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May 16, 1984

Mr. Harold R. Denton, Director
Office of Nuclear Reactor Regulation
U. S. Nuclear Regulatory Commission
Washington, D. C. 20555

Attention: Ms. E. G. Adensam, Chief
Licensing Branch No. 4

Re: McGuire Nuclear Station
Docket Nos. 50-369, 50-370

Dear Mr. Denton:

The purpose of this letter is to provide responses to requests for information contained in Mr. Thomas M. Novak's letter dated March 23, 1980 relative to the existing and planned Inadequate Core Cooling Instrumentation. Additionally this letter contains the Implementation Letter Report identified in Part 3 of Mr. Novak's letter for the Reactor Vessel Level Instrumentation System on Unit 1.

Attachments 1, 2, and 3 comprise the response to the NRC Staff's request for information. Attachment 4 is the Implementation Letter Report for the Reactor Vessel Level Instrumentation System on Unit 1. It is requested that NRC approve the McGuire Unit 1 Reactor Vessel Level System. Since this system will be the same on Unit 2, it is expected that this approval, when received, would apply also to Unit 2.

Please advise if there are questions concerning this matter.

Very truly yours,

H.B. Tucker /BS

Hal B. Tucker

GAC:glb

cc: W. T. Orders
Senior Resident Inspector
McGuire Nuclear Station

Mr. James P. O'Reilly, Regional Administrator
U. S. Nuclear Regulatory Commission
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101 Marietta Street, Suite 3100
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ATTACHMENT 1

RESPONSE TO NRC
REQUEST FOR ADDITIONAL INFORMATION
DUKE POWER COMPANY"S PROPOSED
INADEQUATE CORE COOLING INSTRUMENTATION FOR
MCGUIRE NUCLEAR STATION UNITS 1 AND 2

1. Describe how reference junction compensation will be accomplished under adverse conditions since the use of reference junction compensation equipment inside containment creates the risk that thermocouple indications could become inaccurate under certain accident conditions.

   RESPONSE:

   The design of the upgrade of the McGuire Incore Thermocouple System utilized mineral insulated T/C cabling from the instrument ports to the containment liner. Thermocouple type penetrations are utilized to interface with this cabling system. This approach eliminates the need for the use of reference junction compensation equipment within containment.

2. Provide a proposal for revised Technical Specification dealing with ICCI.

   RESPONSE:

   The current McGuire Technical Specifications for Units 1 and 2 contain requirements on operability and surveillance of the existing Core Exit Thermocouple (CET) System and the Subcooling Margin Monitor (SMM) System. No changes are deemed required in these specifications. Attachment 2 contains proposed changes to the Accident Monitoring Instrumentation Specification (Tables 3.3-10 and 4.3-7). A formal request for these changes will be made after implementation of the revised Emergency Operating Procedures which is scheduled for November, 1984 as described in Duke Power Company's "Response to Supplement 1 to NUREG-0737" (H. B. Tucker letter dated March 29, 1984 which transmitted Revision 3 to Duke Power's response).

3. Provide a detailed description of the final integrated display system for ICC information indicated by the CETs, SMM, and RVLIS.

   RESPONSE:

   The final displays for the ICC monitoring instrumentation will be as follows:

A. Incore Thermocouple System

1) The primary display for the Incore Thermocouple System consists of a CRT graphic which can be displayed on monitors located on control boards MC1 and MC2 (see Attachment 3 for locations). This display generated through the plant Operator Aid Computer. The CRT graphics provide a spatially oriented core map available on demand indicating temperature at each of the 65 core exit thermocouple locations. The readout range extends from 200 degrees F to 2300 degrees F. Trending of selected thermocouple readings and hard copy printouts are available on demand. This display is non class 1E.

2) A Class 1E backup display will be provided on control board MC5. This display will have the capability of reading the upgraded thermocouples within a time interval of no greater than six minutes. The range of this display will extend from 200 degrees F to 2300 degrees F.

B. Subcooling Margin Monitor (SMM)

1) The primary display for the SMM is a CRT graphic which can be displayed on either monitors located on control boards MC1 and MC2. This display is generated through the plant Operator Aid Computer. The CRT graphics provide an on demand display of conservative margin to saturation conditions. In addition, each hot leg temperature, RCS pressure, power level, margin to Psat, each RCS loop margin to Tsat, thermocouple margin to Tsat, and the minimum allowable margins to Psat and Tsat are displayed.

2) In accordance with Duke Power's Control Room Design Review, an additional SMM display will be added to control board MC5. This display will provide subcooling margins for each of the four reactor coolant loops and the reactor vessel.

C. Reactor Vessel Level System (RVLIS)

1) The RVLIS display consists of three Class 1E indicators (per train) located on control board MC8. Each of the three dp loops per train drive an individual control board indicator (see previous submittals for detailed description of RVLIS system and ranges). Each control board indicator has an associated indicating light located adjacent to it to indicate the valid/invalid modes, depending on reactor coolant pump operational status. (See Attachment 3)

4. Clarify the DPC position with respect to conformance to NUREG-0737 Item II.F.2 requirements for SMM, and provide a schedule for SMM upgrade.

RESPONSE:

Duke Power Company maintains that the presently installed SMM will adequately address the NUREG 0737 Item II.F.2 requirements for ICC monitoring instrumentation once the Incore Thermocouple Upgrade is complete. Phase 1 of this upgrade provides the necessary environmental withstand capability for the portions of the T/C system which may be potentially exposed to a harsh environment. Phase II of the incore upgrade will complete the seismic qualification for those inputs.

The single failure criteria has been addressed by the use of qualified, redundant, temperature and pressure readouts in the control room which can be utilized in conjunction with steam tables to determine saturation margins. However, as a result of the McGuire Control Room Design Review (CRDR), Duke Power has committed to install an additional SMM which does not depend on the Operator Aid Computer. This commitment was included in the CRDR portion of Duke Power's "Response to Supplement 1 to NUREG 0737" and is tentatively scheduled for the first refueling outage of each unit after January 1986. The depth provided by this additional system should resolve any remaining single failure concerns.

5. Provide a new implementation schedule for Phase 2 upgrade of the CET system. Although the justification and safety analysis was provided in licensee's January 12, 1984 letter for extension of the implementation date for upgrading of the outside containment portion of the incore thermocouple system beyond December 31, 1983, no schedule commitment was provided.

RESPONSE:

The subject January 12, 1984 letter stated that Duke Power would provide a schedule for the Phase 2 upgrade in the Regulatory Guide 1.97 Accident Monitoring Review Report submitted pursuant to NUREG 0737 Supplement 1. This schedule was provided in the RG 1.97 section of Revision 3 to Duke's "Response to Supplement 1 to NUREG 0737" document (Submitted by H. B. Tucker letter dated March 29, 1984). This schedule provides for the addition of the Class 1E backup display by the end of the first refueling outage for each unit after January, 1986 contingent upon equipment availability.

TABLE 3.3-10

ACCIDENT MONITORING INSTRUMENTATION

INSTRUMENT	REQUIRED NO. OF CHANNELS	MINIMUM CHANNELS OPERABLE
1. Containment Pressure	2	1
2. Reactor Coolant Temperature - T_{HOT} and T_{COLD} (Wide Range)	2	1
3. Reactor Coolant Pressure - Wide Range	2	1
4. Pressurizer Water Level	2	1
5. Steam Line Pressure	2/steam generator	1/steam generator
6. Steam Generator Water Level - Narrow Range	2/steam generator	1/steam generator
7. Refueling Water Storage Tank Water Level	2	1
8. Auxiliary Feedater Flow Rate	2/steam generator	1/steam generator
9. Reactor Coolant System Subcooling Margin Monitor	1	1
10. PORV Position Indicator*	2/valve	1/valve
11. PORV Block Valve Position Indicator**	1/valve	1/valve
12. Safety Valve Position Indicator	2/valve	1/valve
13. Containment Water Level (Wide Range)	2	1
14. In Core Thermocouples	4/core quadrant	2/core quadrant
15. Unit Vent - High Range Noble Gas Monitor (High-High Range - EMF-36)	1	1
16. Steam Relief - High Range Monitor (Unit 1 - EMF-24, 25, 26, 27) (Unit 2 - EMF-10, 11, 12, 13)	1/steam line	1/steam line
17. Containment Atmosphere - High Range Monitor (EMF-51a or 51b)	1	1
18. Reactor Vessel Level Instrumentation	1	1

* Not applicable if the associated block valve is in the closed position.

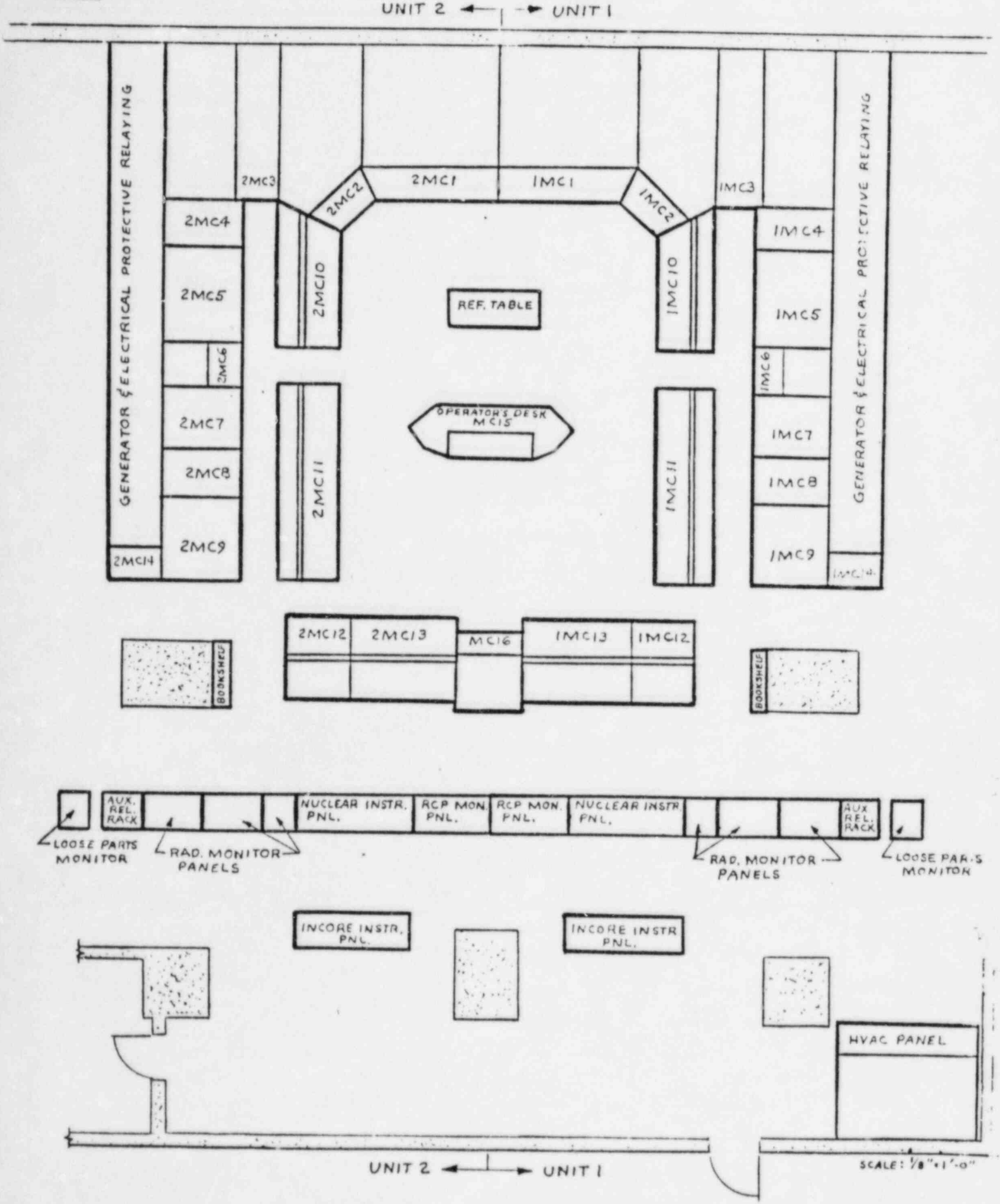
** Not applicable if the associated block valve is in the closed position and power is removed.

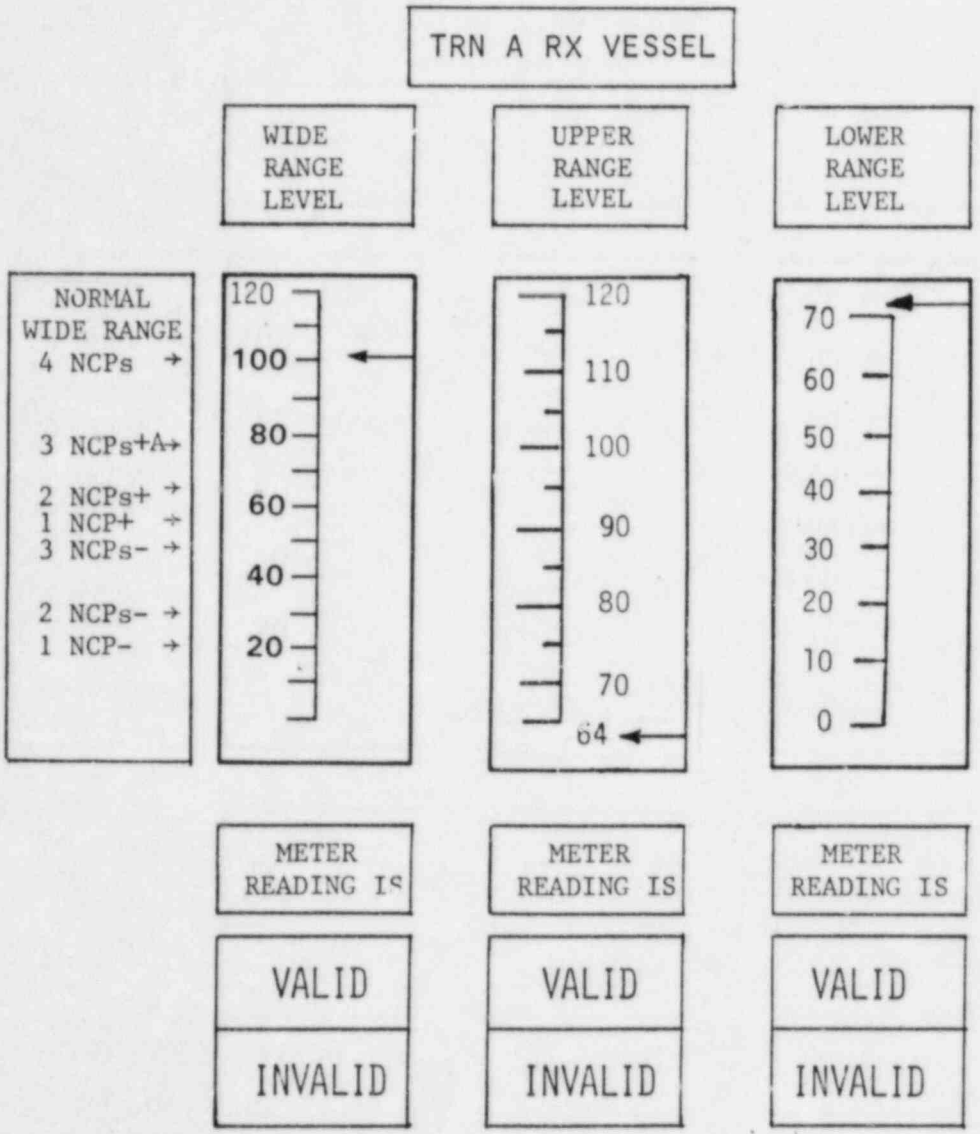
TABLE 4.3-7

ACCIDENT MONITORING INSTRUMENTATION SURVEILLANCE REQUIREMENTS

INSTRUMENT	CHANNEL CHECK	CHANNEL CALIBRATION
1. Containment Pressure	M	R
2. Reactor Coolant Temperature - T_{HOT} and T_{COLD} (Wide Range)	M	R
3. Reactor Coolant Pressure - Wide Range	M	R
4. Pressurizer Water Level	M	R
5. Steam Line Pressure	M	R
6. Steam Generator Water Level - Narrow Range	M	R
7. Refueling Water Storage Tank Water Level	M	R
8. Auxiliary Feedwater Flow Rate	M	R
9. Reactor Coolant System Subcooling Margin Monitor	M	R
10. PORV Position Indicator	M	R
11. PORV Block Valve Position Indicator	M	R
12. Safety Valve Position Indicator	M	R
13. Containment Water Level (Wide Range)	M	R
14. In Core Thermocouples	M	R
15. Unit Vent - High Range Noble Gas Monitor (High-High Range - EMF-36)	M	R
16. Steam Relief - High Range Monitor (Unit 1 - EMF-24, 25, 26, 27) (Unit 2 - EMF-10, 11, 12, 13)	M	R
17. Containment Atmosphere - High Range Monitor (EMF-51a or 51b)	M	R
18. Reactor Vessel Level Instrumentation	M	R

McGUIRE UNITS 1 & 2
CONTROL ROOM LAYOUT




TRN A RX VESSEL
WIDE RANGE LEVEL
UPPER RANGE LEVEL
LOWER RANGE LEVEL
NORMAL WIDE RANGE
4 NCPs →
3 NCPs+A →
2 NCPs+ →
1 NCP+ →
3 NCPs- →
2 NCPs- →
1 NCP- →
120
100
80
60
40
20
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110
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90
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70
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50
40
30
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10
0
METER READING IS
VALID
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METER READING IS
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METER READING IS
VALID
INVALID

Attachment 4
McGuire Nuclear Station - Unit 1
Reactor Vessel Level Instrumentation System
Implementation Letter

1. The Reactor Vessel Level Instrumentation System for Unit 1 has been installed, functionally tested and calibrated under cold and hot conditions. All these test and calibration results are available at McGuire Nuclear Station.

2. Based on test results to date, no performance deviations have been identified. The system met manufacturer specifications for the testing that has been conducted.

3. No significant deviations of the as-built system from the system design have been identified.

4. See response to Question 2 in Attachment 1.

5. See cover letter.

6. The emergency procedures which reference RVLIS are being written using the Westinghouse Owners Group emergency response guidelines (ERG's) as the basis. The NRC Staff has reviewed and approved Revision 0 of the ERG's and has given their concurrence on Revision 1 of the ERG's although a formal Safety Evaluation Report has not been issued. Duke Power Company is using Revision 1 to the ERG's as the basis for the McGuire ERG's and background document. The plant operators will be trained using these documents.