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SUBJECT: Application for amends to TS for licenses DPR-58 & DPR-74,
 removing word "immediately" from unit 1 hydrogen recombiner
 surveillance requirement 4.6.4.2.b.4 & revising plants TS
 3/4.6.4 bases.

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March 3, 1998

AEP:NRC:1275
10 CFR 50.90

Docket No.: 50-315
50-316

U.S. Nuclear Regulatory Commission
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Gentlemen:

Donald C. Cook Nuclear Plant Units 1 and 2
TECHNICAL SPECIFICATION 3.6.4.2 CHANGE REQUEST
HYDROGEN RECOMBINER SURVEILLANCE REQUIREMENTS
AND TECHNICAL SPECIFICATION 3/4.6.4 BASES COMBUSTIBLE GAS CONTROL

This letter and its attachments constitute an application for amendment to the technical specifications (T/Ss) for Cook Nuclear Plant units 1 and 2. This amendment will remove the word "immediately" from the unit 1 hydrogen recombiner surveillance requirement 4.6.4.2.b.4 and revise the unit 1 and unit 2 T/S 3/4.6.4 bases. The reasons for the proposed changes and our analyses concerning significant hazards considerations are contained in attachment 1 to this letter. Attachment 2 contains the current T/S pages, marked-up to reflect the proposed changes. The proposed, revised T/S pages are contained in attachment 3. Attachment 4 contains a copy of a Westinghouse letter discussing the hydrogen recombiner resistance to ground test.

This submittal proposes a change to unit 1 T/S page 3/4 6-25, unit 1 T/S page B 3/4 6-3, and unit 2 T/S page B 3/4 6-4. We believe the proposed changes will not result in: 1) a significant change in the types of effluents or a significant increase in the amounts of any effluents that may be released offsite; or 2) a significant increase in individual or cumulative occupational radiation exposure.

The proposed changes have been reviewed by the plant nuclear safety review committee and will be reviewed by the nuclear safety and design review committee at their next regularly scheduled meeting.

These changes are required to be implemented prior to the startup of unit 1. Therefore, we request that they be reviewed on an expedited basis.

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In accordance with the requirements of 10 CFR 50.91(b)(1), copies of this letter and its attachments have been transmitted to the Michigan Public Service Commission and the Michigan Department of Public Health.

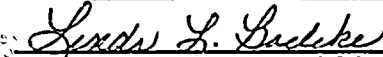
Sincerely,



E. E. Fitzpatrick
Vice President

SWORN TO AND SUBSCRIBED BEFORE ME

THIS 3rd DAY OF MARCH, 1998


Notary Public

My Commission Expires 01-21-2001

/jen

Attachments

c: J. A. Abramson
A. B. Beach
MDEQ - DW & RPD
NRC Resident Inspector
J. R. Sampson

LINDA L. BOELCKE
Notary Public, Berrien County, MI
My Commission Expires January 21, 2001



ATTACHMENT 1 TO AEP:NRC:1275

REASONS AND 10 CFR 50.92 ANALYSES FOR
CHANGES TO TECHNICAL SPECIFICATIONS

Description of Amendment Request

Technical specification (T/S) 3.6.4.2 requires that two independent containment hydrogen recombiner systems be operable during modes 1 and 2. Unit 1 surveillance requirement 4.6.4.2.b.4 requires that a continuity and resistance to ground test be conducted immediately following the system functional test described in surveillance requirement 4.6.4.2.b.3. The proposed change removes the word "immediately" and requires the surveillance to be conducted following the functional test. The revised wording of the surveillance requirement will make the unit 1 T/S read identically with the unit 2 T/S.

The proposed change to the unit 1 and unit 2 T/S bases 3/4.6.4 adds the clarifying sentence, "The acceptance criterion of 10,000 ohms is based on the test being performed with the heater element at an ambient temperature, but can be conservatively applied when the heater element is at a temperature above ambient". This allows the surveillance to be conducted at temperatures higher than the ambient temperature.

Background and Reason for Change

The hydrogen recombiner is used to prevent containment hydrogen concentration following a postulated loss of coolant accident from exceeding 4 volume percent. The hydrogen recombiner accomplishes this by heating air containing hydrogen to a temperature greater than 1150°F, the temperature at which hydrogen will spontaneously react with oxygen to form water.

During surveillance testing of the recombiner on June 17, 1997, the measured resistance to ground of the heater circuit was approximately 6000 ohms thirty minutes following the completion of the recombiner full functional test. Approximately thirty minutes later, the measured resistance to ground exceeded the minimum required value of 10,000 ohms. During a review of this test, the senior resident inspector questioned T/S compliance because the T/S required that the resistance to ground test be performed immediately following the recombiner full functional test, and there was no provision in the T/S for applying an allowance for temperature effects. This was reported under the provisions of 10 CFR 50.72 (b) (2) (i).

The unit 1 T/S contains a requirement to measure the resistance to ground of the recombiner heater phases immediately following a recombiner functional test in which the heater sheath temperature is raised to 1200°F or higher. The measured resistance must be greater than or equal to 10,000 ohms. The time required to prepare for the test, remove electrical leads, and obtain required clearances precludes literal compliance with the requirement that resistance be measured immediately following the functional test. Additionally, the heater material (magnesium oxide) resistance to ground is temperature dependent, decreasing with increasing temperature. Thus, it could be less than 10,000 ohms at temperatures above ambient. The heater material temperature is significantly greater than ambient during and immediately following the functional test.

The current surveillance requirement reads:

4.6.4.2 Each hydrogen recombiner system shall be demonstrated
OPERABLE:

- a. At least once per 18 months by verifying during a recombiner system functional test that the minimum heater sheath temperature increases to $\geq 700^{\circ}\text{F}$ within 90 minutes and is maintained for at least 2 hours.
- b. At least once per 18 months by:
 - 1. Performing a CHANNEL CALIBRATION of all recombiner instrumentation and control circuits.
 - 2. Verifying through a visual examination that there is no evidence of abnormal conditions within the recombiners (i.e., loose wiring or structural connections, deposits of foreign materials, etc.).
 - 3. Verifying during a recombiner system functional test that the heater sheath temperature increases to $\geq 1200^{\circ}\text{F}$ within 5 hours and is maintained for at least 4 hours.
 - 4. Verifying the integrity of all heater electrical circuits by performing a continuity and resistance to ground test immediately following the above required functional test. The resistance to ground for any heater phase shall be $\geq 10,000$ ohms.

We are proposing to change the surveillance requirement to the following:

4.6.4.2 Each hydrogen recombiner system shall be demonstrated OPERABLE:

- a. At least once per 18 months by verifying during a recombiner system functional test that the minimum heater sheath temperature increases to $\geq 700^{\circ}\text{F}$ within 90 minutes and is maintained for at least 2 hours.
- b. At least once per 18 months by:
 - 1. Performing a CHANNEL CALIBRATION of all recombiner instrumentation and control circuits.
 - 2. Verifying through a visual examination that there is no evidence of abnormal conditions within the recombiners (i.e., loose wiring or structural connections, deposits of foreign materials, etc.).
 - 3. Verifying during a recombiner system functional test that the heater sheath temperature increases to $\geq 1200^{\circ}\text{F}$ within 5 hours and is maintained for at least 4 hours.

4. Verifying the integrity of all heater electrical circuits by performing a continuity and resistance to ground test following the above required functional test. The resistance to ground for any heater phase shall be $\geq 10,000$ ohms.

In addition, we are proposing to add the following paragraph to the unit 1 and 2 T/S 3/4.6.4 bases:

The acceptance criterion of 10,000 ohms is based on the test being performed with the heater element at an ambient temperature, but can be conservatively applied when the heater element is at a temperature above ambient.

We have also made minor editorial corrections to the text in the unit 1 and 2 bases.

Justification For Change

The time required to prepare for the test, remove electrical leads, and obtain required clearances precludes literal compliance with the words of the current surveillance requirement, which require that resistance be measured immediately following the functional test. Even if the measurements could be taken immediately, the temperature effects could result in resistance measurements below those at ambient temperature. The proposed wording is consistent with the unit 2 T/Ss and the Westinghouse Standardized Technical Specifications (NUREG-0452). Additionally, the MERITS technical specifications (NUREG-1431) do not require that the resistance to ground test follow the functional test.

The surveillance is a means to provide indication that the heater electric power circuits with the hydrogen recombiner system have maintained their integrity. The insulation resistance test includes plant cabling, recombiner internal cabling, containment penetrations, and the insulating material for the heater elements that make up all three power phases of the system. The resistance test is sequenced to follow the full temperature heat-up test to enable the detection of any degradation caused by the test.

The acceptance criteria of greater than or equal to 10,000 ohms is based on the test being performed at ambient conditions. At temperatures above 1000°F, the heater insulating material, magnesium oxide, exhibits a reduction in electrical resistance, and a resistance value of less than 10,000 ohms would not be considered unusual with the heaters at an elevated temperature. What would be of concern would be downward trending values taken at the same temperature (see attachment 4). Removing the word "immediately" from the T/S will allow time for the heaters to cool, allowing the resistance to be measured near ambient conditions.

The T/S 3/4.6.4 bases are being revised to clarify that the 10,000 ohm resistance criteria is based on the test being conducted when the heater temperature is at ambient temperature. However, because the heater element insulation resistance decreases with increasing temperature, measuring 10,000 ohms or greater at temperatures above ambient is acceptable.

Basis For No Significant Hazards Determination

In accordance with 10 CFR 50.92, the proposed changes do not involve a significant hazards consideration if the changes do not:

1. Involve a significant increase in the probability or consequences of an accident previously evaluated;
2. Create the possibility of a new or different kind of accident from any accident previously evaluated; or
3. Involve a significant reduction in a margin of safety.

Criterion 1

This amendment request does not involve a significant increase in the probability or consequences of an accident previously evaluated. The change removes an ambiguous word from the technical specification. It does not physically alter the recombiner, nor does it adversely impact its operating characteristics.

The resistance to ground test will continue to be used to detect circuit faults. However, with the removal of the word "immediately", it will be possible to conduct the test near the ambient temperature, the temperature for which the 10,000 ohm criterion is applicable. The previously observed resistance value that was lower than 10,000 ohms is not indicative of a faulted heater circuit. Rather, it is the result of an elevated heater temperature and the electrical characteristics of the heater's insulating material, magnesium oxide. Magnesium oxide has a negative electrical resistance temperature coefficient, and it is not unusual or unacceptable for the measured insulation resistance to be less than 10,000 ohms when the heater temperature is elevated.

Criterion 2

This proposed change does not create the possibility of a new or different kind of accident from any accident previously evaluated. The hydrogen recombiner is used to mitigate the consequences of an accident, and it performs no function during normal operation. The change to the surveillance requirement removes an ambiguous word and does not affect the equipment or its installed configuration. No accident initiators that might be introduced by this change have been identified.

Criterion 3

This proposed change does not involve a significant reduction in a margin of safety. The change removes an ambiguous word from the T/S. The performance characteristics for the recombiner are not affected by this change, and no margin of safety is impacted.

The resistance to ground test will continue to be used to detect circuit faults. However, with the removal of the word "immediately", it will be possible to conduct the test near the ambient temperature, the temperature for which the 10,000 ohm criterion is applicable. The previously observed resistance values that were lower than 10,000 ohms are not indicative of a faulted heater circuit. Rather, they are the result of an elevated heater temperature and the electrical characteristics of the heater's insulating material, magnesium oxide. Magnesium oxide has a

negative electrical resistance temperature coefficient, and it is not unusual or unacceptable for the measured insulation resistance to be less than 10,000 ohms when the heater temperature is elevated.

