Entergy

Entergy Nuclear Northeast
Indian Point Energy Center
450 Broadway, GSB
P.O. Box 249
Buchanan, NY 10511-0249
Tel 914 734 6700

Fred Dacimo
Site Vice President
Administration

December 8, 2004

Re: Indian Point Unit 3
Docket No. 50-286
NL-04-154

U.S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Washington, DC 20555-0001

SUBJECT: Reply to RAI regarding Alternate Source Term License Amendment and Transmittal of Supplemental Information (TAC MC3351)

References:
1. NRC letter dated September 30, 2004; "Request for Additional Information Regarding Amendment Application for Alternate Source Term". [ML042660013]
2. Entergy letter to NRC (NL-04-068) dated June 2, 2004; "Proposed Change to Technical Specifications Regarding Full Scope Adoption of Alternate Source Term".

Dear Sir;

Entergy Nuclear Operations, Inc. (ENO) is providing a response to the NRC request for additional information (RAI) in Reference 1 regarding the proposed license amendment request for adoption of Alternate Source Term (Reference 2) for Indian Point 3 (IP3). The responses to questions are provided in Attachment 1.

There are no new commitments identified in this submittal. If you have any questions or require additional information, please contact Mr. Patric W. Conroy at 914-734-6668.

I declare under penalty of perjury that the foregoing is true and correct. Executed on December 8, 2004.

Sincerely,

Fred R. Dacimo
Site Vice President
Indian Point Energy Center

A001

cc: Mr. Patrick D. Milano, Senior Project Manager
Project Directorate I,
Division of Reactor Projects I/II
U.S. Nuclear Regulatory Commission
Mail Stop O 8 C2
Washington, DC 20555

Regional Administrator
Region I
U.S. Nuclear Regulatory Commission
475 Allendale Road
King of Prussia, PA 19406

Resident Inspector's Office
Indian Point Unit 3
U.S. Nuclear Regulatory Commission
P.O. Box 337
Buchanan, NY 10511

Mr. Paul Eddy
NYS Department of Public Service
3 Empire Plaza
Albany, NY 12223

ATTACHMENT 1 TO NL-04-154

REPLY TO NRC REQUEST FOR ADDITIONAL INFORMATION REGARDING PROPOSED LICENSE AMENDMENT REQUEST FOR ADOPTION OF ALTERNATE SOURCE TERM AT INDIAN POINT 3

ENTERGY NUCLEAR OPERATIONS, INC
INDIAN POINT NUCLEAR GENERATING UNIT 3
DOCKET 50-286

Request for additional information from NRC letter dated
September 30, 2004 (Accession Number ML042660013)

Question 1:

In order to complete its evaluation, the staff needs to review the general assumptions and calculations used by the licensee to prove that the containment sump pH will be maintained above seven throughout the duration of the accident.

Describe the procedure utilized for calculating the pH of the containment sump water during the 30-day period after a loss-of-coolant accident. If the calculations were performed manually, describe the methodology and provide sample calculations. If a computer code was used, provide the input to the code and the results calculated by it.

Question 1 Response:

Westinghouse performs a reload-specific containment sump pH analysis for each refueling cycle in accordance with the Reload Safety Evaluation (RSE) process. Since the post-accident containment sump pH performance is a function of the accident mitigating systems, and these plant system requirements can be driven by the core reload requirements, post-accident containment sump pH is evaluated each refueling cycle using an internal practice called the boron design requirements (BORDER) process. A Westinghouse computer code called BORDER has been developed as a convenience code that automates hand calculations to evaluate the post-accident containment sump pH. The BORDER code has the capability of calculating the performance of the Spray Additive System, relative to containment sump pH, which uses sodium hydroxide (NaOH) as the sump pH control agent.

As requested by the above NRC RAI related to computer codes, the following BORDER Code input and results are provided from the bases of the latest Indian Point 3 Cycle 13 RSE.

BORDER Code Input Data:

RWST minimum usable volume (Modes 1 - 4)	288,600 gal
Maximum RWST volume	340,600 gal
RWST minimum boron concentration	2400 ppm
RWST maximum boron concentration	2600 ppm
RWST minimum temperature	35°F
RWST maximum temperature	110°F
Mode 1 RCS liquid mass	522,098 lbs
Spray Additive Tank minimum useable volume	115 ft^3

Spray Additive Tank maximum useable volume	525 ft^3
Spray Additive Tank minimum NaOH concentration	35 wt. %
Spray Additive Tank maximum NaOH concentration	38 wt. %
Minimum total accumulator liquid volume	3100 ft^3
Maximum total accumulator liquid volume	3260 ft^3
Minimum accumulator boron concentration	2000 ppm
Maximum accumulator boron concentration	2600 ppm
Minimum allowable containment sump pH	7.9
Maximum allowable containment sump pH	10

Reload specific fuel (RCS) boron parameters as a function of burnup:

Cycle Burnup MWD/MTU	Minimum RCS Boron (ppm)	Maximum RCS Boron (ppm)
150	1004	1565
4000	1033	1622
10,000	864	1441
20,881	0	562

Discussion of BORDER Code Results

The BORDER code sump pH results are given in terms of allowable spray additive tank NaOH concentrations such that the sump pH limits (given as an input) are met. For the Cycle 13 case, the calculated allowable NaOH concentrations are:

	Criterion	Allowable	pH
Maximum spray additive tank NaOH (wt. %)	* 38	38.6	* 10
Minimum spray additive tank NaOH (wt. %)	* 35	34.6	* 7.9

* BORDER Code Input/criterion. Because the calculated allowable range bounds the criterion, the results are acceptable and the resulting sump pH limits shown above would be bounded.

Question 2:

NUREG-0800, Standard Review Plan Section 6.5.2, "Containment Spray as a Fission Product Cleanup System," states that the coefficient representing the removal of elemental iodine by wall deposition is calculated and is used as input in a computer model used for dose calculations.

Provide the value calculated for the removal coefficient of elemental iodine by wall deposition. If this value was not needed in the calculations, provide the technical basis for not using it.

Question 2 Response:

The Indian Point 3 LOCA dose analysis does not take credit for the removal of elemental iodine by deposition onto containment surfaces.

Question 3:

NUREG-0800 states that the maximum decontamination factor (DF) is 200 for elemental iodine. If the DF results in a number less than 200, then it is expected that this new number will be used in the calculations as it is more conservative. In the "Containment Spray Iodine Removal Model" section of the IP3 Updated Final Safety Analysis Report (UFSAR), the licensee calculated the DF to be approximately 160. This number is reduced to 100 to account for the instantaneous plateout and this was the number used in your UFSAR analysis. On page 9 of the June 2 submittal, the licensee stated that it used 200 as the value for the DF.

Clarify the apparent discrepancy between the information in the June 2 submittal and the UFSAR. Discuss whether another DF was calculated for the AST amendment and provide its value.

Question 3 Response:

The DF of 160 that is currently referred to in the UFSAR was based on a post-LOCA solution volume of 4.157E4 cubic feet and an iodine partition coefficient of 10,000. The DF of 160 reflects a rounding down from the calculated value of 162.8. Because the dose analysis was modeling an instantaneous release of activity from the core and an instantaneous plateout of half of the iodine released to the containment atmosphere, the DF limit was reduced to 100 in keeping with NRC guidance.

The updated analysis credits a solution mass of 3.097E6 lb (i.e., a volume of 5.16E4 cubic feet in the post-LOCA environment) with the result that the calculated DF is 202.7. Since instantaneous plateout is no longer modeled, the NRC-defined DF limit is 200 instead of 100 and the DF was rounded down to 200.