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To: Paul G. Shewman
Chairman, Metal Components Subcommittee
A.C.R.S.

Mike Bender
Chairman, Combination of Dynamic Loads Subcommittee
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Dave Okrent
Chairman, Extreme External Phenomena Subcommittee
A.C.R.S.

From: A. W. Pense
Consultant

Re: Joint Meetings of the Above Subcommittees

Introduction

There are always so many projects reviewed at these meetings that it is difficult to keep them all in perspective by the time the meeting is over. When three committees meet in two days, the problem is that much worse. However, looking over my notes, there are some specific issues on which I can comment as well as make a few general comments that are included here. It is obvious that some of the items we discussed, especially under the headings of Combination of Dynamic Loads and Extreme External Phenomena, were not research programs in themselves but rather situations that will impact or result in research programs in the near future.

In general, the overall needs of reactor safety research seem to be covered although some soft areas look like they should be improved. For example, the point was made that once a User's Need letter was prepared and forwarded to R.E.S., the research could go on forever. I doubt that the case was quite as bad as that, but it did seem some better coordination between D.O.R., D.S.S., and R.E.S. would be desirable (review committees not withstanding). Also, there were several cases where step funding of new areas for the 1981 budget was very large without much justification. This tendency, as well as the tendency to perpetuate old programs, should always be discouraged. On the whole, however, I believe most of the continuing programs have continuing value (even if not given as close scrutiny on this point as they might be) and the future budget estimates

normally realistic. Some individual laboratories have very large budget commitments, like the Lawrence Livermore Laboratory and these situations should be watched closely so that research is properly distributed and not perpetuated.

With respect to the specific items discussed on Tuesday, i.e., the seismic analysis problem and the feed water line cracking problems, both of these problems will generate appropriate long range research responses and I think they have served to reveal some important aspects of the safety research philosophy. They raise the question as to how much responsibility should be put on the N.R.C. staff to monitor the computer codes used by the nuclear vendors. It is my opinion that it is not really sufficient to simply require the vendor to bear the responsibility to prove the system safe. Unless the N.R.C. staff have some yardstick to measure against, some of the code errors that have now come to light will continue. Therefore, I support some of the research efforts designed to produce "N.R.C." codes and "benchmark" cases to serve as a check on vendors. This may sound like doing the vendor's work for them, but I can see no other way to conduct a reasonable check on an analysis that is truly independent. I therefore support such research as necessary from the reactor safety viewpoint.

Metal Components Subcommittee

I support the work on piping which is generally useful, especially the programs to give a more realistic view of the whole pipe break problem. I am a little concerned, as was brought out in the committee discussions, that we properly define the problem (i.e., the pipe whip program came under some fire on this basis as did the flaw size detection program) but this is all valuable research. I am personally interested in the J-R curve work as this seems to me to be a reasonable way to characterize piping by fracture toughness methodology. Irradiation and dosimitry calibration efforts are well founded, I think.

I thought the Steam Generator study proposal is a good idea. It may turn out to be a very large boondoggle but I expect that there will be some surprises to come out of the study and a lot of useful information. It is a bit of a gamble but I would do it. I am totally unimpressed by the statements that no other steam generator will ever be so abused! I think the data to be gained is well worth it and may be very pertinent in the future.

Of the vendor programs, the ones with greatest immediate impact seem to be the EPRI-GE work on stress corrosion cracking of stainless steel and the Westinghouse work on irradiation damage saturation effects. It seems that both of these areas are of high importance, one as an existing and potential problem and the other as a non-problem (perhaps).

In both cases the work being done is shallow, and appears to have little relationship to the mechanisms involved. It is essentially Edisonian and from my viewpoint what we need, besides the quick fix and quick answer is some more fundamental work. It may be that we cannot rely on vendors for this approach and R.E.S. must take a more active role.

Extreme External Phenomena Subcommittee

I feel much less competent to judge the Mechanical and Structural Engineering Research programs but see no major holes or programs out of line with reality. In the areas in which I have some knowledge, it is my opinion that (1) the pumps and valves do need a closer look as they have been neglected, (2) benchmark analysis systems are needed, and (3) advanced seismic restrainers seem to consume a lot of money for their overall value.

Combination of Dynamic Loads Subcommittee

I found this whole meeting fascinating. I have been working for the last two years on bridge failure problems and the description of the as-built plants and their deviation from the as-designed ones has a very familiar ring. I had held fond hopes that nuclear plant construction was a cut above the bridge construction industry. It may be, but not a high enough cut. No amount of seismic research will solve this problem - this is a control and inspection problem. Of course, reanalysis with proper codes and necessary modifications is a fix. The long range solution is benchmark problems and a reliable code as discussed before.

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Copies sent to Shewmon, Etherington, Okrent and Bender.

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