV-1843(A) CLOSES ON RHR WITHDRAWAL WHEN "A" STABILIZING VALVES ARE SELECTED. SV-1843 CLOSES WHEN "B" STABILIZING VALVE SELECTED.

12	3/24/81	REVISED PER DCR-907	GB		
11	2/11/81	REV. PER DCR-668	GB		
10	7/16/80	REVISED PER DCR-858	GB		
9	6/27/80	REVISED PER DCR-858	GB		
8	3/21/80	REVISED PER DCR-502	GB		
7	11/21/79	REVISED PER REVISION SHEET	GB		
6	9/26/79	REVISED PER REVISION SHEET	GB		
5	8/15/79	REVISED AS INDICATED ON REVISION SHEET	GB		
4	7/27/79	REVISED AS PER DCN #1	GB		
3	6/29/79	FINAL DESIGN REVIEW. REVISED AS PER REVISION SHEET.	GB		
2	5/29/79	REVISED AS INDICATED ON REV. SHEET & ISSUED FOR CONSTRUCTION	GB		
1	3/16/79	REVISED AS INDICATED ON DAC SHEETS & ISSUED FOR CONSTRUCTION	BC		
0	12/15/78	REVISED AS INDICATED ON REV. SHEET 1 & ISSUED FOR CONSTRUCTION	BC		
9	9/29/78	REVISED AS NOTED ON REV. SHEET 1 OR INDICATED PIPE MATERIAL CHANGE	BC		
8	8/31/78	REVISED AS NOTED ON REV. SHEET 1 & ISSUED FOR PARTIAL CONSTRUCTION	BC		
7	7/31/78	REVISED AS NOTED ON REVISION SHEET & ISSUED FOR CONSTRUCTION	BC		
6	6/30/78	ISSUED FOR PIPE STRESS AND FABRICATION	BC		
5	11/4/77	REVISED PER AMENDMENT	BC		
4	10/14/77	REV. PER DCR-336-338	BC		
3	9/9/77	REVISED PER DCR-336-338	BC		
2	8/5/77	REVISED PER DCR-336-338	BC		
1	7/7/77	REVISED PER DCR-336-338	BC		
NONE		ISSUED FOR CONSTRUCTION			

BECHTEL
SAN FRANCISCO

DUANE ARNOLD ENERGY CENTER UNIT NO. 1
IOWA ELECTRIC LIGHT AND POWER COMPANY
CEDAR RAPIDS, IOWA

CONTROL ROD DRIVE HYDRAULICS
P & I D
SHEET 1

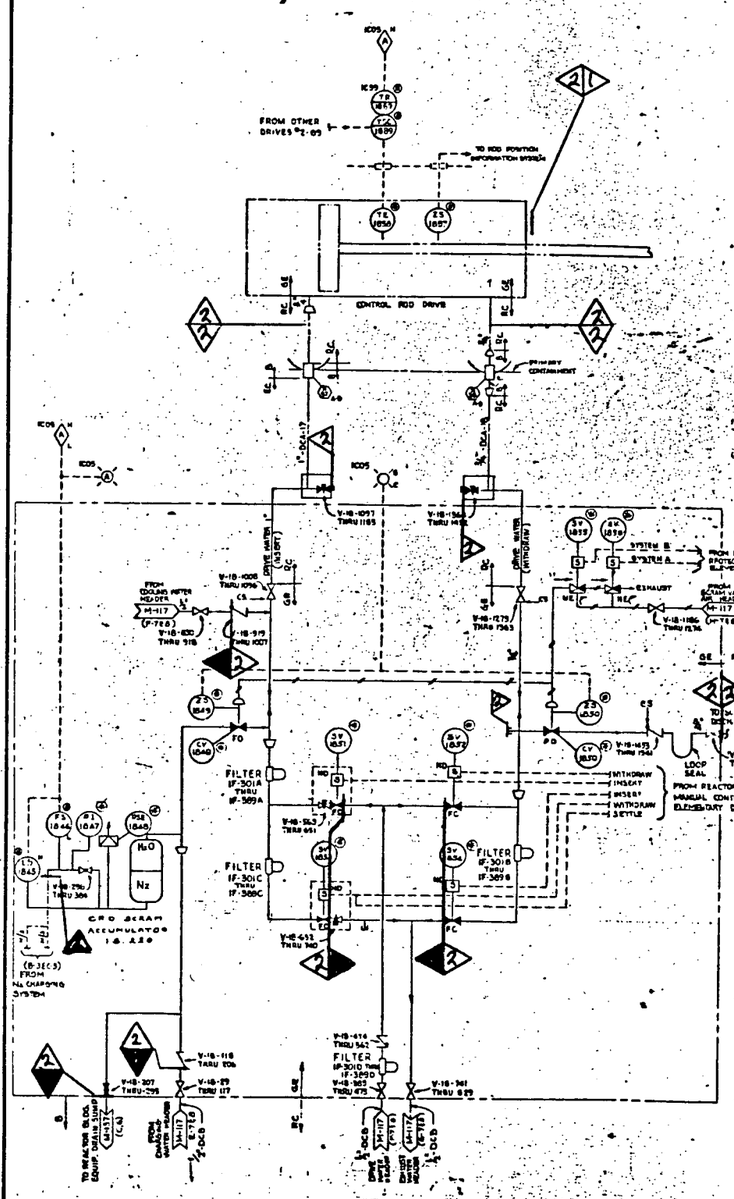
8 | 804 | M-117 | 21

M-117

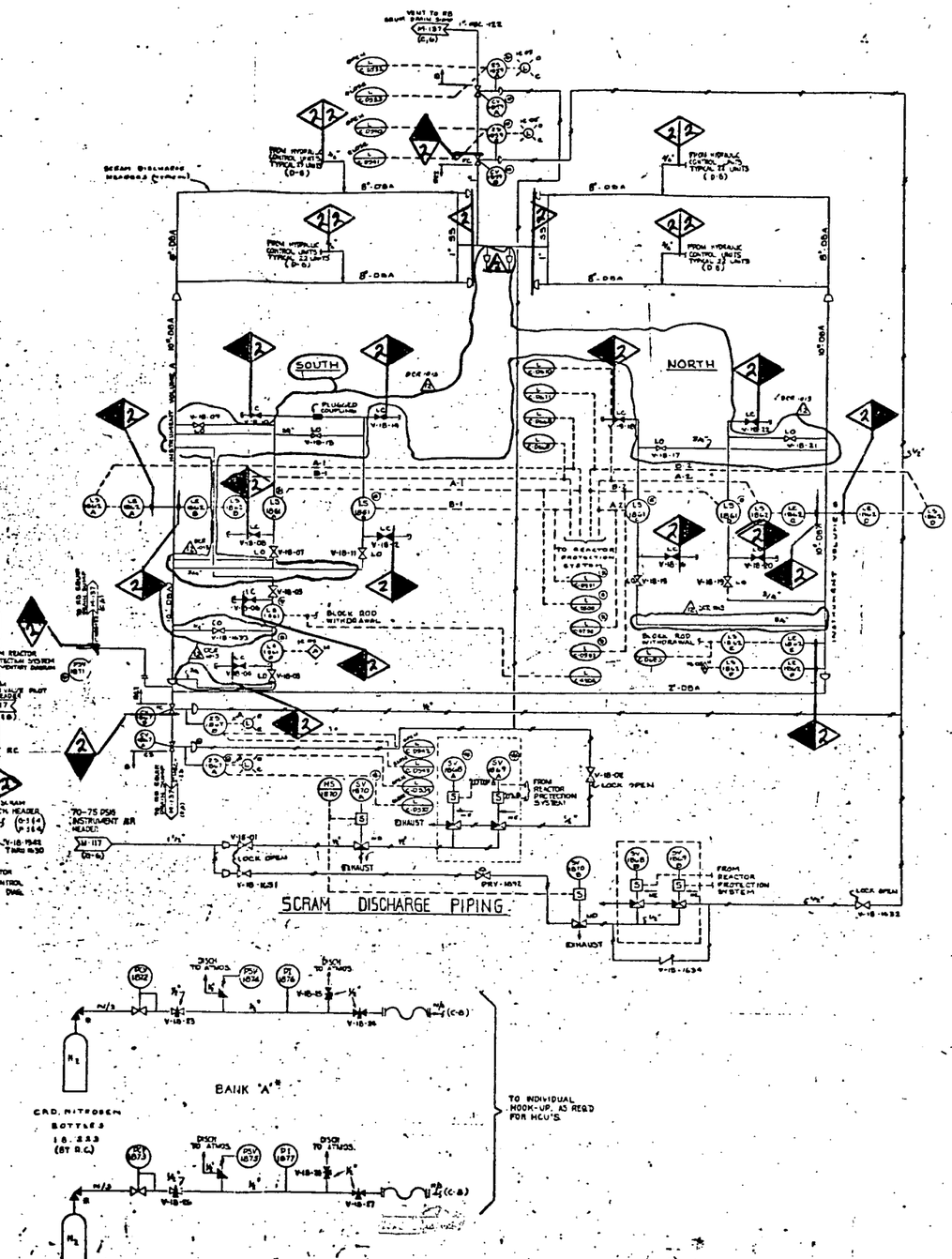
Also Available On Aperture Card

TI APERTURE CARD

8507050306-05



HYDRAULIC CONTROL UNIT *1
(TYPICAL FOR 89 UNITS)



ACCUMULATOR NITROGEN CHARGING SYSTEM

MK	REVISION	BY	CHK	APP	DATE
12	REV PER DCR-1014 SHT 1 AND CORR'D 3 SHTS - SEE REVISION SHEET	JC	BHR		12/84
11	REV PER DCR-962	SK	GK	BE	8/84
10	FINAL DESIGN REVIEW. REVISED AS PER REVISION SHEET.	JC	BHR		8/84
9	ADDED VALVE NOS. ON SYSTEM UP TO V-18-1630 AND QTY. ADDED	JC	BHR		8/84
8	REVISED AS INDICATED ON REVISION SHEET & ISSUED FOR CONSTRUCTION	BK	SK	BE	7/84
7	REVISED AS INDICATED BY DCR SHEET 3 - ISSUED FOR CONSTRUCTION	JC	SK	BE	6/84
6	REVISED AS NOTED ON REVISION SHEET & ISSUED FOR CONSTRUCTION	CM	SK	BE	5/84
5	REVISED AS NOTED ON REVISION SHEET & ISSUED FOR PIPE SHEET & INSULATION	BK	SK	BE	4/84
4	REVISION SHEET	BK	SK	BE	3/84
3	ISSUED FOR PIPE SHEETS AND INSULATION	DMC	SK	BE	2/84
2	ISSUED FOR APPROVAL	BK	SK	BE	12/83
1	REVISED PER DCR-1013 (V-18-1631 (F-2) TO 631 (C-6) & (F-2))	LC	BHR		9/83
0	REVISED PER DCR-1007 (V-18-1631 (F-2) TO V-18-1630 (C-6))	LC	BHR		8/83
	FOR BID DCR-1007 AT Quad-Cities	JC	BHR		12/82

PH W00

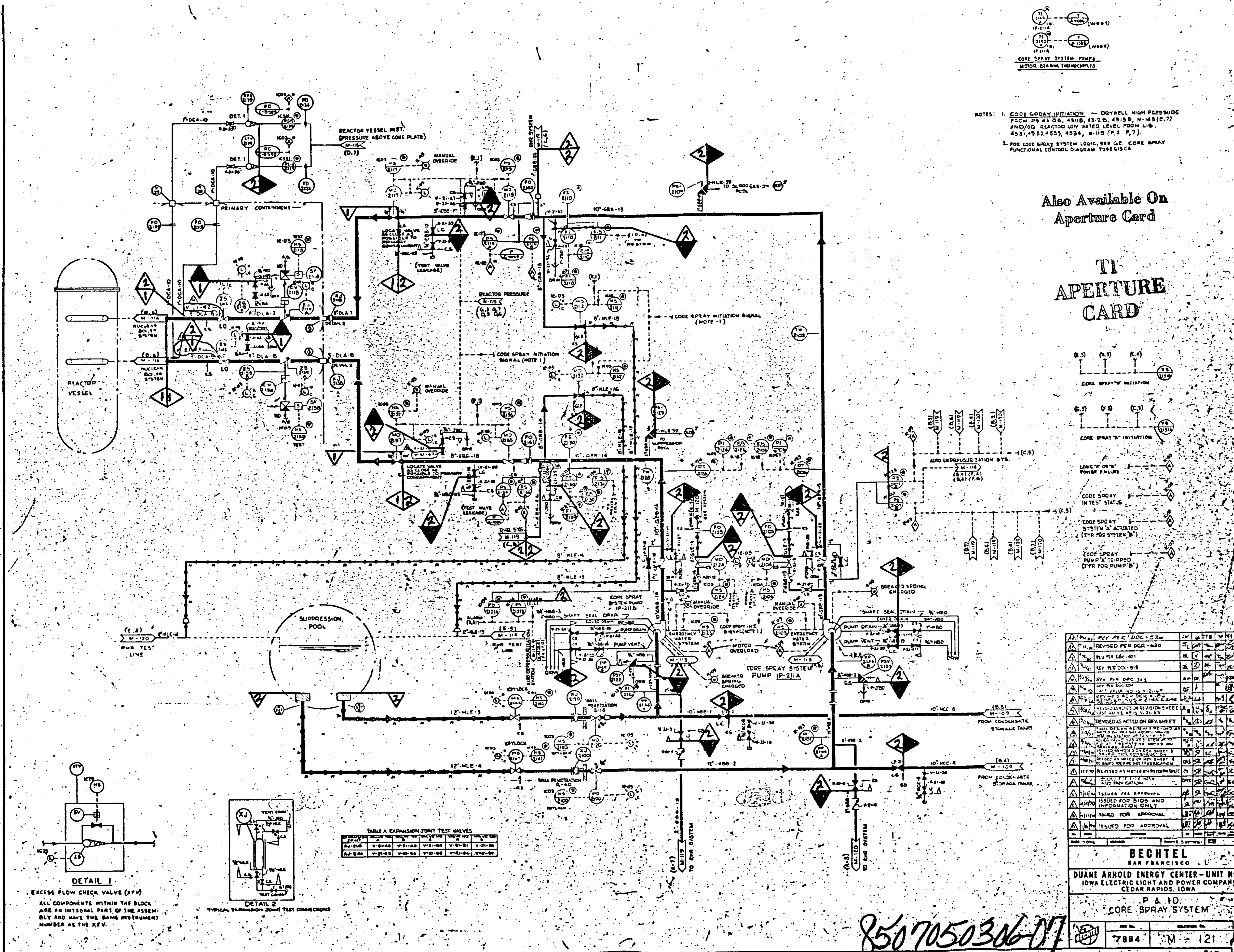
BECHTEL
SAN FRANCISCO

DUANE ARNOLD ENERGY CENTER—UNIT NO 1
IOWA ELECTRIC LIGHT AND POWER COMPANY
CEDAR RAPIDS, IOWA

P & ID
CONTROL ROD DRIVE HYDRAULIC SYSTEM
SHEET 2

JOB NO.	DRAWING NO.	REV.
7884	M-118	12

8507050306-06



NOTES:
1. CORE SPRAY INITIATION — 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).
2. FOR CORE SPRAY SYSTEM LOGIC, SEE GE. CORE SPRAY FUNCTIONAL CONTROL DIAGRAM 729E615CA

Also Available On Aperture Card

TI APERTURE CARD

Revision
REV PER DOC-530
REVISED PER DCR-690
REV PER DCR-421
REV PER DCR-818
REV PER DCR 349
REV PER DCR-204 LAST VALVE NO IS V-21-65
REVISED PER DCR [illegible]
REVISED AS NOTED ON REVISION SHEET LAST VALVE NO IS V-21-65
REVISED AS NOTED ON REV. SHEET
FINAL DESIGN REVIEW & REVISED AS NOTED [illegible]
[illegible]
REVISED AS NOTED ON REV. SHEET & ISSUED FOR CONSTRUCTION
REVISED AS NOTED ON REV. SHEET & ISSUED FOR PIPE SPEC FABRICATION
REVISED AS NOTED ON REVISION SHEET
ISSUED FOR [illegible] AND FABRICATION
ISSUED FOR APPROVAL
ISSUED FOR BIDS AND INFORMATION ONLY
ISSUED FOR APPROVAL
ISSUED FOR APPROVAL

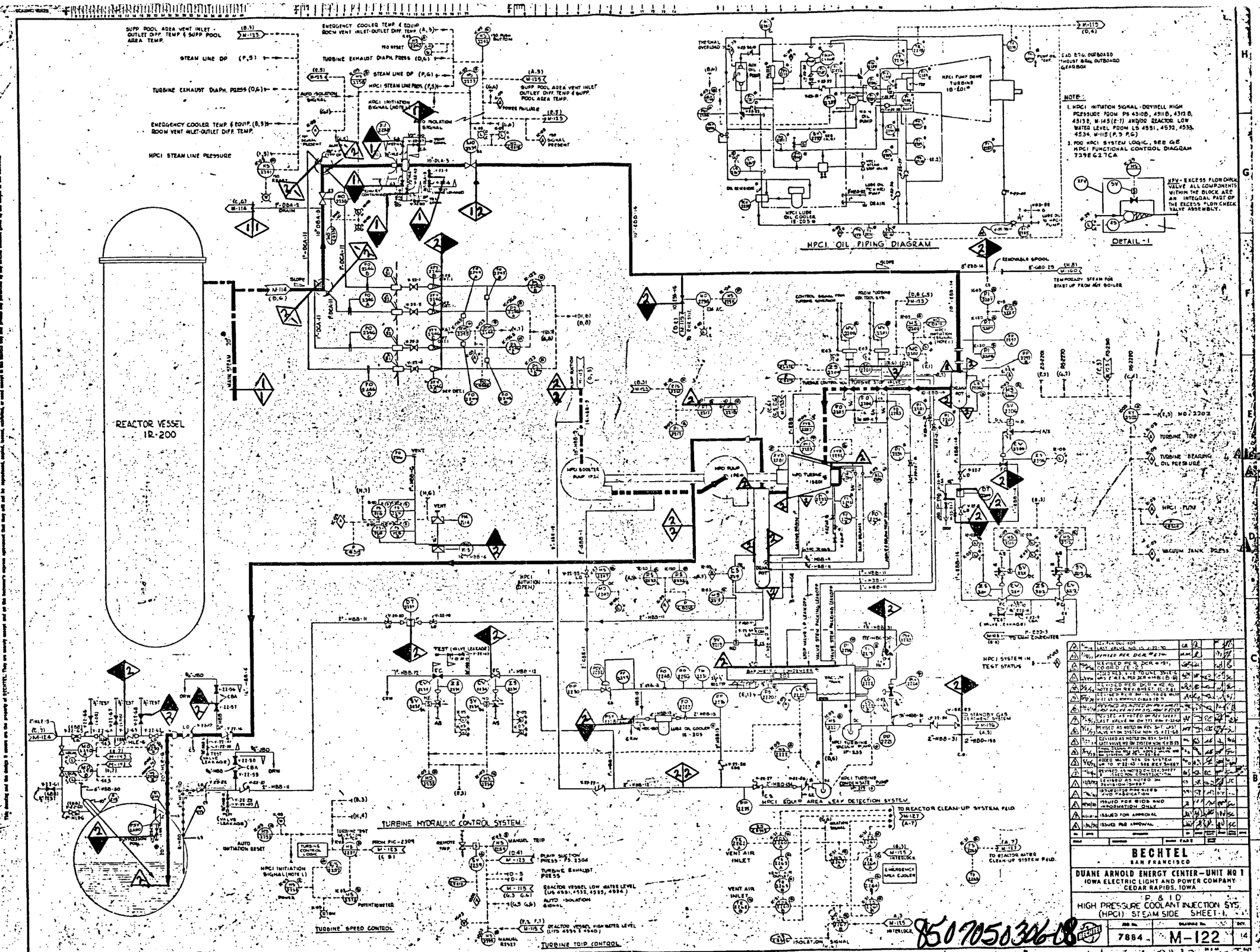
BECHTEL
SAN FRANCISCO

DUANE ARNOLD ENERGY CENTER—UNIT NO 1
IOWA ELECTRIC LIGHT AND POWER COMPANY
CEDAR RAPIDS, IOWA

P & ID
CORE SPRAY SYSTEM

7884 M-121

8507050306-07



NOTES:

1. HPCI INITIATION SIGNAL - DRYWELL HIGH PRESSURE FROM PS 4310 B, 4311 B, 4312 B, 4313 B, N-14B (E,7) AND/OR REACTOR LOW WATER LEVEL FROM LIS 4531, 4532, 4533, 4534, M-115 (P.5 P.6)
2. FOR HPCI SYSTEM LOGIC, SEE G.E. FUNCTIONAL CONTROL DIAGRAM 729E627CA

REACTOR VESSEL
(B-2.00)

TO CONDENSATE STORAGE TANKS M-109

FROM CONDENSATE STORAGE TANKS (C,9) M-109

COND. STORAGE TK. LEVEL

SUPP. CHAMBER HIGH LEVEL (B,8)

AUTO ISOLATION SIGNAL (G.5 H.6) M-122

FROM RCIC M-79 (C-5)

HPCI INITIATION SIGNAL (NOTE 1)

(A,3) (F,4)

FROM MO 2220 & 2320

TEST (VALVE LEAKAGE)

FEEDWATER SYSTEM

TURBINE SPEED CONTROL LOGIC (A-01)

(B,3) M-122

MIN FLOW LINE

SUPPRESSION POOL

EMR TEST LINE

TO MO-1300 (P,3)

WALL PENETRATION B-27

TEST (VALVE LEAKAGE)

BOOSTER PUMP

PUMP

HPCI PUMP 1P204

HPCI PUMP DRIVE TURBINE M-123

STEAM EXHAUST

VENT

INVERTER FAILURE

DC/AC

DC TO AC INVERTER

(E,4) M-123 HPCI 618

(D,9)

(C,6)

(E,2)

Also Available On Aperture Card

TI APERTURE CARD

10	7/1/85	REV PER DCR-500 (B-8)			
9	5/17/85	REV. PER DCR-335 (B-8)			
8	3/29/85	REVISED PER DDC 13			
7	9/24/84	REVISED PER DCN # 191 - CO-ORD (E-3)			
6	7/24/84	REVISED AS NOTED ON R1 SHEET 1 AND VALVE NOS ON SYSTEM NOW IN V.E.S.P.			
5	5/29/84	REVISED AS NOTED ON REV 5HT. LAST VALVE NO'S ON SYSTEM NOW IN V.E.S.P.			
4	3/23/84	FINAL DESIGN REVIEW, REVISED AS NOTED ON REVISION SHEET			
3	9/21/83	ADDED VALVE NOS ON SYSTEM UP TO P.I.R. 335 REV SHEET			
2	5/18/83	REVISED AS NOTED ON REV SHEET & NUMBERING CORRECTION			
1	12/9/82	REVISED AS NOTED ON REVISION SHEET			
	8/5/82	ISSUED FOR CONSTRUCTION AND TEST CERTIFICATION			
	7/1/82	ISSUED FOR APPROVAL			
	4/16/82	ISSUED FOR BIDS & INFO. ONLY			
	4/9/82	ISSUED FOR APPROVAL			
	3/26/82	ISSUED FOR APPROVAL			

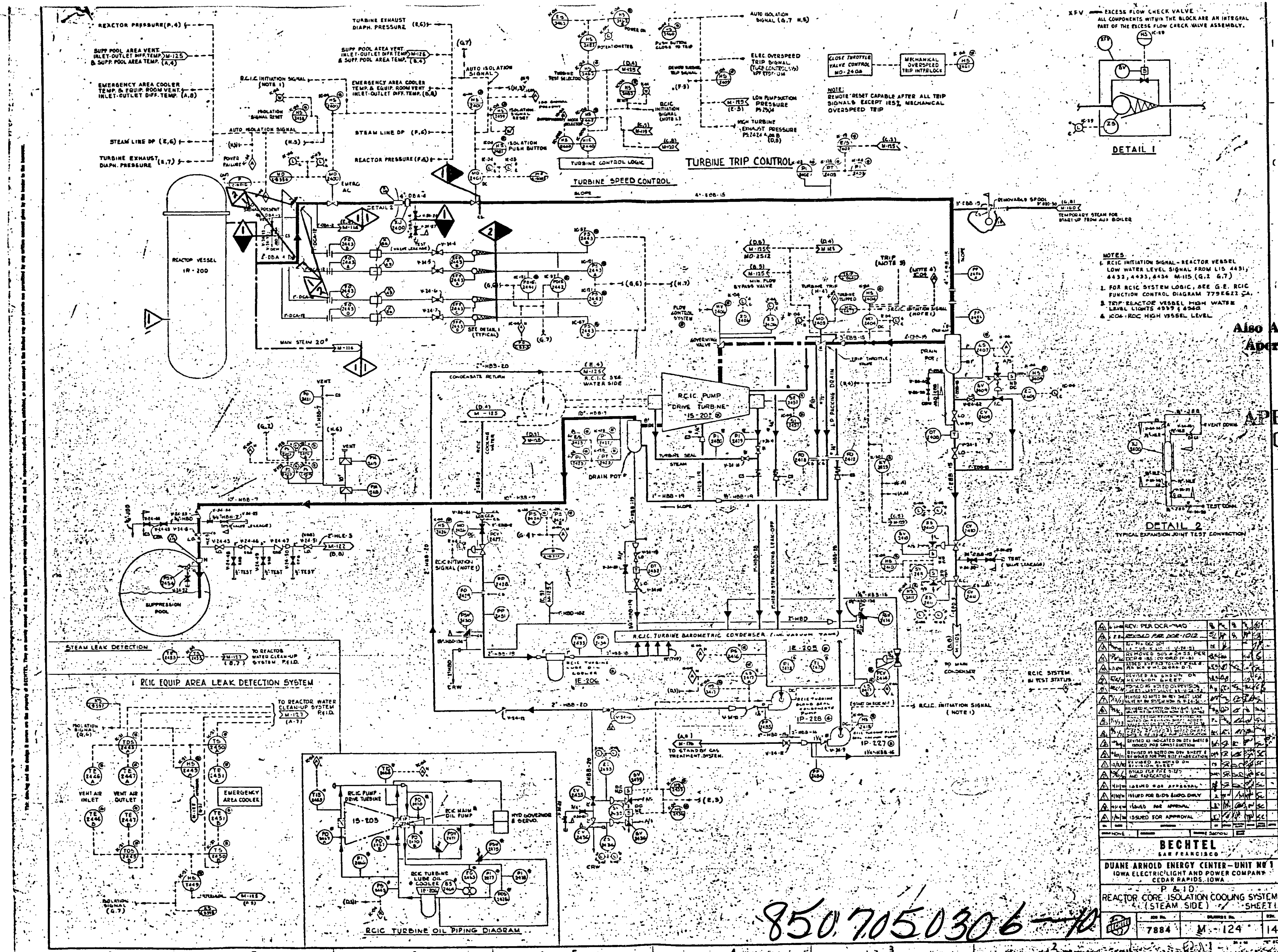
BECHTEL
SAN FRANCISCO

DUANE ARNOLD ENERGY CENTER — UNIT NO 1
IOWA ELECTRIC LIGHT AND POWER COMPANY
CEDAR RAPIDS, IOWA

P & ID
HIGH PRESSURE COOLANT INJECTION SYS. (HPCI) WATER SIDE SHEET 2

	7884	M-123	10

850705030609



Also Available On Aperture Card

TI APERTURE CARD

REACTOR VESSEL IR 200

SUPPRESSION POOL

FROM REACTOR WATER CLEANUP SYSTEM

FEEDWATER

RCIC INITIATION SIGNAL (NOTE #1)

RCIC PUMP JP-226

RCIC PUMP DRIVE TURBINE 15-203

STEAM SUPPLY

STEAM EXHAUST

TO TURBINE CONTROL LOGIC

TURBINE CONTROL SCHEME

RCIC CONDENSATE RETURN

FROM CONDENSATE STORAGE TANKS

INTERLOCK WITH MO-1500 (G-8)

INTERLOCK WITH MO-2400 (F-9)

INTERLOCK WITH MO-2401 (F-9)

RCIC ISOLATION SIGNAL

TEST (VALVE LEAKAGE)

WALL PENETRATION (G.2)

LOCATE AS CLOSE AS PRACTICAL TO TORUS

TO REACTOR WATER CLEAN-UP SYSTEM P&ID M-127 (A-7)

SUPPRESSION POOL AREA LEAK DETECTION SYSTEM

VENT AIR INLET

VENT AIR OUTLET

ISOLATION SIGNAL (NPC1)

INVERTER

INVERTER VOLTAGE

FROM P-10 HEAT EXCHANGERS

NOTES

1. RCIC INITIATION SIGNAL - REACTOR VESSEL LOW WATER LEVEL SIGNAL FROM LIS-263-45A&B, N-11B, C, E & F.
2. FOR RCIC SYSTEM LOGIC, SEE M-E RCIC FUNCTIONAL CONTROL DIAGRAM 729E655 CA.

Also Available On Aperture Card

T1 APERTURE CARD

8507150306-11

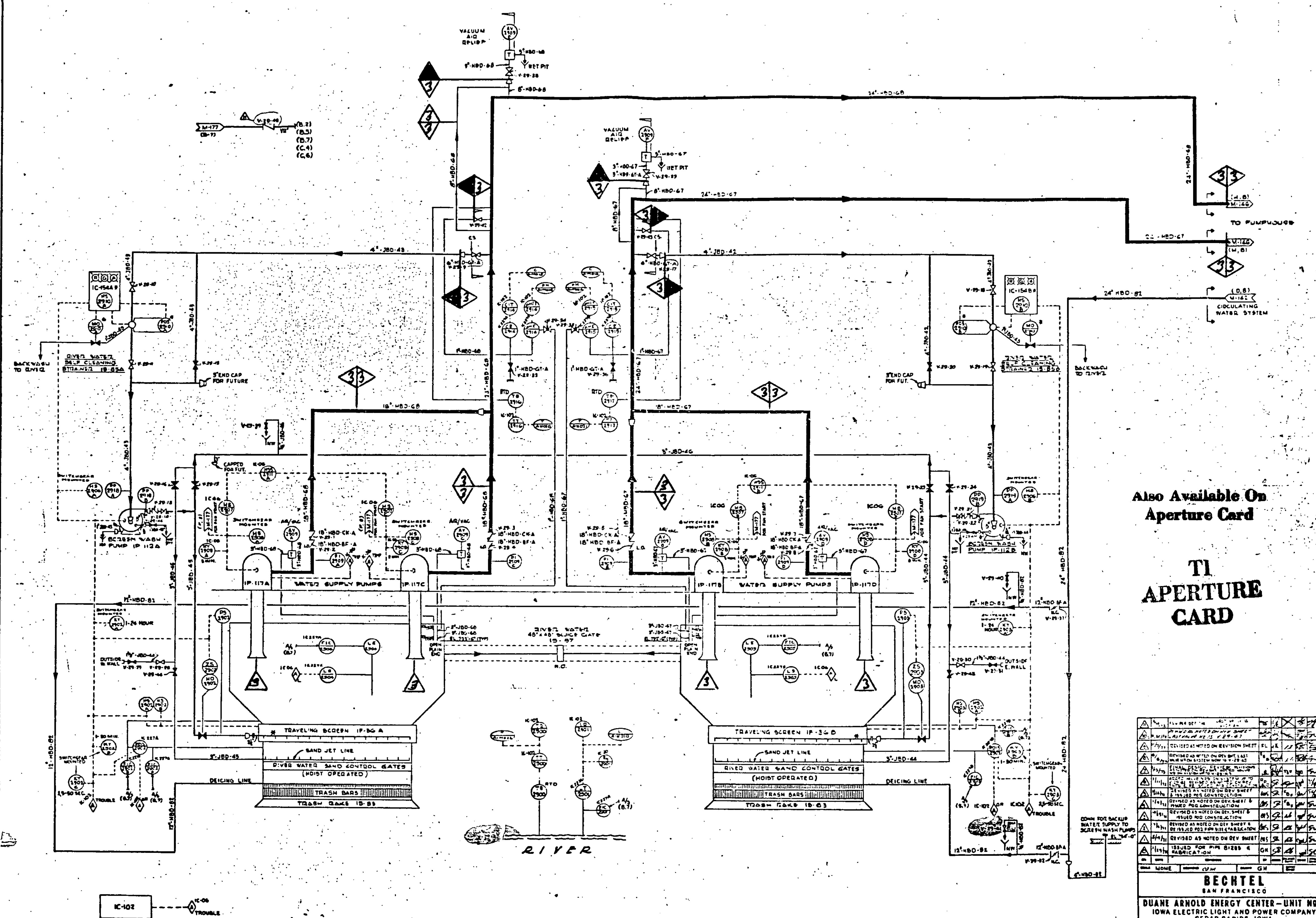
MARK	REVISION	BY	CHK	APP	DATE
15	REV. PER DOC. 494 (G.2)	RL	[illegible]		CAT
14	REVISED PER DCR 1040	RL	[illegible]	[illegible]	[illegible]
13	REV PER DCR-1051	RL	[illegible]	[illegible]	[illegible]
12	REV PER DCR 326	RL	[illegible]	[illegible]	[illegible]
11	REV PER DCR-166	RL	[illegible]	[illegible]	[illegible]
10	REVISED PER DOC 80	RL	[illegible]	[illegible]	[illegible]
9	REVISED PER DCR-241 (C-1)	RL	[illegible]	[illegible]	[illegible]
8	REMOVED BUS # 1327 PER DCR # 185 CO-ORD. (A-1)	RL	[illegible]	[illegible]	[illegible]
7	REVISED AS NOTED ON REV. SHEET UNIT VALVE MOV SYSTEM (1 OF 3)	RL	[illegible]	[illegible]	[illegible]
6	REVISED AS NOTED ON REV SHEET	RL	[illegible]	[illegible]	[illegible]
5	FINAL DESIGN REVIEW & AS NOTED ON REV SHT.	RL	[illegible]	[illegible]	[illegible]
4	REVISED AS NOTED ON REVISION SHEET	RL	[illegible]	[illegible]	[illegible]
3	REVISED AS NOTED ON REV. SHEET ISSUED FOR CONSTRUCTION	RL	[illegible]	[illegible]	[illegible]
2	REVISED AS NOTED ON REVISION SHEET	RL	[illegible]	[illegible]	[illegible]
1	REVISED AS NOTED ON REV. SHEET	RL	[illegible]	[illegible]	[illegible]
0	ISSUED FOR APPROVAL	RL	[illegible]	[illegible]	[illegible]

BECHTEL SAN FRANCISCO

DUANE ARNOLD ENERGY CENTER – UNIT NO 1
IOWA ELECTRIC LIGHT AND POWER COMPANY
CEDAR RAPIDS, IOWA

P & ID:
REACTOR CORE ISOLATION COOLING SYSTEM (WATER SIDE) SHEET 2

BECHTEL	JOB NO. 7884	DRAWING NO. M-125	REV. 15



Also Available On Aperture Card

TI APERTURE CARD

Revision
[partly illegible]
REVISED AS NOTED ON REV SHEET [partly illegible]
REVISED AS NOTED ON REVISION SHEET
REVISED AS NOTED ON REV SHT. LAST VALVE NO. IN SYSTEM NOW IS V-29-45
FINAL DESIGN REVIEW REVISIONS
ADDED VALVE NOS. IN SYSTEM / REVISED AS NOTED ON REV. SHEET
REVISED AS NOTED ON REV SHEET & ISSUED FOR CONSTRUCTION
REVISED AS NOTED ON REV. SHEET & ISSUED FOR CONSTRUCTION
REVISED AS NOTED ON REV. SHEET & ISSUED FOR CONSTRUCTION
REVISED AS NOTED ON REV SHEET & RE-ISSUED FOR PIPE SIZE & FABRICATION
REVISED AS NOTED ON REV SHEET
ISSUED FOR PIPE SIZES & FABRICATION

NONE — GH

BECHTEL
SAN FRANCISCO

DUANE ARNOLD ENERGY CENTER—UNIT NO 1
IOWA ELECTRIC LIGHT AND POWER COMPANY
CEDAR RAPIDS, IOWA

P&ID
RIVER WATER SUPPLY SYSTEM
INTAKE STRUCTURE

JOB No.	DRAWING No.	REV.
7884	M-129	11

8507050306-12

F2-11

1	10/11	REVISED PER DCR 942	GB	GB		
2	12/8	REVISED PER DCR 870 (LAST MARK 1 DCR 870)	GB	GB		
3	5/11	REVISED PER DCR 871				
4	1/11	REVISED PER DDC-150				
5	4/5/10	REVISED PER DDC 1-0 (5.67 VALVE TYPES CHANGED TO "GATE")				
6	7/10	REVISED AS NOTED ON DEV SHEET				
7	7/10	REVISED AS NOTED ON DEV SHEET, ISSUED FOR CONSTRUCTION				
8	10/9	REVISED AS NOTED ON DEV SHEET (ISSUED FOR CONSTRUCTION)				
9	4/9	REVISED AS NOTED ON DEV SHEET (ISSUED FOR CONSTRUCTION)				
10	4/11/11	REVISED AS NOTED ON DEV SHEET ISSUED FOR CONSTRUCTION				
11	4/9/11	REVISED AS NOTED ON DEV SHEET (ISSUED FOR CONSTRUCTION)				
12	4/11/11	REVISED AS NOTED ON DEV SHEET ISSUED FOR CONSTRUCTION				
13	4/11/11	MOV 9435 AND GLOBE VALVE LOCATION CHANGES (SH. 2)				
14	6/9/11	REVISED AS NOTED ON DEV SHEET RE-ISSUED FOR PIPE SHOP FABRICATION				
15	3/4/11	REVISED AS NOTED ON DEV. SHEET				
16	7/6/11	ISSUED FOR PIPE SHOP FABRICATION				
17	9/14/11	ISSUED FOR APPROVAL				
18	2/15	PER PCR 2-0-1070				
19	8/16	REVISED PER PCR 894				

BECHTEL
SAN FRANCISCO

DUANE ARNOLD ENERGY CENTER—UNIT NO 1
IOWA ELECTRIC LIGHT AND POWER COMPANY
CEDAR RAPIDS, IOWA

P&ID
FUEL POOL COOLING & CLEAN-UP SYSTEM

25 No.	DRAWING No.	REV.
7884	M-134	18

8505050306-13

NOTES

PIPING FROM AUTO FILTER IF-122 TO ANALYZER AT-4248B NOT INSTALLED.

DETAIL "A"

INSTRUMENTS LOCATED IN C.W. SYSTEM HYDRAULIC POWER UNIT. FOR DETAILS SEE DWG. 7884-M-148-9.

	TAG NOS.			
1S-92 A	PS-4266 A	PS-4266 A	PI-4266 B	PI-4266 C
1S-92 B	PS-4267 A	PS-4267 B	PI-4267 A	PI-4267 B	PI-4267 C

11	12/31/84	REVISED PER DCR 1478	B	S	
10	11/21/84	REVISED PER DCR-896	S	C	
9	10/8/84	REVISED PER DCR-540	S		
8	10/19/83	REVISED PER DCR #78	S		
7	7/11/83	REVISED PER DCR - 951	S		
6	7/11/83	REV PER DCR-639	S		
5	7/11/83	REVISED PER DCR 608			
4	7/11/83	REVISED PER DCC-180			
3	7/11/83	REVISED PER DCR-398 (D & E)			
2	4/8/83	REVISED PER DCC 0-115, AS NOTED ON REV SHEET			
1	3/4/83	REVISED PER DCC # 5215 ADDED NOTES & DETAIL "A" COORDINATE B-6 & C-6			
0	2/15/83	REVISED AS NOTED ON REVISION SHEET VALVE NOS. V-42-2			
9	1/11/83	REVISED AS NOTED ON REV SHEET VALVE NOS. V-42-2			
8	12/7/82	ADDED DRAIN LINE FOR 10" AUTO STRAINER IN HOUSE POWER UNITS PER DCR NO. 0-3			
7	11/23/82	FINAL DESIGN REVIEW & REVISED AS NOTED ON REVISION SHEET.			
6	7/12/82	REVISED AS NOTED ON REV SHEET & ADDED VALVE NOS. V-42-2 THRU V-42-5			
5	4/11/82	REVISED AS NOTED ON REV SHEET & ISSUED FOR CONSTRUCTION			
4	4/11/82	REVISED PER DCR 0-115			
3	3/5/82	REVISED AS NOTED ON REV SHEET & RE-ISSUED FOR PIPE SIZE FABRICATION			
2	12/31/81	REVISED PER DCC 0-115			
1	12/7/81	ISSUED FOR PIPE SIZES AND FABRICATION			
0	10/30/81	ISSUED FOR APPROVAL			

BECHTEL SAN FRANCISCO

DUANE ARNOLD ENERGY CENTER — UNIT NO 1
IOWA ELECTRIC LIGHT AND POWER COMPANY
CEDAR RAPIDS, IOWA

P & I D
CIRCULATING WATER SYSTEM

BECHTEL	JOB NO. 7884	DRAWING NO. M-142	REV. 12

8507050306-14