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memo

P. A. Morris, Director, DRL

INDIAN POINT 2 REVIEW

An ACRS Subcommittee meeting on Indian Point 2 was held at the O'Hare Airport on May 28, 1970. As a result of the meeting we intend to take specific actions on several items of concern. One of these items involves the growing uncertainty relating to the ability of designers to accurately predict the performance characteristics of a reactor core upon initiation of the emergency core cooling system. The ACRS Subcommittee members indicated that they considered this to be a very serious problem that should be addressed promptly by the staff. We concur with this assessment and request your concurrence with the actions we propose on this matter. These actions as well as others we intend to take on less serious issues are described in the enclosure.

Original signed by R. C. DeYoung

R. C. DeYoung, A/D for PWR's
Division of Reactor Licensing

Enclosure:
Actions to be Taken Subsequent
to the May 28, 1970 I.P. 2
ACRS Subcommittee Mtg

- cc w/encl:
- F. Schroeder, DRL
- D. Muller, DRL
- K. Kniel, DRL
- C. Long, DRL
- K. Goller, DRL
- R. Klecker, DRL
- M. Rosen, DRS
- R. Colmar, DRS

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 R. DeYoung

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OFFICE ▶	DRL:AD/PWRs				
SURNAME ▶	X-7425 DeYoung:sp				
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ACTIONS TO BE TAKEN SUBSEQUENT TO THE

MAY 28, 1970 INDIAN POINT 2 ACRS

SUBCOMMITTEE MEETING

I. ECCS

During the past several months we have been in the process of reviewing information, provided to us by Westinghouse, relating to predictions of core response to ECCS operation developed through the use of the SATAN code. This is a multi-node code much more sophisticated than the previous codes used by Westinghouse. Westinghouse claimed much lower resultant fuel clad temperatures on the basis of the predictions made with the use of the SATAN code.

The responsibility for review of the new analysis was initially assigned to the Nuclear Technology Branch in the old RT organization. The main burden of our work in this area is still being carried out by Dr. Rosen and R. Colmar, both of whom are now assigned to DRS. As a direct result of their work it has become evident that the SATAN code not only does not provide assurance of lower core temperatures but raises serious questions about the ability to reliably calculate the response of the core during the initial blowdown phase associated with the loss of coolant accident. Westinghouse has admitted in private conversations that they erred in their initial claims and now recognize the seriousness of the situation.

The general consensus of those who have reviewed the situation is that a serious problem has been uncovered for all PWR plants. The course of action I propose to take is as follows:

- (1) Request formal submittal on the Indian Point 2 docket of the new information, developed with the use of the new analytical techniques. Also, request the applicant to submit a qualitative assessment of the new calculational techniques with specific discussions on each area of uncertainty, with an estimate of the probability for more or less adverse consequences in the "real" case.
- (2) Request formal submittal on the Indian Point 2 docket of evaluations, using the new analytical techniques, to determine:
 - a. the limiting loss of coolant break size for which assured core cooling is predicted,
 - b. the limiting reduced power level for which assured core cooling is predicted, and

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- c. estimates of the volumes of core associated with local areas of potential flow instability.
- (3) Arrange another generic meeting with Westinghouse, interested ACRS members, and staff and ACRS consultants to discuss the subject in depth. The objective of this meeting will be to obtain individual positions on the subject from those in attendance in order to develop:
 - a. a logical basis for accepting present designs,
 - b. recommended additional analytical work, and
 - c. recommended additional experimental work.
 - (4) On new construction permit cases, require a complete ECCS analysis based on the use of SATAN-type techniques. For construction permit cases presently in process, either require the above type of analysis, if time permits, or hold the ECCS position as an open item to be resolved during the post-CP period.
 - (5) Alert Babcock & Wilcox and Combustion Engineering to the problem immediately. Inform them that assessment of ECCS designs solely on the basis of the codes they have used to date will be unacceptable.

This is a very serious problem that may affect the licensing schedules for several plants. The judgement of most people who have considered the situation is that the core will be cooled adequately, however, the assurance needed is not provided by the evaluation techniques presently available.

II. ANTICIPATED TRANSIENTS WITHOUT SCRAM

The applicant has submitted on the Indian Point 2 docket results of analyses of anticipated transients with failure to scram. The cases considered and the ground rules used for the analysis are not always in accord with those we believe should be addressed. However, our position on this is still in the process of development. For Indian Point 2, we have concluded that nothing further on this matter should be required. Our regulatory review will be continued on subsequent plants. The ACRS Subcommittee Chairman, Dr. Okrent, has advised that he intends to request the staff to address the question of what should be done if the consequences of an anticipated transient without scram are intolerable (neglecting the probability issue).

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III. DIVERSITY OF SCRAM FOR SMALL BREAKS

We intend to require documentation of the applicant's planned design to provide diverse signals.

IV. HYDROGEN CONTROL

Our evaluation of the hydrogen control system for Indian Point 2 is nearly completed. Westinghouse has done an excellent job, but we do have a long list of questions, the answers to which are needed to clarify certain aspects of the system design and performance. Requirements for the system will be included in the technical specifications. The applicant does not presently propose to install a purging system. We intend to advise him of our developing position on this matter, but unless this position is approved by the Commission, we will not require the installation of a purge system at this time.

V. INSTRUMENTATION FOR EVALUATION OF POST ACCIDENT CONDITIONS

We will require the applicant to document information describing a system of instrumentation and procedures he intends to use to assess post accident conditions. The applicant has indicated his willingness to provide this information.

VI. FUEL FAILURE DETECTION

We will require the applicant to document the design and operating requirements for the fuel failure detection system. We will also require it to be addressed in the technical specifications.

VII. IN-CORE INSTRUMENTATION

We will require the moveable in-core detectors to be addressed in the technical specifications in a manner similar to that used for Point Beach and H. B. Robinson. Our present intent is not to include the fixed in-core detectors and the computer as items in the technical specifications.