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MFN-064-85

May 9, 1985

U. S. Nuclear Regulatory Commission
Office of Nuclear Reactor Regulation
Washington, D.C. 20555

Attention: H. L. Thompson, Director
Division of Licensing

Gentlemen:

SUBJECT: IN THE MATTER OF 238 NUCLEAR ISLAND GENERAL ELECTRIC STANDARD SAFETY ANALYSIS REPORT (GESSAR) DOCKET NO. STN 50-447; EMERGENCY RESPONSE INFORMATION SYSTEM (ERIS)

References:
1) Letter, H. C. Pfefferlen (GE) to L. Beltracchi (NRC), "Open Items from Draft SER on GESSAR II SPDS", December 20, 1984
2) Letter, R. Dick (Anacapa Sciences, Inc.) to W. J. Roths (GE), April 2, 1985

Enclosed is a copy of Anacapa Technical Report No. TR-550-1, "Human Factors and Performance Evaluations of ERIS". The material in this report in conjunction with the information in Attachment A should resolve questions raised by the NRC staff regarding the amount of information contained in the GESSAR ERIS displays. This subject was discussed with the staff in a meeting on April 25, 1985 and was addressed also in References 1 and 2.

As discussed in Attachment A, the General Electric Emergency Response Information System (ERIS), is designed to present critical parameter trend, event status and system status information to the operator to facilitate implementing the BWR Owners Group Emergency Procedure Guidelines (EPGs). This goes beyond the specific requirements of NUREG-0737, Supplement 1, which could be satisfied by trend plots and event status alone. While the information requirements of NUREG-0737, Supplement 1, (trend plots and event status) are a significant aid to the operator and have been utilized in some applications, the addition of system status on the top level displays further enhances the display's usefulness in implementing the EPGs. In order to perform this function the status of systems (and only those systems) which may be identified in the EPGs to perform the critical functions (level control, heat removal, etc.) are presented on the top level RPV and Containment Control displays. This assists the operator in determining the most appropriate course of action for handling degraded conditions (i.e., decisions related to attempting to recover inoperative systems vs. taking alternative actions specified in the EPGs). The ERIS displays provide the information needed by the operator to make these important decisions in an informed and timely manner. With proper training these displays should permit

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very rapid assessments of system status with minimal distraction since under most conditions the color coding will indicate system availability. It is primarily under degraded conditions in a desired system that the operator would look at the text detail.

In summary, it is General Electric's technical opinion, supported by our human factors consultant (Anacapa), that the design of the RPV and Containment Control displays represents an effective way of accomplishing the system design objectives. We believe there is no practical way of reducing the amount of information presented without also reducing the effectiveness of the displays in implementing the BWR Owners Group Emergency Procedure Guidelines. Further, we do not believe that the amount of information presented detracts in any way from the effectiveness of the system as a whole. For these reasons we conclude that human factors have been adequately considered in the design of the ERIS RPV and Containment Control displays and that these displays contain the information appropriate to their purpose. We hope this will resolve the staff concern with "clutter".

If you have any questions or comments, please contact H. C. Pfefferlen on (408) 925-3392.

Very truly yours,

R Gridley for

Glenn G. Sherwood, Manager
Nuclear Technologies and Fuel Division

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cc: L. Beltracchi
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ATTACHMENT A

While the General Electric Emergency Response Information System (ERIS) provides the minimum Safety Parameter Display System (SPDS) requirements of NUREG 0737, Supplement 1, the design basis for the GESSAR ERIS is the BWR Emergency Procedure Guidelines (EPGs). In using the EPGs as a design basis, it was found necessary to require two (2) top level display formats, RPV and Containment Control. These formats in turn require simultaneous display on two (2) CRTs since the EPGs direct control of the RPV and the containment parameters at the same time. In supporting the operator information needs addressed in the EPGs, it was necessary to add plant information to the top level formats which goes beyond that required for an SPDS, specifically system status information. This was done in a consolidated and coordinated manner on both displays.

The following material is provided to address the NRC questions regarding the amount of information on the GESSAR ERIS displays and the General Electric rationale for the design.

Required Systems

Each of the systems included in the top level system status display may be needed to implement EPG actions the operator is instructed to take based on the symptomatic control of the displayed critical parameters. The two top level displays provide the critical parameter value and trend information in conjunction with status information for the system(s) which may be used to control the parameter. This is done so that the operator is presented with a clear picture of both cause and effect.

The water injection systems listed on the RPV Control display (top 6 systems) are those identified in the water level control section of the EPGs. These are the systems the operator will attempt to use to control RPV water level; therefore, their association with the RPV water level trend plot on the same display is very useful to the operator. The pressure control or heat removal systems listed on the RPV Control display (next 5 systems) are similarly identified in the pressure control section of the EPGs for use in controlling RPV pressure or performing RPV cooldown. The power control system (SLC) is obviously associated with the reactor power trend plot for events resulting from a failure to scram. All twelve (12) systems are identified on both the RPV Control-Power and Temperature displays for consistency.

The systems listed on the Containment Control display are all directly tied to the displayed trended parameters in the same manner as discussed above and the performance and availability of these systems will directly impact the operator's ability to control the key containment parameters.

It is important to note that all of the listed systems may not have been called upon by the operators during the dynamic simulator evaluations performed by Anacapa Sciences, Inc. The reason for this is that simulated transients are standard design base transients and degraded plant conditions (multiple failures, etc.) were not simulated. It should be noted that the EPGs not only address degraded conditions, but direct operator actions based on the availability of systems which may not normally be used to mitigate design basis events.

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System Status Tags

The System Status Tags (SSTs) are not only system "ON/OFF" indicators, which could be expressed with single status tags as suggested by the NRC, but are intended also to be a top level diagnostic aid to the operator. As may be suggested by the simulator evaluation report, the SSTs were primarily referenced for their status information (e.g. color coding) and not their diagnostic content (e.g. text change). This is to be expected so long as all required mitigation systems are available. However, it must be emphasized that the SSTs were designed to assist the operator with system information not only during design basis events/transients, but also during degraded plant conditions addressed in the EPGs. It is primarily for those potential degraded plant conditions that the top level diagnostic system information is provided.

As the event progresses, the operators may be called upon to take actions as directed by the EPGs to mitigate the event. In performing the required actions, the operators may need to make quick decisions as to which systems should be used to control the key parameters and mitigate the event. It is at this point that the diagnostic value of the status tags becomes important. A top level indication of whether there is a water source available, power available or if the system can inject at the current RPV pressure, etc. is very valuable to the operator in making effective decisions as to which systems should be used. This will eliminate unproductive attempts to use a system which is unavailable and should be turned over to auxiliary operating/maintenance personnel for troubleshooting and system restoration.

The present method of presenting SST information was evaluated during the dynamic simulation. As Anacapa Sciences, Inc. has pointed out (Ref. 2), operator access to the system status information would be adversely impacted in two ways by elimination of this information from the top level display. First, the time required to obtain the information would be increased; and, second, the potential for operator error, while paging from one display to another would be increased. In addition, since the ERIS displays require two CRTs for simultaneous control of the RPV and containment, calling a secondary display for system information would require the loss of key parameter information.

It is General Electric's technical opinion that the systems and information contained in the current RPV and Containment Control displays should be retained for the EPG based displays. They provide useful, clearly presented, concentrated information, coordinated with the key plant parameters and result in effective operator actions in mitigating the plant events.

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