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SOUTHERN NUCLEAR
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MAY 1 6 2016

Docket Nos.: 50-321
50-366

NL-16-0660

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

Edwin I. Hatch Nuclear Plant Units 1 and 2
Response to Request for Additional Information on Secondary Containment
Drawdown Time Technical Specifications Amendment Request

Ladies and Gentlemen:

By letter dated October 15, 2015, Southern Nuclear Operating Company (SNC) submitted a license amendment request for Edwin I. Hatch Nuclear Plant (HNP) Units 1 and 2. The proposed amendment would revise the Unit 1 and 2 HNP Technical Specifications Surveillance Requirement (SR) 3.6.4.1.3 to increase the allowable time for the Standby Gas Treatment System (SGTS) to draw down the secondary containment to the required negative pressure from 2 minutes to 10 minutes.

By letters dated February 18, 2016 and April 15, 2016, the Nuclear Regulatory Commission (NRC) issued requests for additional information (RAIs). SNC partially responded to the February 18, 2016 RAI on March 16, 2016 and responded to the April 15, 2016 RAI on May 9, 2016.

RAI question #1 from the original February 18, 2016 RAI, dealing with Main Control Room ingress and egress doses, was deferred until 90 days from the date of the RAI. The enclosure to this letter responds to that question, thus completing the response to the February 18, 2016 RAI.

This letter contains no NRC commitments.

If you have any questions, please contact Ken McElroy at (205) 992-7369.

Mr. C.R. Pierce states he is Regulatory Affairs Director of Southern Nuclear Operating Company, is authorized to execute this oath on behalf of Southern Nuclear Operating Company and, to the best of his knowledge and belief, the facts set forth in this letter are true.

Respectfully submitted,

C. R. Pierce

C. R. Pierce
Regulatory Affairs Director

CRP/OCV/

*Sworn to and subscribed before me this 16th day of MAY, 2016.*

Laura L. Cr[illegible]

*Notary Public*

*My commission expires:* 10-18-2017

Enclosures: Response to Request for Additional Information

cc: Southern Nuclear Operating Company
Mr. S. E. Kuczynski, Chairman, President & CEO
Mr. D. G. Bost, Executive Vice President & Chief Nuclear Officer
Mr. D. R. Vineyard, Vice President – Hatch
Mr. M. D. Meier, Vice President – Regulatory Affairs
Mr. D. R. Madison, Vice President – Fleet Operations
Mr. B. J. Adams, Vice President – Engineering
Mr. G. L. Johnson, Regulatory Affairs Manager - Hatch
RType: CHA02.004

U. S. Nuclear Regulatory Commission
Ms. C. Haney, Regional Administrator
Mr. M. D. Orenak, NRR Project Manager – Hatch
Mr. D. H. Hardage, Senior Resident Inspector – Hatch

State of Georgia
Mr. J. H. Turner, Director - Environmental Protection Division

**Edwin I. Hatch Nuclear Plant Units 1 and 2**

**Enclosure**

**Response to Request for Additional Information**

NRC Question

The NRC approved use of a full-scope Alternate Source Term pursuant to Title 10 of the *Code of Federal Regulations* (10 CFR) 50.67 at HNP on August 28, 2008, (ADAMS Accession No. ML081770075). Section 50.67(b)(2)(iii) of 10 CFR states that the NRC may issue the amendment only if the applicant's analysis demonstrates with reasonable assurance that:

> Adequate radiation protection is provided to permit access to and occupancy of the control room under accident conditions without personnel receiving radiation exposures in excess of 0.05 Sv (5 rem) total effective dose equivalent (TEDE) for the duration of the accident.

To meet 10 CFR 50.67, the radiation dose for accessing the control room must be evaluated from the site boundary to the control room for both ingress and egress for the duration of the accident. The submittal is missing a discussion and/or calculation that accounts for the control room personnel radiation exposure received upon ingress/egress from the site boundary to the turbine building for the duration of the accident. Please provide an analysis of the radiation dose received from accessing the control room in sufficient detail that will enable the NRC staff to be able to perform an independent calculation.

SNC Response

A summary of the requested ingress/egress dose calculation (site boundary to turbine building) is provided below. The quantitative dose estimate is < 0.1 REM and bounded by conservatisms in the current AST ingress/egress dose contribution from the turbine building to the main control room. The inputs and assumptions documented below should allow the NRC staff to perform an independent calculation.

It is postulated that the control room operator will exit the plant at 24 hours post-accident and thereafter make one round trip daily for ingress/egress between the site boundary and the turbine building. During these trips, the operator will be exposed to the following potential sources:

- Direct radiation shine from the reactor building
- Direct radiation shine from the turbine building
- Activity from the reactor and turbine buildings released at ground level
- Activity from the reactor building released through the plant stack

To facilitate the dose assessment, the ingress/egress pathway is divided into three legs:

- Site boundary to the parking lot – The driving time is estimated to be 5 minutes.
- Parking lot to the security building – The walking time is estimated to be 6 minutes.

- Security building to the service building annex, which is the entrance to the turbine building – The walking time is estimated to be 4 minutes.

Although the wall thicknesses of the reactor and turbine buildings vary, it is conservatively assumed that all walls have a uniform concrete thickness of 1 foot, 6 inches. The minimum distance from the reactor building to the trip legs ranges from 300 feet (security building) to 1200 feet (parking lot). The minimum distance from the turbine building ranges from 100 feet (security building) to 1000 feet (parking lot). A point-kernel computer program is used to calculate the time-dependent shine dose rate for each leg of the trip and is multiplied by the transit time to yield the shine dose over the duration of the accident.

For the activity releases, the average atmospheric dispersion factors from each ground level and elevated release point to each leg of the trip are calculated for time periods of 24 to 96 and 96 to 720 hours using the ARCON96 computer program. These dispersion factors are then used with the activity released from the reactor and turbine buildings to the environment during each time period and trip transit times to calculate inhalation and immersion doses during each leg of the trip. The operator breathing rate is assumed to be at the maximum value of 3.5E-4 $m^3$/sec for the entire duration of the accident in calculating the inhalation doses.

The resulting doses are as follows:

| | Site Ingress/Egress Dose (rem TEDE) | | | | |
|---|---|---|---|---|---|
| Trip Leg | Reactor Building Shine | Turbine Building Shine | Ground Level Release | Elevated Release | Total |
| Site Boundary to Parking Lot | 3.79E-4 | 1.38E-5 | 1.70E-3 | 6.17E-4 | 2.71E-3 |
| Parking Lot to Security Building | 3.22E-3 | 1.31E-4 | 1.98E-2 | 6.05E-4 | 2.38E-2 |
| Security Building to Service Building Annex | 3.40E-3 | 1.42E-4 | 4.07E-2 | 3.61E-4 | 4.46E-2 |
| Total | 7.01E-3 | 2.86E-4 | 6.22E-2 | 1.58E-3 | 7.11E-2 |

The previously calculated control operator doses are as follows:

- Control room air – 3.58 rem TEDE
- Ingress/egress through turbine building – 1.30 rem TEDE
- Turbine building shine into control room – 0.0059 rem TEDE
- Other external sources – 0.03 rem TEDE
- Total – 4.9 rem TEDE

Based on operator walking speed and distance, the transit time for ingress/egress through the turbine building was estimated to be 1.2 minutes per trip. For conservatism, this was rounded up to 2 minutes in calculating the turbine building ingress/egress dose of 1.30 rem TEDE. The dose based on a transit time of 1.2 minutes would be as follows:

(1.30 rem TEDE)(1.2/2.0) = 0.78 rem TEDE

Hence, the conservatism in the previous turbine building ingress/egress dose was 0.52 rem TEDE (1.30 – 0.78). Compared to this, the site ingress/egress dose of 0.0711 rem TEDE is negligible and the previously calculated control room dose of 4.9 rem remains bounding.