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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 Revision to Secondary
Containment Drawdown Time Technical Specifications Amendment Request

Ladies and Gentlemen:

By letter dated October 15 2015, Southern Nuclear Operating Company submitted a Technical Specifications amendment request to increase the required drawdown time for secondary containment given in Surveillance Requirement (SR) 3.6.4.1.3. The Nuclear Regulatory Commission (NRC) issued a request for additional information (RAI) letter dated February 18, 2016.

The response to the first RAI question is to be provided within 90 days of February 18. RAI questions 2 through 9 are to be provided within 30 days of February 18.

Accordingly, the Enclosure to this letter provides the responses to RAIs 2 through 9.

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* March, *2016.*

Notary Public

My commission expires: 10-8-2017

Enclosures: Response to Request for Additional Information, questions 2 through 9

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
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RType: CHA02.004

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

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Mr. J. H. Turner, Director - Environmental Protection Division

Edwin I. Hatch Nuclear Plant Units 1 and 2

Enclosure

Response to Request for Additional Information, questions 2 through 9

By letter dated October 15, 2015 (Agency wide Documents Access and Management System (ADAMS) Accession No. ML15288A528), Southern Nuclear Operating Company (SNC) submitted a license amendment request for Edwin I. Hatch Nuclear Plant (HNP), Unit 1 and 2. The proposed license amendment request would revise HNP Technical Specifications Surveillance Requirement (SR) 3.6.4.1.3 to increase the allowable time for the standby gas treatment system (SGTS) to drawdown the secondary containment to negative pressure from 2 minutes to 10 minutes.

The U.S. Nuclear Regulatory Commission (NRC) staff has found that further information is needed to complete its review. If the request for additional information is already contained in the radiological analysis calculations performed by SNC, please indicate where the information is located.

RAI-1

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 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.

SNC Response

This response will be provided at a future date.

RAI -2

The submittal provides some of the assumptions and results of the radiological consequence analysis of increasing the loss-of-coolant-accident (LOCA) secondary containment draw down time. In addition to the increased secondary containment draw down time, there are changes in the main control room unfiltered in-leakage rate, main condenser volume, and technical support center in-leakage to support the submittal. However, the submittal does not appear to provide (1) a technical basis that addresses why these changes are acceptable, (2) explain the details of the main condenser volume error, or (3) provide the LOCA radiological consequences analysis in enough detail that will enable the NRC staff to be able to perform an independent calculation to confirm the results.

a) Please provide a technical basis that addresses why the changes to the main control room in-filtered in-leakage rate and technical support center in-leakage are acceptable.
b) Please provide the details of the main condenser volume error.
c) Please provide any changes to the input parameters, assumptions, or methodologies used in the LOCA radiological consequences analysis in enough detail that will enable the NRC staff to be able to perform an independent calculation to confirm the results.

SNC Response

a) The original submittal of October 15 provides a justification for the control room in-leakage assumption on page E1-10 as a part of the response to question #3 of the Significant Hazards Evaluation.

The main control room (MCR) filtered in-leakage assumption was at 115 cfm following the HNP implementation of the alternative source term, 10 CFR 50.67, and prior to the current LOCA dose calculation. The MCR in-leakage is now assumed at 39 cfm. As discussed in the response to part b) of this question, the reduction was necessary to offset the dose increase which resulted from the reduced condenser volume. The reduction to 39 cfm is technically acceptable because the HNP MCR filtered in-leakage was physically tested in April of 2015 and the final results were less than the assumed value of 39 cfm. In fact, the results were between 8 and 12 scfm, depending on the test configuration. The tested in-leakage is therefore less than one-third of the assumed value.

During normal operations, the Technical Support Center (TSC) HVAC system consists of an air handling unit with a condensing unit and an outside air inlet damper (X75-F005). During accident conditions, the outside air inlet damper will close, and the filter train air inlet damper will open, diverting the outside air through a filter train consisting of a pre-filter, an electric heater, a set of two HEPA filters, six charcoal adsorbers and a fan unit.

Except for the condensing unit, the TSC HVAC system is housed in a mechanical room. A surveillance procedure, performed once every two years, verifies that the TSC and the TSC mechanical room are at positive pressure with respect to the environment, and also verifies that the outside air supply to the TSC is within 500 cfm.

Unfiltered in-leakage can occur via the outside air damper (X75-F005) to the air handling unit if the damper's seal were to fail. However, an Engineering review of a failure of this damper determined that the maximum leakage past this damper would be 130 cfm, well within the 1000 cfm in-leakage assumption. Another surveillance procedure, also performed once every two years, verifies that the TSC filter train is capable of providing filtered air for the pressurization of the TSC. In addition it ensures that the outside air damper (X75-F005) is closed.

b) While revising the Hatch LOCA AST dose calculation to evaluate the effect of changing the fuel type to Global Nuclear Fuels-2 (GNF2) fuel, a detailed review was performed of the calculation.

As part of this review, several references not currently stored in our records management system or attached to the calculation were tracked down. A discrepancy in the assumed LP Turbine/Condenser free volume was discovered during this process.

A value of 172,000 cubic ft had been assumed in the LOCA AST dose analysis, based on revision 0 of an SNC calculation. However, in a subsequent revision of that calc, the volume was changed to 107,000 cubic feet.

To resolve the discrepancy between the two values as part of our due diligence, the LP Turbine/Condenser free volume was re-calculated as 68,026 cubic ft, based on the condenser drawings.

This correction was expected to increase the calculated doses by a factor of ~2.5 (=172,000/68,026). This necessitated a reduction in unfiltered MCR inleakage to offset the dose increase.

c) The table below provides the changes in the input parameters and assumptions. There were no changes to the calculation methodology:

Input Parameter	120-second Drawdown	10-minute Drawdown	Basis
LP Turbine/Condenser Free Volume	172,000 cu ft	68,026 cu ft	Corrected volume. Increases release concentration by a factor of ~2.5 (=172,000/68,026), which results in similar increase in onsite and offsite doses.
MCR Unfiltered Inleakage Rate	115 CFM	39 CFM	Reduced to offset effect of reduced LP Turbine/Condenser free volume. Conservative WRT tracer gas test results.
TSC Unfiltered Inleakage Rate	10,000 CFM	1,000 CFM	Relax conservatism. Equal to double the filtered intake flow rate.
TSC Filter Efficiency	90%	95%	Relax conservatism. Conservative WRT design and surveillance test efficiencies, 99.97% and 99.95%, respectively.
Volume Correction Factor (VCF)	0.50	0.47	Relax Conservatism. The correction factor is calculated to be 0.47 but was

			previously rounded up to 0.5. To gain margin, the revised calculation uses the value of 0.47 without rounding.

RAI 3

The submittal states that the first of the two analyzed fuel handling accident (FHA) cases assumes that the secondary containment is drawn down within the current technical specification time of 120 seconds. The submittal concludes that both FHA cases are within the dose criteria and that there is no need to evaluate the FHA cases. The NRC staff did not find that a technical basis was provided to support this conclusion.

Please provide the technical basis that supports the conclusion that the FHA case with secondary containment drawn down does not need to be re-evaluted, even though the secondary containment drawdown time is changing from two minutes to ten minutes.

The NRC staff notes that the dose release point (ground level or elevated) depends on whether or not a negative pressure has been established in the secondary containment, and that the atmospheric dispersion values vary with the release point and are an input into the radiation dose calculation.

SNC Response

As discussed in Section 3.0, page E1-3 of the SNC submittal, two cases are analyzed for the FHA, one assuming SGTS operation and one with no SGTS operation.

From a dose perspective, the case with no SGTS operation, and thus no drawdown of the secondary containment, is limiting.

The FHA occurs on the refueling floor with the drywell head and the reactor head off the vessel. One fuel assembly is assumed to be dropped on top of the core, damaging it, as well as other fuel assemblies. Gaseous fission products are ultimately released to the refueling floor atmosphere. The refueling floor is a part of the HNP secondary containment, serviced by the SGTS. For the case analyzed with SGTS operation, a ground level release from the secondary containment is assumed until the negative pressure in the containment reaches the TS acceptance criteria value of 0.20 inches of water. At that point, elevated release through the main stack begins. For the case with no SGTS operation, there is no drawdown of the secondary containment and all releases are assumed to be at ground level. Consequently, as far as off-site doses are concerned, no SGTS operation would clearly result in worse consequences than assuming SGTS with any finite drawdown time. This is also true for the Technical Support Center (TSC) doses, since it (the TSC) is located in the service building annex, which is an administrative building, not a part of the HNP containment nor part of the turbine building.

The HNP Control Room is located in the turbine building. Consequently, any dose to the control room operators as a result of the FHA would be the result of leakage from the secondary containment to the turbine building. Again, the limiting case in this respect is the case of no drawdown time. In such a case, which is already analyzed in the FSAR, there will be more radioactivity leaking out of the secondary containment at ground level and into the turbine building than would be if the SGTS were taking a suction on the secondary containment (at any finite drawdown time), filtering the atmosphere, and releasing it at an elevated level.

Consequently, a re-analysis of the FHA is not required for the case of the two minute drawdown time. Nevertheless, the FHA with the 10 minute drawdown time was re-done for completeness. As expected, the calculated dose results were within the federal guidelines.

RAI 4

The submittal states that two main steam line break cases are evaluated, (1) a rupture inside the secondary containment and (2) a rupture outside secondary containment. The submittal concludes that the radiological consequences of a break outside the containment are more severe than those from a break inside containment, and that it is not necessary to consider the drawdown time with respect to the main steam line break. The NRC staff did not find that a technical basis was provided to support this conclusion.

Please provide the technical basis that supports the conclusion that the radiological consequences of a break outside the containment remains more severe than those from a break inside secondary containment with the proposed 10 minute drawdown time.

SNC Response

The justification for excluding main steam line break dose analysis from consideration for the purposes of this TS amendment request was included in the SNC submittal on page E1-3.

As noted in the original submittal, two main steam line break accidents were considered for the original licensing of HNP, one a main steam line break inside the secondary containment, and one for a break outside of the secondary containment. The break outside the secondary containment would clearly be more severe with respect to off-site doses than the break inside the containment. Obviously, a break outside the secondary containment provides no secondary containment holdup at all. Consequently, any hold-up in the secondary containment will yield lower doses than a break outside of containment. Since offsite doses due to a break outside containment are acceptable with respect to regulatory limits, there was no need to reevaluate offsite doses for the purpose of assessing the impact of change in secondary containment drawdown time.

The HNP main control room is located in the turbine building. For the purposes of calculating a control room dose, the evaluation of the main steam line break outside the secondary containment assumes that the break activity is entirely contained in the turbine building and leaks directly into the control room. Accordingly, the dose to the control room operators is unaffected by the secondary containment drawdown time. As a break in the turbine building clearly bounds one in the secondary containment, there was no need to reevaluate the control room dose to assess impact of the change in secondary containment drawdown time.

The HNP Technical Support Center (TSC) is located in the Service Building Annex, not in the turbine building. For the purposes of calculating doses to the TSC personnel, the analysis of the steam line break outside of secondary containment assumes the turbine building activity is released to the environment with no hold-up. Consequently, for the break inside the secondary containment, any leakage from the secondary containment to the turbine building and from the turbine building to the environment will not result in as much dose to the TSC as would the dose from the break outside containment, regardless of the secondary containment drawdown time. Hence, there was no need to reevaluate the TSC dose to assess impact of the change in secondary containment drawdown time.

RAI-5

The submittal proposed to increase the SR 3.6.4.1.3 allowable time for the SGTS to draw down the secondary containment to 10 minutes from the currently required 120 seconds. Please provide the technical basis for the requested change. Please discuss if:

(1) The trending of SR 3.6.4.1.3 tested draw down times approaches to the allowable time limit, then provide the draw down time trending of the last few hours for each SGTS;
(2) The performance of the equipment and instrument involved with the SR test is degrading over time, then provide the details (e.g. summary of the corrective action for degradation report) for the involved equipment and instrument;
(3) The draw down time analysis was revised, then provide the changes between "before" and "after" change and the revised analysis for review;
(4) None of the above, then provide the technical basis and expected operational flexibility gained by the proposed change.

SNC Response

SNC does not request this change for reasons 1, 2, or 3 listed above.

The primary reason for the change is to increase the margin to the Technical Specification surveillance requirement to drawdown the secondary containment within 120 seconds.

Changes to the plant's licensing basis and safety analysis methods show there are sufficient margins in the LOCA dose calculation to allow relaxing the 120 second criteria. This change will have a modest impact on operational flexibility. The plant has met the current SR criteria for many years, but for example, occasionally has had to re-perform tests while changing to different secondary containment configurations or evaluate or re-perform tests due to wind gusts.

Additionally, SNC notes that some other BWR plants have higher drawdown time requirements and some have no drawdown time requirements in their Technical Specifications.

RAI-6

Please provide additional information on how the SR 3.6.4.1.3 test is performed. Specifically, please provide the locations of pressure measurement in secondary containment. Also, please justify that pressure measurements taken at those locations will ensure a vacuum of ≥ 0.20 inch of water throughout the secondary containment.

SNC Response

The Secondary Containment Volume is divided into 3 zones : the Unit 1 Reactor Building, the Unit 2 Reactor Building, and the Refueling Floor (common between both units). Differential pressure indicators are located inside of each Secondary Containment zone. S econdary Containment Tests use these permanently mounted differential pressure indicators to measure the differential pressure of each zone. These differential pressure indicators have a reference leg to the outside, which ensures that a differential pressure of ≥ 0.20 inches of water is maintained throughout all of the Secondary Containment zones.

RAI -7

NUREG-800, Section 6.2.3, Acceptance Criterion 3.B, states,

The negative pressure differential to be maintained in the secondary containment and other contiguous plant areas should be no less than 0.063 kPa (0.25 inches water gauge) compared to adjacent regions under all wind conditions up to wind speed at which diffusion becomes sufficient to assure site boundary exposures less than those calculated for the design basis accident even if exfiltration occurs. If the leakage rate exceeds 100 percent of the volume per day, there should be a special exfiltration analysis.

Please clarify whether the drawdown analysis has accounted for all wind conditions. If not, please provide justification for not accounting for all wind conditions.

SNC Response

On September 11, 1995, the NRC issued Amendments number 198 and 139 to the Unit 1 and Unit 2 HNP Technical Specifications, respectively. This amendment revised TS Surveillance Requirements (SR) 3.6.4.1.3 and 3.6.4.1.4 for the secondary containment drawdown. Specifically, the amendment reduced the SR acceptance criteria from 0.25 inches of water gauge to 0.20 inches of water gauge negative pressure.

It is noted in the SNC submittal documents and the NRC Safety Evaluation that, at > 0.20 inches of vacuum, there would be no exfiltration from the secondary containment at wind speeds less than 31 mph. This was a slight reduction from the previous wind speed of 35 mph for no exfiltration at 0.25 inches of water vacuum.

This reduction was justified by noting that wind speeds of greater than 24 mph are not frequent, based on Plant Hatch meteorological conditions. At this wind speed, exfiltration would occur at 0.12 inches of water vacuum.

Additionally, the analyses conservatively assume that releases are unfiltered and occur at ground level prior to completion of secondary containment drawdown to the TS acceptance criteria. It also assumes that the source term activity is present upon SGTS initiation. In reality, SGTS starts at accident signal initiation, prior to the initiation of any fuel damage. Additionally, there is some transit time, ignored in the analysis, for the activity to migrate from primary to secondary containment. SGTS would be at a negative pressure before any significant activity was present.

RAI 8

Please provide a method and justification for how the SGTS effectiveness is accounted for in both the drawdown time and radiological consequences analyses when wet steam is present in the secondary containment following a postulated LOCA.

SNC Response

Drawdown time testing is performed per SR 3.6.4.1.3 at a current frequency of 24 months on a staggered test basis. (The frequency is controlled by the Surveillance Frequency Control Program). This SR is the subject of this TS amendment request.

The Ventilation Filter Testing Program described in Administrative Technical Specifications Section 5.5.7, provides testing to ensure the SGTS is effective in filtering and adsorbing radioactive materials prior to their release from the secondary containment. This testing is performed per the requirements of Reg Guide 1.52, Revision 2, at a frequency of at least once every 720 hours of operation.

Among other tests, Paragraph c of Section 5.5.7 requires, for the SGTS, that a laboratory test of a sample of the charcoal adsorber, when obtained as described in Regulatory Guide 1.52, Revision 2, shows the methyl iodide penetration less than 2.5 % when tested in accordance with ASTM D3803-1989 at a temperature of < 30 C and greater than or equal to 95% relative humidity. These filter efficiencies are accounted for in the accident analyses.

RAI-9

The submittal proposed to increase the SR 3.6.4.1.3 allowable time for the SGTS to draw down the secondary containment to 10 minutes from the currently required 120 seconds. Please provide the differences in the secondary containment configuration for these two tests.

SNC Response

There will be no difference in the configuration of the secondary containment between a test performed under the proposed acceptance criteria of SR 3.6.4.1.3, and under the current criteria of SR 3.6.4.1.3. Those configurations, and their variations, are listed and described in both the HNP units' Technical Requirements Manual Section T8.0, and were briefly described in Section 2.1 of the original submittal.

Therefore, the revision in the SR 3.6.4.1.3 acceptance criteria, from 2 minutes to 10 minutes, is the only change with respect to the test. Furthermore, the differential pressure requirement of 0.20 inches of water gauge vacuum in the secondary containment with respect to the outside environment (as required by TS SR 3.6.4.1.4) and with the SGTS in operation (as required by TS SR 3.6.4.1.4) will not be impacted by the proposed change.