Southern Nuclear Operating Company
Post Office Box 1295
Birmingham, Alabama 35201
Telephone (205) 868-5131

Southern Nuclear Operating Company
*the southern electric system*

**Dave Morey**
Vice President
Farley Project

October 11, 1995

Docket No.: 50-348

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

Joseph M. Farley Nuclear Plant - Unit 1
Response to Request for Additional Information
"Unresolved Safety Issue A-46 Summary Report"
Generic Letter 87-02

Ladies and Gentlemen:

By letter dated September 5, 1995 the NRC requested additional information regarding the "Unresolved Safety Issue A-46 Summary Report," prepared by Southern Nuclear Operating Company (SNC) in response to Generic Letter 87-02. The response to the NRC request is provided in Attachment 1 as Questions 1, 2 and 3. In addition, the NRC informally requested further information to be included in this submittal. This additional information is provided as the response to Questions 4 through 11.

If you have further questions, please advise.

Respectfully submitted,

DM Morey

Dave Morey

DPH:maf A-46RAI.DOC

Attachments

cc: Mr. S. D. Ebneter
Mr. B. L. Siegel
Mr. T. M. Ross

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ATTACHMENT 1

**Question 1:**

**Section 2.6, "Plant Operations Department Review of Safe Shutdown Equipment List," refers to a memo from the plant operations manager (reference 13) which described operations comments regarding the SSEL, all of which have been addressed. Please provide the staff with the referenced memo and a description of how each comment was addressed.**

SNC Response

A thorough review of the Units 1 and 2 Safe Shutdown Equipment List (SSEL) was performed by the Plant Farley operations department per section 3.7 of the Seismic Qualification Utility Group (SQUG) Generic Implementation Procedure (GIP). The results of the operations department review are documented in a memorandum from the Plant Farley operations manager, Mr. Phil Crone. A copy of this memo is provided as Attachment 2. This memorandum concludes that, following incorporation of comments stated in the memorandum, procedures exist which will allow the safe shutdown of the plant, assuming only the equipment on the SSELs remains available and operable. Resolution of the operations review comments are stated below:

1. MOV disconnects should be included on the Unit I SSEL 1.

   The disconnect switches listed below were added to the appropriate SSEL:

| | | | |
|---|---|---|---|
| Q1R18B029-A | Q1R18B030-A | Q1R18B031-A | Q1R18B032-A |
| QlRl8B033-B | Q1R18B034-B | Q1R18B035-B | Q1R18B036-B |
| Q1R18B038-A | Q1R18B039-A | Q1R18B040-A | Q1R18B041-B |
| Q1R18B042-B | Q1R18B043-B | | |
| Q2Rl8B029-A | Q2Rl8B030-A | Q2Rl8B031-A | Q2Rl8B032-A |
| Q2Rl8B033-B | Q2Rl8B034-B | Q2Rl8B035-B | Q2Rl8B036-B |
| Q2Rl8B038-A | Q2Rl8B039-A | Q2Rl8B040-A | Q2Rl8B041-B |
| Q2Rl8B042-B | Q2Rl8B043-B | | |

2. The cabinets for RAD monitors R27A and B should be included:

   Control room panels Q1H11NGR2504I-AB and Q2H11NGR2504I-AB, which contain monitors R27A and B, are included on the Units 1 and 2 SSELs, respectively.

3. Room cooler thermostats should be included on the Unit 1 list:

   The room thermostats in the battery charger, MCC, and switchgear rooms were added to the Unit 1 SSEL.

4. Steam generator blow down (SGBD) containment isolation valves are required to be added to the Unit 1 list:

   SGBD valves Q1R24V003A, B, and C were added to the Unit 1 SSEL.

5. FCV-605 and the hot-leg recirculation valves should be added to the Unit 2 list:

   RHR heat exchanger bypass valves Q2E11FCV605A and B and hot-leg recirculation valves Q2E21MOV8884 and Q2E21MOV8886 were added to the Unit 2 SSEL.

**Question 2:**

**Section 3.0, "Relay Evaluation Report," contains a summary of results which indicate that all applicable relay/component combinations were evaluated and categorized into one of several groups. One of these groups specifies "resolved by operator action." Please provide a list of each relay/component which was categorized in this group and describe the specific operator actions required to resolve each, and the method(s) used to identify each.**

SNC Response

Resolution by operator action was a potential categorization for a relay/component component combination. This is the reason it was listed in the report. However, no relays were accepted based on using this method. All relays were resolved by one of other A-46 acceptable methods.

**Question 3:**

**For the operator actions specified in (b), above, are any of these actions time critical? If so, what analyses were performed to verify that these operations could be accomplished in the timeframe required to facilitate safe shutdown? How were potentially harsh environmental conditions factored into these analyses?**

SNC Response

As noted above, no operator actions due specifically to potential relay malfunctions are required.

**Question 4:**

**Provide a complete list of sources of water (tanks, etc.) available for cooldown, including capacities and seismic qualification.**

SNC Response

The Safe Shutdown Equipment List (SSEL) provided as part of the Unresolved Safety Issue (USI) A-46 Summary Report, includes a 500,000 gallon Condensate Storage Tank (CST) and a 500,000 gallon Refueling Water Storage Tank (RWST) for each unit. All four of these tanks are seismically qualified. The RWST provides borated water for makeup to the RCS subsequent to a seismic event, while the CST provides non-borated water for makeup to the secondary side of the steam generators via the Auxiliary Feedwater System (AFW). The Service Water System provides a backup source of water to the AFW pumps should the contents of the CST be depleted. The Service Water System is comprised of a 100 acre storage pond with a seismically qualified dam, pumphouse, and distribution piping. All the Service Water pumps and attendant equipment are provided with Class 1E power supplies. Use of these water sources is proceduralized in emergency and abnormal operating procedures, and training in use and implementation of the procedures is provided to all licensed operators.

Other sources of water, which are not included in the SSEL, are available for makeup to the primary and secondary systems. Exclusion of equipment from the SSEL does not prevent operators from using the equipment if available. Each unit has a 200,000 gallon Reactor Makeup Water Storage Tank and two 21,000 gallon Boric Acid Storage Tanks which can provide RCS makeup. These tanks are seismically qualified. In addition to providing AFW, the CST is the normal source of makeup for the condensate and feedwater system. Inventory in this tank is usually maintained near capacity, but a low level alarm is provided on the CST at the 196,000 gallon level, at which point procedures direct that makeup to the CST be initiated from the Demineralized Water System. There are several sources of water which may provide makeup to the Demineralized Water System.

**Question 5:**

**Are emergency air compressors seismically qualified and provided with safety related power?**

SNC Response

Yes, the compressors and associated distribution piping are seismically qualified. The compressors are provided with Class 1E power supplies.

**Question 6:**

**The report mentions a Train "D" of CCW as an alternate path for decay heat removal in section 2.5.4. Is this correct?**

SNC Response

The reference to Train D was a typographical error. FNP included two trains of CCW in the SSEL. The appropriate wording should refer to Train "B."

**Question 7:**

**Are procedures established for all shutdown paths mentioned in the SQUG Report?**

SNC Response

Yes. One of the criteria used for selection of equipment on the SSEL was that the systems and components specified would be equipment expected to be used by operators in established plant procedures. SNC did not develop a new group of seismic shutdown procedures, but instead relied on existing emergency and abnormal operating procedures. Plant operators are routinely trained in the use of these procedures and practice with them on the plant simulator regularly. The plant Operations Manager provided a letter, referenced in the SQUG Report, which stated that plant operators could safely shutdown the plant using only the equipment on the SSEL if necessary, using established procedures.

**Question 8:**

**Discuss time available for use of qualified water sources before depletion (RWST, CST). Are there calculations to document the time that qualified water sources would be available?**

SNC Response

Per the guidelines of GL 87-02, SNC was not required to assume the occurrence of a LOCA in conjunction with a seismic event. GL 88-20 however, does assume a concurrent LOCA, which was addressed in the FNP Individual Plant Examination of External Events (IPEEE) Report. The SSEL equipment was selected in order to satisfy both generic letters. In a large break LOCA scenario with maximum ECCS injection, the RWST would be depleted to a level that would require initiation of actions to establish recirculation in approximately 20 minutes. Consistent with the FNP design basis, existing plant procedures establish recirculation cooling from the containment sump after drawdown of the RWST. This capability is confirmed through plant testing and operator training.

The Emergency Procedure that addresses natural circulation cooldown to prevent reactor vessel head voiding, directs operator actions based upon available CST inventory. The procedure contains tables with allowable time delay prior to beginning a controlled cooldown, based on CST inventory as well as availability of control rod drive mechanism cooling fans to cool the Reactor Vessel upper head. The procedure also contains a table with CST inventory requirements versus. transfer time to other procedures which allow voiding in the vessel head. The Demineralized Water System has the capability of making up to the CST at a rate of 360 gpm, which is adequate for AFW system requirements. Thus, if the Demineralized Water System is available, the CST can be filled at a rate equal to or greater than AFW pump demand and avoid depleting the CST. If not, procedures require the AFW pump suction be shifted to service water when the CST nears depletion. The Service Water pond is the plant ultimate heat sink and is assumed to be available at all times.

**Question 9:**

**Does FNP plan to use the "Bleed & Feed" method described in EOPs for decay heat removal?**

SNC Response

GL 87-02 (SQUG) requires two "redundant" safe shutdown paths. These paths may employ the same cooldown technique. Thus, the SQUG Report takes credit for two trains of AFW and heat removal via steaming the steam generators. No credit is taken for RCS Bleed and Feed for the GL 87-02 response. GL 88-20 (IPEEE) requires two "diverse" safe shutdown paths, which can not employ the same cooldown technique. Thus, for the IPEEE submittal, FNP has taken credit for RCS Bleed and Feed as one safe shutdown path. There is sufficient equipment included in the Safe Shutdown Equipment List to satisfy both generic letters.

**Question 10:**

**The Support Systems section of the report did not include instrument air, emergency air compressors, or the control rod drive system. Explain.**

SNC Response

The instrument air system is not safety related or seismically qualified. Air operated valves are designed with a fail-safe position which does not depend on an operable air supply. Although the emergency air compressors are not discussed in the Support System text of the Summary Report, they are included in the SSEL for support of the main steam atmospheric relief valves. As mentioned in response to Question 2, the emergency air compressors are seismically qualified and provided with Class 1E power supplies. The control rods fall into the reactor core via gravity upon loss of power to the rod drive system. Thus, the control rod drive system is not required to be functional for the rods to insert negative reactivity and take the reactor subcritical. Even if the control rods fail to insert, there is sufficient boron in the RWST to insure subcriticality.

**Question 11:**

**Does a reactor trip (with or without a loss of offsite power) result in lifting of main steam safety valves for FNP?**

SNC Response

A loss of offsite power with an accompanying reactor trip would, by design, result in lifting of the main steam safety valves. Lifting of main steam safety valves in response to a reactor trip without a loss of offsite power is possible, although the transient would likely be adequately responded to by the atmospheric relief valves and steam dump valves.

ATTACHMENT 2

# Memorandum

DATE: February 21 1995

TO: Keith Wooten

FROM: Phil Crone Phil Crone

RE: Plant Operations Review of Farley Units1 and 2
USI A-46/IPEEE Safe Shutdown Equipment List

CC: Robert Fucich, Randy May

FNP Operations has reviewed the lists and assumptions furnished by Randy May on the above subject and, based on the incorporation of the following comments, we agree that procedures exist which will allow the safe shutdown of the plant, assuming only the equipment on the lists remains available and operable. We further agree that operators are trained on the use of these procedures. This review was based on the "desk top" method. Our comments are as follows:

1. MOV Disconnects should be included on the Unit 1 list.
2. The cabinets for Rad Monitors R27A&B should be included.
3. Room cooler thermostats need to be included on the Unit 1 list.
4. SGBD containment isolation valves need to be added to the Unit 1 list.
5. FCV-605 and the hot leg recirc valves need to be added to the Unit 2 list

GPC/RSF