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RECEIVED
ADVISORY COMMITTEE ON
REACTOR SAFEGUARDS U.S. N.R.C.

Dr. Paul G. Shewmon
Advisory Committee on Reactor Safeguards
Nuclear Regulatory Commission
Washington, D.C. 20555

JUL 19 1979

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Dear Paul:

This is in response to your request for a brief letter or report following my attending the joint meeting of the ACRS Subcommittees on Metal Components and Extreme External Phenomena on July 10 and 11 in Washington as a consultant for ACRS. You indicated that broad general comments would be sufficient at this time since this was my first assignment for ACRS and since I have not attended any of the recent Water Reactor Safety Research Information Meetings. I hope to be in a position to make more substantive comments in the future.

Comments

1. It would have been helpful if the consultants were supplied with the meeting program and handouts from the regulatory staff at least a few days before the meeting. In my case as a new consultant, it would have been particularly helpful to have received copies of ACRS's reports to Congress (Review and Evaluation of the Nuclear Regulatory Commission Safety Research Program, NUREG-0392, December 1977, and the more recent such report which I understand exists) in advance of the meeting. I now have a copy of NUREG-0392 (Al Pense happened to have an extra copy of the report with him in Washington) and I appreciate Mr. Igne's promise to send me the more recent report.
2. I agree with the comments made by you and other ACRS members that the meeting may have attempted to cover too much material in the time available. Also, I found the organization of the meeting and the presentations to be somewhat disjointed. Perhaps an opening presentation devoted to an overview of the NRC research programs showing how they relate to one another, how they relate to the NRC organizational structure and, most importantly, how they relate to current LWR problem areas would have been in order.
3. I found the presentations by the EPRI and vendor representatives to be very helpful in putting the NRC research programs in perspective. But I wonder whether there was a serious omission in that no information was presented concerning the

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DOE research programs that bear on LWR safety questions, particularly with regard to metallurgy and materials. I suspect that Chuck Serpan is well aware of what DOE is doing in research areas relevant to his programs, but I heard no indication of this at the meeting. Perhaps ACRS is already well informed on this point, but if it is not it may wish to look into it.

4. The above comment on DOE research is prompted by my impression that a number of important questions have arisen in recent years regarding radiation embrittlement of pressure vessel steels that have important and immediate regulatory implications and yet seem to require a somewhat long-range research approach. I have in mind such questions as:

- (1) How serious are the decreases in the ductile shelf energy upon irradiation, as indicated most prominently in the B&W welds? Is there a rational basis for the 50 foot-pound minimum limit as specified in Appendix G of 10CFR50 and supplemented by NRC Regulatory Guide 1.99, Revision 1?
- (2) Under what conditions does the radiation embrittlement saturate as a function of neutron exposure and how should the NRC take this into account?
- (3) Are the beneficial effects of low residual element concentrations being properly incorporated into regulatory requirements?

It would be a great ^{deal} easier to answer these questions if there were a better understanding of

- (1) Why the ductile shelf energy is decreased upon irradiation.
- (2) Why radiation embrittlement saturates in certain cases.
- (3) Why reducing copper and trace impurities of other kinds is beneficial, i. e., decreases the radiation embrittlement at reactor operating temperatures.

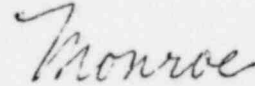
It seems to me that NRC safety research should be directed in part to answering these somewhat longer range questions.

5. At several places in the printed program time is allocated to "Discussion of the Subcommittee Recommendations", but it appeared in fact that very little time was devoted to these discussions. This was probably a consequence of the recognized crowded schedule. I am sorry that more discussion of the subcommittee recommendations did not take place.

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Finally let me say that I came away from the meeting with a new appreciation of the ACRS's complex role in the nuclear enterprise. I was impressed with the way the Subcommittees interacted with the NRC staff. It is clear that a better research program will emerge as a result of this interaction.

Sincerely yours,



Monroe S. Wechsler

cc: M. W. Bender
H. Etherington
D. Okrent

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