

INTEROFFICE MEMORANDUM

CALIFORNIA INSTITUTE OF TECHNOLOGY

CT-1204

TO Professor Milton S. Plesset

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FROM A. J. Acosta

EXTENSION

MAIL CODE

SUBJECT ECCS/B & O Subcommittee
Meetings, January 3-4, 1980

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I was pleased to be able to attend the subcommittee meetings above. I am sure they were valuable and useful to all attendees. There were a few points which I would like to leave with you by this note since because of the full agenda there was not time to discuss them thoroughly at the meeting.

1. Requirements for pump trip (Item 7 of NUREG-0623). The reasons for pump trip (in the short term) were made clear in the event of a SLBOCA. Non-LOCA transients are also considered in Section 7 above. I have two comments: (1) The measured parameters (7.1) other than pressure seem to be rather gross indicators of the increasing void fraction within the pressurized system. One would have thought by this time that better indicators of this important feature would be available to industry. (2) As an alternative to a delayed pump trip it may prove desirable to reduce pump speed to a significantly lower value which would in the event of a SBLOCA retard inventory loss and if only a non-LOCA transient would still have good core heat removal. In the short term it may prove feasible to operate the pump motor at greatly reduced voltage for this reduced speed operation for a sufficient length of time to allow diagnostic procedures to take place (say 10 minutes). In the long term other means can be readily engineered for continuous low-speed operation should that be found useful. I gather that such schemes have already been considered and that there is now the possibility in four leg PWR plants of selective shut down of only some of the pumps.

2. Mention was made of the possible damage to pump components when operated under some conditions of void fraction within the primary system. This is a possibility of course and damage to the pump would clearly be minimized if it were stopped when a large void fraction is present. However, it may well be desirable, even necessary, under some conditions to operate the pump even in slug flow. My question is then what goals, if any, are there for the integrity of the structure of the recirculation pump (blading, bearings, etc.) when two phase flows occur and if not should there be any? Almost certainly one would think some sort of laboratory work will be necessary to address such problems. It appears that there is continuing work in pump testing (Harold Sullivan) that perhaps additional objectives could be achieved with little cost.

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3. Relief valve reliability. I was startled to be told that the chance of a relief valve to stick open upon actuation was about 1/30. This seems to be an excessively high number. The goal to lower such SBLOCA's by adjustment of various set points is plainly a good one but the primary problem appears to be one of equipment reliability. Comments by users at the meeting were discouraging as to the prospects of significantly improved components being soon available. There should be some mechanisms if one is not now there by which industry and government can develop sources of such equipment (in the long term) to whatever level of reliability is deemed necessary—just as there is in other industries.

Sincerely yours,

Allan Acosta
Allan Acosta
PE 2906

AA/rd