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the southern electric system

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NED-85-528
0270N

July 24, 1985

Director of Nuclear Reactor Regulation
Attention: Mr. John F. Stolz, Chief
Operating Reactors Branch No. 4
Division of Licensing
U. S. Nuclear Regulatory Commission
Washington, D. C. 20555

NRC DOCKET 50-321
OPERATING LICENSE DPR-57
EDWIN I. HATCH NUCLEAR PLANT UNIT 1
REQUEST FOR TECHNICAL SPECIFICATIONS CHANGES TO SUPPORT
COMPLETION OF ANALOG TRANSMITTER TRIP SYSTEM INSTALLATION

Gentlemen:

In accordance with the provisions of 10 CFR 50.90 as required by 10 CFR 50.59(c)(1), Georgia Power Company hereby proposes an amendment to the Edwin I. Hatch Unit 1 Technical Specifications (Appendix A to the Operating License). These changes would account for and support the modifications to plant design associated with the planned final installation of a General Electric Company (GE) Analog Transmitter Trip System (ATTS). Installation and licensing of the ATTS is an integral part of GPC's programs for meeting the requirements of 10 CFR 50.49, NUREG-0737, and NUREG-0661.

The enclosed licensing document entitled "Edwin I. Hatch Nuclear Plant Unit 1, Docket No. 50-321, Additional Revisions Associated with the Installation of the Analog Transmitter Trip System," contains a detailed description of these plant modifications, as well as a complete safety evaluation (as required by 10 CFR 50.59) and a significant hazards review (as required by 10 CFR 50.92). This document also contains the proposed amended Technical Specification pages, along with instructions for incorporation of these changes in the section entitled "Proposed Technical Specifications Revisions."

GPC plans to complete the installation of the Plant Hatch Unit 1 ATTS during the upcoming 1985 refueling outage. We are also considering the replacement of transmitters manufactured by the Barton Instruments Company which are currently installed as a result of our earlier ATTS installation efforts, with equivalent devices manufactured by Rosemount, Inc. This

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transmitter replacement effort would be done on an item by item basis as each individual Barton instrument is retired from service either during or following the upcoming Unit 1 outage. For this reason the proposed Technical Specification changes are designed to conservatively accommodate the use of either Barton or Rosemount transmitters where appropriate, as well as allowing for completion of the ATTS installation.

These proposed changes to the Plant Hatch Unit 1 Technical Specifications have been evaluated by both the Plant Review Board and the Safety Review Board and both groups have determined that these changes would not constitute an unreviewed safety question. The probability of occurrence or the consequences of an accident or malfunction of safety-related equipment would not be increased above those analyzed in the FSAR because no increase in accident probabilities or consequences would be introduced by these changes. The probability of an accident or malfunction of a different type than previously evaluated in the FSAR does not result from these changes because the potential accident scenarios following implementation of these modifications are bounded by the present FSAR analyses. The margin of safety as defined in the Technical Specifications is not reduced by these changes because the proposed new operability limits and surveillance requirements for plant systems are consistent with the present safety margins. More detailed justifications for these conclusions are contained in the enclosure section entitled "Proposed Plant Modifications".

GPC respectfully requests that review of these proposed changes be expedited by the NRC staff to support our efforts to install the remainder of the Plant Hatch Unit 1 ATTS during the refueling outage scheduled to commence on November 30, 1985. We also request that the Technical Specifications amendment be issued in November 1985, with implementation at Plant Hatch no later than the actual restart date for Unit 1. This will allow adequate time for preparation and review of plant procedures to implement these changes during the equipment replacement process. GPC will give top priority to providing any additional information requested during the evaluation process and requests that the NRC contact this office should any questions or concerns arise during the course of that review.

Included with this proposal is a check for $150.00 as required by 10 CFR 170.21.

Georgia Power

Pursuant to the requirements of 10 CFR 50.92, Mr. J. L. Ledbetter of the Georgia Department of Natural Resources will be sent a copy of this letter and all applicable attachments.

J. T. Beckham, Jr. states that he is Vice President of Georgia Power Company and is authorized to execute this oath on behalf of Georgia Power Company, and that to the best of his knowledge and belief the facts set forth in this letter are true.

GEORGIA POWER COMPANY

By: J. T. Beckham, Jr.

Sworn to and subscribed before me this 24th day of July, 1985.

William F. Brown
Notary Public

Notary Public, Georgia, State at Large
My Commission Expires Aug.26, 1986

CBS/mb
Enclosure
xc: Mr. H. C. Nix, Jr.
Senior Resident Inspector
Dr. J. N. Grace, (NRC-Region II)
Mr. J. L. Ledbetter

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I. INTRODUCTION

The Edwin I. Hatch Nuclear Plant-Unit 1 (HNP-1) safety-related system instrumentation upgrade program, which includes incorporation of the analog transmitter trip system (ATTS), comprises many equipment modifications and installations to meet many of the requirements and criteria of:

- IE Bulletin 79-01B, Environmental Qualification of Class 1E Equipment*
- NUREG-0737, TMI Lessons Learned*
- NUREG-0696, Safety Parameters Display System Interfaces*
- NUREG-0661, Low Low Set Trip Logic*.

This submittal covers the remaining design modifications to be incorporated through the installation of ATTS. These modifications will be incorporated into the HNP-1 system logic prior to and during the next refueling outage. At the close of the 1985-1986 refueling outage all ATTS modifications will be complete.

The design modifications incorporated during the 1984 refueling outage are discussed in GPC letters NED-84-436 dated September 5, 1984, NED-84-539 dated October 18, 1984 and NED-84-578 dated November 6, 1984. These modifications were approved by HNP-1 Operating License Amendments 103 and 104.

The purpose of this submittal is to provide the bases for the proposed modifications and to provide Georgia Power Company's (GPC) proposed revisions to the Technical Specifications. Section 3B discusses the proposed surveillance revisions for the installation of ATTS. The proposed plant modifications associated with ATTS are discussed in Section IV.

*Subject shown is not necessarily title of document.

II. REFERENCES

1. Edwin I. Hatch Nuclear Plant Unit 2, Docket No. 50-366, Proposed Plant Modification-Low Low Set Logic and Lowered MSIV Water Level, GPC Letter NED-83-108, Proposal for Technical Specifications Changes Which Support Cycle 4 Startup, February 23, 1983.

2. IE Bulletin 79-01B, Environmental Qualification of Class 1E Equipment.

3. IEEE 323-74, IEEE Standard for Qualifying Class 1E Equipment for Nuclear Power Generating Stations.

4. IEEE 344-75, IEEE Recommended Practices for Seismic Qualification of 1E Equipment for Nuclear Power Generating Stations.

5. NEDC-24346, Evaluation of Mark I S/RV Load Cases C3.2 and C3.3 for Edwin I. Hatch Nuclear Plant - Units 1 and 2.

6. NEDO-21617-A, General Electric Licensing Topical Report, Analog Transmitter/Trip Unit System for Engineered Safeguard Sensor Trip Inputs.

7. NUREG-0588, Revision 1, Interim Staff Position on Environmental Qualification of Safety-Related Electrical Equipment.

8. NUREG-0661, Mark I Containment Long Term Program.

9. NUREG-0626, GE Evaluation of Feedwater Transients and Small Break LOCA in GE-Designed Operating Plants.

10. NUREG-0696, Functional Criteria for Emergency Response Facilities.

11. NUREG-0737, Clarification of TMI Action Plan Requirements.

12. Regulatory Guide 1.105, Instrument Setpoints.

13. Draft Standard Technical Specifications for General Electric Boiling Water Reactor (GE-STS) - BWR/4.

14. WASH-1400, An Assessment of Accident Risks in U.S. Commercial Nuclear Power Plants.

15. GPC Letter, NED-84-017, Request for Technical Specification Changes to Support Analog Transmitter Trip System Installation, January 23, 1984.

16. GPC Letter, NED-84-281, Response to NRC Staff Questions on Proposed ATTS Technical Specification Changes, June 7, 1984.

17. GPC Letter, NED 84-321, Revised Responses to NRC Staff Questions on Proposed ATTS Technical Specification Changes, June 14, 1984.

18. GPC Letter, NED-84-436, Request for Technical Specification Changes to Support Analog Transmitter Trip System Installation, September 5, 1984.

19. GPC Letter, NED-84-539, Revision of Request for Technical Specification Changes to Support Analog Trip System Installation, October 18, 1984.

20. GPC Letter, NED-84-578, Revision of Previous HPCI Pressure Trip Technical Specification Change Proposal for ATTS, November 6, 1984.

III. ANALOG TRANSMITTER TRIP SYSTEM (ATTS) INSTALLATION

This document provides a description of the remaining licensing changes due to the installation of ATTS. It, along with GPC's previous submittals (References 18, 19, and 20), provides a complete description of the ATTS modifications for Plant Hatch-Unit 1.

The information provided in Section 3A of the "Technical Specification Revisions Associated With Installation of Analog Transmiter Trip System" document, enclosed in GPC Letter NED-84-436 (Reference 18), still accurately describes the ATTS system. Therefore, that information will not be provided again in this submittal. The only change to the system, described in the previous Georgia Power submittals to the NRC, is that Rosemount model 1154 transmitters may be installed in place of the Barton 763 or 764 transmitters, which were part of the original design. (For some trip functions Rosemount model 1153 transmitters may be used.) The Rosemounts will be used to replace the Bartons due to their greater operational and maintenance flexibility. The Rosemount transmitters have been evaluated and it was determined that they will function satisfactorily in the ATTS system.

Section 3B discusses the proposed surveillance revisions for the complete ATTS installation. The proposed plant modifications associated with ATTS and their justifications are discussed in Section IV.

3A. ATTS DETAILED DESIGN INFORMATION

This information has been previously provided to the NRC in the enclosure to GPC letter NED-84-436 dated September 5, 1985 (Reference 18).

3B. BASES FOR TECHNICAL SPECIFICATIONS REVISIONS FOR ATTS EQUIPMENT[a]

With the incorporation of the remaining portions of ATTS into the HNP-1 design, two types of Technical Specifications revisions are desirable:

- Nomenclature changes
- Modifications to the surveillance frequency of ATTS equipment.

The bases for the Technical Specifications changes over and above these ATTS changes are included in Section IV.

3B.1 The bases for these changes are as follows:

3B.1.a Nomenclature Changes to the Technical Specifications

The installation of ATTS replaces mechanical switches with transmitters. In the past, the Technical Specifications identified the switches as such under the instrument description. Therefore, the Technical Specifications require a revision to reflect this change.

3B.1.b Modifications of the Surveillance Frequency

As evidenced by NEDO-21617-A and NRC Safety Evaluation Report supporting HNP-1 Operating License Amendment 103, the NRC previously approved the following surveillance frequencies for ATTS equipment:

- Once per shift for channel check
- Once per month for channel functional test
- Once per operating cycle for channel calibration.

The revisions contained in the enclosed proposed changes to the Technical Specifications reflect the above surveillance frequencies.

Additional bases for the surveillance frequency revisions are contained within Chapter 6 of NEDE-22154-1 (contained in Reference 15).

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a. See Appendix 1 (page A1-2) for an 10 CFR 50.92 evaluation of the proposed changes to the Technical Specifications Surveillance requirements.

3C. SUMMARY

From the preceding discussions (including those is Reference 18), it may be concluded that the proposed incorporation of the ATTS equipment into the Plant Hatch design and the proposed nomenclature and surveillance requirement changes to the Technical Specifications do not introduce an unreviewed safety question or a significant hazards consideration. These proposed changes take advantage of the sensor improvements for this new equipment.

IV. PROPOSED PLANT MODIFICATIONS TO BE INCORPORATED INTO THE ATTS DESIGN

4A. INTRODUCTION

Section IV provides the bases for the proposed Technical Specifications revisions, in addition to an overview of the evaluation performed to conclude that the proposed modifications constitute neither an unreviewed safety question, nor a significant hazards consideration.

Within this section three values are discussed: the analytical limit, the trip setpoint/allowable value, and the trip setpoint. A detailed discussion on setpoints is contained in section 4A of the "Proposed Plant Modifications to be Incorporated into ATTS design" document submitted to the NRC as an enclosure to GPC letter NED-84-436 dated September 5, 1984 (Reference 18).

4B. SAFETY EVALUATION REPORT

4B.1 RCIC Turbine Exhaust Pressure Trip Setpoint Modification (E51-N656A,C)

The proposed Technical Specifications trip setpoint/allowable value for the RCIC turbine exhaust trip is 45 psig. The justification for increasing the trip setpoint/allowable value from 25 psig to 45 psig is detailed in NEDC-30136 (Appendix 2).

The objective of changing the setpoint is to increase RCIC availability during small-break LOCAs. Raising the setpoint allows a longer period of RCIC operation before its turbine is tripped off by high pressure in the primary containment caused by a LOCA. The original design did not intend RCIC to be operational during LOCA conditions. Even though this system is not required for satisfactory core cooling during an accident, the additional reactor water makeup capacity makes a positive contribution towards safety. The actual Plant Hatch trip setpoint will take into consideration instrument drift.

As justified in Appendix 2, this modification does not constitute an unreviewed safety question. No surveillance frequencies are affected by this modification; and with the exception of the setpoint modification itself, the LCO remains unchanged. Appendix 1 (page A1-3) provides the results of the significant hazards review.

4B.2 Deletion of Drywell Pressure Sensors E11-N011A,B,C,D

The original design of Plant Hatch has the high drywell pressure signals for ECCS coming from eight sensing devices. For example, E11-N011A,B,C,D (existing MPL numbers) provide signals to RHR, core spray, and HPCI; E11-N010A,B,C,D (existing MPL numbers) provide signals to the automatic depressurization system (ADS). This configuration is inconsistent with the inputs for reactor water levels 1 and 2 inputs which are provided by only four sensing devices, namely B21-N031A,B,C,D (existing MPL numbers). To make drywell pressure sensor configuration consistent with water levels 1 and 2 sensors, drywell pressure sensors E11-N010A,B,C,D can be used to provide signals for all four systems of ECCS and still maintain single-failure criteria. Furthermore, this change should increase the reliability of the drywell pressure trip logic for ECCS due to the reduced number of sensors which could potentially fail. Plant safety margin is not being reduced since the level of sensor redundancy for each trip function is maintained.

This change deletes instruments E11-N011A,B,C,D and transfers their associated trip function to instruments E11-N010A,B,C,D. Since these instruments (E11-N010A,B,C,D) are being incorporated into the ATTS modification, the instrument number was changed to E11-N694A, B,C,D.

The proposed Technical Specifications revision changes the Remarks column of tables 3.2-4, 3.2-5, and 3.2-6 to include all the functions of drywell sensors E11-N694A,B,C,D. As a result of the above discussion, this modification constitutes neither an unreviewed safety question, nor a significant hazards consideration. Appendix 1 (page A1-4) provides the results of the significant hazards review.

4B.3 Post-Accident Monitoring Instrument Modifications

The reactor vessel water level, shroud water level and reactor pressure post-accident monitoring instruments all receive input from ATTS instruments. Because of this the existing recorders and indicators are being replaced with qualified class 1E devices compatible with ATTS. Two new recorders are also being added.

The new recorders (1B21-R634A,B) will monitor reactor vessel water level with a -150" to +60" range and reactor pressure with a 0 to 1500 psig range. The reactor pressure function of these recorders replaces the feedwater control system instrumentation which previously provided reactor pressure indication. The reactor water level indicators (1B21-N604A,B) will have a range of -150" to +60" and the shroud water level recorder (1B21-R615) and indicator (1B21-R610) will have a range of -317" to -17". As a result of these changes in instrument ranges, Table 3.2-11 of the Technical Specifications has been revised.

In addition it is also proposed that the calibration frequency of these instruments be revised. The Technical Specifications currently require a 6 month calibration frequency. Since the definition of calibration in the Unit 1 Technical Specifications requires the entire loop to be calibrated, the ATTS transmitters and trip units as well as the monitoring instruments are required to be calibrated once per 6 months. However, the ATTS instruments are only required to be calibrated once per operating cycle. Therefore, it is proposed to require the entire loop to be calibrated once per operating cycle, but also require the recorders themselves to be calibrated once per 12 months. The 12 month interval is the manufacturer's recommended calibration frequency, in the instrument manual, to maintain the specified accuracy in a mild environment (i.e., main control room). The manufacturer's recommended calibration frequency for the indicators is once per five years and since an operating cycle is well within this time period, a specific calibration frequency is not specified for the indicators. It should also be noted that the proposed change is conservative with respect to the Standard Technical Specifications which require calibration once per 18 months.

Since the proposed surveillance requirement takes advantage of the superior ATTS instrumentation, while maintaining current instrument accuracies, and the revisions to the instrument ranges merely updates information, these modifications do not introduce an unreviewed safety question or significant hazards consideration. Appendix 1 (page A1-5) provides the results of the significant hazards review.

4B.4 Trip Setpoint/Allowable Value Modifications for Rosemount Transmitters

This change proposes to revise the trip setpoint/allowable values of the reactor vessel water levels 1, 2 and 3; shroud water level and reactor steam dome pressure low instruments. The original design of ATTS provided for the use of Barton model 764 transmitters for these trip functions and Barton model 764 transmitters were installed for these trip functions during the last Unit 1 refueling outage (1984). However, Georgia Power has decided to replace the Barton transmitters through attrition, with Rosemount model 1154 transmitters, because the Rosemount transmitters offer greater operational and maintenance flexibility. Therefore, new trip setpoint/allowable values are proposed so that either model transmitters can be installed in the plant without requiring Technical Specification changes on a case by case basis. The proposed trip setpoint/allowable values were calculated using the criteria of Regulatory Guide 1.105 and the specifications of both the Barton and Rosemount transmitters. The methodology used to determine the setpoints was previously approved, by the NRC, for Plant Hatch Unit 1 in the safety evaluation included with Operating License Amendment 103. The analytical limits and trip setpoint/allowable values for these instruments are listed below. The designated trip setpoint for the plant will take into consideration instrument drift.

Trip Function	Analytical Limit	Trip Setpoint/ Allowable Value
Reactor Vessel Water Level 1 (B21-N681A,B,C,D ; B21-N691A,B,C,D)	-152.5 inches	-113 inches
Reactor Vessel Water Level 2 (B21-N682,A,B,C,D; B21-N692A,B,C,D)	-58 inches	-47 inches
Reactor Vessel Water Level 3 (B21-N680A,B,C,D; B21-N695A,B,C,D)	7.5 inches	10.0 inches
Reactor Shroud Water Level 0 (B21-N685A,B)	-211 inches	-202 inches
Reactor Vessel Steam Dome Pressure Low (B21-N690E,F; B21-N641B,C)	300 psig	335 psig

Since the trip setpoint/allowable values were calculated using approved methodology and are more conservative than the present values with respect to the analytical limits, this change does not constitute an unreviewed safety question or a significant hazards consideration. Appendix 1 (page A1-6) provides the results of the significant hazards review.

4B.5 Reactor Steam Dome Pressure Permissive for CS and LPCI Modification (1B21-N690A,B,C,D)

This change proposes to delete the upper bound limit of 500 psig for the reactor vessel steam dome pressure permissive for the CS and LPCI injection valves. The current Technical Specifications have both an upper and lower analytical limit for this trip function. The upper bound limit of 500 psig was originally in the Technical Specifications to provide overpressurization protection for the RHR system. However, an upper analytical limit for this instrument is not required, because opening of the LPCI injection valve (F015A,B) will not lead to system overpressurization for the following reasons:

1. Consistent with the Plant Hatch licensing basis, the air-operated check valves (F050A,B) are assumed to be constantly available for providing the isolation function. These check valves use only reactor system pressure to close and do not require external power to stay closed. The air operation is to facilitate testing of the valves. There is not single active mechanical failure that will cause these valves to stay open.

2. The low pressure piping for the RHR system is equipped with relief valves (F025A,B) to accommodate any possible leakage from the isolation valves. Thus if the F050A,B valves do develop leaks, the excessive pressure will be relieved through valves F025A,B.

3. The injection valves (F015A,B) will open if any LOCA signal is present and after the reactor pressure has been depressurized to this setpoint, which is significantly lower than the normal reactor pressure. The concurrent signal requirements are intended to minimize the potential for inadvertent valve opening during normal power operation. During normal power operation the F015A,B valves also serve as the redundant isolation valves to the F050A,B valves for the reactor pressure boundary. During accident conditions the LPCI takes precedence and demands the F015A,B valves to open. The transient time at a pressure slightly above the minimum design pressure of the low pressure piping is relatively short. The air-operated check valves and the relief valves are capable of providing adequate overpressure protection during this short period in an accident.

The lower analytical limit of 425 was chosen to provide adequate margin to ensure that RHR and CS are operating as the reactor pressure drops during LOCA conditions. The trip setpoint/allowable value of 460 was developed using the criteria of Regulatory Guide 1.105 and the specifications of both the Barton and Rosemount transmitters. The designated trip setpoint for the plant will take into consideration instrument drift.

Therefore, this change does not constitute an unreviewed safety question or a significant hazards consideration. Appendix 1 (page A1-7) provides the results of the significant hazards review.

4B.6 Trip Function Identification Modifications

Several of the trip function descriptions were revised to correspond with the HNP-2 Technical Specifications and in some cases to the Standard Technical Specifications. Since these modifications are editorial in nature, an unreviewed safety question is not introduced, nor is a significant hazards consideration. Appendix 1 (page A1-8) provides the results of the significant hazards review.

4.B.7 Miscellaneous Trip Setpoint/Allowable Value Modifications

4.B.7.a. Calculations were performed to determine the new setpoint value for the remaining ATTS instruments to be installed. The setpoint calculations were made using the criteria of Regulatory Guide 1.105. The methodology used was approved by the NRC, for the ATTS, in the safety evaluation included with Operating License Amendment 103. The Plant Hatch analytical limits were used (where applicable) to develop the allowable values and trip setpoints. Unless identified in the text, the analytical limits used to develop these setpoints are the values used in the design basis of Plant Hatch. The values that are proposed to be inserted into the Technical Specifications are the calculated allowable values. The setpoints used at Plant Hatch will take into consideration instrument drift and will be developed from the allowable values. The allowable values and trip setpoints were developed using the specifications of the Barton 763 or 764 and Rosemount 1154 transmitters so that either model transmitter could be installed without requiring a revision to the Technical Specifications. (except for the drywell pressure instruments which have Rosemount specific setpoints). The proposed Technical Specifications revisions include modifications of the trip setpoints/allowable values for the following instruments:

RPS Trip Function	Trip Unit MPL No.
1. Main steam line flow - high	B21-N686A,B,C,D B21-N687A,B,C,D B21-N688A,B,C,D B21-N689A,B,C,D
2. Main steam line tunnel temperature - high	B21-N623A,B,C,D B21-N624A,B,C,D B21-N625A,B,C,D B21-N626A,B,C,D
3. Reactor vessel steam dome pressure - low permissive	B31-N679A,D
4. Drywell pressure - high	C71-N650A,B,C,D
5. RWCU area temperature - high	G31-N662A,D,E,H,J,M
RWCU area ventilation differential temperature - high	G31-N663A,D,E,H,J,M G31-N661A,D,E,H,J,M (no trip)

ECCS Trip Function	Trip Unit MPL No.
1. Drywell pressure - high	E11-N694A,B,C,D
2. RHR pump discharge pressure - high	E11-N655A,B,C,D E11-N656A,B,C,D
3. RHR pump flow - low	E11-N682A,B
4. Core spray pump discharge pressure - high	E21-N655A,B E21-N652A,B
5. Core spray pump discharge flow - low	E21-N651A,B
6. HPCI steam supply pressure - low	E41-N658A,B,C,D
7. HPCI pump discharge flow - high, low	E41-N651
8. HPCI pump suction pressure - low	E41-N653
9. HPCI turbine exhaust diaphragm pressure - high	E41-N655A,B,C,D
10. Suppression chamber water level - high	E41-N662B,D
11. HPCI turbine exhaust pressure - high	E41-N656B,D
12. HPCI emergency area cooler ambient temperature - high	E41-N670A,B
13. RCIC pump discharge flow - high, low	E51-N651
14. RCIC pump suction pressure - low	E51-N683
15. RCIC steam supply pressure - low	E51-N658A,B,C,D
16. RCIC turbine exhaust diaphragm pressure - high	E51-N685A,B,C,D

ECCS Trip Function	Trip Unit MPL No.
17. RCIC steam line differential pressure - high	E51-N657A,B (-) E51-N660A,B (+)
18. Suppression chamber ambient temperature - high	E51-N666A,B,C,D
Suppression chamber differential temperature - high	E51-N663A,B,C,D (no trip) E51-N664A,B,C,D (no trip) E51-N665A,B,C,D
19. RCIC emergency area cooler ambient temperature - high	E51-N661A,B

4B.7.b The bases for these proposed changes are as follows:

4B.7.b.1 Setpoint Bases for Trip Functions Assigned to Reactor Protection System (RPS) Cabinets

1. Main steam line flow - high (B21-N686A,B,C,D; B21-N687A,B,C,D; B21-N688A,B,C,D; B21-N689A,B,C,D)

   The analytical limit of 120 psid corresponds to 140 percent of rated flow. The 140 percent of rated flow is used as an input to the high-energy line break (HELB) calculations. The trip setpoint/allowable value of ≤ 138 percent of rated flow (≤ 115 psid) was developed using the criteria of Regulatory Guide 1.105. The designated trip setpoint for the plant will take into account instrument drift.

2. Main steam line tunnel temperature - high (B21-N623A,B,C,D; B21-N624A,B,C,D; B21-N625A,B,C,D; B21-N626A,B,C,D)

   The analytical limit of 200°F was designed to detect a small steam line break. In addition, it provides early isolation of the main steam line to meet 10 CFR 100 requirements. The trip setpoint/allowable value of ≤ 194°F was developed using the criteria of Regulatory Guide 1.105. The designated trip setpoint for the plant will take into account instrument drift.

3. Reactor vessel steam dome pressure - low permissive (B31-N679A,D)

   The trip function provides the low-pressure permissive signals to the RHR shutdown cooling mode loops. The analytical limit of 162 psig was determined based on plant-specific RHR system piping design and layout. The trip setpoint/allowable value of ≤ 145 psig was developed using the criteria of Regulatory Guide 1.105. The designated trip setpoint for the plant will take into account instrument drift. Two new recorders with a range of 0-1500 psig, will be added to monitor reactor pressure.

4. Drywell pressure - high (C71-N650A,B,C,D)

   The value used as the analytical limit for this RPS scram function is 2.0 psig. The trip setpoint/allowable value of ≤ 1.92 was developed using the criteria of Regulatory Guide 1.105. This value is only applicable for Rosemount transmitters. The designated trip setpoint for the plant will take into consideration instrument drift.

5. RWCU area temperature - high (G31-N662A,D,E,H,J,M)
RWCU area ventilation differential temperature - high (G31-N663A,D,E, H,J,M) (G31-N661A,D,E, H,J,M)

The leak detection system uses ambient and differential temperatures to detect small high-temperature leaks. The present design for this system uses a value of 130°F for the RWCU room outlet ambient temperature and 75°F for the RWCU area differential temperature.

The trip setpoint/allowable values of ≤ 124°F for the RWCU ambient temperature trip and ≤ 67°F for the RWCU differential temperature trip were developed using the criteria of Regulatory Guide 1.105.

4B.7.b.2 Setpoint Basis for Trip Functions Assigned to ECCS Cabinets

1. Drywell pressure - high (E11-N694A,B,C,D)

The value used for the analytical limit for the ECCS function is 2.0 psig. The trip setpoint/allowable value of ≤ 1.92 psig was developed using the criteria of Regulatory Guide 1.105. This value is only applicable for Rosemount transmitters. The designated trip setpoint for the plant will take into consideration instrument drift.

2. RHR pump discharge pressure - high (E11-N655A,B,C,D; E11-N656A,B,C,D)

These instruments provide the RHR pump high-pressure permissive signal for ADS. This ADS interlock which senses if low-pressure ECCS pumps are running is not a direct input to the ECCS calculations; however, correct operation of the interlock is an analytical assumption. To avoid any false indication during an accident, the trip setpoint should be above the suction relief valve setpoint of approximately 100 psig. The range of the analytical limit is between 100 and 150 psig.

Selecting 100 psig as the lower bound for the analytical limit, the trip setpoint/allowable value of ≥ 112 psig was developed using the criteria of Regulatory Guide 1.105. The designated trip setpoint for the plant will take into consideration instrument drift.

This setpoint is listed on Technical Specifications table 3.25, Instrumentation Which Initiates or Controls the LPCI Mode of RHR, and table 3.24, Instrumentation Which Initiates or Controls ADS. To eliminate this unnecessary redundancy, the trip setpoint is being deleted from table 3.25, since this permissive function has no direct effect on LPCI operation.

3. RHR pump flow - low (E11-N682A,B)

This instrumentation is intended for RHR pump protection. It opens the LPCI minimum flow line upon receipt of a low flow signal from both pumps and closes the LPCI minimum flow line when a signal from either pump is not present. The normal RHR pump flowrate in the injection mode is approximately 8000 gal/min. not used in either transient or ECCS calculations, the analytical limit of 1350 gal/min was established. This analytical limit takes into account the maximum unbalance predicted by the manufacturer's test results and a minimum flow of 400 gal/min through each pump needed to protect the pump from overheating. The trip setpoint/allowable value of ≥ 1670 gal/min was developed using the criteria of Regulatory Guide 1.105. The designated trip setpoint for the plant will take into consideration instrument drift. The trip setpoint/allowable value provides more protection than the present setpoint at HNP-1.

4. Core spray pump discharge pressure - high (E21-N655A,B; E21-N652A,B)

The core spray pump discharge pressure - high trip is part of the ADS interlock function. The setpoint of this trip is not used as input to any transient or safety analysis. To avoid a false indication during an accident, this ADS permissive function should be set above the suction relief valve setpoint. To assure this, the analytical limit was conservatively selected to be at ≥ 125 psig. The trip setpoint/allowable value of ≥ 137 psig was developed using the criteria of Regulatory Guide 1.105. The designated trip setpoint for the plant will take into consideration instrument drift.

This trip setpoint is listed on Technical Specifications table 3.26, Instrumentation Which Initiates or Controls Core Spray, and table 3.24, Instrumentation Which Initiates or Controls ADS. To eliminate this redundancy, the trip setpoint is being deleted from table 3.26, since this permissive has no direct effect on core spray operation.

5. Core spray pump discharge flow - low (E21-N651A,B)

The intent of this trip function is to protect the core spray pump by opening the minimum flow valve if the core spray system flow is below the setpoint. The analytical limit of 475 gal/min is a historical value which is currently used as the trip setpoint/allowable value at HNP-1. The ATTS trip setpoint/allowable value of ≥ 610 gal/min was developed using criteria of Regulatory Guide 1.105. The designated trip setpoint for the plant will take into consideration instrument drift. This trip setpoint will provide more margin than the current trip setpoint of 475 gal/min.

6. HPCI steam supply pressure - low (E41-N658A,B,C,D)

This trip function is intended to prevent HPCI turbine stall and possible HPCI turbine damage. The signal of low HPCI steam line pressure will close the HPCI isolation valve and trip the HPCI turbine. Even though the HPCI design specification provides for HPCI operability down to 150 psig, it is desirable to operate HPCI to as low a steam pressure as allowable. It has been determined that the use of an allowable value of ≥ 100 psig will prevent the possibility of damage to the HPCI equipment due to turbine stall. The designated trip setpoint for the plant will take into consideration instrument drift.

7. HPCI pump discharge flow - high, low (E41-N651)

This instrumentation controls the HPCI minimum bypass flow line to the suppression chamber. If the flow is less than or equal to a lower limit, the bypass valve opens when the pressure permissive signal is present. If the flow is equal to or greater than an upper limit, the bypass valve closes. The intent of this function is to protect the HPCI pump from runout. Since this HPCI pump protective function is not analyzed in the FSAR, the analytical limits of 500 gal/min and 800 gal/min are established based on engineering judgment and operating experience.

The trip setpoints/allowable values of ≤ 605 gal/min and ≥ 870 gal/min were developed using the criteria of Regulatory Guide 1.105. The designated trip setpoint for the plant will take into consideration instrument drift.

8. HPCI pump suction pressure - low (E41-N653)

The intent of this trip function is to protect the pump from cavitation due to pump suction loss. (An alarm has also been added to warn the operator when the pump suction pressure is low enough to cause cavitation.) Since this trip function was not analyzed in the FSAR, the analytical limit of 15" Hg vacuum was established on engineering judgment and operating experience. The trip setpoint/allowable value of ≤ 12.6-in. Hg vacuum was developed using the criteria of Regulatory Guide 1.105. The designated trip setpoint for the plant will take into consideration instrument drift.

9. HPCI turbine exhaust diaphragm pressure - high (E41-N655A,D)

The trip setpoint for this instrumentation shall be low enough such that when the rupture disc blows, the transmitter/trip unit will activate immediately, causing isolation of the HPCI system, yet high enough such that atmospheric variations will not cause unnecessary HPCI isolation. This isolation minimizes steam releases to the secondary containment. Since this trip function is not directly considered in any safety or transient analysis performed for the FSAR, no analytical limit is available.

An allowable value of ≤ 20 psig was determined to be adequate in preventing turbine stall. Also, since high-pressure conditions only occur when the diaphragm is ruptured, an abnormally high-pressure condition at the turbine exhaust is always detected by these pressure switches with an allowable value of 20 psig. The trip used for the instruments at the plant will take into consideration instrument drift using the criteria of Regulatory Guide 1.105.

10. Suppression chamber water level - high (E41-N662B,D)

The purpose of this trip function is to transfer the HPCI suction from the plant condensate storage tank to the suppression chamber when the water in the suppression chamber rises above a predetermined level.

Although no analytical limit is developed for this function, the requirements of the Mark I Long-Term Program have been considered. The trip setpoint was developed to minimize undesirable trips.

The allowable value of ≤ 154.2 in. with respect to torus invert was determined by adding the design drift allowance to the trip setpoint.

11. HPCI turbine exhaust pressure - high (E41-N656B,D)

The intent of this trip function is to protect the HPCI turbine casing which is rated at 150 psig. Although this trip function is not directly used as an input to the ECCS analysis, it serves as an important function to prevent potential HPCI turbine casing rupture. The analytical limit for this trip function is, therefore, set at 150 psig.

The trip setpoint/allowable value of ≤ 146 psig was developed using the criteria of Regulatory Guide 1.105. The designated trip setpoint for the plant will take into consideration instrument drift.

12. HPCI emergency area cooler ambient temperature - high (E41-N670A,B)

The leak detection system uses ambient temperature elements to detect any small high-temperature leaks. This trip function provides a signal to trip the HPCI turbine and closes the HPCI isolation valves. The present design for this system uses a value of 175°F for the analytical limit to isolate the HPCI equipment. The trip setpoint/allowable value of ≤ 169°F was developed using the criteria of Regulatory Guide 1.105. The designated trip setpoint for the plant will take into consideration instrument drift.

13. RCIC pump discharge flow - low/high (E51-N651)

This instrumentation controls the RCIC minimum flow bypass valve to the suppression chamber. If the RCIC flow is less than 40 gal/min, the bypass valve opens to protect the pump. If the RCIC flow exceeds 80 gal/min, the bypass valve closes to ensure RCIC injection into the vessel. The analytical limits of 40 gal/min and 80 gal/min are established based on operating experience. The low-flow limit is approximately 10 percent of rated to assure adequate pump protection; the high-flow limit is 20 percent of rated to assure RCIC flow is initiated.

The trip setpoints/allowable values of ≤ 53 gal/min and ≥ 87 gal/ min were developed using the criteria of Regulatory Guide 1.105. The designated trip setpoint for the plant will take into consideration instrument drift.

14. RCIC pump suction pressure - low (E51-N683)

The intent of this trip function is to assure RCIC pump suction availability and protect the pump from cavitation. (An alarm has been added to warn the operator when the pump suction pressure is low enough to cause cavitation.) Since this trip function is not analyzed in the FSAR, the analytical limit of 15-in. Hg vacuum is established, based on engineering judgment and operating experience. The trip setpoint/allowable value of ≤ 12.6-in. Hg vacuum was developed using the criteria of Regulatory Guide 1.105. The designated trip setpoint for the plant will take into consideration instrument drift.

15. RCIC steam supply pressure - low (E51-N658A,B,C,D)

Per the Unit 1 Technical Specifications, the RCIC system is only required to operate down to 150 psig, but the system is capable of operating at lower pressures. The intent of this trip function is to prevent RCIC turbine stall at low reactor pressure. An allowable value of ≥ 60 psig was determined to be adequate in preventing turbine stall. The trip setpoint used for the instruments at the plant will take into consideration instrument drift using the criteria of Regulatory Guide 1.105.

16. RCIC turbine exhaust diaphragm pressure - high (E51-N685A,B,C,D)

The bases for the trip setpoint/allowable value of ≤ 20 psig are identical to that for the HPCI turbine exhaust diaphragm pressure - high trip provided in item 15.

17. RCIC steam line differential pressure - high (E51-N660A,B; E51-N657A,B)

The purpose of this instrumentation is to detect RCIC steam line breaks and to isolate any such break to confine the resulting radioactivity release and limit the reactor inventory loss. The HELB analysis assumes that the RCIC turbine trips and the system isolates at 300 percent of rated flow. However, the HELB analysis is used for guillotine breaks which have flows several times higher than 300 percent of rated flow.

Initially, the setpoints were derived for this trip function using an analytical limit of 300 percent of rated flow and Regulatory Guide 1.105 methodology. The resulting setpoints resulted in an operability concern for GPC due to past experience with the RCIC system at Plant Hatch. Since the setpoints currently being used by the plant were historically known to provide for satisfactory system operation, a required analytical limit was derived from the Plant Hatch existing setpoints using Regulatory Guide 1.105 methodology. This analytical limit was 314 percent of rated flow.

An analysis was performed to assure the acceptability of the new analytical limit. It was determined that for extremely large breaks, the operation of this trip function is almost instantaneous and the difference in isolation time between 300 percent and 314 percent of rated flow is negligible. For smaller breaks where there may be a noticeable difference in time due to the new analytical limit, the leakage detection system (which is the primary protection for smaller breaks) still would provide adequate isolation with less inventory loss and less peak room temperature than the inventory loss and peak room temperature predicted in the HELB guillotine break case.

Using this technique, an allowable value of 306 percent of rated flow was developed.

18. Suppression chamber ambient temperature - high (E51-N666A,B,C,D)
Suppression chamber differential temperature - high (E51-N665A,B,C,D; E51-N663A,B,C,D; E51-N664A,B,C,D)

The leak detection system uses ambient and differential temperature sensors to detect small high-temperature leaks. The present design for this system uses a trip value of 175°F for the suppression chamber ambient temperature - high and 50°F for the suppression chamber differential temperature - high. The new trip setpoint/ allowable values of ≤ 169°F for the ambient temperature and ≤ 42°F for the differential temperature were developed using the criteria of Regulatory Guide 1.105. The designated trip setpoint for the plant will take into consideration instrument drift.

19. RCIC emergency area cooler ambient temperature - high (E51-N661A,B)

The leak detection system uses ambient temperature elements to detect any small high-temperature leaks and provides a signal to trip the RCIC turbine and close the RCIC isolation valves. The present design uses a trip value of 175°F for providing the intended RCIC isolation function. The trip setpoint/allowable value of ≤ 169°F was developed using the criteria of Regulatory Guide 1.105. The designated trip setpoint for the plant will take into consideration instrument drift.

4B.7.c Conclusion

For the trip functions identified in this section, the analytical limits presented are such that neither transient nor safety analysis results documented in the FSAR are adversely affected. The uncertainities associated with instrument accuracy, calibration, and drift are considered in the setpoint determination. Therefore, it is concluded that the proposed instrumentation setpoint changes do not reduce the margin of safety of the current Technical Specifications, or change the FSAR setpoint bases and, therefore, constitute neither an unreviewed safety question as defined in 10 CFR 50.59, nor a significant hazards consideration as described in 10 CFR 50.92. Appendix 1 (page A1-9) provides the results of the significant hazards review.

V. SUMMARY

It can be concluded from the discussions of the preceding sections that the modifications do not introduce an unreviewed safety question, nor a significant hazards consideration. The upgrade program is designed to:

- Improve plant safety
- Reduce instrument drift LERs
- Increase plant reliability and availability
- Aid in meeting the requirements of IE Bulletin 79-01B, NUREG-0737, NUREG-0696, and NUREG-0661.

This submittal provides an overview of the evaluation and the justification for the proposed ATTS and the associated plant modifications to be incorporated into the Plant Hatch design during the 1985 refueling outage. The proposed Technical Specifications revisions are included in Section VI of this document.