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Mr. James M. Taylor Executive Director for Operations U.S. Nuclear Regulatory Commission Washington, D.C. 20555-0001

Dear Mr. Taylor:

SUBJECT: RESOLUTION OF GENERIC SAFETY ISSUE 83, "CONTROL ROOM HABITABILITY"

During the 423rd meeting of the Advisory Committee on Reactor Safeguards, July 13-14, 1995, we heard presentations from the staff concerning resolution of the subject generic safety issue (GSI). We also had the benefit of the documents referenced.

We have had a long-standing interest in a variety of issues relating to control room habitability. The proposed resolution of this GSI deals with two of these issues, meteorological models and toxic chemicals.

The staff has developed meteorological models and computer software (HABIT) that will permit the staff and licensees to make more realistic estimates of radiological doses and toxic-gas exposures of control room personnel to determine compliance with General Design Criterion 19. The improved meteorological models in HABIT are based on reactor-model wind-tunnel tests and reactor-site tracer studies and will supplant the Murphy/Campe models referenced in Standard Review Plan Section 6.4. This extensive experimental program seems to be a promising basis for resolving meteorological concerns. The computer code, EXTRAN, that treats transport from the source to the control room air intake may not be adequate to deal with the wide variety of circumstances that arise. This is a complex arena for computation and any substantive comment by us would require more review of the meteorological models. We will only pursue this if control room habitability is determined by risk analyses to be an important safety issue.

The proposed resolution of GSI-83 is an example of the difficulty that arises in trying to apply design-basis concepts to resolve what is basically a risk issue. The staff appears to be refining the original "conservative" design-basis accident (DBA) approach by taking some of the conservatisms out of the calculational models. The intent of making these new calculations would be to obtain results that meet the DBA acceptance criteria. The problem with this approach is that the level of conservatism in the original DBA calculation has not been determined, nor has an acceptable level of conservatism been defined. We believe that the appropriate resolution of this GSI would be to determine the acceptable risk. This requires a probabilistic treatment and quantified uncertainty using acceptable calculational tools.

The staff is also revising Regulatory Guide 1.78, "Assumptions for Evaluating the Habitability of a Nuclear Power Plant Control Room

During a Postulated Hazardous Chemical Release," to incorporate revised limits on toxic chemicals. We find the revised limits difficult to justify. The revisions have greatly increased limits found in Regulatory Guide 1.78. In most cases, the revised values are above the concentration limits considered "immediately dangerous to life and health." The limits have been chosen to assure that operators will have time to don breathing apparatus. Of more interest would be toxic chemical concentration limits that assure that any degradation of operator performance would not produce an unacceptable increase in risk. In evaluating degradation of operator performance, consideration should be given to the effects protective actions (wearing breathing apparatus, isolating the control room, etc.) will have on operator performance.

Finally, we discussed the 1988 survey of control room habitability systems at twelve nuclear power plants (NUREG/CR-4960). This program, which was initiated in response to concerns raised by the Committee, showed that there were many "compliance issues" with these systems. The staff told us that it had under consideration special plant inspections to deal with this situation. We wish to be kept informed of this activity.

Sincerely,

/s/

T. S. Kress Chairman

References:

- Memorandum dated June 6, 1995, from M. Wayne Hodges, Director, Division of Systems Technology, RES, to John T. Larkins, Executive Director, ACRS, Subject: Resolution of Generic Safety Issue 83, "Control Room Habitability"
- NUREG/CR-6210 dated March 10, 1995, Computer Codes for Evaluation of Control Room Habitability (HABIT)
- NUREG/CR-4960 dated October 1988, Control Room Habitability Survey of Licensed Commercial Nuclear Power Generating Stations
- 4. NUREG/CR-5669 dated July 1991, Evaluation of Exposure Limits to Toxic Gases for Nuclear Reactor Control Room Operators

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