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**UNITED STATES  
NUCLEAR REGULATORY COMMISSION  
ADVISORY COMMITTEE ON REACTOR SAFEGUARDS  
WASHINGTON, D.C. 20555-0001**

December 14, 2000

Dr. William D. Travers  
Executive Director for Operations  
U.S. Nuclear Regulatory Commission  
Washington, D. C. 20555-0001

Dear Dr. Travers:

**SUBJECT: NUCLEAR ENERGY INSTITUTE DRAFT REPORT, NEI 99-03, "CONTROL ROOM HABITABILITY ASSESSMENT GUIDANCE"**

During the 478<sup>th</sup> meeting of the Advisory Committee on Reactor Safeguards, December 6-9, 2000, we reviewed a draft of the Nuclear Energy Institute (NEI) Report, NEI 99-03, "Control Room Habitability Assessment Guidance." Our Subcommittee on Severe Accident Management also reviewed this matter during its meeting of November 15, 2000. During our reviews, we had the benefit of discussions with representatives of NEI and the NRC staff. We also had the benefit of a presentation from Peter Lagus of Lagus Technology, Inc., and of the documents referenced.

**BACKGROUND**

Concern for the integrity of the control room envelope has been an issue for many years. The ACRS identified issues associated with this matter in the 1982-83 timeframe. In 1998, representatives of the NRC staff identified long-standing concerns associated with this issue during a public workshop. In response, NEI formed a Control Room Habitability Task Force and issued an initial draft of NEI 99-03. Subsequent work by a team of NEI and NRC staff representatives culminated in the development of the current draft version under review.

**RECOMMENDATIONS AND OBSERVATIONS**

1. The staff should continue with its development of a regulatory guide on control room habitability, making liberal and extensive use of NEI 99-03.
2. The staff should require that the results of component testing be validated by comparisons with those of tracer gas testing in several control room configurations prior to the staff agreeing to the exclusive use of component testing for pressurized control rooms.

3. If component testing is shown to correlate adequately with the tracer-gas testing, then component testing should be acceptable for the baseline testing for pressurized control rooms and for subsequent periodic testing.
4. The frequency for periodic assessment and testing should be placed on a performance basis much like the requirements of Appendix J to 10 CFR Part 50 for containment leakage testing.
5. A specific limit for allowed in-leakage should be made a part of a plant's licensing basis. This does not necessarily mean it has to be specified in the technical specifications.
6. The potential radiation doses from design basis accidents at adjacent or nearby nuclear power plants should be included in the control room habitability assessment whether or not this is part of the current licensing basis.
7. The approach in NEI 99-03 provides a sound basis for maintaining safe shutdown capability given a challenge from smoke generated external to the control room. The approach could be endorsed by the regulatory guide.

## DISCUSSION

We believe that the current draft version of NEI 99-03 can provide excellent guidance to industry to deal with control room habitability issues and to ensure compliance with the applicable regulations. It is, however, a technical document that includes more detail than needed for a regulatory guide. In addition, there is a very significant open issue (i.e., the proposed option of using component testing for the initial baseline in-leakage assessment for pressurized control rooms). The staff will need to confirm that component testing can reliably establish the total unfiltered in-leakage. It is our view, therefore, that for component testing to be acceptable as the initial baseline determination of the in-leakage, it must be validated by use of tracer-gas testing for several control room configurations and types. By a limited number of comparisons with tracer gas testing, assurance can be provided that all of the vulnerable component leakage paths can be reliably identified. If the results from the two test methods are shown to correlate well, then component testing should be acceptable for subsequent baseline initial testing and for the subsequent required periodic testing to confirm that in-leakage control is being adequately maintained.

The frequency of required periodic assessments and testing needs to be put on a performance basis much like the requirements of Appendix J for containment leakage testing. The frequency is likely to be plant specific and will depend on the factors addressed in the Control Room Habitability Program described in NEI 99-03.

Even with the above approaches, maintaining an acceptable in-leakage rate at all times is not guaranteed. This appears to be an area that could use innovative research aimed at developing a continuous indication of the in-leakage potential.

It is important that the specific limit for in-leakage be made a part of the licensing basis. Rather than specifying the allowed in-leakage as a technical specification, however, NEI 99-03 proposes committing to a Control Room Habitability Program based on inspection, sealing, and

maintenance with periodic component testing. As long as this commitment provides appropriate regulatory control, we do not believe a technical specification commitment is necessary.

Control room habitability regulations are intended to ensure that the operators can occupy the control areas to mitigate any ongoing accident or to safely shut down the plant in the event of external threats. Thus, control room habitability assessment must include any potential radiological source from adjacent or nearby nuclear plants just as is done for toxic sources.

Although no current NRC regulations exist to establish smoke concentration limits or to define a design basis fire, NEI 99-03 contains a recommendation that licensees perform a qualitative evaluation of their ability to manage smoke infiltration into the control room. The industry is to be commended for taking this proactive approach and the staff should consider endorsing the proposed approach in its regulatory guide.

Sincerely,

A handwritten signature in black ink, appearing to read "Dana A. Powers". The signature is fluid and cursive, with the first name "Dana" being more prominent.

Dana A. Powers  
Chairman

References:

1. Letter dated October 13, 2000, from D. Modeen, NEI, to R. Barrett, NRC, transmitting Draft NEI 99-03, Control Room Habitability Assessment Guidance.
2. Letter dated August 18, 1982, from P. Shewmon, ACRS, to Hon. Nunzio J. Palladino, ACRS, Subject: Control Room Habitability
3. Letter dated May 17, 1983, from J. C. Ebersole, ACRS, to W. J. Dircks, Executive Director for Operations, NRC, Subject: ACRS Subcommittee Report on Control Room Habitability