(3)

H. L. Sumner, Jr.
Vice President
Hatch Project

Southern Nuclear
Operating Company, Inc.
Post Office Box 1295
Birmingham, Alabama 35201

Tel 205.992.7279

SOUTHERN COMPANY

Energy to Serve Your World℠

October 1, 2003

NL-03-2037

Docket Nos.: 50-321
50-366

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

Edwin I. Hatch Nuclear Plant
Response to Inspection Report 50-321/50-366 2003006

Ladies and Gentlemen:

As provided by 10 CFR 2.201, Southern Nuclear Operating Company (SNC) is submitting the enclosed response to the Non-cited Violations (NCVs) and Unresolved Items (URIs) in Inspection Report 05000321/2003006 and 05000366/2003006 dated September 1, 2003. The enclosure provides additional information regarding issues described in the URIs and each NCV. In particular, the design modification that is the subject of the URIs was implemented in 1993 and provided an operating enhancement to the Safety Relief Valves by the addition of circuits that are not required for the safety function of the valves. In addition, because the circuits associated with the design modification are not required for a post-fire safe shutdown, the manual operator actions discussed in URI 06-02 are not related to Appendix R, Section III.G.2. Moreover, control room manual actions associated with those circuits can be performed in an adequate and timely manner.

SNC respectfully requests NRC to consider the enclosed additional information in the resolution of the issues contained in the NCVs and URIs. Please contact this office if a meeting to further discuss these matters would be useful.

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

Sincerely,

Lewis Sumner

H. L. Sumner, Jr.

HLS/RDB/sdl

Enclosure: Responses to Inspection Findings

KK-13

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
Director, Office of Enforcement
Mr. S. D. Bloom, NRR Project Manager – Hatch
Mr. D. S. Simpkins, Senior Resident Inspector – Hatch

Enclosure

Responses to Inspection Findings

NRC Unresolved Items:

URI 50-366/03-06-01- Concerns Associated with Potential Opening of SRVs

The team identified a potential concern in that the licensee used manual actions to isolate two 4 to 20 ma instrumentation loop circuits associated with eleven SRVs in lieu of providing physical protection. This did not appear to be consistent with the plant's licensing basis nor 10 CFR 50, Appendix R.

URI 50-366/03-06-02 - Untimely and Unapproved Manual Operator Action for Post-fire SSD

The team found that a local manual operator action to prevent spurious opening of all eleven safety relief valves (SRVs) would not be performed in sufficient time to be effective. Licensee reliance on this manual action for hot shutdown during a fire, instead of physically protecting cables from fire damage, had not been approved by the NRC. 10 CFR 50, Appendix R, Section III.G.2, requires that where cables or equipment, including associated non-safety circuits that could prevent operation or cause mal-operation due to hot shorts, open circuits, or shorts to ground, of redundant trains of systems necessary to achieve and maintain hot shutdown conditions are located within the same fire area outside the primary containment, a means of physical protection against fire damage must be provided.

URI 50-366/-3-06-06 - Inspector Concerns Associated with Implementation of DCR 91-134

10 CFR 50, Appendix B, Criterion III requires that design control measures shall provide for verifying or checking the adequacy of design. An inadequate plant modification, DCR 91-134, failed to implement the design input requirements of "one-out-of-two taken twice" logic for the SRV's backup actuation using PT signals.

SNC Response:

The three URIs are associated with a design modification, DCR 91-134, which was implemented at Plant Hatch in 1993 for both Units 1 and 2. The design modification implemented a safety enhancement to the plant by providing an independent means, redundant to the mechanical actuators, of preventing overpressurization of the Nuclear Steam Supply System. The design mitigates the effects of corrosion-induced setpoint drift on the Target Rock two stage SRVs. The DCR implemented the design input requirements using a design process that included verifying and checking the design for accuracy. The design process fully met the requirements of 10 CFR 50, Appendix B, Criterion III.

Enclosure

Responses to Inspection Findings

URI 50-366/03-06-06 states that "the installed plant modification failed to implement the 'one-out-of-two taken twice' logic that was specified as a design input requirement in the design package." The inspection report describes, in detail, NRC's evaluation of the design with an assessment that the design, as implemented, represented a "two-out-of-two taken twice" logic in addition to a "one-out-of-two taken twice logic." SNC has historically described the logic implemented by DCR 91-134 as "one-out-of-two taken twice" because of generic precedent. In NEDO-10139 "Compliance of Protection Systems to Industry Criteria: General Electric BWR Nuclear Steam Supply System," dated June 1970, "one-out-of-two taken twice" is the terminology used for the configuration described and implemented in DCR 91-134. As a result of its use in the NEDO, this terminology has commonly been used in the BWR industry, including at Plant Hatch.

The URI states that "one-out-of-two taken twice" logic was a design input requirement for the DCR. However, the design input requirements for this DCR are specified in a Design Input Record (DIR). The DIR requirements for this DCR were to install logic to actuate the SRVs on high pressure. No description of "required logic" was stated. The Narrative Design Summary and the Design Verification Summary for this DCR described the design that was produced using the DIR. In those descriptions, the phrase "one-out-of-two taken twice" was used to describe the logic incorporated into the design change package. In addition, the safety evaluation for the DCR, required at that time by 10 CFR 50.59, evaluated the design to assure its adequacy. The terminology used in the safety evaluation to describe the logic being installed by the DCR was based on the terminology conventions commonly used by Plant Hatch, and was based on the GE Topical Report described above. The logic was designed to provide a high degree of assurance that the SRVs would open on high pressure, and the logic, as installed, meets all the requirements of the DIR, including single failure criteria. The general design criteria and industry practice for this type of design application has been that only one failure is assumed in the design criteria. It was not a design requirement for this DCR to install logic that would not be affected by multiple cable failures. Thus, DCR 91-134 implemented the modification in a manner fully consistent with its design input requirements. In addition, the DCR was generated using a controlled design process that included verifying and checking the design for accuracy. The design process used fully met the requirements of 10 CFR 50, Appendix B, Criterion III.

- Logic description
- Associated circuit
- More than one circuit damaged beyond design basis.

As noted above, an objective of the design logic implemented was to provide a high degree of reliability and single-failure resistance. The design as implemented utilizes two Division I and two Division II instrumentation loops. This approach assures that a single spurious signal will not cause an inadvertent SRV actuation, and no single failure, including the total loss of a division, will prevent actuation of the SRVs. The failure scenario postulated by the inspection team included simultaneous separate failures of conductor insulation on two instrument cables, each containing a single twisted pair of conductors with shields and drain wires, to produce leakage currents in the range necessary to simulate high pressure signals and open the SRVs. Not only would these two spurious signals be required concurrently, the leakage or shorts must occur without the conductors shorting to the cable shield or drain conductor.

Thus, the design modification did not introduce a potential common cause failure, as considered in the context of the Plant Hatch design and licensing bases.

This question of whether the design modification should have considered a single cable failure at a time or multiple simultaneous cable failures underlies the issues stated in all three URIs. General Design Criterion (GDC) 21 for protection system reliability and testability requires the system to be designed with sufficient redundancy and independence to assure that no single failure results in the loss of the protection function. This criterion, along with other general design criteria, establishes single failure protection as one of the fundamental design bases for nuclear power. SNC examined the licensing basis documents for Plant Hatch to determine whether an explicit requirement existed to consider multiple failures. No explicit requirement to consider more than one failure was found in the portions of the licensing basis documents relevant to the safety relief valves (SRVs). Rather, the broad requirements of GDC 21, described above, fundamentally represent the Plant Hatch licensing and design basis in this regard.

Of course, within the context of fire protection, the requirements of 10 CFR 50.48 and Appendix R were also evaluated for a requirement to consider more than one failure. This question has been, and continues to be, the subject of industry discussions with NRC. Our understanding of NRC's guidance on this subject is that more than one spurious actuation must be considered in a fire area for high/low pressure interface valve pairs only.

?

From the inspection report, it appears that NRC considers the subject circuits to be "required circuits." SNC considers the circuits to be "associated circuits." NRC Inspection Procedure 71111.05 states that "associated circuits are defined in the "Associated Circuits of Concern" section of the Generic Letter 81-12 Clarification Letter: Mattson to Eisenhut of March 22, 1982 "Fire Protection Rule – Appendix R." This letter states, in part,

> "Associated Circuits of Concern are defined as those cables (safety related, non-safety related Class 1E, and non-Class 1E) that:
>
> 1. Have a physical separation less than that required by Section III.G.2 of Appendix R, and
> 2. Have one of the following:
>   a.
>   b. a connection to circuits of equipment whose spurious operation would adversely affect the shutdown capability (e.g., RHR/RCS isolation valves, ADS valves, PORVs, steam generator atmospheric dump valves, instrumentation, steam bypass, etc.), or
>   c. "

The URIs associated with the DCR involve two instrumentation circuits and associated relay logic that could spuriously actuate and open the SRVs. As stated previously, these two instrumentation circuits are not required for the safety function of the SRVs. Further clarification of the term 'Associated Circuit' was provided in a "Holahan to Hannon"

Responses to Inspection Findings

NRC Memorandum dated November 29, 2000 on the rationale for temporarily halting certain associated circuit inspections. This memorandum states "Associated circuits are distinct from the circuits directly required for operation of post-fire safe shutdown trains of equipment. Associated circuits are not required for post-fire safe shutdown, but could *interfere* with post-fire safe shutdown if damaged by fire." This letter goes on to refer to the same GL 81-12 clarification letter referenced in IP 71111.05 that provided the definition of "associated circuits." The circuits associated with DCR 91-134 clearly fit the definition of "associated circuits" provided by the Holahan memo.

Equipment required?

[redacted]

SNC notes that IP 71111.05 also states, "the scope of this procedure has been temporarily reduced while criteria for review of fire-induced circuit failures of associated circuits is the subject of a voluntary industry initiative. Temporarily, the inspector is not required to address associated circuits issues as a direct line of inquiry nor develop associated circuit inspection findings."

Therefore, based on NRC guidance at this time, SNC believes the concerns expressed in the inspection report by URIs 50-366/03-06-01, -02, and -06 relate to scenarios that are beyond the design and licensing basis of the plant. In addition, since the circuits in question are associated circuits, they fall within the guidance provided in the IP and the above references.

Finally, even if the beyond design and licensing basis scenario described in the inspection report is postulated (that is, the simultaneous conductor-to-conductor shorting of both instrument cables, resulting in the spurious actuation of the SRVs), the risk worth associated with this scenario has been evaluated to be low.

CR. Local action for a beyond design basis activity.

URI 50-366/03-06-02 related to a local manual operator action. This operator action was placed in a fire procedure as a conservative measure to prevent the actuation of the SRVs in the extremely unlikely event a fire in the Unit 2 East Cableway were to result in simultaneous cable shorts or spurious current leakage that might simulate high pressure signals. Because the conditions under which the procedure steps might be performed are beyond the design and licensing basis of the plant, the action is not included in the procedure to satisfy the requirements of 10 CFR 50, Appendix R, paragraph III.G.2. Rather, the steps represent a proactive effort to comprehensively provide the plant operators with additional actions that could be taken. In section 1R05.04/.05.b.1 of the report, it is stated that NRC fire models indicated that fires could potentially cause damage to cables in as short a period as five to ten minutes. However, the Unit 2 East Cableway is marked to restrict transient combustibles from being brought in the area unless accompanied by a continuous fire watch, and the cable trays in which the instrument cables are contained have solid covers that provide a minimum of 30-minute protection from fire damage. The cables are in trays that contain only instrument cables that do not have the energy to initiate a fire within the tray. The cables are located a minimum of nine feet from the floor, and no credible initiation sources are located in the East cableway. In addition, no credit was afforded for the suppression system or the smoke detection system to provide early notification of potential fire conditions in the area. During the inspection, NRC personnel estimated that the subject procedure steps might not occur for 30 minutes, and that sufficient time would not be available before a spurious actuation to perform the manual actions. However, based on the multiple factors

[redacted]

described above, there should be sufficient time for the plant operators to take the manual actions specified to prevent the spurious opening of the SRVs.

Based on the information provided in response to the three URIs discussed in this section, SNC requests that NRC close all three URIs.

NRC Non-cited Violations:

NCV 50-366/03-06-03 - Inadequate Procedure for Local Manual Operator Action for Post-fire SSD Equipment

The team identified a non-cited violation of 10 CFR 50, Appendix R, Section III.G.1 and Technical Specification 5.4.1 because a local manual operator action to operate safe shutdown equipment was too difficult and was also physically unsafe. The licensee had relied on this action instead of providing physical protection of cables from fire damage or preplanning cold shutdown repairs.

SNC Response:

SNC is committed to high standards of occupational safety. Personnel safety is a primary consideration in all actions performed by plant personnel. During the inspection, SNC noted that the subject action has been performed previously and is not required for the hot shutdown of the reactor. The manual action is not required to be performed until about four hours after the event. The determination is based on the knowledge and experience of the individuals assessing the operator manual action. As a result of discussions with the inspection team during the inspection, and with NRC management subsequent to the inspection, SNC performed an additional assessment of the safety and feasibility of the subject local manual operator action. The assessment was performed by experienced licensed personnel with sufficient plant knowledge and experience to provide an authoritative evaluation. Based on the assessment, SNC has reaffirmed that the local manual operator action is capable of being performed safely within the time constraints that would exist. The assessment concluded the valve can safely be manually opened without additional ladders, platforms, or scaffolding. The bonnet of the 2E11F008 valve provides relatively secure footing and allows an Operator to achieve adequate physical proximity to manipulate the 2E11F015A valve handwheel. The MOV handwheel has been manipulated during Refueling Outages for valve flushing for LLRT testing. Another factor relevant to the conclusion that the manual action can be safely performed is the recognition that some amount of time is allowed to manipulate this valve post-fire (four hours), so there is additional time to stage enhanced access or additional personnel to open the valve as desired.

[redacted]

Battery chargers always restored following ~2005 Bob Schi

[redacted]

Based on information provided during the inspection, and based on the results of the additional assessment conducted subsequent to the inspection, SNC requests that this NCV be withdrawn.

NCV 50-366/03-06-04 - Unapproved Manual Operator Actions for Post-fire SSD

The team identified a non-cited violation of 10 CFR 50, Appendix R, Section III.G.2 in that the licensee relied on some manual operator actions to operate safe shutdown equipment, instead of providing the required physical protection of cables from fire damage without NRC approval.

SNC Response:

This issue was not initially characterized as a violation at the exit meeting conducted on July 25, 2003, but was subsequently identified as a NCV during the re-exit held on September 2, 2003.

Two sets of steps in a fire procedure were cited as examples in the inspection report. One step is associated with an operator manual action to reenergize certain battery chargers after an assumed loss of offsite power event in conjunction with a fire event. This combination of events is only required by Appendix R for 'alternative' or 'dedicated' shutdown. For Plant Hatch, this represents a Control Room, Computer Room, or Cable Spreading Room fire (Fire Area 0024). In an October 31, 1986 response to a Request for Additional Information regarding an Appendix R Exemption Request on control room emergency lighting, the manual action of reenergizing the battery chargers was described. The January 2, 1987 NRC SER granting the Appendix R lighting exemption also took note of the battery chargers. The manual action is in recognition of the desirability of restoring the battery chargers following any loss of offsite power. Even with no fire-induced cable damage, the procedure step would be used. Thus, the step is not in the procedure for compliance with Appendix R, Section III.G.2. Rather, the inclusion of a step in the fire procedure to manually reenergize the subject battery chargers provides the operators with additional actions that could be performed should such an unlikely event occur.

get documents basis for this statement. → 2d ?

III.G.3. if lost F.A. causes a loss of offsite power NRC approval long battery chargers.

The other steps referenced in the inspection report relate to manual actions to prevent RPV overfill if HPCI fails to automatically trip on high level. These manual actions were not added to the fire procedure due to a lack of 'separation of redundant trains of cables'. Rather, the safe shutdown function of the RCIC system is 'redundant' to the safe shutdown function of the HPCI system. Circuits 'required' for the operation of RCIC and HPCI are separated as required by Appendix R Section III.G.2. RCIC is used for a path 1 shutdown and HPCI is used for a path 2 shutdown.

Cable routing

Thus, neither of the manual actions described in this NCV represent a manual action associated with Appendix R Section III.G.2. Based on this information, SNC requests that this NCV be withdrawn.