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

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Dr. Joseph M. Hendrie
Chairman
U. S. Nuclear Regulatory Commission
Washington, DC 20555

Dear Joe:

It has become fashionable nowadays for every self-appointed expert to express his opinion about what should be done to avoid an iteration of Three Mile Island. I am sure the ACRS will make its collective views known to you in due time. I wanted to make some points informally that might be lost in the maze of paper you are receiving.

The first is that the development of a usable and readily accessible set of information to the control room operator is something that can be done without significant capital investment and could improve the safety posture of nuclear power plants very quickly. The things I have in mind are:

1. Good one-line diagrams, possibly in isometric form, that physically identify the relative location of important pieces of hardware.

2. Simple checklists of the sort provided with automobile owner's manuals to help in troubleshooting problems of an unusual nature.

3. A good technical data book that has information like the solubility of hydrogen in water; the vapor-liquid-equilibrium data for the reactor coolant; radiolytic dissociation rates for water as a function of temperature, partial pressure of hydrogen, and radiation field intensity; radiation stability of sealants, gaskets, valve seats commonly used within containment; diagrams of important valves which include their operating capacities; characteristic curves for coolant circulating pumps, feedwater pumps, and reactor heat removal pumps; precautionary suggestions for offnormal use of plant equipment; sampling procedures to be used during accidents; and a list of technical experts who are on call to help the reactor operator.

I think that is enough of a tabulation to suggest what needs to be developed, but it is not a complete list. If that information were available on some type of visual display system of suitable reliability or just in an operator's library, we would not have to be so concerned

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about the operator's diagnostic capability.

The second point is that operators need a better understanding of thermodynamic response by these systems through some other means than observing the actions on simulators. The most obvious need is to make sure that every operator understands the relationship between pressure, temperature, and phase equilibria, but they also should understand heat transfer characteristics as a function of velocity, fluid state, and physical configuration of heat transfer surfaces. Again, these are illustrative and they need some considered thought by specialists in operator training.

Finally, it is difficult for me, as an individual, to understand where the NRC Staff, the Licensees, the architect-engineering firms, and the nuclear steam supply vendors are concentrating their attention. I think it would be useful to everyone if there were a complete set of tasks identified so that one could see what the Industry, the Regulators and their Advisors are trying to accomplish. To me, it looks like the activities are proceeding helter-skelter without much rhyme or reason by Licensees, EPRI, EEI, NRC and maybe DOE.

Mike

MB/mh M. Bender