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SOUTHERN COMPANY
Energy to Serve Your World℠

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50-366

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

Edwin I. Hatch Nuclear Plant
Request to Implement an Alternative Source Term
Response to Request for Additional Information Regarding the
Unit 1 Main Steam Isolation Valve Alternate Leakage Treatment Path Evaluation

Ladies and Gentlemen:

On August 29, 2006, Southern Nuclear Operating Company (SNC) submitted a request to revise the Edwin I. Hatch Nuclear Plant (HNP) licensing/design basis with a full scope implementation of an alternative source term (AST). By letters dated November 6, 2006, November 27, 2006, and January 30, 2007, SNC has submitted further information to support the NRC review of the HNP AST submittal. By letter dated March 15, 2007, the NRC requested additional information concerning the Unit 1 main steam isolation valve alternative leakage treatment path, described in enclosure 8 of the referenced August 29, 2006 submittal, which is credited in the AST loss-of-coolant accident (LOCA) analysis.

The enclosure to this letter contains the SNC response to the referenced NRC request for additional information (RAI).

The 10 CFR 50.92 evaluation and the justification for the categorical exclusion from performing an environmental assessment that were included in the August 29, 2006 submittal continue to remain valid.

(Affirmation and signature are provided on the following page.)

A001

HRR

Mr. L. M. Stinson states he is a Vice President 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.

This letter contains no NRC commitments. If you have any questions, please advise.

Respectfully submitted,

SOUTHERN NUCLEAR OPERATING COMPANY

L. M. Stinson
Vice President Fleet Operations Support

Sworn to and subscribed before me this 22 *day of* June, *2007.*

Patricia H. Raymond
Notary Public

My commission expires: 7/21/08

LMS/CLT/daj

Enclosure: Response to Request for Additional Information regarding the Unit 1 Main Steam Isolation Valve Alternate Leakage Treatment Path Evaluation

cc: Southern Nuclear Operating Company
Mr. J. T. Gasser, Executive Vice President
Mr. D. R. Madison, Vice President – Hatch
Mr. D. H. Jones, Vice President – Engineering
RType: CHA02.004

U. S. Nuclear Regulatory Commission
Dr. W. D. Travers, Regional Administrator
Mr. R. E. Martin, NRR Project Manager – Hatch
Mr. J. A. Hickey, Senior Resident Inspector – Hatch

State of Georgia
Mr. N. Holcomb, Commissioner – Department of Natural Resources

Enclosure

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Enclosure

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NRC QUESTION 1

The "BWROG (Boiling Water Reactor Owners Group) Report for Increasing (Main Steam Isolation Valve) MSIV Leakage Rate Limits and Elimination of Leakage Control Systems," states "Individual licenses should provide a detailed description of the alternate MSIV leakage treatment pathway and the basis for its functional reliability, commensurate with its intended safety-related function. (This includes the requirement to demonstrate that MSIV leakage will be successfully transported to the condenser by demonstrating that other potential release paths can be isolated)."

In the attachment, "Edwin I. Hatch Nuclear Plant Unit 1 Main Steam Isolation Valve Alternate Leakage Treatment (ALT) Path Description and Seismic Evaluation," on page 1, of the above report information is provided to ensure that the ALT pathway boundary is isolated and that the release is via the condenser. When the list of valves that close automatically and those that require operator action to be closed is compared to Figure 1, "Schematic of the Alternate Leakage Treatment (ALT) Path," a path still exists to "CRW" through valves 1N11-F004 and 1N11-F042.

A. Please define the Acronym "CRW" as it is not defined in the submittal.

B. Please provide justification for why provisions to isolate the potential release path to "CRW" are not provided.

C. Please confirm that "Sample Panel 1H21-P204" provides an adequate boundary which can be relied upon in the event of a loss-of-coolant accident, and does not require additional isolation.

SNC RESPONSE

A. CRW is the acronym for clean radwaste.

B. The attachment referenced in this RAI was provided as enclosure 8 to the SNC alternative source term (AST) submittal dated August 29, 2006. The referenced page and figure provide a description of the Unit 1 MSIV ALT path. Due to an error on the referenced Figure 1, it appears that there exists a potential release path to CRW. Specifically, valve 1N11-F042, a 1-inch manual valve in a drain line off the steam line, is normally closed; it was inadvertently shown as open on Figure 1. A revised Figure 1 correctly showing 1N11-F042 as normally closed is provided to replace the Figure 1 previously provided in both enclosures 1 and 8 of the AST submittal. Valve 1N11-F004 is a 6-inch manual gate valve in the steam line to the steam jet air ejectors (SJAE) and is correctly shown in Figure 1 as normally open. Therefore, the potential release path to CRW is properly isolated by the normally closed valve 1N11-F042.

C. As described in the following, sample panel 1H21-P204 provides an adequate boundary which can be relied upon in the event of a loss-of-coolant accident (LOCA) and does not require additional isolation.

Sample panel 1H21-P204, as shown in the previously referenced Figure 1, is located in the water analysis room in the control building. It is the sample hood at which grab samples are taken. The sample panel was labeled as 1H21-P204 on Figure 1 for diagrammatical purposes. Sample lines from the main steam lines are routed to the water analysis room where the lines split and initially enter sample panels 1H21-P205 and 1H21-P206. There is a normally closed sample inlet valve for each line within 1H21-P205 and 1H21-P206. These closed manual valves are the ALT path boundary valves for these lines. Operator action is required to open these valves to establish sample flow. Samples from 1H21-P205 are then routed to sample hood 1H21-P204 for grab samples and samples from 1H21-P206 go to analyzers on panel 1H21-P208.

The sample lines, their supports, and the sample panels where the credited normally closed manual boundary valves are mounted were walked down and evaluated for seismic integrity. All outliers were resolved which ensures the seismic integrity of the sample line pathway and the boundary valves.

Based on the information discussed here and in the previously referenced enclosure 8, the normally closed manual valves mounted in the sample panels provide an adequate boundary which can be relied upon in the event of a LOCA, and does not require additional isolation.

NRC QUESTION 2

To isolate the boundary and ensure potential release paths do not exist, local operator actions are required to close certain valves. Please confirm that operators will be able to access and manipulate these valves when required, in all conditions (e.g. radiological, environmental) during postulated accidents and transients that credit the ALT pathway.

SNC RESPONSE

The Unit 1 ALT path and its associated boundary valves are credited for treatment of MSIV leakage only for one accident, specifically LOCA. The local operator actions required to close some of the ALT path boundary valves are described in section 2.7.1.1 of enclosure 1 to the August 29, 2006 AST submittal and also in the path description section of enclosure 8 to the same submittal. In section 2.8.1 of enclosure 1, covering the AST related NUREG-0737 evaluation, SNC identified the establishment of the Unit 1 ALT path as a new activity to be performed post-LOCA in vital areas. It was noted that this activity can be completed with operator exposures of 5 rem TEDE or less. In response to this RAI, more details are provided as follows.

The ingress/egress time to the necessary vital areas in the turbine building and the time spent locally for valve identification and operation for the affected boundary valves is estimated to be approximately 22 minutes. Bounding doses to operators, considering post-LOCA activity buildup in the MSLs and condenser, and release to, and buildup of activity in the turbine building air are calculated to be less than 5 rem TEDE. In the event a LOCA occurs, actual doses to the operators will be controlled by HP in accordance with plant procedures.

A review of the environmental conditions in the referenced vital areas in the turbine building, specifically humidity and temperature, has also been performed. A LOCA does not adversely impact the humidity levels in the turbine building. With regards to temperature in the turbine building post-LOCA, based on experience during 100% power operating conditions, the temperature along the path to, and at, the ALT path boundary valves ranges from 95 °F to 120 °F. The loss of cooling to the referenced turbine building vital areas may increase these temperatures by 20-25 °F, potentially resulting in an increased temperature range of 120 °F to 145 °F. However, post-LOCA, with the reactor and turbine/generator tripped, such temperature extremes are not expected even though piping and equipment may remain hot for some time. Per existing plant procedures, work in areas > 108 °F requires supplemental cooling devices (e.g., ice vest) and work in areas with temperatures in the range of 140 °F is achievable.

In summary, the radiological and environmental conditions post-LOCA in the affected vital areas in the turbine building allow for operator access to close ALT path boundary valves.

NRC QUESTION 3

Section 5.1 of the NRC staff's safety evaluation of the "BWROG Report for Increasing MSIV Leakage Rate Limits and Elimination of the Leakage Control Systems," states "The licensees should also address the radiological aspects of MSIV leakage treatment following a LOCA, coincident with a loss of offsite power assuming the worst case single active failure. This is a design basis event for which the radiological consequences must be shown to be less than the regulatory limits for offsite and onsite (control room) doses." Please explain how the single failure criterion is satisfied when establishing the ALT flow path and isolation boundaries. Also, confirm that valves and other components that make up the ALT flow path and isolation boundaries will not leak in this mode of operation (such as through valve pistons or hinge pins that rely upon steam pressure for establishing leak-tight seal), or alternatively explain how any leakage of this nature is accounted for in the onsite and offsite dose analyses to assure conservative results.

SNC RESPONSE

The Unit 1 MSIV ALT path has been evaluated in accordance with the referenced BWROG topical report NEDC-31858P-A Revision 2 and conforms to the referenced NRC safety evaluation, dated March 3, 1999. As referenced in the previous NRC question 1, the NRC

safety evaluation limitation applicable to the functional design of the ALT is as follows:

> "Individual licensees should provide a detailed description of the ALT drain path and the basis for its functional reliability, commensurate with its intended safety-related function. The licensee should also describe their maintenance and testing program for the active components (such as valves) in the ALT path."

The referenced BWROG topical report adds the following clarification: "This includes the requirement to demonstrate that MSIV leakage will be successfully transported to the condenser by demonstrating that other potential release paths can be isolated." The Unit 1 ALT path conforms to this limitation since it is capable of performing its post-LOCA function during and following a design basis earthquake, assuming offsite power is not available.

The referenced NRC safety evaluation sections 5.1, titled "Functional Design," and 5.3, titled "Reliability of ALT Pathway," provide more detailed discussion relative to the referenced limitation. With respect to the excerpt from section 5.1 quoted in NRC question 3, the submitted AST evaluation of LOCA addresses the radiological aspects of MSIV leakage treatment using the ALT path following a LOCA, coincident with a loss of offsite power assuming the worst case single active failure. The single failure assumed in the AST LOCA radiological evaluation is the failure to close of the inboard MSIV on one of the four main steam lines. It is then assumed that the total MSIV leakage of 100 scfh is through the main steam line with the failed inboard MSIV. This is conservative as there is less activity removal due to deposition within a line with a failed MSIV than a line with two closed MSIVs.

With respect to how the single failure criterion is satisfied when establishing the ALT flow path, the referenced NRC safety evaluation section 5.3 states the following: "The licensees should also provide assurance that valves required to open the ALT path to the condenser are provided with highly reliable power sources, and that a secondary path to the condenser with orifice flow exists." As this is applied to the Unit 1 ALT path, operator action is used to open the specific drain valve required to initiate the flow path to the condenser. The path to the condenser is through motor operated valves (MOVs) 1B21-F020 and 1B21-F021. 1B21-F020 is normally open and will remain open. 1B21-F021 is normally closed and will be opened by operator action from the main control room (MCR) to initiate the flow path. This is the only active valve required to open to establish the ALT path. In accordance with the NRC safety evaluation, MOV 1B21-F021 has a Class 1E power supply to assure it will remain functional assuming loss of offsite power. Therefore since the flow path is via a 3-inch line without an orifice, even in the case of loss of offsite power, the primary drain path to the condenser is open and available. In the unlikely event that 1B21-F021 fails to open, a secondary passive path with an orifice also exists, as shown in Figure 1 (provided in response to NRC question 1). Part of the flow would go through a normally open bypass with a 0.103" dia. orifice around 1B21-F021. The remainder would go to the condenser via the main turbine stop and control valves before seat drain lines which contain a 0.850" dia. orifice. Therefore, the establishment of the ALT flow path to the condenser conforms to the referenced NRC safety evaluation section 5.3.

With respect to how the single failure criterion is satisfied when establishing isolation boundaries for the ALT path, the referenced NRC safety evaluation section 5.3 states the following: "licensees...should provide assurance for the reliability of the entire ALT pathway, including all of its boundary valves." As covered in the Unit 1 ALT path description in the previously referenced enclosure 8 to the AST submittal, the Unit 1 ALT path boundary valves include normally closed valves, valves that automatically close, and MOVs or manual valves that require operator action close them. Review of the designs of the boundary valves indicates that the boundary valves will reliably provide isolation boundaries for the ALT path. As discussed further in the following paragraph, the designs of the valves are such that leak tight seals are provided. As discussed in the response to the previous NRC question 2, the radiological and environmental conditions post-LOCA in the affected vital areas in the turbine building allow for operator access where necessary to close ALT path boundary valves. There will be procedural controls to assure the necessary boundary valves are closed post-LOCA. Finally, the NRC safety evaluation dated September 1, 2004 for Cooper Nuclear Station covering their MSIV ALT path provides a precedent for NRC approval of manual actions to close multiple boundary valves.

Finally, with respect to confirming that valves and other components that make up the ALT flow path and isolation boundaries will not leak in this mode of operation, specifically post-LOCA with the reactor and turbine/generator tripped, the valves of concern are the reactor feed pump turbine (RFPT) high pressure stop valves, 1N11-F177 and 1N11-F178; the main turbine stop valves, 1N30-F005, F006, F007 and F008; the main turbine control valves, 1N30-F009, F010, F011 and F012; and the main turbine bypass valves. All the other valves related to the Unit 1 ALT path are either gate or globe valves that do not require steam pressure to establish a leak-tight seal. For the valves of concern, design characteristics prevent leakage to the environment when steam pressure is not present. They do not require steam pressure to seal adequately. The RFPT high pressure stop valves, the main turbine stop valves, the main turbine control valves, and the main turbine bypass valves all are spring loaded to stay closed without hydraulic or mechanical force to keep them open. The sealing function in these valves is accomplished by sound mechanical contact between the valve disc and seat assisted by hydraulic pressure and spring tension in the valve actuator assembly. Packing and/or stuffing glands prevent leakage around the valve stem.

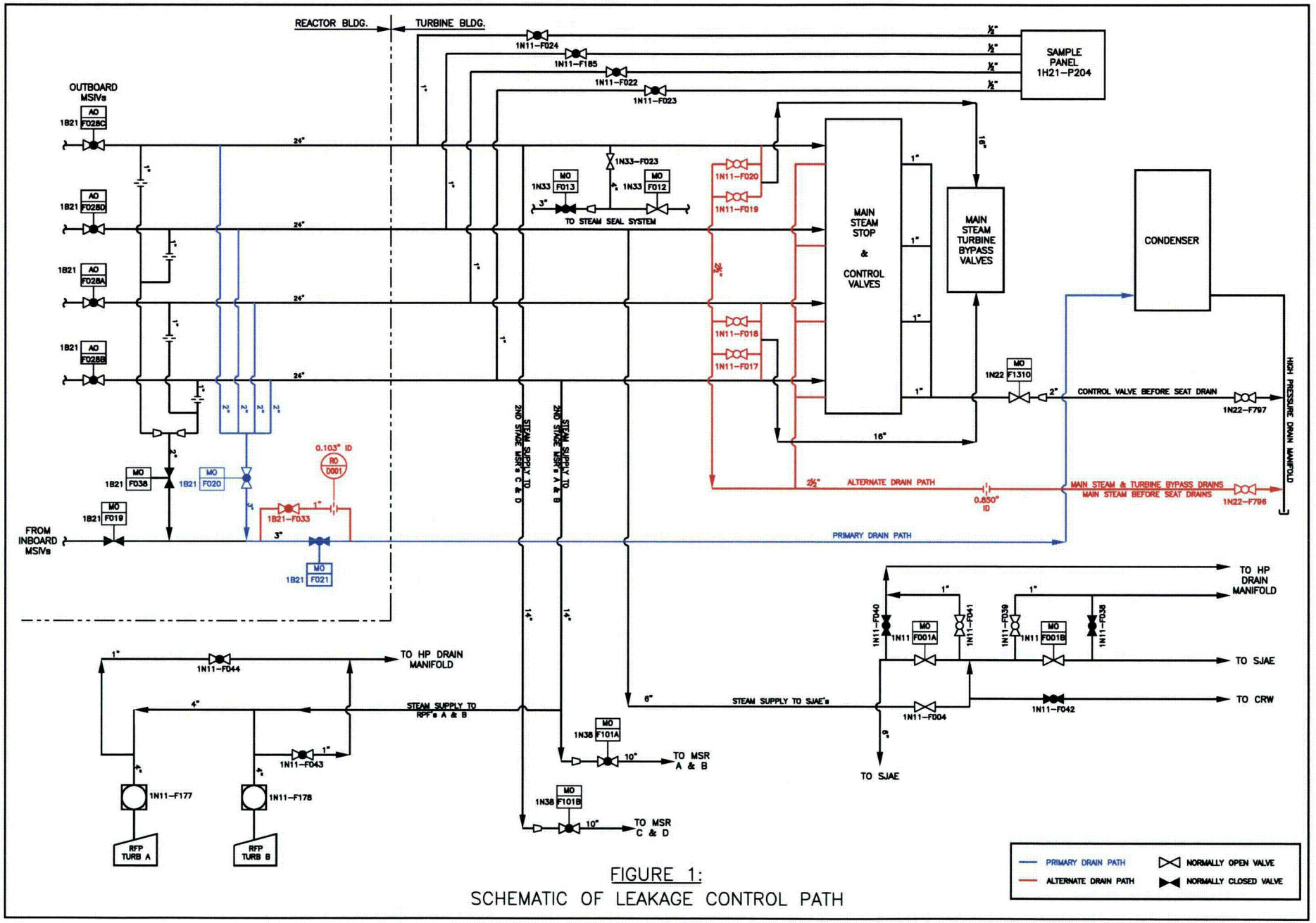

FIGURE 1:
SCHEMATIC OF LEAKAGE CONTROL PATH