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CALIFORNIA INSTITUTE OF TECHNOLOGY

PASADENA, CALIFORNIA 91125

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August 21, 1980

DIVISION OF ENGINEERING
AND APPLIED SCIENCE 104-44

Nuclear Regulatory Commission
Advisory Committee on Reactor Safeguards
Washington D.C. 20555
Attn: Dr.A.Bates

Re: ACRS Fluid Dynamics Subcommittee Meeting August 19,20, 1980.

Dear Dr.Bates:

At the request of Chairman M.S.Plesset I am submitting the brief remarks below as my contribution to the meeting.

- . The presentations by ACRS Fellows, NRC staff, General Electric and TVA personnel were very clear and supported the conclusions described in the ACRS Task Force Report.
There were many issues raised in the discussions of the subcommittee beyond the scope of the "fluid mechanics" charge to the subcommittee. It appears to me that within the fluid mechanics framework only two items are clear cut. These are; one, how is an empty scram discharge volume to be assured during operation prior to scram? two, if instruments are to be used for water level determination in a scram discharge, instrumentation volume estimates need to be made of the environmental conditions under which these instruments will have to be operable.
- . It was universally agreed that water in the East wing of the Browns Ferry unit 3 was responsible for the partial scram. From the TVA presentations made it would appear most likely to me that, indeed, as they suggest, an obstruction was responsible for water retention in the SDV. This obstruction conceivably could be of the form of hydrated rust product from the carbon steel header pipes. Their proposed changes to the piping system would go a long way towards avoiding constriction in the drain line. Still a positive indication of empty headers or SDV should be available.
- . The non-intrusive ultrasonic test device reportedly used by TVA, post incident, should satisfy this need.
- . There appears to be a general problem of a severe environment (pressure and flow oscillations) within the scram instrumentation volume - even in the presence of an open drain valve. It seems clear that a two-phase liquid-air or perhaps liquid, steam, air mixture will occur in this volume and that as a result highly unsteady flows and pressure fluctuations will then ensue as the mixture flows through the valve. Alternately,

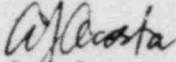
* "A Review of Recent Malfunctions of BWR Scram System" draft report 8 August 1980.

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if the volume contains only homogeneous (hot) liquid a rapid drain valve closure will result in the classic water hammer situation. In any event it is plain that in order for reliable level instrumentation to be developed, conservative estimates of pressure and local flow fluctuations need to be established. No doubt as a result of thinking about this flow environment, diverse alternative designs to the venerable and vulnerable "ball float" will quickly emerge. At the same time these considerations will help establish guidelines for the design of drain pipes, hangars and etc.

It would seem to me that establishing levels of pressure fluctuations in this component (the SIDV) would fall within the purview of the ACRS. At the same time consideration may be given to requiring drain valves to have "slow" closure so that in the event of "homogeneous" water flow, a water hammer is not generated.

Sincerely,


A. J. Acosta
ACRS Consultant

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DEPARTMENT OF STATE

Washington, D.C. 20520

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BUREAU OF OCEANS AND INTERNATIONAL
ENVIRONMENTAL AND SCIENTIFIC AFFAIRS

XSNM01389

MEMORANDUM FOR JAMES R. SHEA
NUCLEAR REGULATORY COMMISSION

Enclosed is an Executive Branch analysis covering two license applications for export of highly enriched uranium to ~~the Federal Republic of Germany, a member of~~ the European Atomic Energy Community (EURATOM). In accordance with the requirements of Section 126 a. (1) of the Atomic Energy Act, as amended, the analysis addresses the extent to which the specific criteria in Sections 127 and 128 are met, as well as certain additional factors envisaged by Section 126 a.(1).

Corrected per instructions from R. Deas, 3/05, 9-27-78

A detailed analysis for the European Community was submitted December 8, 1978 for NRC applications Nos. XSNM01212, 1232, 1233 and 1241. In view of Executive Order 12193, extending the duration of the period specified in the first proviso to Section 126 a. (2) of the Atomic Energy Act of 1954, as amended, to March 10, 1981, that detailed analysis remains valid.

The Executive Branch, on the basis of its review of these cases, has concluded that the requirements of the Atomic Energy Act and P.L. 95-242 have been met and that the proposed export would not be inimical to the common defense and security of the United States. Moreover, the members of EURATOM have adhered to the provisions of the Additional Agreement for Cooperation, as amended. Therefore, the Executive Branch recommends issuance of the requested export licenses.

Louis V. Nosenzo
Louis V. Nosenzo
Assistant Secretary

Enclosures:
As stated

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