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MCGAUGHY, R. W. Iowa Electric Light & Power Co.
RECIP. NAME RECIPIENT AFFILIATION
DENTON, H. Office of Nuclear Reactor Regulation, Director (post 851125

SUBJECT: Application for amend to License DPR-49 consisting of Tech Spec Change (RTS-202), demonstrating feasibility of hydrogen water chemistry sys as mitigator of IGSC of stainless steel piping. Fee paid.

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Iowa Electric Light and Power Company
January 8, 1986
NG-86-0110

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

Subject: Duane Arnold Energy Center
Docket No: 50-331
Op. License No: DPR-49
Technical Specification Change (RTS-202)
Hydrogen Water Chemistry Pre-implementation Test
File: A-117a, SPF-112

Dear Mr. Denton:

In accordance with the Code of Federal Regulations, Title 10, Sections 50.59 and 50.90, Iowa Electric Light and Power Company hereby requests revision of the Technical Specifications (TS) for the Duane Arnold Energy Center (DAEC).

This proposed change will allow Iowa Electric Light and Power Company to demonstrate the feasibility of a Hydrogen Water Chemistry system as a mitigator of Intergranular Stress Corrosion Cracking (IGSCC) of stainless steel piping at the DAEC.

The application (proposed change RTS-202) has been reviewed by the DAEC Operations Committee and DAEC Safety Committee. In accordance with the fee schedule for license amendments (10 CFR 170), a check for $150 is enclosed. The balance of the fee will be paid upon billing.

Pursuant to the requirements of 10 CFR 50.91, a copy of this submittal, including the hazards considerations analysis, is being forwarded to our appointed state official.

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PDR ADOCK 05000331
P PDR

Aool w/check $150.00 #083476

This application, which consists of three signed originals and 37 copies with their enclosures, is true and accurate to the best of my knowledge and belief.

IOWA ELECTRIC LIGHT AND POWER COMPANY

BY Richard W McGaughy
Richard W. McGaughy
Manager, Nuclear Division

Subscribed and sworn to Before Me on this 9th day of January 1986.

Kathleen D. Furman
Notary Public in and for the State of Iowa

RWM/SAR/ta*

Attachments: 1) Evaluation of Change Pursuant to 10 CFR 50.92
2) Proposed Change RTS-202 including List of Affected Pages

cc: S. Reith
L. Liu
L. Root
M. Thadani
NRC Resident Office
T. Houvenagle (ICC)

EVALUATION OF CHANGE WITH RESPECT TO 10 CFR 50.92

Summary

Hydrogen addition will result in an approximate one- to five-fold increase in the nitrogen (N-16) activity in the steam due to increased N-16 carry-over in the main steam. The increased carry-over and radiation is caused by the conversion of N-16 from a soluble to a volatile form in the reactor. The resultant increase in the background radiation level necessitates a temporary change to the Main Steam Line High Radiation scram and isolation setpoints.

The current setpoints are less than or equal to 3 times normal rated power background. In order to support an increase in the setpoints, it must be assured that the off-site radiological effects remain below 10 CFR Part 100 limits.

An ALARA review will be performed prior to beginning the injection test. Extensive in-plant and site radiation surveys will be conducted at regular intervals during the test to monitor the actual doses. As required, radiation protection measures will be implemented to maintain doses as-low-as-reasonably achievable.

In accordance with the requirements of 10 CFR 50.92, the enclosed application is judged to involve no significant hazards based upon the following information:

(1) Does the proposed license amendment involve a significant increase in the probability or consequences of an accident previously evaluated?

Response:

The only event which takes credit for the Main Steam Line High Radiation trips is the design basis control rod drop accident (CRDA). As stated in the DAEC Technical Specification Bases (Sec. 3.3), a CRDA occurring at power greater than 20%, regardless of the rod pattern, will never result in a peak fuel enthalpy that will result in fuel damage. Since the Main Steam Line High Radiation Monitor (MSLRM) setpoints will be increased for hydrogen injection at power levels of 20% or higher, there is no impact on the Technical Specification Bases and the design function of the MSLRM trip will remain valid.

If the reactor drops below 20% rated power prior to setpoint readjustment, the necessary setpoint readjustment shall be made within 12 hours, while these functions are required to be operable. At all times the capability to monitor for fuel failures, which is the purpose of the Main Steam Line Radiation trip setpoint, will be maintained by: i) the continued operability of the main steam radiation monitors which provide signals to the reactor protection and primary containment isolation systems; ii) routine radiation surveys; iii) the performance of primary coolant water analysis; and iv) the continued operability of the Steam Jet-Air Ejector Off-Gas Radiation Monitor. Due to these continued monitoring capabilities, the proposed license amendment does not involve a significant increase in the consequences of an accident previously evaluated.

Although the potential for error exists whenever instrumentation setpoints are adjusted, the resulting increase in the probability or consequences of accidents previously evaluated is considered insignificant due to Iowa Electric's existing Quality Assurance Program, operating procedures as applied to instrument adjustments, and because of special attention given to this test.

(2) Does the proposed license amendment create the possibility of a new or different kind of accident from any accident previously evaluated?

Response:

As stated above, the only event affected by this proposed amendment is the CRDA, which has been previously evaluated. This proposed amendment will result only in the changing of a setpoint; changing a setpoint cannot introduce a new or different kind of accident from any previously evaluated.

(3) Does the proposed amendment involve a significant reduction in a margin of safety?

Response:

A temporary increase in the Main Steam Line High Radiation scram and isolation setpoints will not impact any FSAR Chapter 15 accident or transient analysis, other than the CRDA, as this is the only event where credit is taken for this signal. Also, since the Main Steam Line Radiation monitor setpoint will be increased only for hydrogen injection at power levels of 20% or higher, the Technical Specification Bases and the design function of the Main Steam Line High Radiation trip will remain valid.

In the April 6, 1983 Federal Register, the NRC published examples of amendments that are not likely to involve a significant hazards concern. Example number (vi) of that list states:

"A change which either may result in some increase to the probability or consequences of a previously-analyzed accident or may reduce in some way a safety margin, but where the results of the change are clearly within all acceptable criteria with respect to the system or component specified in the Standard Review Plan: for example, a change resulting from the application of a small refinement of a previously used calculational model or design method."

Based on the above information, it is concluded that the proposed license amendment does not involve significant hazards considerations.

PROPOSED CHANGE RTS-202 TO THE
DUANE ARNOLD ENERGY CENTER
TECHNICAL SPECIFICATIONS

The holders of license DPR-49 for the Duane Arnold Energy Center propose to amend Appendix A (Technical Specifications) to said license by deleting current pages and replacing them with the attached, new pages. A List of Affected Pages is given below.

Iowa Electric is investigating the implementation of Hydrogen Water Chemistry (HWC) as a possible mitigator of Intergranular Stress Corrosion Cracking (IGSCC) in reactor recirculation system piping. To demonstrate the feasibility of a permanent HWC system for the Duane Arnold Energy Center (DAEC), a pre-implementation test will be conducted. The test is to be performed by Iowa Electric and General Electric and is similar in scope to hydrogen injection tests previously performed by GE and continuing programs at Dresden-2. Experience gained from these programs has been incorporated into the DAEC test plan.

From the pre-implementation test, Iowa Electric will develop information on:

1. Primary coolant system hydrogen and oxygen concentration relationships
2. Changes to plant chemistry and electrochemical potential (ECP) of the primary coolant
3. Performance of the off-gas system during hydrogen injection
4. In-plant and site boundary radiation increases due to N-16 activity
5. Locations where additional shielding may be required to support a permanent hydrogen water chemistry program
6. Adequacy of injection points
7. Hydrogen addition system performance for controlling primary coolant oxygen levels
8. Adequacy of sampling equipment and procedures
9. Feasibility of a permanent hydrogen injection system

The pre-implementation test involves injecting hydrogen into the feedwater from 0 to approximately 45 scfm in predefined increments of 2-4 scfm. A stoichiometric amount of oxygen will be added upstream of the recombiner to aid in proper off-gas recombination. During this stage, various chemical and operating parameters ($H_2$, $O_2$, ECP) will be monitored to define the IGSCC immune regime for the DAEC.

Hydrogen addition will result in an approximate one- to five-fold increase in the N-16 activity in the steam. The resultant increase in the background radiation level necessitates a temporary change to the Main Steam Line High Radiation scram and isolation setpoints.

The changes made to DAEC Technical Specifications are the inclusion of a Note to the Main Steam Line High Radiation scram and isolation setpoints (Tables 3.1-1 and 3.2-A). This change will allow the setpoints to initially be changed based on a calculated value of the radiation level expected during the test. Once the test has begun, these setpoints may be changed based on either calculations or measurements of actual radiation levels resulting from hydrogen injection.

The test will be performed with the reactor power at greater than 20% rated power. The initial setpoint change may be made within 24 hours prior to the planned start of the hydrogen injection test. The setpoints shall be reestablished to three times normal rated power background within 24 hours following completion of the test or within 12 hours of establishing reactor power levels below 20% rated power, while these functions are required to be operable.

LIST OF AFFECTED PAGES

3.1-4
3.1-7a
3.1-18
3.2-5
3.2-7
3.2-39