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Mr. Paul Boehnert
Advisory Committee on Reactor Safeguards
US Nuclear Regulatory Commission
Washington, D. C. 20555

Dear Paul,

Dr. Kerr has requested that we send to you our observations of the ATWS meeting of October 22, 1982. The following comments are my response to that request. I hope they will be useful in Dr. Kerr's presentation to the Committee. I have divided them into three broad categories: PRA, Operator Response, and Staff Position.

A. PRA

The PRA discussions were lengthy but far from convincing.

1. The data on scram failure rates are admittedly poor. The existence of an inoperable state of a scram system may not be discovered until a test is performed or a need exists for the system's operation. If the state is a transient one, an intermittent one, or one whose existence is dependent upon some apparently unrelated specific circumstance in the plant, discovery before need for the system's performance may be fortuitous but is not assured.

2. The apparent presumption that ARI reduces the probability of failure of the "electrical" portion of the scram system to zero is difficult to support when the sources of the expected failures are not identified. If one accepts the 2:1 ratio of "electrical" to "mechanical" failures, an electrical backup can at best perform as claimed; at worst, it might introduce new failure modes into the existing system.

3. The analysis of an "average", or generic, plant is certainly attractive from many viewpoints. However, unless there is sufficient reason to believe that specific plants- or, more

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importantly, real plants as they are actually operated - are not substantially different from the models, one's conclusions relative to the reactor population as a whole could be significantly in error. When one is attempting to achieve a very low overall probability of unacceptable consequences in a large population, then a single maverick can have significant effect. However, an extremely good performer will not alter the overall system behavior very much.

B. Operator Response

The discussion of the actions of the operator, acting under EPG's, was particularly disturbing. If it was intended to demonstrate that all would be well handled in the control room in the event of ATWS, it was not convincing. The idea that an operator would respond properly, step by step, to a set of procedures that tell him what to look at and how to react under conditions that have never existed before is, to say the least, not totally acceptable. Without meaning to discredit the ingenuity and capability of today's engineers and their analytical tools, I feel the ability to predict the course of such an event is not that good. And to expect to be able to convey such a prediction, even if perfect, to an operator twenty years later is stretching credibility a bit.

It was pointed out, in the beginning of the discussion of the operator's role, that it is not necessary that the operator know that an ATWS is in progress. He responds to current plant conditions as perceived from specific control room indicators - a sort of conditioned reflex. There are many who believe that if such a response is indeed adequate, automation is a more reliable alternative. I tend to support that position. However, I also believe that on the spot decision making during some types of unpredicted circumstances can be beneficial, and even necessary. That is perhaps why Mr. Cobb's response that the RO would follow the procedures, even if the SRC countermanded them, was particularly disturbing. However, I doubt that the response was correct. There will, I hope, always be a "man in charge" who can make relevant decisions. There is, of course, always the question of proper course of action in the event of contradictory or erroneous information.

C. Staff Position

Mr. Bernero's presentation indicated that a consensus was near on the task force proposal. Not having seen the total proposal I'll comment on my understanding of some of the points discussed.

1. The assumptions that the failure to scram is 3×10^{-5} per demand and $2/3$ of such failures are "electrical" may be all right, but as everyone admits they are only assumptions. The corollary assumption that additional electrical systems such as ARI can virtually eliminate the impact of electrical failures on scrams is, in my view, unsupported.

2. My understanding of the MTC problem for CE and B&W systems is that 50% of the time ATWS would produce unacceptable pressures in the primary system. If this is the case it is, in my view, necessary that either MTC or relief capacity (or both) must be improved to assure adequate pressure limitation. I don't feel qualified to comment on adequacy of the pressure limits chosen.

3. I agree that the BWR pool temperature limits should not be increased arbitrarily to permit more time for the operator to act. Neither the acceptability of the higher limit nor the improvement in the probability of correct operator action (initiating SLCS in time) has been demonstrated and from the discussion cannot be demonstrated at this time.

4. I am in favor of automating the SLCS initiation. With today's hardware, it would seem that the decision making logic could operate faster and more reliably than any operator, given that the designers know what conditions indicate the need for SLCS.

5. I favor a prescriptive approach to the ATWS problem. When an area of concern is disclosed, "reasonable" steps should be taken to allay those concerns. Of course, analysis should be a part of the decision process; however, the ability to make the numbers come out right should not be the main objective. In addition, I agree with Mr. Epler (not surprisingly) that we should expand our efforts to reduce the rate of challenge to our scram system since the success of those efforts can readily be seen and are economically attractive for the utilities.

Sincerely,



Stephen J. Ditto
Consultant

cc: Dr. Kerr