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J. T. Beckham, Jr.
Vice President—Nuclear
Hatch Project

Georgia Power
the southern electric system

HL-1920
002495

January 21, 1992

U.S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Washington, D.C. 20555

PLANT HATCH - UNITS 1, 2
NRC DOCKETS 50-321, 50-366
OPERATING LICENSES DPR-57, NPF-5
MAIN STEAM SAFETY RELIEF VALVE
PRESSURE SENSOR ACTUATION

Gentlemen:

In response to your request following a meeting with representatives of the NRC staff on July 23, 1991, enclosed is the design summary and 10 CFR 50.59 evaluation for our planned addition of pressure sensor actuation for the Main Steam Safety Relief Valves (SRVs). Georgia Power Company (GPC) is in the process of adding a pressure sensor actuated logic system to enhance assurance of SRV actuation at the appropriate pressure setpoint. Specifically, the system will improve reliability of the SRVs thereby minimizing the potential for forced outages as experienced by Plant Hatch, Units 1 and 2 during February, 1991. GPC plans to install the new systems during the next refueling outages for Units 1 and 2, currently scheduled for Spring 1993 and Fall 1992, respectively.

As the new system is not safety related, it will not be included in the Technical Specifications. However, the system will be designed to meet single failure criteria, and will use equipment and components equivalent to our safety related systems. Maintenance and calibration will be performed consistent with that of our safety related systems.

If you have any questions, please contact this office.

Sincerely,

J. T. Beckham, Jr.

JAW/CLT/cr

Enclosures: (See next page.)

A001

Enclosures:

1. Narrative Design Summary - Sensor-activated SRV Initiation and Simplified Diagrams Illustrating the New System
2. 10 CFR 50.59 Safety Evaluation

cc: Georgia Power Company
Mr. H. L. Sumner, General Manager - Nuclear Plant
NORMS

U.S. Nuclear Regulatory Commission, Washington, D.C.
Mr. K. Jabbour, Licensing Project Manager - Hatch

U.S. Nuclear Regulatory Commission, Region II
Mr. S. D. Ebneter, Regional Administrator
Mr. L. D. Wert, Senior Resident Inspector - Hatch

ENCLOSURE 1

PLANT HATCH - UNITS 1,2
NRC DOCKETS 50-321, 50-366
OPERATING LICENSES DPR-57, NPF-5
MAIN STEAM SAFETY RELIEF VALVE
PRESSURE SWITCH ACTUATION

NARRATIVE DESIGN SUMMARY

NARRATIVE DESIGN SUMMARY

SENSOR ACTIVATED SRVs INITIATION

OBJECTIVE:

A new sensor initiated logic is being proposed to actuate the Safety Relief Valves (SRV) electrically at their respective mechanical setpoints (Ref: Figure 1). This will provide a redundant method of preventing overpressurization of the Nuclear Steam Supply System in addition to the mechanical relief mode of the SRV(s).

DISCUSSION:

The safety objective of the SRV system is to prevent overpressurization of the Nuclear Steam Supply System (NSSS).

Automatically controlled SRV(s) are installed on the main steam lines inside primary containment. The valves are dual purpose in that they will relieve pressure by normal mechanical action or by automatic action of an electro-pneumatic control system. A two position switch is provided in the Main Control Room (MCR) for the control of each SRV. The two positions are "OPEN" and "AUTO". In the "OPEN" position, the switch energizes the solenoid operated valve to open the SRV. In the "AUTO" position, the SRV is opened on Automatic Depressurization System (ADS) or Low Low Set (LLS) initiation signals, the normal mechanical action, or the new electrical actuation "backup" mode.

The relief by normal mechanical action is intended to prevent potential overpressurization of the nuclear steam supply system following a main turbine trip or other pressurization transients. On a Loss Of Coolant Accident (LOCA) wherein the High Pressure Coolant Injection (HPCI) system can not supply adequate inventory makeup, the depressurization by automatic action is intended to reduce nuclear system pressure to allow Core Spray (CS) or Low Pressure Coolant Injection (LPCI) to inject water into the reactor vessel.

The proposed modification will meet the following criteria:

1. The new control logic will give the SRV(s) an electrical signal to open at the same setpoints that the valves are supposed to open mechanically. Calculations will account for instrument loop uncertainties (including setpoint tolerances), thus allowing for a setpoint equivalent to the mechanical actuation setpoint.

2. The proposed addition of control logic will not change the existing function of the SRV(s), ADS, or LLS system.

3. One-out-of-two taken twice logic will minimize the potential for inadvertent actuation of the SRV while providing reliable operation of the SRV at the setpoint independent of mechanical action.

NARRATIVE DESIGN SUMMARY

SENSOR ACTIVATED SRVs INITIATION

4. The Emergency Safety System (ESS) Division I to Division II interface will be isolated by fuses.

5. A DC power source will be used.

6. The logic will remain operable in the event of Loss-of-Offsite Power (LOSP).

7. All new hardware will be procured to meet Class 1E (environmental and seismic) requirements as appropriate. Similarly, any existing equipment used will also meet these requirements.

8. No single failure of the new logic shall cause the SRV(s) to lift inadvertently, or prevent the SRV(s) from lifting upon receiving an ADS/LLS signal.

9. This is a non-safety related design change. The proposed modification is intended to be used during abnormal plant operation to increase the reliability of the NSSS depressurization system.

10. One solenoid is provided for each SRV.

11. Calibration and maintenance requirements already established by Plant Hatch Technical Specifications for Nuclear Boiler System (B21) equipment will apply to this proposed modification.

CONCLUSION:

ESS DIVISION I AND DIVISION II SENSORS (1-out-of-2 Taken Twice Logic):

In order for the Unit 1 and Unit 2 SRV(s) to actuate, two pressure signals will be required. The Unit 1 SRV(s), set to operate at 1080 psig, will require two signals from the trip units set at 1080 psig. The SRV(s) set to operate at 1090 psig will require one signal from the trip units set at 1080 psig and a second signal from the trip units set at 1090 psig. The remaining SRV(s) set to operate at 1100 psig will require one signal from the trip units set at 1090 psig and a second signal from the trip units set at 1100 psig (Ref. Table A, Hatch Unit 1). The Hatch Unit 2 SRV(s) are intended to function in a similar manner. The Unit 2 SRV setpoints are 1090, 1100, and 1110 psig respectively (Ref. Table A, Hatch Unit 2).

This modification will require installation of four new pressure transmitters (PTs), two per panel, on local panels H21-P404 and H21-P405. This modification will require the installation of four new cables (approx. 700' each), one per PT, from MCR panel H11-P927 and H11-P928 to the new PTs, located on the local instrument panel H21-P404 and H21-P405 elevation 158' of the Reactor Building and four conduits (approx. 40' each), one per PT, from the new PTs to the nearest tray. Eleven cables (approx. 100' each) will run between MCR panels H11-P602 and H11-P927. Eleven cables (approx. 50' each) will run between MCR panels H11-P927 and H11-P928.

NARRATIVE DESIGN SUMMARY

SENSOR ACTIVATED SRVs INITIATION

Two Master Trip Units (MTUs) and two Slave Trip Units (STUs) will be added per panel, to the Main Control Room (MCR) panels H11-P927 and H11-P928. Six existing spare relays (per panel) now located in panels H11-P927 and H11-P928 will be used.

Figures 1, 2, and 3 show a simplified logic, P&ID, and elementary. Table A shows each SRV and its function, division, setpoint, and relays used to energize the solenoid in the proposed scheme.

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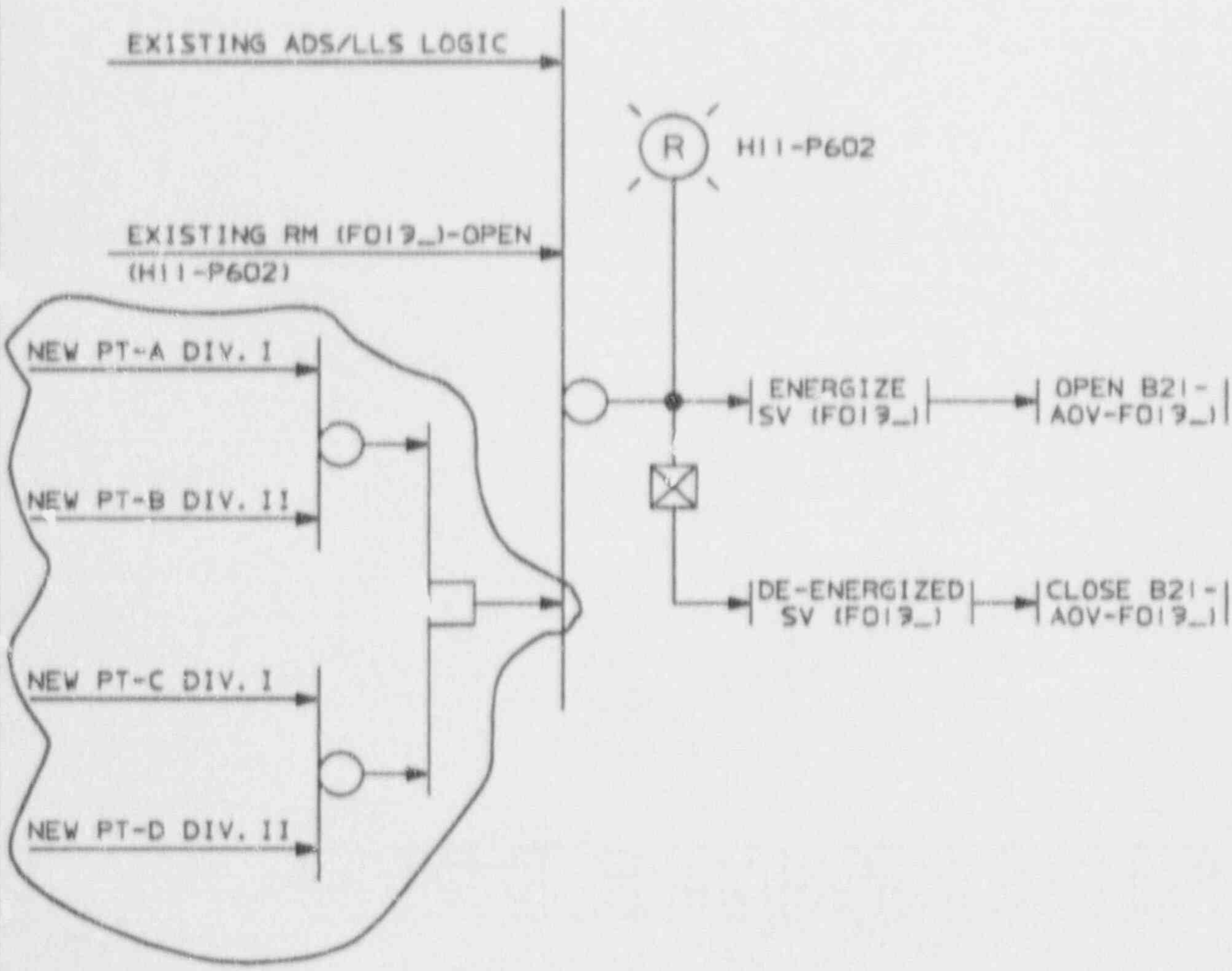
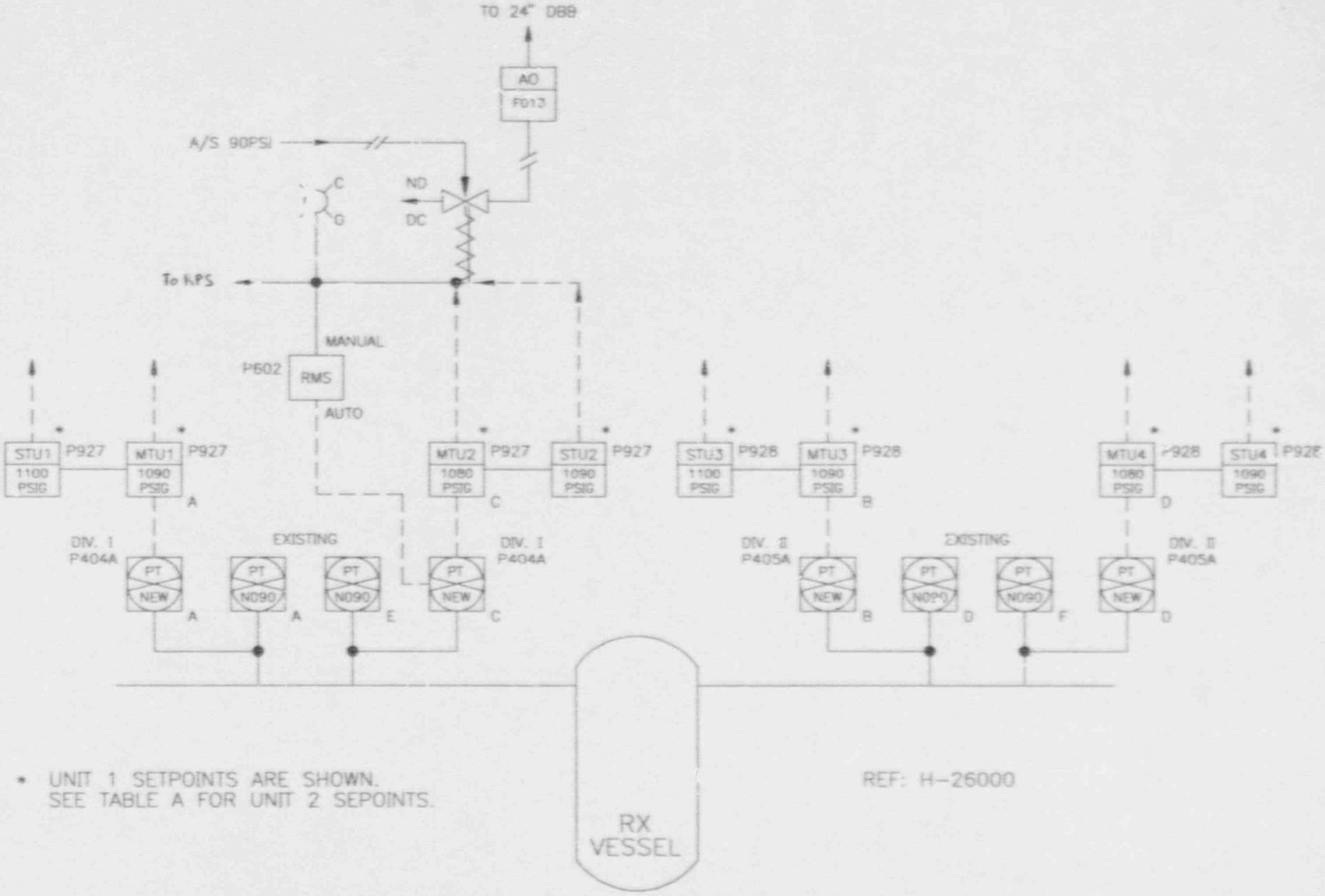
ESS DIV. I & DIV. II SENSORS



1 OUT-OF 2 TAKEN TWICE LOGIC

FIGURE 1

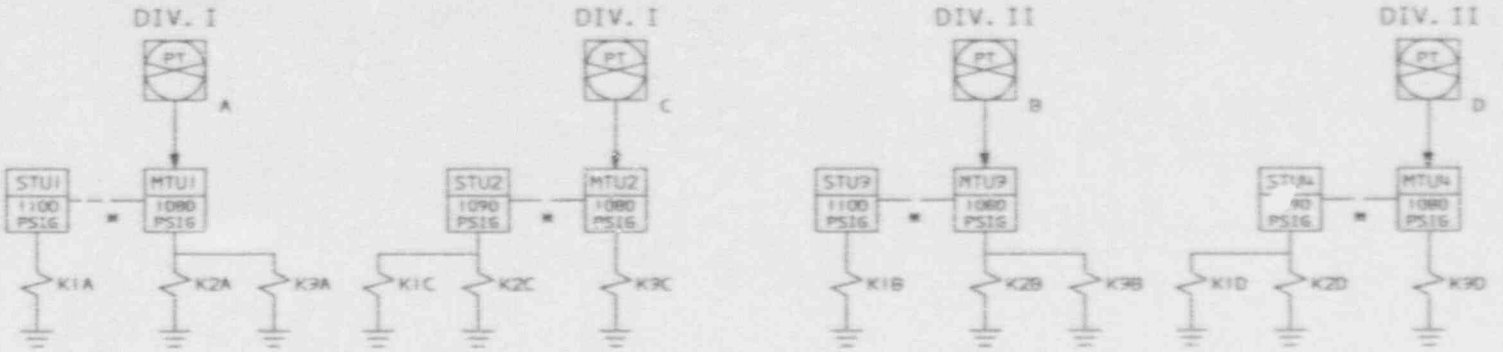


* UNIT 1 SETPOINTS ARE SHOWN.
SEE TABLE A FOR UNIT 2 SEPOINTS.

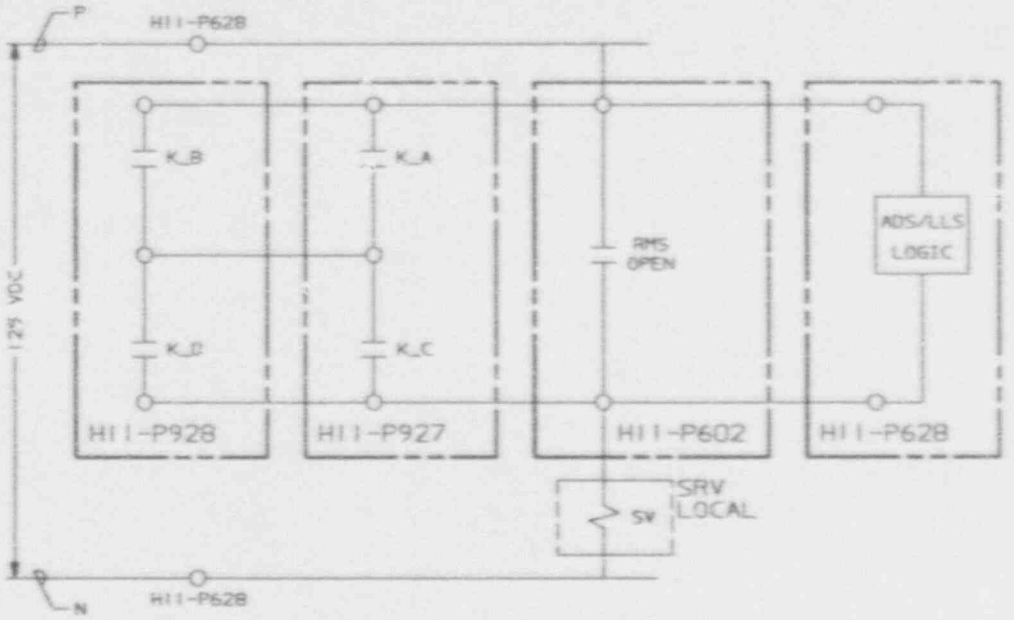
REF: H-26000

1 OUT-OF 2, TAKEN TWICE, LOGIC

DIV. I & DIV. II SENSORS



* UNIT 1 SETPOINTS SHOWN. SEE TABLE A FOR UNIT 2 SETPOINTS.



1 OUT-OF 2 TAKEN TWICE LOGIC
TYPICAL

PREPARED BY: Samuel E. Trotter DATE: 10-2-91

VERIFIED BY: Kyle A Floyd DATE: 10-2-91

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TABLE A

HATCH UNIT 1

VALVE MPL #	FUNCTION	DIV	SET POINT PSIG	RELAYS
B21-F013A	LOW LOW SET	2	1080	K2A, K2B, K3C, K3D
B21-F013B	AUTOMATIC DEPRESSURIZATION	1	1100	K1A, K1B, K2C, K2D
B21-F013C	LOW LOW SET	2	1100	K1A, K1B, K2C, K2D
B21-F013D	AUTOMATIC DEPRESSURIZATION	1	1090	K3A, K3B, K1C, K1D
B21-F013E	AUTOMATIC DEPRESSURIZATION	1	1080	K2A, K2B, K3C K3D
B21-F013F	AUTOMATIC DEPRESSURIZATION	1	1090	K3A, K3B, K1C, K1D
B21-F013G	LOW LOW SET	1	1080	K2A, K2B, K3C, K3D
B21-F013H	LOW LOW SET	1	1090	K3A, K3B, K1C, K1D
B21-F013J	AUTOMATIC DEPRESSURIZATION	1	1100	K1A, K1B, K2C, K2D
B21-F013K	AUTOMATIC DEPRESSURIZATION	1	1090	K3A, K3B, K1C, K1D
B21-F013L	AUTOMATIC DEPRESSURIZATION	1	1080	K2A, K2B, K3C, K3D

HATCH UNIT 2

VALVE MPL #	FUNCTION	DIV	SET POINT PSIG	RELAYS
B21-F013A	AUTOMATIC DEPRESSURIZATION	1	1100	K3A, K3B, K1C, K1D
B21-F013B	LOW LOW SET	1	1090	K2A K2B, K3C, K3D
B21-F013C	AUTOMATIC DEPRESSURIZATION	1	1100	K3A, K3B, K1C, K1D
B21-F013D	LOW LOW SET	2	1090	K2A, K2B, K3C, K3D
B21-F013E	AUTOMATIC DEPRESSURIZATION	1	1110	K1A, K1B, K2C, K2D
B21-F013F	LOW LOW SET	1	1090	K2A, K2B, K3C, K3D
B21-F013G	LOW LOW SET	2	1090	K2A, K2B, K3C, K3D
B21-F013H	AUTOMATIC DEPRESSURIZATION	1	1110	K1A, K1B, K2C, K2D
B21-F013K	AUTOMATIC DEPRESSURIZATION	1	1100	K3A, K3B, K1C, K1D
B21-F013L	AUTOMATIC DEPRESSURIZATION	1	1110	K1A, K1B, K2C, K2D
B21-F013M	AUTOMATIC DEPRESSURIZATION	1	1100	K3A, K3B, K1C, K1D

PREPARED BY: Samuel E. Lutter DATE: 10-2-91

VERIFIED BY: Kyle D. Floyd DATE: 10-2-91

CAD INTERGRAPH KB-04

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ENCLOSURE 2

PLANT HATCH - UNITS 1,2
MRC DOCLETS 50-321, 50-366
OPERATING LICENSES DPR-57, NPF-5
MAIN STEAM SAFETY RELIEF VALVE
PRESSURE SWITCH ACTUATION

10 CFR 50.59 SAFETY EVALUATION

A. SAFETY SYSTEM APPLICABILITY:

The document to which this evaluation applies represents:

1. [X] Yes [ ] No A change to a safety-related equipment or document?
   Basis for answer: The Nuclear Boiler System(B21) Safety Relief Valves(SRV) are safety-related equipment described in the Unit 1 and Unit 2 FSARs. The proposed modification provides non-safety related sensor initiated, one-out-of-two, taken twice, logic to actuate the SRV(s), for Units 1 and 2, at their respective mechanical setpoints. The intent is to minimize the potential for overpressurization of the Nuclear Steam Supply System (NSSS), in each unit.

2. [X] Yes [ ] No A change which could impact safety-related equipment or document?
   Basis for answer: The proposed modification is a non-safety related design that will meet Class 1E equipment and Seismic Class I requirements. The Unit 1 and Unit 2 FSARs will be revised to reflect the added capability provided by this design change.

3. [ ] Yes [X] No A change to a system, structure, or component which handles/controls radiation hazards?
   Basis for answer: The SRV(s) functions and operation do not encompass handling or controlling radioactive effluents.

B. 10CFR50.59 APPLICABILITY:

The document to which this evaluation applies represents:

1. [X] Yes [ ] No A change to the plant as described in the FSAR (i.e., will this change require a revision to some portion of the FSAR?)
   Basis for answer: The proposed modifications provide an electrical signal to open the SRV(s) at the setpoints used to open the valves by mechanical action. Section 4.4 of the Unit 1 FSAR and Section 5.2.2 of the Unit 2 FSAR will be impacted.

2. [ ] Yes [X] No A change to procedures described in the FSAR? (i.e., is the document a safety-related procedure?)
   Basis for answer: This evaluation addresses a design change, and not a procedure change. Any plant procedures impacted by this design change, and requiring revisions, will be evaluated separately.

3. [ ] Yes [X] No A test or experiment not described in the FSAR which affects plant safety?
   Basis for answer: This evalauation addresses a design change, and not a test or experiment.

4. [ ] Yes [X] No A change to the Technical Specifications and/or Environmental Technical Specifications incorporated in the operating license?
   Basis for answer: This is a non-safety related modification intended for use during abnormal plant operation to increase reliability by providing a reliable backup to the NSSS depressurization system. The non-safety related equipment is properly isolated from the safety-related portion of the B21 system, so no malfunction of this new equipment will adversely affect the safety-related operation of the SRV(s). Therefore, since no licensing credit is sought for this modification, no limiting conditions for operation or

surveillance requirements will need to be added to the Technical Specifications. Also, since this modification will not impact the operation of any safety-related system, no change to any existing portion of the Technical Specifications will be required.

IF the answer to all the questions in Sections A and B are "NO", skip section C. IF the answer to any question in section A or B is 'YES", complete section C.

C. UNREVIEWED SAFETY QUESTION CRITERIA:

1. [ ] Yes [X] No Does the proposed activity increase the probability of occurrence of an accident previously evaluated in the FSAR?

   Basis for answer: The proposed modification will not change the existing function of the SRV(s), ADS, or LLS systems. The sensor initiated logic being proposed to electrically activate the SRV(s) is in a one out of two taken twice logic scheme. The worst case failure mode of this proposed logic modification is a short in the logic which causes an inadvertant opening of an SRV, which has previously been analyzed in chapter 15.1-17 of the Unit 2 FSAR. The relays, transmitters and associated hardware for this modification will be procured and installed to the necessary 1E, seismic, environmental and/or design standards to ensure proper isolation from the safety related functions of the SRV(s). These required components will be designated as Class 1E to insure replacements are procured and installed to the same standards. Therefore, the likelihood of an inadvertant SRV opening transient is not significantly increased. Thus, this proposed modification does not increase the probability of occurrence of a previously reviewed accident.

2. [ ] Yes [X] No Does the proposed activity increase the consequences of an accident previously evaluated in the FSAR?

   Basis for answer: Because there is no change to SRV function, there is no increase to the consequences of previously evaluated accident scenarios described in the Unit 1 and 2 FSARs.

3. [ ] Yes [X] No Does the proposed activity increase the probability of occurrence of a malfunction of equipment important to safety previously evaluated in the FSAR?

   Basis for answer: All new hardware proposed by this modification will be procured to meet Class 1E requirements (as appropriate). The new sensor initiated logic is one-out-of-two, taken twice, so a single failure cannot cause inadvertent SRV actuation. Therefore, no increase in the occurrence probability of a previously evaluated equipment malfunction results from the modification. The reliability of the SRV(s) is enhanced by the addition of the proposed modification.

4. [ ] Yes [X] No Does the proposed activity increase the consequences of a malfunction of equipment important to safety previously evaluated in the FSAR?

   Basis for answer: No single failure of the proposed SRV actuation logic will cause the SRV(s) to lift inadvertently, or prevent lifting upon ADS/LLS activation.

5. [ ] Yes [X] No Does the proposed activity create the possibility of an accident of a different type than any previously evaluated in the FSAR?

Basis for answer: The FSAR evaluates pressurization transients and small pipe break LOCA events, in which proper SRV operation is important. One-out-of-two twice taken logic will minimize the potential for inadvertent SRV actuation in case of a false signal, while providing for increased reliability of operation at the design basis setpoints. Thus, no new types of accidents are introduced, as a result of this modification.

6. [ ] Yes [X] No Does the proposed activity create the possibility of a malfunction of equipment important to safety of a different type than any previously evaluated in the FSAR?

Basis for answer: The ESS Division 1 to Division II interface will be isolated by the addition of fuses. Loss of power to the Units 1 and 2 control rooms, via UPS failure, could result in failure of the Master/Slave trip units, installed by this proposed modification. The electrical actuation of the SRV(s) is redundant to the mechanical actuation; therefore, their function is unimpaired. Because of that redundancy, this change does not create the possibility of a malfunction of the SRV(s) beyond that considered in the FSARs.

7. [ ] Yes [X] No Does the proposed activity reduce the margin of safety as defined in the basis for any Technical Specification?

Basis for answer: As the function of the SRV(s), ADS, and LLS systems remain unchanged, and the addition of the electrical actuation logic actually enhances SRV operability and reliability, the margin of safety defined in the basis for Technical Specification is not reduced by the proposed modification. There is no change to Unit 1 and Unit 2 Environmental Technical Specifications. There are no acceptance limits increased or failure points decreased due to this proposed modification.

IF the answer to any of the questions in Section C is "YES", an unreviewed safety question is indicated. Approval from the NRC is required before the document can be used; refer to project procedures for guidance on exceptions to this.

D. TECHNICAL SPECIFICATIONS CONSIDERATIONS:

1. [ ] Yes [X] No Does this document require a change to the Technical Specifications and/or the Environmental Technical Specifications?

Basis for answer: This is a non-safety related modification intended for use during abnormal plant operation to increase reliability by providing a reliable backup to the NSSS depressurization system. As non-safety related equipment, it is properly isolated from the safety-related portion of the Nuclear Boiler System, so that no malfunction of this new equipment will adversely affect the safety-related operation of the system. Therefore, since no licensing credit is taken for the new design, no limiting conditions for operation or surveillance requirements will need to be added to the

Technical Specifications for this modification. Also, since this modification will not impact the operation of any safety-related system, no change to any existing portion of the Technical Specifications will be required.

2. IF a change to the Technical Specifications and/or the Environmental Technical Specifications is required:

   a. Record associated Document Change Request (DoCR) Number: To be determined.

   b. [ ] Yes [ ] No Does the amendment have to be implemented prior to use of the document?

   c. IF the answer to D.2.b was "YES", specify controls on document use:

   d. IF the answer to D.2.b was "NO", tell why it is permissible to use it prior to implementation of the amendment:

Prepared By: Anoop Chauhan, I&C/EQ Date: 12/13/91
Lead Engineer / Discipline

Reviewed By: Jarrah Dajani, I&C/EQ Date: 12-13-91

I Duane Brock Date 12/13/91
C [illegible] Date 12-13-91
E [illegible] Date 12-13-91
M Ed Day Date 12-13-91
NS/PL James P. Jarrell Date 1-3-92