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IPN-02-022
March 29, 2002

U.S. Nuclear Regulatory Commission
ATTN: Document Control Desk
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SUBJECT: Indian Point 3 Nuclear Power Plant
Docket No. 50-286
License No. DPR-64
Response to Request For Additional Information Regarding Proposed Technical Specification Amendment for Laboratory Testing Of Nuclear-Grade Activated Charcoal per NRC Generic Letter 99-02

References:
1. NRC letter to Indian Point 3, "Request For Additional Information Re: Proposed Technical Specification Amendment For Laboratory Testing of Nuclear-Grade Charcoal (TAC No. MB3329)," dated February 8, 2002.
2. Indian Point 3 letter to the NRC, "Proposed Technical Specification Amendment for Laboratory Testing Of Nuclear-Grade Activated Charcoal per Generic Letter 99-02," dated October 23, 2001 (IPN-01-076).

Dear Sir:

The purpose of this letter is to respond to the NRC staff request for additional information (Reference 1) regarding an application for amendment to Section 5.5.10 of Appendix A to the Indian Point 3 (IP3) Technical Specifications (TS) (Reference 2). Attachment I repeats the 3 questions in Reference 1 and provides a response to each. The responses identify exceptions to the safety factor of 2 discussed in Generic Letter 99-02 for the Containment Fan Cooler Units and the Control Room Ventilation System. The responses also identify several revisions to the safety evaluation presented in Reference 2 but have no effect on the "no significant hazards evaluation" presented in the safety evaluation.

In accordance with 10 CFR 50.91, a copy of this letter is being submitted to the designated New York State official.

There are no new commitments made by Entergy Nuclear Operations, Inc (ENO) in this submittal. If you have any questions regarding this submittal, please contact Mr. K. Kingsley at (914) 734-6034.

A081

I declare under penalty of perjury that the foregoing is true and correct.

Very truly yours,

Executed on 3/29/02
(Date)

Robert J. Barrett
Vice President, Operations
Indian Point 3 Nuclear Power Plant

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RESPONSE TO FEBRUARY 8, 2002 RAI ON GL 99-02 PROPOSED TS CHANGE

The three NRC Staff questions on submittal IPN-01-076, dated October 23, 2001, and the IP3 responses are presented below. The NRC Staff questions are in quotes and the answers are not. The questions refer to the Containment Fan Cooler Units (CFCU) and Control Room Ventilation System (CRVS) unless otherwise noted.

1. "TS 5.5.10, "Ventilation Filter Testing Program," for the CFCUs requires that a laboratory test of a sample of the charcoal adsorber shows methyl iodide removal efficiency of 85% when tested in accordance with American Society for Testing and Materials (ASTM) D3803-89, at a temperature of 86 °F and a relative humidity of 95%. On page 5 of 10 of Attachment II to the October 23, 2001, submittal, ENO states that, "The TS efficiency of 85% (equivalent to 15% penetration) provides a factor of safety (penetration assumed in analysis divided by penetration acceptance criteria) of 2 without considering the 1% allowable bypass." The staff finds that, in reality, the total penetration is 16% (15% penetration as laboratory tested and 1% bypass) for CFCUs which will result in a safety factor of 1.875. The NRC staff guidance in GL 99-02 specifies a safety factor of 2. Clarify the discrepancy."

   Response: ENO agrees that proper calculation of the safety factor should include the 1% allowable bypass. To evaluate the safety factor, the required filter efficiency was determined by adding the 1% allowable bypass to the 70% methyl iodide efficiency assumed in the accident analyses. This was done since the maximum possible filter efficiency for the accident is 99% due to the bypass. The Technical Specification criterion for methyl iodide removal is 85% efficiency. The safety factor was determined, using the formula in GL 99-02, to be 1.93 as noted below:

$$SF = \frac{[100\% - \text{accident methyl iodide efficiency assumed plus 1\% bypass}]}{[100\% - \text{methyl iodide efficiency allowed by TS acceptance criteria}]}$$

$$SF = [100\% - (70 + 1)] / [100\% - 85] = 29/15 = 1.93$$

   The safety factor of 1.93 reflects original licensed plant design bases and is retained as an exception to GL 99-02. The safety evaluation submitted in Reference 1 should be revised by changing:

   > "The TS efficiency of 85% (equivalent to 15% penetration) provides a factor of safety (penetration assumed in analysis divided by penetration acceptance criteria) of 2 without considering the 1% allowable bypass. Dose analyses assumed a methyl iodide removal efficiency of 70% for the charcoal."

to

> "The TS efficiency of 85% (equivalent to 15% penetration) provides a factor of safety of 1.93 (100% minus 70% efficiency assumed in dose analysis plus 1% to reflect allowable bypass that must be compensated for by filter efficiency divided by penetration acceptance criteria). This constitutes an exception to the safety factor of 2 discussed in GL 99-02. GL 99-02 notes that the NRC staff has approved reductions in the safety factor for plants adopting ASTM D3803-1989 on a case-by-case basis. This exception is based on original design."

and

> "The FSAR will be revised to clarify that TS surveillance testing of the ventilation system is based upon a maximum flow of 8,800 cfm and a safety factor of 2 for the assumed methyl iodide removal efficiency without considering a 1% factor for bypass."

to

> "The FSAR will be revised to clarify that TS surveillance testing of the ventilation system is based upon a maximum flow of 8,800 cfm and a safety factor of 1.93 for the assumed methyl iodide removal efficiency considering a 1% factor for bypass."

2. "On page 4 of 10 of Attachment II to the October 23 submittal, ENO stated that "The Indian Point 3 CRVS has two filters (Reference 6) with each having a 1" bed depth that was designed with a residence time of 0.075 seconds at 1,000 cfm. This equates to a face velocity of 66.7 ft/min...(Reference 3)". However, (a) Item 2 on page 2 of 3, (b) tabulated items for the CRVS in Attachments I and III on page 5.0-24, and (c) Item 3.b in Attachment II on page 1 of 10 identified a face velocity of 50 ft/min for 1-inch deep charcoal beds for the CRVS filters. Clarify the discrepancy with respect to the design face velocity and the face velocity used during laboratory testing of a sample of charcoal adsorber, and provide an explanation and justification as to how this condition meets the guidance of GL 99-02."

Response: It was the understanding of ENO that the NRC staff wanted the submittal to discuss the basis for the face velocity used for testing. The safety evaluation therefore noted that the CRVS was originally designed and licensed with a maximum flow of 1000 cfm through each of the filters (2000 cfm total flow). The safety evaluation identifies Reference 6 as providing that design information. The current licensing basis is the dose calculations approved when addressing NUREG 0737 Item III.D.3.4. The NRC in Reference 9 of the safety evaluation approved these. These dose calculations assumed the outside air for pressurization was at a maximum of 400 cfm rather than the original design of 1000 cfm. System functional testing, safety evaluation Reference 7, assures that the maximum flow is limited to 1500 cfm (750 cfm per filter). The system functional test is performed to satisfy Technical Specification surveillance

requirements 3.3.7.2, 3.7.11.2 and 3.7.11.4. No operator actions are required to assure the maximum flow is maintained since monthly surveillance testing (3PT-M025, "Control Room Ventilation System Function") is performed using mode selector switches and there are no other tests moving dampers. The face velocity at the original design flow of 1000 cfm was 66.7 ft/min. The face velocity at 750 cfm was determined to be 50 ft/min by ratio. This value was incorporated into the proposed Technical Specification in accordance with the guidance of GL 99-02 which states, "If the system has a face velocity greater than 110 percent of 0.203 m/s (40 ft/min), then the revised TS should specify the face velocity." The proposed Technical Specification therefore meets the guidance of GL 99-02.

3. "On page 4 of 10, Paragraphs 3, 4, and 5, of Attachment II, to your submittal dated October 23, 2001, you stated that "The current TS for CRAFS requires that impregnated charcoal shall have a methyl iodide removal efficiency $\geq$ 90% at $\pm$ 20% of the accident design flow rate... The proposed TS increases the methyl iodide removal efficiency to > 91%... The 1% increase in the required efficiency is to reflect the allowable value of 1% for bypass leakage... The TS efficiency of 91% provides a factor of safety of 1 and 1% allowable for bypass. Dose analyses assumed a methyl iodide removal efficiency of 90% for the charcoal filter." The total penetration is 9% including 1% bypass which results in a safety factor of 1.11.

Provide a discussion explaining how this situation meets the guidance of GL 99-02. On the basis of the above, it is not clear whether adequate protection will be afforded to the operators in the event of a design-basis accident."

Response: GL 99-02 stated "If you choose to adopt the ASTM D3803-1989 protocol, submit a TS amendment request to require testing to this protocol within 180 days of the date of this generic letter. The request should contain the test temperature, RH, and penetration at which the proposed TS will require the test to be performed and the basis for these values. If the system has a face velocity greater than 110 percent of 0.203 m/s (40 ft/min), then the revised TS should specify the face velocity. Also, indicate when the next laboratory test is scheduled to be performed. (Enclosure 2 is a sample TS that the NRC considers acceptable.)" The sample Technical Specification had expected wording and, in brackets, wording that is adjusted to reflect plant specific designs. ENO has chosen to adopt the ASTM D3803-1989 protocol and a Technical Specification change was proposed in Reference 2. The proposed Technical Specification followed the expected wording and revised the bracketed wording to reflect plant design. Changes were as follows:

- The reference to Regulatory Guide 1.52 was deleted since IP3 is not a Regulatory Guide 1.52 plant.

- The methyl iodide removal efficiencies assumed in our accident analyses and approved by the NRC in a safety evaluation were used instead of the penetration value. This is acceptable because the methyl iodide efficiency and the penetration are directly related.

- The test temperature of 86°F and relative humidity of 95% were used but exception to the safety factor of 2 cited in the Generic Letter was taken. The proposed Technical Specification has no safety factor built into it because the current Technical Specification has no safety factor built into it. As noted earlier in the GL, the laboratory test acceptance criteria for penetration "contain a safety factor to ensure that the efficiency assumed in the accident analysis is still valid at the end of the operating cycle. Because ASTM D3803-1989 is a more accurate and demanding test than older tests, addressees that upgrade their TS to this new protocol will be able to use a safety factor as low as 2 for determining this acceptance criteria for charcoal filter efficiency." The licensing basis of IP3 has never contained a factor of safety in the Technical Specification. Nevertheless, adequate protection is afforded to the operators in the event of a design basis accident because of the IP3 practice of replacement of the CRVS charcoal every refuel outage and the safety factor that exists between actual test results and the required charcoal efficiency. This cycle specific safety factor provides reasonable assurance that charcoal efficiency is valid at the end of the operating cycle. This licensing basis was retained in the proposed Technical Specification.

The most recent test using the ASTM D3803-1989 protocol yielded an efficiency of 94.28% (penetration of 5.72%) for methyl iodide. The available safety factor for this cycle is therefore the assumed penetration of 9% divided by the as tested penetration of 5.72% or 1.57. The expected degradation over time of charcoal cannot be accurately determined due to a lack of data. Previous test results were to older standards and are unacceptable for this purpose. Nothing in the test results for the Containment Purge System (CPS), Fuel Storage Building Ventilation System (FSBVS) or CFCU since 1999 (the charcoal is not changed every outage in these systems) has indicated that the CRVS margin is unacceptable. For example, the FSBVS charcoal test results are 99.13% in September 1999, 98.5% in January 2001 and 97.55% in January 2002 (the 1999 and 2001 tests were converted from 99.27% and 98.74% using formula 1 in ASTM D3809-1989 to account for testing at a face velocity of 50 ft/min rather than 59 ft/min). The FSBVS charcoal was changed just prior to the September 1999 test and has not been changed since. The FSBVS provides a conservative basis to assess the CRVS margin since the FSBVS was run more than 1700 hours between September 1999 and January 2002 whereas the CRVS is run about 15 minutes per month or about 6 hours between refuel outages.

In order to reflect the above response, the safety evaluation submitted in Reference 1 should be revised by changing:

> "The TS efficiency of 91% provides a factor of safety of 1 and 1% allowable for bypass. Dose analyses assumed a methyl iodide removal efficiency of 90% for the charcoal filter. These dose analyses represent the current licensing basis (Reference 9) and constitute an exception to the safety factor of 2 discussed in GL 99-02. GL 99-02 notes that the NRC staff has approved reductions in the safety factor for plants

adopting ASTM D3803-1989 on a case-by-case basis. The CRVS charcoal was tested in May 2001 using the criteria of the proposed TS and a test result of 94.28% efficiency was achieved (Reference 10).

The FSAR will be revised to clarify that TS surveillance testing of the ventilation system is based upon a maximum flow of 1,500 cfm and a safety factor of 1 for the assumed methyl iodide removal efficiency plus a 1% factor for bypass."

to

"The TS efficiency of 91% provides no factor of safety (i.e., the safety factor is one). The assumed efficiency of 90% in dose analyses plus 1% for bypass gives a penetration of 9%. When divided by the proposed penetration of 9%, the safety factor is one. The dose analyses represent the current licensing basis (Reference 9) and constitute an exception to the safety factor of 2 discussed in GL 99-02. GL 99-02 notes that the NRC staff has approved reductions in the safety factor for plants adopting ASTM D3803-1989 on a case-by-case basis. The CRVS safety factor is cycle specific and not in the TS. The CRVS charcoal was tested in May 2001 using the criteria of the proposed TS and a test result of 94.28% efficiency (penetration of 5.72%) was achieved (Reference 10). The available safety factor for charcoal degradation is therefore the assumed penetration of 9% divided by the as-tested penetration of 5.72%, or 1.57 for this cycle. The TS acceptance criteria do not provide for a specific margin because this is the current licensing basis and insufficient test data exist to define an acceptable margin. The margin changes each cycle since the CRVS charcoal is replaced every refuel outage.

The FSAR will be revised to clarify that TS surveillance testing of the ventilation system is based upon a maximum flow of 1,500 cfm (uncertainty included) for two filters and no safety factor for charcoal degradation considering the 90% assumed methyl iodide removal efficiency plus a 1% factor for bypass. Margin for degradation is maintained by the difference between the 91% efficiency in the Technical Specifications and the actual test results. Charcoal is replaced every refuel outage."