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SOUTHERN COMPANY
Energy to Serve Your World℠

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

Edwin I. Hatch Nuclear Plant
Response to Request for Additional Information on Oscillating Power Range Monitor
Technical Specifications Change Request

Ladies and Gentlemen:

On July 3, 2003, the NRC requested Southern Nuclear Generating Company (SNC) provide additional information concerning our Oscillating Power Range Monitor (OPRM) Technical Specifications change submittal. The request consisted of five questions and was sent to SNC via electronic correspondence.

Enclosed you will find our response. A transcription of the NRC question precedes our responses.

Mr. H. L. Sumner, Jr. 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

H. L. Sumner, Jr.

Sworn to and subscribed before me this 19th *day of* August, *2003.*

Notary Public

My commission expires: 7/1/2006

HLS/OCV/daj

A001

Enclosures: Response to Request for Additional Information

cc: Southern Nuclear Operating Company
Mr. J. D. Woodard, Executive Vice President
Mr. G. R. Frederick, General Manager – Plant Hatch
Document Services RTYPE: CHA02.004

U. S. Nuclear Regulatory Commission
Mr. L. A. Reyes, Regional Administrator
Mr. S. D. Bloom, NRR Project Manager – Hatch
Mr. D. S. Simpkins, Senior Resident Inspector – Hatch

State of Georgia
Mr. L. C. Barrett, Commissioner – Department of Natural Resources

Enclosure
Edwin I Hatch Nuclear Plant
Response to Request for Additional Information on OPRM Technical Specifications Change Request

NRC Question #1

According to guidance specified in Generic Letter 94-02, both Hatch Units 1 and 2 are Long-Term Stability Option III – OPRM system plants. OPRM instrumentation should be included in the TS based on 10 CFR 50.36 to meet requirements stated in GDC criterion 12 and 13 of 10 CFR 50 Appendix A. Provide Technical basis for the proposed deletion of TS 3.3.1.1.I.2 and the regulatory basis for a conclusion that you still meet Option III OPRM requirements.

SNC Response

Southern Nuclear Operating Company (SNC) formally committed to long term stability solution Option III in the Plant Hatch response to Generic Letter (GL) 94-02 dated September 8, 1994.

GL 94-02 requires BWRs to develop and submit, to the NRC, a plan for long term stability corrective actions to ensure a plant is in compliance with GDC criteria 12 and 13. It also requires plants to "...address the need for near term and long term technical specifications modifications." In the Plant Hatch response referenced above, SNC also committed to placing the Power Range Monitoring system, of which the oscillating power range monitoring (OPRM) system is a part, into the Technical Specifications (TS).

10 CFR 50.36 provides criteria for including limiting conditions of operation (LCO) in the TS. Criterion 3 describes structures and systems which function to mitigate accidents or transients that may present a challenge to the integrity of a fission product barrier. Since the OPRM system protects against violation of the Minimum Critical Power Ratio (MCPR) safety limit, it is reasonable to include it in the TS, and we have done so.

SNC is not proposing to eliminate the OPRM TS; but merely proposes to modify Hatch TS ACTION statement, 3.3.1.1.I.2. The LCO for the OPRM system, as provided in TS 3.3.1.1, Table 3.3.1.1-1, item 2.f will remain in the TS.

10 CFR 50.36(c)(2) states, "When a limiting condition for operation... is not met, the licensee shall shut down the reactor or follow any remedial action permitted by the specifications until the condition can be met". SNC proposes as remedial action for Plant Hatch the implementation of an alternate method of detection and suppression which is already allowed, under the current TS, for 120 days.

Therefore, Plant Hatch will continue to comply with applicable regulations with the proposed TS implemented because an LCO for the OPRM system continues to exist, with remedial actions.

Regarding the technical basis for the proposed elimination of the ACTION, the alternate method is adequate to protect the MCPR Safety Limit (SLMCPR) during instability

events. The procedures used are thorough and provide the operator with criteria for recognizing thermal hydraulic instabilities in the reactor and with the necessary guidance for suppressing them. These procedural actions are detailed in the SNC response to Question #3.

Additionally, the TS themselves implicitly recognize the technical adequacy of the alternate actions by permitting operation with inoperable OPRMs for 120 days, provided the alternate actions are implemented.

NRC Question #2

Please describe in detail the current implementation status of the OPRM system including system calibration and trip setpoint based on approach stated in NEDO-32465-A, "Reactor Stability Detect and Suppress Solution Basis Methodology for Reload Applications," or based on plant-specific data approach and also provide details of plant specific OPRM Setpoint methodology.

SNC Response

Plant Hatch is an Option III plant and the OPRM systems on both units are currently OPERABLE.

Hatch uses General Electric (GE) NUMAC based Power Range Neutron Monitors (PRNM) and the OPRM function of the PRNM system is calibrated using Hatch procedure, "APRM Calibration", at a frequency of once every 24 months. This procedure requires checks of all OPRM setpoints, oscillation period (minimum and maximum), amplitude threshold setpoints S1 and S2, growth rate factor setpoints (trip and alarm), maximum amplitude setpoints (trip and alarm), and confirmation counts setpoints (amplitude, trip and alarm), number of required OPRM cells per OPRM, number of required LPRM inputs per cell, and auto bypass setpoints (reactor power, recirculation flow, corner frequency and period tolerance). The procedure also requires checks that ensure the proper LPRMs are assigned each OPRM cell, that the high and low voltage power supplies are within tolerances, that recirculation flow output range is within tolerance, and includes input calibration checks for LPRMs and flow signals.

Recirculation system calibration is performed using Hatch's "APRM Recirc Flow Calibration" procedure which requires calibration of each recirculation flow transmitter and Average Power Range Monitor (APRM) flow input to the OPRM system.

Additionally, the Hatch procedure "Core Flow Measurement Instrument Calibration" is performed at least every 24 months to calibrate the core flow measurement instrumentation (jet pump summers) to match the actual core flow (these signals are used by the APRMs as a representation of core flow).

Currently, the Hatch Unit 1 and 2 OPRM setpoints are based on the new set of generic DIVOM curves that GE developed two years ago as part of Part 21 actions concerning potential non-conservatisms in the generic Option III DIVOM curve.

The specific DIVOM curve that is used at a particular time in the cycle is based on the Figure of Merit (FOM) which GE also developed at that time. GE uses cycle specific information in combination with these DIVOM curves to provide Hatch with a set of tables of OPRM setpoint vs. Operating Limit Minimum Critical Power Ratio (OLMCPR). Each table is based on a different FOM. These tables are included in the Supplemental Reload Licensing Report (SRLR), supplied to SNC by GE. SNC then incorporates this information into the Core Operating Limits Report (CoLR) for use by the Hatch site staff. Prior to each cycle, SNC calculates the projected FOM throughout the cycle every 1000 MWd/st. If a FOM is observed to be too high, the core design is adjusted. Additionally, prior to every sequence exchange, SNC calculates an updated FOM and the Hatch site staff adjusts the OPRM setpoints, in accordance with the values in the CoLR.

NRC Question # 3

Please describe in detail the alternate method to detect and suppress thermal-hydraulic instability oscillations and justify that alternate method is an adequate means for safe operation under 13% extended power uprate (EPU) condition without an operable OPRM system.

SNC Response

The alternate method to detect and suppress thermal-hydraulic instabilities is described, for each unit, in a permanent plant abnormal procedure. This procedure is entered whenever the OPRM system is out of service, and 1) indications are received of a potential instability, or 2) the reactor is operating in the region of potential instability.

The procedure requires the operator to scroll through all the Local Power Range Monitors (LPRM) to determine their individual oscillations, and to frequently monitor them. If the APRM or LPRM flux noise increases noticeably over current or normal values, or if LPRM alarms are received, the operator must continually monitor the APRMs and LPRMs. (Normal APRM and LPRM flux noise is defined in the procedure as approximately 3 % to 5 % at full power and 1 % to 3 % at 50 % power.)

The Unit 1 and 2 power-flow maps in the above procedures define the region of potential instability and divides it into two areas:

1) An immediate scram region (< 40 % core flow and > 88 % load line) and

2) An immediate exit region (< 50 % core flow and > 62 % load line).

If at any time, the reactor is operating in the scram region of the map, the reactor operator is required to immediately scram the reactor. If, at any time, the reactor is operating in the exit region, the operator is required to immediately increase core flow or insert control rods to leave the region. The above actions are not required if the OPRM system is in service and operable.

Additionally, if while operating in the region of potential instabilities, any of the following conditions exist, the reactor operator is required to immediately scram the reactor:

1) Any APRM is observed to have bandwidth oscillations $\geq$ 5% peak-to-peak and increasing, or

2) Two or more Local Power Range Monitors LPRMs are observed with bandwidth oscillations $\geq$ 5% peak-to-peak and increasing, or

3) Any APRM upscale or downscale alarm is received on the operator display assemblies (ODAs) or two or more LPRM upscale or downscale alarms are received on the ODAs cycling on and off with a period of < 3 seconds.

Furthermore, the alternate method, as described in the procedure, also requires immediate scram, at any point on the power flow map, if any APRM is observed with a bandwidth oscillation exceeding 10 %, or if two or more LPRMs are observed with peak-to-peak oscillations exceeding 10 % and the cause is unknown or believed to be the result of core thermal hydraulics.

It is noteworthy that on a dual recirculation pump trip, with the OPRM system inoperable, the reactor must also be scrammed. This action is listed in the Hatch abnormal procedure for a trip of the recirculation pumps. Again, these actions are not required if the OPRM system is in service and operable.

The applicability of the exclusion regions to the Hatch Unit 1 and 2 cores has been assessed periodically by GE. GE has performed ODYSY calculations to core and channel decay ratios for several different operating cycles, including the current Hatch 1, Cycle 21. The analysis incorporated the effects of: 1) operation up to the MELLA rod line following power uprate to 113.5% of the original licensed power level, 2) a 24 month fuel cycle core, and 3) a mixed core of GE-13 and GE-14 fuel designs. The Hatch 1, Cycle 21 core design was then run with Hatch 2 hydraulic inputs. These calculations showed that the exclusion regions, as contained in the Hatch alternate detection and suppression procedures, continue to provide adequate stability protection for both Hatch units with an inoperable OPRM system.

NRC Question # 4

Please clarify that the alternate method is a permanent core flow map for Hatch plant operation, or is it cycle dependent. Also, justify that the alternate method is updated to correspond to changes in core/fuel design and power operation and is sufficient to detect and suppress thermal-hydraulic instability oscillations under all possible operating conditions.

SNC Response

The alternate method for detection and suppression is provided in permanent plant procedures. The alternate methods are not cycle dependent.

However, as described in the SNC response to question number 3 above, SNC does re-validate the exit regions on the power-flow maps if there are changes in the fuel design or the operating conditions that could affect stability. For example, the exit regions were re-validated for both units when GE-14 fuel was introduced into the plant.

NRC Question # 5

The generic solution to deal with 10 CFR Part 21 on the non-conservative generic DIVOM curve has been an open end issue for at least the last two years. It is an individual utility's responsibility to make sure that their own long-term solution option is working rather than waiting for a final unpredicted result. Current operating experience at Hatch demonstrates that a plant specific input for the OPRM trip setpoint works well. Provide the rationale why Hatch plants do not need TS 3.3.1.1.I.2.

SNC Response

SNC has been proactive in obtaining adequate Hatch OPRM setpoints, following the GE Part 21 issuance in June of 2001. The new setpoints, which were based on Hatch specific core designs, were provided to the site and OPRMs were declared operable in July of 2001. SNC contracted with GE to run plant specific TRACG cases to confirm the bounding nature of the application of GEs set of generic DIVOM curves to Hatch. (More information on the site implementation of those setpoints is provided in the SNC response to question #2.)

Additionally, SNC continues to be involved with industry efforts to resolve the generic DIVOM issue. For example, SNC personnel have participated in technical reviews of GE response to the issue. These reviews have included evaluations of the DIVOM analysis procedure, the TRACG qualification document, and the design record files for the Hatch 1 Cycle 20 and Hatch 2 Cycle 17 TRACG DIVOM analysis.

The above efforts are intended to ensure that the Hatch OPRM setpoints are adequate to protect the SLMCPR during design instabilities.

Indeed, current operating experience does confirm that the setpoints are working well. However, in light of the recent experience with the Part 21 reports questioning the adequacy of generic methods, it is possible that an unforeseen situation could come up that could again require SNC to declare the OPRMs inoperable for an extended period of time. If this occurs the Hatch Units could be put into a shutdown requirement if the OPRMs are not made operable within the 120 days. Or, perhaps more likely, if an inadvertent shutdown of Hatch Unit 1 or 2 occurred while the OPRMs were inoperable within the 120 day period, we would be unable to transition to Mode 1, because of the lack of a LCO 3.0.4 exemption.