UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D. C. 20555

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

SUPPORTING AMENDMENT NO. 88 TO

FACILITY OPERATING LICENSE NPF-5

GEORGIA POWER COMPANY
OGLETHORPE POWER CORPORATION
MUNICIPAL ELECTRIC AUTHORITY OF GEORGIA
CITY OF DALTON, GEORGIA

EDWIN I. HATCH NUCLEAR PLANT, UNIT 2

DOCKET NO. 50-366

1.0 INTRODUCTION

By submittal dated March 20, 1987, (Reference 1) the Georgia Power Company proposed Technical Specification changes to permit a temporary increase in the Edwin I. Hatch Nuclear Plant Unit 2 main steam line high radiation scram and isolation setpoints to facilitate the testing of hydrogen addition water chemistry. The addition of hydrogen to BWR reactor coolant has been shown to reduce problems associated with intergranular stress corrosion cracking of the stainless steel piping. These proposed changes are necessary since, on the basis of prior experience at Hatch Unit 1, it is anticipated that main steam line radiation levels may increase by a factor of three to eight during the tests over the routinely experienced dose rates. In addition, the changes would correct a typographical error in Table 3.3.6.7-1 of the Technical Specifications.

Receipt of the March 20, 1987 amendment request was noticed in the Federal Register on July 15, 1987 (52 FR 26586). That notice described the changes requested by the licensee and discussed the basis for a proposed no significant hazards consideration determination.

Since that time, the NRC staff has had several telephone conversations with representatives of the licensee, primarily pertaining to the results of the hydrogen addition tests that previously had been approved for Hatch Unit 1. A November 23, 1987 submittal from the licensee (Reference 2) provides information regarding the higher in-plant radiation levels that have been measured during the Unit 1 hydrogen addition tests, confirms that the guidelines of the Electric Power Research Institute (EPRI) for installation of BWR hydrogen water chemistry have been followed for Unit 2, and corrects an erroneous reference to a Technical Specification table.

The November 23, 1987 submittal does not change the licensee's March 20, 1987 original request and does not in any way affect the NRC staff's proposed finding of no significant hazards consideration.

2.0 EVALUATION

2.1 High Radiation Scram and Isolation Setpoints

The Main Steam Line Radiation Monitors (MSLRMs) provide reactor scram and reactor vessel and primary containment isolation signals upon detection of high activity levels in the main steam lines. Additionally, these monitors serve to limit radioactivity releases in the event of fuel failures. The proposed Technical Specification changes (to Tables 2.2.1-1, 3.3.1-1, 3.3.2-1, 3.3.2-2, 3.3.6.7-1 and 3.3.6.7-2) would allow adjustments to the normal background radiation level and associated trip setpoints for the MSLRMs at reactor power levels greater than 20% rated power. The adjustments are needed to accommodate the expected increase in main steam activity levels as a result of hydrogen injection into the primary system. This is primarily due to increased nitrogen-16 (N-16) levels in the steam phase.

The licensee states that the only transient or postulated accident which takes credit for the main steam line high radiation scram and isolation signals is the control rod drop accident (CRDA). The staff notes that for a CRDA, the MSLRMs' primary function is to limit the transport of activity released from failed fuel to the turbine and condensers by initiating closure of the main steam isolation valves and thus isolating the reactor vessel. Main steam line high radiation will also produce a reactor scram signal (reactor scram in the event of a CRDA, however, would be initiated by signals from the Neutron Monitoring System) and will isolate the mechanical vacuum pump and the gland seal steam exhaust system to reduce leakage of fission products to the atmosphere from the turbine and condensers.

Generic analyses of the consequences of a CRDA have shown that fuel failures are not expected to result from a CRDA occurring at greater than 10% power. As power increases, the severity of the rod accident rapidly decreases due to the effects of increased void formation and increased Doppler reactivity feedback. Since the setpoint adjustments will be restricted to power levels above 20% of rated power, the staff concludes that the currently approved CRDA analysis for Hatch 2 remains appropriately bounding.

2.2 Radiation Protection/ALARA

The staff also has reviewed the proposed Technical Specification change to assure that the licensee has considered the radiological implications of the dose rate increases associated with N-16 equilibrium changes during hydrogen addition at BWRs. The review was also intended to determine that the licensee has adequately considered radiation protection/ALARA measures for the course of the test, in accordance with 10 CFR 20.1(c) and Regulatory Guide 8.8, "Information Relevant to Ensuring that Occupational Radiation Exposures at Nuclear Power Stations will be as Low as is Reasonably Achievable."

An overall objective of the test is to determine general in-plant and site boundary dose rate increases due to hydrogen addition. The licensee has indicated that normal health physics/ALARA practices and procedures for Hatch will be continued throughout the test. Additionally, main steam system dose rates will be monitored by surveys on a routine basis. The licensee also indicated that specific locations will be identified where temporary shielding may be needed for long-term implementation of hydrogen injection.

A similar test was previously approved for Hatch Unit 1 (Amendment 125, issued May 2, 1986). The licensee has provided a radiological assessment of the Unit 1 test by letter dated November 23, 1987. Dose control and surveillance efforts planned for the Unit 2 test are similar to those previously approved for the Unit 1 hydrogen addition test. Tests of this type have been proposed and conducted at other operating BWRs following formal staff review and approval of similar Technical Specification changes. The test conditions, as identified by the vendor, as well as the measures proposed for radiation protection/ALARA at the Edwin I. Hatch Nuclear Plant Unit 2, are consistent with those utilized at the other BWRs during their successful hydrogen addition tests. None of these tests involved any significant, unanticipated, radiological exposures or releases.

2.3 Compressed Hydrogen Storage and Distribution System

In its letters dated March 20 and November 23, 1987, (References 1 and 2), the licensee provided information on the hydrogen and oxygen storage and distribution system to facilitate the Hydrogen Water Chemistry pre-implementation test. The licensee's hydrogen and oxygen storage and distribution system is designed to minimize the potential hazard to safety related systems and meets the applicable parts of the BWR Owners Group, "Guidelines for Permanent BWR Hydrogen Water Chemistry Installations," 1987 Revision.

The pre-implementation test will be conducted with the guidance of General Electric (GE), taking into consideration the lessons learned from approximately eight other hydrogen injection tests previously performed with GE assistance. Compressed hydrogen will be supplied and stored onsite in a gaseous tube trailer. The separation distance of the hydrogen tube trailer and safety related structures meets the BWR Owners Group (BWROG) Guidelines. With respect to the hydrogen distribution system, an excess flow valve is provided in the 1 inch flexible metallic hose connecting the hydrogen storage tanks with the injection system. The purpose of this valve is to limit the release rate of hydrogen in the event of a pipe break. In the hydrogen injection area inside the plant, hydrogen monitors are provided at the booster pump and the hydrogen injection control valves. These monitors are set to alarm and isolate the hydrogen injection system when hydrogen concentrations exceed 2%.

Since the licensee stores substantial amounts of chlorine onsite for the purpose of water treatment, the staff evaluated the potential synergistic effect associated with the storage of hydrogen. The combination of hydrogen gas and chlorine gas can explode in the presence of any form of energy, such as sunlight or heat (250°C). Therefore, it is prudent to maintain an adequate separation distance between the chlorine and hydrogen storage facilities. The hydrogen tube tank trucks will be parked a distance of 100 feet away from the chlorine tank car. The licensee has stated that the closest approach the hydrogen supply truck will make to the chlorine tank car is approximately 50 feet. The 50 foot separation distance is judged to be sufficient to prevent interaction in the unlikely event of a simultaneous chlorine and hydrogen release, since it meets the requirements of NFPA 50A-2984, Standards for Gaseous Hydrogen Systems at Consumer Sites.

On the basis of the above evaluation, we find that the proposed Technical Specification changes are in accordance with the BWROG (1987 Revision) "Guidelines for Permanent Hydrogen Water Chemistry Installations," are bounded by prior accident analysis, are consistent with Regulatory Guide 8.8, and meet General Design Criteria 3, and Branch Technical Position CMEB 9.5.1 of NUREG-0800. The changes are therefore acceptable.

3.0 ENVIRONMENTAL CONSIDERATION

This amendment changes a requirement with respect to installation or use of a facility component located within the restricted area as defined in 10 CFR Part 20. The staff has determined that the amendment involves no significant increase in the amounts, and no significant change in the types, of any effluents that may be released offsite; and that there should be no significant increase in individual or cumulative occupational radiation exposure. The Commission has previously issued a proposed finding that this amendment involves no significant hazards consideration and there has been no public comment on such finding. Accordingly, this amendment meets the eligibility criteria for categorical exclusion set forth in 10 CFR 51.22(c)(9). Pursuant to 20 CFR 51.22(b), no environmental impact statement nor environmental assessment need be prepared in connection with the issuance of this amendment.

4.0 CONCLUSION

The Commission made a proposed determination that the amendment involves no significant hazards consideration which was published in the Federal Register on July 15, 1987 (52 FR 26586), and consulted with the state of Georgia. No public comments were received, and the state of Georgia did not have any comments.

We have concluded, based on the considerations discussed above, that: (1) there is reasonable assurance that the health and safety of the public will not be endangered by operation in the proposed manner, and (2) such activities will be conducted in compliance with the Commission's regulations, and the issuance of the amendment will not be inimical to the common defense and security or to the health and safety of the public.

5.0 REFERENCES

1. Letter from J. P. O'Reilly, Georgia Power Company, to the NRC, dated March 20, 1987.

2. Letter from L. T. Gucwa, Georgia Power Company, to the NRC, dated November 23, 1987.

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Dated: January 13, 1988

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