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AEP
INDIANA
MICHIGAN
POWER

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C0101-05
10 CFR 50.90

Docket No.: 50-315

U.S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Mail Stop O-P1-17
Washington, DC 20555-0001

Donald C. Cook Nuclear Plant Unit 1
TECHNICAL SPECIFICATION CHANGE REQUEST
SPRAY ADDITIVE TANK MAXIMUM VOLUME AND SODIUM HYDROXIDE CONCENTRATION

Pursuant to 10 CFR 50.90, Indiana Michigan Power Company (I&M), the Licensee for Donald C. Cook Nuclear Plant (CNP) Unit 1, proposes to amend Appendix A, Technical Specifications (T/S), of Facility Operating License DPR-58. I&M proposes to change the limiting condition for operation (LCO) of T/S 3/4.6.2.2.a, "Spray Additive System," to specify a maximum allowed contained volume and sodium hydroxide (NaOH) concentration for the spray additive tank. The LCO currently lists only the minimum required contained volume and NaOH concentration for the spray additive tank.

I&M is submitting this request in accordance with Nuclear Regulatory Commission (NRC) Administrative Letter 98-10, "Dispositioning of Technical Specifications that are Insufficient to Assure Plant Safety," because the current requirements are nonconservative. I&M has determined that the maximum allowed contained volume and NaOH concentration for the spray additive tank should be specified to support a bounding calculation of the maximum pH value for the containment spray solution and for the water contained in the containment recirculation sump under postulated accident conditions.

Attachment 1 provides a detailed description and safety analysis to support the proposed changes. Attachment 2 provides marked up T/S pages and Attachment 3 provides the proposed T/S pages with the changes incorporated. Attachment 4 describes the evaluation performed in accordance with

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10 CFR 50.92(c), which concludes that no significant hazard is involved. Attachment 5 provides the environmental assessment. No new commitments are made in this submittal.

I&M requests NRC review and approval in accordance with normal NRC review schedules for this type of request, and a 30-day implementation period following approval.

No previous submittals affect T/S pages that are included in this request. If any future submittals affect these T/S pages, then I&M will coordinate changes to the pages with the NRC Project Manager to ensure proper T/S page control when the associated license amendment requests are approved.

Copies of this letter and its attachments are being transmitted to the Michigan Public Service Commission and Michigan Department of Environmental Quality, in accordance with the requirements of 10 CFR 50.91.

Should you have any questions, please contact Mr. Ronald W. Gaston, Manager of Regulatory Affairs, at (616) 465-5901 extension 1366.

Sincerely,

R. P. Powers
Senior Vice President, Nuclear Operations

\dmb

Attachments

c: J. E. Dyer
MDEQ - DW & RPD
NRC Resident Inspector
R. Whale

AFFIRMATION

I, Robert P. Powers, being duly sworn, state that I am Senior Vice President, Nuclear Operations of American Electric Power Service Corporation and Vice President of Indiana Michigan Power Company (I&M), that I am authorized to sign and file this request with the Nuclear Regulatory Commission on behalf of I&M, and that the statements made and the matters set forth herein pertaining to I&M are true and correct to the best of my knowledge, information, and belief.

American Electric Power Service Corporation

R. P. Powers
Senior Vice President, Nuclear Operations

SWORN TO AND SUBSCRIBED BEFORE ME

THIS 2 DAY OF JANUARY, 2001

Jennifer L Kernosky
Notary Public

My Commission Expires 5/26/05

JENNIFER L KERNOSKY
Notary Public, Berrien County, Michigan
My Commission Expires May 26, 2005

ATTACHMENT 1 TO C0101-05

DESCRIPTION AND SAFETY ANALYSIS FOR THE PROPOSED CHANGES

A. Summary of Proposed Changes

Indiana Michigan Power Company (I&M), the Licensee for Donald C. Cook Nuclear Plant (CNP) Unit 1, proposes to amend Appendix A, Technical Specifications (T/S), of Facility Operating License DPR-58. I&M proposes to change the limiting condition for operation (LCO) of T/S 3/4.6.2.2.a, "Spray Additive System," to specify a maximum allowed contained volume and sodium hydroxide (NaOH) concentration for the spray additive tank. The LCO currently lists only a minimum required contained volume and NaOH concentration for the spray additive tank.

The proposed T/S changes are described in detail in Section E of this attachment. T/S pages that are marked to show the proposed changes are provided in Attachment 2. The proposed T/S pages, with the changes incorporated, are provided in Attachment 3.

B. Description of the Current Requirements

T/S 3/4.6.2.2 requires the spray additive system to be operable in Modes 1, 2, 3, and 4. T/S 3/4.6.2.2.a specifically addresses requirements for the spray additive tank, with a required contained volume of at least 4000 gallons of not less than 30 percent by weight NaOH solution.

C. Bases for the Current Requirements

Following a loss-of-coolant accident (LOCA) inside containment, the spray additive system adds NaOH to the borated refueling water storage tank (RWST) water that is sprayed into containment by the containment spray system. Following a LOCA, the containment spray water becomes mixed in the containment recirculation sump with ice melt from the ice condenser, reactor coolant from the reactor coolant system (RCS), water being injected to the RCS from the safety injection accumulators, and water being injected to the RCS from the RWST by the emergency core cooling system.

The minimum limits for the required contained volume and NaOH concentration for the spray additive tank (SAT) ensure the solution recirculated within containment after a LOCA has a pH of at least 7.6. This pH minimizes the evolution of iodine from the containment recirculation sump water, and minimizes the effect of corrosion on mechanical systems and components.

D. Need for Revision of the Requirements

I&M has determined that the maximum allowed contained volume and NaOH concentration for the spray additive tank should be specified to support a bounding calculation of the maximum pH

value for the containment spray solution and for the water contained in the containment recirculation sump under postulated accident conditions.

In accordance with the guidance in Nuclear Regulatory Commission (NRC) Administrative Letter 98-10, "Dispositioning of Technical Specifications that are Insufficient to Assure Plant Safety," administrative controls were implemented as a compensatory measure for the nonconservative T/S requirements. These administrative controls are only appropriate as a short-term action, and timely submittal of a license amendment request is required for permanent resolution.

E. Description of the Proposed Changes

I&M proposes to revise T/S 3/4.6.2.2.a for Unit 1 to require a contained volume between 4000 and 4600 gallons of between 30 and 34 percent by weight NaOH solution in the spray additive tank.

I&M also proposes four types of format changes to the revised Unit 1 page. The types of changes to be applied are:

(1) Reformat the header to include numbered first and second tier T/S section titles and a full-width single line to separate the header section titles from the page text.

(2) Reformat the footer to include "COOK NUCLEAR PLANT-UNIT 1" on the left side of the page, "Page (page number)" center page, "AMENDMENT (past amendment numbers, with strikethrough, and ending with the current amendment number)" on the right side, and a full-width single line to separate the footer from the page text.

(3) Delete the double lines under "LIMITING CONDITION FOR OPERATION" and "SURVEILLANCE REQUIREMENTS."

(4) Fully justify the text and change the font.

F. Bases for the Proposed Changes

I&M has calculated the minimum and maximum values for containment spray and containment recirculation sump pH during large break LOCA and small break LOCA events. In order to support a bounding calculation of the maximum pH values, it is necessary to assume a maximum deliverable volume of NaOH from the spray additive system, as well as a maximum NaOH concentration in the spray additive tank. CNP Unit 2 T/S 3/4.6.2.2.a includes both a minimum and maximum contained volume and NaOH concentration for the spray additive tank. To facilitate the pH analyses of the LOCA events, the calculations performed assumed the Unit 2 maximum values that are now proposed for Unit 1.

The input assumptions for establishment of the environmental qualification (EQ) envelope of 10 CFR 50.49, "Environmental Qualification of Electric Equipment Important to Safety for Nuclear Power Plants," are not required to be included in the TS. However, the proposed upper limit on volume and concentration for the SAT also supports a bounding EQ calculation of pH during the LOCA and main steam line break (MSLB) events.

The assumptions used in the pH analyses are consistent with NUREG-0800, "Standard Review Plan," Section 6.1.1, "Engineered Safety Features Materials," Branch Technical Position (BTP) MTEB [Materials Engineering Branch] 6-1, "pH for Emergency Coolant for PWRs [pressurized water reactors]," and Section 6.2.5, "Combustible Gas Control in Containment." These guidance documents specify the following acceptance criteria:

1. The minimum pH should be 7.0.

2. For the spray water recirculated from the containment sump, the higher the pH in the 7.0 to 9.5 range, the greater the assurance that no stress corrosion cracking will occur.

3. If a pH greater than 7.5 is used, consideration should be given to the hydrogen generation problem from corrosion of aluminum in the containment.

In addition to these guidance documents, NRC Inspection and Enforcement (IE) Bulletin 77-04, "Calculational Error Affecting the Design Performance of a System for Controlling pH of Containment Sump Water Following a LOCA," specifies that the optimum pH control consists of stabilizing the pH in the recirculated fluid within four hours.

The analyses performed using the proposed Unit 1 maximum volume and NaOH concentrations verified that the following acceptance criteria were satisfied for LOCA events:

1. Following a LOCA, the pH of the containment recirculation sump solution is maintained at or above 7.0 after switchover to recirculation of water from the containment recirculation sump to the emergency core cooling system and containment spray system. This is consistent with the assumptions used in the current analyses of the radiological consequences of a LOCA.

2. The pH of the containment recirculation sump solution is maintained within the band of 7.6 to 9.5 following a LOCA, as stated in the Bases for T/S 3/4.5.5. This acceptance criterion is verified to be met within the four hours specified in NRC IE Bulletin 77-04.

3. The analyses for determining hydrogen generation following a large break LOCA assume a specific time-dependent pH profile for the containment spray and containment recirculation sump solutions. The existing minimum and proposed maximum limits for the contained volume and NaOH concentration for the SAT do not result in an increase in the previously

predicted hydrogen generation rates. Therefore, the current hydrogen generation analyses remain bounding.

The proposed change is consistent with NUREG-1431, "[Improved] Standard Technical Specifications," Revision 1. In addition, the proposed change is consistent with T/S 3/4.6.2.2.a for CNP Unit 2, which already includes both minimum and maximum values for spray additive tank volume and NaOH concentration.

The proposed changes to the format of the Unit 1 page are administrative. They are intended to improve the appearance. They are not intended to introduce other changes.

G. Discussion of Risk

Administrative controls have been established to maintain the Unit 1 SAT parameters within the limits proposed until this request is approved. These controls are required to ensure that the plant is operated within the current design and licensing basis. The administrative limits are within the ranges allowed by the current T/S.

Implementation of the prescribed T/S changes maintains the design and licensing basis of the CNP spray additive system and overall containment spray system by ensuring acceptable pH of both the containment spray and containment recirculation sump fluids. Therefore, the accident analyses presented in Chapter 14 of the CNP Updated Final Safety Analysis Report remain valid and bounding, and the design and licensing basis is preserved by the proposed T/S changes. The risk associated with the original design and licensing basis is not changed.

H. Schedule Requirements

I&M requests NRC review and approval in accordance with normal NRC review schedules for this type of request, and a 30-day implementation period following approval. As previously described, I&M has implemented appropriate administrative controls that will ensure conservative operation of CNP while this submittal is under staff review. The administrative controls will no longer be required after the proposed changes are approved and implemented.

ATTACHMENT 2 TO C0101-05

TECHNICAL SPECIFICATIONS PAGE
MARKED TO SHOW PROPOSED CHANGES

REVISED PAGE
UNIT 1

3/4 6-12

SPRAY ADDITIVE SYSTEM

LIMITING CONDITION FOR OPERATION

3.6.2.2 The spray additive system shall be OPERABLE with:

a. A spray additive tank containing ~~at least~~ a volume between 4000 and 4600 gallons of ~~not less than~~ between 30 and 34 percent by weight NaOH solution, and

b. Two spray additive eductors each capable of adding NaOH solution from the chemical additive tank to a containment spray system pump flow.

APPLICABILITY: MODES 1, 2, 3 and 4.

ACTION:

With the spray additive system inoperable, restore the system to OPERABLE status within 72 hours or be in at least HOT STANDBY within the next 6 hours; restore the spray additive system to OPERABLE status within the next 48 hours or be in COLD SHUTDOWN within the following 30 hours.

SURVEILLANCE REQUIREMENTS

4.6.2.2 The spray additive system shall be demonstrated OPERABLE:

a. At least once per 31 days by verifying that each valve (manual, power operated or automatic) in the flow path that is not locked, sealed, or otherwise secured in position, is in its correct position.

b. At least once per 6 months by:

1. Verifying the solution level in the tank, and

2. Verifying the concentration of the NaOH solution by chemical analysis.

ATTACHMENT 3 TO C0101-05

PROPOSED TECHNICAL SPECIFICATIONS PAGE

REVISED PAGE
UNIT 1

3/4 6-12

SPRAY ADDITIVE SYSTEM

LIMITING CONDITION FOR OPERATION

3.6.2.2 The spray additive system shall be OPERABLE with:

a. A spray additive tank containing a volume between 4000 and 4600 gallons of between 30 and 34 percent by weight NaOH solution, and

b. Two spray additive eductors each capable of adding NaOH solution from the chemical additive tank to a containment spray system pump flow.

APPLICABILITY: MODES 1, 2, 3 and 4.

ACTION:

With the spray additive system inoperable, restore the system to OPERABLE status within 72 hours or be in at least HOT STANDBY within the next 6 hours; restore the spray additive system to OPERABLE status within the next 48 hours or be in COLD SHUTDOWN within the following 30 hours.

SURVEILLANCE REQUIREMENTS

4.6.2.2 The spray additive system shall be demonstrated OPERABLE:

a. At least once per 31 days by verifying that each valve (manual, power operated or automatic) in the flow path that is not locked, sealed, or otherwise secured in position, is in its correct position.

b. At least once per 6 months by:

1. Verifying the solution level in the tank, and

2. Verifying the concentration of the NaOH solution by chemical analysis.

ATTACHMENT 4 TO C0101-05

NO SIGNIFICANT HAZARDS CONSIDERATION EVALUATION

Indiana Michigan Power Company (I&M) has evaluated this proposed amendment and determined that it does not involve a significant hazard. According to 10 CFR 50.92(c), a proposed amendment to an operating license does not involve a significant hazard if operation of the facility in accordance with the proposed amendment would not:

1. involve a significant increase in the probability of occurrence or consequences of an accident previously evaluated;

2. create the possibility of a new or different kind of accident from any previously evaluated; or

3. involve a significant reduction in a margin of safety.

I&M proposes to change the limiting condition for operation (LCO) of T/S 3/4.6.2.2.a, "Spray Additive System," to specify a maximum allowed contained volume and sodium hydroxide (NaOH) concentration for the spray additive tank. The LCO currently lists only a minimum required contained volume and NaOH concentration for the spray additive tank.

I&M has determined that the maximum allowed contained volume and NaOH concentration for the spray additive tank should be specified to support a bounding calculation of the maximum pH value for the containment spray solution and for the water contained in the containment recirculation sump under postulated accident conditions.

The determination that the criteria set forth in 10 CFR 50.92 are met for this amendment request is indicated below.

1. Does the change involve a significant increase in the probability of occurrence or consequences of an accident previously evaluated?

Adding a maximum limit for the allowed contained volume and NaOH concentration for the spray additive tank does not increase the probability of occurrence of any accident. The spray additive system cannot initiate any previously analyzed accident. The proposed changes ensure that the spray additive system and the associated containment spray system can perform the accident mitigation functions required during a LOCA or MSLB event. This action does not affect the initiating frequency of a LOCA or MSLB event. Therefore, the proposed changes do not increase the probability of an accident previously evaluated.

The accidents previously evaluated in Chapter 14 of the Updated Final Safety Analysis Report that are possibly affected by operation of the spray additive system are a loss-of-coolant accident (LOCA) and a main steam line break (MSLB). These postulated accidents are expected to result

in a containment spray signal, which then results in the automatic starting of the containment spray pumps and the opening of the valves associated with the spray additive system. The spray additive system adds NaOH to the containment spray water being supplied from the refueling water storage tank (RWST) to adjust the pH of the containment spray and containment recirculation sump solutions.

Following a LOCA, the containment spray water becomes mixed in the containment recirculation sump with ice melt from the ice condenser, reactor coolant from the reactor coolant system (RCS), water being injected to the RCS from the safety injection accumulators, and water being injected to the RCS from the RWST by the emergency core cooling system. Following a MSLB, the containment spray water becomes mixed in the containment recirculation sump with ice melt from the ice condenser and the secondary coolant released from the ruptured steam line.

The existing minimum and proposed maximum limits for the contained volume and NaOH concentration for the spray additive tank ensure a pH value of between 7.6 and 9.5 for the solution recirculated within containment after a LOCA. This pH band minimizes the evolution of iodine from the containment recirculation sump, and minimizes the effect of chloride and caustic stress corrosion on mechanical systems and components. An increase in pH value to at least 7.0 in the containment recirculation sump during the recirculation phase following a LOCA is consistent with the iodine retention assumptions of the accident analyses. Therefore, the consequences of a LOCA remain unchanged by the proposed changes. For a MSLB, there is no increase in consequences since the containment spray system and containment recirculation sump are not credited for removal and retention of fission products from the containment atmosphere.

The analyses for determining hydrogen generation following a large break LOCA assume a specific pH time-dependent profile for the containment spray and containment recirculation sump solutions. The existing minimum and proposed maximum limits for the contained volume and NaOH concentration for the spray additive tank do not result in an increase in the previously predicted hydrogen generation rates. Therefore, the current hydrogen generation analyses remain bounding.

For both LOCA and MSLB events, the existing minimum and proposed maximum limits for the contained volume and NaOH concentration for the spray additive tank ensure that the pH of the containment spray solution is within the bounds used in evaluations for environmental qualification of required equipment.

Therefore, the proposed changes cannot increase the probability of occurrence or consequences of an accident previously evaluated.

2. Does the change create the possibility of a new or different kind of accident from any accident previously evaluated?

Adding a maximum allowed contained volume and NaOH concentration for the spray additive tank does not create the possibility of an accident of a new or different type than any previously evaluated. The proposed changes ensure that the spray additive system, and the associated containment spray system, can perform the required accident mitigation functions during a LOCA or MSLB event. There are no other types of accidents that can be postulated that would require the use of the spray additive system or the associated containment spray system for mitigation. The proposed changes do not introduce any new association between the spray additive system and any radioactive system, including the RCS. Therefore, emergency operation of the spray additive system, or postulated failures of the spray additive system, cannot initiate any type of accident.

Therefore, the proposed changes do not increase the possibility of a new or different kind of accident than previously evaluated.

3. Does the change involve a significant reduction in a margin of safety?

The proposed limits on maximum allowed contained volume and NaOH concentration for the spray additive tank ensure that the original margin of safety is maintained by ensuring acceptable pH control following a LOCA or MSLB event. Therefore, the proposed changes ensure that the margin of safety is maintained by limiting the maximum pH of the containment spray and containment recirculation sump solutions following a LOCA or MSLB event.

Therefore, the proposed changes do not involve a significant reduction in the margin of safety.

In summary, based upon the above evaluation, I&M has concluded that these changes involve no significant hazards consideration.

ATTACHMENT 5 TO C0101-05

ENVIRONMENTAL ASSESSMENT

Indiana Michigan Power Company has evaluated this license amendment request against the criteria for identification of licensing and regulatory actions requiring environmental assessment in accordance with 10 CFR 51.21. I&M has determined that this license amendment request meets the criteria for a categorical exclusion set forth in 10 CFR 51.22(c)(9). This determination is based on the fact that this change is being proposed as an amendment to a license issued pursuant to 10 CFR 50 that changes a requirement with respect to installation or use of a facility component located within the restricted area, as defined in 10 CFR 20, or that changes an inspection or a surveillance requirement, and the amendment meets the following specific criteria.

(i) The amendment involves no significant hazards consideration.

As demonstrated in Attachment 4, this proposed amendment does not involve a significant hazards consideration.

(ii) There is no significant change in the types or significant increase in the amounts of any effluent that may be released offsite.

The proposed amendment involves a revision to the Technical Specifications affecting requirements for the spray additive system. The spray additive system directly interfaces with a potentially radioactive system, namely the containment spray system. However, the proposed changes do not affect this interface, and do not create any potential for increasing the release of any contained radioactive fluids from either system. The proposed change to the operation of the spray additive tank does not result in the generation of any additional radioactive or nonradioactive effluents. Therefore, there is no significant change in the types or significant increase in the amounts of any effluents released offsite.

(iii) There is no significant increase in individual or cumulative occupational radiation exposure.

The spray additive system directly interfaces with a potentially radioactive system, namely the containment spray system. However, the proposed changes do not affect this interface, and do not create any potential for increasing the amount of any contained radioactive fluids in either system. The proposed changes limit the maximum amount of solution contained in the spray additive tank. The proposed changes to the operation of the spray additive tank do not affect the operation of any other radioactive system such that radiation levels in the facility would be increased. Therefore, there is no significant increase in individual or cumulative occupational radiation exposure resulting from this change.