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Vogtle Project

September 27, 1985

Director of Nuclear Reactor Regulation
Attention: Ms. Elinor G. Adensam, Chief
Licensing Branch #4
Division of Licensing
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

Log: GN-709
File: X5AB04

NRC DOCKET NUMBERS 50-424 AND 50-425
CONSTRUCTION PERMIT NUMBERS CPPR-108 AND CPPR-109
VOGTLE ELECTRIC GENERATING PLANT-UNITS 1 AND 2
SAFETY PARAMETER DISPLAY SYSTEM IMPLEMENTATION

Dear Mr. Denton:

Attached for your review are five (5) copies of information related to the implementation of a Safety Parameter Display System (SPDS) for Plant Vogtle-Units 1 and 2. The attachments provide the SPDS implementation plan and the SPDS Safety Analysis Report prepared for Georgia Power Company by Energy Incorporated. This information is provided in accordance with the requirements of NUREG-0737, Supplement 1.

If your staff requires any additional information please do not hesitate to contact me.

Sincerely,

J. A. Bailey
Project Licensing Manager

JAB/rlk/caa
Attachment
xc: D. O. Foster
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J. E. Joiner, Esquire
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SPDS IMPLEMENTATION PLAN

As a result of the Three Mile Island nuclear power plant accident on March 28, 1979, and the subsequent studies of needed improvements to nuclear power plant safety, the Nuclear Regulatory Commission (NRC) and the nuclear industry identified the need for a Safety Parameter Display System (SPDS). The SPDS will provide a concise display of critical plant parameters to the control-room operators to aid them in rapidly and reliably determining the safety status of the plant. The SPDS is in addition to the control-room instrumentation required by General Design Criteria 13 and 19 of Appendix A to 10 CFR 50 that provides the operators with the information necessary for safe reactor operation under normal, transient, and accident conditions. The SPDS, therefore, represents an improvement to the control room as it enhances the operator's ability to rapidly comprehend plant conditions and to interact in situations that require human intervention.

The SPDS for the Vogtle Plant will be integrated into a comprehensive computer system that includes the emergency response facilities (ERF) data acquisition, data processing, and display functions. The SPDS will utilize cathode-ray tube (CRT) monitors, strategically placed and having appropriate man-machine interfaces. By means of user-called displays, an abundance of information on the safety status of the plants can be quickly made available to operations and technical staff.

NUREG-0737, Supplement 1, requires that, as a minimum, the SPDS must provide safety status information to plant operators that includes:

(1) reactivity control,
(2) reactor core cooling and heat removal from the primary system,
(3) reactor coolant system integrity,
(4) radioactivity control, and
(5) containment conditions.

The Vogtle SPDS will use the following categories based on the Emergency Response Guideline recommendations of the Westinghouse Owner's Group for critical safety function status monitoring:

(1) reactivity,
(2) core cooling,
(3) heat sink,
(4) reactor cooling system integrity,
(5) reactor cooling system inventory, and
(6) containment

In addition to the parameters necessary to provide information on the status of the critical safety functions, the operator has information available from the Plant Effluent Radiation Monitoring System (PERMS) as well as other Regulatory Guide 1.97 parameters and other parameter inputs into the ERF computer. The SPDS Safety Analysis Report provides a detailed discussion of the parameters selected for the SPDS and their justification. The control room will have two (2) CRT consoles for SPDS and one CRT console for use by the Shift Supervisor. The SPDS consoles are interlocked such that the top level SPDS display will be presented on at least one of the two CRTs continuously so that the operator always has the status of the critical safety functions. Inputs to the ERF computer are provided via data links or multiplexer units. All class 1E safety-related input signals to the ERF computer and SPDS are provided with class 1E isolation devices provided by Westinghouse. This prevents the operation of the ERF computer, or faults developing in the ERF computer system, from affecting the operation of the normal safety-related displays in the control room. The control room displays of the individual parameters provide the backup display to the SPDS. The inputs to the ERF computer system, and therefore the SPDS, are validated through the use of validation algorithms which entail the use of such factors as comparison of redundant sensors, comparison of similar sensors, or independent calculation based on separate parameters.

The human factors aspects of the SPDS design will be evaluated as part of the control room design review process. An independent verification and validation review of the SPDS design and installation will be performed by Energy Incorporated using the guidelines available from NSAC and the ERC NUTAC. The SPDS system has been installed on the VEGP simulator for use in operator training and evaluation. This gives the operators hands-on experience in the use of the SPDS and has facilitated valuable feedback from the operators on ways to improve the SPDS displays.

The installation of the SPDS hardware and software in the Unit 1 main control room will be completed prior to fuel load for Unit 1.