MAINE YANKEE ATOMIC POWER COMPANY

EDISON DRIVE
AUGUSTA, MAINE 04336
(207) 623-3521

August 22, 1985
MN-85-153 GDW-85-226

Director of Nuclear Reactor Regulation
United States Nuclear Regulatory Commission
Washington, D. C. 20555

Attention: Mr. Edward J. Butcher, Jr.
Acting Branch Chief
Operating Reactors Branch No. 3
Division of Licensing

References: (a) License No. DPR-36 (Docket No. 50-309)
(b) MYAPCo Letter to USNRC dated February 28, 1985 (MN-85-42)
(c) MYAPCo Letter to USNRC dated July 16, 1985 (MN-85-137)

Subject: Maine Yankee Control Room Design Review

Gentlemen:

Per your request, attached please find the HED resolution package. This package was previously sent to you informally on August 8, 1985.

Very truly yours,

MAINE YANKEE ATOMIC POWER COMPANY

G D Whittier

G. D. Whittier, Manager
Nuclear Engineering & Licensing

GDW/bjp

Enclosure:

cc: Dr. Thomas E. Murley w/o Enclosure
Mr. Cornelius F. Holden w/o Enclosure

A003 1/1 Limited Dist

6310L-RJP

VERIFICATION OF CHANGE

HED#	CPA#	EDCR#	DRAWING #	OTHER
51				SEE NOTE 4.
52	38-84		11550-FCB-3CB	
66			11550-FCB-3BN	
71	40-84	85-12		
72			11550-FCB-3BA	
73				SEE NOTE 4.
75	14-84			
76				SEE NOTE 4.
81				SEE NOTE 4.
84			11550-FCB-3BC	
86				SEE NOTE 4.
88				SEE NOTE 4.
101		83-32		
102		83-32		
105	122-84			
113	35-84			
148	17-84	84-71		
162			11550-FCB-3CE	
166			11550-FCB-3BK	
208				SEE NOTE 3.
225			11550-FCB-3BA	
236			11550-FCB-3CP	
245				SEE NOTE 2.
247			11550-FCB-3CB	
286	25-84			
292	25-84			
298				FUTURE: SEE NOTE 1.
342				SEE NOTE 8.

VERIFICATION OF CHANGE

HED#	CPA#	EDCR#	DRAWING #	OTHER
403			11550-FCB-3CN	SEE NOTE 2.
407				FUTURE: SEE NOTE 1.
408				FUTURE: SEE NOTE 1.
436			11550-FCB-3BA 11550-FCB-3BA	
503			11550-FCB-3BE 11550-FCB-3BG	
559	40-84	85-12		
569	84-84			
578	37-84	84-60		
586				FUTURE: SEE NOTE 1.
589	27-84	85-09		
598		83-32		
616				SEE NOTE 9.
618			11550-FCB-3BN	
619			11550-FCB-3BN	
621				SEE NOTE 5.
622				SEE NOTE 5.
625	10-84	84-75		
641	132-83	84-11		
665			11550-FCB-3CF	
677			11550-FCB-3CC	
756				SEE NOTE 7.
783				FUTURE: SEE NOTE 1.
790			11550-FCB-3CE	
793			11550-FCB-3CJ	
795	11-84			
796	38-84			
835				SEE NOTE 6.

NOTE 1:

CHANGE HAD BEEN PLANNED FOR 1985 OUTAGE. HOWEVER, WILL NOT BE IMPLIMENTED UNTIL SOME TIME IN THE FUTURE (1986 OR 1987 OUTAGE).

NOTE 2:

VERIFIED BY MAINE YANKEE ATOMIC POWER CO. MATERIAL PURCHASE REQUEST DATED 7/29/85.

NOTE 3:

AUX. FEED WATER SWITCHES HAVE BEEN REMOVED THEREFORE HED 208 IS NO LONGER APPLICABLE.

NOTE 4:

VERIFICATION OF CHANGE DOCUMENTED IN APPENDIX A.

NOTE 5:

VERIFICATION OF CHANGE DOCUMENTED IN APPENDIX B.

NOTE 6:

VERIFICATION OF CHANGE DOCUMENTED IN APPENDIX C.

NOTE 7:

CHANGE EXPLAINED BY HED

NOTE 8: CHANGES WERE INKED DIRECTLY ON INSTRUMENT.

NOTE 9:

VERIFICATION OF CHANGE DOCUMENTED IN APPENDIX D.

C.P.A.s

Conceptual Project No.: [illegible]
Date: July 23, 1984
Originator: J. Buczynski
Preliminary Project Cost Estimate: 10,000.00

H.F.

- [ ] Plant Manager
- [ ] Director Eng.
- [ ] Mngr of Ops
- [ ] V. P. of Ops
- [ ] Director Eng.
- [ ] FED Drftg

(HED #'s 52,796)

MAINE YANKEE CONCEPTUAL PROJECT AUTHORIZATION

TITLE: Pressurizer Panel Changes

Project Description/Discussion: The following changes have been made to make the pressurizer section of MCR-C more logical and easier to understand. (See attached sketch for new locations of components).

Justification for Project: These changes would associate the selector switches closer in proximity to the corresponding indicators. This would provide a cause-effect relationship between the action being taken and the associated indication and thereby reducing errors.

Projected Schedule: by end of 1985 Refueling.

Comments:

APPROVED

Dept. Head (Project Mgr.): D. J. [signature] Recommend Further Investigation

Plant Eng. Dept.: T. M. [signature] Recommend Further Investigation

Plant Mgr: E.W. Recommend Further Investigation

Mgr of Operations: C.D. Frizzle Approval Further Investigation

Vice President of Operations: JBR Approve Further Investigation.

No. 32

HED RECORD

-3
0

PANEL I.D. MCB-C-V

COMPONENT I.D. 150

COMPONENT TITLE/SERVICE Selector Switch/Pressurizer Level Ch. X or Y

DISCREPANCY

Selector does not point at indicator being selected

GUIDE No. ______ TITLE ______

GUIDE No. ______ TITLE ______

GUIDE No. ______ TITLE ______

H.E. LIMITS ______

TASK I.D. Subtask 3 /EOP 2-70-3/2.7.2

PHOTO RECORD ______

COMMENTS ______

VERIFICATION ______

HED RECORD

-1
0

PANEL I.D. MCB-C-V

COMPONENT I.D. PC 101X,Y

COMPONENT TITLE/SERVICE Pressurizer Pressure Channel Selector Switch

DISCREPANCY

Selector does not point at indicator being selected

GUIDE No. ________ TITLE ________

GUIDE No. ________ TITLE ________

GUIDE No. ________ TITLE ________

H.E. LIMITS ________

TASK I.D. Subtask 3/EOP 2-70-3/2.7.4

PHOTO RECORD ________

COMMENTS switch not directed to selected controller.

VERIFICATION ________

REV. 00

No. 215

-3
0

HED RECORD

PANEL I.D. MCB-C-V

COMPONENT I.D. 150

COMPONENT TITLE/SERVICE Selector Switch/Pressurizer Level Channel Select

DISCREPANCY

Wrong type control for function

(should be OT2 type)

GUIDE No. 6.4.1.1c(1) TITLE General Principles - Human Suitability

GUIDE No. TITLE

GUIDE No. TITLE

H.E. LIMITS Each control should be recognizable in terms of it's function

TASK I.D. Subtask 4

PHOTO RECORD

COMMENTS

VERIFICATION

HED RECORD

-A
-D

PANEL I.D. MCB-C-V

COMPONENT I.D. /150

COMPONENT TITLE/SERVICE PZR Level Channel Select

DISCREPANCY

Label is below control

GUIDE No. 6.6.2.1.a TITLE Normal Placement

GUIDE No. TITLE

GUIDE No. TITLE

H.E. LIMITS Labels should be placed above the element(s) they describe

TASK I.D.

PHOTO RECORD

COMMENTS No room on MCB

VERIFICATION

NO. 566

30

HED RECORD

PANEL I.D. MCB-C-V

COMPONENT I.D. TE-110/57

COMPONENT TITLE/SERVICE Selector Switch

DISCREPANCY

These indicators are not as near in proximity as they can be with their associated controls or displays.

GUIDE No. 6.9.1.1a TITLE Single Control and display pair/proximity

GUIDE No. TITLE

GUIDE No. TITLE

H.E. LIMITS A visual display that will be monitored during control manipulation should be located as near as possible to the controls.

TASK I.D. Sub Task 4.

PHOTO RECORD

COMMENTS Add to CAR on Press Select Switch

VERIFICATION

No. 796

HED RECORD

10° D

PANEL I.D. MCB-C-V

COMPONENT I.D. LIC-101Y/78 + PC-101X/80 + HIC-101-1/91

COMPONENT TITLE/SERVICE Controllers/Pressurizer Level + Spray Characteristics + Pressurizer Pressure.

DISCREPANCY

Operators have confused the pressurizer level and pressure controllers with that of the spray characteristics.

GUIDE No. 6.6.6.1 TITLE Need For Location Aids

GUIDE No. TITLE

GUIDE No. TITLE

H.E. LIMITS Operator performance can be enhanced through use of locations aids.

TASK I.D. Subtask 1B

PHOTO RECORD

COMMENTS

VERIFICATION

REV. 00

NO 531

HED RECORD

1260

PANEL I.D. MCB-C-V

COMPONENT I.D. 15

COMPONENT TITLE/SERVICE PORV Set Point Selector

DISCREPANCY

Selector switch not near associated display

GUIDE No. 6.9.1.2.b.2 TITLE Multiple controls or displays

GUIDE No. TITLE

GUIDE No. TITLE

H.E. LIMITS Control should be placed as near as possible to the display...

TASK I.D. Sub Task 4.

PHOTO RECORD

COMMENTS Lo set meter is on rear of MCB LEG

See CAH Pres Section

VERIFICATION

HED RECORD

5-3-0

PANEL I.D. MCB-C-V

COMPONENT I.D. PC-101X, -101Y

COMPONENT TITLE/SERVICE Pressurizer Pressure/Pressurizer

DISCREPANCY

Pressure indicators have selector control mounted above the displays

GUIDE No. 6.9.1.2.b(1) TITLE Multiple controls or displays

GUIDE No. TITLE

GUIDE No. TITLE

H.E. LIMITS Displays should be located above the controls.

TASK I.D. Sub Task 4.

PHOTO RECORD

COMMENTS Add to [illegible] 5.6.6

VERIFICATION

NO. 547

HED RECORD

5-3

0

PANEL I.D. MCB-C-V

COMPONENT I.D. LIC-101X, -101Y/78

COMPONENT TITLE/SERVICE Pressurizer level/Pressurizer

DISCREPANCY

Pressurizer level indicators have a selector control mounted above the indicators

GUIDE No. 6.9.1.2.b(1) TITLE Multiple controls or displays

GUIDE No. TITLE

GUIDE No. TITLE

H.E. LIMITS Displays should be located above the controls

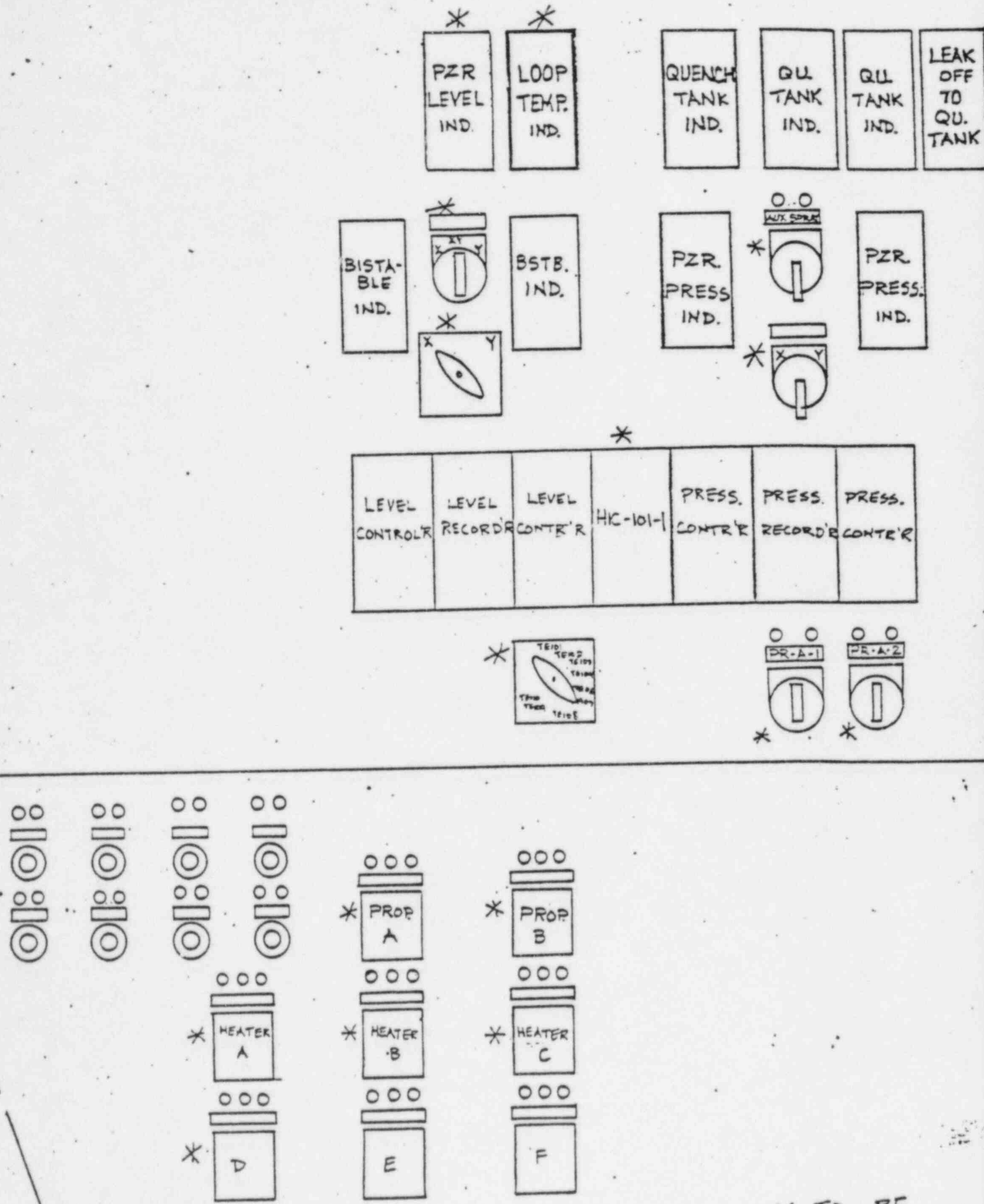
TASK I.D. Sub Task 4.

PHOTO RECORD

COMMENTS Same as 566

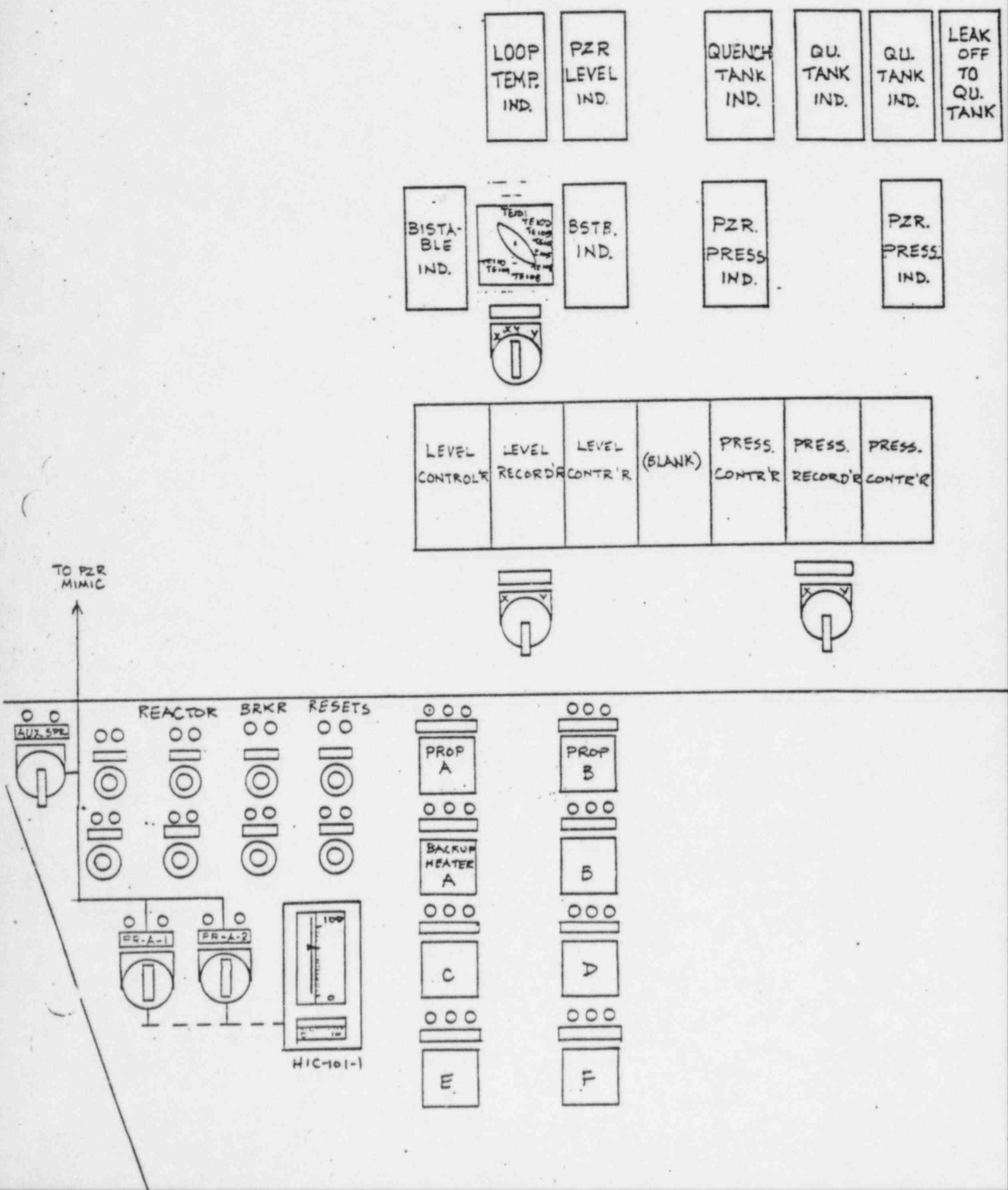
VERIFICATION

EXISTING PRESSURIZER PANEL INSTRUMENTS & CONTROLS



* TO BE RELOCATED

PROPOSED PZR PANEL I&C LOCATIONS



Date: 7/25/84
Originator: J. Buczynski
Preliminary Project Cost Estimate: $15,000.00

H.F.

(ESD #'s 71,559)

☐ Plant Manager
☐ Director Eng.
☐ Mngr of Ops
☐ V. P. of Ops
☐ Director Eng.
☐ PED Drftg

MAINE YANKEE CONCEPTUAL PROJECT AUTHORIZATION

TITLE: Improve CVCS/Loop Panel Layout

Project Description/Discussion: CVCS and Loop Panel indications are to be relocated for better utilization of the instruments in order that consistent, orderly system action can be achieved. This project has been designed to minimize the number of cut-outs and alterations on the MCB. See attached notes and drawing for new locations of instruments and ass[illegible]ated mimics.

J[illegible]fication for Project: These changes would make the configuration of the MCB more logical and easier to use.

Projected Schedule: By the end of 1985 Refueling.

Comments: APPROVED

Dept. Head (Project Mgr.): J. J. Stebert
Recommend Further Investigation

Plant Eng. Dept: [signature]
Recommend Further Investigation

Plant Mgr: ECW
Recommend Further Investigation

Mgr of Operations: CD Frizzle
Approved Further Investigation

Vice President of Operations: JBR
Approve Further Investigation

HED RECORD

-3

~~1300~~ 1500

PANEL I.D. MCB-C-V

COMPONENT I.D. FIC-218Y, -228Y, -238Y/90

COMPONENT TITLE/SERVICE Flow controller/seal water

DISCREPANCY

Seal water controllers not located with other seal instruments and other seal not well coordinated.

GUIDE No. 6.8.2.1c(1) TITLE Functional consideration

GUIDE No. TITLE

GUIDE No. TITLE

H.E. LIMITS Used together to perform tasks related to a specific functions (seal water system)

TASK I.D. Subtask 3 - Subtask 4

PHOTO RECORD

COMMENTS

VERIFICATION

HED RECORD

HE-2
~~1500~~ 1500

PANEL I.D. MCB-C-V&BB

COMPONENT I.D. HIC-101 PIQ & FI-202

COMPONENT TITLE/SERVICE Controllers and Indicators/Letdown Flow Control

DISCREPANCY

For ease of operation it would be better to have a single HIC controller indicating flow

GUIDE No. ______ TITLE ______

GUIDE No. ______ TITLE ______

GUIDE No. ______ TITLE ______

H.E. LIMITS ______

TASK I.D. Subtask 3

PHOTO RECORD ______

COMMENTS Conserve Space

VERIFICATION ______

HED RECORD

130

PANEL I.D. MDB-C-V

COMPONENT I.D. TI-215/113

COMPONENT TITLE/SERVICE Indicator/Seal Water inlet temp.

DISCREPANCY

These indicators are not as near in proximity as they can be with their associated controls or displays.

GUIDE No. 6.9.1.1a TITLE Single Control and display pair/proximity

GUIDE No. TITLE

GUIDE No. TITLE

H.E. LIMITS A visual display that will be monitored during control manipulation should be located as near as possible to the controls.

TASK I.D. Sub Task 4.

PHOTO RECORD

COMMENTS

VERIFICATION

NO.

HED RECORD

1.3

PANEL I.D. MCB-C-V

COMPONENT I.D. PI-215/111

COMPONENT TITLE/SERVICE Indicator/Seal Water Return Pressure

DISCREPANCY

These indicators are not as near in proximity as they can be with their associated controls or displays.

GUIDE No. 6.9.1.1a TITLE Single Control and display pair/proximity

GUIDE No. TITLE

GUIDE No. TITLE

H.E. LIMITS A visual display that will be monitored during control manipulation should be located as near as possible to the controls.

TASK I.D. Sub Task 4.

PHOTO RECORD

COMMENTS

VERIFICATION

HED RECORD

2 3

10

PANEL I.D. MCB-C-V

COMPONENT I.D. P1A-216/108

COMPONENT TITLE/SERVICE Indicating Alarm/Loop Fill Header Pressure

DISCREPANCY

These indicators are not as near in proximity as they can be with their associated controls or displays.

GUIDE No. 6.9.1.1a TITLE Single Control and display pair/proximity

GUIDE No. TITLE

GUIDE No. TITLE

H.E. LIMITS A visual display that will be monitored during control manipulation should be located as near as possible to the controls.

TASK I.D. Sub Task 4.

PHOTO RECORD

COMMENTS

VERIFICATION

No. 562

5-2

HED RECORD

PANEL I.D. MCB-C-V

COMPONENT I.D. P1A-212/107

COMPONENT TITLE/SERVICE Indicator/Charging Manifold Pressure

DISCREPANCY

These indicators are not as near in proximity as they can be with their associated controls or displays.

GUIDE No. 6.9.1.1a TITLE Single Control and display pair/proximity

GUIDE No. TITLE

GUIDE No. TITLE

H.E. LIMITS A vissual display that will be monitored during control manipulation should be located as near as possible to the controls.

TASK I.D. Sub Task 4.

PHOTO RECORD

COMMENTS

VERIFICATION

NO. 563

13-0

HED RECORD

PANEL I.D. MCB-C-V

COMPONENT I.D. TIC-201/102

COMPONENT TITLE/SERVICE Indicator/Letdown Temp.

DISCREPANCY

These indicators are not as near in proximity as they can be with their associated controls or displays.

GUIDE No. 6.9.1.1a TITLE Single Control and display pair/proximity

GUIDE No. TITLE

GUIDE No. TITLE

H.E. LIMITS A visual display that will be monitored during control manipulation should be located as near as possible to the controls.

TASK I.D. Sub Task 4.

PHOTO RECORD

COMMENTS

VERIFICATION

NO. 364

HED RECORD

130

PANEL I.D. MCB-C-V

COMPONENT I.D. AI-203/104

COMPONENT TITLE/SERVICE Indication/Boron Concentration

DISCREPANCY

These indicators are not as near in proximity as they can be with their associated controls or displays.

GUIDE No. 6.9.1.1a TITLE Single Control and display pair/proximity

GUIDE No. TITLE

GUIDE No. TITLE

H.E. LIMITS A visual display that will be monitored during control manipulation should be located as near as possible to the controls.

TASK I.D. Sub Task 4.

PHOTO RECORD

COMMENTS

VERIFICATION

NO. 565

HED RECORD

30

PANEL I.D. MCB-C-BB

COMPONENT I.D. P1C-211/70

COMPONENT TITLE/SERVICE Controller/Seal Water Pressure

DISCREPANCY

These indicators are not as near in proximity as they can be with their associated controls or displays.

GUIDE No. 6.9.1.1a TITLE Single Control and display pair/proximity

GUIDE No. TITLE

GUIDE No. TITLE

H.E. LIMITS A visual display that will be monitored during control manipulation should be located as near as possible to the controls.

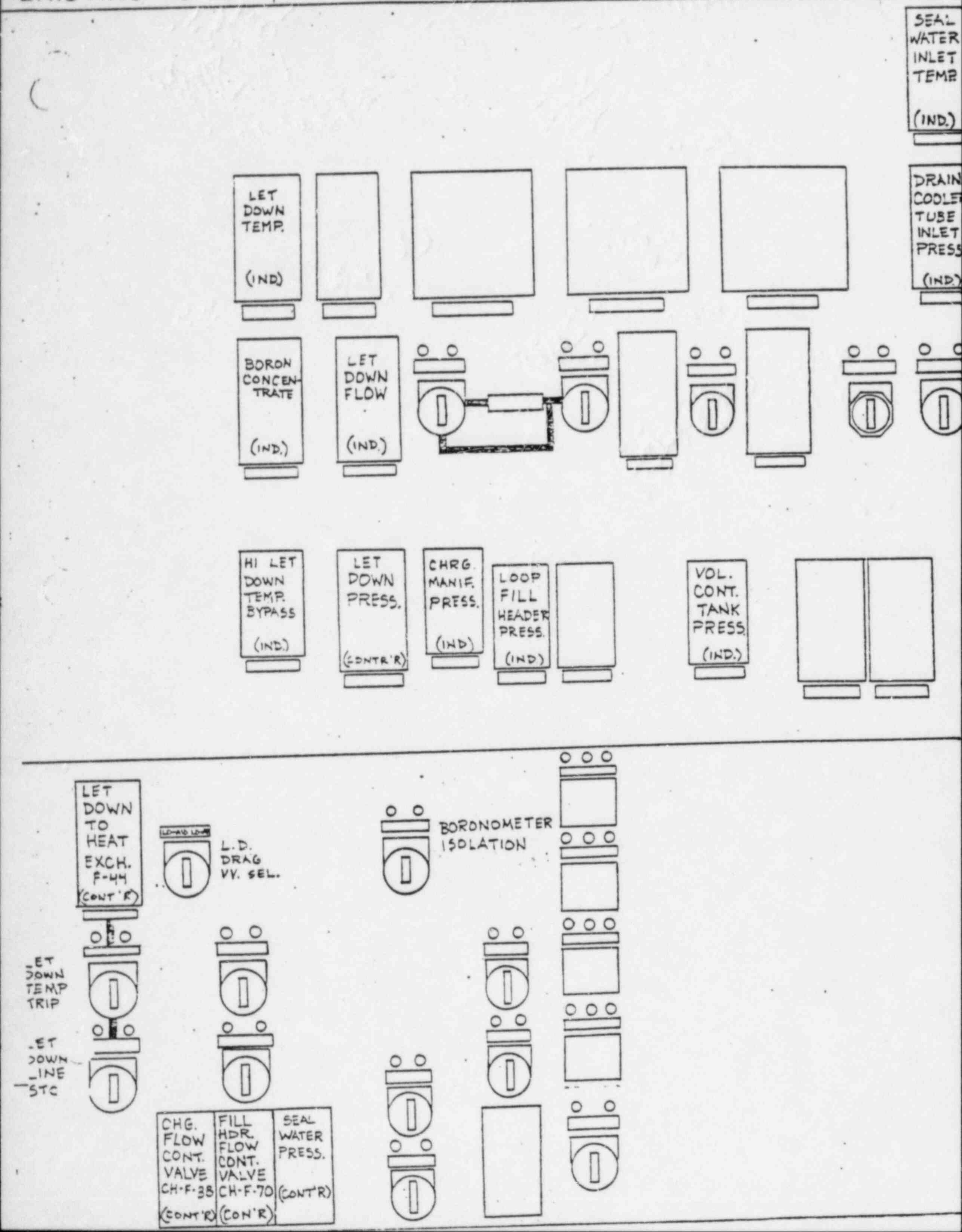
TASK I.D. Sub Task 4.

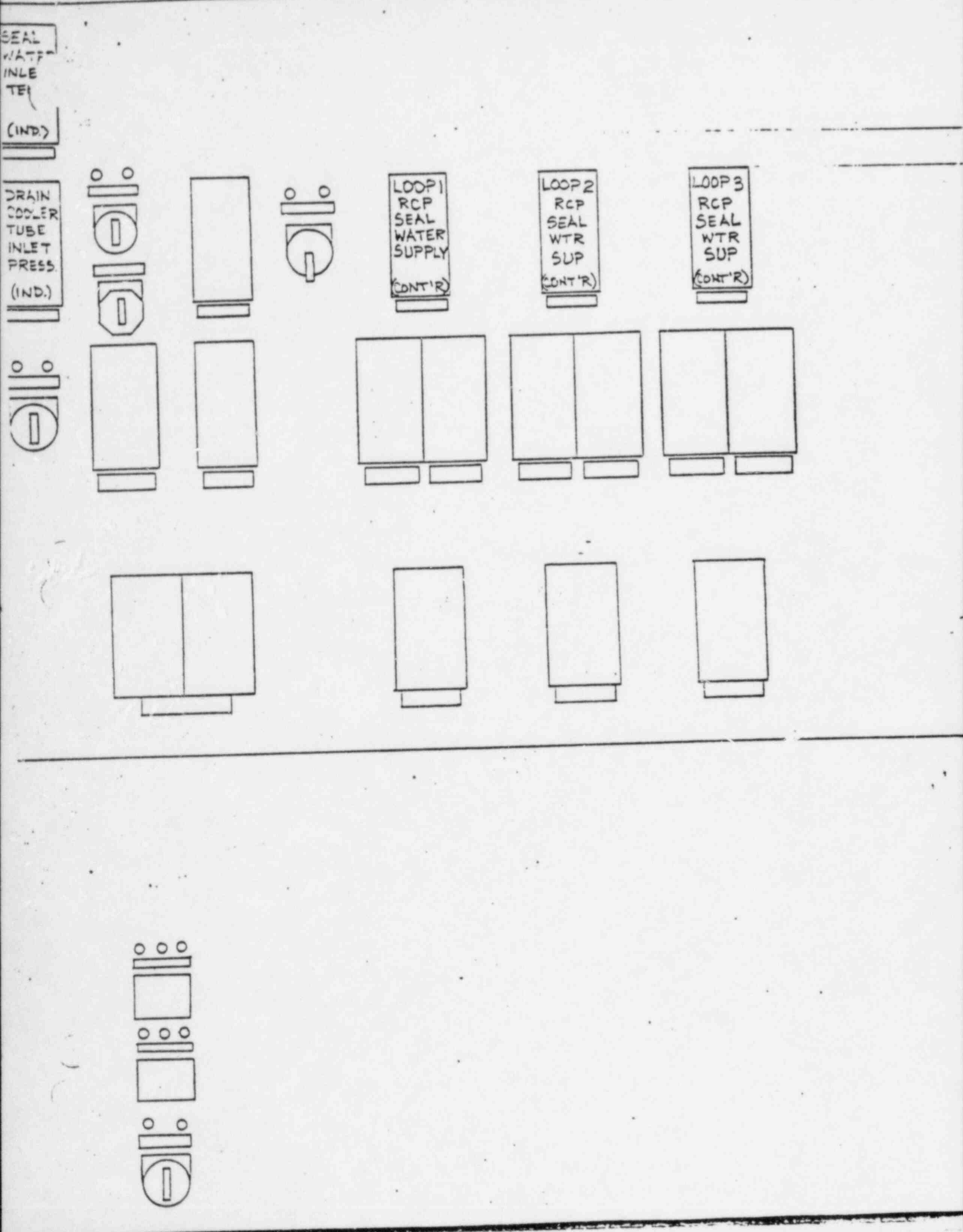
PHOTO RECORD

COMMENTS

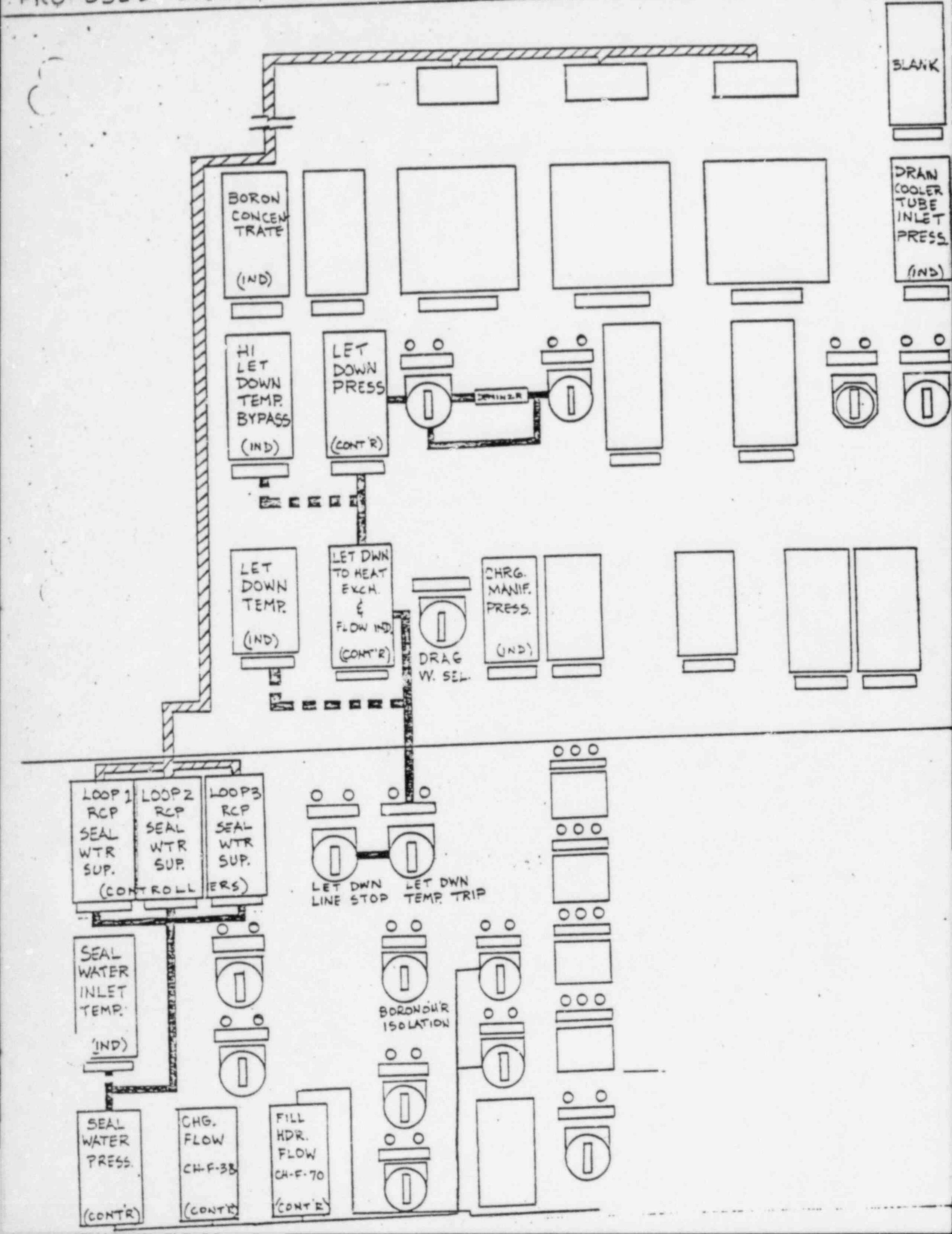
VERIFICATION

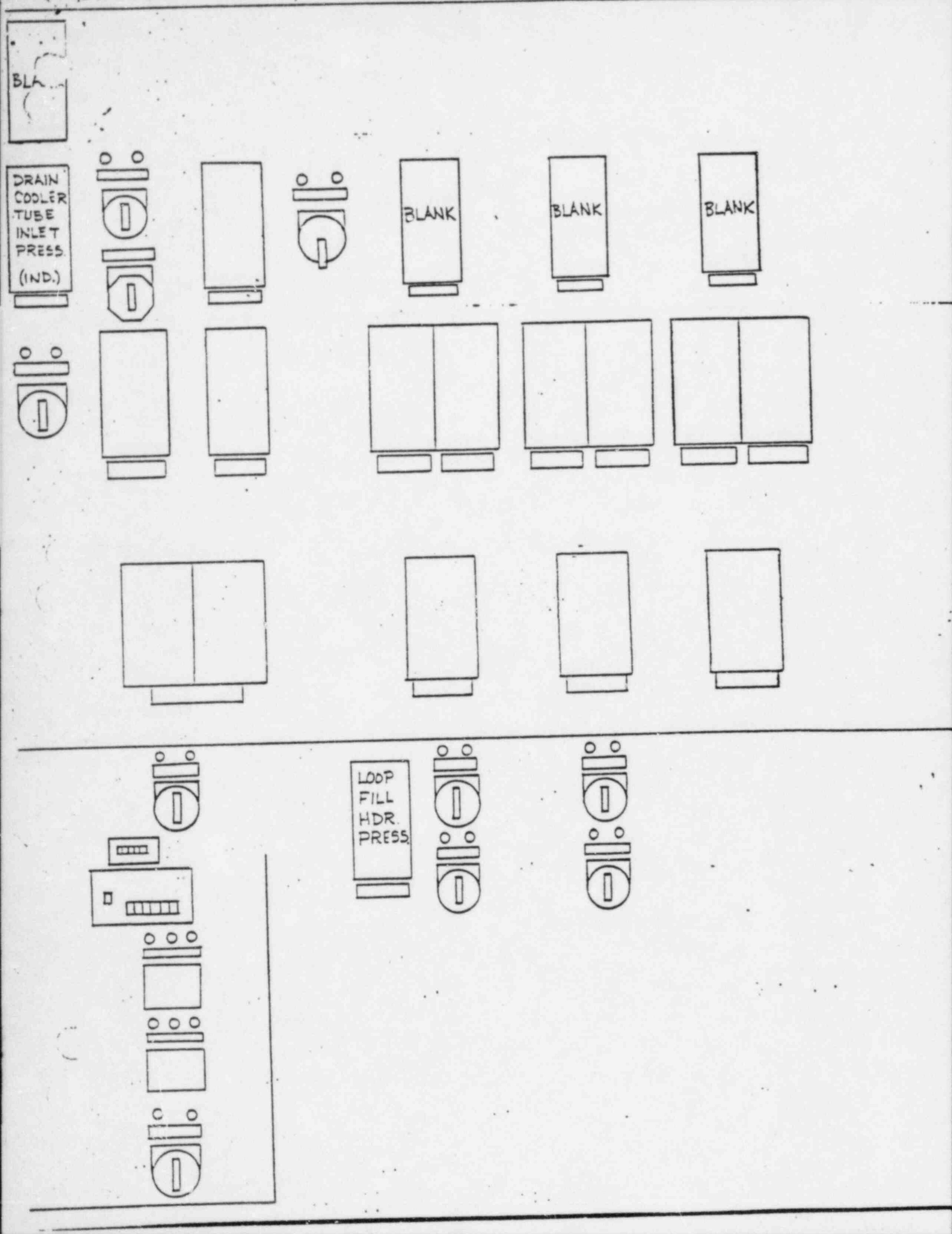
EXISTING CVCS & LOOP CONTROLS, SEC. C




SEAL WATE INLE TE (IND.)
DRAIN COOLER TUBE INLET PRESS. (IND.)
LOOP 1 RCP SEAL WATER SUPPLY (CONT'R)
LOOP 2 RCP SEAL WTR SUP (CONT'R)
LOOP 3 RCP SEAL WTR SUP (CONT'R)

PROPOSED CVCS & LOOP




BLA
DRAIN COOLER TUBE INLET PRESS (IND.)
BLANK
BLANK
BLANK
LOOP FILL HDR. PRESS

Date: 10/05/83
Originator: J. Buczynski
Preliminary Project Cost Estimate: 6,000.00

H.F.

(HED #75)

- [ ] Plant Manager
- [ ] Director Eng.
- [ ] Mngr of Ops
- [ ] V. P. of Ops
- [ ] Director Eng.
- [ ] PED Drftg

MAINE YANKEE CONCEPTUAL PROJECT AUTHORIZATION

TITLE: CIS/SIAS Light Box Test Switches

Project Description/Discussion: Position of test switches are located too high on MCB. These switches should be relocated in order to be reached easier. (See attached sketch).

Justification for Project: These switches should be able to be activated by all the Operators.

Projected Schedule: by end of 1985 Refueling.

Comments:

APPROVED

Dept. Head (Project Mgr.): J.O. Hebert
Recommend Further Investigation

Plant Eng. Dept:: T.W. Gifford
Recommend Further Investigation

Plant Mgr: E.W.
Recommend Further Investigation

Mgr of Operations:: C.D. Frizzle
Approved Further Investigation

Vice President of Operations: JBR
Approve Further Investigation

no. 75

HED RECORD

-1

~~1250~~ 1500

PANEL I.D. MCB-C-V

COMPONENT I.D. 153,154,155,59

COMPONENT TITLE/SERVICE Light Box/CIS/SIAS

DISCREPANCY

~~(1) Position of test switch too high on board~~ Need separate CPA

(2) Test switch not identified as to which box it goes with

(3) Test switch is in some cases testing functions so that it lights some lights in different boxes

GUIDE No. TITLE

GUIDE No. TITLE

GUIDE No. TITLE

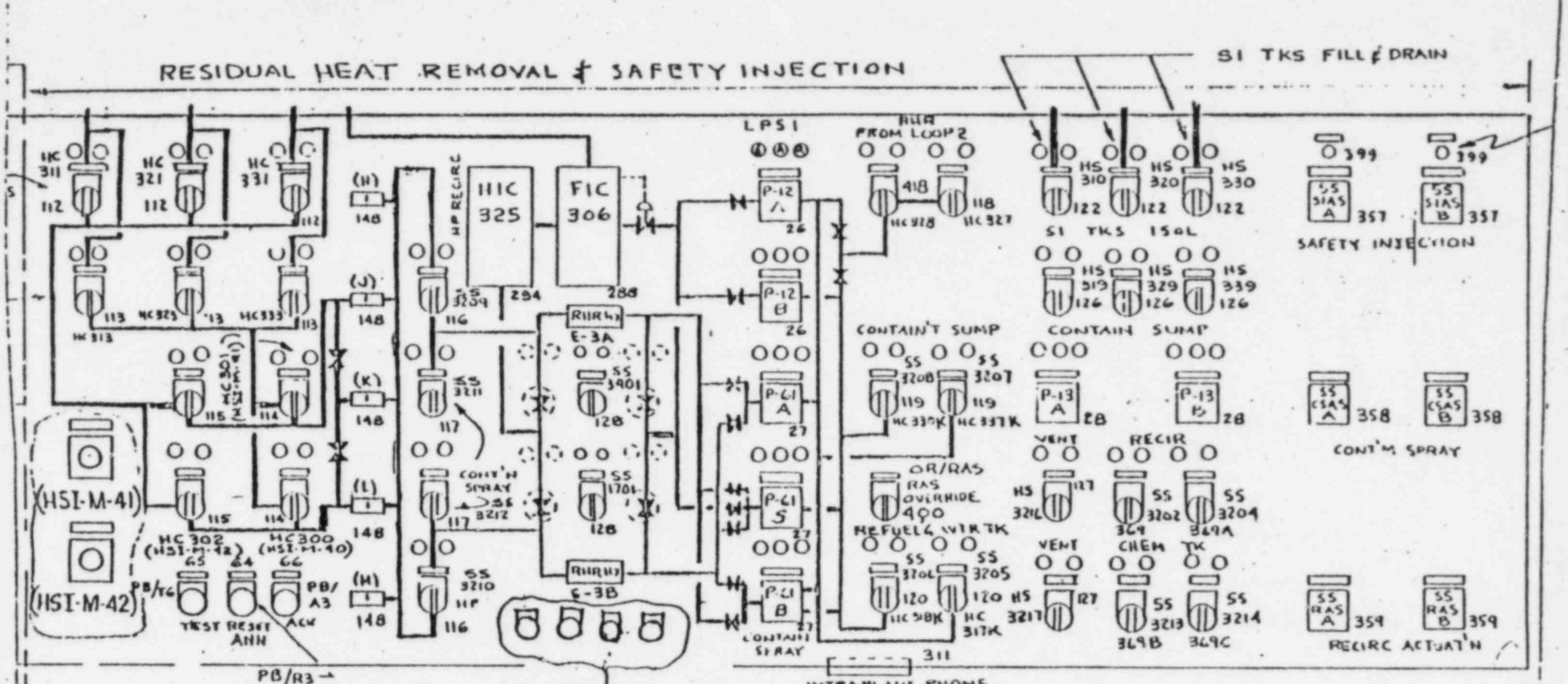
H.E. LIMITS

TASK I.D. Subtask 3/EOP 2-70-3/2.4.8

PHOTO RECORD

COMMENTS

ERIFICATION



BENCHBOARD, RHR AND SAFETY INJECTION

Suggested location

checked

Conceptual Project No.: 122-84
Date: 7/31/84
Originator: R. Lamothe
Preliminary Project Cost Estimate: $58,000.00

(HED # 105)

JRH

OCT 15 1984

- [x] Dept. Head
- [x] Plant Engineering
- [x] Plant Manager
- [x] Director Eng.
- [x] Mngr of Ops
- [ ] V. P. of Ops
- [ ] Director Eng.
- [ ] PED Drftg

To DPR 10-4-84

MAINE YANKEE CONCEPTUAL PROJECT AUTHORIZATION

TITLE: R.C.S. Temperature Indication

Project Description/Discussion: Present R.C.S. water temperature indicators for Tcold (T1A-111Y, 121Y, 131Y) and for Thot (TI-111X, 121X, 131X) do not have required scale ranges. Also, Thot channels are not isolated from the plant computer, and the indications are not located on the front of the MCB and do not include any recorders. Replacing the existing single range transmitter for Tcold with a dual range one, similar to the Thot transmitter, will provide 0°-750°F outputs. The dual range transmitter has built-in isolation between outputs, with the computer on the 515°-615°F channel. Indicators and 2-pen recorders fed from the higher range outputs will be located on the loop control panel of section C. The above provides the range, isolation and location necessary to meet R.G. 1.97 requirements

Justification for Project: R.G. 1.97 specifies Thot and Tcold instrument loops with a 0°-750°F range, direct operator access to temperature displays, provision of recorders and computer isolation from the 1E loops.

Projected Schedule: 1985 Refueling

Comments: Attached are a sketch of the proposed layout and the HED's from the H.F. Project to be integrated into the final fix

Dept. Head (Project Mgr.): [signature] Recommend Further Investigation

Plant Eng. Dept.: T.M. Tifford Recommend Further Investigation

Plant Mgr: CDF Recommend Further Investigation

Mgr of Operations: C.D. Frizzle Approve Further Investigation

Vice President of Operations: [initials] Approve Further Investigation

no. 105

HED RECORD

5-2
1260

PANEL I.D. MCB-C-V

COMPONENT I.D. ?

COMPONENT TITLE/SERVICE Temp. Indication/Hot Leg of RCS

DISCREPANCY

There is not available a continuous T. hot leg indication on the front of the Main Control Board. For following Natural Circulation, there should be (Recommend placement one per Hot leg on Main Control Board).

GUIDE No. 6.1.1.1b TITLE Accessability of Instrumentation

GUIDE No. TITLE

GUIDE No. TITLE

H.E. LIMITS Operators should not have to leave the primary operating area during operational sequences

TASK I.D. Subtask 3 Subtask 4

PHOTO RECORD

COMMENTS

VERIFICATION

No. 299

HED RECORD

PANEL I.D. MCB-B-(In Back)

COMPONENT I.D. NA

COMPONENT TITLE/SERVICE Indicator/T_{Hot} Let of RCS

DISCREPANCY

Scale does not encompass cooldown temperatures

GUIDE No. 6.5.1.2d TITLE Usability of Displayed Valves - Scale Range

GUIDE No. TITLE

GUIDE No. TITLE

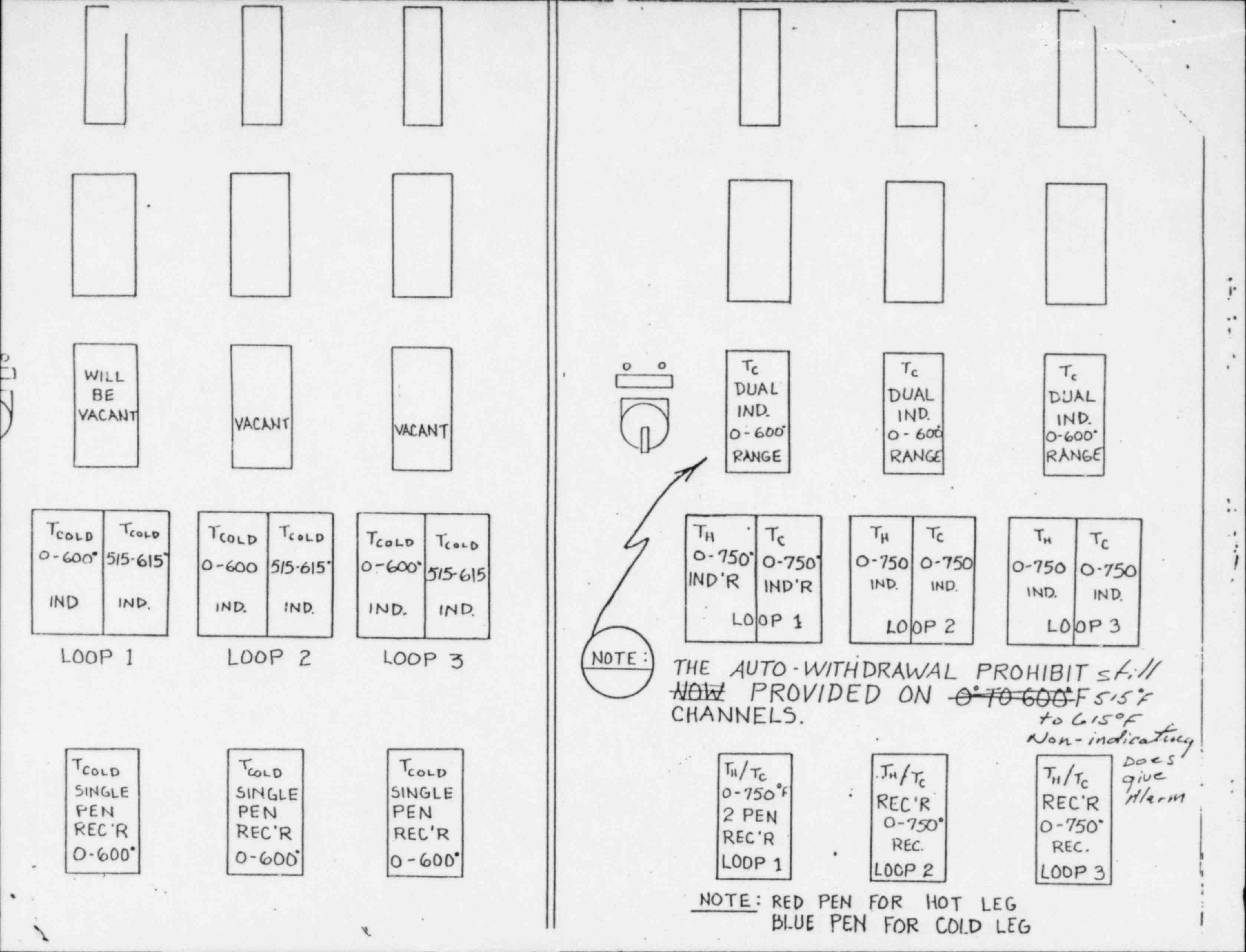
H.E. LIMITS Scales should be selected to encompass the expected range of operation

TASK I.D. Subtask 4

PHOTO RECORD

COMMENTS

VERIFICATION



WILL BE VACANT
VACANT
VACANT
T COLD 0-600° IND
T COLD 515-615° IND.
LOOP 1
T COLD 0-600 IND.
T COLD 515-615° IND.
LOOP 2
T COLD 0-600° IND.
T COLD 515-615 IND.
LOOP 3
T COLD SINGLE PEN REC'R 0-600°
T COLD SINGLE PEN REC'R 0-600°
T COLD SINGLE PEN REC'R 0-600°
T C DUAL IND. 0-600° RANGE
T C DUAL IND. 0-600° RANGE
T C DUAL IND. 0-600° RANGE
T H 0-750° IND'R
T C 0-750° IND'R
LOOP 1
T H 0-750 IND.
T C 0-750 IND.
LOOP 2
T H 0-750 IND.
T C 0-750 IND.
LOOP 3
NOTE:
THE AUTO-WITHDRAWAL PROHIBIT still ~~NOW~~ PROVIDED ON ~~0° TO 600°~~ F 515°F to 615°F CHANNELS.
Non-indicating
Does give Alarm
T H/T C 0-750°F 2 PEN REC'R LOOP 1
T H/T C REC'R 0-750° REC. LOOP 2
T H/T C REC'R 0-750° REC. LOOP 3
NOTE: RED PEN FOR HOT LEG
BLUE PEN FOR COLD LEG

Conceptual Project No.: 35-84
Date: 8-15-83
Originator: J. Buczynski
Preliminary Project Cost Estimate: 25,000.00
(HEO # 113)

H.F.

- [ ] Plant Engineering
- [ ] Plant Manager
- [ ] Director Eng.
- [ ] Mngr of Ops
- [ ] V. P. of Ops
- [ ] Director Eng.
- [ ] PED Drftg

MAINE YANKEE CONCEPTUAL PROJECT AUTHORIZATION

TITLE: Replacement of Metrascope

Project Description/Discussion: The Metrascope should be replaced with a computer driven 13" CRT display located on the vertical panel in Section B. This CRT would be located in place of ~~replace the~~ the Conrac. The Conrac would in turn be replaced by a 19" CRT that would display MPX numbers upon demand by the operator. This CRT would be placed on the annunciator panel in Section B replacing the unused projector screen. The CRT information will retain individual rod position indication, serving those functions as the old Metrascope. Improvement to rod identification will be further evaluated.

Justification for Project: Present location of Metrascope is poor, viewing is difficult due to low positioning. The Metrascope has become obsolete and difficult to maintain. Spare parts are non-existant. New locations would enable better grouping of rod position indications.

Projected Schedule: by end of the 1985 Refueling.

Comments: APPROVED

Dept. Head (Project Mgr.): D. Siebert
Recommend Further Investigation

Plant Eng. Dept.: T. M. Ward
Recommend Further Investigation

Plant Mgr: EWW
Recommend Further Investigation

Mgr of Operations: CD Frizzle
Approved Further Investigation

Vice President of Operations: JBR
Approve Further Investigation.

No. 113

HED RECORD

5-20

PANEL I.D. MCB-B-V (Floor)

COMPONENT I.D. N/A

COMPONENT TITLE/SERVICE Metroscope/Rod Positions

DISCREPANCY

Instrument is too low - obscured by operators desk

GUIDE No. 6.1.1.3.a TITLE Furniture and Equipment Layout (Viewing)

GUIDE No. TITLE

GUIDE No. TITLE

H.E. LIMITS

TASK I.D. Subtask 4

PHOTO RECORD

COMMENTS

VERIFICATION

NO 546

HED RECORD

PANEL I.D. MCB-B

COMPONENT I.D. Metrascope

COMPONENT TITLE/SERVICE Metrascope/Rod Height

DISCREPANCY

metrascope ~~TDFT recorder~~ is mounted below controls Typo error

GUIDE No. 6.9.1.2a(1) TITLE Multiple controls or displays

GUIDE No. TITLE

GUIDE No. TITLE

H.E. LIMITS Controls should be mounted below the display

TASK I.D. Subtask 4

PHOTO RECORD

COMMENTS

VERIFICATION

Conceptual Project No.: 1/-84
Date: 10/05/83
Originator: J. Buczynski
Preliminary Project Cost Estimate: 10,000.00

H.F.

(HEO # 148)

☐ Plant Manager
☐ Director Eng.
☐ Mngr of Ops
☐ V. P. of Ops
☐ Director Eng.
☐ PED Drftg

MAINE YANKEE CONCEPTUAL PROJECT AUTHORIZATION

TITLE: Reactor Head Vent Selector Switches

Project Description/Discussion: These controls (RC-M-54/56 and PR-M-89/90) are not used frequently and, therefore, should be moved, reduced in size, to the ESF Panel.

Justification for Project: These controls are taking up space on the MCB which could used by other instruments that are actuated more often.

Projected Schedule: By end of the 1985 refueling.

Comments: APPROVED

Dept. Head (Project Mgr.): D Q Stelat
Recommend Further Investigation

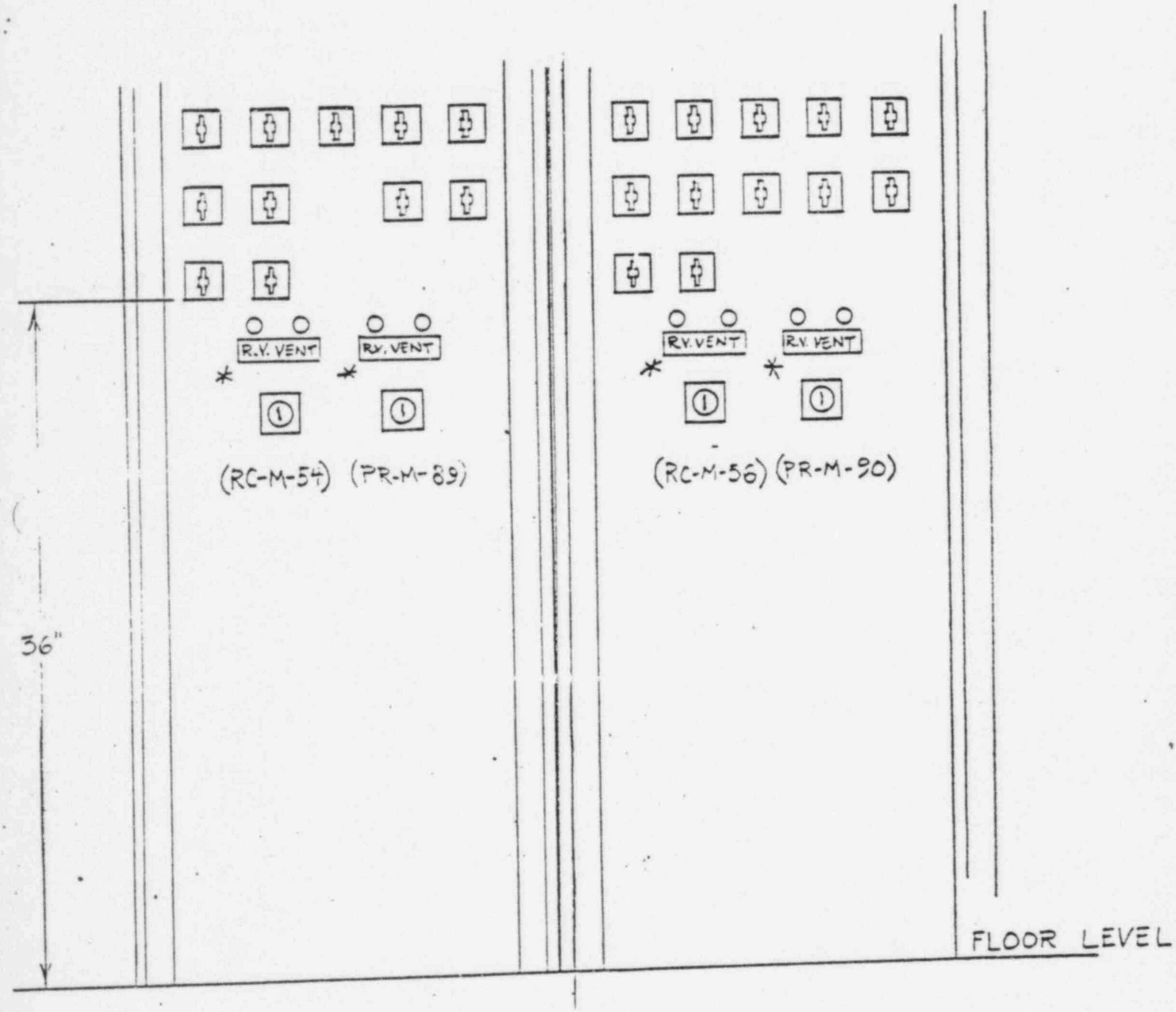
Plant Eng. Dept.: T. M. Hoffmann
Recommend Further Investigation

Plant Mgr: E.W.
Recommend Further Investigation

Mgr of Operations: C.D. Frizzle
Approve Further Investigation

Vice President of Operations: JBR
Approve Further Investigation.

PROPOSED LOCATION FOR REACTOR HEAD VENT SELECTOR SWITCHES



ESF PANEL

HED RECORD

PANEL I.D. MCB-C-BB

COMPONENT I.D. PCC-M-43,SCC-M-165/26

COMPONENT TITLE/SERVICE Keylock Switches/Reactor Head Vent

DISCREPANCY

Takes up too much space for the amount of use

GUIDE No. 6.4.1.1b TITLE General Principles - Economy

GUIDE No. TITLE

GUIDE No. TITLE

E.E. LIMITS Selected controls should be economic of space

TASK I.D. Subtask 4

PHOTO RECORD

COMMENTS

VERIFICATION

HED RECORD

PANEL I.D. MCB-C-BB

COMPONENT I.D. PCC-M-43,SCC-M-165/26

COMPONENT TITLE/SERVICE Keylock Switch/Reactor Head Vent

DISCREPANCY

Out of normal switch size

GUIDE No. 6.4.2.2c TITLE Coding of Controls - Size Coding

GUIDE No. 6.4.1.1c TITLE General Principles - Function Recognizability

GUIDE No. TITLE

H.E. LIMITS Controls used for performing the same function on different items of equipment should be the same size

TASK I.D. Subtask 4

PHOTO RECORD

COMMENTS

VERIFICATION

HED RECORD

PANEL I.D. MCB-C-BB

COMPONENT I.D. RC-M-54,-56; PR-M-89,-90/56

COMPONENT TITLE/SERVICE Keylock Switches/Reactor Vessel Head Vent System

DISCREPANCY

On a tee handle there should be a method of determining which end of the tee is the position of the switch

GUIDE No. 6.4.4.5d(1) TITLE Rotary Selector Controls - Position Indication

GUIDE No. TITLE

GUIDE No. TITLE

H.E. LIMITS Position indication should be provided

TASK I.D. Subtask 4

PHOTO RECORD

COMMENTS

VERIFICATION

HED RECORD

PANEL I.D. MCB-C-BB

COMPONENT I.D. RC-M-54,56; PR-M-89,90/56

COMPONENT TITLE/SERVICE Selector Switch/Reactor Vessel Head Vent

DISCREPANCY

Selector switches do not have system function label

GUIDE No. 6.6.3.1.a. TITLE Kinds of information-primary function

GUIDE No. TITLE

GUIDE No. TITLE

H.E. LIMITS

TASK I.D. Subtask 4

PHOTO RECORD

COMMENTS

VERIFICATION

HED RECORD

PANEL I.D. MCB-C

COMPONENT I.D. SEE ATTACHED LIST

COMPONENT TITLE/SERVICE LABELS

DISCREPANCY

Temporary labels used (Dymo Tape).

See Attached List

GUIDE No. 6.6.5.1.W. TITLE Use and control of temporary labels

GUIDE No. ______ TITLE ______

GUIDE No. ______ TITLE ______

H.E. LIMITS Temporary labels should be used only when necessary.

TASK I.D. Sub Task 4.

PHOTO RECORD ______

COMMENTS ______

VERIFICATION ______

HED 504.
CONTINUATION

LABEL LIST

	LOCATION	LABEL
	MCB-C-V	
1.	PR2012/92	CONTAINMENT PRESSURE
		CONTAINMENT SUMP
		CONTAINMENT HYDROGEN
2.	PR2013/92	CONTAINMENT PRESSURE
		CONTAINMENT SUMP
		CONTAINMENT HYDROGEN
3.	Sat Mon/151	HPSI TERM 50 MIN.
4.	PR 102X/92	PR 102X
	MCB-C-BB	
5.	RCM-54/56	RC-M-54
6.	RCM-56/56	RC-M-56
7.	PR-M-89/56	PR-M-89
8.	PR-M-90/56	PR-M-90
	MCB-C-V	
9.	Loop 1/126	SEAL WATER RETURN
10.	Loop 2/126	SEAL WATER RETURN
11.	Loop 3/126	SEAL WATER RETURN
	MCB-C-BB	
12.	P-1-1	LIFT
13.	P-1-2	LIFT
14.	P-1-3	LIFT
15.	P-1-1	B.S.
16.	P-1-2	B.S.
17.	P-1-3	B.S.
	MCB-C-V	
18.	/153	CIS ONLY
19.	/155	CIS & SIAS
	MCB-C-BB	
20.	VV/RAS/31	NORMAL
21.	VV/RAS/31	OVERRIDE
22.	SIAS-A/66	BLOCK-AUTO-MANUAL
23.	CSAS-A/66	BLOCK-AUTO-MANUAL
24.	RAS-A/66	BLOCK-AUTO-MANUAL
25.		

NO.

HED RECORD

1.3.0

PANEL I.D. MCB-C-BB

COMPONENT I.D. RC-M-54,56 & PR-M-89,90

COMPONENT TITLE/SERVICE Selector Switches/R.V. Head ~~Unit~~ VENT

DISCREPANCY

Controls not used frequently (should relocate to ESF Panel).

GUIDE No. 6.4.1.1b(1) TITLE Economy

GUIDE No. TITLE

GUIDE No. TITLE

H.E. LIMITS There should be a good reason to require a control for the function concerned.

TASK I.D. Subtask 4

PHOTO RECORD

COMMENTS

VERIFICATION

Conceptual Project No.: 83-84

Date: 10/05/83

Originator: J. Buczynski

Preliminary Project Cost Estimate: 3,000.00

(HED #'s 286,292)

H.F.

- [ ] Plant Manager
- [ ] Director Eng.
- [ ] Mngr of Ops
- [ ] V. P. of Ops
- [ ] Director Eng.
- [ ] PED Drftg

MAINE YANKEE CONCEPTUAL PROJECT AUTHORIZATION

TITLE: EHC System

Project Description/Discussion: The color coding on the EHC System is the exact opposite of the MCB. These indicating lights should be red-open green-closed. The pushbuttons on the MSR Panel are backwards from the EHC System. The pushbuttons should have open on top and closed on bottom on the MSR Control Panel. The keylocks are oriented with "OFF" at a position other than vertical.

Justification for Project: This would make the systems consistent with the rest of the therefor reducing the chance of error.

Projected Schedule: by end of 1985 Refueling.

Comments: APPROVED

Dept. Head (Project Mgr.): J. R. Hebert
Recommend Further Investigation

Plant Eng. Dept.: T. M. Gifford
Recommend Further Investigation

Plant Mgr: E. W.
Recommend Further Investigation

Mgr of Operations: C. D. Frizzle
Approval Further Investigation

Vice President of Operations: JBR
Approve Further Investigation

HED RECORD

5-3
0

PANEL I.D. MCB-A-BB

COMPONENT I.D. 107

COMPONENT TITLE/SERVICE Control Panel/Electric Hydrolic Control System

DISCREPANCY

On this panel red light means closed and green light means open. Just the opposite for the rest of the Valve indications

GUIDE No. 6.5.3.3d TITLE Design and Use of Legend Light Indications-Color Coding

GUIDE No. TITLE

GUIDE No. TITLE

H.E. LIMITS Color coding should be consistent throughout the control room

TASK I.D. Subtask 4

PHOTO RECORD

COMMENTS Correct color coding - [illegible]

VERIFICATION

HED RECORD

130

PANEL I.D. MCB-A-BB

COMPONENT I.D. 107

COMPONENT TITLE/SERVICE Control Panel/EHC System

DISCREPANCY

Off is in the non-vertical position

GUIDE No. 6.4.4.3d TITLE Key-operated Controls-ON/OFF Orientation

GUIDE No. TITLE

GUIDE No. TITLE

H.E. LIMITS Locks should be oriented so that the switch is off or normal when key is in vertical position

TASK I.D. Subtask 4

PHOTO RECORD

COMMENTS orient switch accordingly - Remark switch position as they will have been rotated

VERIFICATION

HED RECORD

5-3
1260
285

PANEL I.D. MCB-A-BB

COMPONENT I.D. 108

COMPONENT TITLE/SERVICE Control Panel/

DISCREPANCY

Pushbuttons have closed on top and open on bottom - backwards from the EHC system pushbuttons.

GUIDE No. 6.5.3.3b(1) TITLE Design and Use of Legend Light Indicators

GUIDE No. TITLE

GUIDE No. TITLE

H.E. LIMITS General legend design should be consistent throughout the control room

TASK I.D. Subtask 4

PHOTO RECORD

COMMENTS Correct pushbuttons as necessary

VERIFICATION

REV. 00

Conceptual Project No.: 84-84
Date: 7/20/84
Originator: R. Lamothe
[Prel]iminary Project Cost Estimate: 8,000.00

H.F.

(HED # 569)

☐ Dept. Head
☑ Plant Engineering
☑ Plant Manager
☐ Director Eng.
☐ Mngr of Ops
☐ V. P. of Ops
☐ Director Eng.
☐ PED Drftg

MAINE YANKEE CONCEPTUAL PROJECT AUTHORIZATION

TITLE: PCC, SCC and Service Water Indicators

Project Description/Discussion: Improper alignment and location of indicators for the service water, PCC and SCC controls present difficulty in associating corresponding indicators with operated controls. These indicators should be more distinct in location for immediate reference to the operator.

[Just]ification for Project: Such adjustments to indicator alignment and locations would place them closer in proximity to associated controls. This control-indicator association would reduce chances of error.

Projected Schedule: By end of 1987 refueling

Comments: APPROVED

Dept. Head (Project Mgr.): D. J. Delbert
Recommend Further Investigation

Plant Eng. Dept.: [signature]
Recommend Further Investigation

Plant Mgr: EW
Recommend Further Investigation

Mgr of Operations: C D Frizzle
Approve Further Investigation

Vice President of Operations: [signature]
Approve Further Investigation

HED RECORD

130

L I.D. MCB-A-V

COMPONENT I.D. TI3425, 1713/60 & 63 & P9A & B, P10A & B/5 & P29A, B, C, D/2

COMPONENT TITLE/SERVICE Indicators & Controls/Service Water, PCC and SCC

DISCREPANCY

These indicators are not lined up properly and are not as near in proximity as they can be with their associated controls or displays.

IDE No. 6.9.1.1a TITLE Single Control and display pair/proximity

GUIDE No. TITLE

GUIDE No. TITLE

H.E. LIMITS A visual display that will be monitored during control manipulation should be located as near as possilbe to the controls.

TASK I.D. Sub Task 4.

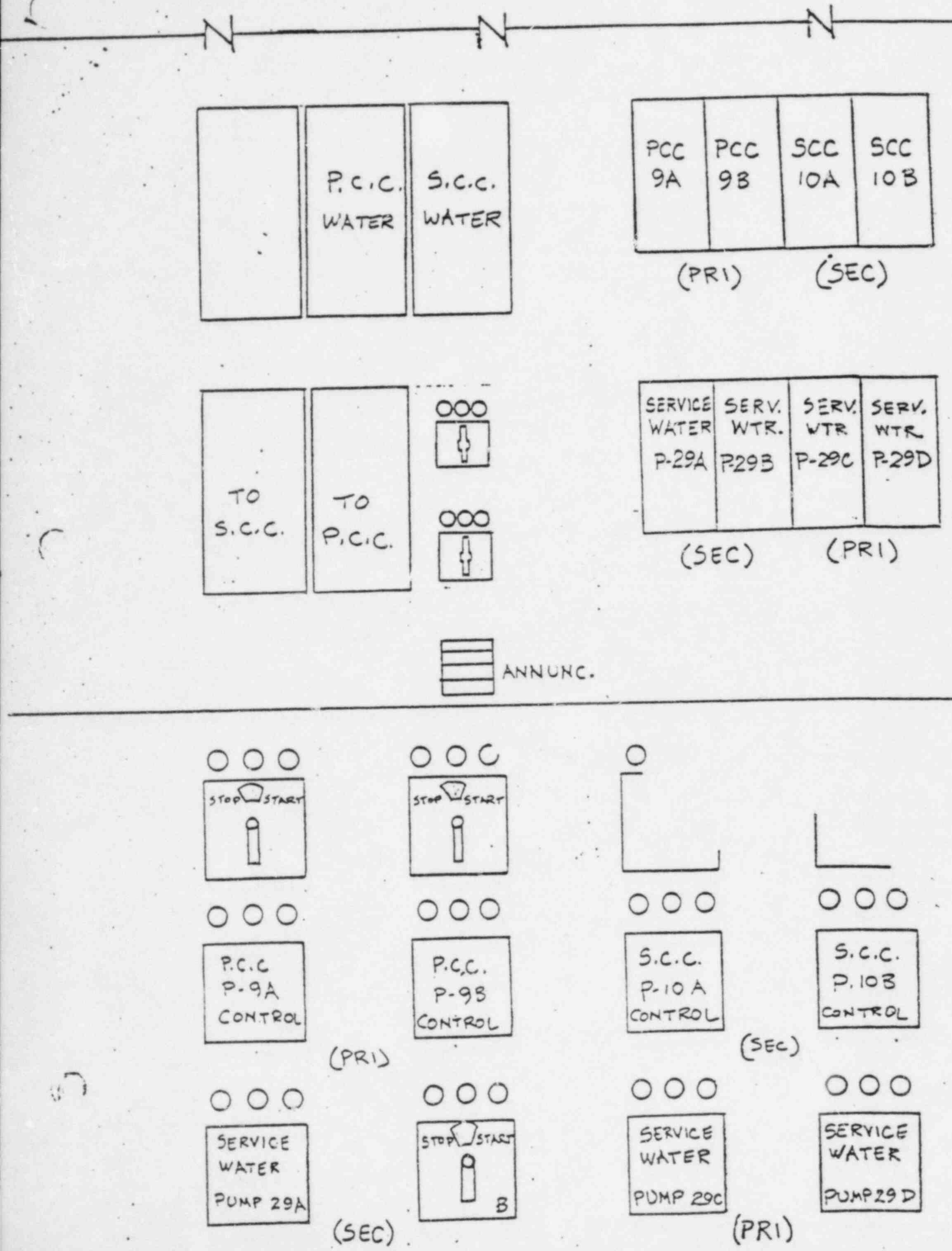
PHOTO RECORD

COMMENTS Re-align correctly

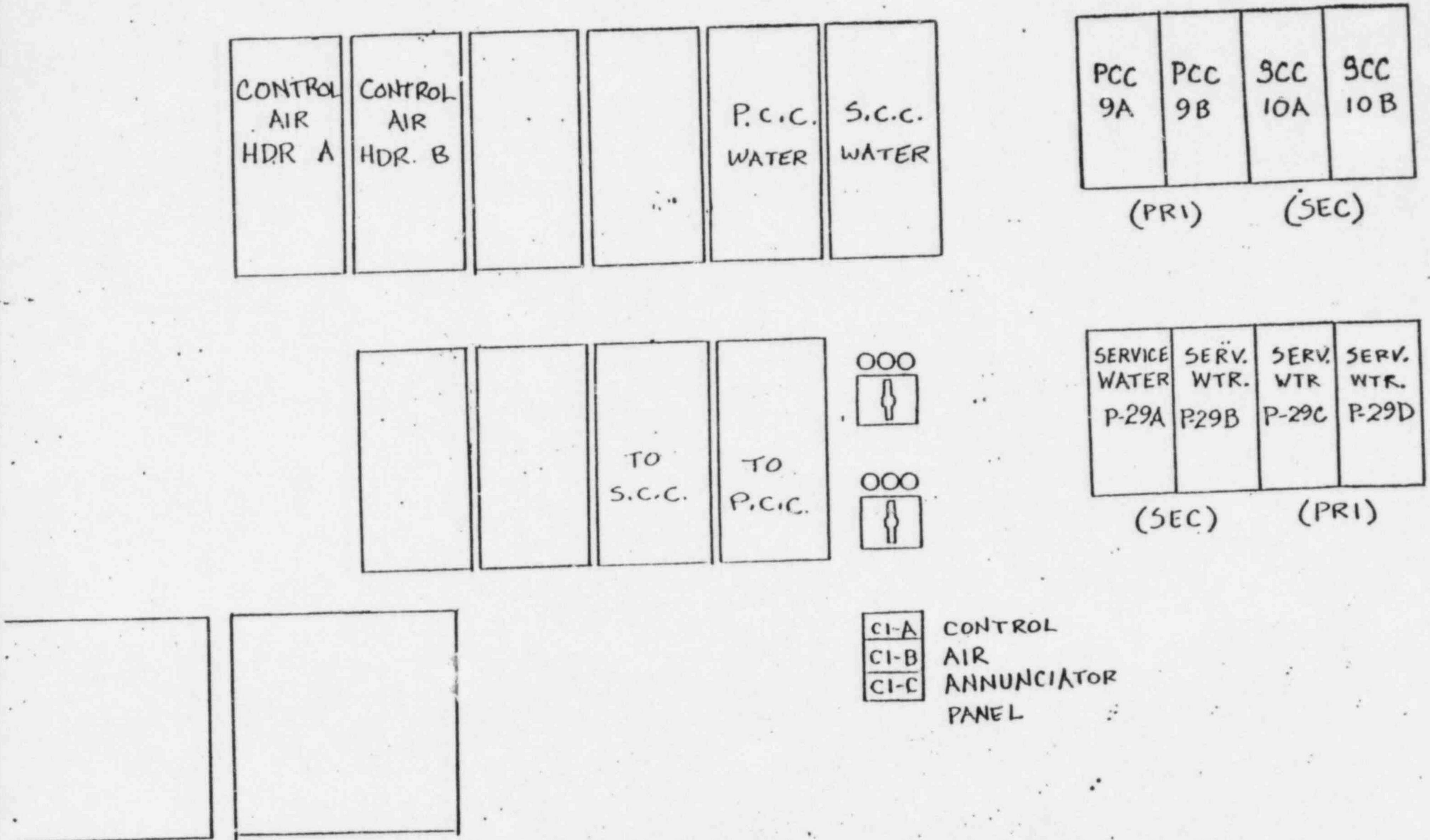
VERIFICATION

REV. 00

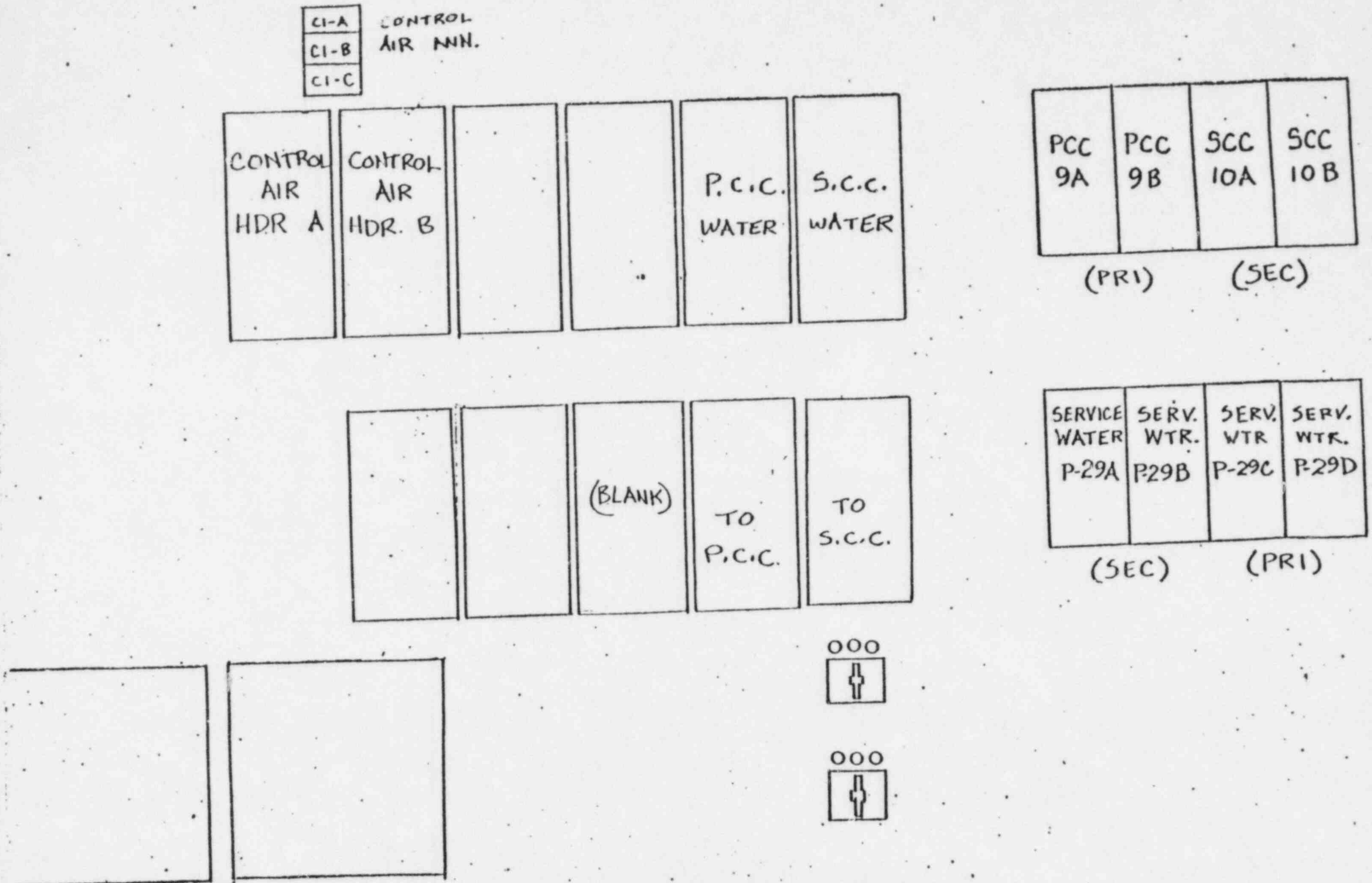
.NG SERVICE WATER INDICATION & CONTROLS - SECTION A



EXISTING INSTRUMENTATION & CONTROLS FOR SERVICE WATER



PROPOSED LOCATION - SERVI[illegible] WATER INST. & CONTROLS



Routing: (check & forward)
- [ ] Dept. Head
- [ ] Plant Engineering
- [ ] Plant Manager
- [ ] Director Eng.
- [ ] Mngr of Ops
- [ ] V. P. of Ops
- [ ] Director Eng.
- [ ] FED Drftg

Conceptual Project No.: 37-84
Date: 9/19/83
Originator: J. Buczynski
Preliminary Project Cost Estimate: $8,000.00

(HED # 578)

H.F.

MAINE YANKEE CONCEPTUAL PROJECT AUTHORIZATION

TITLE: Correct Input Signals For SIAS Annunciator

Project Description/Discussion: An annunciator alarm that reads, "Loss of Control" occurs on SIAS actuation when there actually is no loss of control power. This is a false annunciation. The addition of new circuitry as shown on the attached sketch would resolve this problem.

Justification for Project: False annunciation could lead to premature or unjustifiable action. This problem goes against established Human Factors Engineering Principles for ambiguous annunciation.

Projected Schedule: By the end of the 1985 Refueling.

Comments: APPROVED

Dept. Head (Project Mgr.): E. J. Gilbert — Recommend Further Investigation

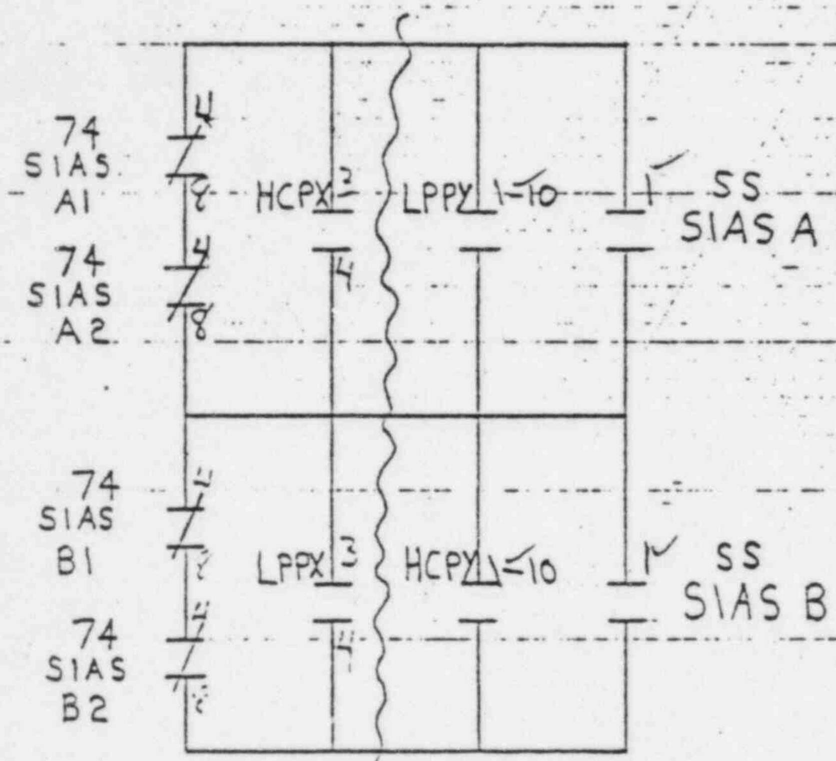
Plant Eng. Dept.: T. McGuffey — Recommend Further Investigation

Plant Mgr: E. W. W. — Recommend Further Investigation

Mgr of Operations: C. D. Frizzle — Approval Further Investigation

Vice President of Operations: JBR — Approve Further Investigation

ANNUNCIATOR CIRCUIT FOR LOSS OF CONTROL POWER



EXISTING CIRCUIT ← | → NEW CIRCUITRY NEEDED TO PROVIDE CLOSE CONTACTS UPON ACTIVATION OF SIAS THAT WILL BYPASS THE LOSS OF CONTROL POWER ANNUNCIATION.

HED RECORD

No. 3-17

PANEL I.D. MCB-C-A

COMPONENT I.D. 116/RH

COMPONENT TITLE/SERVICE Annunciator/Residual Heat Removal

DISCREPANCY

Annunciator 3-3 Safety Injection loss of control power. Alarms on Safety Injection - shouldn't, haven't really lost control power. (sensing of control power should be moved)

GUIDE No. ______ TITLE ______

GUIDE No. ______ TITLE ______

GUIDE No. ______ TITLE ______

H.E. LIMITS ______

TASK I.D. Subtask 3

PHOTO RECORD ______

COMMENTS ______

VERIFICATION ______

REV. 00

Conceptual Project No.: 27-84

Date: 09/23/83

Originator: J. Buczynski

P[illegible]iminary Project Cost Estimate: 8,000.00

(HEO # 589)

- [ ] Plant Engineer. Eng
- [ ] Plant Manager
- [ ] Director Eng.
- [ ] Mngr of Ops
- [ ] V. P. of Ops
- [ ] Director Eng.
- [ ] FED Drftg

MAINE YANKEE CONCEPTUAL PROJECT AUTHORIZATION

TITLE: Light Indication for VCT Isolation Valve H.F.

Project Description/Discussion: CH-M-87 is located on the back of the MCB. When this valve closes it isolates the VCT, but giving no indication to the primary operating area. This could be resolved by adding indicating lights and switch to the MCB as per attached sketches.

Justification for Project: These newly installed indicating lights would provide an [illegible]ication to operations in the primary operating area that the VCT has been isolated.

Projected Schedule: by end of 1985 Refueling.

Comments: APPROVED

Dept. Head (Project Mgr.): D. Q. Delbert
Recommend Further Investigation

Plant Eng. Dept.: T. [illegible]
Recommend Further Investigation

[illegible]ant Mgr: ECW
Recommend Further Investigation

Mgr of Operations: CD Frizzle
Approval Further Investigation

Vice President of Operations: JBR
Approve Further Investigation

NO. 30

HED RECORD

S-1

O

E. I.D. MCB-C-Back

MPONENT I.D. CH-M-87

MPONENT TITLE/SERVICE Selector Switch/Outlet to VCT

DISCREPANCY

Location of valve, in back of MCB, prevents noticing it's closure therefore isolating the VCT

G No. TITLE

GUIDE No. TITLE

GUIDE No. TITLE

E.E. LIMITS

TASK I.D. Subtask 3

PHOTO RECORD

COMMENTS Move to Section C Indicating Lights only

RIFICATION

REV. 00

Date: 09/20/83
Originator: J. Buczynski
Prelimi[illegible] Project Cost Estimate: 10,000.00

H.F.

(HED #625)

- ☐ [illegible]
- ☐ Director Eng.
- ☐ Mngr of Ops
- ☐ V. P. of Ops
- ☐ Director Eng.
- ☐ PED Drftg

MAINE YANKEE CONCEPTUAL PROJECT AUTHORIZATION

TITLE: Installation of Indications

Project Description/Discussion: These indications (see attached HED'S) are not available to the operators. These conditions should be conveniently provided in their appropriate locations as shown on attached sketch.

Jus[illegible]ication for Project: These indications need to be provided to ensure the [illegible]ty of the plant.

Projected Schedule: by the end of 1985 Refueling.

Comments:

APPROVED

Dept. Head (Project Mgr.): [signature] Recommend Further Investigation

Plant Eng. Dept:: [signature] Recommend Further Investigation

Plant Mgr: G.C.W. Recommend Further Investigation

Mgr of Operations:: [signature] Approved Further Investigation

Vice President of Operations: [signature] Approve Further Investigation

HED RECORD

-1.
1260

I.D. MCB-B-BB

COMPONENT I.D.

COMPONENT TITLE/SERVICE Pushbutton/Steam Dump Override

DISCREPANCY

No direct indication that this control has been actuated or not (should have an indicating light off the bypass controller).

GUIDE No. TITLE

GUIDE No. TITLE

GUIDE No. TITLE

H.E. LIMITS

TASK I.D. Subtask 3

PHOTO RECORD

COMMENTS Orange flashing indicating light above stm. dump override. Possibly add an alarm on the computer.

VERIFICATION

REV. 00

PANEL I.D. MCB-C-BB

COMPONENT I.D. PR-A-38/4

COMPONENT TITLE/SERVICE Indicating Lights/Quench TK to PDT

DISCREPANCY

No indicating lights available (should provide).

GUIDE No. Miscellaneous TITLE

GUIDE No. TITLE

GUIDE No. TITLE

H.E. LIMITS Subtask 4

TASK I.D.

PHOTO RECORD

COMMENTS Add Limit switches and Red/Green indicating lights for above noted Valve.

VERIFICATION

te: 10/05/83
or: J. Byczynski
te: 10,000.00

- [ ] Director Eng.
- [x] Mngr of Ops
- [ ] V. P. of Ops
- [ ] Director Eng.
- [ ] PED Drftg

① ~~JGB~~
② JRH
(HED #641)
DEC 21 1983

NKEE CONCEPTUAL PROJECT AUTHORIZATION

TO DPR
12/21

Containment Recorders/Indicators

These recorders/indicators should be placed on MCB-C near the CIS Light Boxes. LPSI flow control override for LSI-F-59 moved next to flow controller.

Justification for Project: This would provide the operators with feedback when the CIS [illegible] t Boxes have annunciated. This would provide a verification of the CIS Light Box indications.

Projected Schedule: by the end of 1985 Refueling.

Comments: This CPA needs to be completed prior to the installation of the ICC and ITOP designs this refueling (1984). This CPA is from the Human Factors review program.

Dept. Head (Project Mgr.): [signature] Recommend Further Investigation

Plant Eng. Dept: [signature] Recommend Further Investigation

ant Mgr: [signature] Recommend Further Investigation

Mgr of Operations: [signature] Approved Further Investigation

Vice President of Operations: [signature] Approve Further Investigation

NO. 5?5

HED RECORD

5.3.0

PANEL I.D. MCB-C-V

COMPONENT I.D. 01-306-50

COMPONENT TITLE/SERVICE Selector Switch/LPSI Flow Cont. override for LSI-F-59

DISCREPANCY

Selector switch on vertical section and associated controller on bench board not easily associated. (Should be on bench board with controller.)

GUIDE No. TITLE

GUIDE No. TITLE

GUIDE No. TITLE

H.E. LIMITS

TASK I.D. Subtask 3

PHOTO RECORD

COMMENTS Add to CPM for Containment Parameters

VERIFICATION

HED RECORD

1 3 0

PANEL I.D. MCB-C-V

COMPONENT I.D. 92

COMPONENT TITLE/SERVICE Recorders/Containment parameters

DISCREPANCY

Display not mounted close to CIS controls

GUIDE No. 6.9.1.1a TITLE Proximity

GUIDE No. TITLE

GUIDE No. TITLE

H.E. LIMITS A visual display that will be monitored during control manipulation should be located in the same proximity.

TASK I.D. Subtask 4

PHOTO RECORD

COMMENTS Move to future SPDS, + to Safeguards cv front. PR-2d12 (containment pressure) is to converted to a narrow range 0-40 psia recorder. This would enable reading normal operating pressures with the sensitivity required

VERIFICATION

REV. 00

No. 641

HED RECORD

PANEL I.D. MCB-C-V

COMPONENT I.D. RI-6113A&B/152

130

COMPONENT TITLE/SERVICE Indicator/Containment Radiation

DISCREPANCY

Display not mounted close to CIS controls

GUIDE No. 6.9.1.1a TITLE Proximity

GUIDE No. TITLE

GUIDE No. TITLE

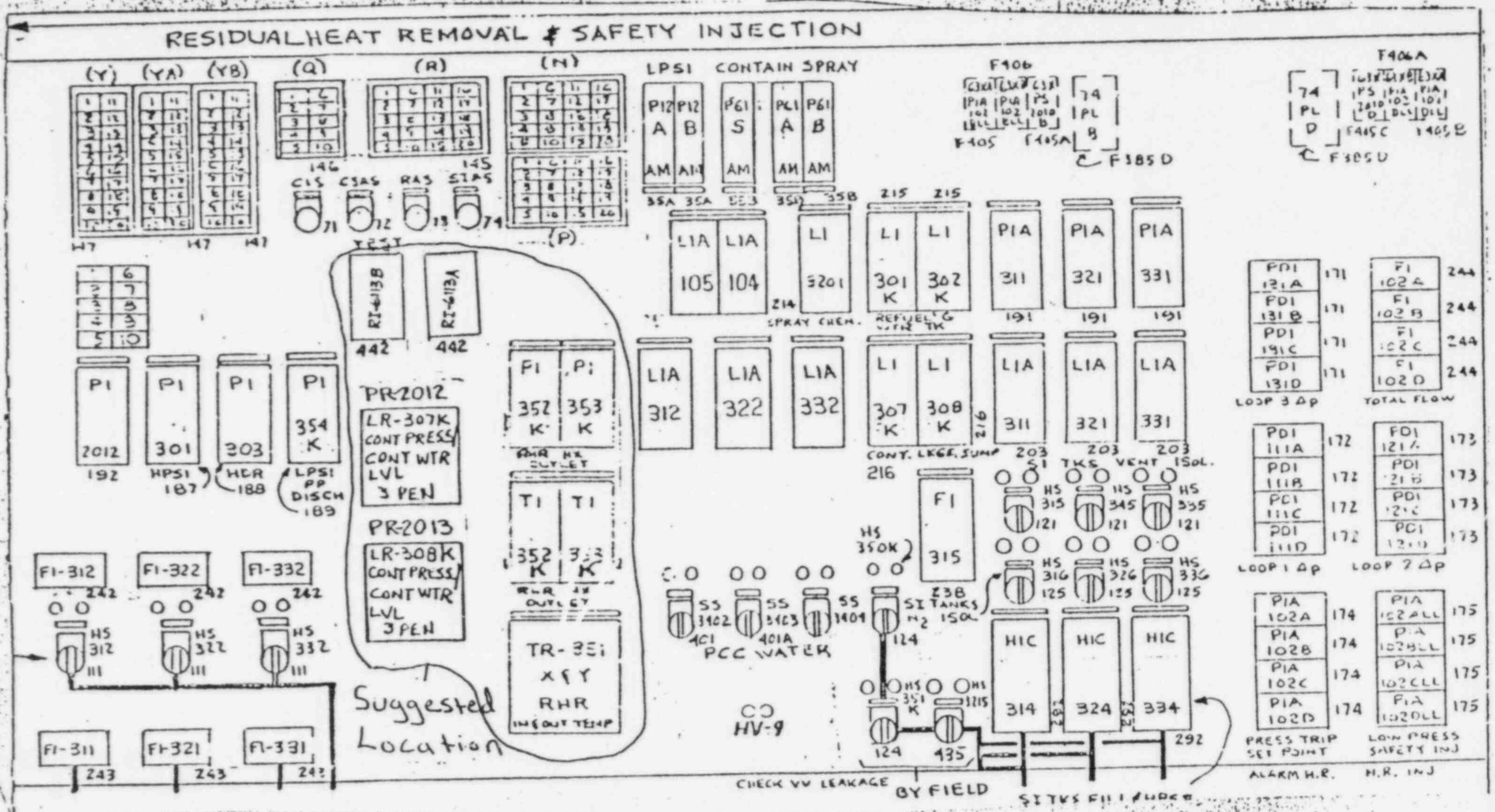
H.E. LIMITS A visual display that will be monitored during control manipulation should be located in the same proximity.

TASK I.D. Subtask 4

PHOTO RECORD

COMMENTS

VERIFICATION


RESIDUAL HEAT REMOVAL & SAFETY INJECTION
(Y)
(YA)
(YB)
(Q)
(R)
(N)
(P)
LPSI
CONTAIN SPRAY
F406
F406A
F405
F405A
F385D
74 PL B
74 PL D
F405C
F405B
CIS
CSAS
RAS
STAS
TEST
RI-6113B
RI-6113A
442
PR-2012
LR-307K
CONT PRESS
CONT WTR
LVL
3 PEN
PR-2013
LR-308K
CONT PRESS
CONT WTR
LVL
3 PEN
FI 352 K
PI 353 K
RHR HX OUTLET
TI 352 K
TI 353 K
RHR HX OUTLET
TR-351
X & Y
RHR
IN & OUT TEMP
Suggested Location
PI 2012
PI 301
PI 303
PI 354 K
192
HPSI 187
HCR 188
LPSI PP DISCH 189
LIA 105
LIA 104
LI 5201
LI 301 K
LI 302 K
SPRAY CHEM.
REFUEL'G WTR TK
PIA 311
PIA 321
PIA 331
191
LIA 312
LIA 322
LIA 332
LI 307 K
LI 308 K
CONT. LKGE. SUMP
216
LIA 311
LIA 321
LIA 331
203
SI TKS VENT ISOL.
FI 315
HS 350K
SS 3402
SS 3403
SS 3404
PCC WATER
SI TANKS N2 ISOL
HS 315
HS 345
HS 335
HS 316
HS 326
HS 336
HIC 314
HIC 324
HIC 334
HS 351 K
HS 3215
124
435
CO HV-9
CHECK VV LEAKAGE
BY FIELD
SI TKS FILL/PURGE
292
FI-312
FI-322
FI-332
242
HS 312
HS 322
HS 332
FI-311
FI-321
FI-331
243
PDI 131A
PDI 131B
PDI 131C
PDI 131D
171
LOOP 3 ΔP
FI 102A
FI 102B
FI 102C
FI 102D
244
TOTAL FLOW
PDI 111A
PDI 111B
PDI 111C
PDI 111D
172
LOOP 1 ΔP
PDI 121A
PDI 121B
PDI 121C
PDI 121D
173
LOOP 2 ΔP
PIA 102A
PIA 102B
PIA 102C
PIA 102D
174
PRESS TRIP SET POINT
PIA 102ALL
PIA 102BLL
PIA 102CLL
PIA 102DLL
175
LOW PRESS SAFETY INJ
ALARM H.R.
H.R. INJ

Date: 10/05/83

Originator: J. Buczynski

Preliminary Project Cost Estimate: 500.00

(HED# 795)

H.F.

☐ Plant Manager
☐ Director Eng.
☐ Mngr of Ops
☐ V. P. of Ops
☐ Director Eng.
☐ PED Drftg

MAINE YANKEE CONCEPTUAL PROJECT AUTHORIZATION

TITLE: Annunciator Pushbuttons

Project Description/Discussion: The annunciator controls should be consistant in their color coding. They should be black - test, green - reset and blue - acknowledge. This should be true for all annunciator controls sections of the MCB.

Justification for Project: This would comply with NUREG 0700 and also reduce the chance of error actuating the turbine limit permissive pushbutton which is associated with the EHC System.

Projected Schedule: by the end of 1985 Refueling.

Comments:

APPROVED

Dept. Head (Project Mgr.): [signature] Recommend Further Investigation

Plant Eng. Dept.: [signature] Recommend Further Investigation

Plant Mgr: [signature] Recommend Further Investigation

Mgr of Operations: [signature] Approved Further Investigation

Vice President of Operations: [signature] Approve Further Investigation

-K3
D

HED RECORD

PANEL I.D. Various

COMPONENT I.D. ANN

COMPONENT TITLE/SERVICE Annunciator

DISCREPANCY

Annunciator controls are not coded per guidelines

GUIDE No. 6.3.4.2 TITLE Control Set Design

GUIDE No. TITLE

GUIDE No. TITLE

H.E. LIMITS Annunciator controls should be coded

TASK I.D. Subtask 4

PHOTO RECORD

COMMENTS Four (4) coding schemes are presented while shape coding is the same for all annunciator controls, it is not unique to the annunciator, the same control is used for other functions.

CPA to code by color (Green, blue, Black) No Red!

VERIFICATION

No. 795

HED RECORD

10 0

PANEL I.D. MCB-A-BB

COMPONENT I.D. 107 + R1/26

COMPONENT TITLE/SERVICE Push Buttons/Annunciator reset + Valve Position Limiter Perissive

DISCREPANCY

Operators have confused the annuciator reset with the valve position limiter permissive.

GUIDE No. 6.4.1.1 c(1) TITLE Human Suitability

GUIDE No. TITLE

GUIDE No. TITLE

H.E. LIMITS Each control should be recognizable in terms of it's functions.

TASK I.D. Subtask 1B & 4

PHOTO RECORD

COMMENTS by memo

VERIFICATION

E.D.C.R.s

(CHED #'s 101, 102, 598)

JRH

MAR 8 1984

EDCR No. 83-32
Major ECN No. 0
Task No.
W.O. No.

Form 17-21-3-1
Revised

ENGINEERING DESIGN CHANGE REQUEST
(YANKEE NUCLEAR SERVICES DIVISION)

Title: SUBCOOLING MARGIN MONITOR UPGRADE

Priority: 1 1 SHUTDOWN 84

Design Grade: 1

PED Cognizant Reviewer:

Date: 3/8/84

QJAD Reviewer:

Date: 3/6/84

Plant Operations Review Committee

Approval Recommendation: (Secretary of PORC)

Date:

Plant Manager Approval

Approved:

Date:

INFORMATIONAL COPY
NOT YET FINAL APPROVED

Manager of Operations Approval

Approved:

Date:

Comments:

Form No. 17-21-6-1
Revised 8/1/83

EDCR # 83-32

ECN # 0

DESIGN VERIFICATION DOCUMENTATION SHEET

The results of design verification efforts shall be clearly documented with the identification of the reviewer.

I HAVE REVIEWED EDCR 83-32 ECN 0 "SUBCOOLING MARGIN MONITOR UPGRADE" IN ACCORDANCE WITH M.V. PROCEDURE # 17-21-6.

THE DESIGN AS DELINEATED ON THE ATTACHED MV-E-5D-40 SERIES DRAWINGS IS CORRECTLY REFLECTED ON THE FE AND ESK DRAWING REVISIONS PROVIDED, AND WITHIN THE TEXT OF THE EDCR.

I RECCOMMEND THAT EDCR 83-32 BE APPROVED AS WRITTEN, PROVIDED THAT NO M.V. JOB ORDERS BE ISSUED FOR THE PORTIONS OF THE DESIGN CHANGE THAT HAVE NOT BEEN FINALIZED BECAUSE THEY ARE SPECIFIED AS OPEN ITEMS IN SECTION 16 OF EDCR 83-32, OR AS COMMENTS REQUIRING RESOLUTION IN THIS DESIGN VERIFICATION DOCUMENTATION SHEET. THESE OPEN ITEMS AND COMMENTS WILL BE RESOLVED BY ECN PRIOR TO IMPLEMENTATION OF THOSE ITEMS.

NOTE THAT RESOLUTION OF TWO (16.1 AND 16.3) OF THE OPEN ITEMS ARE CONTINGENT UPON THE APPROVAL OF OTHER EDCRS (84-01 AND 83-14) WHICH INTERFACE EITHER ELECTRICALLY OR MECHANICALLY WITH EDCR 83-32

THE SAFETY EVALUATION PROVIDED IN SECTION 15 ADEQUATELY ADDRESS THE REQUIREMENTS OF 10 CFR 50.59

Reviewed By: [signature] 3/5/84
Date

Concurrence: [signature]
Cognizant Supervisory Engineer

3297N-JRH

Form No. 17-21-6-1
Revised 8/1/83

EDCR # 83-32
ECN # 0
Page 5 of 6
Page 2 of 3

DESIGN VERIFICATION DOCUMENTATION SHEET

The results of design verification efforts shall be clearly documented with the identification of the reviewer.

THE FOLLOWING COMMENTS HAVE BEEN DISCUSSED WITH THE YAEC COGNIZANT ENGINEER. RESOLUTION WILL BE OBTAINED PRIOR TO WORK ON AFFECTED SECTIONS:

1. FSAR ATTACHMENT FIG 7.5-1 AND MY EE-50-40-03 DEPICT AN ANALOG DRIVE TO SMM CORE REGION (HOT LEG INJ DISPLAY) TEXT DESCRIBES A DIGITAL DISPLAY NOTE: ECN 1 CHANGES DRIVE TO BCD.

2. CABLE NUMBERS: SOME CABLE #S HAVE BEEN PREVIOUSLY ASSIGNED. NOTE: ECN WILL ASSIGN NEW CABLE #'S AND ASSIGN TO EDCR 83-14 THE RESPONSIBILITY FOR CABLE NUMBERING FOR SPDS CABLES.

3. SMMS WILL BE POWERED FROM VITAL BUS #1, IAW NOTE #2 OF EE-3DAG INCREASED LOADING ON VITAL BUSSES REQUIRES ANALYSIS TO ENSURE INVERTERS ARE NOT OVERLOADED. NOTE: ECN WILL ADDRESS

Reviewed By: [signature] / 3/5/84
Date

Concurrence: [signature]
Cognizant Supervisory Engineer

3297N-JRH

Form No. 17-21-6-1
Revised 8/1/83

EDCR # 83-32

ECN # C

DESIGN VERIFICATION DOCUMENTATION SHEET

The results of design verification efforts shall be clearly documented with the identification of the reviewer.

4 STEAM GENERATOR PRESSURE SIGNALS — TERMINAL BLOCK NOMENCLATURE DIFFERS BETWEEN FE-3DS SHEET 1 AND FE-3DAP. NOTE: ECN WILL MAKE ALL TERMINOLOGY THE SAME.

5 ESK-3M IS CONTACT DEVELOPMENT FOR NEW SELECTOR SWITCHES. ESK-3M IS NOT REFERENCED ON OTHER PRINTS. NOTE: ECN WILL ADDRESS.

6. PZR PRESS PWR SUPPLIES X-102X AND X-102Y WERE INSTALLED IN PANEL 7 BY EDCR 79-31 AND POWERED FROM VITAL BUS 4. EDCR 80-29 CHANGED THE AC INPUT FROM VITAL BUS 4 TO VITAL BUS 1. PANEL 7 CONTAINS CHANNEL C INSTRUMENTATION. PER T. GIFFORD X-102X AND X-102Y WILL NOT BE RELOCATED THIS OUTAGE.

7. SECTION E.2 (d) "RECOMMENDATION FOR WIRE AND CABLE HANDLING" YAEC-[illegible] WILL BE USED AS DEEMED NECESSARY BY M.Y. FIELD ENGINEER.

Reviewed By: [signature] 1/3/5/84
Date

Concurrence: [signature]
Cognizant Supervisory Engineer

1297N-JRH

FORM WE-100-1
REVISION 4

ENGINEERING
DESIGN CHANGE REQUEST
NUCLEAR SERVICES DIVISION
YANKEE ATOMIC ELECTRIC CO.

EDCR NO.: 83-32
PLANT: MAINE YANKEE
W.O.: 5862

EDCR TITLE: SUBCOOLING MARGIN MONITOR UPGRADE

	C M Woodworth COGNIZANT ENGINEER	2/2/84 DATE
ENGINEERING PREPARATION AND REVIEW	LEAD ENGINEER	DATE
	ENGINEERING MANAGER	DATE
OPERATIONAL QA REVIEW	OQA	2/14/84 DATE
PROJECT-DEPT. ACCEPTANCE	PROJECT MANAGER	DATE

MAINE YANKEE EDCR 83-32

SUBCOOLING MARGIN MONITOR UPGRADE

1.0 REFERENCES

(a) NUREG-0737, Item II.F.2, and Appendix B.

(b) Maine Yankee Letter (MN 83-83) to USNRC, Subject: "Inadequate Core Cooling Instrumentation System (Generic Letter No. 82-28)", dated April 29, 1983.

(c) Memorandum, W. G. Alcusky/W. H. Reed to R. P. Shone, Subject: "Subcooling Margin Monitor - ICC Upgrade: Conceptual Design", dated November 7, 1983.

(d) Service Request No. 83-72.

(e) Telecon Summary, C. Woodworth to T. Gifford, dated January 9, 1984.

(f) YAEC Letter (MYP 84-19) to Rosemount, Inc., Subject: "Rosemount Temperature Transmitter Model No. 444", dated January 9, 1984.

(g) Memorandum (MYP 84-109) D. Fucito/W. E. Henries to C. Woodworth/ W. H. Reed, Subject: "Seismic Mounting of Equipment for the Subcooling Margin Monitor Upgrade EDCR 83-32-11, dated February 2, 1984.

2.0 ENCLOSURES

(A) EDCR Document Review Forms
(B) References
(C) Specification
(D) FSAR Pages Affected
(E) Drawings

3.0 ORGANIZATION RESPONSIBLE FOR THE DETAILED DESIGN

The Instrumentation and Control Engineering Group - Maine Yankee Project has been designated as the lead organization for this EDCR design.

Cognizant Engineers: C. M. Woodworth - Yankee Nuclear Services Division
T. M. Gifford - Maine Yankee

Maine Yankee plant personnel are responsible for installation and test procedures, revisions to Emergency Operating Procedures, and operator training in the use of this equipment.

4.0 COST ESTIMATE

NSD Engineering	$ 50,000
Materials	135,000
Installation	30,000
Total	$215,000

5.0 SCHEDULE

5.1 Equipment Procurement

The new subcooling margin monitors and associated indicators are on order with Combustion Engineering, Inc., Windsor, Connecticut, PO Number 36557. The scheduled delivery is April 1, 1984.

The Acromag Card Cage, temperature transmitter, and isolators are on order with Acromag, Inc., Wixom, Missouri, PO Number 36657. The scheduled delivery is March 1, 1984. The instrument switches are on order with Electroswitch Corp., Weymouth, Massachusetts, MPR Number 3961. The scheduled delivery is March 1, 1984.

The pressurizer pressure recorder (PR102X) is on order with Leeds & Northrup, North Wales, Pennsylvania. The scheduled delivery is March 15, 1984.

All other materials required for this modification have been ordered or will be on order to ensure delivery before the April 1984 refueling outage.

5.2 Implementation

Installation of equipment is scheduled for completion prior to startup after the scheduled April 1984 refueling outage.

6.0 REASON FOR CHANGE

Reference (b), Maine Yankee's letter, responds to the USNRC request for a final design description for the Inadequate Core Cooling (ICC) Monitoring System. Part of this final design description includes the addition of saturation monitoring equipment for the reactor head region and the three (3) steam generators, as well as the addition of a backup core exit thermocouple display.

The USNRC requirements stated in Reference (a), include the use of eight (8) qualified core exit thermocouples (CETs) as inputs to the Saturation Margin Monitoring (SMM) equipment. This change will add four (4) qualified CET inputs to the existing four (4) qualified CETs inputs.

7.0 DESCRIPTION OF CHANGE

7.1 General

This change requires the removal of the existing Combustion Engineering Inc. (CE) saturation margin monitor calculator module, display module, and associated prefabricated cables. This existing equipment was designed for four (4) core exit thermocouple and three (3) hot leg RTD temperature inputs with a high-select logic and two system pressure inputs with a low-select logic which is incompatable with the upgrade SMM system design. The existing CE equipment will be replaced by three (3)

new SMM calculator modules (core region, reactor head region, and steam generators), and associated display modules and prefabricated cables. Also, one (1) core exit thermocouple temperature and one (1) reactor head RTD temperature digital displays will be added. Four (4) new temperature and pressure input selector switches will also be added. The following is a detailed description of this change.

The SMM System MCB equipment selection and layout including switches, indicators, recorder, and MCB mimic graphics has been reviewed and specified, from a human factors standpoint, by Maine Yankee personnel and is part of the overall Control Room human factors review. The MCB mimic graphics for the ICC equipment is not a part of this EDCR.

The Subcooling Margin Monitor System will provide indication of the margin to saturation in the following locations:

1. Reactor Vessel Core Region

2. Reactor Vessel Head Region

3. Steam Generator U-Tubes (3) (under certain conditions)

This indication will be provided in the Post-Accident Monitoring (PAM) panel in Sections B and C of the Main Control Board (MCB). The displays for these three regions will be part of an integrated display for the whole ICC Instrumentation System. This display will be arranged to enhance the operator's understanding of the conditions in the Primary System and will allow him to detect the onset of ICC conditions at an early stage. Revised Emergency Operating Procedures and extensive operator training in the use of these displays are required which are not within the scope of this EDCR.

The range of the SMM will be from 50°F superheat to 200°F subcooling margin. (Superheat will be indicated by a negative temperature margin.)

The SMMs will be seismically qualified, Class 1E microprocessor-based units. The SMM System will be single channel powered from Vital Bus #1. Limited equipment redundancy is provided by the switching network described below.

The temperature inputs to the core region SMM may be transferred from the primary CET inputs to the alternate reactor head region RTDs to allow the core region SMM to monitor the margin to saturation in the reactor head region. Also, the reactor head region SMM temperature inputs may be transferred from the primary reactor head RTDs to the alternate CET inputs to allow the reactor head region SMM to monitor margin to saturation in the core region. This is accomplished via two ten-position temperature

input selector switches associated with each SMM (one position for each CET and RTD). The CET and reactor head RTD temperature displays will also be switched since these displays are driven by the associated SMM and display the selected temperature input to the SMM (CET or RTD). The core region SMM ten-position selector switch should normally be in one of the eight CET positions. Selection of either of the two RTD positions with this switch should be done only when it is necessary to monitor the reactor head region with the core region SMM (e.g., to a reactor head region SMM failure). Likewise, the reactor head region SMM ten-position selector switch should normally be in one of the two RTD positions.

Selection of any of the eight CET positions with this switch should be done only when it is necessary to monitor the core region with the reactor head region SMM (e.g., a core region SMM failure).

The core region SMM satisfies the requirements of the USNRC NUREG-0737, Section II.F.2, (Reference (a), Enclosure (B-1)) as responded to in Maine Yankee's letter to the USNRC (Reference (b), Enclosure (B-2)). The reactor head region SMM and the steam generator SMM are not required by NUREG-0737, Section II.F.2, but are added to provide additional points to monitor the Reactor Coolant System conditions. The core region SMM display is the prime display for margin to saturation. Both the core region and the reactor head region SMM displays will provide margin to saturation indication in their associated regions for all Reactor Coolant System conditions. The steam generator SMM display will provide margin to saturation in the steam generator U-tube region under limited conditions. Revisions to the Emergency Operating Procedures are required to address all conditions and to define the limits of these displays. Extensive operator training in the use of this equipment is also required.

The SMM display will flash upon a computer board malfunction or an out-of-range input signal. For a computer board malfunction, the display will flash until the problem is corrected. If an input signal is out of range (less than two or more than ten volts for the CETs and less than one or more than five volts for all other inputs), the display will flash only while the invalid signal is present. Switching to another input channel with a valid signal range will clear the flashing from the display module and return the SMM to normal operation.

7.2 Core Region SMM

The inputs to the core region SMM will be as follows:

1. Temperature signal from any one of eight qualified core exit thermocouples in the following locations: T-4, N-11, D-11, L-18, J-11, J-5, T-16, G-18.

2. Pressure signal from either PT-102X or PT-102Y;

3. Alternate temperature signal: derived from either one of two vessel head RTDs, TE-145A or TE-145B.

The core region SMM will be designed to accept switchable inputs. Only one temperature and one pressure signal will be input to the monitor at any one time.

A ten-position core region SMM temperature input selector switch, located on the MCB Section B PAM panel, will be used to select the specific core exit thermocouple to be input to the core region SMM. The alternate temperature input to the core region SMM, derived from the reactor head region RTDs, will also be selectable via this switch.

A two-position SMM pressure input selector switch, located on the MCB Section C PAM insert panel, will be used to select either one of two pressure channels derived from the pressurizer pressure transmitters, PT-102X and Y. This selector switch is common to all three SMMs. Therefore, selection of one pressure channel will be input to all three SMMs simultaneously.

The core region SMM digital display will be located above the core region SMM temperature input selector switch on the MCB Section B PAM panel.

7.3 Reactor Head Region SMM

The inputs to the reactor head region SMM will be as follow:

1. Temperature derived from one of two vessel head RTDs, TE-145A or TE-145B.

2. Pressure signal from either PT-102X or PT-102Y.

3. Alternate temperature signal: derived from any one of eight qualified core exit thermocouples in the following locations: T-4, N-11, D-11, L-18, J-11, J-5, T-16, G-18.

The head region SMM will be designed to accept switchable inputs. Only one temperature and one pressure signal will be input to the monitor at any one time.

A ten-position reactor head region SMM temperature input selector switch, located on the MCB Section B PAM insert panel, will be used to select the specific reactor head region RTD to be input to the reactor head region SMM. The alternate temperature input to the reactor head region SMM, derived from the core exit thermocouples, will also be selectable via this switch.

The reactor head region SMM pressure input is selectable via the common two-position selector switch mentioned in the core region SMM input description above.

The reactor head region SMM digital display will be located above the reactor head region SMM temperature input selector switch on the MCB Section B PAM panel.

7.4 Steam Generator SMM

The inputs to the Steam Generator (SG) SMM will be as follows:

1. Temperature: pressure signals from PT-1013A, 1023A, and 1033A, converted, within the SMM, to equivalent saturation temperatures.

2. Pressure signal from either PT-102X or PT-102Y.

The SG SMM will be designed to accept switchable inputs. Only one temperature and one pressure signal will be input to the monitor at any one time.

A three-position steam generator pressure (temperature) input selector switch, located on the MCB Section C PAM insert panel, will be used to select the specific steam generator (1, 2, or 3) pressure signal to be input to the SG SMM.

The SG SMM pressure input is selectable via the common two-position selector switch mentioned in the core region SMM input description above.

The SG SMM digital display will be located above the SG SMM pressure input selector switch on the MCB Section C PAM panel.

7.5 SMM Alarms

Alarm outputs from the core region, head region, and SG SMMs will be paralleled to energize the existing alarms, 515 (window P1-5) and 557 (window P4-5), on Annunciator Cabinet P on Section C of the MCB. The first point will alarm when the margin decreases to less than 40°F ("Change in Saturation Conditions"). The second point will alarm when the margin decreases to less than 25°F ("Margin to Saturation Low").

7.6 SMM Indication for Hot Leg Injection

An analog output from the core region SMM will be used to drive a new indicator to be located near the switches for hot leg injection on Section C of the MCB. The range of this indicator will be -50°F to +200°F margin. This display will be used during throttling of the HPSI discharge valves (HSI-M-41 and 42) when overcharging conditions are encountered.

7.7 Core Exit Thermocouple Display

A seismically qualified, Class 1E, core exit thermocouple display will be provided on the PAM panel in Section B of the MCB. This display will be part of the integrated ICC display and will serve as a backup to the primary core exit thermocouple display generated by the main process computer.

The backup display will consist of a digital indicator and selector switch. The selector switch will be used to select any one of eight thermocouples to be input to the indicator. This switch also selects the temperature signal to be input to the core region SMM. The range of the display will be 0-2300°F. The eight thermocouple inputs consist of two thermocouples per quadrant. The locations are T-4, N-11, D-11, L-18, J-11, J-5, T-16, G-18.

The eight thermocouple inputs to the backup display will be isolated from the main process computer in the SPDS isolation cabinet.

The power source for the thermocouple display will be Vital Bus #1.

7.8 Reactor Vessel Head Temperature Display

A seismically qualified, Class 1E, vessel head temperature display will be provided on the PAM panel in Section B of the MCB. This display will be part of the integrated ICC display. A digital indicator and selector switch will comprise this display. The selector switch will be used to select one of the two vessel head RTDs to be input to the indicator. The range of the display will be 0-750°F. This selector switch also selects the temperature signal to be input to the reactor head region SMM.

The power source for the vessel head temperature display will be Vital Bus #1.

7.9 SMM System Inputs

7.9.1 Core Exit Thermocouples

The existing four qualified core exit thermocouple (N11, D11, L18, and T4) inputs to the SMMs will be maintained. However, these input cables must be rerouted from the outside containment penetration directly to the Auxiliary Logic Cabinet 1 to insure Channel "A" separation. Also, four more qualified core exit thermocouples (J11, J5, T16, and G18) will be routed from the outside containment penetration directly to the Auxiliary Logic Cabinet 1 to complete the required eight qualified core exit thermocouple inputs to the SMMs. Thermocouples J5 and T4 will be disconnected from penetration G4-2 inside the

reactor containment and rerouted to penetration F9-1. New cables for this rerouting will not be required since the distance from the seal table to the F9 penetration is shorter than to the G4 penetration.

The four existing qualified Acromag thermocouple transmitters and the four existing qualified Acromag signal isolators will also be maintained for the existing core exit thermocouples. Four new qualified Acromag thermocouple transmitters and four new qualified Acromag signal isolators, including a new Acromag card cage and power supply, will be added to the Auxiliary Logic Cabinet 1 for the additional core exit thermocouple loops.

7.9.2 Pressurizer Pressure Transmitters

The two existing pressurizer pressure inputs to the SMM will be maintained except that the inputs will be wired to the two new Acromag signal isolators in auxiliary logic Cabinet 1. The output of the signal isolators will be wired to the new pressurizer pressure selector switch.

A new L&N series 100 narrow recorder will replace the existing recorder (PR-102X) for trending pressurizer pressure.

7.9.3 Hot Leg Resistance Temperature Detectors

The existing hot leg RTD inputs (TE-111X, 121X, and 131X) to the SMM will be disconnected at the loop transmitter outputs. These inputs are no longer required since the eight (8) CETs provide a direct measurement of core temperature.

7.9.4 Reactor Head Resistance Temperature Detectors

The existing reactor head RTDs (TE-145A and B) will be wired to two new qualified RTD transmitters located in MCB Panel 1. Existing power supplies (X3, DA) in Panel 1 will be used to drive the loops. The outputs from these transmitters will be wired to the core region and reactor head region SMM temperature selector switches.

7.9.5 Steam Generator Pressure Transmitters

The existing steam generator pressure loops (PT-1013A, PT-1023A, PT-1033A) will be modified to provide inputs to the new SMMs via the new steam generator pressure selector switch. This will be accomplished by disconnecting the resistors at the computer point terminals in MCB Panel 5 and reconnecting and wiring to the above mentioned selector switch.

7.10 SMM System Outputs

The following outputs will be provided to the main process computer from the SMM System via the SPDS isolation cabinet (refer to MY EDCR 83-14):

1. Core Exit Thermocouple J11 Temperature (4-20 mA)
2. Core Exit Thermocouple J05 Temperature (4-20 mA)
3. Core Exit Thermocouple T04 Temperature (4-20 mA)
4. Core Exit Thermocouple T16 Temperature (4-20 mA)
5. Core Exit Thermocouple L18 Temperature (4-20 mA)
6. Core Exit Thermocouple G18 Temperature (4-20 mA)
7. Core Exit Thermocouple D11 Temperature (4-20 mA)
8. Core Exit Thermocouple N11 Temperature (4-20 mA)
9. Pressurizer Pressure PT-102X (4-20 mA)
10. Pressurizer Pressure PT-102Y (4-20 mA)
11. Steam Generator 1 Pressure PT-1013A (4-20 mA)
12. Steam Generator Pressure PT-1023A (4-20 mA)
13. Steam Generator 3 Pressure PT-1033A (4-20 mA)
14. Core Region SMM Margin to Saturation (4-20 mA)
15. Reactor Head Region SMM Margin to Saturation (4-20 mA)
16. Steam Generator SMM Margin to Saturation (4-20 mA)
17. Core Region SMM Alternate Temperature (RTD) Selected (contact)
18. Reactor Head Region SMM Alternate Temperature (CET) Selected (contact)
19. Steam Generator 1 Pressure (Input to SG SMM) Selected (contact)
20. Steam Generator 2 Pressure (Input to SG SMM) Selected (contact)
21. Steam Generator 3 Pressure (Input to SG SMM) Selected (contact)

8.0 DESIGN CRITERIA

8.1 Quality Assurance

In addition to the Quality Assurance programmatic/administrative requirements incorporated in the Engineering Manual (EM), the YAEC Operational Quality Assurance Manual YOQAP-1-A, and the Maine Yankee Operational Quality Assurance Program, the following documents apply to this design change:

ANSI N45.2.2-1972, Packaging, Shipping, Receiving, Storage and Handling of Items for Nuclear Power Plants (with exceptions as indicated in Appendix B of the Maine Yankee Operational Quality Assurance Program).

8.2 Technical

(a) The Subcooled Margin Monitor System was designed to meet the provisions of IEEE Standards 323-1974 and 344-1975.

(b) The Acromag T/C transmitters, isolators, and rack assemblies are designed to meet IEEE Standard 344-1975.

(c) Cable shall be separated in accordance with MYS-2957, Criteria for Identification and Separation of Electrical Cables for Maine Yankee Atomic Power Station, Maine Yankee Atomic Power Company, Wiscasset, Maine, dated July 15, 1970.

(d) Cable shall be handled in accordance with YAEC-1163, "Recommendations for Wire and Cable Installation and Handling", dated October 6, 1978.

(e) The Rosemount RTD transmitters (See Open Item No. 16.4).

9.0 EQUIPMENT PROCUREMENT INFORMATION

9.1 Specifications

(a) Maine Yankee Specification MYPS-14, "Specification for 300 Volt Instrument Cable for Maine Yankee Atomic Power Company Wiscasset, Maine", Revision 0, dated June 26, 1979.

(b) Maine Yankee Specification MYPS-12, "Specification for 600 Volt Power and Control Cable for Maine Yankee Atomic Power Station", Revision 1.

(c) Subcooled Margin Monitor System, Specification No. MY-EDCR 83-32-S1, Revision 0. See Enclosure (C).

9.2 Bill of Materials

Item	Quantity	Description
1	1	Acromag Card Cage Enclosure, Model No. 791-CG-115
2	1	Acromag Power Supply, Model No. 781-AC
3	4	Acromag T/C Transmitter, Model No. 712K, 0-2300^{o}F Span, 4-20 mA dc output
4	6	Acromag Signal Isolator, Model No. 712L, 4-20 mA dc output
5	12	250 ohm, 0.1% Precision Resistor
6	4	500 ohm, 0.1% Precision Resistor
7	1	Electroswitch Series 20K, 2-pole, 10-deck, 10-position, maintained instrument switch with oval handle (engraved with pointer), Catalog No. 20KB-4052A1 to Switch 2-10 V dc. Nameplate: black letters on green background. No title engraving required. Position engraving to be: Position 1: "J11" Position 2: "J5" Position 3: "T4" Position 4: "T16" Position 5: "L18" Position 6: "G18" Position 7: "D11" Position 8: "N11" Position 9: "RTD1" Position 10: "RTD2" (Reference: Core Region SMM Temperature Select Switch)
8	1	Electroswitch Series 20K, 2-pole, 10-deck, 10-position, maintained instrument switch with oval handle (engraved with pointer), Catalog No. 20KB-4052A1 to Switch 1-5 V dc. Nameplate: black letters on green background. No title engraving required. Position engraving to be:

Item	Quantity	Description
		Position 1: "RTD1" Position 2: "RTD2" Position 3: "J11" Position 4: "J5" Position 5: "T4" Position 6: "T16" Position 7: "L18" Position 8: "G18" Position 9: "D11" Position 10: "N11" (Reference: Head Region SMM Temperature Select Switch)
9	1	Electroswitch Series 20K, 2-pole, 2-deck, 2-position maintained instrument switch with oval handle (engraved with pointer), Catalog No. 20KB-2252D4 to Switch 1-5 V dc. Nameplate: black letters on green background. No title engraving required. Position engraving to be: Position 1: "PT-102X" Position 2: "PT-102Y" (Reference: Pressurizer Pressure Select Switch)
10	1	Electroswitch Series 20K, 3-pole, 5-deck, 3-position maintained instrument switch with oval handle (engraved with pointer), Catalog No. 20KB-2353C8 to Switch 1-5 V dc. Nameplate: black letterr on green background. No title engraving required. Position engraving to be: Position 1: "SG-1" Position 2: "SG-2" Position 3: "SG-3" (Reference: Steam Generator Pressurizer Select Switch)

Item	Quantity	Description
11	1	Leeds & Northrup Speedomax 100 Series Narrow Recorder, single pen, 4-20 mA dc input, one alarm switch, 0-3250 psig range, 120 V ac, 60 Hz input power 2 cm/hr and 12 cm/hr chart speeds, with non-glare window, linen tag fastened with wire (Tag Identification: "PR-102X"), and service and parts manual Catalog No. 131-304-03-C0213-6-BL-048-206-056 (Reference: Pressurizer Pressure Recorder PR-102X)
12	1 pkg. of 20	Omega Alloy Spade Lug, Catalog No. SLCH-20
13	1 pkg. of 20	Omega Alloy Spade Lug, Catalog No. SLAL-20
14	2,700 ft.	Chromel-Alumel Thermocouple Extension Wire, Single Pair, Shielded, Firewall III (per Specification MYPS-14)
15	2,200 ft.	2 Conductor 16AWG, Shielded, 600 V, Cross-linked Polyethylene Firewall III Instrument Cable (per Specification MYPS-14)
16	90 ft.	12 Conductor 12AWG, 600 V, Cross-linked Polyethylene Firewall III Control Cable (per Specification MYPS-12)
17	75 ft.	2 Conductor 12AWG, 600 V, Cross-linked Polyethylene Firewall III Control Cable (per Specification MYPS-12)
18	3	CE PWR Subcooled Margin Monitor
19	1	CE Core Exit Thermocouple Temperature Display
20	1	CE Reactor Head RTD Temperature Display
21	1	CE Core [illegible]ion SMM Display (hot leg injectio[illegible]

Item	Quantity	Description
22	2	Rosemount Temperature Transmitters, Catalog No. 0444RI9U1A2NAR0755 (TE-145A, B)
23	11	States Type ZWM, Sliding-Link 12-point Terminal Block, Cat. No. ZWM-25012
24	8	Outside Penetration Plug Pin Kit, Cat. No. R19P1081G04 (D. G. O'Brien)
25	2	Inside Penetration Plug Pin Kit, Cat. No. R19P1081G05 (D. G. O'Brien)
26	70 ft.	Rigid Steel Conduit, 2-Inch

10.0 DRAWINGS

Drawing No.	Rev.	Title
MY-E-50-014-0	1	Steam Generator Pressure Channels
MY-E-50-040-3	3	Wiring Diagram - Primary Coolant Saturation Monitor (Sheet 1)
MY-E-50-040-3	3	Wiring Diagram - Primary Coolant Saturation Monitor (Sheet 2)
11550-FE-3CD	15	External Connection Diagram, Sheet 4, MCB Section B
11550-FE-3CE	7	External Connection Diagram, Sheet 5, MCB Section B
11550-FE-3CL	7	Wiring Diagram, Sheet 3, MCB Section B
11550-FE-3DF	6	Wiring Diagram Bench Mtd. Equipment, Sheet 6A, MCB Section C (Sheet 1)
11550-FE-3DF	0	Wiring Diagram Bench Mtd. Equipment, Sheet 6B, MCB Section C (Sheet 2)
11550-FE-3DG	9	Wiring Diagram Bench Bd. Mtd. Equipment, Sheet 7, MCB Section C
11550-FE-3DK	12	Wiring Diagram Front Mtd. Equipment, Sheet 10, MCB Section C
11550-FE-3DP	10	Wiring Diagram Front Mtd. Equipment, Sheet 14, MCB Section C

Drawing No.	Rev.	Title
11550-FE-3DR	8	Wiring Diagram Front Mtd. Equipment, Sheet 16, MCB Section C
11550-FE-3DS	19	External Connection Diagram, Sheet 17A, MCB Section C (Sheet 1)
11550-FE-3DS	0	External Connection Diagram, Sheet 17B, MCB Section C (Sheet 2)
11550-FE-3DAG	19	External Connection Diagram, Sheet 26, MCB Section C
11550-FE-3DAK	17	Wiring Diagram Rear Mtd. Equipment, Sheet 29, MCB Section C
11550-FE-3DAL	17	Wiring Diagram Rear Mtd. Equipment, Sheet 30, MCB Section C
11550-FE-3DAM	18	Wiring Diagram Rear Mtd. Equipment, Sheet 31, MCB Section C
11550-FE-3DAP	10	Wiring Diagram Rear Mtd. Equipment, Sheet 33, MCB Section C
11550-FE-3DAR	15	Wiring Diagram Rear Mtd. Equipment, Sheet 35, MCB Section C
11550-FE-3GA	0	Wiring Diagram Auxiliary Logic Cabinet 1, Sheet 1
11550-FE-3GB	1	Wiring Diagram Auxiliary Logic Cabinet 1, Sheet 2
11550-FE-3GC	1	External Connection Diagram Auxiliary Logic Cabinet 1
11550-FE-6B	0	Wiring Connection Detector, Incore Instrumentation Seal Table, Sheet 2
11550-FE-18ZA	0	Wiring Diagram, Miscellaneous Circuits Service Building, Sheet 1
11550-FE-36T	4	Wiring Diagram, Containment Electrical Penetrations, Sheet 18
11550-FE-36W	4	Wiring Diagram Containment Electrical Penetrations, Sheet 21
11550-FE-42A	15	Duct Loading Schedule, Control Room

Drawing No.	Rev.	Title
11550-FE-42E	6	Conduit and Tray Plan, Vital Bus and Reactor Trip Circuits.
11550-FE-42H	0	Miscellaneous Conduits in Control Room
11550-ESK-3M	0	Control Switch Developments, Sheet 12
11550-ESK-4F	9	Elementary Diagram Outline MCB, Sheet 6, Vertical Front, SG Display and Reactivity
11550-ESK-4G	10	Elementary Diagram Outline MCB, Sheet 7, Vertical Front Reactivity, Press., CVCS, Loop
11550-ESK-4H	13	Elementary Diagram Outline MCB, Sheet 8, Vertical Front, RHR, Safety Injection
11550-ESK-4NA	0	Front Layout Auxiliary Logic Cabinet 1 (Main Control Room)
11550-ESK-10AY	8	Elementary Diagram Annunciators, Sheet 23
11550-ESK-10AZ	7	Elementary Diagram Annunciators, Sheet 24
11550-ESK-11AK	0	Front Layout Auxiliary Logic Cabinet 1 (Main Control Room)
11550-1.25-254A	A	Reactor Coolant System Loop Temperature Control Channels Interconnection Diagram
11550-1.25-107D	D	Steam Generator Protective Area Channel A Wiring Diagram
11550-1.25-69D	D	Steam Generator Pressure Channel P-1013 Interconnection Diagram
11550-SE-111N	14	Cable Schedule, Computer System Analog Inputs Incore T/Cs, Sheet 13
11550-SE-111R	7	Cable Schedule, Computer System Analog Inputs Incore Instrumentation, Sheet 16
11550-SE-111AL	5	Cable Schedule Computer System Digital Inputs, Sheet 11
11550-SE-113J	12	Cable Schedule Instrumentation Transmitters, Sheet 9

Drawing No.	Rev.	Title
11550-SE-113K	3	Cable Schedule Instrumentation Transmitters, Sheet 10
11550-SE-130S	7	Duct Conduit Loading Schedule, Sheet 8 of 12

11.0 CALCULATIONS AND ANALYSIS

11.1 Analysis for the seismic mounting of the Acromag Card Cage states terminal block has been documented in MYC-490 and will be maintained in YNSD Document Control Center.

12.0 PROCEDURES

12.1 Welding

Not Applicable

12.2 NDE

Not Applicable

12.3 Installation and Test

Installation and test procedures will be developed by plant personnel.

12.4 Other Procedures

The plant personnel are responsible for revising the plant operating and surveillance procedures to reflect this design change.

13.0 FSAR PAGES AFFECTED

FSAR Page 7-53 (see Enclosure (D)).

14.0 LICENSING

14.1 Technical Specification Pages Affected

None

14.2 Proposed Change Letter

Not Applicable

15.0 SAFETY EVALUATION

15.1 Safety Classifications

The Subcooling Margin Monitor System is a safety-related system. The following features are safety grade:

- Temperature inputs from the core exit thermocouples
- Temperature inputs from the reactor head RTDs
- Pressure inputs from the pressurizer pressure channels PT-102X and PT-102Y
- Pressure inputs from the steam generator pressure channels PT-1013A, PT-1023A, and PT-1033A

Outputs from the Subcooling Margin Monitor System to the plant computer, which is non-safety grade, are isolated at the SPDS isolation cabinet via safety grade isolators (Reference EDCR 83-14).

15.2 Discussion

The core region SMM fulfills the primary coolant saturation monitor requirements of the USNRC NUREG-0737, Section II.F.2 (Reference (a), Enclosure (B-1)) as noted in Maine Yankee's response to the USNRC (Reference (b), Enclosure (B-2)). The reactor head region and steam generators' SMMs provide additional points in the reactor coolant system for the operator to monitor margin to saturation. In addition, a safety grade display is provided for the reactor head region RTD temperature indication.

In addition, the core region SMM and the reactor head region SMM, and their associated saturation margin displays, may be manually switched to provide mutual backup to each other. Also, the backup core exit thermocouple temperature display (driven by the core region SMM) and the reactor head region RTD temperature display (driven by he reactor head region SMM) are manually switched along with their respective SMM. The capability to switch these devices provides an added degree of inadequate core cooling (ICC) monitoring reliability.

Operator guidelines on the use of ICC monitoring equipment, of which the SMMs and backup core exit thermocouple temperature display are a part, are incorporated into the appropriate emergency operating procedures and will be refined upon completion of ICC monitoring system analysis noted in Maine Yankee's response to the USNRC (Reference (b), Enclosure (B-2)).

In light of the above discussion, this EDCR does not impair the safety to the general public, in that it does not:

1. Increase the probability of occurrence of a previously evaluated accident;

2. Create the possibility of an unreviewed accident; or

3. Reduce the margin of safety as defined in Technical Specifications.

15.3 Conclusions

The proposed modification has been analyzed to assure that it does not create any unreviewed safety questions as defined in 10CFR50.59(a)(2).

16.0 OPEN ITEMS

16.1 Main Control Board Equipment Seismic Analysis/Mounting Details

The Main Control Board (MCB) equipment seismic analysis/mounting details are dependent on the MCB seismic response spectra analysis to be performed during the 1984 refueling outage. The MCB equipment seismic mounting details for this EDCR will be provided via EDCR 84-01 after completion of the seismic response spectra analysis and before the completion of the 1984 refueling outage.

16.2 Combustion Engineering, Inc. SMM Input/Output Wiring Details

The Combustion Engineering, Inc. (CE) plant-specific wiring drawings have not been received. However, the basic wiring methods and equipment should not differ significantly from the previous SMM supplied by CE; therefore, the information presently shown on the appropriate EDCR drawings should enable initial EDCR review.

Final wiring details will be provided via revisions to the appropriate drawings which will be submitted as an ECN to this EDCR before the start of the 1984 refueling outage.

16.3 SPDS/SMM Cable Routing Details

The routing of eighteen (18) cables between the MCB and the SPDS isolation cabinet is dependent on conduit/tray to be determined as a part of EDCR 83-14, SPDS Isolation Cabinet. Routing of these cables will be provided via revisions to the appropriate drawings which will be submitted as an ECN to EDCR 83-14 before the start of the 1984 refueling outage.

16.4 Rosemount Transmitter Seismic Analysis

The Rosemount transmitters purchased for use in the reactor head region RTD loops are not seismically qualified, however, they are similar to Rosemount transmitters previously seismically qualified by Maine Yankee (see Reference (f), Enclosure (B-5)). The applicability of the previous transmitters' seismic test report will be determined upon receipt of Rosemount's reply and the results included in this EDCR via an ECN.

(HED# 641) W.C. 144-3-

PORC 4-6-84

START WORK 4-9-84

APR 6 1984

Form No. 17-21-2-1
Revised 8/1/83
Page 19 of 22

ENGINEERING DESIGN CHANGE REQUEST (MY)

EDCR No. 84-11
Task No. 6.16
W.O. No. 91-35
EDN No. 0

Title: Human Factors Relocation of Containment Parameter Recorders and indicators

Priority: A1 Design Grade: 1

Project Engineer: S.J. Urbanowski per Telecon TMY Date: 4/4/84

PED Reviewer: T.M. Wiford Date: 4/4/84

CQAD Reviewer: RJS Hilbert Date: 4/5/84

Plant Operations Review Committee

Approval Recommendation: ______ Date: ______
(Secretary of PORC)

Plant Manager Approval

Approved: ______ Date: ______

YNSD

Reviewed*: ______ Date: ______

NOTE:

* Not required for Design Grades 2 and 3

INFORMATIONAL COPY
NOT YET FINAL APPROVED

Manager of Operations Approval

Approved: ______ Date: ______

Comments: ______

341CN-CRH

Form No. 17-21-6-1
Revised 8/1/83

EDCR # 84-11
ECN # 0

DESIGN VERIFICATION DOCUMENTATION SHEET

The results of design verification efforts shall be clearly documented with the identification of the reviewer.

I have reviewed the above noted EDCR ~~for conformance~~ in accordance to design verification procedure 17-21-6, Attachment 1. Recommend approval of EDCR in that it does not present any unreviewed safety questions as defined in 10CFR50.59(a)(2). The following comments have been discussed with the cognizant Engineer and will be resolved by ECN;

1.) FE-3DAE Terminal block 1J-83 should be LJR21(2) instead of LJR2(2).

2.) FE-3DK, 3DS, and 3DT need to be updated to include changes based on 84-11 EDCR after EDCR 80-06 documents are updated on the controlled prints.

Reviewed By: [signature] 4/4/84
Date

Concurrence: [signature] 4/4/84
Cognizant Supervisory Engineer

3297N-JRH

FORM WE-100-1
REVISION 4

ENGINEERING
DESIGN CHANGE REQUEST
NUCLEAR SERVICES DIVISION
YANKEE ATOMIC ELECTRIC CO.

EDCR NO.: 84-11
PLANT: MAINE YANKEE
W.O.: 5867

EDCR TITLE: HUMAN FACTORS RELOCATION OF CONTAINMENT PARAMETER RECORDERS AND INDICATORS

S F Urbanowski
COGNIZANT ENGINEER
3/27/84
DATE

ENGINEERING PREPARATION AND REVIEW

S F Urbanowski
LEAD ENGINEER
3/27/84
DATE

R P Shone
ENGINEERING MANAGER
4/2/84
DATE

OPERATIONAL QA REVIEW

[illegible signature]
OQA
4/2/84
DATE

PROJECT DEPT. ACCEPTANCE

[illegible signature]
PROJECT MANAGER
4/2/84
DATE

EDCR 84-11

1.0 REFERENCES

(a) Maine Yankee Service Request #M-83-66, dated 12/7/83 (Includes CPA 132-83).

(b) Memo, T. M. Gifford to S. F. Urbanowski, TMG-84-08, dated 3/6/84.

(c) EDCR 84-1, Main Control Board Modifications.

2.0 ENCLOSURES

(A) Review Forms
(B) References: (a), (b)
(C) Revised Drawings

3.0 ORGANIZATIONS RESPONSIBLE FOR THE DETAILED DESIGN

The Maine Yankee Project - Electrical Engineering Group is responsible for the wiring details associated with the relocation of equipment.

The Maine Yankee Project - Mechanical Analysis Group is responsible for the seismic analysis of the Main Control Board (MCB) and mounting details associated with the equipment affected by this EDCR (see EDCR 84-1).

The Maine Yankee Human Factors Steering Committee is responsible for the proposed arrangement of the MCB.

4.0 COST ESTIMATE

NSD Engineering	$3,000
Equipment and Materials	7,000
Installation	4,000
Contingency (25%)	3,500
TOTAL	$17,500

5.0 SCHEDULE

5.1 Equipment Procurement

All equipment necessary for this EDCR has been ordered for delivery prior to the refueling outage.

5.2 Implementation Schedule

This EDCR is scheduled for implementation during the 1984 refueling outage.

6.0 REASON FOR CHANGE

NUREG-0700 requires an evaluation of the Maine Yankee Control Room with regards to the man-machine interface. The results of this evaluation

indicate that improvements to the man-machine interface require the relocation of various containment parameter indicators and recorders in the C Section of the MCB.

7.0 DESCRIPTION OF CHANGE

7.1 General

The EDCR addresses the electrical modifications necessary to implement the relocation of containment parameter indicators and recorders in MCB Section C as requested in MY Service Request #M-83-66 [Reference (a)].

This EDCR does not provide any new or additional plant operational capability for the operators.

Seismic qualification of the MCB and mounting details for all relocated equipment is addressed by EDCR 84-1 [Reference (c)].

7.2 Design Details

The following sections contain information which address each item to be relocated on the MCB, Section C.

7.2.1 CIS/CSAS/RAS/SIAS Light Box Test Push Buttons

The CIS/CSAS/RAS/SIAS Light Box Test Push Buttons will be relocated from below the light boxes on the vertical panel to the front edge of the bench board.

7.2.2 SDHX By-Pass Switch (01/306) and Lights

The SDHX By-Pass Switch (01/306) and two indicating lights will be moved from the vertical panel to a new location in the mimic immediately to the right of FIC-306 on the bench board.

7.2.3 HV-9 Indicating Lights

Two indicating lights for HV-9 will be moved to the location formerly occupied by the lights associated with control switch 01/324. The removal of control switches and lights 01/314, 01/324, and 01/334 is covered by EDCR 81-3, ECN #3.

7.2.4 PI-352K, PI-353K, TI-352K, TI-353K, TR-351

PI-352K, PI-353K, TI-352K, TI-353K, and TR-351 will be moved to the right approximately 8 inches such that they will be located below the SIAS Light Box. In addition, Reference (b) specifies that PI-352K and TI-352K change positions with PI-353K and TI-353K, respectively.

7.2.5 RI-6113A, RI-6113B, PR-2012/LR-307K, PR-2013/LR-308K

RI-6113A, RI-6113B, PR-2012/LR-307K, and PR-2013/LR-308K will be moved from near the MCB B and C section junction to a location below the RAS Light Box formerly occupied by the equipment described in 7.2.4 above. In addition to the relocation, PR-2012/LR-307K and PR-2013/LR-308K will be replaced with new 3 pen recorders. The original recorders were a horizontal type which showed increasing values from left to right. The new recorders, which consider human engineering, are a vertical type that show increasing values as higher readings on a vertical scale.

8.0 DESIGN CRITERIA

8.1 Quality Assurance

This EDCR is prepared according to the programmatic/administrative requirements outlined in the YAEC Engineering Manual, ~~YAEC Operational Quality Assurance Program (YOQAP-I-A)~~, and Maine Yankee Operational Quality Assurance Program. afu 4/2/84

8.2 Technical

IEEE-323, 1974 "Qualifying Class 1E Equipment for Nuclear Power Generating Stations"

IEEE-344, 1975 "Recommended Practices for Seismic Qualification of Class 1E Equipment for Nuclear Power Generating Stations"

9.0 EQUIPMENT PROCUREMENT INFORMATION

9.1 Specifications

None.

9.2 Bill of Materials

Quantity	Description
3 (Includes one spare)	Leeds and Northrup, 3-pen recorder, Model #123-304-304-304-00-00-00-C0211-C0083-C0109-6-FL-452-752-852-056, Ranges: 0-200 psia (Containment Pressure) 0-10 ft (Containment Water Level) 0-20% (Containment Hydrogen) Quality Level: B Safety Classification: Class 1E Environmental Quality Level: 3 Seismic Category: 1 Order From: The Leen Company

10.0 DRAWINGS

Drawing No.	Rev.	Title
11550-ESK-4AA	2	Equipment List
11550-ESK-4D	7	Outline, Control Board-Sh. 4
11550-ESK-4G	10	Outline, Control Board-Sh. 7
11550-ESK-4H	13	Outline MCB Sh. 8 Vert. Fnt. RHR & SIS
11550-FE-3CD	15	Ext. Conn. Dia.-Sh. 4, MCB Sect.-B
11550-FE-3DB	2	Wir. Diag. Bnch. Bd. Mtd.-Sh. 2
11550-FE-3DJ	8	Wir. Diag. Frnt. Mtd. Eqp.-Sh. 9, MCB-C
11550-FE-3DK	12	Wir. Diag. Frnt. Mtd. Eqp.-Sh. 10, MCB-C
11550-FE-3DR	8	Wir. Diag. Mtd. Equip.-Sh. 16
11550-FE-3DS	17	Exter. Conn. Diag.-Sh. 17, Mn. Cont. Bd.
11550-FE-3DT	17	Ext. Conn. Diag.-Sh. 18, MCB Sect.-C
11550-FE-3DAA	16	Ext. Conn. Diag.-Sh. 20, MCB Sect.-C
11550-FE-3DAB	19	Exter. Conn. Diag.-Sh. 21, Mn. Cont. Bd.
11550-FE-3DAE	19	Exter. Conn. Diag.-Sh. 24, Mn. Cont. Bd.

11.0 CALCULATIONS AND ANALYSES

EDCR 84-1 [Reference (c)] contains the seismic analysis of the MCB and mounting details for any relocated equipment.

12.0 PROCEDURES

12.1 Welding

Not applicable.

12.2 NDE

Not applicable.

12.3 Installation and Testing

The plant is responsible for the preparation of installation and testing procedures.

12.4 Other

The recommendations of YAEC-1163, "Recommendations for Wire and Cable Installation and Handling" should be followed.

13.0 FSAR PAGES AFFECTED

None.

14.0 LICENSING

None.

15.0 SAFETY EVALUATION

15.1 The safety classifications of the MCB equipment affected by the EDCR are as follows:

Item	Safety Classification
CIS/CSAS/RAS/SIAS Light Box Test Push Buttons	Non-Class 1E
SDHX By-Pass Switch	Non-Class 1E
HV-9	Non-Class 1E
PI-352K	Class 1E
PI-353K	Class 1E
TI-352K	Non-Class 1E
TI-353K	Non-Class 1E
TR-351	Non-Class 1E
RI-6113A	Class 1E
RI-6113B	Class 1E
PR-2012/LR-307K	Class 1E
PR-2013/LR-308K	Class 1E

Note: Relocated Non-Class 1E equipment will be seismically mounted to ensure that it will not compromise the Class 1E equipment operation.

15.2 The proposed modifications described in Section 7.0 of this EDCR are basically relocations of MCB equipment per the recommendations of the Maine Yankee Human Factors Steering Committee. This EDCR does not impair the safety to the general public, in that it does not:

1. Increase the probability of occurrence of a previously evaluated accident,
2. Create the possibility of an unreviewed accident, or
3. Reduce the margin of safety as defined in Technical Specifications.

15.3 The proposed modification has been analyzed to assure that it does not create any unreviewed safety questions as defined in 10CFR50.59(a)(2).

16.0 OPEN ITEMS

None.

EDCR 84-11

ENCLOSURE (A)

FORM WE-100-4
REVISION 5

ENGINEERING / OQA
REVIEW FORM
NUCLEAR SERVICES DIVISION
YANKEE ATOMIC ELECTRIC COMPANY

EDCR NO: 84-11 ECN: –
ENCLOSURE: A PAGE 1 OF 9
PLANT: MAINE YANKEE
WORK ORDER NO: 5867

EDCR TITLE: RELOCATION OF RECORDERS / INDICATORS FOR CONTAINMENT PARAMETERS (HUMAN FACTORS)

COMMENTS	RESOLUTION
Reviewed for wiring and other electrical aspects. Comments are marked on the text and prints.	All comments resolved and incorporated. S.J. Uhlenowski 4/2/84

Comments Continued On Page –

REVIEWER:

PROJECT DEPT.:		OTHER DEPT.	
EE	[X]	EED	[ ]
I&CE	[ ]	PED-ESG	[ ]
ME	[ ]	MSG	[ ]
SE	[ ]	NED	[ ]
		OQA	[ ]

A. Kalevi Hyyrynen 3/28/84
REVIEWER/DATE

FORM WE-100-4
REVISION 5

ENGINEERING/OQA REVIEW FORM

NUCLEAR SERVICES DIVISION
YANKEE ATOMIC ELECTRIC COMPANY

EDCR NO: 84-11 ECN: -
ENCLOSURE: A PAGE 3 OF 9
PLANT: MAINE YANKEE
WORK ORDER NO: 5867

EDCR TITLE: RELOCATION OF RECORDERS / INDICATORS FOR CONTAINMENT PARAMETERS (HUMAN FACTORS)

COMMENTS	RESOLUTION
THIS EDCR IS IN ACCORDANCE WITH WE-100 AND IS ACCEPTABLE TO ME AS IS.	

Comments Continued On Page ______

REVIEWER:

PROJECT DEPT:		OTHER DEPT.	
EE	☐	EED	☐
I&CE	☐	PED-ESG	☐
ME	☒	MSG	☐
SE	☐	NED	☐
		OQA	☐

[signature] 3-29-84
REVIEWER/DATE

FORM WE-100-4
REVISION 5

ENGINEERING/OQA
REVIEW FORM
NUCLEAR SERVICES DIVISION
YANKEE ATOMIC ELECTRIC COMPANY

EDCR NO: 84-11 ECN: –
ENCLOSURE: A PAGE 2 OF 9
PLANT: MAINE YANKEE
WORK ORDER NO: 5867

EDCR TITLE: RELOCATION OF RECORDERS / INDICATORS FOR CONTAINMENT PARAMETERS (HUMAN FACTORS)

COMMENTS	RESOLUTION
REVIEWED IN LIGHT OF ENI WE100	
WITHOUT COMMENT	

Comments Continued On Page ______

REVIEWER:

PROJECT DEPT:
- EE ☐
- I&CE ☒
- ME ☐
- SE ☐

OTHER DEPT.
- EED ☐
- PED-ESG ☐
- MSG ☐
- NED ☐
- OQA ☐

W H [illegible] 29 March '84
REVIEWER/DATE

FORM WE-100-4
REVISION 5

ENGINEERING / OQA REVIEW FORM

NUCLEAR SERVICES DIVISION
YANKEE ATOMIC ELECTRIC COMPANY

EDCR NO: 84-11 ECN: -
ENCLOSURE: A PAGE 4 OF 9
PLANT: MAINE YANKEE
WORK ORDER NO: 5867

EDCR TITLE: RELOCATION OF RECORDERS / INDICATORS FOR CONTAINMENT PARAMETERS (HUMAN FACTORS)

COMMENTS	RESOLUTION
Reviewed in accordance with WE-100. This EDCR relocates and in one instance changes the type of recorders/indications on the main control board. From a systems engineering aspect there are no comments.	
Dennis J. O'Brien 3/28/84	
R. Benson	

Comments Continued On Page ____

REVIEWER:

J. J. O'Brien 3/28/84
R. P. Benson 3-28-84
REVIEWER/DATE

PROJECT DEPT:		OTHER DEPT.	
EE	[ ]	EED	[ ]
I&CE	[ ]	PED-ESG	[ ]
ME	[ ]	MSG	[ ]
SE	[X]	NED	[ ]
		OQA	[ ]

FORM WE-100-4
REVISION 5

ENGINEERING/OQA REVIEW FORM

NUCLEAR SERVICES DIVISION
YANKEE ATOMIC ELECTRIC COMPANY

EDCR NO: 84-11 ECN: –
ENCLOSURE: A PAGE 5 OF 9
PLANT: MAINE YANKEE
WORK ORDER NO: 5867

EDCR TITLE: RELOCATION OF RECORDERS / INDICATORS FOR CONTAINMENT PARAMETERS (HUMAN FACTORS)

COMMENTS	RESOLUTION
Reviewed in accordance with WE-100. As all work will take place in the control room we have no radiological concerns requiring resolution.	

Comments Continued On Page ______

REVIEWER:

PROJECT DEPT:
- EE ☐
- I&CE ☐
- ME ☐
- SE ☐

OTHER DEPT.
- EED ☒
- PED-ESG ☐
- MSG ☐
- NED ☐
- OQA ☐

N.M. Panzarino / 5-28-[illegible]
REVIEWER/DATE

FORM WE-100-4
REVISION 5

ENGINEERING/OQA
REVIEW FORM
NUCLEAR SERVICES DIVISION
YANKEE ATOMIC ELECTRIC COMPANY

EDCR NO: 84-11 ECN: -
ENCLOSURE: A PAGE 6 OF 9
PLANT: MAINE YANKEE
WORK ORDER NO: 5867

EDCR TITLE: RELOCATION OF RECORDERS / INDICATORS FOR CONTAINMENT PARAMETERS (HUMAN FACTORS)

COMMENTS	RESOLUTION
Reviewed in accordance with WE-100.	
No [illegible] comments	

Comments Continued On Page ______

REVIEWER:

PROJECT DEPT:		OTHER DEPT.	
EE	☐	EED	☐
I&CE	☐	PED-ESG	☒
ME	☐	MSG	☐
SE	☐	NED	☐
		OQA	☐

[signature] 3/21/84
REVIEWER/DATE

FORM WE-100-4
REVISION 5

ENGINEERING/OQA REVIEW FORM

NUCLEAR SERVICES DIVISION
YANKEE ATOMIC ELECTRIC COMPANY

EDCR NO: 84-11 ECN: –
ENCLOSURE: A PAGE 7 OF 9
PLANT: MAINE YANKEE
WORK ORDER NO: 5867

EDCR TITLE: RELOCATION OF RECORDERS / INDICATORS FOR CONTAINMENT PARAMETERS (HUMAN FACTORS)

COMMENTS	RESOLUTION
No welding and NDE –	
acceptable for WE-100	

Comments Continued On Page NA

REVIEWER:

PROJECT DEPT:		OTHER DEPT.	
EE	☐	EED	☐
I&CE	☐	PED-ESG	☐
ME	☐	MSG	☒
SE	☐	NED	☐
		OQA	☐

[signature] 29 Mar 84
REVIEWER/DATE

FORM WE-100-4
REVISION 5

ENGINEERING/OQA REVIEW FORM

NUCLEAR SERVICES DIVISION
YANKEE ATOMIC ELECTRIC COMPANY

EDCR NO: 84-11 ECN: -
ENCLOSURE: A PAGE 8 OF 9
PLANT: MAINE YANKEE
WORK ORDER NO: 5867

EDCR TITLE: RELOCATION OF RECORDERS / INDICATORS FOR CONTAINMENT PARAMETERS (HUMAN FACTORS)

COMMENTS	RESOLUTION
No adverse comments	

Comments Continued On Page ____

REVIEWER:

PROJECT DEPT:		OTHER DEPT.	
EE	☐	EED	☐
I&CE	☐	PED-ESG	☐
ME	☐	MSG	☐
SE	☐	NED	☒
		OQA	☐

J Hanlon 29MAR84
REVIEWER/DATE

FORM WE-100-4
REVISION 5

ENGINEERING/OQA REVIEW FORM

NUCLEAR SERVICES DIVISION
YANKEE ATOMIC ELECTRIC COMPANY

EDCR NO: 84-11 ECN: –
ENCLOSURE: A PAGE 9 OF 9
PLANT: MAINE YANKEE
WORK ORDER NO: 5867

EDCR TITLE: RELOCATION OF RECORDERS / INDICATORS FOR CONTAINMENT PARAMETERS (HUMAN FACTORS)

COMMENTS	RESOLUTION
In Section 8.0 Design Criteria under 8.1 Quality Assurance: Remove "YAEC Operational Quality Assurance Program (YOQAP-1-A) as it does not apply	Comment Resolved w/ S Uobenauch 4/2/84 [signature] 4/2/84
This review was performed in accordance with WE 100	

Comments Continued On Page ______

REVIEWER:

PROJECT DEPT: EE ☐ I&CE ☐ ME ☐ SE ☐

OTHER DEPT: EED ☐ PED-ESG ☐ MSG ☐ NED ☐ OQA ☒

[signature] 3/30/84
REVIEWER/DATE

EDCR 84-11

ENCLOSURE (B)

EDCR 84-11 ECN
ENCLOSURE B
PAGE 1 OF 7

RECEIVED
DEC 1 1983
MAINE YANKEE PROJECT

Form No. MY-A-24-83

MY/YNSD SERVICE REQUEST

Service Request No. M-83-66
Issue Date 12/7/83

TITLE OF PROJECT: H.F. Containment Parameters Relocation

DESCRIPTION OF PROJECT: (State Objectives and Milestones)

see attached CPA/HEDE for description of changes, CPA 132-83. Needs to be designed, parts bought and delivered prior to the 1984 refueling.

JUSTIFICATION FOR PROJECT: Needs to be completed prior to the installation of ICC and LTOP instrumentation packages.

MY Cognizant Person: J.M. Tifford
MY Work Order No.: 81-35
Engineering Task No.: 6116
EDCR/CPA No.(s): 132-83
Other:

Cost Limit (If Appropriate)
Schedule Restrictions: Must be done prior to 1984 refueling
Copy(s) Attached: CPA 132-83
Proj. Requested by: [signature] 12/7/83
Date
Authorization [signature] 12/7/83
(MOD or MMF) Date

YNSD RESPONSE

YNSD Cognizant Person(s) S. F. URBANOWSKI YNSD Work Order No(s): 5667

Milestone Schedule: This job is late in coming. NSD will attempt to complete by late March.

Cost Estimate: 20 MAN-DAYS (YNSD ENGINEERING) APPROX. $6,000

Discussion/Comments: TOTAL PROJECT COST WILL BE PROVIDED LATER. SCHEDULE FOR EDCR IS CONTINGENT UPON PLANT SUPPORT FOR INFORMATION. Does NOT include seismic qualification of the modified control board.

MYPM Signature: [signature]
Date: 1/25/84

HED RECORD

No. 64C

PANEL I.D. MCB-C-V

COMPONENT I.D. 92

EDCR 84-11 ECN
ENCLOSURE B
PAGE 3 OF 7

1 3 0

COMPONENT TITLE/SERVICE Recorders/Containment parameters

DISCREPANCY

Display not mounted close to CIS controls

GUIDE No. 6.9.1.1a TITLE Proximity

GUIDE No. TITLE

GUIDE No. TITLE

H.E. LIMITS A visual display that will be monitored during control manipulation should be located in the same proximity.

TASK I.D. Subtask 4

PHOTO RECORD

COMMENTS MOVE TO [illegible] [illegible] [illegible]

[illegible] PF [illegible]

Corvei[illegible]

[illegible]

VERIFICATION

EDCR 84-11		ECN
ENCLOSURE 8		
PAGE 2		OF 7

Conceptual Project No.: 132-8[illegible]
Date: 10/05/83
Originator: J. Byczynski
Preliminary Project Cost Estimate: 10,000.00

- [ ] [illegible] Engineer
- [ ] Plant Manager
- [ ] Director Eng.
- [ ] Mngr of Ops
- [ ] V. P. of Ops
- [ ] Director Eng.
- [ ] PED Drftg

MAINE YANKEE CONCEPTUAL PROJECT AUTHORIZATION

TITLE: Containment Recorders/Indicators

Project Description/Discussion: These recorders/indicators should be placed on MCB-C near the CIS Light Boxes. LPSI flow control override for LSI-F-59 moved next to flow controller.

Justification for Project: This would provide the operators with feedback when the CIS Light Boxes have annunciated. This would provide a verification of the CIS Light Box indications.

Projected Schedule: by the end of 1989 Refueling.

Comments: This CPA needs to be completed prior to the installation of the ICC and SPDS design this refueling (1984). This CPA is from the Human Factors review program.

Dept. Head (Project Mgr.): [illegible signature]
Recommend Further Investigation

Plant Eng. Dept.: T. McGifford
Recommend Further Investigation

Plant Mgr: ______
Recommend Further Investigation

Mgr of Operations: ______
Approve Further Investigation

Vice President of Operations: ______
Approve Further Investigation

HED RECORD

Nc 593

PANEL I.D. MCB-C-V

EDCR 84-11 ECN
ENCLOSURE B
PAGE 4 OF 7

COMPONENT I.D. 01-306-50

COMPONENT TITLE/SERVICE Selector Switch/LPSI Flow Cont. override for LSI-F-5!

DISCREPANCY

Selector switch on vertical section and associated controller on bench board not easily associated. (Should be on bench board with controller.)

GUIDE No. ______ TITLE ______

GUIDE No. ______ TITLE ______

GUIDE No. ______ TITLE ______

H.E. LIMITS ______

TASK I.D. Subtask 3

PHOTO RECORD ______

COMMENTS [illegible]

VERIFICATION ______

NO. 641

HED RECORD

EDCR 84-11	ECN
ENCLOSURE 8	
PAGE 5	OF 7

13
0

PANEL I.D. MCB-C-V

COMPONENT I.D. RI-6113A&B/152

COMPONENT TITLE/SERVICE Indicator/Containment Radiation

DISCREPANCY

Display not mounted close to CIS controls

GUIDE No. 6.9.1.1a TITLE Proximity

GUIDE No. TITLE

GUIDE No. TITLE

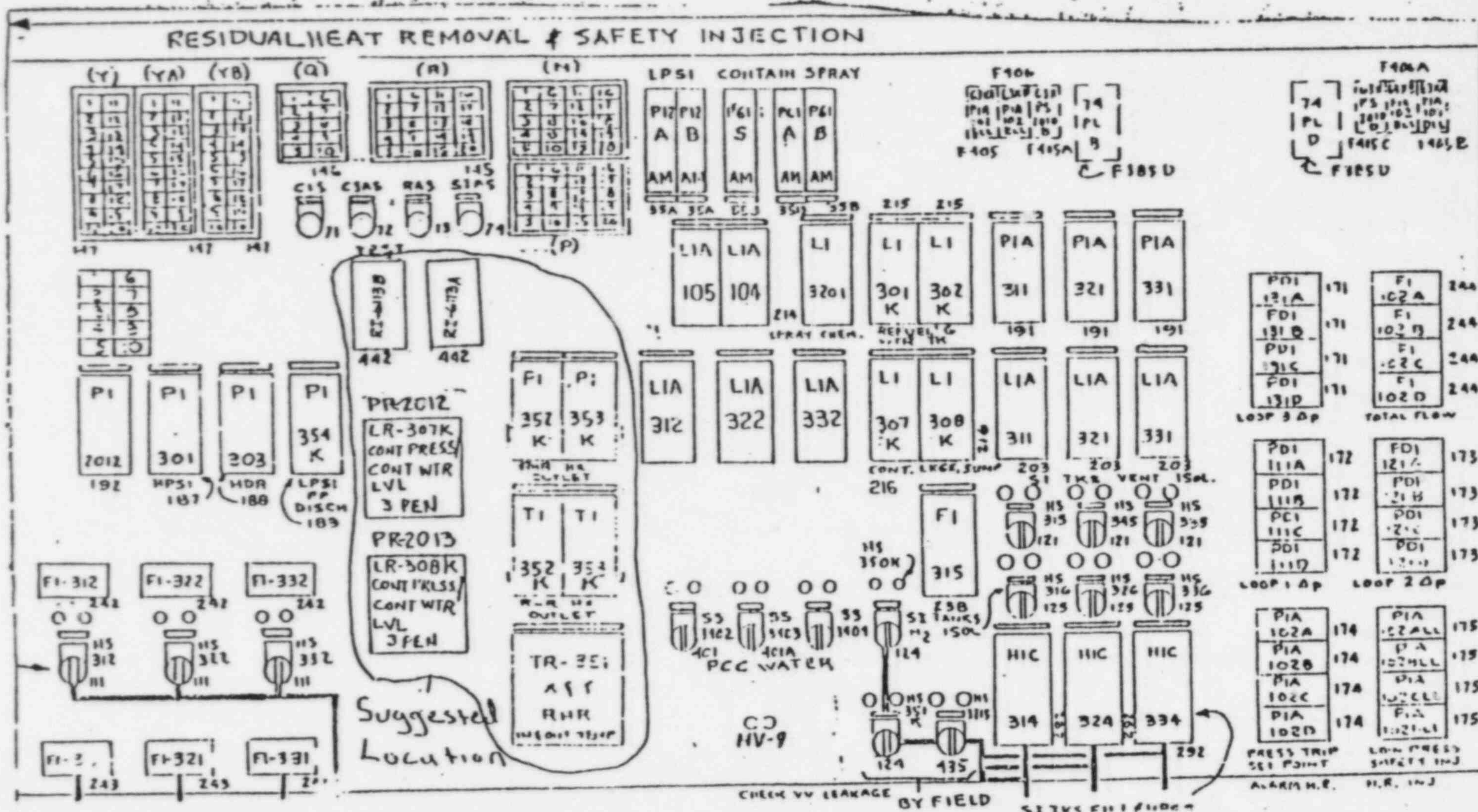
H.E. LIMITS A visual display that will be monitored during control manipulation should be located in the same proximity.

TASK I.D. Subtask 4

PHOTO RECORD

COMMENTS

VERIFICATION



EDCR 84-11 ECN
ENCLOSURE B
PAGE 6 OF 7

EDCR 84-11 ECN
ENCLOSURE B
PAGE 7 OF 7

MEMORANDUM

TO: Stan Urbanowski — YNSD (Company/Location) — March 6, 1984

FROM: T. M. Gifford — MYA (Company/Location) — FILE TMG-84-08

SUBJECT: Swapping of Indicators

Revise the Containment Parameters Relocation EDCR to include the swapping E-3A Pressure and Temperature indicators with E-3B's. The associated instrument numbers are PI & TI 352K with PI & TI 353K. If you have any questions, please don't hesitate to call me at ext. 2548.

T. M. Gifford

T. M. Gifford
Sr. Electrical Engineer

TMG/plb

EDCR 84-11

ENCLOSURE (C)
(DRAWINGS)

(HED # 578)

JAN 9 1985

JRH

ENGINEERING DESIGN CHANGE REQUEST (MY)

EDCR No. 84-60
Task No.
W.O. No. 84-23
ECN No.

Title: Improve SIAS "Loss of Control" Annunciator

Priority: Complete before end of 1985 Refueling Outage Design Grade: 1

Project Engineer: H. Maddox / R.D. Wimpbell Date: 10-30-84

PED Reviewer: [illegible] Date: 11/4/84

OQAD Reviewer: W. Tracy Date: 12-31-84

Plant Operations Review Committee

Approval Recommendation: ______ (Secretary of PORC) Date: ______

Plant Manager Approval

Approved: ______ Date: ______

YNSD

Reviewed*: ______ Date: ______

NOTE:

INFORMATIONAL COPY
NOT YET FINAL APPROVED

* Not required for Design Grades 2 and 3.

Manager of Operations Approval

Approved: ______ Date: ______

Comments: ______

Form 21-202-2
Rev. 6
Rev. Date: 08/29/84
Page 1 of 1

OQAD EDCR REVIEW COMMENT SHEET

I have reviewed EDCR 84-60 in accordance with procedures 21-202 and 17-21-2. I concur with the QA requirements and Design Grade.

note: This review was performed prior to the YNSD review.

William Leary, 12-31-84
REVIEWED BY / DATE

10 CFR 50.59 Safety Evaluation

Document Title: IMPROVE SIAS "LOSS OF CONTROL" ANNUNCIATOR Date 12-17-84

Procedure ☐ EDCR ☒ Test/Experiment ☐ Document No. 84-60 Rev. No. 0

(1) Does this action violate any technical Specifications? Explain briefly: NO - ANNUNCIATOR SYSTEM NOT COVERED IN TECH SPECS.

☐ Yes: this action must be revised to comply with Tech. Specs. or approved by the NRC in order to be implemented

☒ No: continue.

(2) Does this action require an unreviewed safety question determination? i.e., Does this action involve a change to a system or structure described in the FSAR and, important to nuclear safety, or a procedure as described by the FSAR; or is it an abnormal test/experiment not described by the FSAR?*

Explain briefly: NO - THE ANNUNCIATOR IS NOT ADDRESSED SPEFICALLY IN FSAR. IT IS REFFERED TO IN THE FSAR. Three THRU Five Below are Completed For Reference.

☐ Yes; continue. *See paragraph 4.4

☒ No; the document may be approved. Go to (8).

Unreviewed Safety Question Determination

(3) List any accidents specified in Chapter 14 of the FSAR and the Safety Analysis Review Section of the current Core Performance Analysis which could be affected by this action.

NONE - THE INTENT IS TO CORRECT ANNUNCIATOR ERROR - NOT TO CHANGE SIAS

Could this action increse the probability that any of these accidents may occur? Yes ☐ No ☒

Could this action increase the consequences of any of these accidents? Yes ☐ No ☒

Does this action create the possibility of an accident not bounded by those specified in the FSAR and the Core Performance Analysis? Yes ☐ No ☒

Explain briefly: CHANGE IS TO ANNUNCIATOR CIRCUIT.

(4) Could this action increase the probability that any malfunctions of equipment important to Nuclear Safety may occur? Yes ☐ No ☒

If so list. NO - ANNUNCIATOR CKT NOT INCLUDED IN ACCIDENT ANALYSIS

Could this action increase the consequences of any malfunctions of equipment important to Nuclear Safety? Yes ☐ No ☒

Explain briefly: NO - BY ELIMINATING ERROR MORE ACCURATE DATA IS PROVIDED BY OPERATOR.

Does this action create the possibility of a malfunction not anticipated in the accidents specified in the FSAR and the Core Performance Analysis? Yes ☐ No ☒

Explain briefly: NO - ELIMINATES EXISTING ANNUNCIATOR ERROR

(5) Could this action reduce the margin of safety defined in the basis of any Technical Specification (Section 1-4)? Yes ☐ No ☒

NOTE: "Margin of Safety" implies a margin between an operating limit and a known safe condition.

Explain briefly: NO - SEE ABOVE

(6) If any of the questions in the Unreviewed Safety Question Determination are answered yes, the proposed action is and unreviewed safety question and NRC approval is required prior to its implementation, or it must be withdrawn.

(7) If all of the questions in the Unreviewed Safety Question Determination are answered no, the proposed action is not an unreviewed safety question and may be approved. Go to (8).

(8) The proposed action does not involve a violation of Technical Specifications or an unreviewed safety question and may be implemented without prior NRC approval in accordance with 10 CFR 50.59.

Does this safety evaluation render any FSAR wording incorrect or obsolete? Yes ☐ No ☒

If yes, send a copy to the Licensing Department so the FSAR can be updated. Briefly explain the wording discrepancy:

Hugh Madden PED
Originator/Department

(9) Forward the safety evaluation attached to the applicable document package to the PORC Secretary for distribution. The NSEG will verify the safety evaluation during the review period.
NSEG review - Satisfactory.

Nuclear Safety Engineer

Form No. 17-21-6-1
Revised 8/1/83

EDCR # 84-60
ECN #

DESIGN VERIFICATION DOCUMENTATION SHEET

The results of design verification efforts shall be clearly documented with the identification of the reviewer.

This EDCR does involve a safety class system but it does not present an unreviewed safety question per 10CFR 50.59. This change will eliminate annunciator confusion to the operator when a safeguard system is activated or blocked. The voltage sensing relay will be rewired to monitor the 86 device coil and thus will warn the operator if it fails open. All of the basic questions of attachment I in procedure 17-21-6 have either been addressed or do not apply. Cable separation, FSAR and technical adequacy of the design have been addressed. All of my comments pertaining to "Improve SIAS "Loss of Control" annunciator have been incorporated into the EDCR. I have no further comments

Reviewed By: R. Jutras 11/4/84
Date

Concurrence: Frank S. Allen 11/5/84
Cognizant Supervisory Engineer

3297N-JRH

1.0 REFERENCES:

(a) CPA 37-84, "Correct Input Signals for SIAS Annunciator"

(b) M.Y. CRDR HED No. 578

(c) Memo R. Wyckoff to T.M. Gifford, "Recommendation for Re-Evaluation of HED No. 578/CPA 37-84" and enclosures

(d) "ERCIP Steering Committee Meeting Notes", October 4 & 11, 1984.

2.0 ENCLOSURES:

2.1 Enclosure "A" - Drawings

2.2 Enclosure "B" - References (a), (b) & (c) 10CFR50.59 Safety Evaluation.

3.0 DESCRIPTION:

This EDCR addresses not only "RH" Annunciator Window 3-3 (Reference b) but the other three (3) ECCS "Loss of Control" annunciator windows as well - CIS, CSAS, & RAS. Although Reference (b) indicated a Human Factors problem extant with the SIAS annunciator, it was felt that the other windows should be included for consistency (References (c), (d)).

Basically, this design change relocates the electrical sensing point of the four (4) ECCS sets of alarm relays ("74" devices) designed by Stone & Webster to monitor for an open circuit in the trip path for each of the final actuation relays ("86" devices). See Sketch #14.1.

Additionally, the four (4) associated "Loss of Control" annunciator windows onthe RH annunciator panel (MCB Section C) are relabelled to clearly indicate their function with the words "86 DEVICE TRIP PATH FAULT" preceded with the respective system designation (SIAS, CIS, CSAS, or RAS).

Finally, the annunciators electrical logic is modified to reflect the slight sensing functionality change of the "74" devices. See Sketch #14.2.

4.0 REASON FOR CHANGE/ADVANTAGES:

HED 578 documents the fact that the "SIAS LOSS OF CONTROL" annunciator alarms on an automatic SIAS, and shouldn't. Reference (c) describes the reason for this as well as for the other conditions which cause this alarm.

Rather than alter the annunciator logic to preclude such alarms it was decided by the ERCIP Steering Committee to relocate the sensing point of the alarm relays.

Sketch #14.1 shows that relocation to the "top" of the "86" devices. The advantages of this approach are:

1. The "74" devices more closely monitor for "86" device trip path faults that cannot otherwise be deduced, e.g., open circuited "86" device coils or stuck/sluggish mechanical performance.
2. No additional components need be purchased and added to effect the change.
3. A substantial reduction of unnecessary alarms is achieved.
4. Operator understanding of the annunciators is simplified and made clearer.

The disadvantage of this approach is that the "74" devices no longer will affirm trip path continuity through the series/parallel group of (4) contacts to each of the "86" devices.

To counter this disadvantage the white indicating lights next to each "86" device will be left electrically connected "as-built". An information label next to each light will read:

(SIAS, CIS, CSAS, RAS) 86 DEVICE
TRIP PATH COMPLETE

In conclusion, this design change will accomplish the following:

A. ECCS Annunciator Functions "________86 DEVICE TRIP PATH FAULT"

Alarm on:
1. Loss of 125 VDC Control Power
2. 86 Device Coil Open Circuit
3. Sluggish or Inoperative 86 Device at the time of any actuation demand
4. Failure of the 74 Device itself

4.0 REASON FOR CHANGE/ADVANTAGES (cont.):

B. 86 Device White Indicating Light:

Extinguish on:
1. Loss of 125 VDC Control Power
2. 86 Device coil open circuit
3. Inoperative 86 device (stuck in reset) while any actuation demand exists
4. Failure of any of the (4) contacts to make continuity to the 86 Device
5. 86 Device successfully tripped
6. 86 Device successfully blocked
7. Failure of the light itself.

5.0 COST ESTIMATE:

5.1 Engineering - EDCR development, Implementation & Test Procedure development, Field Engineering	$4,585
Crafts - Labor & Supervision	$3,850
Materials - SIS Wire, Blank Annunciator Windows, Consumables	$ 60
Contingency - 10%	$ 850
TOTAL	$9,325

6.0 SCHEDULE:

6.1 Procurement of parts/material can and will be done through existing stockroom inventory. The design requires (4) annunciator blank windows and (8) identification phoenelic labels. The remainder of materials are consumables (tie-wraps, Sta-Kon Lugs, etc.)

6.2 The implementation schedule is for this design change to be accomplished during the 1985 Refueling Outage. The exact timing to be determined through the S/D Coordinator as there will be the need to de-energize the various ECCS actuation train control power buses.

7.0 ORGANIZATIONS RESPONSIBLE FOR THE DETAILED DESIGN:

This design was developed by R.D. Wyckoff of WYTEK Corp. under the cognizance of MYAPCo PED personnel and in conformance with PED and OQAD Procedures.

Maine Yankee PED is responsible for installation or relocation of wiring and any other implementation instruction mandated actions.

8.0 DESIGN INPUT:

The Design Input List (Attachment 1 - PED Procedure 17-21-1) was consulted during the detailed design. All applicable items were considered and addressed.

9.0 QC/QA REQUIREMENTS:

9.1 With the exception of a small amount of SIS Wire and ring lugs which might be necessary to remake certain ECCS "86 Device Trip Paths this design change requires no Safety Class IE Material Purchase. Those few Safety Class IE materials will be drawn from Maine Yankee Stockroom at the time of implementation.

9.2 The implementation instructions will call for QC Inspection/Hold Points as necessary where the work effort could impact the ECCS "86" Device Trip Path integrity.

9.3 The Testing Instructions will similarily address QC Inspection/Hold Points as necessary during the testing of the "86" Device Trip Paths' integrity.

9.0 QC/QA REQUIREMENTS (cont'd):

9.4 The remainder of the design change involves annunciator wiring changes and labeling and is not safety related.

10.0 SAFETY EVALUATION:

10.1 No changes are made to the ECCS Acutation Logic Scheme. No new mounting or materials are required which could impact on the existing seismic or electrical integrity of the various ECCS acutation devices or their wiring.

Implementation of this change elminates false annunciation after safeguards system actuation, and provides more consistent information to operators, thereby, improving safeguards indication.

10.2 Based on the above discussion this EDCR does not increase the probability of occurrance of a previously evaluated accident, or create the possibility of an unreviewed accident and the margin of safety as defined in the Technical Specifications has not been reduced.

10.3 Therefore, the proposed modifications have been analyzed to assure they do not create any unreviewed safety questions as defined in 10CRF50.59 (a) (2).

11.0 PLANT DIAGRAMS REFERENCED:

Drawing Number	Rev. No.	Title
FE-3DA	7	WIR DIAG-BNCHBD-MTD EQUIP MCB SECTION "C"
FE-3DAH	15	WIR DIAG-REAR-MTD EQUIP MCB SECTION "C"
FE-3DAJ	15	WIR DIAG-REAR-MTD EQUIP MCB SECTION "C"
FE-3DH	7	WIR DIAG-BNCHBD-MTD EQUIP MCB SECTION "C"
ESK-7B	12	ELEM DIAG AUX SYSTEM CONT SH.2
ESK-7C, 1	21	ELEM DIAG AUX SYSTEM CONT SH.3
ESK-7D, 1	20	ELEM DIAG AUX SYSTEM CONT SH.4
ESK-7E	10	ELEM DIAG AUX SYSTEM CONT SH.5
ESK-7F	11	ELEM DIAG AUX SYSTEM CONT SH.6
ESK-7J	12	ELEM DIAG AUX SYSTEM CONT SH.9
ESK-7K	10	ELEM DIAG AUX SYSTEM CONT SH.10
ESK-10N	10	WINDOW ARRG'T ANNUN SH. 13
ESK-10AAC	13	ELEM DIAG ANNUNCIATORS SH.27

12.0 OPEN ITEMS:

12.1 There are no open items.

13.0 DESIGN ANALYSIS/CALCULATIONS:

Testing, rather than calculations, was performed on a similar electrical scheme as this EDCR outlines for the "74" Devices. The intent of the benchtesting was to confirm that the "74" Device would not drop out out during the time from application of 105 VDC to the "86" Device Series Contacts (17 & 18 - see Sketch #14.1) opening.

The nominal drop-out time of an open circuited "74" Device, initially energized from 105 VDC (the estimated lowest voltage that would be seen on the battery buses) is approximately 9 milliseconds.

The nonminal transfer time of an "86" Device from reset to tripped (contact opening in this case) at the same 105 VDC is 13 milliseconds.

The "74" Device Dropout Time, in situ, is nominally 40 milliseconds due to the essential short circuit across its' coil during the time that the trip signal path from +105 VDC, through the forward biased trip diode and the "86" device contacts exists. This is due to the low impedance "suppression" path which is allowing the "74" Device coil collapse EMF to create a current which tends to oppose the collapsing magnetic field and thus impedes the device drop-out.

Therefore, it was concluded from this testing that the "74" device would not drop out on a "normal" actuation scenerio. This precludes a spurious alarm on the annunciator.

However, should the "86" Device take 40 or more milliseconds to trip or should its' series contacts fail to open then the "74" device would de-energize, causing an alarm. This is considered sufficient margin that should the scenerio occur it would merit investigation as a potential problem with the "86" Device. Thus the alarm is warranted.

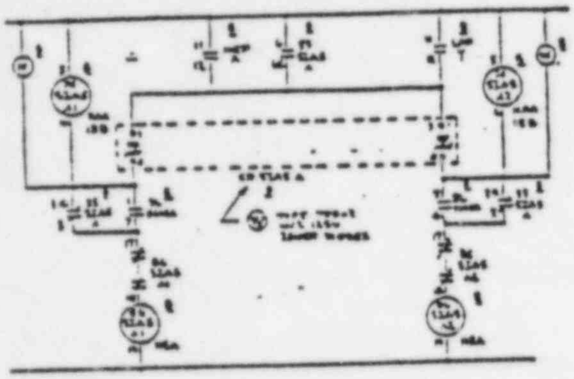
14.0 SKETCHES:

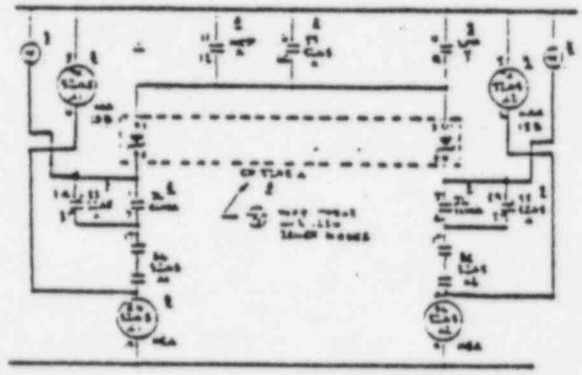
14.1 This sketch depicts the "As-Built" and "After Implementation" schematic diagrams of the applicable affected circuitry.

14.2 This sketch similarly shows the changes to the annunciator windows logic.

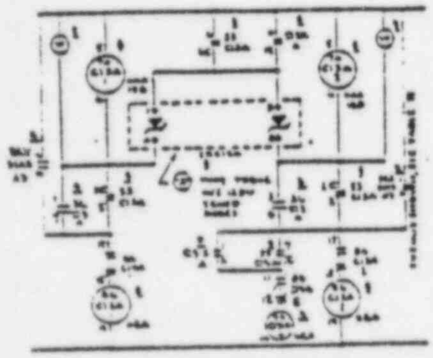
"AS BUILT" "AFTER IMPLEMENTATION"

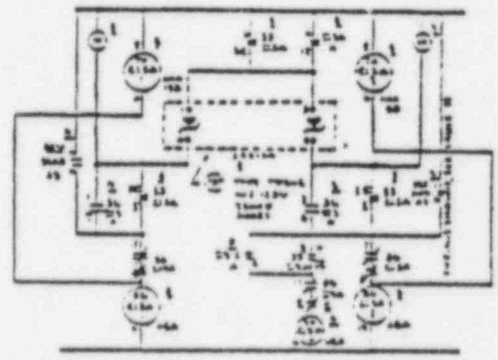
SIAS



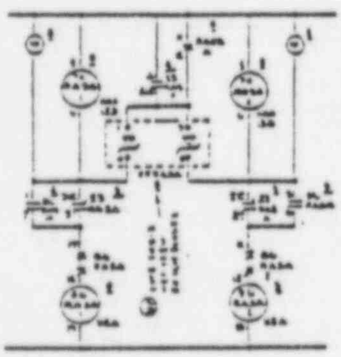


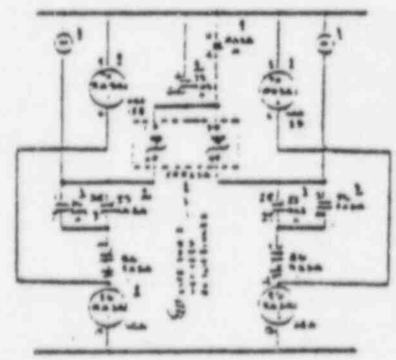
CIS



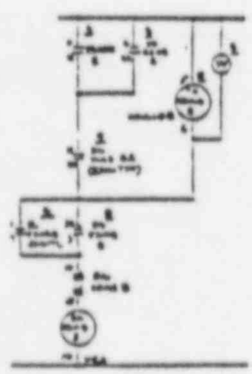


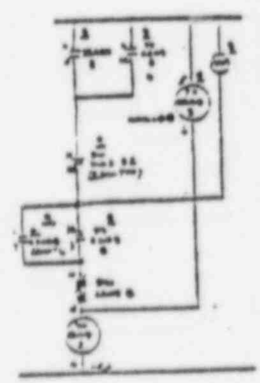
RAS





CSAS
(Train B shown)
(Train A similar)

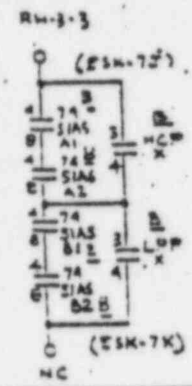


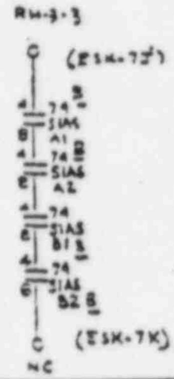


SKETCH 14.2

"AS BUILT" "AFTER IMPLEMENTATION"

SIAS





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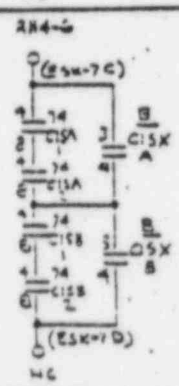
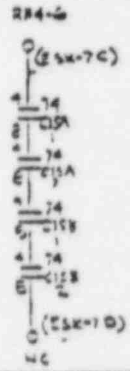
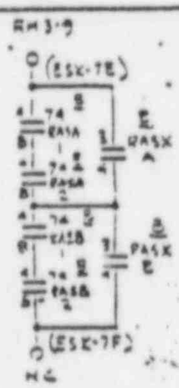
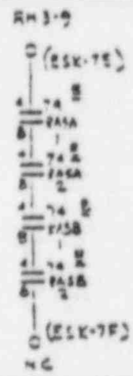


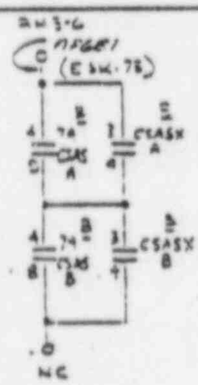


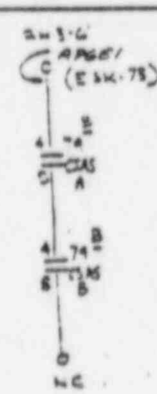
RAS





CSAS





MEMORANDUM

Ref. (c)
EDCR 84-60

TO T.M. Gifford — MYAPCo (Company or Location) — September 28, 1984

FROM R.D. Wyckoff — WYTEK Corp. (Company or Location) — FILE

SUBJECT Recommendation for re-evaluation of HED No. 578 / CPA 37-84

Enclosures 1.) Unnumbered sketch "Annunciator Circuit for Loss of Control Power" from CPA 37-84
2.) Composite Drawings - ECCS "74" Devices Wiring

Background: I have been assigned the task of developing EDCR's for certain CPA's which relate to Control Board HED's. The first CPA I decided to start with was CPA 37-84, titled "Correct Input Signals for SIAS Annunciator", which was generated from HED No. 578.

While researching for the EDCR (Number Assigned: 84-60) I had conversations with licensed operators, Training dept. instructors and PED personnel. I also verified certain "As Built" simulator algorithms to the ESK logic with Mike Swartz.

These actions have led me to generate this memo, detailing my concerns and listing recommendations, and to stop further work on EDCR 84-60 until resolution is made by cognizant Maine Yankee personnel.

Approved
change the 74 device lead to top side of coil & change as well.
14/50 change required

Discussion: The unnumbered sketch (Enc. 1) suggests an approach to correct HED No. 578. My recent efforts to generate an EDCR lead me to conclude that a more cost effective method is available than the one contemplated. I offer the following for consideration:

ORIGINAL ANNUNCIATOR DESIGN INTENT

The original intent of 74 SIAS (A1, 2, B1, 2) relays was to provide automatic annunciation of an open circuit condition in any of the four SIAS "86" devices during either "normal" (non-accident) or manually initiated conditions (blocking or initiating SIAS).

This functionality is inferred from the fact that all four ECCS systems have similar "74" device annunciation schemes (See Enc. 2). It would probably take me a week to confirm that inference through research into S&W design bases documents. The present MY Panalarm response procedures, however, should suffice to allow me to use that inference as a premise.

RECOMMENDATION "A"

If one accepts the inferred functionality as a premise then the SIAS A and B train manual control switches should not defeat the annunciator logic as suggested in enclosure 1.).

RECOMMENDATION "B"

My second recommendation is to do nothing to the existing "SIAS Loss of Control" annunciator logic but rather to change the window wording to accurately reflect its purpose. I suggest the following:

SIAS 86 DEVICE
TRIP PATH
OPEN.

This wording clearly indicates that the normally complete circuit for either of the 86 devices has been opened. The operator is then reminded to take whatever corrective action is necessary to restore the trip circuit continuity.

For uniformity the other three ECCS "Loss of Control" annunciator windows should be similarly changed with only their respective names (RAS, CIS & CSAS) included to differentiate between them.

Discussion: The SIAS trip logic, up until the accomplishment of EDCR 82-7, involved automatic trip of the "A" Train by the HCP-X relay and the "B" train by the LPP-X relay. The SIAS Loss of Control annunciator scheme reflected that logic in that each of these two relays provided a contact across its associated "74" device contacts to preclude annunciation of a "loss of Control" when the train had been automatically tripped.

Obviously, when redundant automatic trip relays (HCPY & LPPY) were added through the completion of EDCR 82-7 then the annunciator logic was no longer valid. Therefore, any automatic SIAS initiation will cause the SIAS Loss of Control alarm.

It could be argued that HED 578 requires some kind of hardware corrective (such as the addition of redundant HCP & LPP(Y) contacts – Enc. 1.) However, nowhere in the SIAS EOP 2-70-1 does it require the operator to regard or take action upon the receipt of the Loss of Control annunciator. The entrance into that EOP is clearly laid out and logical. The operator is concerned only with successful SIAS system operation

In fact, a strong argument exists to support my recommendation:

Assuming that the annunciator <u>does not</u> which it does alarm upon automatic initiation of SIAS <u>and</u> the "86" devices are still tripped, then sometime later (during the SIAS recovery phase) when either automatic trip signal clears, the annunciator <u>will alarm</u>. It might not be obvious to the busy operator that this is "normal" and he may be distracted during a time when his skills and attention are most needed.

Better to have the alarm in at the start of the scenerio and have it clear <u>only</u> when the operator takes logical restorative action e.g. upon clearing the auto trip signals and then manually resetting the "86" devices for normal operation.

<u>RECOMMENDATION "C"</u>

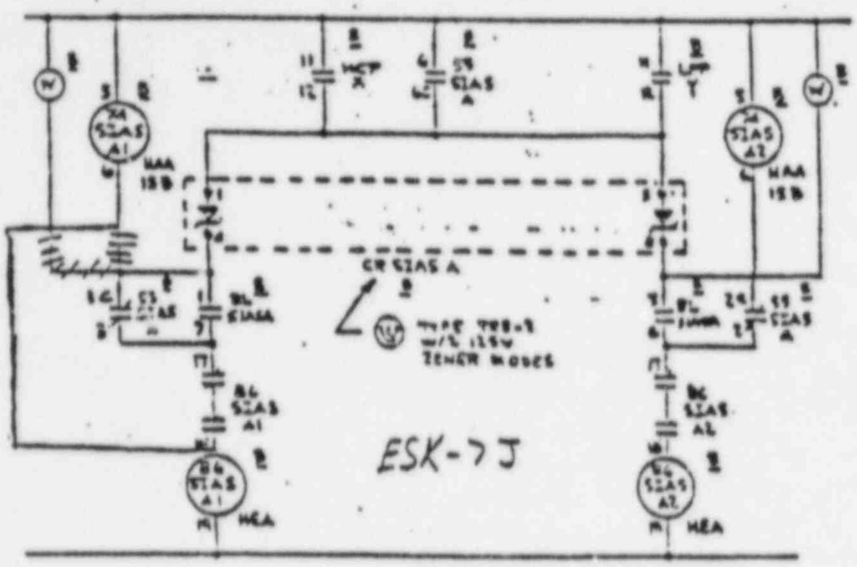
Should it be determined that the annunciator window remain unchanged I recommend that the SIAS "74" devices be electrically powered from the 125 VDC supply buses, downstream of the breakers, similar to the four SIAS Trip Logic "74" device wiring (ESK-7H).

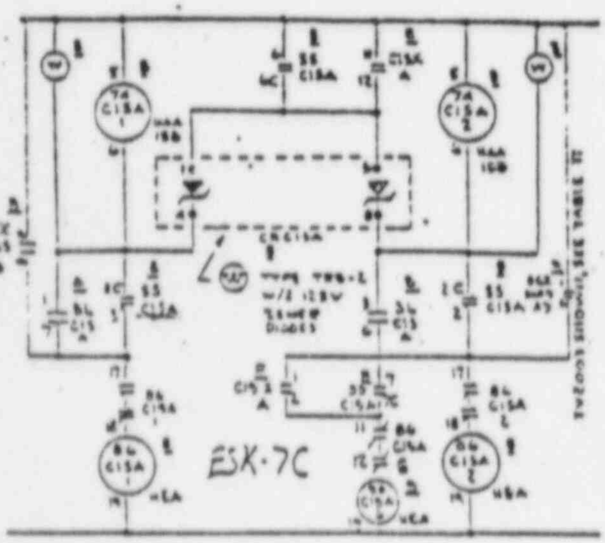
This change would bring the functionality of the SIAS "74" devices in line with the annunciator window labeling. It also eliminates unnecessary alarms caused by either initiating <u>or</u> blocking SIAS. However, the original intent of the alarm relays would be defeated and only the white indicating lights next to their respective "86" device operating handles remain to alert the operator of a possible problem with the "86" device or its trip circuitry.

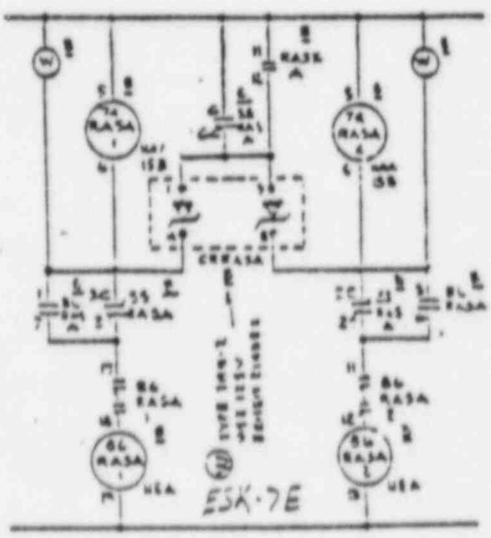
Although it is highly unlikely that a coil of an "86" device would open while carrying only the holding current of its "74" device and the white indicating light I believe that this change would potentially create questions and concerns among reviewers that, by themselves, could entail substantial research to answer and allay. I do not forsee an unanswered safety concern here but rather a more complicated approach to solving what appears to be a simple labelling and training problem.

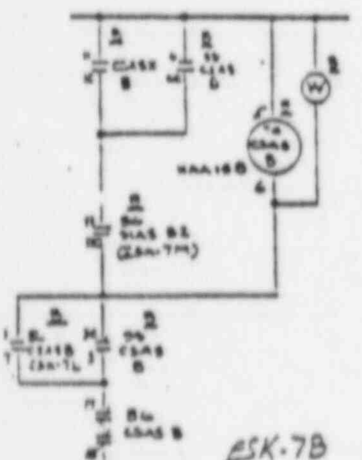
I do not recommend wiring up spare contacts of the recently installed HCP-Y and LPP-Y relays into the SIAS Loss of Control annunciator just to eliminate the occurrance of the alarm during an automatic initiation (as previously discussed) because that doesn't address the "Manual" and "Block" conditions extant nor does it manifestly improve the operator's understanding of what the alarm is telling him.

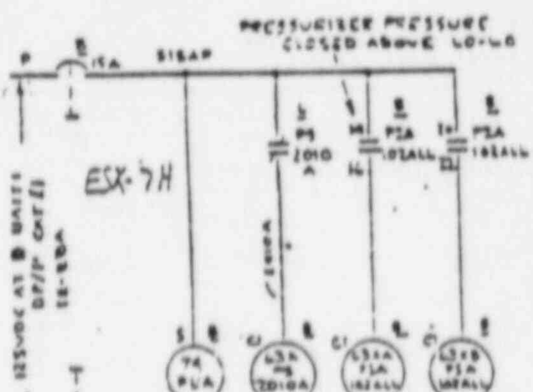
Same for all









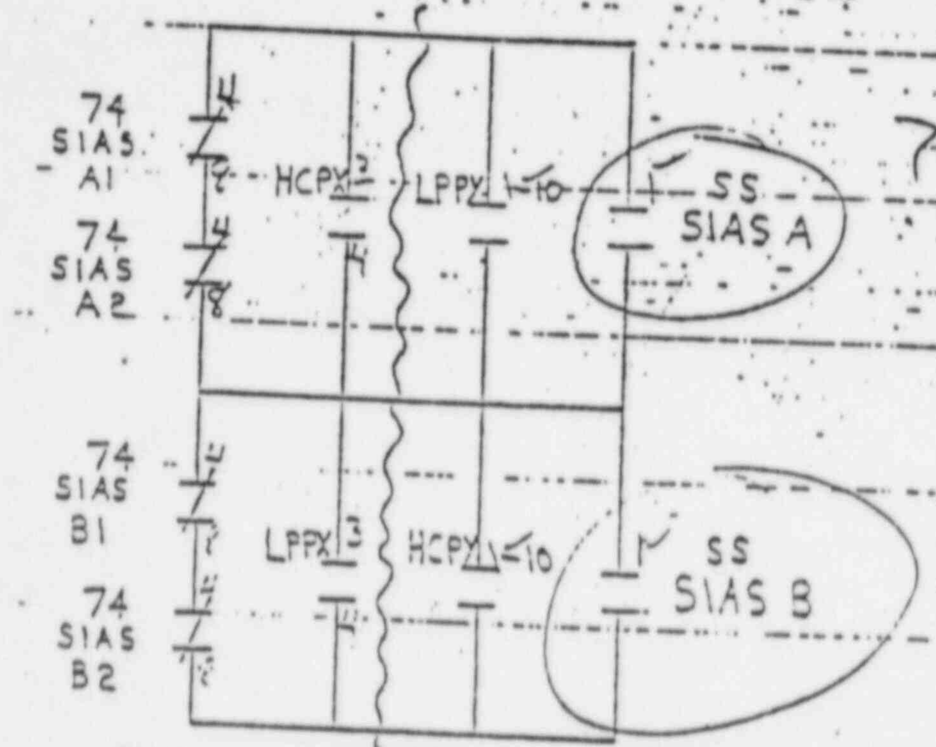


Enclosure 2.)

R.D. Wyckoff To T.M. Gifford Sept. 28, 1989

ANNUNCIATOR CIRCUIT FOR LOSS OF CONTROL POWER

74 device
Alarm Relay



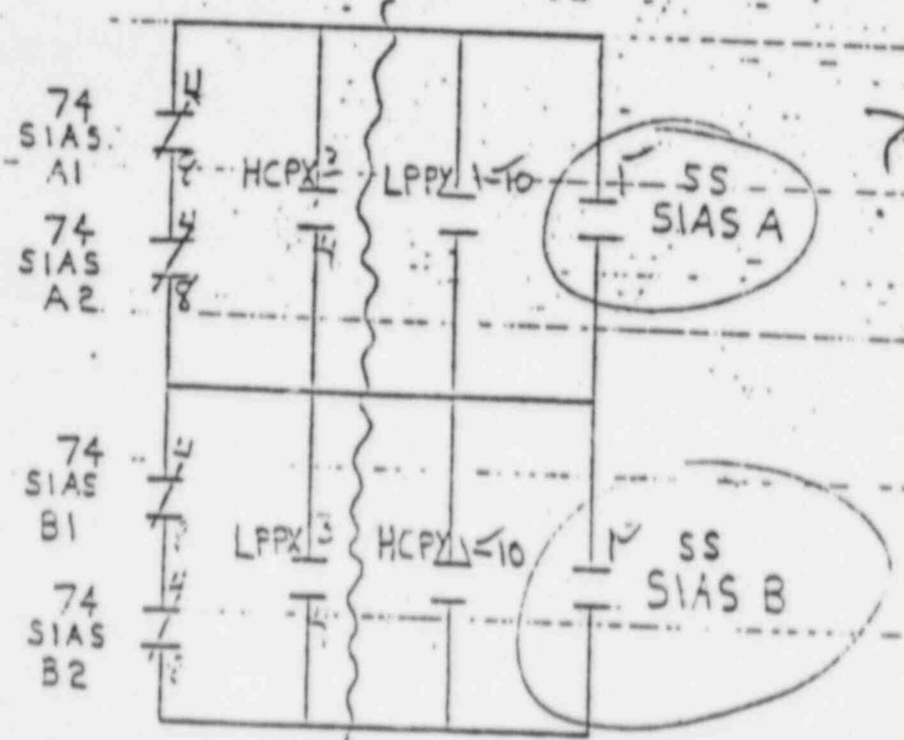
EXISTING CIRCUIT ← | → NEW CIRCUITRY NEEDED TO PROVIDE CLOSE CONTACTS UPON ACTIVATION OF SIAS THAT WILL BYPASS THE LOSS OF CONTROL POWER ANNUNCIATION.

Enclosure 1.)

R.D. Wyckoff To T.M. Gifford Sept. 28, 1989

ANNUNCIATOR CIRCUIT FOR LOSS OF CONTROL POWER

74 device
Alarm Relay



EXISTING CIRCUIT ← | → NEW CIRCUITRY NEEDED TO PROVIDE CLOSE CONTACTS UPON ACTIVATION OF SIAS THAT WILL BYPASS THE LOSS OF CONTROL POWER ANNUNCIATION.

Enclosure 1.)

(HED# 148)

W/C 69-84-11

ENGINEERING DESIGN CHANGE REQUEST (MY)

EDCR No. 84-71
Task No. 6.16
W.O. No. 84-23
ECN No. 0

RECEIVED
APR 0 9 1985
MAINE YANKEE PROJECT

Title: RELOCATION OF REACTOR HEAD VENT SELECTION SWITCHES

Priority: Refueling Outage 1985 Design Grade: 1

Project Engineer: [signature] / Fred Gifford / Hugh Madden Date: 2-21-85

PED Reviewer: R. J. [signature] Date: 2/26/85

QCAD Reviewer: A. Jones Date: 3/11/85

Plant Operations Review Committee

Approval Recommendation: P. L. Newcomb Date: 3/21/85
(Secretary of PORC)

Plant Manager Approval

Approved: John Garrity Date: 3/25/85

YNSD

Reviewed*: P. L. Anderson Date: 4/24/85
SEE COMMENTS ON REVIEW SHEETS. PLA

NOTE:

* Not required for Design Grades 2 and 3.

Manager of Operations Approval

Approved: C. D. Frizzle Date: 5/2/85

APPROVED

Comments:

3410N-JRH

PLANT DESIGN CHANGE REQUEST REVIEW FORM

EDCR NO.: 84-71 PLANT: Maine Yankee PRIORITY: ReFueling Outage 85

EDCR TITLE: Relocation of Reactor Head Vent Selection Switches

Work Order: 5804

LOGGED IN: Art 4/9/85 (Initial/Date) LOGGED OUT: Art 4/26/85 (Initial/Date)

I. ENGINEERING REVIEW AND COMMENTS:

A. COGNIZANT ENGINEER REVIEW

SEE COMMENT SHEET

[illegible] I&C 10 APR 85
Reviewer/Discipline/Date

B. SUPPLEMENTAL REVIEWS BY OTHER PROJECT DISCIPLINES

Reviewed in accordance with WE-101 for electrical aspects with no comments

A. Kelvin Hyyrynen /EE/ 4/12/85
Reviewer/Discipline/Date

Review per WE-101 for Systems Engineering aspects with no comments.

[illegible] SE 4/16/85
Reviewer/Discipline/Date

The seismic review requested in SR-M85-57 has been performed in Yankee Calculation MYC-657. The acceptable results were reported in MYP85-307.

Reviewer/Discipline/Date

This review should close out the open item discussed in Section 12.1

WE Henries/ME/ 4/24/85

PLANT DESIGN CHANGE REQUEST REVIEW FORM
Sheet 2 of 3

EDCR NO.: 84-71 PLANT: Maine

C. SUPPLEMENTAL REVIEWS

Reviewed in accordance with WE-101. This change does not have a negative impact on plant licensing or safety analysis.

R.P. Sl[illegible] NED 4/22/85
NED Reviewer/Group/Date

Reviewed in accordance with WE-101. As work is to be performed in the control room, there are no radiological concerns requiring resolution. [illegible] RPG/4-24-85
EED Reviewer/Group/Date

Reviewed in accordance with WE-101. No fire protection comments.

[illegible] 4/23/85
PED Reviewer/ESG/Date

No welding or NDE concerns - Reviewed per WE-101 - no comments.

[illegible] 23 Ap 85
PED Reviewer/MSG/Date

Reviewed in accordance with OQA-TIL-3 Rev. 6 with no comments. [illegible] 4/25/85

T. Chillhan 4/25/85
OQA Reviewer/Date

FORM WE-101-3
Revision 3

PLANT DESIGN CHANGE REQUEST REVIEW FORM
Sheet 3 of 3

EDCR NO.: 84-71 PLANT: Maine

D. RECOMMENDATION TO ENGINEERING MANAGER

Recommend that this EDCR be implemented as written, with due consideration given the attached comments.

Lead Engineer/Date 24 April 85

E. ENGINEERING MANAGER REVIEW

✓ Approved per recommendation above

__ Rejected per recommendation above

__ Other, see Comments

COMMENTS:

Engineering Manager/Date 4/24/85

II. OQA REVIEW AND COMMENT

No further comments.

THIS PDCR HAS BEEN REVIEWED IN ACCORDANCE WITH OQA-III-2

OQA Reviewer/Date 4/25/85

ENVIRONMENTAL QUALIFICATION REVIEW
(Reference: MYP 85-39)

EDCR NO.: 84-71

PLANT: MAINE YANKEE

COMMENTS: Sheet 1 of 1

This EDCR has been reviewed for EQ concerns in accordance with WE-101, Memo MYP 85-39, and the Maine Yankee EQ Program Manual. The equipment covered by the design change are not included in the EQ Program and are not subject to the requirements of 10CFR50.49.

Comments continued on Sheet —

S.J. Urbanowski 4-17-85
Reviewer/Date

FORM WE-101-4
Revision 2

PLANT DESIGN CHANGE REQUEST

COMMENT SHEET

PDCR NO.: 84-7

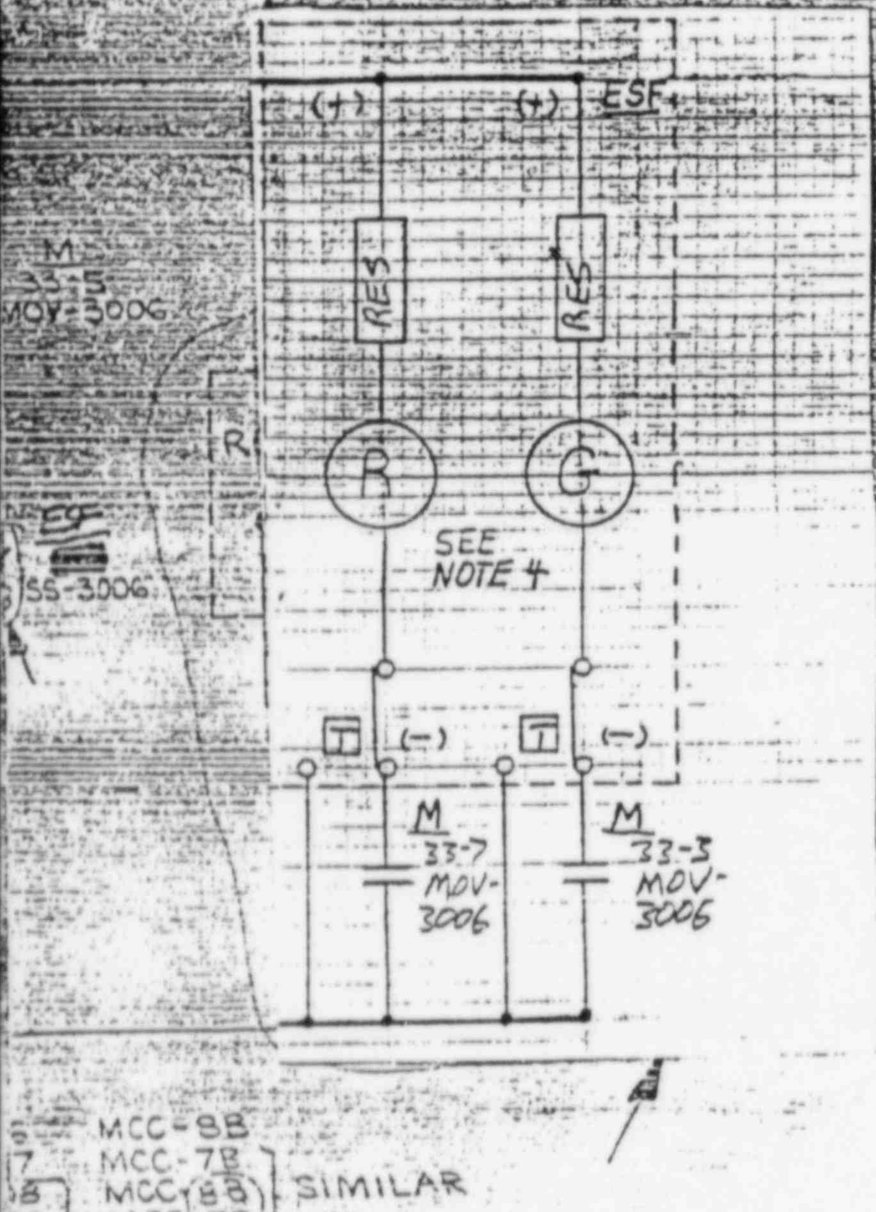
PLANT: MAINE

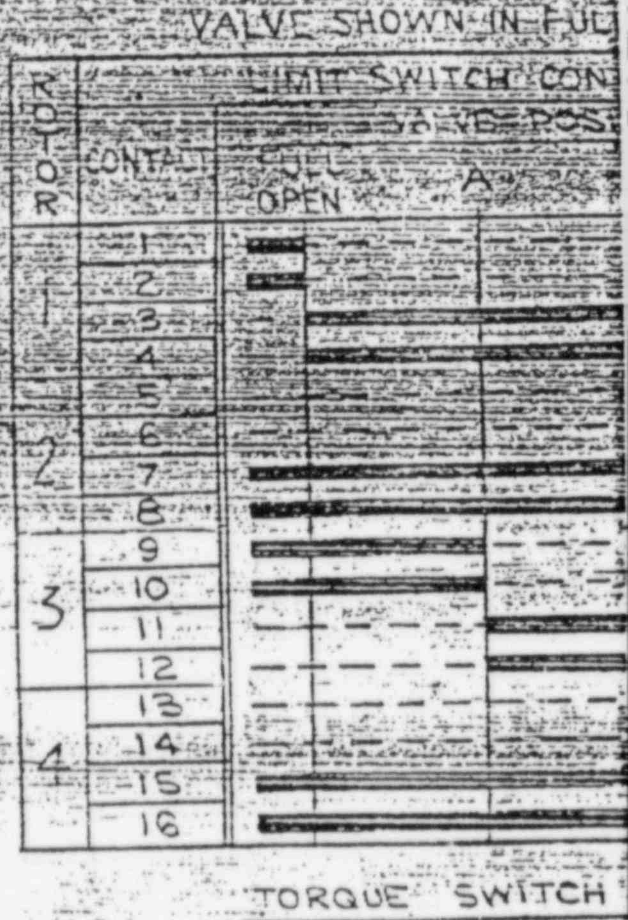
COMMENTS: Sheet 1 of 1

AS AN ALTERNATE METHOD OF WIRING THE ELECTRICAL WIRING PULL TO TEST [illegible] THE ATTACHED SKETCH INDICATES THE METHOD USED IN THE PLANT FOR EXISTING PULL TO TEST INSTRUMENTS. IT REQUIRES THAT ONE MORE WIRE BE INSTALLED, BUT USES THE SCHEME INDICATED IN THE PDCR AND PROVIDES FOR STANDARDIZING THE PULL TO TEST FEATURE.

Comments continued on Sheet ______

[illegible] 11 April 85
Reviewer/Date





(17) CLOSING TORQUE SWITCH
CIRCUIT IF MECHANICAL
CLOSING CYCLE OR FULL

(18) OPENING TORQUE SWITCH
CIRCUIT IF MECHANICAL
DURING OPENING CYC

THIS CHANGE FOR
EDCR 84-71 ONLY
HCM 2-14-85

...ERENCES SEE ESK-6BB
...WIRING DIAGRAM SEE
...28 SERIES
...ARE TERMINALS LOCATED
...TERMINAL BOX
...INTERNAL TO LAMP ASSY
...CATES THE SWITCH

→ INDICATES CHANGE

ORIGINAL ISSUE PER EDCR 79-54	5/7/82	E.W. 5/9/82	RML 4/11/83	4/12/83

REV. NO. | DESC...

YANKEE
YANKE...
20 TURNP...
N...

MAINE YANKEE A...
WISCA...

ELEM. DIAG...

DESIGNED BY	DATE	CHECKED BY
PMR	3/25/81	E. Hiditos...
ORIGINAL ISSUE DATE		ACCOUNT NO
		EDCR 79-...

Form 21-202-1
Rev. 7
Rev. Date: 01/02/85

OQAD EDCR REVIEW COMMENT SHEET

I have reviewed EDCR 84-71, "Relocation of Reactor Head Vent Selection Switches," and have no comments

[signature] 1/31/85
REVIEWED BY DATE

Form No. 17-21-6-1
Revised 8/1/83

EDCR # 84-71
ECN #

DESIGN VERIFICATION DOCUMENTATION SHEET

The results of design verification efforts shall be clearly documented with the identification of the reviewer.

The EDCR dealing with the relocation of the reactor head vent selection switches has one open item. The system is presently tagged out as a result of N.R.C./N.Y. discussions. The system must be tested prior to closing out this package regardless of N.R.C./N.Y. discussions. This system is safety class and does not present an unreviewed safety question per 10 CFR 50.59. All of the basic questions of attachment I in procedure 17-21-6 have either been addressed or do not apply. Cable seperation, FSAR and technical adequacy of the design have been addressed. I have no further comments.

NOTE: Prior to start of work notify licensing for status of system

Reviewed By: R Jutras 12/26/85

Date

Concurrence: Frank L. Glee 2/28/85

Cognizant Supervisory Engineer

3297N-JRH

1.0 REFERENCES:

1.1 Nureg 0700.

1.2 Electroswitch Technical Bulletin "MOD-1" dated June 1, 1980.

1.3 M.Y. EDCR #79-54, "Reactor Vessel Vents".

2.0 ENCLOSURES:

2.1 CPA #17-84

2.2 10CFR50.59 evaluation

3.0 DESCRIPTION:

3.1 This EDCR addresses several Human Engineering Descrepancies (HED's) incoprorated in CPA #17-84. These HED's are concerned with the 4 valves and their associated control switches in the Reactor Vessel Vent System. Two of these valves (RC-M-54 & 56) are used to vent the Reactor Head and two are used to vent the Pressurizer (PR-M-89 & 90).

Comments of the HED's are summarized below:

3.1.1 HED #147: Switches are oversized for the amount of use.

3.1.2 HED #148: Switches are not typical to others performing similar function.

3.1.3 HED #294: Switch T-handles do not have position indicators.

3.1.4 HED #475: Switches do not have system function labels.

3.1.5 HED #771: Switches are infrequently used and should be relocated to the ESF Panels.

3.2 The HED's shall be corrected as follows:

3.2.1 HED 771: Switches shall be relocated to ESF Panels.

Modifications for the relocation of the switches shall include:

1. Panel cutouts to accept switches in the ESF Panels.

3.0 DESCRIPTION (Cont'd):

2. One new run of conduit from each of the ESF Panels to the MCB, Sec C.; 3" Conduit will be used to allow for future modifications.
3. Two new runs of 7 conductor 12 AWG cable from each of the ESF Panels to the MCB, Sec C. These cables will land on existing spare terminals internal to ESF. The other end will terminate at the existing terminal points in the MCB presently used by the MOV selector switches.
4. All wire/cable will be Safety Class 1E.
5. CPA 17-84 included a sketch which delineated the new positions of the selector switches. The positions specified in this EDCR differ from the position specified to maintain train separation and to maintain compliance with Nureg 0700, Sec. 6.1.2.5.a.1.

3.2.2 HED's 147, 148, 294, and 475: Selector Switch descrepancies. These HED's will be corrected by replacing the selector switches with new Electroswitch type 20K. These new switches are similar to other selector switches on the ESF Panels except that they will be key operated. The key will act as the selector switch handle when inserted. Valve #'s and switch positions (Close, Norm, Open) will be engraved on the switch faceplate. RC-M-54 and RC-M-56 will have identical keys. PR-M-89 and PR-M-90 will have identical keys. The two sets of keys will not be interchangable. One spare key for each selector switch will be supplied.

3.3 The switches will be wired to existing internal terminal blocks as indicated in Sketches 5 through 8. The functional characteristics of the Control Circuitry will not be altered.

3.4 Testing of the MOV circuits will meet the following criteria:

3.4.1. The valve shall cycle from full shut to full open and from full open to full shut.

3.4.2 The valve shall demonstrate throttling ability typical to other throttle valves on the MCB.

NOTE: There are no auto functions for these valves.

3.0 DESCRIPTION (Cont'd):

3.5 One spare control switch for each valve shall be ordered and stock coded in Stores.

4.0 REASON FOR CHANGE/ALTERATION:

4.1 IAW Nureg 0700, Sec. 6.4, Controls and Associated Valve Position Indications shall be similar in design, size, and operation to other controls with similar functions.

4.2 IAW Nureg 0700, Sec. 6.4.1.1b, Controls Selected should comply with the "Economy of Space" concept. These new controls will be consistent with similar controls on the ESF panels.

4.3 This document reflects the concepts developed in CPA 17-84.

5.0 COST ESTIMATE:

5.1 Engineering		$ 2,320.00
5.2 Materials		2,075.00
5.3 Labor		6,060.00
5.4 Testing		176.00
	Subtotal	$10,631.00
	Plus 10% Contingency	1,063.00
	TOTAL EST.	$11,694.00

6.0 SCHEDULE:

6.1 Implementation projection - 1985 Refueling.

7.0 ORGANIZATION RESPONSIBLE:

7.1 M.Y. PED

8.0 DESIGN INPUT:

8.1 This Design Change was based upon HED's initiated during a detailed Control Room Design Review conducted in response to Nureg 0737. This EDCR has been prepared IAW Maine Yankee Procedure #17-21-2, "Engineering Deisgn Change Request, Maine Yankee". The design input list of procedure 17-21-2 has been reviewed. Applicable portions have been addressed as appropriate.

9.0 QA/QC REQUIREMENTS:

9.1 This design change is Safety Class 1E. Implementation Instructions will require QC to witness cable termination and functional testing.

10.0 SAFETY EVALUATION:

10.1 This design change does not involve an unreviewed safety question because the change will not alter the electrical design or functional characteristics of the circuit.

Physical Impact on the system will involve:

a. Relocation of Reactor Head Vent System Controls.
b. Replacement of Reactor Head Vent System Selector Switches with a new type.
c. Installation of new cable from present terminal boards in the MCB, Sec. C to the ESF Panels.

All materials, as applicable, will be Safety Class 1E. Relocation of these infrequently used controls will reduce "visual clutter" of the MCB. Therefore:

1. It has been determined that this design change will not increase the probability of occurance or consequences of an accident.
2. The possibility of an accident has not been increased.
3. The margin of safety as defined in Technical Specifications and FSAR has not been decreased.

There are no un-reviewed safety questions IAW 10CFR50.59.

11.0 PLANT DIAGRAMS REFERENCED:

11.1 Diagrams Altered:

ESK-3L, 4MA, 4MB, 4MC, 4MD, 6CX, and 4C.
FE - 3CD, 3DG, 3DS, 3KA, 3KB, 42F, and 42G
SE - 107 AM, 107AU

11.0 PLANT DIAGRAMS REFERENCED (Cont'd):

11.2 Diagrams Referenced:

FE - 9H and 9N

SE - 107 AG, 107 AJ, 107 AP, and 107 AR.

12.0 OPEN ITEMS:

12.1 Seismic Analysis to be performed by Yankee Atomic, Framingham, Mass. The project engineer of EDCR 84-71 shall review the Seismic Analysis and issue an ECN to clear item 12.1 when he is satisfied that requirements have been met.

13.0 DESIGN ANALYSIS/CALCULATION:

NONE

14.0 SKETCHES:

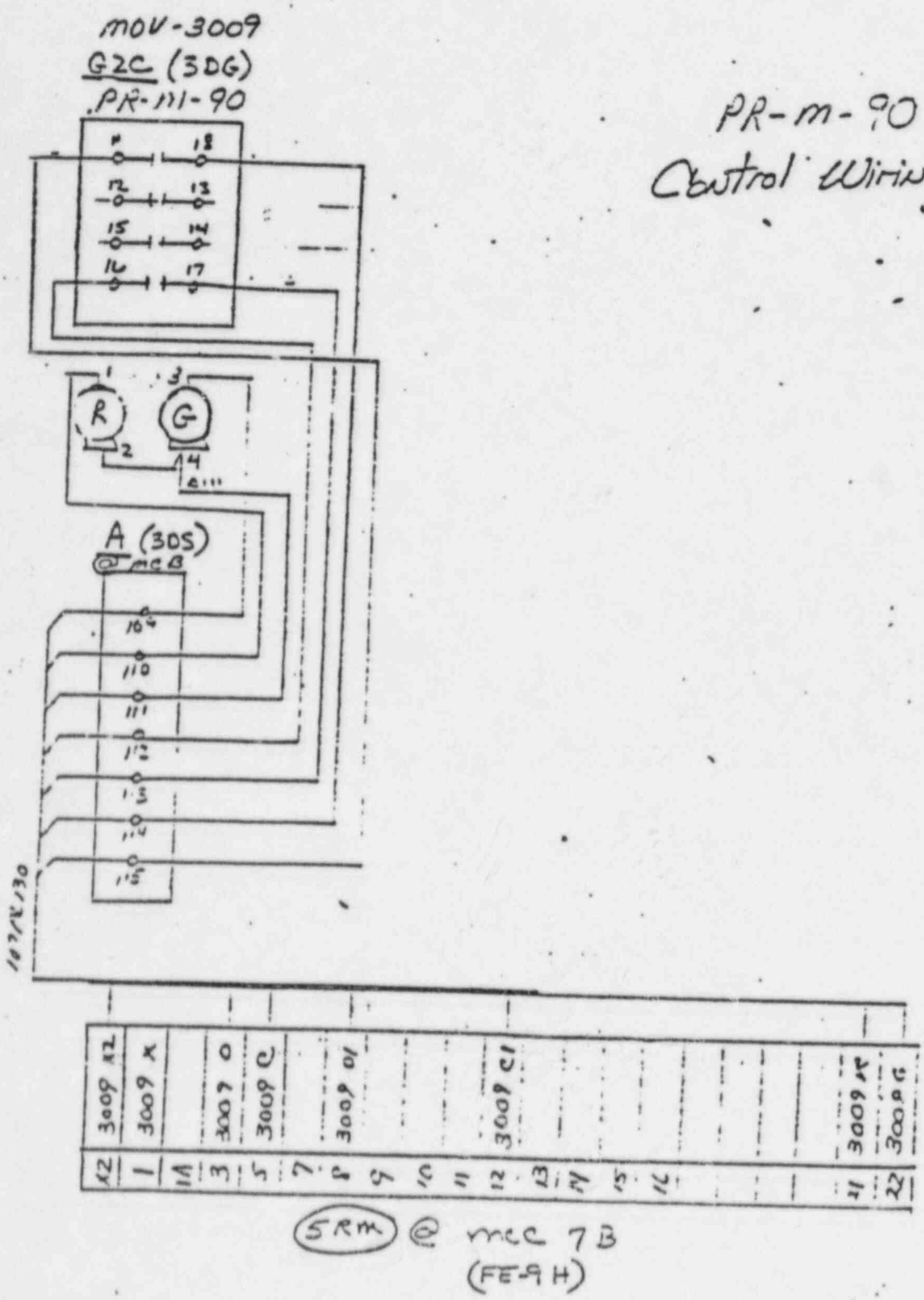
14.1 Sketches 1 through 4 are present plant configuration for PR-M-90 (MOV-3009), RC-M-56 (MOV 3007), PR-M-89 (MOV 3008), and RC-M-54 (MOV-3006).

14.2 Sketches 5 through 8 are proposed plant configuration for PR-M-90 (MOV-3009), RC-M-56 (MOV-3007), PR-M-89 (MOV-3008), and RC-M-54 (MOV-3006).

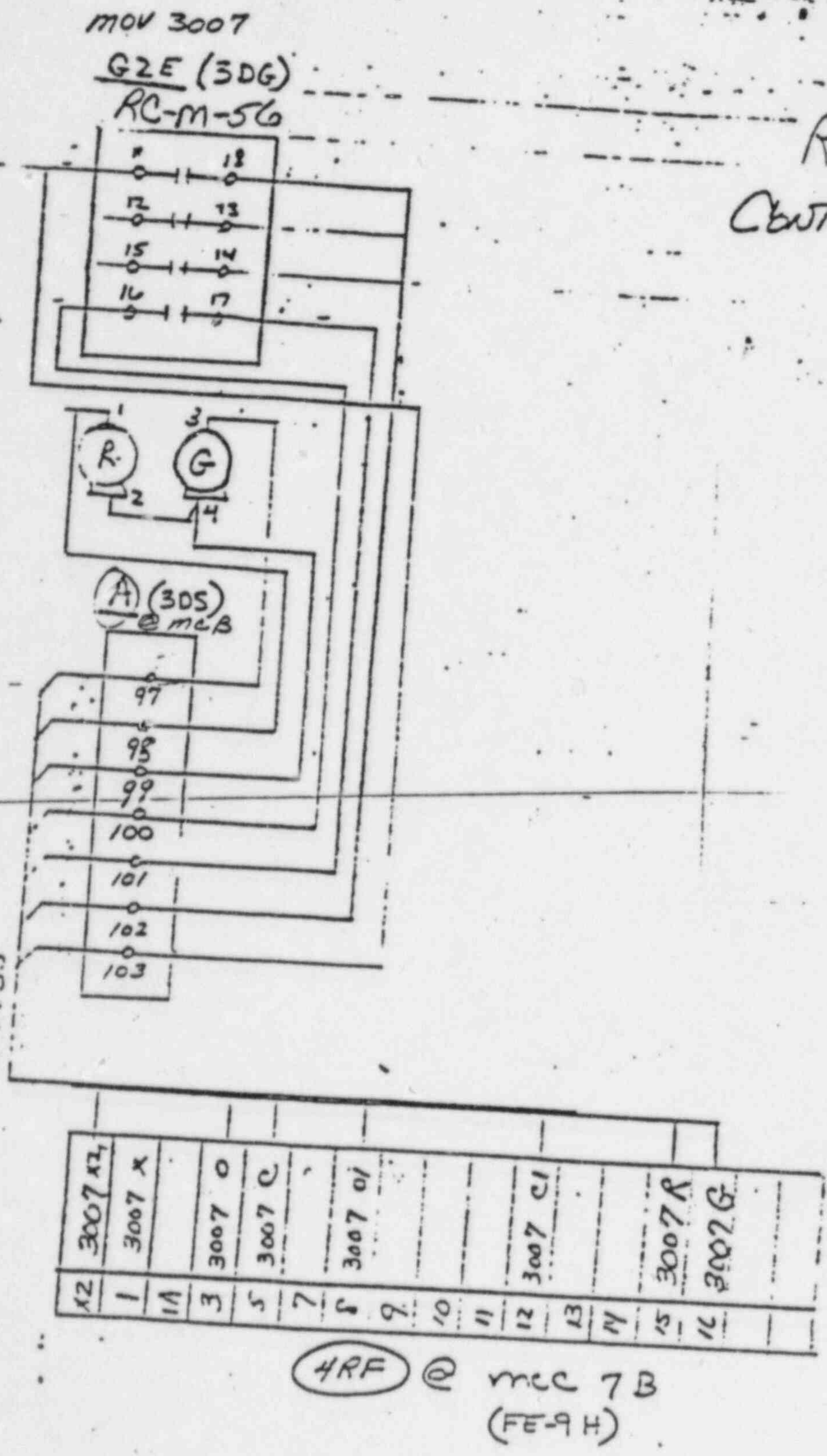
14.3 Sketch #9 shows dimensions and configuration of Electroswitch to be used as replacement.

PR-m-90

Control Wiring Ckt



Present.

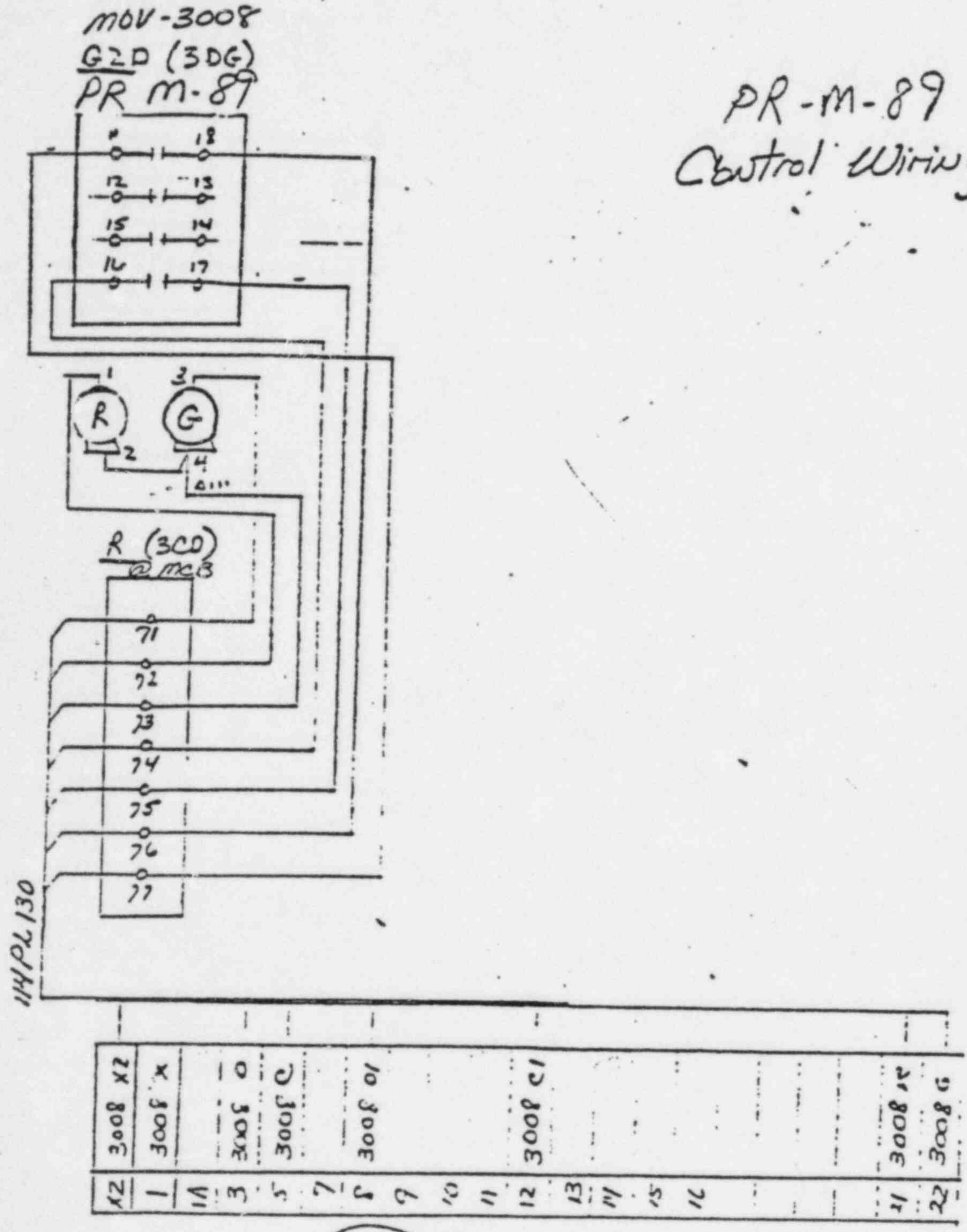


RC-m-56
Control Wiring Ckt

Present

MY 84-71-2

PR-M-89
Control Wiring Ckt



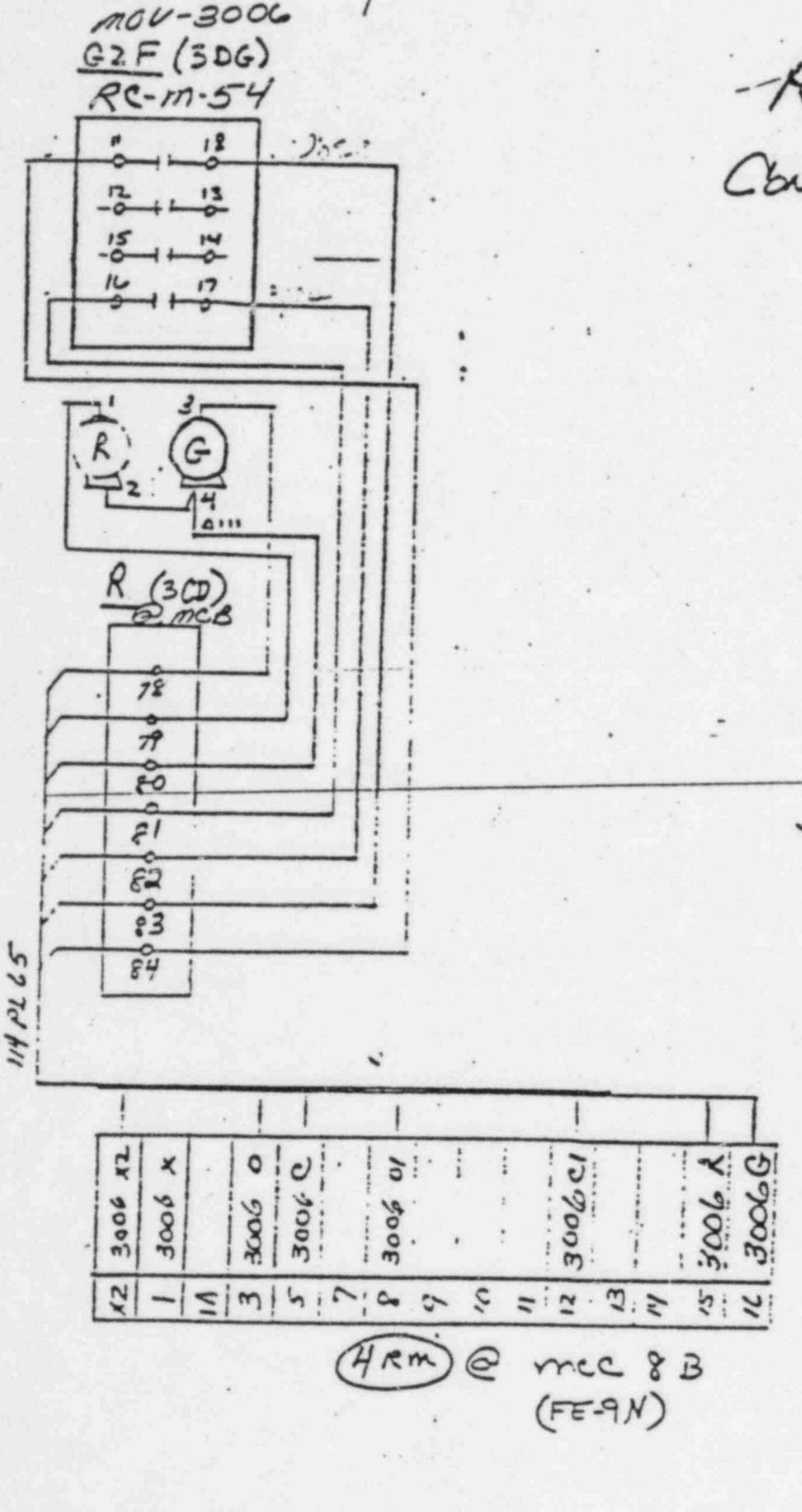
4RJ @ mcc 2B
(FE-9N)

Present

MY 84-71-3

RC-M-54

Control Wiring Ckt

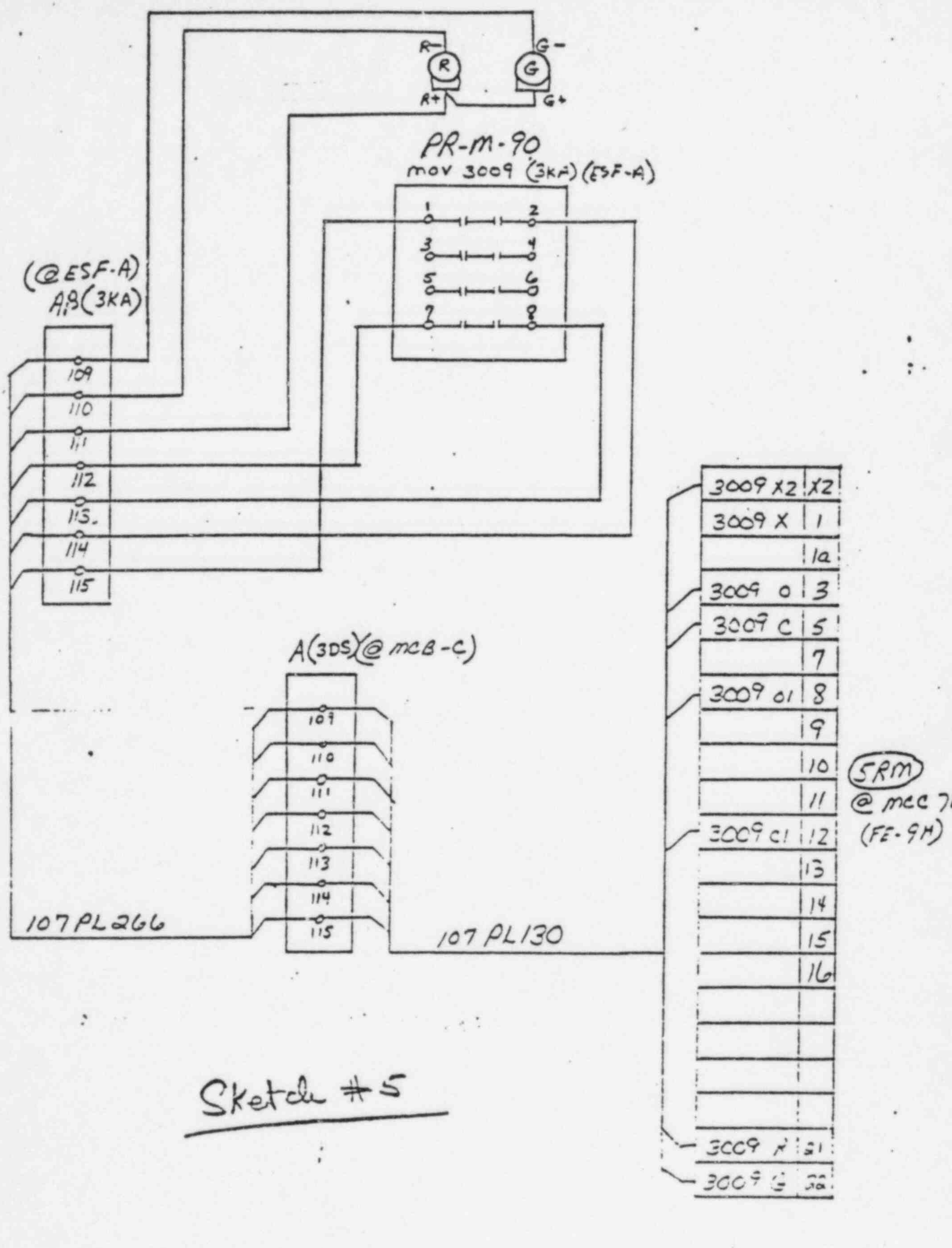


Present

MY 84-71-7

page 10 of 15

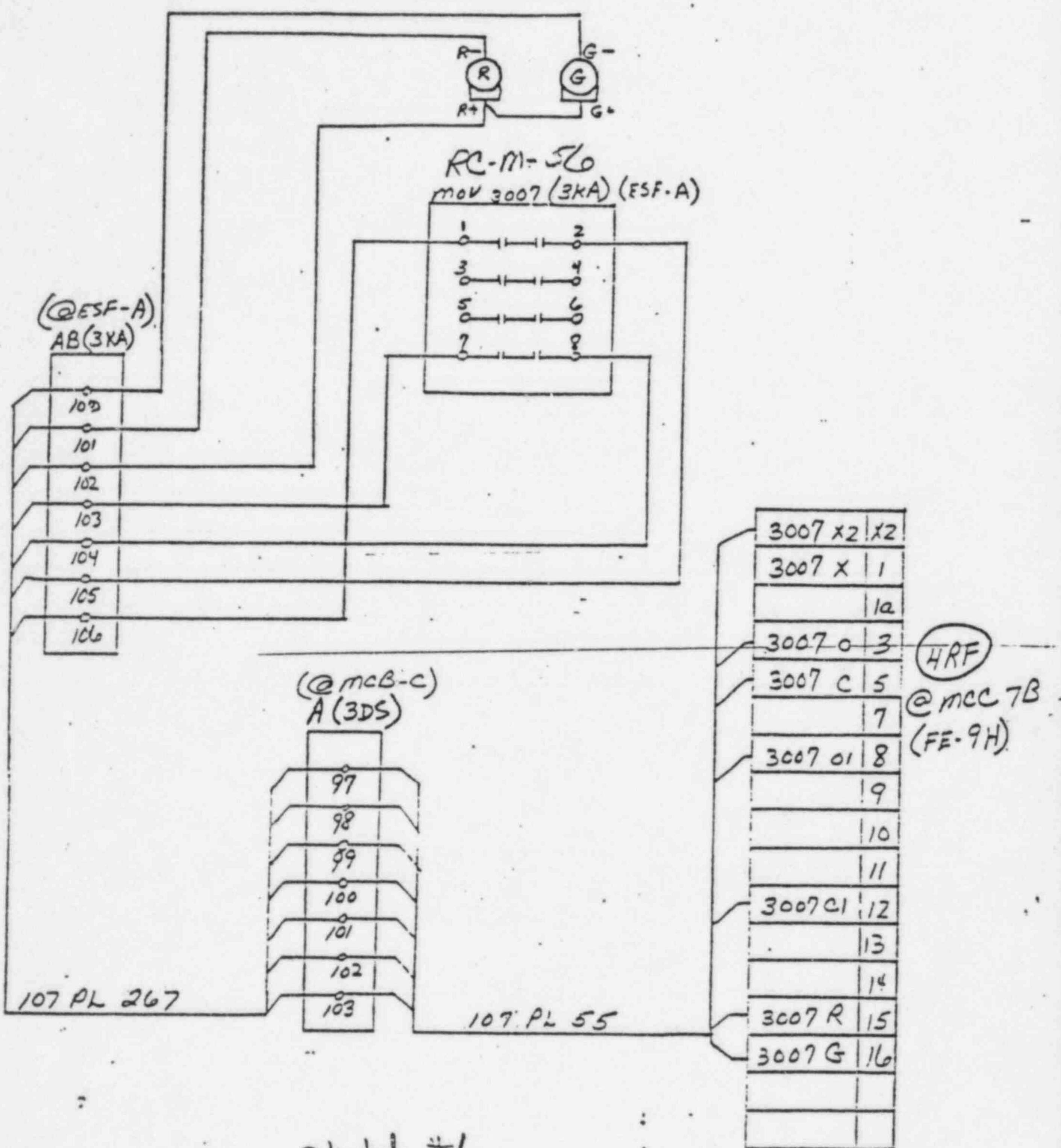
FOOR 84-71



Sketch #5

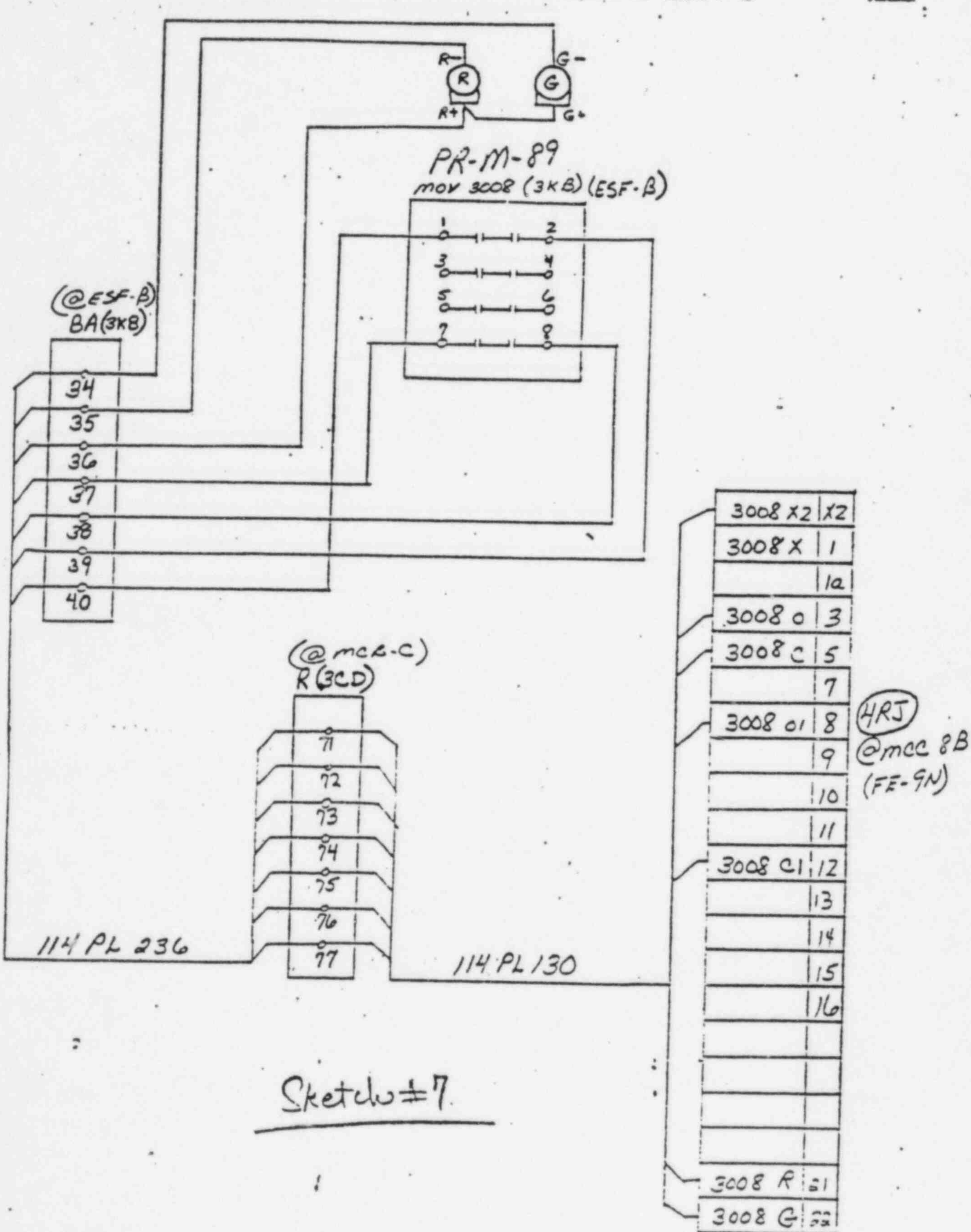
Proposed

MY 84-71-5
EDCR 84-71



Sketch #6

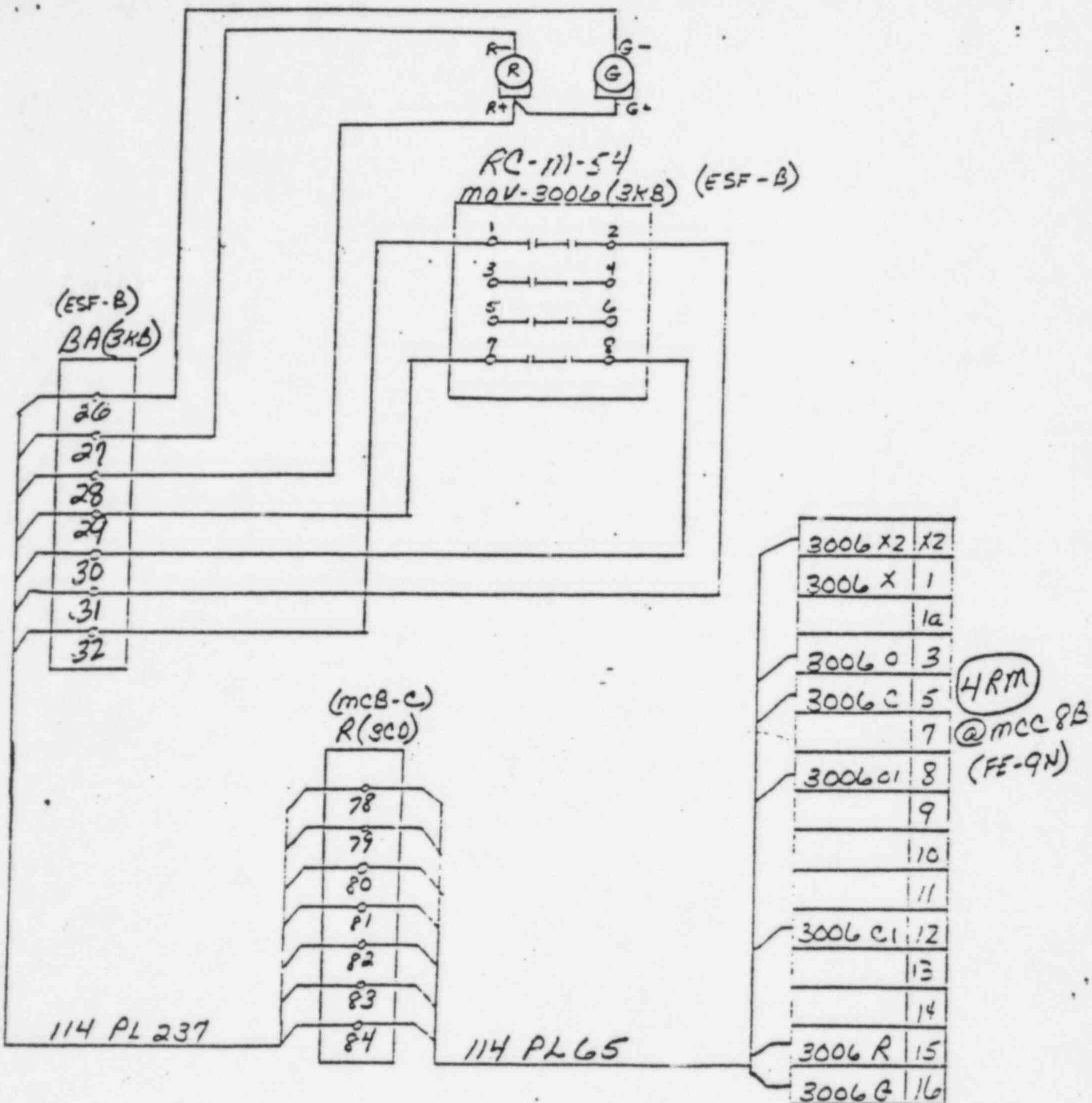
Proposed



Sketch #7

Proposed

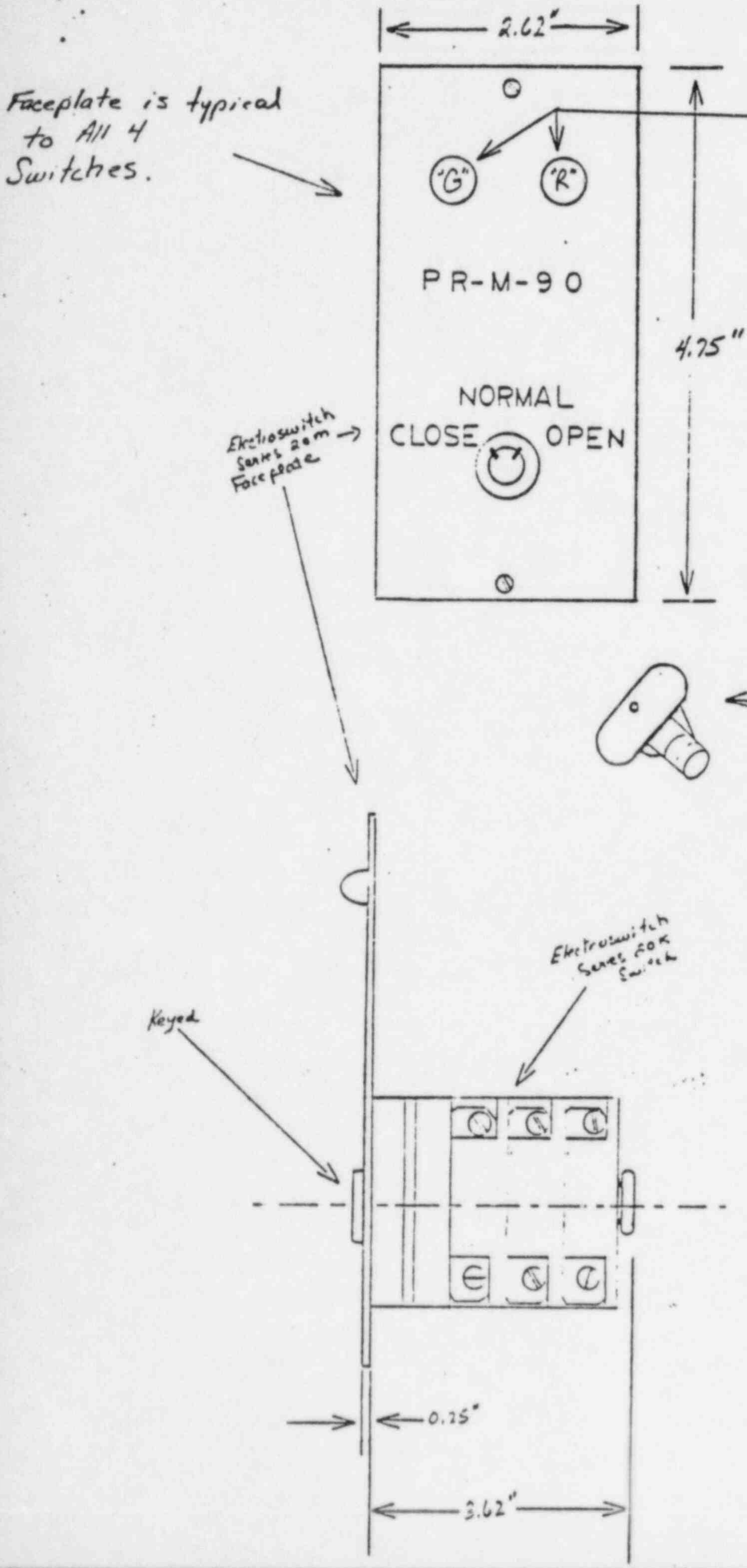
MY 84-71-7
EDCR 84-71



Sketch #8

Proposed

MI 84-71-8
EDCR 84-71



Lamps to be supplied with the "push to test" feature.

1. Keyed, 2 ea per Switch Purchased
2. Keys for PR-M-89 & 90 are interchangeable
3. Keys for PR-M-54 & 56 are interchangeable
4. Keys removable only in the Normal Position
5. Keyed Switch Assembly meets applicable "IE" & "Seismic" Specifications

M4 84-71-9

Sketch #9

EOCR 84-71

J RABERT

JUL 26 1985

(HEO #625)

COG. PSS : J. WEAST

ENGINEERING DESIGN CHANGE REQUEST (MY)

EDCR No. 84-75
Task No. 6.16
W.O. No. 84-23
EDN No.

Title: PROVIDE INDICATOR, STEAM DUMP OVERRIDE AND PR-A-38

Priority: 1985 Refueling Design Grade: 2

Project Engineer: Brian J. Dunn Date: July 15/1985

PED Reviewer: D.E. Collamore Date: 18 July, 1985

QQAD Reviewer: A. Jon Date: 7/25/85

Plant Operations Review Committee

Approval Recommendation: ______________ (Secretary of PORC) Date: ______________

Plant Manager Approval

Approved: ______________ Date: ______________

INFORMATIONAL COPY
NOT YET FINAL APPROVED

YNSD

Reviewed*: ______________ Date: ______________

NOTE:

* Not required for Design Grades 2 and 3.

Manager of Operations Approval

Approved: ______________ Date: ______________

Comments:

34ICN-JRH

Form No. 17-21-6-1
Revised 8/1/83

EDCR # 84-75
ECN #

DESIGN VERIFICATION DOCUMENTATION SHEET

The results of design verification efforts shall be clearly documented with the identification of the reviewer.

I have reviewed this EDCR, "Provide Indicator, Steam Dump Override and PR-A-38" per procedure 17-21-6. Design inputs and functional requirements are correct, the circuits as designed perform the design function. Materials specified are appropriate. QA, QC, seismic and EQ concerns have been included to the extent required.
I have performed a 100% point to point wiring check with no errors found. I agree with the design analysis and safety evaluation. All of my comments have been resolved or included. Means are specified for closure of open items. I have no further comments.

Reviewed By: DE Collamore 18 July 1985
Date
Concurrence: R E Grant 7/23/85
Cognizant Supervisory Engineer

OQAD EDCR REVIEW COMMENT SHEET

I have reviewed EDCR 84-75 and have the following comments:

1. Even though the calculations in section 13 are fairly simple procedure 17-21-5 should be used.
2. Step 5.25 - the dollar amount for contingency was left out (note - all substeps of 5.2 are incorrectly numbered).

PED RESPONSE

1. An analysis has been performed in accordance with procedure 17-21-5 and is attached to the EDCR.
B J Drain

2. Agreed. EDCR text changed.
R E Grant

Comments resolved. A. [signature] 7/25/85

A. [signature] / 7/23/85
REVIEWED BY / DATE

EDCR 89-75

1.0 REFERENCES

1.1 Agastat Catalog for Series 7000 timing relay and SRC timing relay.

1.2 Nureg 0700.

1.3 NAMCO Controls Handout #7.5M, date 1-84, (EA-170/750-83).

2.0 ENCLOSURES

2.1 CPA 10-84, "Installation of Indications".

2.2 Bill of Materials.

2.3 10CFR50.59 Evaluation.

2.4 Load Analysis for EDCR 89-75

BJD 7/24/85

3.0 DESCRIPTION

3.1 This EDCR addresses the need for positive indication of automatic changes in the Feedwater Regulating System and Primary Drain System. It contains two sections; one addressing the Feedwater Regulating System, and the other addressing the Primary Drain System. It has been written to support the recommendations of CPA 10-84.

3.2 HED #625 "Pushbutton, Steam Dump Override"

This HED addresses the need for positive indication alerting the operator to the fact that control of the Feedwater Regulatory Bypass Valves (FW-A-112, 212, 312) has transferred from the MCB controller to the trip set controller on the feedwater control cabinets behind the MCB.

During normal power the bypass valves are not used. On a turbine trip, sensed by a loss of auto stop oil pressure, control of the bypass valves is transferred from the MCB controller to a manual trip set controller on the feedwater control cabinets. The trip set controller is preset to position the bypass valves to approximately 32% open (2% total feed flow). The turbine trip signal also closes the feedwater regulating valve. Control of the bypass valves may be transferred back to the MCB controller by depressing the Steam Dump Override pushbuttons on the MCB.

Three amber, flashing, indicating lights will be installed on the MCB Section B benchboard, approximately one inch, above each of the Steam Dump Override pushbuttons. When control of the bypass valves is transferred to the trip set controller, these three lights will start flashing.

This will be accomplished as follows:

In each of the three feedwater control cabinets there is a relay (K-3) that on a turbine trip is energized and transfers control of the bypass valve from the MCB to trip set controller. A spare set of contacts exists on each relay. The spare contacts will be used to initiate each flashing circuit. Refer to Sketch 1 for circuit diagram. This contact will be wired in series with a new Agastat series SRC Repeat-Cycle timer relay which in turn will cause the amber lights to flash.

New cable will be installed between the Feedwater Control Cabinets and the Main Control Board.

Each circuit will be powered from 120V AC existing within each cabinet.

Functional testing of the completed circuit will be performed to verify that the following criteria has been met.

3.2.1 All three indicating lights will start to flash when control is swapped to the trip set controller.

3.2.2 Each light will stop flashing when its associated override pushbutton is depressed.

3.2.3 Existing systems operations remain unchanged.

3.3 <u>HED #681 - "Position Indication, PR-A-38"</u>

This HED addressed the need for Valve Position Indication (VPI) for PR-A-38, (Quench Tank to Primary Drain Tank) at the MCB. PR-A-38 routinely operates automatically, a function of Quench Tank Level. The operator should have positive indication of valve position since an open valve implies that the Quench Tank is being pumped to the Primary Drain Tank. No direct indication is available in the control room at this time.

This indication is to be provided as follows:

Two new NAMCO Limit Switches will be installed on the valve to provide direct indication of valve position. The mounting bracket, lever actuator, and limit switch assembly shall be fabricated in the field to ensure functionality.

One green and one red (GE, ET-16 type) indicating light will be installed above the existing PR-A-38 Selector Switch. The green light "ON" indicates the valve is shut, red light "ON" - valve open, both lights "ON" indicates the valve is in the intermediate position.

The existing Control Cable between the MCB and the outer penetration room has three spare conductors. These spare conductors will be used for this change. A new 3 conductor cable

will be installed from the inside penetration room to the junction box near the quench tank. The new cable will follow a routing similar to that of the existing control cable 1M158.

The circuit will be powered from DP/PAC, Breaker #12. Functional testing will be performed to verify the following criteria has been met:

3.3.1 PR-A-38 shall be stroked from full shut to full open and back to full shut.

3.3.2 Appropriate indication of valve position should be present at all times.

Much of the work will take place in containment. The Pressurizer Quench Tank is located in a high radiation area. The ALARA checklist has been reviewed. One possible option to reduce personnel exposure is the use of temporary shielding. This job will require a detailed ALARA review.

4.0 REASON FOR CHANGE/ALTERATION

This design change was generated to resolve HED #625 and HED #681 that were generated during the Human Factors Review of the Control Room. Both of the proposed changes were designed to increase operator awareness of systems status.

5.0 COST ESTIMATE

Engineering 5,000

5.1 HED #625, "Pushbutton, Steam Dump Override"

5.1.1	Engineering	$ 3,000.00
5.1.2	Material	500.00
5.1.3	Labor	1,200.00
5.1.4	Testing	29.00
5.1.5	Contingency 10%	700.00
5.1.6	Total	$ 5,400.00

1200
9275
10,475 labor
($60 testing)

5.2 HED #681, "Provide Indication, PR-A-38"

5.2.1	Engineering	$ 2,000.00
5.2.2	Material	1,800.00
5.2.3	Labor	9,275.00
5.2.4	Testing	29.00
5.2.5	Contingency 10%	1310.
5.2.6	Total	$14,414.00

R Brant 7/23/85

6.0 SCHEDULE

This EDCR is scheduled for implementation during the upcoming 1985 Refueling Outage.

7.0 ORGANIZATION RESPONSIBLE

7.1 The Maine Yankee Plant Engineering Department is responsible for this Design Change.

7.2 The Maine Yankee Human Factors Steering Committee is responsible for the MCB arrangement.

8.0 DESIGN INPUT

This design change was based upon H.E.D.'s initiated during a detailed Control Room Design Review conducted in response to NUREG 0737. This EDCR has been prepared IAW Maine Yankee Procedure #17-21-2, "Engineering Design Change Request, M.Y.". The design input list of procedure 17-21-2 has been addressed as appropriate.

9.0 QA/QC REQUIREMENTS

All work in this design package is NNS. No QA/QC holds/inspections will be specified.

10.0 SAFETY EVALUATION

10.1 HED #625, "Pushbutton, Steam Dump Override"

This proposal will affect NNS electrical systems. It will provide indication to increase operator awareness of Steam Dump and Feed System Status in the event of a turbine trip.

The proposed change does not change the probability of a turbine trip, nor does it affect Steam Dump or Feedwater System circuitry or operation. Lamp failure of one of the flashing lights will be treated typically, as is any lamp failure.

10.2 HED #681, "Position Indication - PR-A-38"

This proposal will affect NNS circuits and systems. The indication will increase operator awareness of the status of a Radioactive Fluid System. This proposal will not affect the operability of PR-A-38. Lamp failure of one of the indicating lights shall be treated typically, as is any lamp failure.

Therefore these proposals;

a) do not create the possibility of any unreviewed accident,

b) do not increase the probability of an occurrence, or consequences of any previously reviewed accident or malfunction; and

c) do not decrease any margin of safety as defined by Maine Yankee Technical Specification or FSAR.

Based on the above, this EDCR is not an unresolved safety question as defined by 10CFR50.59.

11.0 PLANT DIAGRAMS REFERENCED

The following drawings are affected by this EDCR:

Drawing No.	Rev.	Title
ESK-4B	10	Outline Main Control Board, Sheet 2, Benchboard
ESK-4C	10	Outline Main Control Board, Sheet 3, Benchboard
ESK-11K	11	Elementary Diagram, Misc. Circuits, Sheet 6, Steam Dump Override Indication Lights
ESK-11AR	New	Steam Dump Override Indication Lights
SE-120Q	4	Misc. Cable Schedule, Sheet 13, Service Building, Air Condition System
SE-120R	8	Misc. Cable Schedule, Sheet 14
SE-120S	12	Misc. Cable Schedule, Sheet 15
FE-3CB	13	External Connection Diagram, Sheet 2, Main Control Board, Section B
FE-3CK	7	Wiring Diagram, Sheet 2, Main Control Board, Section B
FE-3DG	10	Wiring Diagram Benchboard, Mounted Equipment Main Control Board, Section C
FE-3DS	21	External Connection Diagram, Sheet 17, Main Control Board, Section C
FE-3EH	10	External Connection Diagram Feedwater Reg. System, Panels 1 and 2
FE-3EJ	11	External Connection Diagram Feedwater Req. System, Panel 3

FE-18E, Sh. 1	21	Wiring Details, Sheet 5A, Reactor Building Area
FE-18E, Sh. 2	0	Wiring Details, Sheet 5B, Reactor Building Area
FE-36E	12	Wiring Diagram, Containment Penetrations, Sheet 5
FE-42F	10	CWD and Sleeve Loading, Containment, CA Tray and Switchgear Rooms
FE-46D	8	Conduit Plan - Sheet 4, Reactor Containment
FE-46K	11	Sleeve Loading Schedule, Reactor MCC Room Spray and Safety Injection Area
FE-46L	7	Sleeve Loading Schedule Reactor Building
1.25-112D	4	Interconnection Diagram, Feedwater Regulating System No. 2
1.25-113D	4	Interconnection Diagram, Feedwater Regulating System No. 3
1.25-247A	4	Interconnection Diagram, Feedwater Regulating System No. 1
1.25-262	5	Elementary Wiring, Feedwater Regulating System

12.0 OPEN ITEMS

12.1 HED #625, "Pushbutton, Steam Dump Override"

1. Seismic evaluation of lamps will be provided in EDCR 85-11.

12.2 HED #681, "Position Indication, PR-A-38"

Seismic evaluation of lamps to be mounted at PR-A-38 Selector Switch will be provided in EDCR 85-11

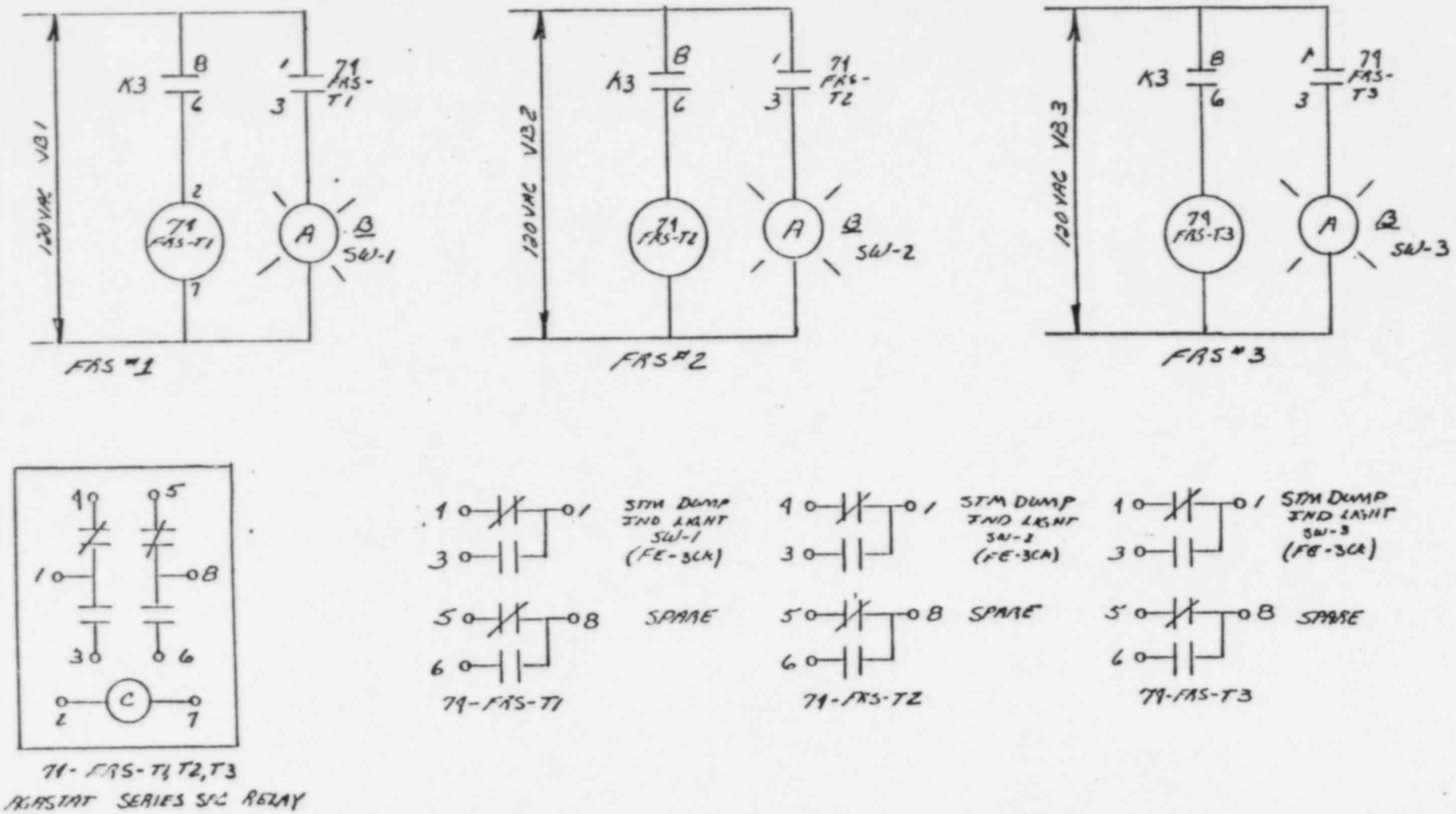
13.0 DESIGN ANALYSIS CALCULATIONS

SEE ENCLOSURE 2.4 FOR DESIGN ANALYSIS

BJ Dain
7/24/85

14.0 <u>SKETCHES:</u>

14.1 Sketch #1 - Steam Dump Indicating Light Schematic (New ESK-11AR).



NOTE: K3 EXISTING IN PRESENT FEEDWATER REG SYSTEM CABINETS REF DWG. 125-262

FEEDWATER REG SYSTEM
TRIPSET CONTROLLER INDICATION
EDCR 81-75 SKETCH #1

ENCLOSURE 2.2

Bill of Materials

Item	Quantity	Description
1	3	Agastat Series SRC, Dual-Function Repeat-Cycle Timer Relay, Model #SRC-72AAAA
2	3	Agastat, Octal Socket, 8 Pins, BCSA08SC
3	1	Namco, Limit Switch, Model #EA170-11302, 10° Trip Travel, Clockwise Operation, Standard Mount
4	1	Namco, Limit Switch, Model #EA170-12302, 10° Trip Travel, Counter Clockwise Operation, Standard Mount
5	2	Namco, Limit Switch Operating Level, Style R, Model #EL060-53300
6	1	D. G. O'Brien Penetration Repair Kit, Kit #R191022K01
7	1	D. G. O'Brien Penetration Repair Kit, Kit #R191022K05
8	1000 ft.	3 Conductor, 12 AWG Control Cable in accordance with MYPS-14, Revision 2
9	200 ft.	2 Conductor, 12 AWG Control Cable in accordance with MYPS-14, Revision 2
10	2	General Electric, Model # ET-16, Indicating Lights

10 CFR 50.59 Safety Evaluation

Document Title: PROVIDE INDICATION STEAM DUMP OVERRIDE + PR-A-38 Date 7-15-85

Procedure ☐ EDCR ☒ Test/Experiment ☐ Document No. 84-75 Rev. No. ______

(1) Does this action violate any technical Specifications? Explain briefly: NO - PROVIDE ADDITIONAL INDICATIONS WHICH ARE NNS BUT WILL INCREASE OPERATORS AWARENESS OF SYSTEM

☐ Yes: this action must be revised to comply with Tech. Specs. or approved by the NRC in order to be implemented

☒ No: continue.

(2) Does this action require an unreviewed safety question determination? i.e., Does this action involve a change to a system or structure described in the FSAR and, important to nuclear safety, or a procedure as described by the FSAR; or is it an abnormal test/experiment not described by the FSAR?*

Explain briefly: YES - THESE ACTIONS WILL CAUSE CHANGES TO STEAM DUMP SYSTEM AND THE CHANGES HOWEVER DO NOT AFFECT THE SYSTEM FUNCTIONALLY

☒ Yes; continue. *See paragraph 4.4

☐ No; the document may be approved. Go to (8).

Unreviewed Safety Question Determination

(3) List any accidents specified in Chapter 14 of the FSAR and the Safety Analysis Review Section of the current Core Performance Analysis which could be affected by this action.

NO ACCIDENTS WILL BE AFFECTED BY THIS CHANGE.

Could this action increse the probability that any of these accidents may occur ? Yes ☐ No ☒

Could this action increase the consequences of any of these accidents? Yes ☐ No ☒

Does this action create the possibility of an accident not bounded by those specified in the FSAR and the Core Performance Analysis? Yes ☐ No ☒

Explain briefly: NO - CHANGE ONLY ADDS INDICATORS

(4) Could this action increase the probability that any malfunctions of equipment important to Nuclear Safety may occur? Yes ☐ No ☒

If so list. NO - INDICATORS ARE DRIVEN BY EITHER NNS RELAY CONTACTS OR NNS LIMIT SWITCHES

Could this action increase the consequences of any malfunctions of equipment important to Nuclear Safety? Yes ☐ No ☒

Explain briefly: SAME AS ABOVE

Does this action create the possibility of a malfunction not anticipated in the accidents specified in the FSAR and the Core Performance Analysis? Yes ☐ No ☒

Explain briefly: SAME AS ABOVE

(5) Could this action reduce the margin of safety defined in the basis of any Technical Specification (Section 1-4)? Yes ☐ No ☒

NOTE: "Margin of Safety" implies a margin between an operating limit and a known safe condition.

Explain briefly: NO - NO CONTROL FUNCTIONS ARE ADDED OR CHANGED BY THIS EDCR

(6) If any of the questions in the Unreviewed Safety Question Determination are answered yes, the proposed action is and unreviewed safety question and NRC approval is required prior to its implementation, or it must be withdrawn.

(7) If all of the questions in the Unreviewed Safety Question Determination are answered no, the proposed action is not an unreviewed safety question and may be approved. Go to (8).

(8) The proposed action does not involve a violation of Technical Specifications or an unreviewed safety question and may be implemented without prior NRC approval in accordance with 10 CFR 50.59.

Does this safety evaluation render any FSAR wording incorrect or obsolete? Yes ☐ No ☒

If yes, send a copy to the Licensing Department so the FSAR can be updated. Briefly explain the wording discrepancy: ______

Brian A. Drain 7/15/85
Originator/Department

(9) Forward the safety evaluation attached to the applicable document package to the PORC Secretary for distribution. The NSEG will verify the safety evaluation during the review period.
NSEG review - Satisfactory.

FORM NO. 17-21-5-1
REVISED 8-1-83

CALCULATION SHEET

TITLE Load Analysis for EDCR 84-75 PAGE 1 OF 1

FILE NO.

PREPARED BY B/Drain DATE July 24, 85 REVIEWED BY R Grant DATE 7/24/85 EDCR NO. 84-75

Purpose: To Determine if additional loads will affect existing circuitry

References: 1) Agastat Repeat Timer Relay Model # SHC-72AAAA rated at .024 amps

2) General Electric Indicating Lights Model #ET-16 rated at .05 Amps normal, .20 Amps Inrush.

Analysis:

1) Steam dump Override indication will consist of a Agastat relay and a GE Indication light to be added to the circuitry of ~~th~~ each feedwater reg cabinet. The total current ~~o~~ draw for the new relay and indicating light will be .224 Amps.

∴ The additional .224 Amps load on each of the feedwater reg. cabinets will not overload the existing breaker/fuse of each cabinet.

2) Position Indication for PR-A-38 will add two idicating lights to the existing control circuity for PR-A-38

worst case: both lamps ~~coming~~ turning on at once. The Total inrush current would be .40 amps.

∴ The additional load of .40 Amps will not overload the existing breaker of the control Circuit

EDCR 84-75
Enclosure 2.4
Page 1 of 1

(HEDS105,589)

JRH

AUG 2 1985

EDCR No. 85-09
Major ECN No. 0
Task No. 8.05
W.O. No. 84-24

Form 17-21-3-1
Revised 8/1/83
Page 8 of 9

ENGINEERING DESIGN CHANGE REQUEST
(YANKEE NUCLEAR SERVICES DIVISION)

Title: Regulatory Guide 1.97 RCS Temperature Modifications

Priority: NRC / Prior to End of 1985 Refueling

Design Grade: 1

PED Cognizant Reviewer: [signature] Date: 6/19/85

OQAD Reviewer: [signature] Date: 6/26/85

Plant Operations Review Committee

Approval Recommendation: P. L. Newcomb (Secretary of PORC) Date: 7/23/85

APPROVED

Plant Manager Approval

Approved: [signature] ~~Date:~~ 7/24/85

Manager of Operations Approval

Approved: [signature] Date: 7/30/85

Comments:

3221N JRH

Form No. 17-21-6-1
Revised 8/1/83

EDCR # 85-09
ECN # 0

DESIGN VERIFICATION DOCUMENTATION SHEET

The results of design verification efforts shall be clearly documented with the identification of the reviewer.

I have reviewed EDCR 85-09 in accordance with PED Procedure No. 17-21-6 by addressing Attachment 1, pages 1 and 2 of said procedure. The following comment will be addressed at a later date but prior to end of Refueling by an ECN;

1) FM-30A should be referenced as Rev. 26 instead of Rev. 23.

The correct layout of instruments address the Human Factors Considerations, correct inputs selected, mounting and seismic analysis is addressed in another EDCR, Vital Bus Loading has not been significantly changed, separation criteria has been maintained and there is increased pertinent information to the operators. As these are examples of the things looked at under Proc. No. 17-21-6, and based on above resolution of comments recommended approval of EDCR.

Reviewed By: [signature] 10/19/85
Date

Concurrence: [signature]
Cognizant Supervisory Engineer

3297N-JRH

OQAD EDCR REVIEW COMMENT SHEET

I reviewed EDCR 85-09, "Regulatory Guide 1.97 RCS Temperature Modifications," in accordance with procedures 21-202 and 17-21-3.

1. It appears that the qualification documentation for items 2 and 3 in section 9.2 should be identified as an open item.

2. Enclose 01, page 8, is missing from the package.

1. YNSD already has the test report and has incorporated the report information into the accounting details of EDCR 85-11. Report was already reviewed as being acceptable for Maine Yankee. The note in the EDCR was put in to see if Maine Yankee wanted a copy of the report from the vendor for our Q.C. files only, not as a prerequisite to the EDCR going operational.

2. page 8 was misplaced between pages 1 and 2 of same Enclosure. Order of pages has been corrected. 6/25/85

comments resolved.
O. J. 6/26/85

REVIEWED BY, 6/21/85
DATE

FORM WE-100-1
REVISION 4

ENGINEERING
DESIGN CHANGE REQUEST
NUCLEAR SERVICES DIVISION
YANKEE ATOMIC ELECTRIC CO.

EDCR NO.: 85-09

PLANT: MAINE YANKEE

W.O.: 5819

EDCR TITLE: REGULATORY GUIDE 1.97 RCS TEMPERATURE MODIFICATIONS

David A. Kul
COGNIZANT ENGINEER
5-28-85
DATE

ENGINEERING PREPARATION AND REVIEW

W H Reid
LEAD ENGINEER
3 June '85
DATE

R. P. Shone
ENGINEERING MANAGER
6/7/85
DATE

OPERATIONAL QA REVIEW

[illegible]
OQA
6/7/85
DATE

PROJECT DEPT. ACCEPTANCE

W. J. Metena
PROJECT MANAGER
6/7/85
DATE

10 CFR 50.59 SAFETY EVALUATION

Form [illegible]
Revised: [illegible]

Date 6/18/85

Document Title: Reg. Guide 1.97 RCS TEMP Mod

Document No. 85-09 Rev. No. 0

Procedure [ ] EDCR [X] Test/Experiment [ ]

(1) Does this action violate any Technical Specification? Explain briefly: Not mentioned in Tech. Spec.

[ ] Yes; this action must be revised to comply with Tech. Specs. or approved by the NRC in order to be implemented.

[X] No; continue.

(2) Does this action require an unreviewed safety question determination? i.e., Does this action involve a change to a system or structure described in the FSAR and, important to nuclear safety, or a procedure as described by the FSAR; or is it an abnormal test/experiment not described by the FSAR?*
Explain briefly: Figure 4.3-1 is affected

*See paragraph 4.4

[X] Yes; continue

[ ] No: the document may be approved. Go to (8).

Unreviewed Safety Question Determination

(3) List any accidents specified in Chapter 14 of the FSAR and the Safety Analysis Review Section of the current Core Performance Analysis which could be affected by this action.
None

Could this action increase the probability that any of these accidents may occur? Yes [ ] No [X]
Could this action increase the consequences of any of these accidents? Yes [ ] No [X]
Does this action create the possibility of an accident not bounded by those specified in the FSAR and the Core Performance Analysis? Yes [ ] No [X]
Explain briefly: improved monitoring of Th + Tc and [illegible] trend improves [illegible] capabilities to changes [illegible]

(4) Could this action increase the probability that any malfunctions of equipment important to Nuclear Safety may occur? Yes [ ] No [X]
If so, list. Class 1E instruments are all qualified and ASME [illegible] Class 1E [illegible]

Could this action increase the consequences of any malfunctions of equipment important to Nuclear Safety? Yes [ ] No [X]
Explain briefly: See above

Does this action create the possibility of a malfunction not anticipated in the accidents specified in the FSAR and the Core Performance Analysis? Yes [ ] No [X]
Explain briefly: See above

(5) Could this action reduce the margin of safety defined in the basis of any Technical Specification (Sections 1-4)? Yes [ ] No [X]

NOTE: "Margin of Safety" implies a margin between an operating limit and a known safe condition

Explain briefly: Since [illegible], the accuracies of [illegible]

(6) If any of the questions in the Unreviewed Safety Question Determination are answered yes, the proposed action is an unreviewed safety question and NRC approval is required prior to its implementation, or it must be withdrawn.

(7) If all of the questions in the Unreviewed Safety Question Determination are answered no, the proposed action is not an unreviewed safety question and may be approved. Go to (8).

(8) The proposed action does not involve a violation of Technical Specifications or an unreviewed safety question and may be implemented without prior NRC approval in accordance with 10 CFR 50.59.

Does this safety evaluation render any FSAR wording incorrect or obsolete? Yes [X] No [ ]
If yes, send a copy to the Licensing Department so the FSAR can be updated. Briefly explain the wording discrepancy: See Enclosure F of EDCR

[illegible signature] [illegible]
Originator/Department

(9) Forward the safety evaluation attached to the applicable document package to the PORC Secretary for distribution. The NSEG will verify the safety evaluation during the review period.
NSEG review - Satisfactory.

Danny P. McDonald
Nuclear Safety Engineer

Form No. 17-21-6-1
Revised 8/1/83

EDCR # 85-09
ECN # 0

DESIGN VERIFICATION DOCUMENTATION SHEET

The results of design verification efforts shall be clearly documented with the identification of the reviewer.

I have reviewed EDCR # 85-09 and have the following comments:

1. Enclosures B thru F are not included in this copy of the EDCR. Look up in EDCR File in Dave Ross' office
2. The Safety Evaluation Section of the EDCR is adequate.
3. I will review and sign the Safety Evaluation Form when it is available to me. (Not all of this copy is legible.)
4. Description item 7.4 states that the range of the existing Hot Leg Temperature channels TT-111X, 121X, and 131X is 515-665°F; the range is actually 515-615°F for those three signals. This may make it impossible to connect the new transmitter with a range of 515-665°F to the old circuit with a range of 515-615°F.
5. Bill of Materials Item #5: The Setup charge seems unreasonable if it is solely for the installation of the chart paper.

Reviewed By: [signature] 17-11-85
Date

Concurrence: ______________________
Cognizant Supervisory Engineer

3297N-JRH

EDCR 85-09

REGULATORY GUIDE 1.97 RCS TEMPERATURE MODIFICATIONS

1.0 REFERENCES

(a) Maine Yankee Service Request No. MY-84-109, "Regulatory Guide 1.97 Implementation."

(b) Memo, D. A. Kulp to R. P. Shone, "Maine Yankee Regulatory Guide 1.97 Evaluation," dated October 3, 1983 (MYP 83-448).

(c) Memo, T. M. Gifford to Distribution, "Regulatory Guide 1.97 Review Results," dated January 30, 1984 [TMG 84-05(25.16)].

(d) Memo, D. A. Kulp to R. P. Shone, "Conceptual Memorandum for Regulatory Guide 1.97 Modifications to RCS Hot and Cold Leg Temperature Indication," dated January 4, 1985 (MYP 84/980, Revision 1).

(e) Memo, D. A. Kulp to R. P. Shone, "Equipment Required for Regulatory Guide 1.97 Modifications," dated February 20, 1985 (MYP 85-128).

(f) Memo, D. A. Kulp to W. E. Henries, "Seismic Mounting of Equipment for EDCR 85-09," dated April 26, 1985 (MYP 85-330).

(g) Memo, W. E. Henries to D. A. Kulp, "Seismic Mounting of Equipment for EDCR 85-09," dated May 24, 1985 (MYP 85-439).

2.0 ENCLOSURES

(A) Review Forms
(B) References
(C) Sketches
(D) Vendor Information
(E) FSAR Pages Affected
(F) Drawings

3.0 ORGANIZATION RESPONSIBLE FOR THE DETAILED DESIGN

Instrumentation and Control Engineering section of Maine Yankee Project:

Cognizant Engineer: D. A. Kulp
Plant Cognizant Engineer: T. M. Gifford

Mechanical Analysis Engineering Section will provide seismic mounting details for all new equipment.

4.0 COST ESTIMATE

YNSD Engineering	$ 26,562
Outage Support	1,100
Equipment	62,700
Installation	4,400
Subtotal	94,762

25% Contingency	23,690
TOTAL	$118,452

5.0 SCHEDULE

5.1 Equipment Procurement

The equipment necessary for this design change should arrive on-site prior to the 1985 refueling outage.

5.2 Implementation

This design change will be installed and tested during the 1985 refueling outage.

6.0 REASON FOR CHANGE

Regulatory Guide 1.97 specifies the temperature range and display requirements for the Reactor Coolant System temperature instrumentation. Maine Yankee has responded to Regulatory Guide 1.97 by requesting that NSD prepare an EDCR in accordance with the concept described in Reference (a).

7.0 DESCRIPTION OF CHANGE

7.1 This design change provides the operator with a trend of both hot and cold leg temperature on a dual pen recorder for each loop. The three recorders will be installed on the loop control panel of the MCB.

7.2 Hot and cold leg temperatures are measured with well-mounted RTDs. This design change will use existing RTDs and cables and will only require equipment changes in the Control Room. The attached Sketch SK-85-09-1 indicates the front section of the Main Control Board with existing and proposed equipment arrangements. The following summarizes these Main Control Board changes:

a. 0-600°F Cold Leg Indication - The existing three (one per loop), cold leg, 0-600°F, NNS, single pen recorders and the three (one per loop), 0-600°F, NNS indicators will be removed. They will be replaced by three (one per loop) dual display cold leg indicators which will be installed in the MCB spaces vacated by a separate design change.

b. 515-615°F Cold Leg Indication - These three (one per loop) narrow-range indicators will remain unchanged.

c. 0-750°F Hot Leg and Cold Leg Recorders - Three (one per loop), qualified, dual pen recorders will be added. They will be located in the MCB space previously occupied by the 0-600°F cold leg single pen recorders.

7.3 There are six (6) existing NNS wide-range (0-600°F) cold leg temperature channels (TT-115x, 115y, 125x, 125y, 135x, 135y) located on the loop control panel of the MCB. Each RCS loop has one indicator and one recorder associated with it. Removal of the NNS recorders will provide room for the qualified recorders. Three dual display indicators added to the MCB, as shown in Sketch SK-85-09-1 will retain the NNS temperature channel information available to the operator. The space for the dual indicators will be vacated by a separate design change. Sketch SK-85-09-04 shows the NNS cold leg temperature channel arrangement.

7.4 There are three (3) hot leg temperature channels (TT-111x, 121x, 131x) that have a range of 515-665°F. Each channel is displayed on the back of Section "B" of the MCB. The three channels are also used as input to the RRS. To meet the requirements of Regulatory Guide 1.97, a wide-range (0-750°F) temperature channel for each RCS loop is needed. This will be accomplished by installing a dual range temperature transmitter in each channel. These transmitters have a wide-range of 0-750°F and a narrow range of 515-665°F. The wide-range output from each transmitter will be connected to a dual pen recorder on the loop control panel of the MCB. On this section of the MCB, three dual pen qualified recorders will be added as shown in Sketch SK-85-09-1. The narrow-range output from the transmitters will be connected to the existing circuits as described above. Sketch SK-85-09-2 shows the proposed hot leg temperature channel arrangement.

7.5 There are three (3) cold leg temperature channels (TT-111y, 121y, 131y) that have a range of 515-615°F. Each channel is displayed on the front of the MCB in the loop control section. The three channels are also used as inputs to the RRS. To meet the requirements of Regulatory Guide 1.97, a wide-range (0-750°F) temperature channel for each RCS loop is needed. This will be accomplished by installing a dual range temperature transmitter in each channel. These transmitters will have a wide range of 0-750°F and a narrow range of 515-615°F. The wide-range output from each temperature transmitter will be connected to the second pen of the new dual pen recorders discussed in Section 7.3. The narrow-range output of the transmitter will be connected to the existing circuits described above. Sketch SK-85-09-3 shows the proposed cold leg temperature channel arrangement.

7.6 The equipment to be installed for hot and cold leg temperature channels must be seismically mounted. The three (3) qualified strip chart recorders and three (3) dual indicators will be installed by EDCR 85-11, "MCB Plate Replacement." The six temperature transmitters will be mounted as specified in Enclosure (B7). Sketches SK-85-09-5, 6 and 7 show the general equipment arrangement in Cabinet 1, 2 and 3 of the MCB Section "C", where the transmitters will be installed.

8.0 DESIGN CRITERIA

8.1 Quality Assurance

8.1.1 This EDCR was prepared in accordance with the programmatic/administrative requirements of the Yankee Engineering Manual, Yankee Atomic Operations Quality Assurance Manual (YOQAP-1-A), and the Maine Yankee Quality Assurance Manual.

8.1.2 ANSI Standard N45.2.2-1972, "Packaging, Shipping, Receiving, Storage, and Handling of Items for Nuclear Power Plants," shall apply.

8.2 Technical

8.2.1 IEEE Standard 323-1974, "Qualifying Class 1E Equipment for Nuclear Power Generating Stations."

8.2.2 IEEE Standard 344-1975, "Recommended Practices for Seismic Qualification of Class 1E Equipment for Nuclear Power Generating Stations."

8.2.3 Regulatory Guide 1.100, Revision 1, "Seismic Qualification of Electric Equipment for Nuclear Power Plants."

8.2.4 Regulatory Guide 1.97, Revision 3, "Instrumentation for Light Water Cooled Nuclear Power Plants to Assess Plant and Environmental Conditions During and Following an Accident."

8.2.5 MYS-2957, "Criteria for Identification and Separation of Electrical Cables for Maine Yankee Atomic Power Station, Maine Yankee Atomic Power Company, Wiscasset, Maine," dated July 15, 1970.

8.2.6 NUREG-0737, "Clarification of TMI Action Plan Requirements," dated November 1980.

9.0 EQUIPMENT PROCUREMENT INFORMATION

9.1 Specification

Maine Yankee Specification MYPS-14, Revision 2, "Specification for 300 Volt Instrument Cable for Maine Yankee Atomic Power Station."

9.2 Bill of Materials

Item	Quantity	Description
1	3	Leeds & Northrup Speedomax 100 Series Recorder Dual Pen, Colors Red and Blue Scale Ranges: 0-750°F Inputs: 4-20 mA Power: 120 VAC 60 Hz Chart Speed: 3 cm/hr With nonglare glass Model No. 125-304-304-00-00-L0117-L0117-6-CO-048 Cost: $1,807 each - Delivery Time: 9 weeks Qualified to IEEE 323-1974 and IEEE 344-1975
2	4*	RIS Dual Range Isolated Temperature Transmitter Ranges: Wide Range 0-750°F Narrow Range 515-615°F Input: 200 ohm, 3-Wire RTD Output: 4-20 mA Isolation between outputs is to be 600 V Model No. SC 1373-323 Cost: $4,650 each - Delivery Time: 26 weeks Qualified to IEEE 323-1974 and IEEE 344-1975 * 1 Spare
3	4*	RIS Dual Range Isolated Temperature Transmitter Ranges: Wide Range 0-750°F Narrow Range 515-665°F Input: 200 ohm, 3-Wire RTD Output: 4-20 mA Isolation between outputs is to be 600 V Model No. SC 1373-323 Cost: $4,650 each - Delivery Time: 26 weeks Qualified to IEEE 323-1974 and IEEE 344-1975 * 1 Spare
4	100 ft.	Single Conductor No. 14 AWG SIS Wire
5	10 min.	0-750°F Chart Paper Cost: $11.25 each - Set Up Charge $150.00

6	4	International Instruments Dual 6" Edsewise Indicator Scale Ranges: 0-600°F Input: 4-20 mA To be supplied with nonglare lens Model No. 1251 V-B600 DCUA - B600 DCUA
7	1	Steel Plate 20-3/4" x 13" x 3/16" made of A-36 steel, Certificate of Compliance is required
8	1	Steel Plate 20-3/4" x 10" x 3/16" made of A-36 steel, Certificate of Compliance is required
9	12	Unistrut Nuts, Part #P6013-1420 (1/4")
10	12	1/4-20 UNC, 2A, RH, Hex Head Cap Screws 3/4" Long, Unistrut Part #HHCS02507SEG NOTE: If bolt material is not known, a minimum installation test torque of 5 in-lb will verify the acceptability of the bolts.
11	1 box	#12 screws and nuts (A-307) NOTE: If bolt material is not known, a minimum installation test torque of 5 in-lb will verify the acceptability of the bolts.

NOTE: A test report should be purchased for Item 1, 2, and 3 if Maine Yankee does not presently have copies. Otherwise, a Certificate of Compliance should be requested.

10.0 DRAWINGS

See Enclosure (C).

11.0 CALCULATIONS AND ANALYSIS

The Mechanical Engineering section of the Maine Yankee Project has performed the analysis for mounting the transmitters in the MCB. The Calculation Number is MYC-672 and it will be kept on file in the DCC. The mounting of equipment on the front of the control board will be analyzed under EDCR 85-11 "MCB Plate Replacement."

12.0 PROCEDURES

12.1 Welding

Not applicable.

12.2 NDE

Equipment mountings should be inspected by the Cognizant Engineer to insure that the seismic mounting requirements of the equipment meets the minimal torque requirements specified in Enclosure (B7) if the bolt material is unknown. A signoff will be included in the Installation Procedure to verify this step.

12.3 Installation and Testing

The installation and testing instructions will be generated by the YNSD Cognizant Engineer prior to the 1985 refueling outage and forwarded to Maine Yankee for review and approval. The installation and testing instructions will be generated per Maine Yankee Engineering Procedures.

12.4 Operating Procedure

The plant personnel are responsible for revising all operating procedures that are affected by this design change.

13.0 FSAR PAGES AFFECTED

At the present time there is one FSAR Drawing affected. See Enclosure (E).

14.0 LICENSING

At the present time, there are no Technical Specifications affected by this design change. However, this design change was addressed in the Maine Yankee submittal to the NRC on Regulatory Guide 1.97.

15.0 SAFETY EVALUATION

15.1 The hot leg and cold leg temperature channels are 1E instrument loops. All of the new equipment will be purchased and installed as 1E components with the exception of the 0-600^{o}F dual indicator that will be used in NNS instrument loops.

15.2 This change will provide qualified hot and cold leg temperature channels with trending available on the front of the MCB. The design of these instrument loops will not reduce the safety margin during operation, but will provide more information to the operator about the loop status during any transients that the plant is subject to.

15.3 This design change does not constitute an unreviewed safety question, as defined in 10CFR50.59(a)(2), and as defined below for the reason addressed above:

a) The design change does not increase the probability of occurrence or the consequences of an accident,

b) The change will not create the possibility of an accident or malfunction of a different type than previously evaluated in the safety analysis report, and

c) The change will not reduce the margin of safety defined in the Technical Specifications.

16.0 OPEN ITEM

The mounting of the strip chart recorders will be seismically analyzed and mounted per EDCR 85-11, "MCB Plate Replacement," that will be issued by plant personnel. Upon issuance of EDCR 85-11, this open item will be automatically closed out.

EDCR 85-09

ENCLOSURE A

REVIEW FORMS

FORM WE-100-4
REVISION 5

ENGINEERING/OQA
REVIEW FORM
NUCLEAR SERVICES DIVISION
YANKEE ATOMIC ELECTRIC COMPANY

EDCR NO: 85-09 ECN: ______
ENCLOSURE: A PAGE 1 OF 10
PLANT MAINE YANKEE
WORK ORDER NO: 5819

EDCR TITLE: REGULATORY GUIDE 1.97 RCS TEMPERATURE MODIFICATIONS

COMMENTS	RESOLUTION
Reviewed according to WE-100 for electrical aspects. No comments	

Comments Continued On Page —

REVIEWER:

PROJECT DEPT.		OTHER DEPT.	
EE	☒	EED	☐
I&CE	☐	PED-ESG	☐
ME	☐	MSG	☐
SE	☐	NED	☐
		OQA	☐

A.K. Hyoyne 6/6/85
REVIEWER/DATE

FORM WE-100-4
REVISION 5

ENGINEERING/OQA REVIEW FORM

NUCLEAR SERVICES DIVISION
YANKEE ATOMIC ELECTRIC COMPANY

EDCR NO: 85-09 ECN: ____
ENCLOSURE: A PAGE 2 OF 10
PLANT MAINE YANKEE
WORK ORDER NO: 5819

EDCR TITLE: REGULATORY GUIDE 1.97 RCS TEMPERATURE MODIFICATIONS

COMMENTS	RESOLUTION
Reviewed in accordance with WE-100 all comments have been resolved	

Comments Continued On Page —

REVIEWER:

PROJECT DEPT.		OTHER DEPT.	
EE	☐	EED	☐
I&CE	☒	PED-ESG	☐
ME	☐	MSG	☐
SE	☐	NED	☐
		OQA	☐

Brian J. Drain 6/3/85
REVIEWER/DATE

FORM WE-100-4
REVISION 5

ENGINEERING/OQA REVIEW FORM

NUCLEAR SERVICES DIVISION
YANKEE ATOMIC ELECTRIC COMPANY

EDCR NO: 85-09 ECN: ______
ENCLOSURE: A PAGE 3 OF 10
PLANT MAINE YANKEE
WORK ORDER NO: 5819

EDCR TITLE: REGULATORY GUIDE 1.97 RCS TEMPERATURE MODIFICATIONS

COMMENTS	RESOLUTION
I have reviewed this EDCR in accordance w/ WE-100 and have the following comment: Pg 5, Sect 9.2: Items 1, 2 and 3 are listed as being qualified to IEEE 344-75 - MAE has reviewed the test report for item 1 (L&N Recorder) in Calc MYC-579 however we have no record of reviewing items 2 & 3 - should we perform this review or has it been performed by others?	[illegible] OK WE Henries 6-6-85

Comments Continued On Page ______

REVIEWER:

PROJECT DEPT.		OTHER DEPT.	
EE	☐	EED	☐
I&CE	☐	PED-ESG	☐
ME	☒	MSG	☐
SE	☐	NED	☐
		OQA	☐

WE Henries 6/3/85
REVIEWER/DATE

FORM WE-100-4
REVISION 5

ENGINEERING/OQA REVIEW FORM

NUCLEAR SERVICES DIVISION
YANKEE ATOMIC ELECTRIC COMPANY

EDCR NO: 85-09 ECN: ______

ENCLOSURE: A PAGE 4 OF 10

PLANT MAINE YANKEE

WORK ORDER NO: 5819

EDCR TITLE: REGULATORY GUIDE 1.97 RCS TEMPERATURE MODIFICATIONS

COMMENTS	RESOLUTION
(1) E.Q. Program Manual should be listed as Reference or under Design Criteria since safety evaluation states "IE"	The [illegible] modification [illegible] EDCR are not included in the Scope of the EQPM [illegible] DAK [illegible]
(2) This EDCR was reviewed per the guidelines of WE-100. No SEG impact was noted and no comments other than (1) above was required.	
	The Resolution is correct. Comment withdrawn after review of defined scope of EQPM. J. Duke

Comments Continued On Page ______

REVIEWER:

PROJECT DEPT.
- EE ☐
- I&CE ☐
- ME ☐
- SE ☒

OTHER DEPT.
- EED ☐
- PED-ESG ☐
- MSG ☐
- NED ☐
- OQA ☐

[signature] 6/4/85
REVIEWER/DATE

FORM WE-100-4
REVISION 5

ENGINEERING/OQA REVIEW FORM

NUCLEAR SERVICES DIVISION
YANKEE ATOMIC ELECTRIC COMPANY

EDCR NO: 85-09 ECN: ____

ENCLOSURE: A PAGE 5 OF 10

PLANT MAINE YANKEE

WORK ORDER NO: 5819

EDCR TITLE: REGULATORY GUIDE 1.97 RCS TEMPERATURE MODIFICATIONS

COMMENTS	RESOLUTION
Reviewed in accordance with WE-100. We have no radiological concerns requiring resolution.	

Comments Continued On Page ____

REVIEWER:

PROJECT DEPT.		OTHER DEPT.	
EE	☐	EED	☒
I&CE	☐	PED-ESG	☐
ME	☐	MSG	☐
SE	☐	NED	☐
		OQA	☐

N.M. Canzarino / 6-4-85
REVIEWER/DATE

FORM WE-100-4
REVISION 5

ENGINEERING/OQA REVIEW FORM

NUCLEAR SERVICES DIVISION
YANKEE ATOMIC ELECTRIC COMPANY

EDCR NO: 85-09 ECN: ______
ENCLOSURE: A PAGE 6 OF 10
PLANT MAINE YANKEE
WORK ORDER NO: 5819

EDCR TITLE: REGULATORY GUIDE 1.97 RCS TEMPERATURE MODIFICATIONS

COMMENTS	RESOLUTION
Reviewed in accordance with WE-100. No further comments	

Comments Continued On Page ______

REVIEWER:

PROJECT DEPT.		OTHER DEPT.	
EE	☐	EED	☐
I&CE	☐	PED-ESG	☒
ME	☐	MSG	☐
SE	☐	NED	☐
		OQA	☐

[illegible signature] [illegible date]
REVIEWER/DATE

FORM WE-100-4
REVISION 5

ENGINEERING/OQA
REVIEW FORM
NUCLEAR SERVICES DIVISION
YANKEE ATOMIC ELECTRIC COMPANY

EDCR NO: 85-09 ECN: ______
ENCLOSURE: A PAGE 7 OF 10
PLANT MAINE YANKEE
WORK ORDER NO: 5819

EDCR TITLE: REGULATORY GUIDE 1.97 RCS TEMPERATURE MODIFICATIONS

COMMENTS	RESOLUTION
Section 12.2 should state how mountings are to be inspected. Is this a visual inspection per procedure or a drawing conformance inspection via QC?	Section was revised. D.A.K. [illegible] 6-6-85 OK w. Telcon J. L[illegible] 6-6-85
WE-100 reviewed — no NDE or welding concerns other than above	

Comments Continued On Page N/A

REVIEWER:

PROJECT DEPT.		OTHER DEPT.	
EE	☐	EED	☐
I&CE	☐	PED-ESG	☐
ME	☐	MSG	☒
SE	☐	NED	☐
		OQA	☐

[illegible signature] 3 June 85
REVIEWER/DATE

FORM WE-100-4
REVISION 5

ENGINEERING / OQA
REVIEW FORM
NUCLEAR SERVICES DIVISION
YANKEE ATOMIC ELECTRIC COMPANY

EDCR NO: 85-09 ECN: ____
ENCLOSURE: A PAGE 8 OF 10
PLANT MAINE YANKEE
WORK ORDER NO: 5819

EDCR TITLE: REGULATORY GUIDE 1.97 RCS TEMPERATURE MODIFICATIONS

COMMENTS	RESOLUTION
All comments have been resolved. This EDCR has been reviewed in accordance with WE-100. This change will not have a negative impact on plant licensing or safety analyses.	

Comments Continued On Page ____

REVIEWER:

PROJECT DEPT.		OTHER DEPT.	
EE	☐	EED	☐
I&CE	☐	PED-ESG	☐
ME	☐	MSG	☐
SE	☐	NED	☒
		OQA	☐

Michael M. Scott 6/5/85
REVIEWER/DATE
B.C. Slifer 6/5/85

FORM WE-100-4
REVISION 5

ENGINEERING/OQA REVIEW FORM

NUCLEAR SERVICES DIVISION
YANKEE ATOMIC ELECTRIC COMPANY

EDCR NO: 85-09 ECN: ____
ENCLOSURE: A PAGE 9 OF 10
PLANT MAINE YANKEE
WORK ORDER NO: 5819

EDCR TITLE: REGULATORY GUIDE 1.97 RCS TEMPERATURE MODIFICATIONS

COMMENTS	RESOLUTION
Reviewed in accordance with OQA III-3 Rev 6 and WE-100 Rev 12 OQA has no comments.	

Comments Continued On Page ____

REVIEWER:

PROJECT DEPT.		OTHER DEPT.	
EE	☐	EED	☐
I&CE	☐	PED-ESG	☐
ME	☐	MSG	☐
SE	☐	NED	☐
		OQA	☒

Tom Childress 6-5-85
REVIEWER/DATE

FORM WE-100-4
REVISION 5

ENGINEERING/OQA REVIEW FORM

NUCLEAR SERVICES DIVISION
YANKEE ATOMIC ELECTRIC COMPANY

EDCR NO: 85-09 ECN: ____
ENCLOSURE: A PAGE 10 OF 10
PLANT MAINE YANKEE
WORK ORDER NO: 5819

EDCR TITLE: REGULATORY GUIDE 1.97 RCS TEMPERATURE MODIFICATIONS

COMMENTS	RESOLUTION
Reviewed for EQ concerns in accordance with WE-100, Memo MYP 85-39, and the Maine Yankee EQ Program Manual. The equipment covered by this EDCR is already addressed in the EQ Program Manual and the proposed modification does not adversely affect the qualifications of this equipment.	

Comments Continued On Page —

REVIEWER:

PROJECT DEPT.
- EE ☐
- I&CE ☐
- ME ☐
- SE ☐

OTHER DEPT.
- EED ☐
- PED-ESG ☐
- MSG ☐
- NED ☐
- OQA ☐

EQ ☒

S.F. Ustarowski / 6-6-85
REVIEWER/DATE

EDCR 85-09

ENCLOSURE B

REFERENCES

ENCLOSURE (B)

References

(B1) Maine Yankee Service Request No. MY-84-109, "Regulatory Guide 1.97 Implementation."

(B2) Memo, D. A. Kulp to R. P. Shone, "Maine Yankee Regulatory Guide 1.97 Evaluation," dated October 3, 1983 (MYP 83-448).

(B3) Memo, T. M. Gifford to Distribution, "Regulatory Guide 1.97 Review Results," dated January 30, 1984 [TMG 84-05(25.16)].

(B4) Memo, D. A. Kulp to R. P. Shone, "Conceptual Memorandum for Regulatory Guide 1.97 Modifications to RCS Hot and Cold Leg Temperature Indication," dated January 4, 1985 (MYP 84-980, Revision 1).

(B5) Memo, D. A. Kulp to R. P. Shone, "Equipment Required for Regulatory Guide 1.97 Modifications," dated February 20, 1985 (MYP 85-128).

(B6) Memo, D. A. Kulp to W. E. Henries, "Seismic Mounting of Equipment for EDCR 85-09," dated April 26, 1985 (MYP 85-330).

(B7) Memo, W. E. Henries to D. A. Kulp, "Seismic Mounting of Equipment for EDCR 85-09," dated May 24, 1985 (MYP 85-439).

Form No. MY-A-24-83

MY/YNSD SERVICE REQUEST

Service Request No. MY-84-109
Issue Date 9/5/84

TITLE OF PROJECT: R.G. 1.97 implementation

DESCRIPTION OF PROJECT: (State Objectives and Milestones)

The Six CPA's attached are to be Engineered with proposed facial and dimensional layout drawings. These drawings are then to be presented to the ERCIP Steering Comm. for approval, then transformed into EDCR with implementation instructions written and installed during the 1985 refueling

JUSTIFICATION FOR PROJECT:

NRC R.G. 1.97 commitment

MY Cognizant Person: T.W. GIFFORD
MY Work Order No.: 84-24
Engineering Task No.: 8.05
EDCR/CPA No.(s): Not Available yet
Other:

Cost Limit (If Appropriate) 67,575.00
Schedule Restrictions: Installed by end of 1985 Refueling
Copy(s) Attached: CPA's - 6
Proj. Requested by: [signature] 9/5/84 Date

Authorization [signature] 10/7/84
(MOO or MMF) Date

YNSD RESPONSE

YNSD Cognizant Person(s) D. A. KULP

YNSD Work Order No(s): 5986

Milestone Schedule: Conceptual design presented to ERCIP Steering Org end of Oct

Cost Estimate: To Be detailed in Conceptual Memo

Discussion/Comments: Each of the Attached CPAs will be a separate EDCR and a Conceptual Memo will be issued with price for each job

MYPM Signature:
Date:

EDCR 85-09 ECN
ENCLOSURE B1
PAGE 1 OF 10

- ☐ Plant Engineer
- ☐ Plant Manager
- ☐ Director Eng.
- ☐ Mngr of Ops
- ☐ V. P. of Ops
- ☐ Director Eng.
- ☐ FED Drftg

Date: 7/31/84

Originator: R. Lamothe

Preliminary Project Cost Estimate: $58,000.00

Hold A.

MAINE YANKEE CONCEPTUAL PROJECT AUTHORIZATION

TITLE: R.C.S. Temperature Indication

Project Description/Discussion: Present R.C.S. water temperature indicators for Tcold (TIA-111Y, 121Y, 131Y) and for Thot (TI-111X, 121X, 131X) do not have required scale ranges. Also, Thot channels are not isolated from the plant computer, and the indications are not located on the front of the MCB and do not include any recorders. Replacing the existing single range transmitter for Tcold with a dual range one, similar to the Thot transmitter, will provide 0°-750°F outputs. The dual range transmitter has built-in isolation between outputs, with the computer on the 515°-615°F channel. Indicators and 2-pen recorders fed from the higher range outputs will be located on the loop control panel of section C. The above provides the range, isolation and location necessary to meet R.G. 1.97 requirements

Justification for Project: R.G. 1.97 specifies Thot and Tcold instrument loops with a 0°-750°F range, direct operator access to temperature displays, provision of recorders and computer isolation from the 1E loops.

Projected Schedule: 1985 Refueling

Comments: Attached are a sketch of the proposed layout and the HED's from the H.F. Project to be integrated into the final fix

Dept. Head (Project Mgr.): J. R. Hebert
Recommend Further Investigation

Plant Eng. Dept.: T. M. Tifford
Recommend Further Investigation

Plant Mgr: ____________
Recommend Further Investigation

Mgr of Operations: ____________
Approve Further Investigation

Vice President of Operations: ____________
Approve Further Investigation

EDCR 85-09 ECN
ENCLOSURE B1
PAGE 2 OF 10

HED RECORD

5-2
1260

PANEL I.D. MCB-C-V

COMPONENT I.D. ?

COMPONENT TITLE/SERVICE Temp. Indication/Hot Leg of RCS

DISCREPANCY

There is not available a continuous T. hot leg indication on the front of the Main Control Board. For following Natural Circulation, there should be (Recommend placement one per Hot leg on Main Control Board).

GUIDE No. 6.1.1.1b TITLE Accessability of Instrumentation

GUIDE No. TITLE

GUIDE No. TITLE

H.E. LIMITS Operators should not have to leave the primary operating area during operational sequences

TASK I.D. Subtask 3 Subtask 4

PHOTO RECORD

COMMENTS

VERIFICATION

EDCR 85-09 ECN
ENCLOSURE B1
PAGE 3 OF 10

HED RECORD

PANEL I.D. MCB-B-(In Back)

COMPONENT I.D. NA

COMPONENT TITLE/SERVICE Indicator/T_{Hot} Let of RCS

DISCREPANCY

Scale does not encompass cooldown temperatures

GUIDE No. 6.5.1.2d TITLE Usability of Displayed Valves - Scale Range

GUIDE No. TITLE

GUIDE No. TITLE

H.E. LIMITS Scales should be selected to encompass the expected range of operation

TASK I.D. Subtask 4

PHOTO RECORD

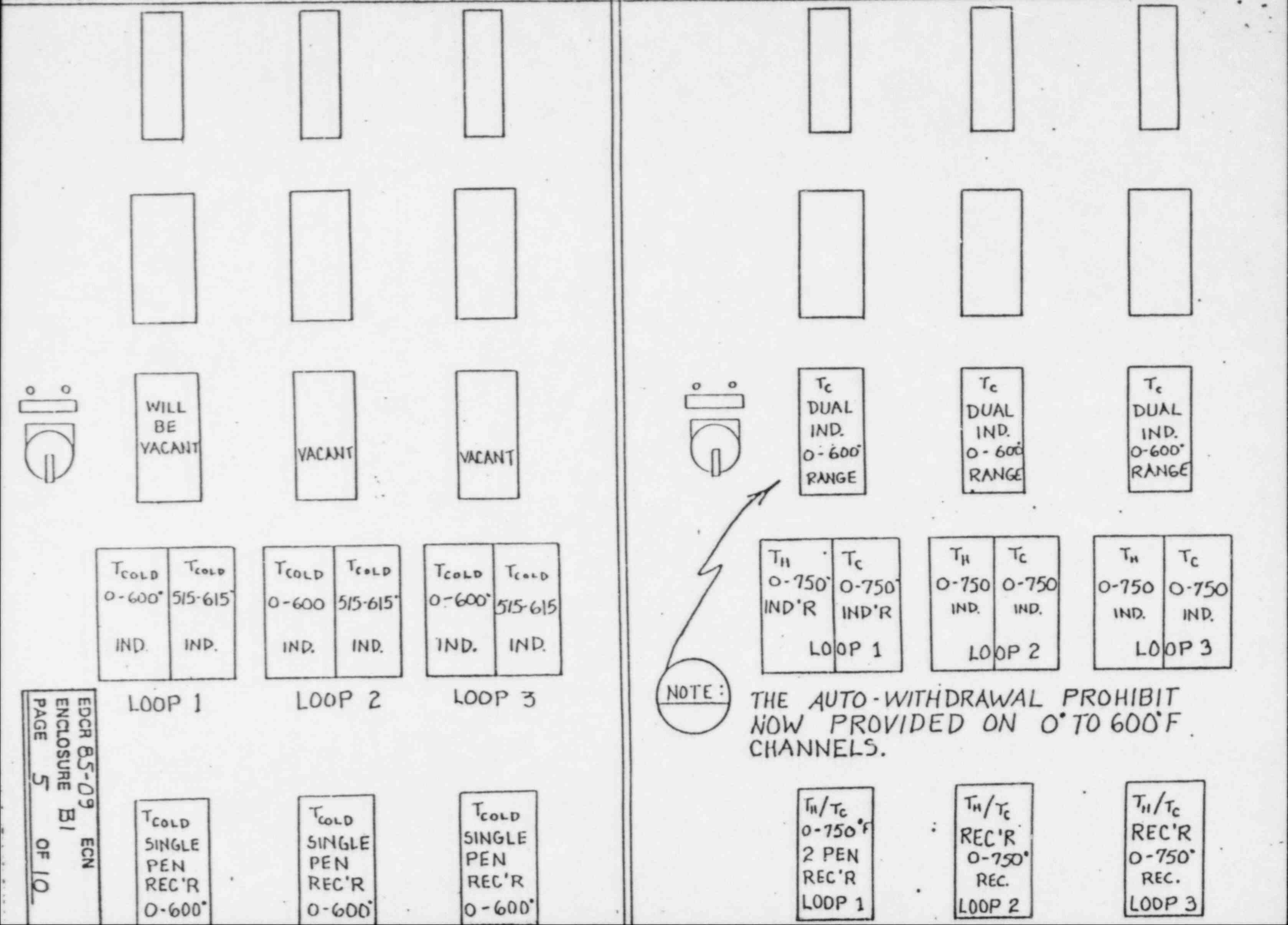
COMMENTS

VERIFICATION

EDCR 85-09 ECN
ENCLOSURE B1
PAGE 4 OF 10

REV. CO

EXISTING LOOP CONTROLS PANEL | PROPOSED LOOP CONTROLS PANEL



EDCR 85-09 ECN
ENCLOSURE B1
PAGE 5 OF 10

☐ Plant Manager
☐ Director Eng.
☐ Mngr of Ops
☐ V. P. of Opr
☐ Director Eng.
☐ PED Drftg

Date: 7-27-84
Originator: R. Lamothe
Preliminary Project Cost Estimate: $12,000.00

Hold up

MAINE YANKEE CONCEPTUAL PROJECT AUTHORIZATION

TITLE: Core Exit Thermocouple Isolation

Project Description/Discussion: Currently there is no isolation for ten (10) Core Exit Thermocouple Channels to the plant computer. Such isolation shall be provided for T/C - Y8, L2, F11, G13, G6, N17, W13, F1, D3 and B5. Additional Core Exit Channels as thermocouples are upgraded to class IE status.

Justification for Project: Regulatory Guide 1.97 calls for isolation of the plant computer (NNS) from all class IE instrument loops.

Projected Schedule: 1985 Refueling

Comments:

Dept. Head (Project Mgr.): [signature]
Recommend Further Investigation

Plant Eng. Dept.: [signature]
Recommend Further Investigation

Plant Mgr:
Recommend Further Investigation

Mgr of Operations:
Approve Further Investigation

Vice President of Operations:
Approve Further Investigation

EDCR 85-09 ECN
ENCLOSURE B1

Date: 7/27/84
Originator: R. Lamothe
Preliminary Project Cost Estimate: $35,000.00

☐ Plant Manager
☐ Director Eng.
☐ Mngr of Ops
☐ V. P. of Opr
☐ Director Eng.
☐ PED Drftg

No Ahead

MAINE YANKEE CONCEPTUAL PROJECT AUTHORIZATION

TITLE: RCS RADIATION MONITORS

Project Description/Discussion: The Radioactive Concentration instrumentation for the Circulating Primary Coolant (RM-3103, RM-3102) are monitors which are not seismically qualified and are not powered from separate supplies. Separation of these variables, through separation of power supplies, and seismic qualification of these instruments is to be implemented.

Justification for Project: Regulatory Guide 1.97 designates seismic qualification for Radiation Monitoring instrumentation, as well as separate power buses to meet single failure criteria.

Projected Schedule: 1985 Refueling

Comments:

Dept. Head (Project Mgr.): J. R. Gilbert
Recommend Further Investigation

Plant Eng. Dept.: T. M. Hufford
Recommend Further Investigation

Plant Mgr:
Recommend Further Investigation

Mgr of Operations:
Approve Further Investigation

Vice President of Operations:
Approve Further Investigation

EDCR 85-09 ECN
ENCLOSURE B1
PAGE 7 OF 10

Date: 7/27/84
Originator: R. J. Lamothe
Preliminary Project Cost Estimate: $8,000.00

- [ ] Plant Engineer
- [ ] Plant Manager
- [ ] Director Eng.
- [ ] Mngr of Ops
- [ ] V. P. of Ops
- [ ] Director Eng.
- [ ] PED Drftg

go ahead

MAINE YANKEE CONCEPTUAL PROJECT AUTHORIZATION

TITLE: PRESSURIZER LEVEL INDICATORS

Project Description/Discussion: Pressurizer Level Instrumentation (LT-101X and LT101Y) should be electrically separated and have the computer isolated from each instrument loop. In isolating the control portion from indication portion of these two loops, both provisions can be attained.

Justification for Project: Single failure criteria specified in Regulatory Guide 1.97 requires electrical separation of the two instruments and instrument loop isolation of the plant computer.

Projected Schedule: 1985 Refueling

Comments:

Dept. Head (Project Mgr.): J. P. Gebert
Recommend Further Investigation

Plant Eng. Dept.: T. M. Yfford
Recommend Further Investigation

Plant Mgr: ______
Recommend Further Investigation

Mgr of Operations: ______
Approve Further Investigation

Vice President of Operations: ______
Approve Further Investigation

Date: R. J. Lamothe
Originator: 45,000.00
Preliminary Project Cost Estimate:

- [ ] Plant Engineer
- [ ] Plant Manager
- [ ] Director Eng.
- [ ] Mngr of Ops
- [ ] V. P. of Ops
- [ ] Director Eng.
- [ ] PED Drftg

hold up

MAINE YANKEE CONCEPTUAL PROJECT AUTHORIZATION

TITLE: STEAM GENERATOR SAFETY RELIEF VALVE POSITION

Project Description/Discussion: At present, there exists no instrumentation which reveals the position of the steam generator safety relief valve. An open/closed indication on the main control board will be provided by way of acoustic monitors on each steam generator safety header. A total of 3 systems wired to the loose parts monitoring panel will be Instal similar to the PORV's and pressurizer safeties systems.

Justification for Project: Guidelines set in R.G. 1.97 require an open/closed indication for steam generator safety relief valve position instrumentation.

Projected Schedule: 1985 Refueling

Comments:

Dept. Head (Project Mgr.): [signature] Recommend Further Investigation

Plant Eng. Dept: [signature] Recommend Further Investigation

Plant Mgr: Recommend Further Investigation

Mgr of Operations: Approve Further Investigation

Vice President of Operations: Approve Further Investigation

EDCR 85-09 ECN
ENCLOSURE B1
PAGE 9 OF 10

Date: 7/27/84
Originator: R. Lamothe
Preliminary Project Cost Estimate: $15,000.00

- ☐ Plant Manager
- ☐ Director Eng.
- ☐ Mngr of Ops
- ☐ V. P. of Ops
- ☐ Director Eng.
- ☐ PED Drftg

go ahead

MAINE YANKEE CONCEPTUAL PROJECT AUTHORIZATION

TITLE: RCS PRESSURE INSTRUMENTATION

Project Description/Discussion: The RCS Pressure Instrumentation (PT-102X,102Y) should have both channels separated to different power supply vital buses. Also necessary is the addition of a recorder for the 102Y channel. An isolator will be required for the channel which will be removed from the saturation monitor vital bus in order to provide correct channel separation. Both channels are presently powered from the saturation monitor bus.

Justification for Project: Regulatory Guide 1.97 specifies separate power supply buses to meet single failure criteria and adequate channel separation.

Projected Schedule: 1985 Refueling

Comments:

Dept. Head (Project Mgr.): [signature]
Recommend Further Investigation

Plant Eng. Dept: [signature]
Recommend Further Investigation

Plant Mgr: ____________
Recommend Further Investigation

Mgr of Operations: ____________
Approve Further Investigation

Vice President of Operations: ____________
Approve Further Investigation

EDCR 85-09 ECN
ENCLOSURE B1
PAGE 10 OF 10

JUL 3 1985

(HED #'s 71,559)

ENGINEERING DESIGN CHANGE REQUEST (MY)

EDCR No. 85-12
Task No.
W.O. No. 84-23
ECN No.

Title: IMPROVE CVCS/LOOP PANEL LAYOUT

Priority: 85 REFUELING

Design Grade:

INFORMATIONAL COPY NOT ... APPROVED

Project Engineer: K.C. Mahajan Date: 6-3-85

PED Reviewer: [signature] Date: 6/4/85

CQAD Reviewer: [signature] Date: 6-28-85

Plant Operations Review Committee

Approval Recommendation: ______________ Date: ______
(Secretary of PORC)

Plant Manager Approval

Approved: ______________ Date: ______

YNSD

Reviewed*: ______________ Date: ______

NOTE:

* Not required for Design Grades 2 and 3.

Manager of Operations Approval

Approved: ______________ Date: ______

Comments:

Form No. 17-21-6-1
Revised 8/1/83

EDCR # 85-12
ECN # 0

DESIGN VERIFICATION DOCUMENTATION SHEET

The results of design verification efforts shall be clearly documented with the identification of the reviewer.

I have reviewed EDCR 85-12 in accordance with PED Procedure No. 17-21-6 by addressing attachment 1, pages 1 and 2 of the procedure and find no comments. The Safety Analysis adequately addresses both a safety evaluation and 10 CFR 50.59 determination. Only one item in the EDCR is safety class IE, FIC-216 Fill Header Flow Controller. The functionality of this device is not changing only the Location. Seismic analysis and mounting are addressed in EDCR 85-11 and are therefore not part of this EDCR. Separation criteria is being maintained and Loading of buses have not significantly changed. Based on the above, recommend approval of EDCR.

Reviewed By: T. M. [illegible] 1/4/85 Date

Concurrence: R. W. Gilbert 1/8/85
Cognizant Supervisory Engineer

3297N-JRH

Form 21-202-1
Rev. 7
Rev. Date: 01/02/85

OQAD EDCR REVIEW COMMENT SHEET

I have reviewed EDCR 85-12 in accordance with 21-202 and 17-21-6 with the following comments:

1. The prints associated with this EDCR have not been sent to EAG for duplication as per 17-22-2.
2. The prints associated with this EDCR have not been stamped "This change for EDCR — only."
3. The sketches in the back of the EDCR are not numbered.
4. Should print FE-30AQ, which is referenced in the EDCR, be included with the prints?

PED COMMENTS

1. Prints are sent for Duplication. —
2. Prints have been stamped.
3. Sketches are numbered
4. Print FE-3DAQ which is only referenced as Dwg refered should not be included with the prints changed.

K. C. Mahajan 6-25-85

W. Tracy / 6-18-85
REVIEWED BY / DATE

1.0 REFERENCES:

1.1 CPA 40-84
1.2 NUREG 0700, Sect. 6-8-2-1 and 6-9-1-1a
1.3 FCB - 3CF, 3CG and 3CM
1.4 YEW Instruction Manual - YEW Series 80, Model SLPC

2.0 ENCLOSURES:

2.1 CPA 40-84
2.2 10CFR50.59, Safety Evaluation

3.0 DESCRIPTION:

This EDCR will implement the recommendations of CPA 40-84. CVCS and loop panel indicators will be relocated for better utilization of the instruments in order that consistant, orderly system actions will be achieved by;

A. Placing "functionally related controls and displays grouped together to perform tasks related to a specific function (Ref. CPA 40-84, HED#71).

B. Replacing limiter, controller and indictor by single indicating controller for ease of operation and to conserve space (Ref. CPA 40-84, HED #97).

C. Placing visual displays near their associated controller, because controllers and displays which are normally used together should be located in close proximity to each other, but positioned and

separated adequately so that the display is not obstructed during operation. This allows the operator to read it clearly (without parallax errors) from a normal operating position. (Ref. CPA 40-84, HED's #559,561,562, 563 and 564).

3.1 For changes in the location of instruments for CVCS and Loop Control Systems refer to Sketch #1 & 2 (ESK-4C & 4G) and see Table 1 of this EDCR. Other details are shown in the Notes column of Table 1.

3.2 The new panel cutouts and facial plates will be completed in accordance with EDCR 85-11 "Main Control Board Facial Plates for H.F. Design Changes". New labelling and mimic lines will be added in accordance with EDCR 84-73, "MCB Label and Mimic Enhancements".

3.3 HED#97 recommends replacement of LY-101W, HIC-101 and FI-202 with FIC-101P,Q. As shown in Sketch #3, the limiter LY-101W limits the (4-20MA) control signal to (11-16 MA). Low setpoint limit = 11 MA and high setpoint limit = 16MA per I&C Dept. Instrument Calibration Form # 6.2.3, Procedure No. 3.6.2.1.12, Rev. 7, Page 42). Letdown flow controller HIC-101 allows the automatic or manual control of the letdown drag valves LD-A-9 or LD-A-10. The valve or valves which receive the control signal are selected by control switch SS-101-3. Letdown flow indicator FI-202 indicates the letdown flow downstream of the drag valves. Sketch #3 also shows that a new programmable indicating controller can be used in place of HIC-101 and this new controller can limit the control signal, indicate the flow, allowing limiter LY-101W and flow indicator FI-202 to be eliminated.

3.4 This EDCR will replace LY-101W, HIC-101 and FI-202 by FIC-101P,Q. FIC-101P,Q will be purchased from YEW Company with a special scale. YEW will program the controller so that (1) controller will limit the control signal to (11-16MA). (2) Controller will respond to

level signal only for control function. (3) Controller will indicate the flow as process variable. The program will be loaded in ROM by YEW and a hard copy of source program will be available to us for records. (Refer PED letter #0103-85, dated May 17, 1985.) One spare controller will be ordered and stock coded in Stores.

3.5 Sketch #4 shows the front panel of FIC-101P,Q, its various controls and displays are explained. For details, refer to YEW Instruction Manual - YEW Series 80, Model-SLPC. (Reference 1.4).

3.6 Sketch #5 shows the interconnection diagram of the FIC-101 P,Q.

3.7 Sketch #6 shows the internal and external connections of the FIC-101P,Q.

The existing controller HIC-101 is F&P Model 53ED3211 (will be replaced by FIC-101P,Q) with 4-20 MA input signal and 4-20MA out put signal. HIC-101 gets its input from the limiter, LY-101W which is F&P Model 55EL-2211A. LY-101W will be eliminatd due to the capability of new programable indicating controller FIC-101 P,Q. FIC-101 P,Q will limit the control signal from (4-20MA) to (11-16MA). Hence, FIC-101P,Q will get (4-20MA) input signal from HS-101-1 and LY-101V to its terminals 1 and 2 for control function (refer to Sketch #5).

The controller FIC-101 P,Q will also eliminate FI-202 which is Sigma Model 9222-00E with a (4-20 MADC) input signal equivalent to 0-220 GPM (per I&C Calibration Sheet). Hence, FIC-101 P,Q will get (4-20 MADC) input signal equivalent to 0-220 GPM from square root extractor FY-202 to its terminals 3 and 4 for indication and not for control function (refer to Sketch #5). This will be achieved by loading the program in ROM of the controller by YEW.

6

The output signal (4-20MA) of the HIC-101 goes to the input of the LY-101P and LY-101Q via selector switch SS-101-3 (refer to Sketch #3 and DWG D-4467-416-121). The new controller FIC-101P,Q will have the 1 to 5 V DC, inputs at its terminals 1 and 2, 3 and 4 and 4-20 MA DC output signal at its terminals A and B. The HIC-101 has 4-20 MA DC input and 4-20 MA DC output. As the input signals are from the analog current transmitters, i.e., 4-20 MA DC in this case, a precision 250 Ohm (± 0.1%) resistor will be connected between the analog input terminals (1 and 2, 3 and 4) of the FIC-101P,Q (refer to Sketch #5). The resistance tolerance is critical in this case because the resistors are utilized to accurately convert the current signals from transmitter (4-20 MA DC) to a specified analog input voltage signals (1 to 5 V DC). Output of the controller FIC-101P,Q is 4-20 MA DC (between the terminals A & B) the same as HIC-101. The controller FIC-101P,Q will have two 4-20 MA DC inputs (actually two 1 to 5 V DC by connecting 250 Ohm precision resistors) with 0-225 GPM Linear Scale. The FIC-101P,Q will need a cutout size of 80±0.5mm (W) x 172±0.5mm(H). At present, we have 76mm(W)x152mm(H) cutout size. The required cutout size will be made in accordance with EDCR 85-11. Hence, the replacement of LY-101W, HIC-101 and FI-202 by FIC-101P,Q will not result in any functional change. Refer to Drawings FE-3DF, FE-3DAT and D-4467-416-121 for addition of new controller FIC-101P,Q and FE-3DS, FE-3DAN, FM-31A, FM-91A and D-4467-416-231 for elimination of FI-202 and FE-3DQ, FE-3DAP and D-4467-416-121 for elimination of LY-101W.

4.0 REASON FOR CHANGE/ADVANTAGES:

This change is required for better utilization of the instruments as defined in NUREG-0700. These changes correct Human Engineering Discrepancies #71,97,559,561,562,563 and 564 generated during the Control Room review.

9079N-TMG

5.0 COST ESTIMATES:

These costs are based on the relocation of 8 controllers, 4 indicators, 4 control switches and replacement of LY-101W, HIC-101 and FI-202 with FIC-101P,Q on MCB Sect C, CVCS and Loop Control Panels. Walkdown of the existing installation indicates that this is feasible.

Cost Labor		$ 4,708.00
MY Engineering		9,240.00
Material		4,100.00
Contingency (10%)		1,804.80
	TOTAL	$19,852.80

6.0 SCHEDULE:

6.1 Material consists of switchboard wires #14. Lugs, labels (Brady Markers) will be drawn from misc. Engr. project materials for 1985 Outage.

6.2 Controllers FIC-101P,Q will be purchased from YEW, Dept. Request No. 04-85-2-51. YEW will also write and load the program in ROM of both the controllers and send the hard copy of the source program for our records. Also one spare controller will be ordered and stock coded in Stores. These materials will be available on site by June, 1985.

6.3 The implemenation of this EDCR will be completed during 1985 Refueling Outage.

7.0 ORGANIZATIONS RESPONSIBLE FOR THE DETAILED DESIGN:

7.1 Maine Yankee PED

8.0 DESIGN INPUT:

8.1 The following items from the Design Input List - Attachment 1, Procedure 17-21-2 apply 1,2,8,13,14,15,16,17,19,20,30,32 and 33.

9.0 QA/QC REQUIREMENTS:

9.1 This job will be mostly NNS, except the relocation of fill header controller (FIC-216) which is Class 1E.

9.2 New material for FIC-216 (i.e., #14 SIS Switch Board Wire) as applicable will be Class 1E. Implementation Instructions will require that all newly terminated wires to the FIC-216 be subject to Q.C. inspection and that functional tests be witnessed by Q.C.

9.3 New material as applicable for NNS portion of design change (refer Table 1 of this EDCR) will be NNS Class.

9.4 The Implementation and Testing Instructions will address Q.C. inspection/hold points as necessary where Class 1E components are involved.

10.0 SAFETY EVALUATION:

The FSAR, Sect. 9 and Tech. Spec., Sect. 3.5 have been reviewed during the preparation of this EDCR. The existing layout is not discussed in either the FSAR or Tech. Specs. The change will provide the relocation of controllers, indicators, switches and replacement of a limiter, controller and indicator by a programmable indicating controller as described in Table 1 of this EDCR. Table 1, Serial No. 4, 5 and 20, the instruments HIC-101, FI-202 and LY-101W will be replaced by a new

indicating controller FIC-101P,Q for ease of operators and to conserve the space, and this replacement will not result in any functional change (refer to Sec. 3-6). The intention of the changes is to provide a more logical configuration to the operators and reduce the possibility of error. Implementation Instructions for Class 1E instrument (FIC-216) will require Q.C. verification of new wiring. Additionally, testing will be performed to verify that wiring has been properly installed.

Based on the above, the change does not increase the probability of occurrence or consequences of an accident or malfunction of equipment important to safety previously evaluated in the FSAR. This is true since the change is being incorporated to reduce the possibility of operator error.

This change does not create the possibility for an accident or malfunction of a different type than any evaluated previously in the FSAR. This is true since all control functions remain exactly the same as before the change.

The change does not reduce the margin of safety or defined in the basic for any technical specification. This is also true since no control functions are changed.

Based on all of the preceeding, this change is not an unreviewed safety question as defined in 10CFR50.59.

TABLE - 1 EDCR 85-12

CVCS AND LOOP CONTROL MCB SECT C

SERIAL NO.	REASON FOR CHANGE	INSTRUMENT BEING RELOCATED	INSTRUMENT SYSTEM	NEW LOCATION OF INST. IN PLACE OF PRESENTLY OCCUPIED BY/ NEW CUTOUT	REF. SKETCH NO. FOR NEW LOCATION	DESIGN CHANGE	NOTES
1	HED 71	FIC-218Y	Seal Water	HIC-101	Sketch-2 (ESK-4C)	NNS	Previous Tag # PDC-151. Tag changed to FIC-218Y per PDCR 25-73.
2	HED 71	FIC-228Y	Seal Water	SS-101-3	Sketch-2 (ESK-4C)	NNS	Previous Tag # PDC-161. Tag changed to FIC-228Y per PDCR 25-73
3	HED 71	FIC-238Y	Seal Water	On RT. Side of SS-101-3 New PNL Cut	Sketch-2 (ESK-4C)	NNS	Previous Tag # PDC-171. Tag changed to FIC-238Y per PDCR 25-73.
4	HED 97	(HIC-101)	Let Down Flow Control	PIC-201	Sketch-1 (ESK-4G)	NNS	LY-101w HIC-101 and FI-202 are being replaced by FIC-101 P,Q.
5	HED 97	(FI-202)	Let Down Flow Indicator	PIC-201	Sketch-1 (ESK-4G)	NNS	LY-101w HIC-101 and FI-202 are being replaced by FIC-101 P,Q.
6	HED 559	TI-215	Seal Water Inlet Temp	On LT. Side of FIC-212	Sketch-2 (ESK-4C)	NNS	
7	HED 560	(PI-215)	Seal Water Return Press				HED voided. FCB's supercede CPA-40-84. PI-215 will stay as is.
8	HED 561	PIA-216	Loop Fill HDR. Press	Between HS256 & HS110 New PNL Cut	Sketch-2 (ESK-4C)	NNS	
9	HED 562	PIA-212	Charging Manifold Pressure	PIA-216	Sketch-1 (ESK-4G)	NNS	
10	HED 563	TIC-201	Let Down Temp.	TIC-204	Sketch-1 (ESK-4G)	NNS	

11.0 PLANT DIAGRAMS REFERENCED:

11.1 Diagrams revised.

ESK-4c, 4g
FE-3DE, 3DF, 3DL, 3DM, 3DN, 3DP, 3DQ, 3DS, 3DT, 3DU, 3DAC, 3DAF, 3DAG, 3DAN, 3DAP, 3DAT
FM-31A, 91A
11550-1-25-49B & 1-25-236A

11.2 Diagrams referenced

FE-3DAQ

12.0 OPEN ITEMS:

12.1 EDCR 85-11 address Main Control Board modifications - mechanical. This EDCR has not yet been written. This item will be automatically closed out at the time of EDCR 85-11 approval.

12.2 EDCR 84-73 addresses new labels and mimics. This EDCR has not yet been written. This item will be automatically closed out at the time of EDCR 84-73 approval.

13.0 DESIGN ANALYSIS/CALCULATIONS:

This section is not applicable - the system functions are not changed.

14.0 SKETCHES:

Sketches #1,2,3,5 & 6, EDCR 85-12 and Table 1 are included. They are described in Section 3 of this EDCR.

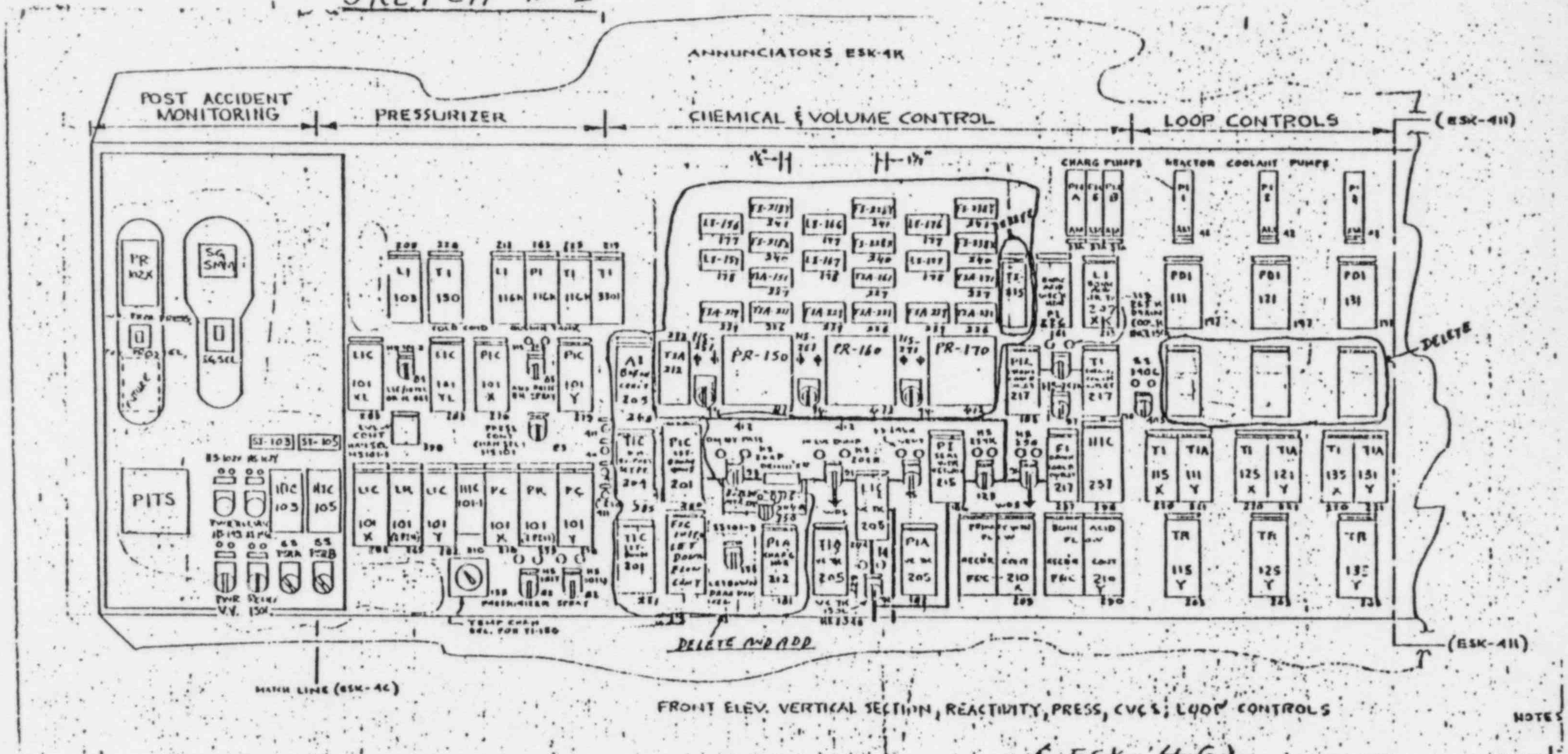
TABLE - 1 EDCR 85-12

CVCS AND LOOP CONTROL MCB SECT C

SERIAL NO.	REASON FOR CHANGE	INSTRUMENT BEING RELOCATED	INSTRUMENT SYSTEM	NEW LOCATION OF INST. IN PLACE OF PRESENTLY OCCUPIED BY/ NEW CUTOUT	REF. SKETCH NO. FOR NEW LOCATION	DESIGN CHANGE	NOTES
11	HED 564	AI-203	Boron Concentration	TIC-201	Sketch-1 (ESK-4G)	NNS	
12	Obvious	PIC-201	Letdown Press	FI-202	Sketch-1 (ESK-4G)	NNS	
13	Obvious	TIC-204	Letdown Temp Bypass	AI-203	Sketch-1 (ESK-4G)	NNS	
14	Obvious	SS-101-3	Letdown Drag Valve SEL LD-A-9:10	PIA-212	Sketch-1 (ESK-4G)	NNS	
15	Obvious	HS-201K	Letdown Line Stop LD-M-2	HS204Q	Sketch-2 (ESK-4C)	NNS	
16	Obvious	HS-242	Letdown Temp. Trip LD-T-5	Below HS204Q	Sketch-2 (ESK-4C)	NNS	
17	Obvious	HS-204Q	Borononmeter ISOL	Above PIA in Deminzr Loop New PNL Cut	Sketch-1 (ESK-4G)	NNS	CPA shows its new loc. above switch 01/212 on ESK 4C. CPA 40-84 has been superceded by FCB per HF steering Com.
18	Per FCB	FIC-216	Fill HDR Flow CH-F-70	On RT. Side of PIC-211	Sketch-2 (ESK-4C)	IE	
19	Per FCB	PIC-211	Seal Water Pressure SL-P-3	HS-201K and HS-242	Sketch-2 (ESK-4C)	NNS	
20	HED 97	(LY-101w) Rear of MCB-C	Letdown Level Signal Limeter	PIC-201	Sketch-1 (ESK 4G)	NNS	LY-101w, HIC-101 and FI-202 are being replaced by FIC-101P,Q.

EDCR # 85-12.

SKETCH # 1

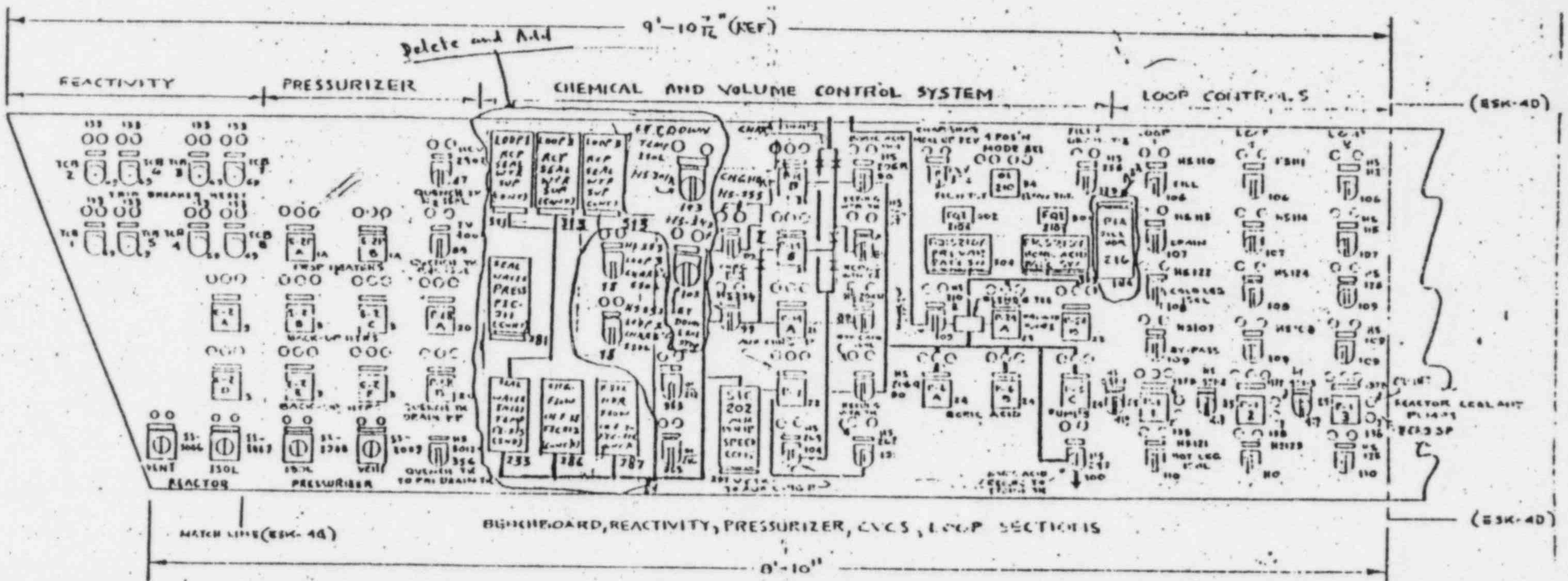


FRONT ELEV. VERTICAL SECTION, REACTIVITY, PRESS, CVCS; LOOP CONTROLS

(ESK-4G)

EDCR # 85-12.

SKETCH # 2

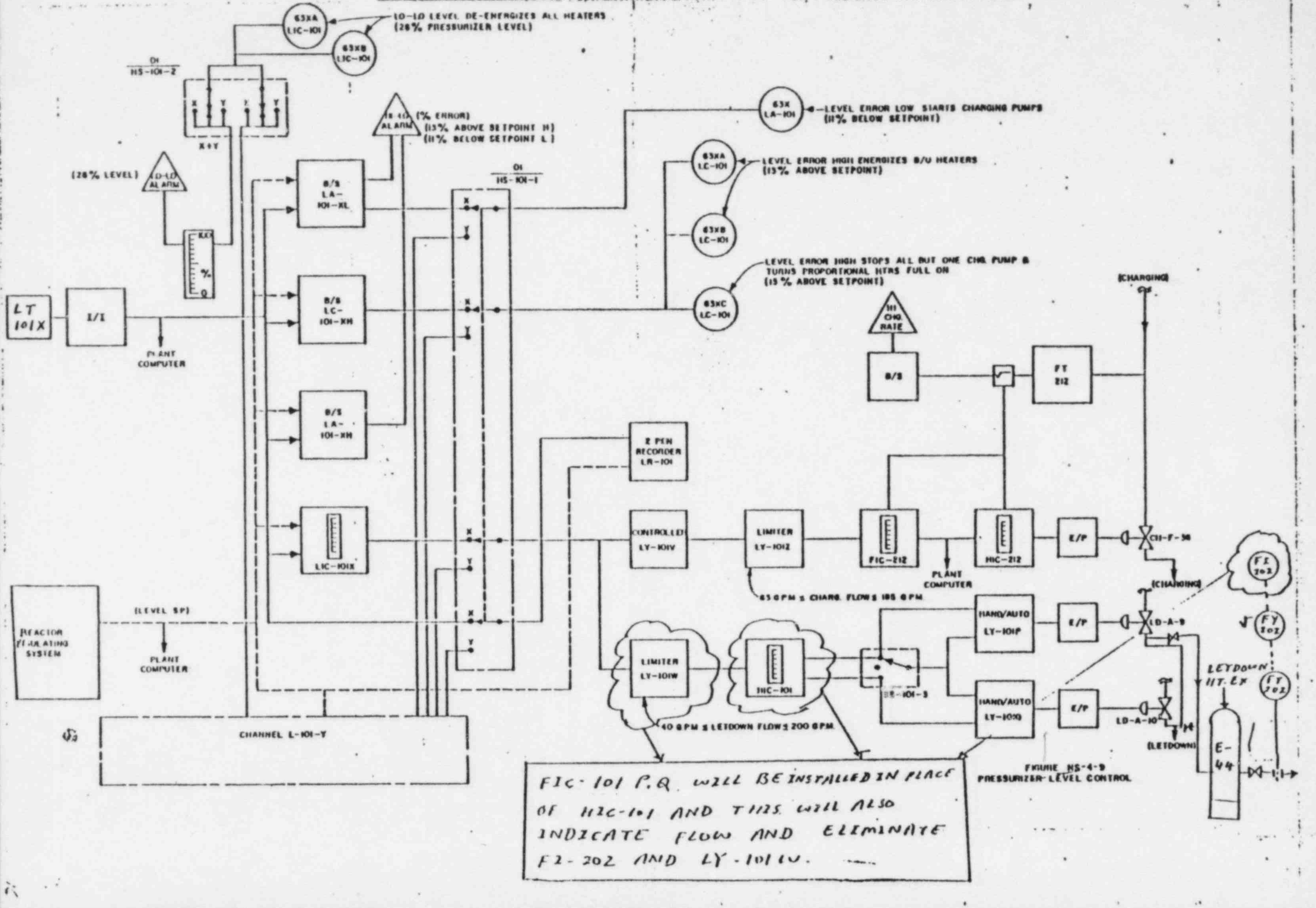


(ESK- 4C)

NOTES:

SKETCH # 3

EDCR # 85-12



FIC-101 P.Q. WILL BE INSTALLED IN PLACE OF HIC-101 AND THIS WILL ALSO INDICATE FLOW AND ELIMINATE FI-202 AND LY-101W.

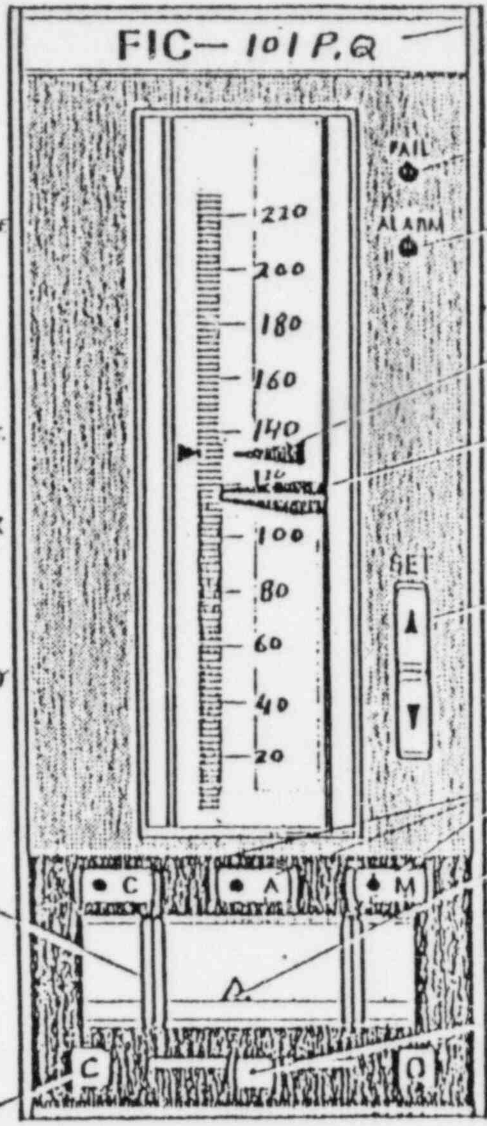
SKETCH # 4. EDCR # 85-12.

YEW Model SLPC PROGRAMMABLE CONTROLLER FIC-101 P.Q. YEWSERIES 80

NOTES :-

1. THE PROCESS VARIABLE POINTER COLOR WILL BE CHANGED FROM "RED TO BLACK" BY I/C DEPT. DUE TO H.F. REQUIREMENTS.

2. MANUAL OPERATION LEVER SLOT WIDTH WILL BE REDUCED BY I/C DEPT TO AVOID THE POSSIBILITY OF OVERSHOOTING OF THE PROCESS VARIABLE.



Name plate

Fail lamp (red)

Alarm lamp (yellow)

Process variable pointer (red)
(MOVING COIL INDICATOR - SEE NOTE 1)

Setpoint index (blue)
press switches

Setpoint UP/DOWN

Mode transfer switches
M = MANUAL, A = AUTO, C = CASCADE OR COMPUTER

Output indicator

Output index

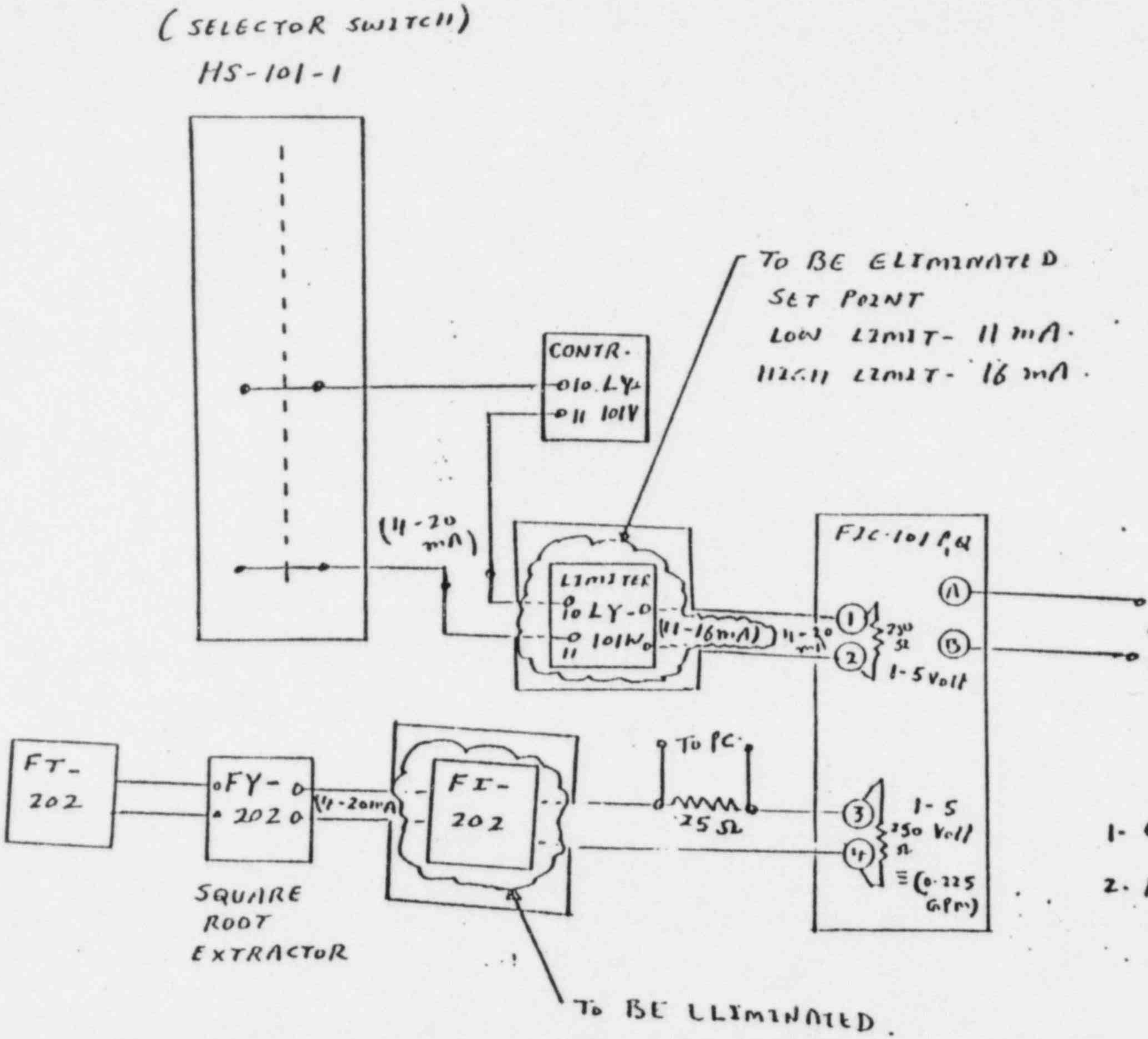
Manual OPERATION LEVER
SPRING RETURN TO CENTER
(SEE NOTE-2)

Valve action display
(C = CLOSE O = OPEN)

SKETCH # 4, EDCR # 85-12

EDCR- 85-12

SKETCH # 5 - INTER CONNECTION DIAGRAM



1- CONTROL FUNCTION - WITH LEVEL SIGN ONLY.

2. PROCESS VARIABLE - WITH FLOW SIGNAL (ONLY FOR INDICATION AND NOT FOR CONTROL FUNCTION)

NORMAL FLOW - 80 GPM

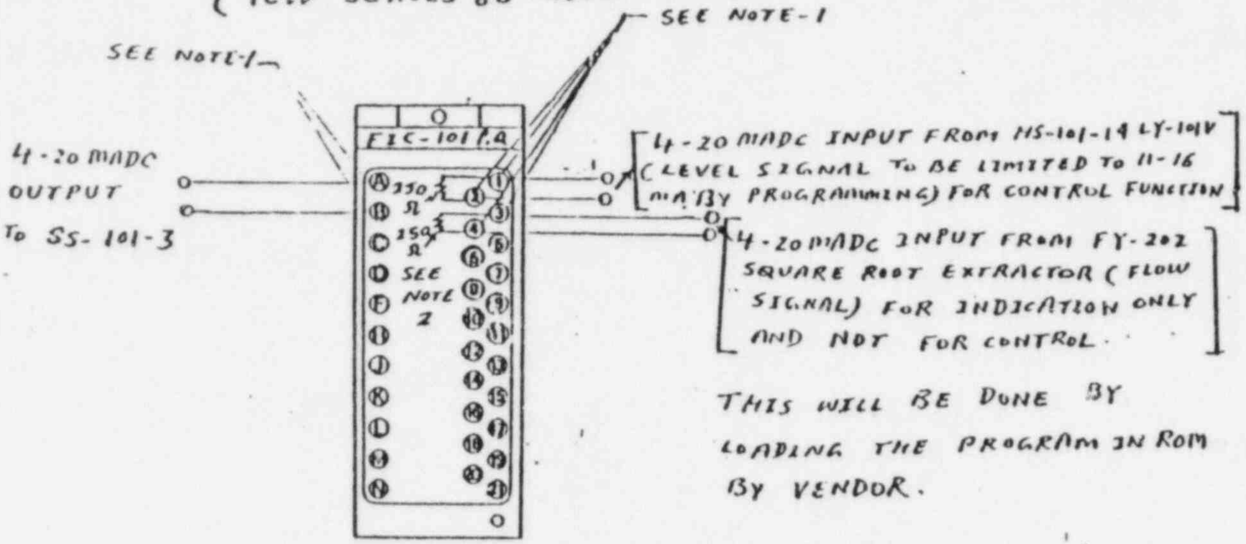
MAX FLOW - 200 GPM.

SKETCH #6

EDCR 85-12

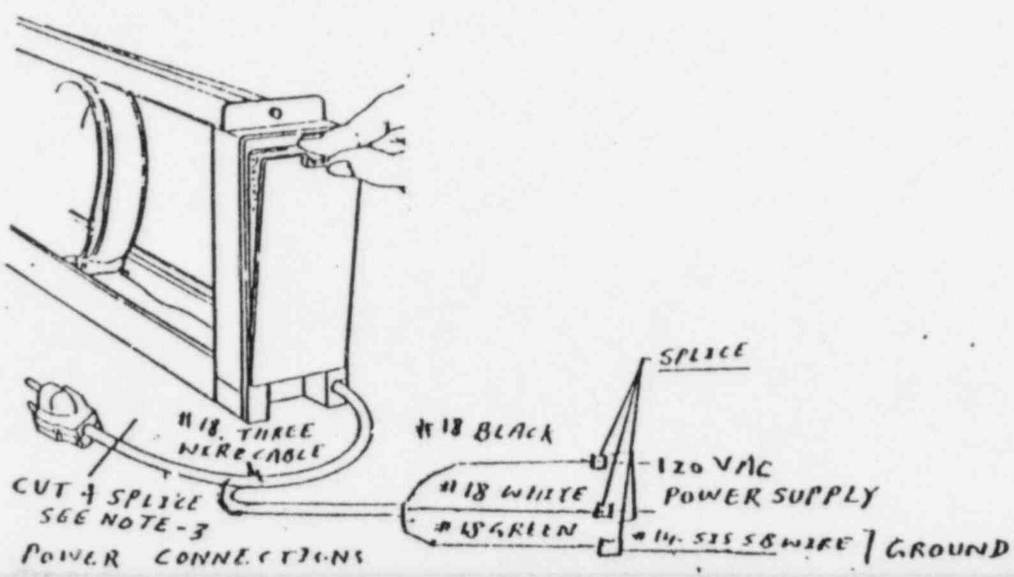
FIC-101 P.Q

(YEW SERIES 80 MODULE SLPC)



THIS WILL BE DONE BY LOADING THE PROGRAM IN ROM BY VENDOR.

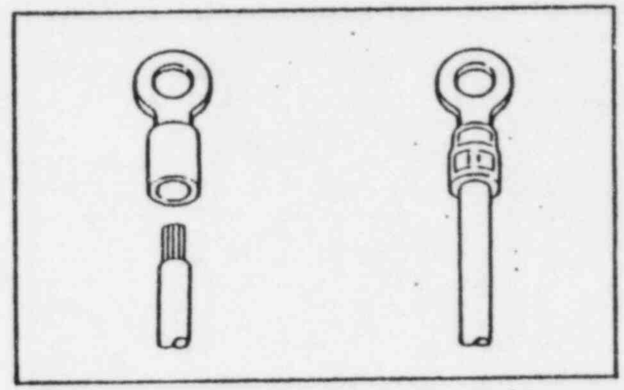
CONTROL SIGNAL CONNECTIONS



POWER CONNECTIONS

NOTES :-

1. Install round crimp-on solderless lugs on each end of the wires to be connected to the instrument terminal board. (Use 4 mm screws.)



. Solderless Crimp-On Terminal Lugs.

2. GET TWO 250 Ω PRECISION RESISTORS FROM STORES AND CONNECT BETWEEN THE INSTRUMENT TERMINAL BOARD TERMINALS 1-2 AND 3-4- AS INPUTS ARE 4-20 MADC.

3. SPLICE THE CABLE BY USING RAYCHEM CORP HEAT SHRINKABLE INSULATING AND SEALING TUBING "WCSF-70" FROM STORES AND CONNECT THE BLACK AND WHITE WIRES TO THE WIRES PREVIOUSLY CONNECTED TO HIC-101 (REFER FE-3. CONNECT A SUITABLE LENGTH OF #14 WIRE TO GREEN WIRE AND CONNECT TO GROUND BUS.

10 CFR 50.59 Safety Evaluation

Document Title: IMPROVE CVCS/LOOP PANEL LAYOUT Date ____

Procedure ☐ EDCR ☒ Test/Experiment ☐ Document No. 85-12 Rev No. 0

(1) Does this action violate any technical Specifications? Explain briefly: No Functional changes occur due to this EDCR

☐ Yes: this action must be revised to comply with Tech. Specs. or approved by the NRC in order to be implemented

☑ No: continue.

(2) Does this action require an unreviewed safety question determination? i.e., Does this action involve a change to a system or structure described in the FSAR and, important to nuclear safety, or a procedure as described by the FSAR; or is it an abnormal test/experiment not described by the FSAR?*

Explain briefly: yes Figure 9.1-1 has been modified to combine HIC 101 and FI-202 into FIC-101P,Q

☑ Yes: continue. *See paragraph 4.4

☐ No: the document may be approved. Go to (8).

Unreviewed Safety Question Determination

(3) List any accidents specified in Chapter 14 of the FSAR and the Safety Analysis Review Section of the current Core Performance Analysis which could be affected by this action.

None

Could this action increse the probability that any of these accidents may occur? Yes ☐ No ☑

Could this action increase the consequences of any of these accidents? Yes ☐ No ☑

Does this action create the possibility of an accident not bounded by those specified in the FSAR and the Core Performance Analysis? Yes ☐ No ☑

Explain briefly: No Functional change has occurred

(4) Could this action increase the probability that any malfunctions of equipment important to Nuclear Safety may occur? Yes ☐ No ☑

If so list. Separation Criteria and class 1E parts retain the availability of class 1E equipment

Could this action increase the consequences of any malfunctions of equipment important to Nuclear Safety? Yes ☐ No ☑

Explain briefly: No Functional change has occurred

Does this action create the possibility of a malfunction not anticipated in the accidents specified in the FSAR and the Core Performance Analysis? Yes ☐ No ☑

Explain briefly: No Functional changes has occurred

(5) Could this action reduce the margin of safety defined in the basis of any Technical Specification (Section 1-4)? Yes ☐ No ☑

NOTE: "Margin of Safety" implies a margin between an operating limit and a known safe condition.

Explain briefly: No Effect to Tech. Spec.

(6) If any of the questions in the Unreviewed Safety Question Determination are answered yes, the proposed action is and unreviewed safety question and NRC approval is required prior to its implementation, or it must be withdrawn.

(7) If all of the questions in the Unreviewed Safety Question Determination are answered no, the proposed action is not an unreviewed safety question and may be approved. Go to (8).

(8) The proposed action does not involve a violation of Technical Specifications or an unreviewed safety question and may be implemented without prior NRC approval in accordance with 10 CFR 50.59.

Does this safety evaluation render any FSAR wording incorrect or obsolete? Yes ☑ No ☐

If yes, send a copy to the Licensing Department so the FSAR can be updated. Briefly explain the wording discrepancy: FIG 9.1-1 FI-202 CHANGED TO FIC-101P,Q

[signature] /PED

Originator Department

(9) Forward the safety evaluation attached to the applicable document package to the PORC Secretary for distribution. The NSEG will verify the safety evaluation during the review period.

NSEG review - Satisfactory.

Nuclear Safety Engineer

APPENDICIES

APPENDIX A.

MY-0-73-85

OPERATIONS DEPARTMENT REVISION REQUEST

PROCEDURE TITLE: Steam Generator Tube Rupture

PROCEDURE NO.: 2-70-3 REV. NO.: 6

PROCEDURE STEPS AFFECTED Complete Procedure Revision

DATE REQUIRED:

1. As soon As Possible
2. As Soon As Practical
3. Other

PROCEDURE REVIEWED:

YES NO

(circle one)

REASON FOR CHANGE: To implement industry experience in SGTR events. Change precipitated by INPO SOER 83-2.

Major Procedure Rewrite

Strategy defines Procedure Steps to:

- Enter from 2-70-0, 2-70-1, AOP 2-25
- RCP trip restart criteria per YAEC Study #1484
- Identify & isolate faulted S.G.
- Cooldown to 490°F
- Addresses 1. overfill of S.G.
  2. RX head voiding
  3. strategy for cooldown
- Long term alignment
- Diagnosis chart

HED's addressed by the rewrite of this procedure are:

HED # 51, 53, 54, 68, 73, 76, 81, 86, 88

ORIGINATOR RE Larmault 6/11/85

PSS

SOS

DATE/TIME

COMMENTS:

STEAM GENERATOR TUBE RUPTURE

1.0 ENTRY CONDITONS

1.1 Steam Generator Tube Rupture with a leak rate large enough to require initiation of procedure 2-70-0, Emergency Shutdown from Power:

- uncontrollably decreasing pressurizer pressure or level

  OR

- high radiation alarms from main steam lines or air ejector

1.2 Steam generator leak identified by AOP 2-25 High Radiation Levels.

2.0 OPERATOR ACTIONS

2.1 Enable all Th and Tc stop valves:

- remove white tags
- close disconnect switches
- close breakers
- open loop bypass valves

2.2 Throttle HPSI to maintain approximately 50°F subcooling.

2.3 Identify faulty SG:

- high radiation in main steam line
- high activity from sample
- high SG level or reduced feed flow
- steam flow/feed flow mismatch

CAUTION

DO NOT ISOLATE 3 LOOPS AT A TIME

2.4 Isolate faulty SG (when identified):

- close associated interconnecting fill valves
- secure associated RCP
- close associated Th and Tc stop valves
- check closed associated loop drain valves
- stop seal water injection to associated RCP
- stop feedwater to faulted SG
- close associated "stop check" valve (MS-59, 79, or 99)
- check closed associated blowdown valve

2.5 Establish 100°F/hour RCS cooldown using intact SG's: (refer to procedure 1-7, Plant Cooldown)

- steam dump/turbine bypass system (PREFERRED)

  OR

  atmospheric dump valve (UNCONTROLLED RELEASE)

2.6 If Th or Tc stop valves closed or if RCS pressure less than 985 psig close EFCV or NRV in affected steam line.

2.7 If all criteria below are met, terminate SIAS using procedure 2-70-1, section 3.0 "Unjustified SIAS":

- RCS subcooling at least 50°F
- PZR level at least 50%
- one SG level at least 150" WR
- Safety injection no longer required to maintain either pressurizer pressure or level.

2.8 If at any time the criteria of step 2.7 cannot be maintained, restart HPSI.

NOTE

RAPID DEPRESSURIZATION WILL PROBABLY CAUSE A STEAM BUBBLE TO FORM UNDER THE REACTOR VESSEL HEAD

NOTE

IN CASE OF CONFLICT BETWEEN STEPS 2.5 AND 2.9, STEP 2.9 HAS PRIORITY

2.9 Maintain RCS pressure 20 psig greater than faulty SG.

2.10 Cooldown to RHR entry conditions.

2.11 Maintain faulty SG level:

- align blowdown tank to waste treatment
- periodically drain via blowdown header
- refer to FM-87B

2.12 Conduct radiation surveys throughout the plant.

Dept. Mgr.________ PORC______________

Proc. No. EOP 2-70-3
Class. A
Rev. No. 6
Issue Date
Review Date

EOP 2-70-3 STEAM GENERATOR TUBE RUPTURE

DRAFT

1.0 ENTRY CONDITIONS

EOP 2-70-1, "Safety Injection".

AOP 2-10, "Loss of Pressure Control/RCS Leak

1.2 Plant conditions indicate that a steam generator tube rupture has occured. Any one, or more, of the following may be present:

1.2.1 RMS air ejector high activity alarm.

1.2.2 Steam flow/feed mismatch.

1.2.3 Increased charging flow, decreased letdown flow.

1.2.4 RMS steam generator blowdown high activity alarm.

1.2.5 Decreasing pressurizer pressure.

1.2.6 Main steam line monitor activity alarm.

1.2.7 Increasing steam generator level.

1.2.8 High activity in steam generator liquid sample.

2.0 OPERATOR ACTIONS

2.1 Confirm the diagnosis of a steam generator tube rupture by:

* 2.1.1 Refer to the Break Identification Chart Figure 1.1.

* 2.1.2 Sample all steam generators for gross activity.

2.2 If SIAS is actuated, RCP operation is permitted if the following conditions are met with a Steam Generator Tube Rupture.

2.2.1 RCS Subcooling greater than 25°F

2.2.2 RCP Vibration less than 25 Mils

2.2.3 RCP Ampmeter Oscillation not excessive (less than 100 amps).

2.2.4 CIS not actuated

*Continuous Step

* 2.3 If RCS pressure is less than 1,300 psia with SIAS, trip two of three RCP's.

* 2.3.1 Trip the RCP in the ruptured loop.

* 2.3.2 Trip a second RCP.

2.3.2.1 RCP #1 spray control valve PR-A-1.

2.3.2.2 RCP #2 spray control valve PR-A-2.

2.3.2.3 RCP #3 no spray function.

* 2.4 Monitor the running RCP for VIBRATION & AMPMETER fluctuation.

2.5 If RCS subcooling is less than 25°F then trip the running RCP.

2.6 Verify that the RCS hot leg temperature is less than 525°F to prevent lifting S.G. safeties after isolating a S.G.

R 2.7 Depressurize the RCS within the limits of MPT while cooling down the RCS.

2.8 If the RCS hot leg temperature is greater than 525°F, cool down the RCS to 525°F by,

---

CAUTION

If safety injection is operating, as RCS pressure decreases Primary to Secondary leak rate will decrease and HPSI flow will increase

---

2.8.1 Preferred Method:

Main steam dump system to the main condenser. Take manual control of the steam dump system and rapidly cooldown at a rate not to exceed 100°F/hr.

or

CAUTION

(1) To minimize the unmonitored release of radio activity, use of the atmospheric steam dump valve with the ruptured S/G should be minimized.

(2) MS-A-162 is unavailable if SIAS is actuated.

2.8.2 Alternate Method:

If the condenser or steam dump system is not available, commence cooldown to 525°F using the atmospheric dump valve.

* 2.8.2.1 If SIAS has actuated - Boration is from the RWST.

R * 2.8.2.2 If SIAS - not actuated, Borate RCS per TDB Curve prior to decreasing RCS temperature to less than 500°F.

R 2.8.2.3 Continue RCS cool down to less than 490°F while performing Step 2.9 and boration.

2.9 Determine which steam generator has the tube rupture:

2.9.1 Monitor main steam piping for activity;

2.9.1.1 Locally, with a portable detector at main steam lines.

2.9.1.2 Control Room steam line radiation monitors.

2.9.2 Evaluate S/G sample results taken previously.

2.9.3 Monitor RMS for S/G Blowdown activity indication.

2.9.4 Steam Generator steam flow/feed flow mismatch.

2.10 Isolate the Steam Generator with higher activity, higher radiation levels or increasing water levels. Reference Appendix "A" Isolation of a Ruptured Steam Generator".

2.11 Verify the correct S/G is isolated by checking radiation indications, and steam generator levels increases in the ruptured steam generator.

2.12 If the wrong steam generator has been isolated, then unisolate that steam generator and repeat step 2.9 of this procedure.

* 2.13 Continue plant cooldown to less than 490°F with the steam dump system, in the Plant Cooldown Mode.

NOTE

RCP start selection should provide spray flow for RCS Pressure Control

RCP #1 = Spray Control Valve PR-A-1
RCP #2 = Spray Control Valve PR-A-2
RCP #3 = No Spray Function

---

*Continuous Step

2.14 If all RCPs were stopped, then the RCP's in the intact loops should be restarted. Determine whether RCP restart criteria are met by the following:

2.14.1 The RCS is at least 25°F subcooled. Reference subcooling margin monitor on MCB.

2.14.2 Containment Isolation Signal not actuated. CIS only lite box not lit.

2.14.3 RCP not faulted.

2.14.4 RCP loop isolation valves open.

2.14.5 RCP - oil pumps running "In Auto".

2.14.6 PCC system in operating (No Lo Flow Alarm).

2.14.7 RCP seal injection (5) five GPM greater than return flow.

2.14.8 PR-A-1 & 2 spray valves closed.

2.15 If RCP restart criteria are met, and;

Cold Leg Isolation - Open

Hot Leg Isolation - Open

Bypass Isolation - Open

2.15.1 Start a RCP.

2.15.2 Ensure proper RCP operation by monitoring subcooling, RCP AMPERAGE and pump VIBRATION.

2.16 Monitor pressurizer level for decrease due to loop shrinkage.

* 2.17 If Safety Injection is operating, then it should be throttled as necessary to maintain 25°F - 50°F subcooling.

2.18 If the Safety Injection termination criteria are met and the isolated steam generator is still overfilling with primary fluid, then throttle the running HPSI pumps.

*Continuous Step

R 2.19 Depressurize and Control RCS pressure to within 5-10 psid of the ruptured S.G. pressure. Minimum RCS/SG Delta-P will minimize tube rupture leakage.

NOTE

Throughout the event, including cooldown, maintain the RCS within acceptable Pressure/Temperature Limits of MPT by the following methods of RCS depressurization:

2.19.1 Preferred Method

- RCP(s) Running - Pressurizer Spray Valves - PR-A-1 or 2
- Throttling HPSI via HSI-M-41 or HSI-M-42

2.19.2 Alternate Method

- Auxiliary Pressurizer Spray operate slowly over a few minutes to minimize thermal shock to the spray nozzle - NO SIAS

CAUTION

Monitor quench tank parameters for pressure and temperature Quench Tank Rupture Disc ruptures 100 psig.

If PORV's are used to depressurize the RCS, with RCP's off, reactor vessel upper head voiding may occur due to insufficient head cooling.

- PORV Operation to Quench Tank (operate one at a time).

2.20 Resume primary plant cooldown per OP 1-7 forced circulation (preferred) or natural circulation. Cooldown should not exceed 100°F/hr.

2.21 Maintain ruptured steam generator level between 45% and 70% via auxiliary feed or draining per Appendix "B".

* 2.22 Sample the condensate and other connecting systems, including turbine building sumps, for radioactivity.

* 2.23 Observe the Service Building and PAB ventilation systems' radiation monitors and any other applicable monitors. Take corrective actions, per - AOP-2-25.

* 2.24 Monitor the condensate inventory during the cooldown, to ensure adequate supply is available.

CAUTION

RCP'S SHALL NOT BE RUN IN THE SOLID WATER CONDITION.

Solid water operation of the pressurizer should be avoided unless 25°F of subcooling cannot be maintained in the RCS. If the RCS is solid, closely monitor any makeup or draining of any system, heatup or cooldown, to avoid any rapid pressure changes.

---

* 2.25 Maintain pressurizer level in the indicating range, with 30% to 50% unless it is necessary to go solid to restore RCS subcooling by;

2.25.1 Control charging and letdown,

or

2.25.2 Operating and/or throttling of Safety Injections.

2.26 Continue plant cooldown per OP 1-7 and observe the limits of MPT.

* 2.27 Cooldown RCS to RHR Entry Conditions

2.27.1 The ruptured S/G has been identified & isolated.

R 2.27.2 Depressurize and Control RCS pressure to within 5-10 psid of the ruptured S.G. pressure. Minimum RCS/SG Delta-P will minimize tube rupture leakage.

2.27.3 Safety Injection should be throttled to maintain subcooling.

<u>or</u>

2.27.4 CVCS be aligned for operation with a boration path available and Pressurizer Pressure & Level Control being maintained.

2.27.5 RCP(s) running to provide pressurizer spray and mixing of the RCS.

* 2.28 Ruptured S/G level is being maintained between 45% & 70% via auxiliary feed or draining per Appendix "B".

2.29 <u>DEPRESSURIZATION OF RCS TO RHR ENTRY CONDITIONS</u>

<u>CAUTION</u>

The RCS is coupled to the secondary side of the Steam Generator via the tube rupture. <u>RCS depressurization must follow not lead</u>, the S.G. depressurization, or the Steam Generator will act as a pressurizer.

2.30 Cooldown the ruputred steam generator per/Appendix "B".

<u>NOTE</u>

Observe the limits of MPT during the complete cooldown process.

2.31 Reduce RCS pressure at a rate not to exceed the depressurization of the ruptured S/G pressure. Always maintaining 25°F subcooling.

2.31.1 Maintain pressure in the RCS greater than S/G pressure during the cooldown.

2.32 <u>COOLDOWN TO COLD SHUTDOWN</u>

2.32.1 Place RHR in service per OP 1-13-1 and continue plant cooldown.

2.32.2 Maintain a RCP in operation to permit mixing and cooling under the Rx head to prevent voiding.

2.32.3 Continue S/G cooldown and depressurization per Appendix "B".

CAUTION

Should Steps 2.29 thru 2.31 fail to depressurize the RCS, then a void should be suspected.

2.33 Request Technical Support Center to evaluate the isolated steam generator data, request permission to isolate the loop at this time with the loop isolation valves.

2.34 The following are indications of void formations;

- Letdown flow greater than charging flow.
- Pressurizer level increasing significantly greater than expected while operating pressurizer spray.
- Rx head RTD temperature indication increasing.

2.35 If evidence of voiding continues, request the Technical Support Center personnel to evaluate venting of the pressurizer and/or the reactor vessel head, to remove non-condensible gases. Monitor pressurizer level to trend RCS inventory.

2.36 If necessary, a natural circulation cooldown is performed by the steps in Op 1-7 plant cooldown.

2.37 Plant Cooldown Procedure OP 1-7 provides the necessary steps to ensure the RCS is cooled down within administrative limits.

3.0 FINAL CONDITIONS

Operators should ensure the following concerns have been addressed to preclude exceeding operating limits.

3.1 Critical Safety Functions are satisfied.

3.2 The cooldown is within the limits of MPT Curve.

3.3 OP 1-7 & 1-13-1 are being adhered to to ensure LTOP Limits are addressed.

3.4 Reactor Head voiding is minimized.

3.5 Overfilling of the ruptured steam generator is being addressed by the use of Appendix B draining via blowdown and throttling of safety injection or CVCS normal operation.

3.6 Health Physics personnel are monitoring Secondry Plant Equipment for contamination.

3.7 Technical Support Center Personnel are evaluating plant conditions and are developing Contingency Plans as necessary to ensure the plant is cooled down. Repairs are being addressed in the form of contingency plans to address the potential contamination of the secondary plant.

3.8 Technical Support Center personnel are evaluating the options available to use the loop stop valves for isolation.

APPENDIX A

Isolating Ruptured Steam Generator (Select one)

	S/G #1	S/G #2	S/G #3
--Trip the RCP in the Faulted Loop	RCP #1	RCP #2	RCP #3
--Close RCP Seal Leakoff Return MOV	SL-M-29	SL-M-40	SL-M-51
--Close the Main Feed Water Valves:			
MFWRV'S,	FW-F-107	FW-F-207	FW-F-307
MFWRV-BP	FW-A-112	FW-A-212	FW-A-312
MOV Isolation	FW-M-104	FW-M-204	FW-M-304
--Close the Auxiliary Feed Isolation Valves			
AFWRV	AF-W-A-101	AF-W-A-201	AF-W-A-301
AFWRV	AF-W-A-338	AF-W-A-339	AF-W-A-340
--Close the Main Steam Non Return Valve	MS-M-10	MS-M-20	MS-M-30
--Close Main Steam NRV B/P Valves	MS-50	MS-70	MS-90
--Close EFCV	MS-11	MS-22	MS-33
--Close the Ruptured S/G Non Return Stop Check Valve (knocker valve) to the atmospheric Decay HeatRelease Header	MS-59	MS-79	MS-99
--Close Main Steam Line Trap Drains Root Stops	MS-49	MS-69	MS-89
--Close the S/G Blowdown Valves BD -	BD-T-12	BD-T-22	BD-T-32
BD -	BD-T-141	BD-T-143	BD-T-145
--Verify S/G Drains Closed. (PAB)	BD-59	BD-59	BD-59

NOTE

If S.G. Blowdown is aligned to Primary
Vent Stack isolate or redirect to condenser.

APPENDIX B

Cooldown of a Ruptured Steam Generator via Blowdown

1.0 INITIAL CONDITIONS

1.1 Chemistry has sampled the ruptured S/G and has issued a Release Permit if blowdown fluid is to be released directly to the service water over board.

1.2 Operation Department Personnel, if possible, should confer with the Technical Support Center to determine if alternative methods of cooling the S/G are to be used.

Alternative Methods

- Ruptured S/G Cooldown via Backfill
- Ruptured S/G Cooldown via the Main Condenser or Atmosphere
- Use of Loop Stop Valves

1.3 Containment Isolation not actuated.

2.0 PROCEDURE

2.1 Two methods of draining are available:

2.1.1 Draining via the S/G blowdown system which provides cooling and prevents flashing prior to release:

or

2.1.2 Draining via the manual drain system to containment sump which does not provide cooling and requires personnel to enter containment for manual valve operation.

2.2 Alignment of the Ruptured S/G to the Blowdown Tank

2.2.1 Select the faulted S/G to be drained and align as indicated.

	VALVE	S/G #1	S/G #2	S/G #3
2.2.2	At ESF Panel open Containment Isolation Valve	BD-T-141 BD-T-142	BD-T-143 BD-T-144	BD-T-145 BD-T-146
2.2.3	At ESF Panel open Containment Isolation Valve	BD-T-12	BD-T-22	BD-T-32

2.2.4 Align PCC to E-100 S/G Blowdown cooler inlet PCC-457 Open
outlet PCC-451 Open
TCV Operable

2.2.5 Align blowdown tank effluent to E-100 Blowdown Cooler

- Open BD-80 Blowdown Cooler Inlet Isolation Valve
- Open BD-82 Blowdown Cooler Loop Seal Bypass Valve
- Close BD-87 Inlet to B.D. Demin.

2.2.6 Align for the selected drain mode.

2.2.6.1 To drain to Aerated Drain Header, Ref. 1-19-5, Section 4.0.

OR

2.2.6.2 To drain to Service Water Outlet or ADT's via test tank pumps, Ref. 1-19-5, Section 4.0.

OR

2.2.6.3 To drain to Yard Storm Sewer Unmonitored — Close BD-42, Open BD-65

2.2.7 Open the inlet to the blowdown tank for the faulted S/G.

	S/G #1	S/G #2	S/G #3
Open	BD-66	BD-67	BD-68
Open	BD-S-1	BD-S-2	BD-S-3

R 2.3 Maintain communications with the control room operator and position the selected BD Valves to the position necessary to allow the Rx Operator to maintain RCS pressure greater than S/G pressure to minimize leakage of the RCS into the ruptured S.G.

2.4 Continue in this mode until the S/G is cooled and depressurized.

NOTE

Transfer the contents of ADT's to BWST's when level in one (1) ADT exceeds 4000 gallons.

2.5 Should additional draining of the Ruptured Steam Generator be necessary align the S/G Manual Drain System when the RCS is less than 210ºF.

2.5.1 Reference OP 1-19-5 Steam Generator Blowdown via Test Tank Pumps for alignments.

2.6 During this mode of operations (which is very slow)(ensure the S/G Level is maintained between 45% & 70% level indicated.

2.7 Maintain communications with control room and containment personnel. Continue the cooldown and depressurization of the RCS per OP 1-7 and continue the depressurization of the faulted S/G via this method.

3.0 FINAL CONDITIONS

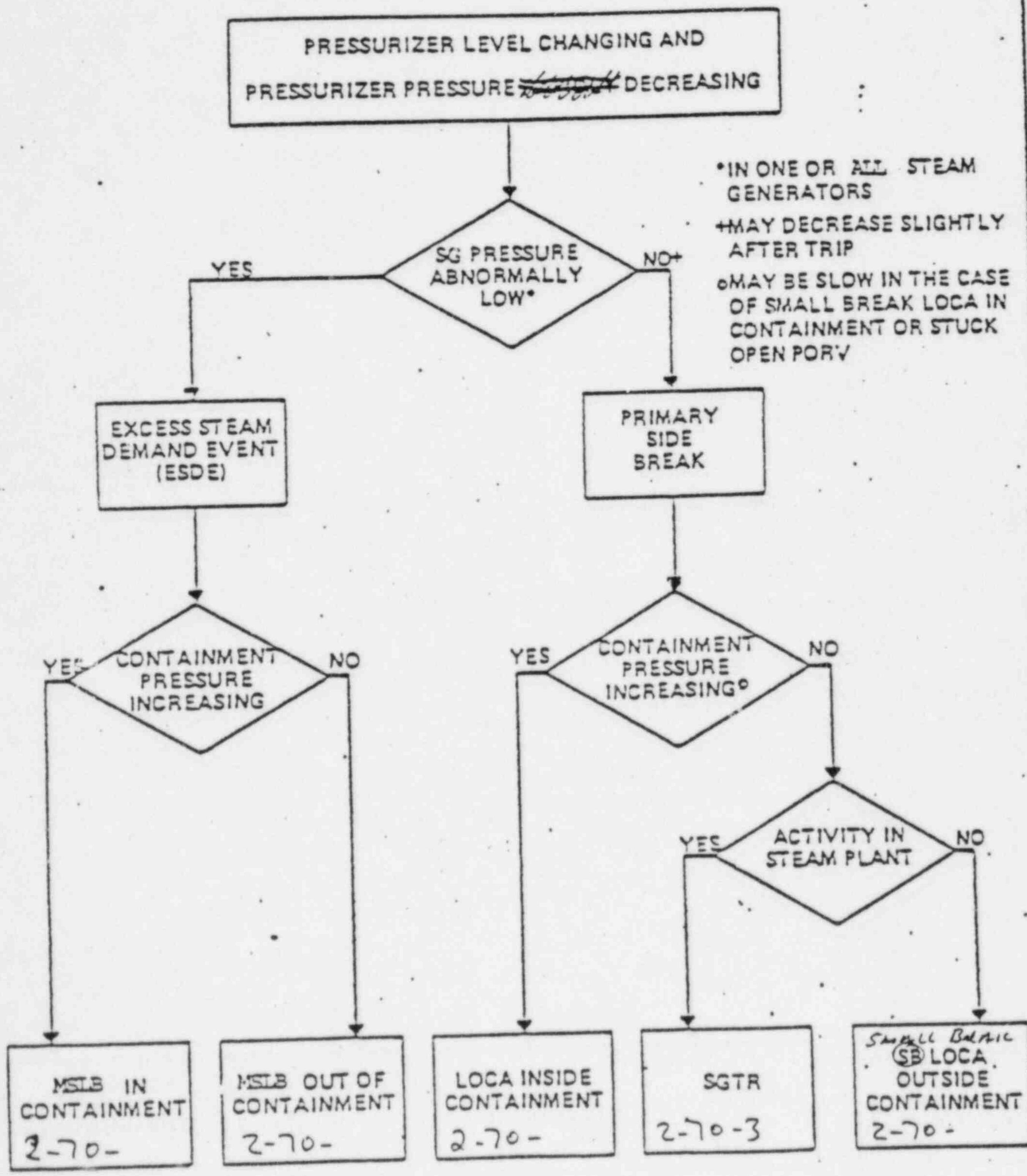
The primary plant is being depressurized per OP 1-7 and RHR per OP 1-13-1. The ruptured S/G is being depressurized per this method.

Technical Support Center personnel are devising Contingency Action Plans to initiate Secondary plant cleanup and repairs as necessary.

Operations personnel are monitoring the plant cooldown and depressurization and making preparations to close the loop stop valves for S/G isolation draining and repairs.

BREAK IDENTIFICATION CHART

FIGURE 1.1



Dept. Head REA
Plt. Mgr. [illegible]
PORC [illegible] 2/2/84
MOO [illegible]

Proc. No. EOP 2-70-3
Class A
Rev. No. 5
Issue Date 2-2-84
Review Date 2/86

EOP 2-70-3 STEAM GENERATOR TUBE RUPTURE

1.0 ENTRY CONDITONS

1.1 Steam Generator Tube Rupture with a leak rate large enough to require initiation of procedure 2-70-0, Emergency Shutdown from Power:

- uncontrollably decreasing pressurizer pressure or level

OR

- high radiation alarms from main steam lines or air ejector

1.2 Steam generator leak identified by AOP 2-25 High Radiation Levels.

2.0 OPERATOR ACTIONS

2.1 Enable all Th and Tc stop valves:

- remove white tags
- close disconnect switches
- close breakers
- open loop bypass valves

2.2 Throttle HPSI to maintain approximately 50°F subcooling.

2.3 Identify faulty SG:

- high radiation in main steam line
- high activity from sample
- high SG level or reduced feed flow
- steam flow/feed flow mismatch

CAUTION

DO NOT ISOLATE 3 LOOPS AT A TIME

2.4 Isolate faulty SG (when identified):

- close associated interconnecting fill valves
- secure associated RCP
- close associated Th and Tc stop valves
- check closed associated loop drain valves
- stop seal water injection to associated RCP
- stop feedwater to faulted SG
- close associated "stop check" valve (MS-59, 79, or 99)
- check closed associated blowdown valve

PCR #84-639

2.5 Establish 100°F/hour RCS cooldown using intact SG's and reduce RCS pressure to maintain 50°F subcooled to minimize the RCS leak rate (refer to procedure 1-7, Plant Cooldown)

- steam dump/turbine bypass system (PREFERRED)

  OR

  atmospheric dump valve (UNCONTROLLED RELEASE)

R 2.6 If Th and Tc stop valves closed or if RCS pressure less than 985 psig close EFCV or NRV in affected steam line.

2.7 If all criteria below are met, terminate SIAS using procedure 2-70-1, section 3.0 "Unjustified SIAS":

- RCS subcooling at least 50°F
- PZR level at least 50%
- one SG level at least 150" WR
- Safety injection no longer required to maintain either pressurizer pressure or level.

2.8 If at any time the criteria of step 2.7 cannot be maintained, restart HPSI.

NOTE

RAPID DEPRESSURIZATION WILL PROBABLY CAUSE A STEAM BUBBLE TO FORM UNDER THE REACTOR VESSEL HEAD

NOTE

IN CASE OF CONFLICT BETWEEN STEPS 2.5 AND 2.9, STEP 2.9 HAS PRIORITY

2.9 Maintain RCS pressure 20 psig greater than faulty SG.

2.10 Cooldown to RHR entry conditions.

2.11 Maintain faulty SG level:

- align blowdown tank to waste treatment
- periodically drain via blowdown header
- refer to FM-87B

2.12 Conduct radiation surveys throughout the plant.

From ANI in their review of our S/G tube rupture proc.

SGTR
ANI - CONCERNS

Attachment I

SYMPTOMS

1. Decreasing pressurizer pressure.
2. Decreasing pressurizer water level.
3. Radiation monitor alarms.
4. Steam flow/feed flow mismatch.
5. Increasing S/G water level.
6. Increasing S/G pressure.

IDENTIFICATION

7. An unexpected rise in one S/G water level with feedwater flow reduced or stopped.
8. High radiation alarms from affected S/G.
9. High activity from any one S/G, as determined by analysis of a sample.
10. Higher than normal S/G pressure.

NC 11. Are R.C.P.'s restarted.?

NC 12. Is there a caution or note on void formation while in natural circulation.

13. Do they have an atmospheric steam relief valve.
14. Is the atmospheric steam relief utilized for a S/G tube rupture.

NC 15. Is the atmospheric steam relief valve isolated on the affected S/G.

16. Is removal of decay heat & cooldown addressed in Emergency Procedure.
17. Is the reduction of primary system pressure addressed.

NC 18. Is there a caution or note on maximum Δt across pressurizer spray nozzle.

NC 19. Is guidance provided for controlling SI flow.

NC 20. Is there a caution or note addressing diluting the primary system from the affected S/G.

NC 21. Are fission gases in the affected S/G addressed.

22. Is sub-cooled margin addressed in the procedure.

Attachment

Facility	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	Remarks
Arkansas	X	X	X	-	X	-	X	X	-	X	Yes	No	--	--	--	No	No	No	No	No	No	Yes	
Beaver Valley	Dif. Proced.						X	X	X	-	Yes	No	Yes	Yes	Yes	Yes	Yes	No	Yes	No	No	Yes	
Callaway																							
Calvert Cliffs	X	X	X	-	-	-	X	-	-	-	No	No	Yes	Yes	Yes	Yes	Yes	No	No	No	No	Yes	
Comanche Peak																							
Ct. Yankee	X	X	X	X	X	-	X	X	X	-	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	No	Yes	
D.C. Cook	X	X	X	X	X	-	X	-	X	-	Yes	No	Yes	Yes	No	Yes	Yes	No	Yes	Yes	No	Yes	
Crystal River	X	X	X	-	-	-	-	X	-	-	Yes	No	No	--	--	Yes	Yes	No	Yes	No	No	Yes	
Diablo Canyon	symptoms in other proced.						X	X	X	-	Yes	No	Yes	Yes	Yes	Yes	Yes	No	Yes	No	No	Yes	
Farley	X	X	X	-	X	-	X	X	X	X	Yes	No	Yes	Yes	Yes	Yes	Yes	No	Yes	No	No	Yes	
Ft. Calhoun	X	X	X	X	X	X	see remarks				No	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	No	No	Yes	
Ginna																							
Indian Pt.2&3																							
Kewaunee	X	X	X	X	-	-	X	X	X	-	Yes	No	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	No	Yes	
Maine Yankee	X	X	X	X	-	-	X	X	X	-	No	No	Yes	Yes	No	Yes	Yes	No	No	No	No	Yes	
McGuire																							
Millstone	X	X	X	X	X	-	X	-	X	-	No	No	Yes	No	No	Yes	Yes	No	Yes	Yes	No	Yes	
North Anna	-	-	X	-	-	-	X	X	-	X	Yes	No	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	No	Yes	
Oconee	X	X	X	-	-	-	X	X	X	X	Yes	No	No	--	--	Yes	Yes	No	Yes	No	No	Yes	
Palisades	X	X	X	-	-	-	X	X	X	X	Yes	No	Yes	Yes	Yes	No	Yes	No	No	Yes	No	No	
Palo Verde	X	X	X	X	X	-	-	X	X	-	Yes	No	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	No	Yes	
Pt. Beach	X	X	X	X	X	X	X	X	X	X	Yes	No	Yes	Yes	No	Yes	Yes	No	Yes	No	No	Yes	
Prairie Island	X	X	X	X	-	-	X	-	X	-	No	No	Yes	Yes	No	Yes	Yes	No	Yes	Yes	No	Yes	
Rancho Seco																							
Robinson	X	X	X	X	X	X	X	X	X	X	Yes	Yes	Yes	Yes	No	Yes	Yes	No	Yes	Yes	No	Yes	
St. Lucie																							
Salem																							
San Onofre	X	X	X	X	X	-	X	X	X	-	Yes	Yes	Yes	Yes	No	Yes	Yes	No	Yes	Yes	No	Yes	
Sequoyah	symptoms in other proced.						X	X	X	-	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	No	Yes	
Summer	X	X	X	X	X	-	X	X	X	-	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	No	No	Yes	
Surry	X	X	X	-	-	-	X	X	[illegible]	-	Yes	Yes	Yes	Yes	No	Yes	Yes	No	Yes	No	No	Yes	
TMI 1	X	X	X	-	X	-	X	X	X	-	Yes	No	No	--	--	Yes	Yes	No	Yes	No	No	Yes	
Trojan	X	X	X	X	X	-	X	X	X	-	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	No	Yes	
Turkey Pt.	Dif. Proced.						X	X	X	-	Yes	No	Yes	Yes	No	Yes	Yes	No	Yes	No	No	Yes	
Waterford	X	X	X	-	-	-	X	X	X	-	No	No	Yes	Yes	No	Yes	Yes	No	Yes	Yes	No	Yes	
Watts Bar																							
Yankee Rowe	X	X	X	X	X	X	X	X	X	X	Yes	Yes	Yes	Yes	No	Yes	Yes	No	Yes	No	No	Yes	
Zion	X	X	X	X	X	-	X	X	X	-	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No	Yes	
Davis Besse	X	X	X	-	-	-	-	X	X	-	Yes	Yes	Yes	Yes	No	Yes	Yes	No	Yes	No	No	Yes	

Bases

1-5 Symptoms

The symptoms will be the first indication to the operator that he has a primary to secondary leak or a leak of some type in the primary system but will probably not be sufficient to determine exactly what his problem is.

6-10 Identification

These items will allow him to complete his diagnosis of the situation and should enable him to determine not only that he has a primary to secondary leak but identify the affected steam generator. The best identifier of a primary to secondary leak is a radiation alarm from the secondary system. This should occur early on in the transient. The more difficult part is to determine the affected steam generator. Differences between steam flow and feed flow to a given steam generator or a difference between level of steam generators is an indication but will not be a positive indication because of instrument error and the relatively small flow through the failed tube when compared to normal feedwater and steam flow. The best way to determine the affected steam generator is by a radiation reading. Ginna identified the affected steam generator by using a hand held instrument to compare the radiation levels of the two steam lines.

11 Restart of Reactor Coolant Pumps

All facilities are still required to stop the reactor coolant pumps at some pressure between operating and the secondary safety valve relief pressure. There should be some criteria for restarting the pumps which is based on the pressure being under control and a certain subcooled margin.

12 Void Formation

If the reactor coolant pumps are stopped there will probably be a steam void formed in the reactor vessel head as was the case at Ginna. The procedure should warn of this in a caution or a note. A steam void in the reactor vessel head is not unexpected with the reactor coolant pumps secured nor does it present a severe problem if recognized by the operator and certain other criteria are met. The procedure should have acceptance criteria for void maintenance. These criteria should include a subcooled reactor coolant system and a verification of natural circulation flow. If these exist the void can be allowed to exist. If not, effort must be devoted to reducing or removing the void and regaining the subcooled margin.

13 Atomospheric Steam Relief Valve

The atmospheric steam relief valve is upstream of the MSIV and has a controllable setpoint on steam generator pressure. It also has an inline isolation valve. If the facility does not have one then the next two items are not applicable. For some reason B&W plants don't have such a valve. It may be of value to pursue the reason for this.

14 Utilization of Atmospheric Steam Relief Valve

The valve should be used on the unaffected steam generator if the secondary system is not available such as during a loss of offsite power in conjunction with the tube rupture.

Isolation of Atmospheric Steam Relief Valve

One purpose of this valve is to reduce the number of challenges to the safety valves. Therefore, its setpoint is slightly less than the setpoint of the lowest set safety valve. Some of the tube rupture procedures isolate this valve or render it inoperative on the affected side. This will allow pressure in the isolated affected steam generator to rise a few psi higher prior to a relief to the atmosphere. Thus it will give the operator a little more time to reduce primary system pressure. However, in the long run we feel it is better to leave the atmospheric relief valve in operation because it is isolable. In the event of several high pressure challenges the relief or safety valves will pass water which can cause them to stick open. Since the atmospheric relief valve has an in-line isolation valve, leakage through it can be stopped. The code safety valves do not have isolation valves. Failure of one of the safety valves will result in uncontrolled leakage to the atmosphere. This happened at Ginna and resulted in a small uncontrolled leak for about one hour. If primary system pressure cannot be reduced quickly enough to prevent over-pressurizing the steam generator, the blowdown system should be used to slow the steam generator pressure increase.

16 Removal of Decay Heat and Cooldown

490°F

In addition to removing decay heat, the primary system must be cooled down to allow for the reduction of pressure to less than the steam generator safety valve setpoint and maintain a specified subcoded margin. The amount of cooldown will be plant specific and should be specified in the procedure.

17 Reduction of Primary System Pressure

Pressure must be reduced to less than the steam generator safety valve setpoint. The preferable way to do this is by use of the normal pressurizer spray system. However, if the reactor coolant pumps are not running other means must be utilized. The preferable alternative is auxiliary spray with the PORV as the third choice. Pressure reduction must be coordinated with the reduction of safety

injection flow to maintain a relatively constant reactor coolant system inventory and equalize pressure across the ruptured tube.

18 Differential Temperature Limit on Auxiliary Spray

Most PWRs have a differential temperature limit between the auxiliary spray water and the pressurizer spray nozzle. This limit must be observed to limit thermal stress and prevent cracking or failure of the nozzle or associated piping.

19 Control of Safety Injection Flow

As mentioned earlier the safety injection flow must be reduced and eventually terminated as the reactor coolant system pressure is reduced to equal secondary pressure. However, if it is reduced prematurely heat removal capability could be jeopardized. Therefore, the operator needs guidance. As a minimum to reduce or terminate safety injection flow a steam generator must be available for removing heat, pressurizer level must be under control and the reactor coolant system must be subcooled by some minimum amount.

20 Dilution of Primary System

As the plant is cooled down there may be times when the reactor coolant system pressure is less than steam generator pressure. At such time secondary water will flow from the steam generator into the reactor coolant system and dilute the boron concentration. The procedure should include a caution note to this affect.

21 Fission Gas in the Affected Steam Generator

Fission gas will be present in the reactor coolant which enters the affected steam generator through the leak. As the plant is depressurized, this gas will come out of solution and remain in the steam generator. There must be a provision for transferring this gas to the waste gas system. Temporary lines were run at Ginna for this purpose.

22 Sub Cooled Margin Monitor

Several of the paragraphs above make reference to this important indicator. It is crucial in determining the condition of the coolant. These instruments were installed in great haste following the TMI accident. You should check to assure the inputs to the monitor provide representative information and are of sufficiently wide range. For example, when the reactor coolant pumps are stopped a large differential temperature will exist. Th will be most representative of core temperature but it may not be the sole input to the monitor. Also the monitor may be located away from the operator with no remote readout. Take a hard look at the entire setup to assure the operator is provided with representative information without having to leave his primary station.

Dept. Head RCA
Plt. Mgr. [illegible]
PORC [illegible] 2/2/84
MOO [illegible]

Proc. No. EOP 2-70-3
Class A
Rev. No. 5
Issue Date 2-2-84
Review Date 2/86

EOP 2-70-3 STEAM GENERATOR TUBE RUPTURE

1.0 ENTRY CONDITONS

1.1 Steam Generator Tube Rupture with a leak rate large enough to require initiation of procedure 2-70-0, Emergency Shutdown from Power:

- uncontrollably decreasing pressurizer pressure or level

OR

- high radiation alarms from main steam lines or air ejector

1.2 Steam generator leak identified by AOP 2-25 High Radiation Levels.

2.0 OPERATOR ACTIONS

2.1 Enable all Th and Tc stop valves:

- remove white tags
- close disconnect switches
- close breakers
- open loop bypass valves

2.2 Throttle HPSI to maintain approximately 50°F subcooling.

2.3 Identify faulty SG:

- high radiation in main steam line
- high activity from sample
- high SG level or reduced feed flow
- steam flow/feed flow mismatch

CAUTION

DO NOT ISOLATE 3 LOOPS AT A TIME

2.4 Isolate faulty SG (when identified):

- close associated interconnecting fill valves
- secure associated RCP
- close associated Th and Tc stop valves
- check closed associated loop drain valves
- stop seal water injection to associated RCP
- stop feedwater to faulted SG
- close associated "stop check" valve (MS-59, 79, or 99)
- check closed associated blowdown valve

PCR #84-639

2.5 Establish 100°F/hour RCS cooldown using intact SG's and reduce RCS pressure to maintain 50°F subcooled to minimize the RCS leak rate (refer to procedure 1-7, Plant Cooldown)

- steam dump/turbine bypass system (PREFERRED)

  OR

  atmospheric dump valve (UNCONTROLLED RELEASE)

R 2.6 If Th and Tc stop valves closed or if RCS pressure less than 985 psig close EFCV or NRV in affected steam line.

2.7 If all criteria below are met, terminate SIAS using procedure 2-70-1, section 3.0 "Unjustified SIAS":

- RCS subcooling at least 50°F
- PZR level at least 50%
- one SG level at least 150" WR
- Safety injection no longer required to maintain either pressurizer pressure or level.

2.8 If at any time the criteria of step 2.7 cannot be maintained, restart HPSI.

NOTE

RAPID DEPRESSURIZATION WILL PROBABLY CAUSE A STEAM BUBBLE TO FORM UNDER THE REACTOR VESSEL HEAD

NOTE

IN CASE OF CONFLICT BETWEEN STEPS 2.5 AND 2.9, STEP 2.9 HAS PRIORITY

2.9 Maintain RCS pressure 20 psig greater than faulty SG.

2.10 Cooldown to RHR entry conditions.

2.11 Maintain faulty SG level:

- align blowdown tank to waste treatment
- periodically drain via blowdown header
- refer to FM-87B

2.12 Conduct radiation surveys throughout the plant.

APPENDIX B

MY-0-73-85

OPERATIONS DEPARTMENT REVISION REQUEST

PROCEDURE TITLE: Emergency Shutdown from Power

PROCEDURE NO.: 2-70-0 REV. NO.: 12

PROCEDURE STEPS AFFECTED Human Factors Review for CRDR

DATE REQUIRED:

1. As soon As Possible
2. As Soon As Practical
3. Other

PROCEDURE REVIEWED:

YES NO

(circle one)

REASON FOR CHANGE: Attachment - List the Human Engineering Dificiencies that were identified during the Control Room Design Review conducted by Tedd Gifford and John Senders, M/Y Human Factors consultant.

This Procedure Update, incorporates the following (HED'S).

HED - 620, 621, 622, 109

Additional procedure changes were made.

Step 4.2d - added kick out to 2-70-3 RMS ALarms for;

- S.G. blowdown Monitor
- An Ejection Monitor
- Steam Line Monitor

RCP Trip Study YAEC 1484

Step 5.0 note preceeding Step 5.0 Trip RCP's when RCS subcooling is < 25°F

Step 5.2(e) RCS Subcooling less than 25°F trip all RCP's

Step 6.1(i) Subcooling greater than or equal to 25°F

Step 9.0 changed STA to NSE (terminology)

Step 6.0 Heat removal - Step (6.0) PCR 84-58

Step 10.0 Step 10.5 PCR 84-590

Step 10.0 Step 10.7 PCR 84-325

ORIGINATOR R E Arsenault 6/11/85

PSS

SOS

DATE/TIME

COMMENTS:

8343N-REA

changes to be made
conditions initialy
deleted when typing con.

Dept. Head________
PORC________
MOO________

Proc. No. EOP 2-70-0
Class. A
Rev. No. 12
Issue Date________
Review Date________

DRAFT

EOP 2-70-0 EMERGENCY SHUTDOWN FROM POWER

1.0 ENTRY CONDITIONS

1.1 Automatic reactor trip due to a RPS parameter exceeding its setpoint.

1.2 Automatic reactor trip due to a turbine trip with power greater than 15%.

1.3 Any event which leads the operator to manually trip the plant.

2.0 INITIAL ACTIONS

2.1 Manually trip reactor.

2.2 Manually trip turbine.

3.0 REACTIVITY CONTROL

3.1 IMMEDIATE

1) - Ensure reactor trip breakers open
- Ensure all trippable CEA's inserted
- Ensure power decreasing

3.2 REMEDIAL

1) Only 1 CEA fails to insert:

- Open MG set output breakers
- Proceed to Section 4.0

2) 2 to 10 CEA's fail to insert:

- Open MG set output breakers
- Initiate EOP 2-70-5, Emergency Boration

3) 11 or more CEA's fail to insert:

- Open MG set output breakers
- Initiate EOP 2-70-5, Emergency Boration
- Reenergize CEDM's and drive rods

~~G. Blackmore~~

HED-620, 621, 622, 109

4.0 RCS INVENTORY CONTROL

4.1 IMMEDIATE

1) Ensure pressurizer level 20-34%

(gradually lower setpoint to 34%)

4.2 REMEDIAL

1) Less than 20% and not recovering

a) - Increase charging
- Reduce letdown

b) - Prevent unnecessary cooldown

c) - Initiate Safety Injection (EOP 2-70-1)

(R) d) - RMS Alarms for;

- S.G. Blowdown
- Air Ejector
- Steam Line Monitor

- Initiate Steam Generator Tube Rupture (2-70-3)

CAUTION

DO NOT ATTEMPT TO REDUCE INVENTORY IF A PRESSURIZER STEAM SPACE LEAK IS APPARENT BY INDICATED HIGH PRESSURIZER LEVEL AND DECREASING PRESSURE

---

2) Greater than 34% and not decreasing

a) - Reduce charging
- Increase letdown

b) - Prevent unnecessary heatup

c) - Utilize alternate letdown

6.0 HEAT REMOVAL (cont'd)

6.1 IMMEDIATE (CONT'D)

5) Ensure operation of main condenser and steam dump/turbine bypass system

6) Ensure proper FW operation:

- check SG levels increasing
- check 1 main feed pump running
- check main feed reg valves closed
- check bypass valves 32% open

With Main Feedwater Feeding the S/G's

a) - Shut down the aux. feedpumps

b) - Recover the S/G levels via the main feed

c) - Switch to aux. feed as desired when the S/G levels are above the feed ring (40% narrow range)

R d) - Ensure motor cooling ventilation dampers are opened on operating electric main feed pump.

OR

If Main Feed is Inoperable

a) - Reduce aux. feed flow to 200 gpm per S/G

b) - Recover the S/G level to normal and adjust AFW flow as required

c) - Do not realign AFW to first point heaters until there isn't any potential for voiding in the main feed lines and the S/G levels are above the feed ring (40% narrow range)

6.2 REMEDIAL (CONT'D)

7) Main condenser or steam dump/turbine bypass not operable:

- Open atmospheric steam dump valve and isolation MOV
- Return MOV isolation switch to neutral

8) Main feed reg valves fail to close

*R a) - Close Main Feed Isolation Valves MOV's (FW-M-104, 204, 304)

b) - (last resort)

- Trip main FW pumps
- Trip heater drain pumps
- Trip condensate pumps
- Initiate auxiliary FW if not on

9) Normal feed flow not available

a) - Initiate EOP 2-70-6, Loss of Feedwater

* HED # ~~260~~ NO 620

7.0 CONTAINMENT

7.1 IMMEDIATE

1) Ensure containment pressure less than 5 psig

*(R) SAFEGUARDS PUMP RUNNING
P-12 A, B ~~(s)~~
P-14 A, B or (S)
P-61 AB or (S)

2) Ensure containment radiation levels normal

*

7.2 REMEDIAL

1) Greater than 5 psig:

- Ensure actuation of CIS/SIAS
- Check safeguards light boxes
- If individual CIS/SIAS valves fail to operate, attempt to manually operate valves from control room

2) Greater than 20 psig:

- Ensure actuation of CSAS

3) Containment radiation levels high AND Containment purge operating:

- Secure containment purge

4) Initiate the indicated procedure: AOP 2-25, High Radiation Levels

*(R) Check SIAS lite ~~Box~~ - IF CSAS VALVE(s) FAIL to operate, attempt to manually operate VALVES From the Control Room.

* HED#109

8.0 VITAL AUXILIARIES

8.1 IMMEDIATE

8.2 REMEDIAL

NOTE

Upon a turbine trip with the main generator connected to the 345 KV switchyard and station service power supplied by the unit breakers, automatic transfer to reserve and disconnect of the main generator should occur within 2 minutes

---

CAUTION

Do not open the main generator output breakers (KG-1, KG-1/375, T1H) until station loads have been transferred to reserve power.

8.1 IMMEDIATE

1) Ensure automatic transfer to reserve power

- reserve breakers closed (1R, 2R, 3R, 4R)
- unit breakers open (1U, 2U, 3U, 4U)
- *R All busses energized thru Reserve Breakers

2) Ensure the main generator is disconnected

	- KG-1	OPEN
	- KG-1/375	OPEN
*R	- exciter breaker	OPEN
*R	- T1H	OPEN

*HED #~~200~~ 620

8.2 REMEDIAL

1) Automatic transfer to reserve power does not occur within 2 minutes of trip:

- Manually transfer to reserve power
- *R Reference EOP 2-70-9 Loss of Offsite Power

2) Generator does not automatically disconnect:

- Open KG-1, KG-1/375, T1H
- Open exciter breaker
- Close MS-M-100, 101

3)	Ensure proper operation of vital auxiliaries according to the folowing criteria:	3)	At least one vital auxiliary is lost or is operating in a degraded mode:	
	<u>Vital Auxiliary</u>		- Initiate the indicated procedure:	
	<u>PCC</u>		AOP 2-33	LOSS OF PCC
		*R	$<$ 95°F MCB Temp. Ind.	
	less than 95°F and greater than 70 psig	*R	$>$ 70 PSIG locally at P-9A or B	
	<u>SCC</u>		AOP 2-32	LOSS OF SCC
		**R	$<$ 95°F MCB Temp. Ind.	
	less than 95°F and greater than 70 psig	**R	$>$ 70 PSIG locally at P-10A or B	
	<u>Service Water</u>		AOP 2-31	SERVICE WATER HEADER RUPTURE
	check header pressure alarms			
	<u>Control Air (all headers)</u>		AOP 2-28	LOSS OF CONTROL AIR
	greater than 70 psig			
	<u>Offsite Power</u>		EOP 2-70-9	LOSS OF OFFSITE POWER
	all buses properly energized through the reserve breakers			

** HED - 622
* HED - 621

9.0 STA/MANAGEMENT/E-PLAN

9.1 IMMEDIATE ACTIONS

1) Notify the STA and DCO

2) Initiate Emergency Plan Procedure 2.50.0

- potential or actual degradation of plant safety
- events which will arouse public interest (eg. noise nuisance)

10.0 SUBSEQUENT ACTIONS

CAUTION

Rapid feeding/overfeeding of SG's could cause RCS cooldown.

---

*R 10.1 When SG's are returned above 35% NR depress "OVERRRIDE" buttons to restore auto control to Main Feed bypass valves.

*R 10.2 ~~Trip~~ TRIP Heater Drain Pumps. ~~tripped~~.

10.3 Trim secondary plant to one FW pump and one condensate pump.

*R Re-align Stand-By Pumps per OP 1-101-1 & 1-104-1 prior to restart.

10.4 Open turbine drain valves:
(Valves marked with an "#" automatically open on Auto Stop Oil pressure).

Valve	Source
HD-A-299	TK-104A (Cross Under Drain Tank)
HD-A-300	TK-104B (Cross Under Drain Tank)
GS-F-55	HP Turbine
# GS-F-56	HP Turbine
# GS-F-57	HP Turbine
# GS-F-58	HP Turbine
# GS-F-59	HP Turbine

* HED - 620

4838 2575B

Dept. Head [signature] for P&A
Plt. Mgr. [signature]
PORC [signature]
MOO [signature]

Proc. No. EOP 2-70-0
Class. A
Rev. No. ~~11~~ 12
Issue Date 10-13-83
Review Date 10-13-85

EOP 2-70-0 EMERGENCY SHUTDOWN FROM POWER

1.0 ENTRY CONDITIONS

1.1 Automatic reactor trip due to a RPS parameter exceeding its setpoint.

1.2 Automatic reactor trip due to a turbine trip with power greater than 15%.

1.3 Any event which leads the operator to manually trip the plant.

2.0 INITIAL ACTIONS

2.1 Manually trip reactor.

2.2 Manually trip turbine.

3.0 REACTIVITY CONTROL

3.1 IMMEDIATE

1) - Ensure reactor trip breakers open
- Ensure all trippable CEA's inserted
- Ensure power decreasing

3.2 REMEDIAL

1) Only 1 CEA fails to insert:

- Open MG set output breakers
- Proceed to Section 4.0

2) 2 to 10 CEA's fail to insert:

- Open MG set output breakers
- Initiate EOP 2-70-5, Emergency Boration

3) 11 or more CEA's fail to insert:

- Open MG set output breakers
- Initiate EOP 2-70-5, Emergency Boration
- Reenergize CEDM's and drive rods

4.0 RCS INVENTORY CONTROL

4.1 IMMEDIATE

1) Ensure pressurizer level 20-34%

(gradually lower setpoint to 34%)

4.2 REMEDIAL

1) Less than 20% and not recovering

a) - Increase charging
- Reduce letdown

b) - Prevent unnecessary cooldown

c) - Initiate Safety Injection (EOP 2-70-1)

(R) d) - RMS ALARMS FOR;
- S.G. Blowdown
- AIR EJECTOR
- STEAM LINE monitor

~~INITIATE~~ STEAM GENERATOR TUBE RUPTURE (2-70-3)

CAUTION

DO NOT ATTEMPT TO REDUCE INVENTORY IF A PRESSURIZER STEAM SPACE LEAK IS APPARENT BY INDICATED HIGH PRESSURIZER LEVEL AND DECREASING PRESSURE

---

2) Greater than 34% and not decreasing

a) - Reduce charging
- Increase letdown

b) - Prevent unnecessary heatup

c) - Utilize alternate letdown

NOTE

POST TRIP RCS PRESSURE WILL NORMALLY BE BETWEEN 1800 AND 2260 PSIG

5.0 RCS-PRESSURE CONTROL

5.1 IMMEDIATE

1) Ensure subcooling 50-150°F

5.2 REMEDIAL

1) Less than 50°

a) - Increase charging
   - Reduce letdown

b) - Prevent unnecessary heatup

c) - Energize heaters when level greater than 28%

d) - Reduce spray:

   - close spray valve or isolate

   - trip RCP's (last resort)

e) - Close PORV
   - Close block valve

f) - Initiate SIAS (EOP 2-70-1)

2) Greater than 150°

a) - Heaters off

b) - Prevent unnecessary cooldown

c) - Reduce pressure to bring subcooling less than 150°F

d) - (Pressure above 2285 psig) Spray on

e) - (Pressure above 2385 psig) PORV's and block valves open

f) - (Pressure above 2485) check safeties open by accoustic acc.

6.0 HEAT REMOVAL

6.1 IMMEDIATE	6.2 REMEDIAL
1) Ensure RCP's operating	1) Not operating: - Initiate EOP 2-70-7, Natural Circulation
2) Ensure core exit thermocouples decreasing toward 532°F	2) Not decreasing toward 532°F: - attempt to increase heat removal - attempt to restore secondary heat sink 3) Exceeds 800°F OR secondary heat sink unavailable: - Initiate SIAS (EOP 2-70-1) - Open PORV's, PORV block valves, and additional flow paths if needed to increase ECCS flow NOTE: If the establishment of additional flow paths would violate Containment Integrity Emergency Tech Spec relief should be sought via proper channels.
3) Ensure the following valves have closed: - turbine stop valves - governor valves - intercept valves - reheat stop valves	4) Turbine steam supply cannot be isolated AND SG pressure falls below 500 psig: - close EFCV's
4) Ensure SG pressures 890-910 psig	5) Not 890-910 psig: - check proper operation of steam dump/turbine bypass system 6) Less than 400 psig: - EFCV's auto close - Initiate EOP 2-70-4, Steam Line Break

6.0 HEAT REMOVAL (cont'd)

6.1 IMMEDIATE (CONT'D)

5) Ensure operation of main condenser and steam dump/turbine bypass system

6) Ensure proper FW operation:

- check SG levels increasing
- check 1 main feed pump running
- check main feed reg valves closed
- check bypass valves 32% open

R With Main Feedwater Feeding the S/G's

a) - Shut down the aux. feedpumps

b) - Recover the S/G levels via the main feed

c) - Switch to aux. feed as desired when the S/G levels are above the feed ring (40% narrow range)

~~PCR #84-58~~

d) - Ensure motor cooling ventilation dampers are opened on operating electric main feed pump.

OR

If Main Feed is Inoperable

R a) - Reduce aux. feed flow to 200 gpm per S/G

b) - Recover the S/G level to normal and adjust AFW flow as required

R c) - Do not realign AFW to first point heaters until there isn't any potential for voiding in the main feed lines and the S/G levels are above the feed ring (40% narrow range)

*HED #620 NO

6.2 REMEDIAL (CONT'D)

7) Main condenser or steam dump/turbine bypass not operable:

- Open atmospheric steam dump valve and isolation MOV

- Return MOV isolation switch to neutral

8) Main feed reg valves fail to close

*(R) a) - Close ~~MFRV~~ MAIN FEED ISOLATION VALVES MOV's (FW-M-104, 204, 304)

b) - (last resort)

- Trip main FW pumps
- Trip heater drain pumps
- Trip condensate pumps
- Initiate auxiliary FW if not on

9) Normal feed flow not available

a) - Initiate EOP 2-70-6, Loss of Feedwater

7.0 CONTAINMENT

7.1 IMMEDIATE

1) Ensure containment pressure less than 5 psig

(R)* - SAFEGUARDS PUMPS RUNNING
P-12 A, B or S
P-14 AB
P-61 AB or S

(R)* - check CSAS lite box. If CSAS Valve fails to ~~[illegible]~~ OPERATE Attempt to manually operate valves from Control Room

2) Ensure containment radiation levels normal

7.2 REMEDIAL

1) Greater than 5 psig:

- Ensure actuation of CIS/SIAS
- Check safeguards light boxes
- If individual CIS/SIAS valves fail to operate, attempt to manually operate valves from control room

2) Greater than 20 psig:

- Ensure actuation of CSAS

3) Containment radiation levels high AND Containment purge operating:

- Secure containment purge

4) Initiate the indicated procedure: AOP 2-25, High Radiation Levels

* HED#109

8.0 VITAL AUXILIARIES

8.1 IMMEDIATE

8.2 REMEDIAL

NOTE

Upon a turbine trip with the main generator connected to the 345 KV switchyard and station service power supplied by the unit breakers, automatic transfer to reserve and disconnect of the main generator should occur within 2 minutes

CAUTION

Do not open the main generator output breakers (KG-1, KG-1/375, T1H) until station loads have been transferred to reserve power.

8.1 Immediate

1) Ensure automatic transfer to reserve power

- reserve breakers closed (1R, 2R, 3R, 4R)
- unit breakers open (1U, 2U, 3U, 4U)

*(R) ALL BUSSES ENERGIZED thru RESERVE BREAKERS

2) Ensure the main generator is disconnected

- KG-1 OPEN
- KG-1/375 OPEN
- *(R) T1H OPEN
- exciter breaker OPEN

8.2 Remedial

1) Automatic transfer to reserve power does not occur within 2 minutes of trip:

- Manually transfer to reserve power

*(R) REFERENCE EOP-2-70-9 LOSS OF OFFSITE POWER

2) Generator does not automatically disconnect:

- Open KG-1, KG-1/375, T1H
- Open exciter breaker
- Close MS-M-100, 101

* NED # 620

3) Ensure proper operation of vital auxiliaries according to the folowing criteria:	3) At least one vital auxiliary is lost or is operating in a degraded mode:
Vital Auxiliary	- Initiate the indicated procedure:
PCC	AOP 2-33 LOSS OF PCC
less than 95°F and greater than 70 psig	* (R) < 95°F MCB TEMP. IND. > 70 PSIG LOCALLY AT P-9A AND B
SCC	AOP 2-32 LOSS OF SCC
less than 95°F and greater than 70 psig	** (R) < 95°F MCB TEMP. IND. > 70 PSIG LOCALLY AT P.10A AND B
R Service Water	AOP 2-31 SERVICE WATER HEADER RUPTURE
check header pressure alarms	
Control Air (all headers)	AOP 2-28 LOSS OF CONTROL AIR
greater than 70 psig	
Offsite Power	EOP 2-70-9 LOSS OF OFFSITE POWER
all buses properly energized through the reserve breakers	

** HED - 622

* HED - 620

9.0 STA/MANAGEMENT/E-PLAN

9.1 IMMEDIATE ACTIONS

1) Notify the STA and DCO

2) Initiate Emergency Plan Procedure 2.50.0

- potential or actual degradation of plant safety
- events which will arouse public interest (eg. noise nuisance)

10.0 SUBSEQUENT ACTIONS

CAUTION

Rapid feeding/overfeeding of SG's could cause RCS cooldown.

---

*(R) 10.1 When SG's are returned above 35% NR depress "OVERRRIDE" buttons to restore auto control to ~~MFWRV~~ MAIN FEED bypass valves.

*(R) 10.2 ~~Check~~ TRIP Heater Drain Pumps tripped.

10.3 Trim secondary plant to one FW pump and one condensate pump.

*(R) 10.4 Open turbine drain valves:
(Valves marked with an "#" automatically open on Auto Stop Oil pressure).

Valve	Source
HD-A-299	TK-104A (Cross Under Drain Tank)
HD-A-300	TK-104B (Cross Under Drain Tank)
GS-F-55	HP Turbine
# GS-F-56	HP Turbine
# GS-F-57	HP Turbine
# GS-F-58	HP Turbine
# GS-F-59	HP Turbine

RE-ALIGN STAND-BY PUMPS PER OP-1-101-1 & 1-104-1 PRIOR TO RESTART

* HED-620

10.5 Check open extraction steam drain valves:
(All valves automatically open on low Auto Stop Oil pressure).

~~PCR #84-590~~

Valve	Associated Extraction Heater
HPD-A-99	E-11A (1st Point)
HPD-A-100	E-11B (1st Point)
SD-A-256	E-14B (4th Point)
SD-A-257	E-14A (4th Point)
SD-A-258	E-13B (3rd Point)
SD-A-259	E-13B (3rd Point)

10.6 Check closed MS-M-100 and MS-M-101.
(reheater isolation valves)

~~PCR #84-325~~

10.7 Press the reset button on the MSR control panel and check temperature control valves closed and MSR scavenging vent diverter valves to MSR.

10.8 Check moisture separator/reheater manual valve controller at ZERO.

10.9 Turn main generator voltage regulator OFF.

10.10 Control RCS Temperature:

Dump steam to condenser
OR
Dump steam to the atmosphere using decay heat release system

10.11 Obtain switching orders from the dispatcher.

10.12 As the turbine coasts down, check proper operation of the following equipment:

At 8 psi bearing oil pressure

P-49 Turning Gear Oil Pump
P-88 Seal Oil Backup Pump

At 600 rpm (decreasing)

Bearing Lift Pump

At zero speed

Turning Gear

~~ok~~ 10.13 Execute section 4.15, "Post Trip Operation of P-2C", of procedure 1-104-5 "Turbine Driven Feed Pump Operation".

ok - MED 620

10.14 Change scales on the wide range log chart to keep pens on scale.

10.15 Verify normal decreasing count rate.

10.16 Initiate Procedure 1-6, Reactor Shutdown.

10.17 Within one hour of a plant trip, initiate Procedure 1-106-1, Boiler Warmup.

10.18 Between 2 and 6 hours following a trip from above 15% thermal power a RCS sample must be taken for isotopic analysis of iodine. (Tech Spec 4.2, Table 4.2-1.)

10.19 Reference Procedure 1-26-1, Operational Event Reporting.

HED ORGINAL

Dept. Head REA	Proc. No. EOP 2-70-0
Plt. Mgr. [illegible]	Class. A
PORC [illegible]	Rev. No. 10
MOO [illegible]	Issue Date 11/24/82
	Review Date 10/24/83

EMERGENCY SHUTDOWN FROM POWER

1.0 ENTRY CONDITIONS

1.1 Automatic reactor trip due to a RPS parameter exceeding its setpoint.

1.2 Automatic reactor trip due to a turbine trip with power greater than 15%.

1.3 Any event which leads the operator to manually trip the plant.

2.0 INITIAL ACTIONS

2.1 Maunually trip reactor.

2.2 Manually trip turbine.

3.0 REACTIVITY CONTROL

3.1 IMMEDIATE

1) - Ensure reactor trip breakers open
- Ensure all trippable CEA's inserted
- Ensure power decreasing

3.2 REMEDIAL

1) Only 1 CEA fails to insert:

- Open MG set output breakers
- Proceed to Section 4.0

2) 2 to 10 CEA's fail to insert:

- Open MG set output breakers
- Initiate EOP 2-70-5, Emergency Boration

3) 11 or more CEA's fail to insert:

- Open MG set output breakers
- Initiate EOP 2-70-5, Emergency Boration
- Reenergize CEDM's and drive rods

4.0 RCS INVENTORY CONTROL

4.1 IMMEDIATE

1) Ensure pressurizer level 20-34%

(gradually lower setpoint to 34%)

4.2 REMEDIAL

1) Less than 20% and not recovering

a) - Increase charging
- Reduce letdown

b) - Prevent unnecessary cooldown

c) - Initiate Safety Injection (EOP 2-70-1)

CAUTION

DO NOT ATTEMPT TO REDUCE INVENTORY IF A PRESSURIZER STEAM SPACE LEAK IS APPARENT BY INDICATED HIGH PRESSURIZER LEVEL AND DECREASING PRESSURE

2) Greater than 34% and not decreasing

a) - Reduce charging
- Increase letdown

b) - Prevent unnecessary heatup

c) - Utilize alternate letdown

NOTE

POST TRIP RCS PRESSURE WILL NORMALLY BE BETWEEN 1800 AND 2260 PSIG

5.0 RCS PRESSURE CONTROL

5.1 IMMEDIATE

1) Ensure subcooling 50-150°F

5.2 REMEDIAL

1) Less than 50°

   a) - Increase charging
      - Reduce letdown

   b) - Prevent unnecessary heatup

   c) - Energize heaters when level greater than 28%

   d) - Reduce spray:

      - close spray valve or isolate

      - trip RCP's (last resort)

   e) - Close PORV
      - Close block valve

   f) - Initiate SIAS (EOP 2-70-1)

2) Greater than 150°

   a) - Heaters off

   b) - Prevent unnecessary cooldown

   c) - Reduce pressure to bring subcooling less than 150°F

   d) - (Pressure above 2285 psig) Spray on

   e) - (Pressure above 2385 psig) [illegible]

   f) - (Pressure above 2485) check safeties open by accoustic acc.

6.0 HEAT REMOVAL

6.1 IMMEDIATE

1) Ensure RCP's operating

2) Ensure core exit thermocouples decreasing toward 532°F

PCR #83-004

PCR #83-004

3) Ensure the following valves have closed:

- turbine stop valves
- governor valves
- intercept valves
- reheat stop valves

4) Ensure SG pressures 890-910 psig

6.2 REMEDIAL

1) Not operating:

- Initiate EOP 2-70-7, Natural Circulation

2) Not decreasing toward 532°F:

- attempt to increase heat removal
- attempt to restore secondary heat sink

3) Exceeds 800°F
OR
secondary heat sink unavailable:

- Initiate SIAS (EOP 2-70-1)

- Open PORV's, PORV block valves, and additional flow paths if needed to increase ECCS flow

NOTE: If the establishment of additional flow paths would violate Containment Integrity Emergency Tech Spec relief should be sought via proper channels.

4) Turbine steam supply cannot be isolated
AND
SG pressure falls below 500 psig:

- close EFCV's

5) Not 890-910 psig:

- check proper operation of steam dump/turbine bypass system

6) Less than 400 psig:

- EFCV's auto close
- Initiate EOP 2-70-4, Steam Line Break

6.0 HEAT REMOVAL (cont'd)

6.1 IMMEDIATE (CONT'D)

5) Ensure operation of main condenser and steam dump/turbine bypass system

6) Ensure proper FW operation:

- check SG levels increasing
- check 1 main feed pump running
- check main feed reg valves closed
- check bypass valves 32% open
- throttle aux feed flow

6.2 REMEDIAL (CONT'D)

7) Main condenser or steam dump/turbine bypass not operable:

- Open atmospheric steam dump valve and isolation MOV
- Return MOV isolation switch to neutral

8) Main feed reg valves fail to close

(R) a) - Close ~~FRV MOVs~~ MAIN FEED ISOLATION VALVES (FW-M-104, 204, 304)

b) - (last resort)

- Trip main FW pumps
- Trip heater drain pumps
- Trip condensate pumps
- Initiate auxiliary FW if not on

9) Normal feed flow not available

a) - Initiate EOP 2-70-6, Loss of Feedwater

7.0 CONTAINMENT

7.1 IMMEDIATE

1) Ensure containment pressure less than 5 psig

IF P-61 A or B Spray Pumps or P-14 A or B (s) charging pumps fail- attempt restart of the Affected EQUIPMENT

2) Ensure containment radiation levels normal

PCR #83-002

7.2 REMEDIAL

1) Greater than 5 psig:

- Ensure actuation of CIS/SIAS
- Check safeguards light boxes
- If individual CIS/SIAS valves fail to operate, attempt to manually operate valves from control room

2) Greater than 20 psig:

- Ensure actuation of CSAS

3) Containment radiation levels high AND Containment purge operating:

- Secure containment purge

4) Initiate the indicated procedure: AOP 2-25, High Radiation Levels

8.0 VITAL AUXILIARIES

8.1 IMMEDIATE / 8.2 REMEDIAL

NOTE

Upon a turbine trip with the main generator connected to the 345 KV switchyard and station service power supplied by the unit breakers, automatic transfer to reserve and disconnect of the main generator should occur within 2 minutes

CAUTION

Do not open the main generator output breakers (KG-1, KG-1/375, T1H) until station loads have been transferred to reserve power.

8.1 IMMEDIATE	8.2 REMEDIAL
1) Ensure automatic transfer to reserve power - reserve breakers closed (1R, 2R, 3R, 4R) - unit breakers open (1U, 2U, 3U, 4U)	1) Automatic transfer to reserve power does not occur within 2 minutes of trip: - Manually transfer to reserve power
3) Ensure the main generator is disconnected - KG-1 OPEN - KG-1/375 OPEN (R) - T1H OPEN - exciter breaker OPEN	2) Generator does not automatically disconnect: - Open KG-1, KG-1/375, T1H - Open exciter breaker - Close MS-M-100, 101
Reverse Sequence (R) 2. All Busses Properly Energized thru the Reserved Breakers	Reference EOP-2-70-9 Loss of Offsite Power.

4) Ensure proper operation of vital auxiliaries according to the folowing criteria:

3) At least one vital auxiliary is lost or is operating in a degraded mode:

- Initiate the indicated procedure:

Vital Auxiliary		
PCC less than 95°F and greater than 70 psig (R) Note. Check pressure locally at operating pump P-9A or B	AOP 2-33	LOSS OF PCC
SCC less than 95°F and greater than 70 psig (R) Note. Check pressure >70 psig locally at operating pump P-10A or B ✓ PCR #83-001	AOP 2-32	LOSS OF SCC
Service Water check header pressure alarms	AOP 2-31	SERVICE WATER HEADER RUPTURE
Control Air (all headers) greater than 70 psig	AOP 2-28	LOSS OF CONTROL AIR
Move to step 8.1.2 — Offsite Power all buses properly energized through the reserve breakers	EOP 2-70-9	LOSS OF OFFSITE POWER

9.0 STA/MANAGEMENT/E-PLAN

9.1 IMMEDIATE ACTIONS

1) Notify the STA and DCO

2) Initiate Emergency Plan Procedure 2.50.0

- potential or actual degradation of plant safety
- events which will arouse public interest (eg. noise nuisance)

10.0 SUBSEQUENT ACTIONS

CAUTION

Rapid feeding/overfeeding of SG's could cause RCS cooldown.

(R) 10.1 When SG's are returned above 35% NR depress "OVERRRIDE" buttons to restore auto control to ~~NFMRV~~ bypass valves.

(R) 10.2 TRIPZ ~~Check~~ Heater Drain Pumps ~~tripped.~~ MAIN FEED

10.3 Trim secondary plant to one FW pump and one condensate pump.

(R) Note: REFERENCE OP-1-101-1 & 1-104-1 for REALIGNMENT of PUMPS

10.4 Open turbine drain valves:
(Valves marked with an "#" automatically open on Auto Stop Oil pressure).

Valve	Source
HD-A-299	TK-104A (Cross Under Drain Tank)
HD-A-300	TK-104B (Cross Under Drain Tank)
GS-F-55	HP Turbine
# GS-F-56	HP Turbine
# GS-F-57	HP Turbine
# GS-F-58	HP Turbine
# GS-F-59	HP Turbine

10.5 Check open extraction steam drain valves:
(All valves automatically open on low Auto Stop Oil pressure).

Valve	Associated Extraction Heater
HPD-A-299	E-11A (1st Point)
HPD-A-100	E-11B (1st Point)
SD-A-256	E-14B (4th Point)
SD-A-257	E-14A (4th Point)
SD-A-258	E-13B (3rd Point)
SD-A-259	E-13B (3rd Point)

10.6 Check closed MS-M-100 and MS-M-101.
(reheater isolation valves)

10.7 Close moisture separator/reheater temperature control valves using RESET button on control panel.

10.8 Check moisture separator/reheater manual valve controller at ZERO.

10.9 Turn main generator voltage regulator OFF.

10.10 Control RCS Temperature:

Dump steam to condenser
OR
Dump steam to the atmosphere using decay heat release system

10.11 Obtain switching orders from the dispatcher.

10.12 As the turbine coasts down, check proper operation of the following equipment:

At 8 psi bearing oil pressure

P-49 Turning Gear Oil Pump
P-88 Seal Oil Backup Pump

At 600 rpm (decreasing)

Bearing Lift Pump

At zero speed

Turning Gear

(R) 10.13 Ensure P-2C ~~turning gear is operating~~. is in the Recirc. mode or on turning gear

10.14 Change scales on the wide range log chart to keep pens on scale.

10.15 Verify normal decreasing count rate.

PCR #82-881
10.16 Initiate Procedure 1-6, Reactor Shutdown.

PCR #82-881
10.17 DELETED

10.18 Within one hour of a plant trip, initiate Procedure 1-106-1, Boiler Warmup.

10.19 Between 2 and 6 hours following a trip from above 15% thermal power a RCS sample must be taken for isotopic analysis of iodine. (Tech Spec 4.2, Table 4.2-1.)

10.20 Reference Procedure 1-26-1, Operational Event Reporting.

APPENDIX C

MY-O-73-85

OPERATIONS DEPARTMENT REVISION REQUEST

PROCEDURE TITLE: Emergency Loop Shutdown

PROCEDURE NO.: 2-70-8 REV. NO.: 10

PROCEDURE STEPS AFFECTED 1.1, 3.13 Note After Step 3.0

DATE REQUIRED:

1. As soon As Possible
2. As Soon As Practical
3. Other

PROCEDURE REVIEWED:

YES NO

(circle one)

REASON FOR CHANGE:

- HED #835 directing operator to line up PCC to HP Drain Cooler in Step 3.13
- Step 3.4 incorporate PCR 83-255
- Deleted info carried into OP 1-[illegible]-7 - PCR 83-172
- Deleted info carried into OP 1-[illegible]-7 - PCR 83-274
- Deleted Step 1.1.2 entry from S.[illegible].T.R.
- Added a new Step 1.1.2 per direction of Manager of Operation to isolate a loop with a S.C.T.R., if directed from Technical Support Center (TSC) personnel.
- Added Note RCP Trip Criteria [illegible] subcooling per YAEC 1484 RCP Trip Study
- Step 3.1 & 3.2 Terminology Hot Leg & Cold Let Isolation Valves per HED #70.

ORIGINATOR R E Archambault 6/11/85

[illegible]

[illegible]

DATE/TIME

COMMENTS:

8343N-REA

Difference

5077

Dept. Head REA
Plt. Mgr. [illegible]
PORC [illegible]
MOO [illegible]

Proc. No. EOP 2-70-8
Class A
Rev. No. ~~8~~ 9
Issue Date 12-10-82
Review Date 12-10-84

PCR No. 83-172
PCR No. 83-274

(10)

EMERGENCY LOOP SHUTDOWN

1.0 ENTRY CONDITIONS

~~PCR #83-172~~

(R) 1.1 RCP malfunction which requires pump shutdown:

- loss of power

~~PCR #83-274~~

- (R) seal water ~~return~~ LEAKOFF flow greater than CVCS capacity
- (A) all three of the lower seal stages fail
- seal leakoff decreases to 0.5 gpm or less AND the seal dP on any seal (except the vapor seal) is 100 psi or less
- lower seal cavity temperature increases to 200°F
- seal water return temperature increases to 200°F
- (R) seal water ~~return~~ LEAKOFF FLOW temperature exceeds 180°F EVEN WITH maximum seal water injection flow
- RCP bearing temperature exceeds 185°F

1.2 Other equipment or safety problem requiring RCP shutdown or RCP shutdown and loop isolation.

2.0 OPERATOR ACTIONS

2.1 Initiate EOP 2-70-0, Emergency Shutdown from Power.

2.2 Trip the RCP.

2.3 If loop isolation is desired perform Section 3.0, "Loop Isolation".

2.4 Assess plant conditions and perform further actions as necessary.

3.0 LOOP ISOLATION

CAUTION

Only perform these actions if loop isolation is desired.

3.1 Clear tags from Th/Tc breakers and disconnects.

3.2 Close Th/Tc breakers and disconnects.

3.3 Close associated interconnecting fill valves.

~~PCR #83-255~~

3.4 Open the loop by-pass valve.

3.5 Close associated Th and Tc stop valves.

3.6 Close associated loop drain valves.

3.7 Stop seal water injection to associated RCP.

3.8 Check closed associated sample line.

3.9 Stop feed water to associated SG.

3.10 Close associated NRV (preferred) or EFCV.

3.11 Close associated stop check valve (MS-59, 79, 99) in atmospheric steam dump/terry turbine supply line.

3.12 Check closed associated blowdown valve.

(R) 3.13 ALIGN PCC to H.P. DRAIN COOLER

3.1~~3~~4 Maintain loop pressure at least 100 psi above steam generator pressure. (Use MCB pressure indication for the loop drain header).

3.1~~4~~5 If loop depressurization is desired, drain from the loop via the High Pressure Drain Cooler (E-35) to the VCT or the Quench Tank.

3.1~~5~~6 Shift charging flow and pressurizer spray flow to the operating loop.

NOTE

(R) IF LOOP ISOLATION WAS REQUIRED BECAUSE OF RCP SEAL FAILURE, RCP SEAL LEAKAGE FLOW SHOULD be isolated to the AFFECTED LOOP to Prevent excessive SEAL LEAKAGE flow FROM the FAILED SEAL to IMPEDE LEAK OFF flow FROM the INTACT RCP SEALS.

APPENDIX D

MY-O-73-85

OPERATIONS DEPARTMENT REVISION REQUEST

PROCEDURE TITLE: Total Loss of Forced Reactor Coolant Flow/Natural Circulation

PROCEDURE NO.: 2-70-7 REV. NO.: 6

PROCEDURE STEPS AFFECTED

DATE REQUIRED:

1. As soon As Possible
2. As Soon As Practical
3. Other

PROCEDURE REVIEWED:

YES NO

(circle one)

REASON FOR CHANGE:

- Incorporate HED #615
- EOP-2-70-7 STEP 2-1-7 INCORPORATES HED #616
- Step 1.2 Entry Conditions RCS Subcooling Less than 25°F
- Changes RCP start criteria from 50°F subcooling to twenty-five degrees subcooling in Step 2.1, 2.1.1, 2.1.2
- Step 2.1 Amplified conditions to support RCP restart
- Step 2.5 Additional directions for operators
- Step 2.14 Terminology for Loop Isolation Valves/HED #70

ORIGINATOR RE Arseneault 6/11/85

PSS

SOS

DATE/TIME

COMMENTS:

8343N-REA

No. 616

HED RECORD

.3

0

PANEL I.D. MCB-C-V

COMPONENT I.D. N/A

COMPONENT TITLE/SERVICE Indicator/Seal Water Return Flow

DISCREPANCY

Called out for in a procedure but does not exist. Do have supply flow - leakage flow to infer return flow.

HED satisfied by the removal of "RCP Seal water return flow" and appropriate references to OP-1-10-7 RCP operation have been inserted. OP-1-10-7 correctly identifies Seal leakage flow.

EOP-2-70-7 Step 2.1-7 incorporates HED #616

GUIDE No. ______ TITLE ______

GUIDE No. ______ TITLE ______

GUIDE No. ______ TITLE ______

H.E. LIMITS ______

TASK I.D. Subtask 3

PHOTO RECORD ______

COMMENTS ______

VERIFICATION ______

Dept. Mgr.__________
PORC__________
MOO__________

Proc. No. EOP 2-70-7
Class A
Rev. No. 6
Issue Date__________
Review Date__________

EOP 2-70-7 TOTAL LOSS OF FORCED REACTOR COOLANT FLOW/NATURAL CIRCULATION

DRAFT

1.0 ENTRY CONDITIONS

1.1 Total loss of forced reactor coolant flow as identified by EOP 2-70-0, Emergency Shutdown from Power.

R 1.2 Termination of forced reactor coolant flow required by EOP 2-70-0, RCS Subcooling Less Than 25°F or CIS actuated.

R 1.3 Station black out 2-70-9.

2.0 OPERATOR ACTION

CAUTION

If only one RCP is operable, consider saving the pump for future forced flow cooling.

R 2.1 If the following conditions are established, than restart RCP(s).

R The following conditions support RCP restart:

2.1.1 RCS subcooling - GREATER THAN 25°F.

2.1.2 CIS - NOT ACTUATED.

2.1.3 RCP - NOT FAULTED.

2.1.4 RCS loop isolation valves - OPEN.

Cold leg isolation valve - open
Hot leg isolation valve - open
Bypass isolation valve - closed

2.1.5 RCP oil pumps - RUNNING IN AUTO.

2.1.6 PCC system - IN OPERATION.

2.1.7 RCP seal injection - 5 GPM GREATER THAN RETURN.

2.1.8 PZR spray valves - CLOSED.

2.2 If RCP's are not operable, then establish PZR level at least 50%.

NOTE

RCS flow rates are greatly reduced during natural circulation. This increases RCS response time.

2.3 Use the following indications to estimate natural circulation cooling effectiveness:

- T_C constant or decreasing
- T_H constant or decreasing
- Incore thermocouples trending with T_H RTD's
- R Delta-T less than full power delta-T (44°F)

NOTE

A steam bubble may form under the reactor vessel head. Large steam bubbles can interfere with natural circulation. Reactor head temperature can be used to estimate head conditions.

2.4 Commence a plant cooldown. Refer to OP 1-7, Plant Cooldown.

R 2.5 Attempt to identify the cause of Loss of Forced Flow - start RCPs when power is available and RCS subcooling is greater than 25°F. (Refer back to Step 2.1.)

PURCHASE REQUESTS

PLANT ☒

MAINE YANKEE ATOMIC POWER COMPANY
MATERIAL PURCHASE REQUEST

P.O. NO. ______ Page ____ of ____

Date 7/29/85
Ordering Dept. ENG-AUG
Prepared by RANDY LACASSE/TEDD GIFFORD

-06 | Dept Req No 04-85-7-105 | Prev P.O. | Procurement Level
-23 | Edcr No 84-73 | Task No 6.16 | W.C. No 69-81-35

For Engineering Use Only

Nuclear Safety Class	NNS	Environ Quality level	N/A	QDR #
Quality Level	N/A	Seismic Qual	☐ YES ☑ NO	

FOR PURCHASING USE ONLY

Stores Stock Code	Quant. Req'd	Unit of Meas	Description and Reason for Request	Account Number	Comm. Code	Unit Cost	Ext. Cost
			THE SCALE FACES LISTED BELOW ARE TO BE USED AS REPLACEMENT FACES FOR BOTH ~~THE~~ MAIN CONTROL BOARD AND ~~S~~SIMULATOR SIGMA METERS. THIS MPR COVERS THE BASIC COST OF THE BLANK SCALE (@ 5.50 per/SCALE) AND THE COSTS OF APPLYING THE APPROPRIATE SCALE MARKINGS. (SEE ATTACHED SHEET)				

Estimated Cost $900.00 | ☒ | TOTAL COST

8/30/85

Special Instructions ***RUSH***

Vendor Name VERSATILE INSTRUMENTS | Spoke To TOM CHASE
Address P.O. Box 43 Toronto, Ont. M8Z-2X3 | Phone No 416-239-8161

Ship Via
Confirmed Delivery Date
Shipping Terms
Payment Terms

Reason for Selecting Vendor

Reason	Specified	Desired
Evaluation	☐ (Lowest $ Bid)	☐
rg. Delivery	☐	
e Source	☑	
t formance		☐
Approved ndor		☐

Route	Approvals	Date
X	Sect Head [signature]	8/1/85
✓	PED [signature]	8/1/85
N/A	OQAD [initials]	
✓	Dept. Manager [signature]	8/1/85
	Plant Manager	
X	Stores or NSS Admin	
X	Cost Control	

Route	Approvals	Date
X	Mat. Control Sect Head	
	Manager of OPS	
	Manager Admin	
	Vice pres	
	President	
X	Purch.	

MAINE YANKEE ATOMIC POWER COMPANY

MATERIAL PURCHASE REQUEST

REQ NO.

Department

Request No.

Date 7/29/85

Ordering Dept ENG-AUG.

Prepared by RANDY LACOSSE/TEDD GIFFORD

Page 1 of 1

P.O. NO.

ITEM NO.	STORES STOCK CODE	QUANT REQ'D	UNIT OF MEAS	DESCRIPTION AND REASON FOR REQUEST	ACCOUNT NUMBER	COMM CODE	UNIT COST	EXT COST
				(@ ~~\$~~ 19.50 Per/SCALE) FOR A				
				TOTAL OF 25.00 Per/SCALE.				
				THE VENDOR SHALL COMPLY				
				WITH ALL ATTACHED REQUIREMENTS				
				PERTAINING TO SCALE MARKINGS				
				AND DUE DATE.				
				Note: Attachments to be stapled on				
				once MPR is back in augusta				
				by Randy Lacosse				
1		26	EA	9222-SIGMA METER FACES W/				
				APPROPRIATE SCALE MARKINGS.				
				@\$ 650.00				
2		20	EA	9222- BLANK SIGMA METER FACES				
				W/ Ø AND FULL RANGE MARKINGS				
				@\$ 110.00				
3		20	EA	9263- BLANK SIGMA METER FACES				
				W/ Ø AND FULL RANGE MARKINGS.				
				@\$ 110.00				

REQUIREMENTS & SPECIFICATIONS

1. Due date for finished scales - 9/16/85 need by end of refueling outage.

2. All scales to be done according to attached measurements and standards.

3. All scales are shown with No. of cutouts for indicator lights.

4. All scales are shown with Major Graduations, Intermediate Grad., and Minor Grad. between at least two Majors. Minors are to be repeated for the remainder of the scale.

5. All units are given and are to be placed above top scale marking, centered in the area to the right of the scale markings if possible. (See Standards)

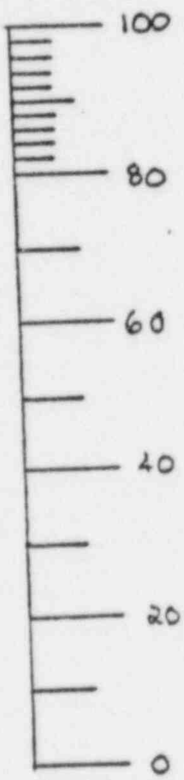
6. All lettering stroke widths are to be 1/32". All scale graduation marking stroke widths are to be 0125".

7. The quantity of each given scale face is given in a circle directly below each scale.

SCALE FACE SPECIFICATIONS

2-INDICATOR LIGHTS VOLUME CONTROL TANK PRESSURE (PSIG)

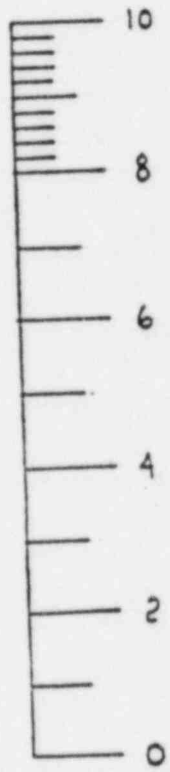
SEPERATION BETWEEN MINOR GRAD. ≈ 1.8 mm



②

2-INDICATOR LIGHTS CONTAINMENT SUMP LEVEL LI-(307,308)K (FEET)

SEPERATION BETWEEN MINOR GRAD. ≈ 1.8 mm

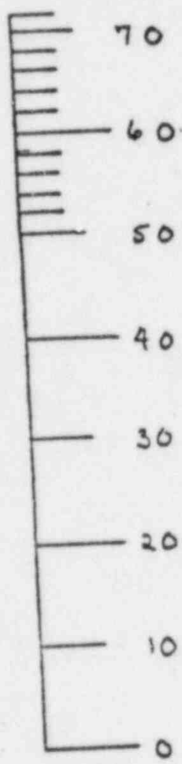


④

SCALE FACE SPECIFICATIONS

2-INDICATOR LIGHTS

PRESS QUENCH TANK LEVEL (INCHES)

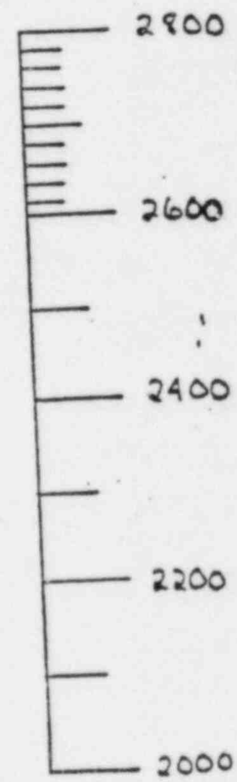


SEPERATION BETWEEN MINOR GRAD. ≈ 2.5 mm

2

1-INDICATOR LIGHT ON BOTTOM

CHARGING MANIFOLD (PSIG)



SEPERATION BETWEEN MINOR GRAD. ≈ 2.25 mm

2

SCALE FACE SPECIFICATIONS

1-INDICATOR LIGHT ON TOP

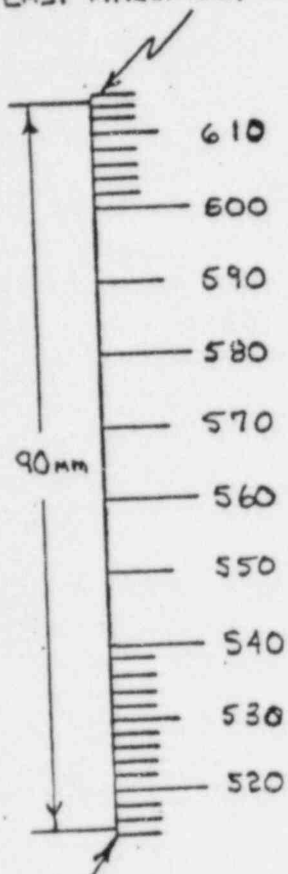
TC NR LOOP (1,2,3) (°F)

2-INDICATOR LIGHTS

RWST LEVEL
LI-(301,302)K (GALS)

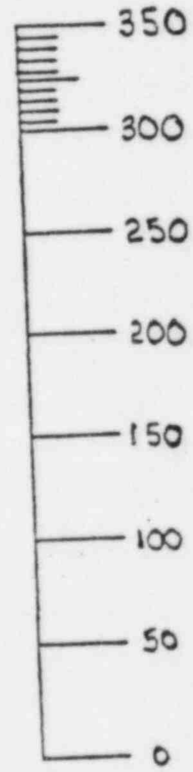
LAST MARKING 0.9 mm ABOVE ORIGINAL FULL SCALE

SEPERATION BETWEEN MINOR GRAD. ≈ 1.8 mm



1st MARKING 0.9 mm From Original Zero Line

SEPERATION BETWEEN MINOR GRAD. ≈ 1.3 mm



(6)

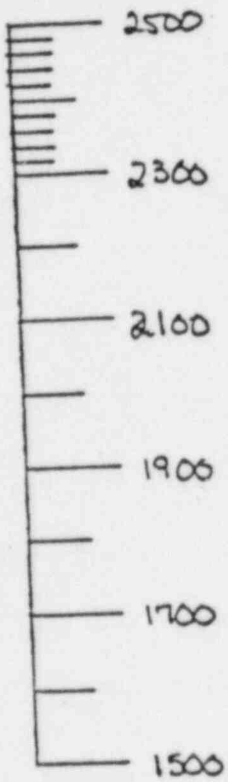
(4)

SCALE FACE SPECIFICATIONS

2-INDICATOR LIGHTS

PRESSURIZER PRESSURE (PSIG)

SEPERATION BETWEEN MINOR GRAD: ≈ 1.8 mm



STANDARDS: SCALE MARKINGS