TO: Dr. Ivan Catton
Chair, ACRS Thermal Hydraulics Sub Committee

VIA: Paul Boehnert

FROM: V.K. Dhir

SUBJECT: June 23 & 24 Meeting of the ACRS Thermal Hydraulics Subcommittee.

At the meeting presentations were made by Westinghouse, NRR and Research. Westinghouse presentations included descriptions of Separate Effects Tests, and of Integral Tests under High and Low Pressures. NRR discussed its needs for having both high and low pressure data prior to certification of AP-600. The presentations of Research dealt mostly with the modifications to ROSA facility, and their plans to augment models in RELAP5. In the following I give my observations from these presentations.

Westinghouse Presentations

1. The material provided to us prior to the meeting was mostly unrelated to topics that were discussed at the meeting. As you know, much more can be accomplished at a meeting if the participants have an opportunity to review the pertinent material prior to the meeting.

2. I have attended several subcommittee meetings on AP-600, but I have yet to receive a document from Westinghouse describing the design and safety features of AP-600 and predicted performance of AP-600 under transient and abnormal conditions.

3. In the same vein, no documentation was provided on the Scaling methodology employed in support of the SPES facility.

4. SPES facility has several desirable features such as two cold legs per loop and scaled full power. However, it has several non-prototypicalities as well. The non-prototypicalities are shorter pressure vessel, high thermal mass, and dissimilar geometric configuration of cold legs.

5. The use of SPES facility by Westinghouse to conduct full height full pressure integral tests is a step in the right direction. They should be encouraged to pursue these experiments but at the same time must make a sincere effort to preserve geometrical configuration of cold legs with a pump in each leg and to have a scaled pressurizer.

6. Based on the information provided at the meeting, OSU facility appears to be a good facility to conduct low pressure integral tests. Westinghouse should go ahead with their plans to conduct experiments on this facility. However, before completely endorsing this facility, I would like to review the scaling report handed out at the meeting. It is nice to know that industry and NRC will be co-operating and using the same facility for low pressure tests.

7. I know little about the models in the NOTRUMP Code used by Westinghouse. I hope NRC has reviewed this code and found it suitable for AP-600.

NRR Presentations

1. It was not clear at all as to why NRR is not satisfied with the SPES facility and wants to pursue the ROSA facility? Both facilities have their merits and drawbacks. What are the key criteria NRR is using with respect to choice of integral facilities and why?

Research Presentation

1. It was evident that a deliberate attempt was being made by someone from the Research staff to confuse the issues with respect to modifications and atypicalities of the ROSA facility, and the results obtained with the RELAP Code. This type of approach is not constructive at all and should be discouraged.

2. With all of the proposed modifications to ROSA-IV, many of the identified non-prototypicalities will be removed. However, the key non-prototypicality that will still persist is lack of two cold legs per loop. This non-prototypicality is crucial since CMT's are connected to the cold legs and they serve an important safety function.

3. The above non-prototypicality would not be that critical if we had great confidence in the ability of the RELAP Code to model the complex interactions that are expected to occur during depressurization and emptying of the CMT's.

4. I believe that Research is rushing into tests with ROSA without having any well laid out plan to have an augmented RELAP Code by the time the test results become available from ROSA.

5. Considering the above points (2-4) and the fact that ROSA results will not be used for certification of AP-600, (although will be used for FDA) I do not recommend going ahead with ROSA at this time. Further effort need to be expanded by Research to do the following:

   (i) Through NRR, urge Westinghouse to make the suggested modifications to SPES. With these modifications, SPES will be very close to being prototypical.

   (ii) Establish the applicability of the data from SPES for Code assessment and validation. If the data is expected to be deficient in anyway assess the reasons as to why?

   (iii) Discuss again with JAERI about the possibility of adding another cold leg to each loop of ROSA. If it is not possible at all, give serious consideration to building a well scaled facility in U.S. In the long run advantages of having such a facility in U.S. are obvious.

   (iv) Develop an aggressive program to enhance the capability of RELAP code to model the phenomena and complex interactions that are expected to occur in AP-600. This effort should accompany separate effect tests and integral tests on a scale smaller than the OSU facility.

In summary, Westinghouse should be encouraged in their plans with respect to OSU and SPES facility. SPES facility should inlcude the suggested modifications. Research should not commi, to ROSA facility in a hurry. Because of the existence of a crucial non-prototypicality (single cold leg per loop) in ROSA. fewer number of tests that will be done on ROSA. and the possibility that the facility may not be available beyond the current set of tests, the costs to benefit ratio of the tests on ROSA will be very high.