June 26, 2000

MEMORANDUM FOR: File

FROM: S. Patrick Sekerak, Project Manager, Section 1 ***/RA/***
Project Directorate IV & Decommissioning
Division of Licensing Project Management
Office of Nuclear Reactor Regulation (NRR)

SUBJECT: GRAND GULF NUCLEAR STATION, UNIT 1 (GGNS); ELECTRONIC TRANSMISSION OF ITEMS FOR DISCUSSION IN A TELEPHONE CONFERENCE RE: GGNS ALTERNATE SOURCE TERM LICENSE AMENDMENT REQUEST (TAC NO. MA8065)

The attached items for discussion were prepared by the NRR Probabilistic Safety Assessment Branch, and electronically transmitted to Mr. Jerry Roberts of Entergy Operations, Inc. on June 21, 2000, in preparation for a telephone conference with the NRR Technical Staff. The primary purpose of the teleconference is to discuss issues associated with suppression pool water chemistry as affected by the proposed adoption of the alternate source term.

This memorandum and the attachment do not convey a formal request for information or represent an NRC staff position. Formal questions, if any, may be developed after the teleconference depending on the results of the discussions.

Docket No. 50-416

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ITEMS FOR DISCUSSION / CLARIFICATION
GRAND GULF LICENSE AMENDMENT REQUEST FOR
FULL-SCOPE APPLICATION OF ALTERNATIVE SOURCE TERM
(TAC NO. MA8065)

QUESTIONS

(1) Equation 3-0a in page 4 of 12 of Attachment 7 is approximately true at 25°C, but not at higher temperatures. The concentration of free hydrogen ions increases with temperature, lowering the pH. For example, at 95°C, the pH of pure water is about 6.2, as compared to 7.0 at 25°C. State the maximum expected suppression pool water temperature following a design basis accident and its corresponding calculated pH value.

(2) In Section 3.3 of Attachment 7, you used the model provided in NUREG/CR-5950 for estimating the production of hydrochloric acid. This model utilizes the radiative flux to the *surface* of the Hypalon material rather than the *average* flux through the material. For γ-radiation, these two quantities are nearly the same. However, for β-radiation, the average is 11.2% of the surface value as you indicated. Thus, your evaluation may lower the effects of β-radiation in acid production to only 11.2% of its legitimate value. Explain the differences.

CLARIFICATIONS

(1) In Section 3.3 of Attachment 7, you stated that cables in conduit or totally enclosed raceway will not contribute any hydrochloric acid to the suppression pool. Describe in more detail its construction for leak-tightness and potential diffusion of hydrochloric acid that may be produced into the containment.

(2) In Section 4.0 of Attachment 7, it appears that nitric acid formation is applied only in the drywell, and only resulting from gamma radiation in the sump. This phenomena should occur in any air-water system (including the containment), and effects of beta-radiation should also included.

(3) In Attachment 8, the containment airborne gamma dose is shown to be zero after 480 hours, so the integrated dose is constant after this time. Is this realistic?

(4) No suppression pool beta dose is shown in Attachment 8. Thus, formation of nitric acid is under predicted.

(5) In Attachment 8, there is no mention of a drywell sump, which might also be a repository for I, Cs, and containment acids.

(6) Table 3-1 of Attachment 9 indicates that ^{132}I is ignored. Any initial source of this isotope would certainly be decayed within one day, however, the supply is continually renewed by decay of the tellurium precursor. Thus, deposition of Te in containment may continue to replenish ^{132}I supply.

(7) Several equations in Section 5.2.1 of Attachment 9 [including Eq. (5-1)] involve mixing English and metric units, with no apparent conversion factors.

(8) Uncertainty analysis in Attachment 9 involving temperature (Section 4.2) is largely irrelevant, unless all computational parameters are temperature dependent.

(9) Uncertainty analysis in attachment 9 regarding the CsOH source is good. Such analysis should include additional quantities, such as acid generation, in order to be comprehensive.

TYPOGRAPHICAL ERRORS

(1) Appendix A to Attachment 7. A.3 Sample Calculation. Reference to Figure A-1 should be Table A-1. Variable "t" should be the thickness "th". Quantity on p. 6 should be "4.055E-6 mols", although use of this quantity in the final equation does result in the correct value of 5.55E-4 mols HCl/lb-Mrad.