

July 9, 1985

DMB 616

Docket No. 50-289

Mr. Henry D. Hukill, Vice President
and Director - TMI-1
GPU Nuclear Corporation
P. O. Box 480
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Dear Mr. Hukill:

Our letter dated April 5, 1985, informed you that the staff's audit of your Safety Parameter Display System (SPDS) for Three Mile Island, Unit 1 would be rescheduled. With your staff's agreement, the audit is now scheduled for August 12-14, 1985, at the plant site beginning at 10:00am on August 12. A revised audit plan is enclosed for your information. Additional information can be obtained from the Project Manager, Owen Thompson (302-492-7471).

Sincerely,

"ORIGINAL SIGNED BY:"

John F. Stolz, Chief
Operating Reactors Branch #4
Division of Licensing

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Mr. Henry D. Hukill
GPU Nuclear Corporation

Three Mile Island Nuclear Station
Unit No. 1

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Atomic Safety & Licensing Board Panel
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

Atomic Safety & Licensing Appeal
Board Panel (8)
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

Docketing and Service Section
Office of the Secretary
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

AUDIT PLAN
FOR THE
THREE MILE ISLAND UNIT 1
SAFETY PARAMETER DISPLAY SYSTEM

Background

All holders of operating licenses issued by the Nuclear Regulatory Commission (licensees) and applicants for an operating license (OL) must provide a Safety Parameter Display System (SPDS) in the control room of their plant. The Commission approved requirements for the SPDS are defined in Supplement 1 to NUREG-0737.

The purpose of the SPDS is to provide a concise display of critical plant variables to control room operators to aid them in rapidly and reliably determining the safety status of the plant. NUREG-0737, Supplement 1, requires licensees and applicants to prepare a written safety analysis describing the basis on which the selected parameters are sufficient to assess the safety status of each identified function for a wide range of events, which include symptoms of severe accidents. Licensees and applicants shall also prepare an implementation plan for the SPDS which contains schedules for design, development, installation, and full operation of the SPDS as well as a design verification and validation plan. The safety analysis and the implementation plan are to be submitted to the NRC for staff review. The results of the staff's review are to be published in a Safety Evaluation Report (SER).

NRC Audit Team

The NRC Audit Team will consist of a representative from the Human Factors Engineering Branch assisted by personnel from Science Applications International Corporation (SAIC).

Licensees Preparations

Data, information, and documents on the design, development and test of the SPDS should be available for the NRC Audit Team's use and review. Also, personnel knowledgeable in the design, development, and test of the SPDS should be available to answer questions from the NRC Audit Team.

Audit Tasks

The audit is composed of six tasks that are defined as:

- I. Entry Briefing,
- II. SPDS Design Process and Human Factors Engineering,
- III. Design Verification and Validation,
- IV. Data Validation,

- V. Unreviewed Safety Question,
- VI. Exit Briefing.

Details on each of these tasks are provided next.

I. ENTRY BRIEFING

1. The NRC Audit Team will conduct an entry briefing to discuss schedule and the audit plan.
2. The licensee is to define the scope of the SPDS within the computer system in which it is implemented.
 - ° Define location of SPDS formats/pages which contain data on each of the Critical Safety Functions.

II. SPDS DESIGN PROCESS AND HUMAN FACTORS ENGINEERING

1. SPDS System's Specifications:
 - ° Evaluate Human Factors Standards and Guidelines specified for designer's use in development of display system;
 - ° Evaluate design basis of display system;
 - ° Evaluate specifications for performance requirements:
 - display devices,
 - response time to user's requests,
 - user-display interface devices,
 - updating of data,
 - use of color,
 - information density,
 - display hierarchy and access to data,
 - labels and units for data sets.
2. Detailed Design Specification:
 - ° Evaluate process used to decompose display system specifications to design details:

- display devices,
- response time to user's request,
- user-display interface devices,
- use of color,
- information density,
- display hierarchy and access to data,
- labels and units for data sets.

3. Computer Code and Data Base:

- audit computer code and data base for conformance to design specifications.

4. Display Formats:

- Evaluate use of labels and units,
- Evaluate use of color,
- Evaluate information density/clutter,
- Evaluate access to all data needed to evaluate each Critical Safety Function,
- Evaluate update of data.

5. Display Devices and Display System Interfaces:

- Determine if the display screen flickers,
- Evaluate display controls,
- Evaluate keyboards, keypads, and interface devices for ease of operator use.

III. DESIGN VERIFICATION AND VALIDATION

1. Verification and Validation Program:

- Evaluate scope and depth of program,
- Compare program to NSAC 39.

2. Design Verification:

- Evaluate results from design verification activities,
- Evaluate results from unit test of computer programs,
- Evaluate process used to resolve identified discrepancies.

3. Design Validation:

- Evaluate scope of test plans and test procedures,
- Evaluate coordination of test of display system with other control room activities and with user-in-the loop tests,
- Evaluate acceptance criteria used for validation tests,
- Evaluate test report,
- Evaluate scope, type, and resolution of discrepancies identified during design validation.

IV DATA VALIDATION

1. Data Validation Method:

- Evaluate method used to validate data,
- Audit scope and depth of the data validation method as a function of the number of sensors available,
- Audit the criteria used to validate data

2. Displayed Results, Data Validation:

- Evaluate method used to code quality of the data for operator use, the scope of application among display formats, and the ease of perception by a user.

V UNREVIEWED SAFETY QUESTION:

- Evaluate results from the licensee's assessment of the SPDS system in accordance with licensee's technical specifications to determine whether the changes involve an unreviewed safety question or change of technical specification.

VI EXIT BRIEFING

1. NRC audit team caucus to discuss results and prepare exit briefing.
2. Conduct Exit Briefing with licensee, state preliminary audit findings and solicit comments.