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May 29, 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: Catawba Nuclear Station
Docket Nos. 50-413 and 50-414

Dear Mr. Denton:

Mr. H. B. Clayton's memo of April 5, 1984 to Mr. D. L. Ziemann provided a summary of a Westinghouse Owner's Group Procedure Subcommittee meeting held on March 29, 1984 and described clarifications to the Control Room Design Review Task Analysis described in Supplement 1 to NUREG-0737. Duke Power responded to the Supplement 1 to NUREG-0737 on June 1, 1982 with the Catawba Unit 1 Control Room Review Supplemental Report and was later audited by the staff on August 9-12, 1983. Attached is a response to those Task Analysis clarification comments of Mr. Clayton's memo.

Very truly yours,

Hal B. Tucker
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Hal B. Tucker

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Attachment

cc: Mr. James P. O'Reilly, Regional Administrator
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NRC Resident Inspector
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cc: Mr. Jesse L. Riley
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Catawba Nuclear Station
Comments on the Relationship of Duke Power's Response
to Supplement 1 of NUREG-0737 and
Mr. H. B. Clayton's Memo of April 5, 1984

- 1) Based on the presentations by Mr. McKinney and Mr. Surman, it appears that Revision 1 of the ERG and background documents do provide an adequate basis for generically identifying information and control needs.
- 5) It appears that the Basic version of the ERG and background documentation provide an adequate basis for generically deriving information and control needs. However, because of the differences in the organization of the material in the background documents between Basic and Revision 1, it is apparent that it would be easier to extract the needed information from the Revision 1 background documents.

Comment

Duke Power used the Basic version of the Westinghouse Owner's Group ERG and background documentation to conduct a plant-specific Control Room Review Task Analysis. Duke's Design Engineering Department converted the generic ERGs into plant specific ERGs (established plant specific operating parameters) for the Control Room Review Team's use in developing a list of operator tasks for each emergency operation and to identify the display and control requirements for each task.

The Westinghouse Owner's Group Generic Task Analysis documentation, under development during the time frame in which the Catawba Task Analysis was being conducted, was used for reference material.

- 2) Each licensee and applicant, on a plant-specific basis must describe the process for using the generic guidelines and background documentation to identify the characteristics of needed instrumentation and controls. For the information of this type that is not available from the ERG and background documentation, licensees and applicants must describe the process to be used to generate this information (e.g., from transient and accident analyses) to derive instrumentation and control characteristics. This process can be described in either the PGP or DCRDR Program Plan with appropriate cross-referencing.

Comment

The Task Analysis process is described in the Control Room Review Final Report Section (pages 50 through 62) of Duke Power Company's Catawba Nuclear Station Responses to Supplement 1 to NUREG-0737. This section details the selection and training of Task Analysis Teams, the scope and methods including a flow chart of activities, sample documentation, a human factors assurance activity conducted by Bio Technology; and defines a list of human engineering principles evaluated in the Task Analysis process. An integral part of this process is the identification of the characteristics of needed controls and displays, the determination of the absence or presence of those devices, and human engineering suitability evaluation of those devices.

- 3) For potentially safety-related plant-specific deviations from the ERG instrumentation and controls, each licensee and applicant must provide in the PGP a list of the deviations and their justification. These should be submitted in the plant-specific technical guideline portion of the PGP, along with other technical deviations.

Comment

Plant-specific deviations from ERG instrumentation and controls will be provided to the staff in response to License Condition 25, which is discussed in the Catawba SER.

- 4) For each instrument and control used to implement the emergency operating procedures, there should be an auditable record of how the needed characteristics of the instruments and controls were determined. These needed characteristics should be derived from the information and control needs identified in the background documentation of Revision 1 of the ERG or from plant-specific information.

Comment

In Duke Power's Control Room Review Plan, the objective of Task Analysis was to evaluate the human engineering suitability of the controls and displays necessary to support the operator actions required during emergency operations. To accomplish this objective, a Task Analysis Team consisting of one reactor operator and one mechanical/nuclear systems engineer were required to perform four major activities.

Develop a complete list of operator tasks for each emergency operation to be analyzed from the Westinghouse Owner's Group Emergency Response Guideline.

Identify the display and control requirements for each operator task.

Determine the presence or absence of the required controls and displays.

Evaluate the human engineering suitability of the required controls and displays.

In this process, Task Analysis was divided into two phases: 1) a pre-fill stage followed by 2) a walk-through evaluation using a full-scale mock-up of the Catawba Control Room.

In the pre-fill stage, the reactor operator and the systems engineer analyzed the Westinghouse Owner's Group ERGs, supporting background documentation, plant-specific ERGs, and used supporting operations and engineering documents to develop a complete list of operator tasks and to identify the characteristics of the display and control requirements for each operator task. During this analysis, the control and display characteristics were compared to control room components and those components missing or not conforming to the required characteristics were documented as HEDs. The documentation resulting from the pre-fill stage for each ERG included a Task Sequence Chart listing all tasks allocated to the operator; Task Data Forms for each task describing the operator's location, the action to be taken, the component he uses, and the component parameters used to verify operator actions; and HEDs documenting those controls and displays either missing or not conforming to the characteristics defined in the pre-fill process.

In the walk-through evaluation, the reactor operator performed each action identified on the Task Data Form and reported his actions to the observing engineer. The engineer monitored the operator's actions to ensure that each step was completed in the proper sequence, observed the operator's interaction with the controls and displays, and determined the adequacy of the controls and displays available to the operator. The result of this phase, documented on the Task Data Form, was either a confirmation that the controls and displays were adequate and properly arranged for the task, or an HED documenting the potential problems identified.

The Task Analysis process summarized above was a systematic approach governed by established procedures, standard data collection and evaluation forms, and performed by a reactor operator and Mechanical/Nuclear Systems Engineer trained in Task Analysis techniques by Human Factor Consultants from Bio Technology. The program was routinely audited by Bio Technology to assure that the procedures were followed and that the objectives of Task Analysis were met including the determination that the appropriate controls and displays were available to the operator. The procedures and resulting documentation demonstrate that the appropriate control and display requirements have been identified and properly evaluated.