

3-15-79

DRAFT

MEMO FOR: Chairman Hendrie
 Commissioner Gilinsky
 Commissioner Kennedy
 Commissioner Bradford
 Commissioner Ahearne

*Bob, As per your suggestion,
 I have prepared a status
 paper for Commission (3-4 pages)
 Any comments?*

THRU: L. V. Gossick, Executive Director for Operations

*Ashik
 cc Mattson
 Novak*

FROM: H. R. Denton, Director, Office of Nuclear Reactor Regulation

SUBJECT: ANTICIPATED TRANSIENTS WITHOUT SCRAM

The issue of scram reliability and anticipated transients without scram (ATWS) has been under discussion for many years. In September 1973, the then AEC regulatory staff published a "Technical Report on Anticipated Transients Without Scram" (WASH-1270) which enunciated the staff's position that certain design features should be required to reduce the probability and mitigate the consequences of such events. That report led to the development by the industry and the staff of substantial additional information regarding ATWS. The staff reviewed this information and then results of industry analyses of postulated ATWS events and in 1975 issued a series of status reports summarizing the staff's conclusion regarding acceptable methods of evaluating such postulated events and, based on these evaluations, identifying the equipment and design changes the staff believed to be required. These requirements were sharply criticized by the nuclear industry. Since the publication of the 1975 status reports, additional information relevant to ATWS has been developed by the industry, the staff, and the Reactor Safety Study group.

In 1977 the staff initiated an extensive reevaluation of all the information available on the subject of ATWS, and, in particular, the material developed subsequent to publication of the staff status reports. A technical report, NUREG-0460, Volumes 1 and 2, which includes the details of this reevaluation was published in April 1978.

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The report discusses the significance of ATWS events to reactor safety *and* ~~the~~ the probability that an ATWS event might occur. This probability is then compared with the desired safety objective. The possible and proposed means of attaining the desired safety objective are presented. The specific regulatory requirements proposed by the staff for use in determining the acceptability of ATWS evaluations are also discussed.

Since the publication of the first two volumes of NUREG-0460 in April 1978, the staff has met with the Regulatory Requirements Review Committee, the Advisory Committee on Reactor Safeguards, and industry representatives to discuss ATWS. In addition, the Review Committee on the Reactor Safety Study has issued its findings and recommendations to the NRC.

On the basis of this new information, the NRR staff has reevaluated the recommendations in the first two volumes of NUREG-0460 and issued its findings and recommendations in Volume 3, December 1979. The new report reflects the staff's current view, further supported by the recent Commission statement on WASH-1400, that a numerical safety objective is not satisfactory for use in nuclear regulatory decision making at this time, although quantitative risk ~~requirements~~ ^{assessments} are valuable supplements to the engineering evaluation of ATWS. The staff has made extensive use of event trees/fault trees to assess the impact of several alternative plant modifications for ATWS ranging from none to those needed to satisfy the proposed licensing criteria for new plants in NUREG-0460, Volumes 1 and 2. The staff has analyzed the corresponding degrees of assurance of safety that the modifications are judged to provide and selected a mix of prevention and mitigation measures for several classes of nuclear power plants that will provide an acceptable level of safety. Table 1, reproduced from Volume 3 of NUREG-0460, summarizes the alternate plant modifications. In Volume 3, the staff has recommended that early operating plants (in operation prior to Dresden 2) be modified in accordance with Alternative 2 and any additional improvements would be considered on case by case basis. The staff has further recommended that plants which received their construction permit prior to 1/1/78 be modified in accordance with Alternative 3 (some prevention and some mitigation)

whereas all other plants are to be modified in accordance with Alternative 4 (very high mitigation capability). Although the staff believes that more complete mitigation required under Alternative 4, is preferred; however, mitigation alone, as a solution to ATWS, is not only very expensive to backfit but on a cost effective basis it may not provide as much increment in safety for plants for which the primary system construction has been significantly completed. The RRRC met in early January to consider this volume of NUREG-0460 and concurred with the staff approach. However, the committee was evenly divided as to whether standard plants should be required to provide modifications ^{under} Alternative 3 or Alternative 4. The Committee's recommendations (Enclosure 1) have been placed in the public document room and their availability noticed in the Federal Register.

As you know the ACRS has been actively reviewing the staff analyses and proposals on ATWS. Several meetings have been held by the ACRS with the staff and the industry representatives so that they can develop a sound recommendation on this difficult issue. We expect the ACRS to make their recommendations in March or April 1979.

In Volume 3 of NUREG-0460 the staff recommended that requirements for specific plant modifications comprise the ATWS rule and to assure that a plant or a group of plants under consideration complies with the ATWS requirements, the staff is requiring vendors (with utility support) to perform certain generic analyses. In this regard the staff has issued (Enclosure 2) a set of questions, including requests for specific analyses, to the vendors and following our review of the responses, we would recommend an ATWS regulation for Commission consideration.

If the generic analysis approach is successful, the rule to be proposed for Commission action will not treat ATWS as a design basis accident and will not require a new safety analysis of ATWS on each licensing use. There might be specific exceptions in the future where an analysis for a particular plant would be required if that specific design is not enveloped by the generic evaluations.

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Finally, we hope to propose to the Commission an ATWS rule around May 30, 1979 and the type of the regulation proposed would depend on the degree of success we have with the early verification approach described above. The staff recommendations to the Commission would also take into consideration the ACRS comments and recommendations.

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