

400 Chestnut Street Tower II

April 11, 1980

Director of Nuclear Reactor Regulation
Attention: Mr. L. S. Rubenstein, Acting Chief
Light Water Reactors Branch No. 4
Division of Project Management
U.S. Nuclear Regulatory Commission
Washington, DC 20555

Dear Mr. Rubenstein:

In the Matter of the Application of) Docket Nos. 50-327
Tennessee Valley Authority) 50-328

Your letter to H. G. Parris dated December 27, 1979, transmitted comments on our proposed revision to the Sequoyah Nuclear Plant (SNP) Abnormal Operating Instruction for Reactor Trip (AOI-1) that we submitted on October 17, 1979. This proposed revision was prepared in response to S. A. Varga's letter to H. G. Parris dated August 17, 1979. Mr. Varga's letter stated that the Commission would, by rulemaking, determine the required modifications to resolve the Anticipated Transient Without Scram (ATWS) concerns and the required schedule for the implementation of such modifications. Mr. Varga's letter also requested that the following steps be taken during the interim period: (1) emergency procedures should be developed to train operators to recognize an ATWS event, including consideration of control room indications, and that the emergency procedures should be sufficiently simplified and unambiguous to permit prompt ATWS recognition, and (2) the operator should be trained to take immediate actions in the event of an ATWS.

In accordance with that guidance, TVA revised AOI-1 to incorporate specific indications which must be observed for reactor trip followed by mitigating operator actions in the event a reactor trip does not occur. Specific instructions were minimal because the common symptom of all ATWS events is the failure of the control rods to drop into the core following an automatic reactor trip signal. Therefore, the immediate operator actions consisted of verification of automatic actions and guidance on other means of achieving reactor trip, turbine trip, and starting auxiliary feedwater to mitigate the consequences of the transient.

B003
SE
1/1

8004150 608

Director of Nuclear Reactor Regulation

April 11, 1980

In accordance with the comments contained in your December 27, 1979, letter, TVA has written a separate Emergency Operating Instruction for ATWS (EOI-14). TVA has also modified the transient specific procedures to add a step in the immediate operator action to verify automatic reactor trip. This ATWS modification to the transient specific procedures adds a statement that if reactor trip cannot be verified the operator should refer to the new EOI-14 and proceed with ATWS-related actions. The addition of a separate procedure, structured such that once the operator completes ATWS-related actions the operator would go back to the procedure germane to the initiating transient, will prevent the other operating procedures from being cluttered with ATWS verbiage.

Enclosed for your review is a copy of our new Emergency Operating Instruction EOI-14 and our response to your December 27, 1979, letter. If you have any questions or if we can be of any further assistance, please get in touch with D. L. Lambert at FTS 854-2581.

Very truly yours,

TENNESSEE VALLEY AUTHORITY

L M Mills *by D/L*

L. M. Mills, Manager
Nuclear Regulation and Safety

Enclosure

cc: Mr. M. A. Siano, Project Manager (Enclosure)
TVA Projects
Commercial Operations Division
Westinghouse Electric Corporation
P.O. Box 355
Pittsburgh, Pennsylvania 15230

ENCLOSURE

REVIEW OF ATWS PROCEDURES FOR SEQUOYAH NUCLEAR PLANT

A. Symptoms

1. The procedure lists the parameters which cause the reactor to scram, but does not describe the actual indications available to the operators in the control room which would make him aware that an ATWS event has occurred. These ATWS symptoms would depend on initiating event and, therefore, they ought to be evaluated for at least the following three key events:

Loss of Main Feedwater
Loss of Offsite Power
Stuck Open PORV

In making the evaluation it is important to show for each event what symptoms would indicate to the operator that scram action was called for but did not occur.

Response

Specific plant conditions are difficult to list for each type of ATWS event in either a single or multiple number of emergency operating instructions. Symptoms such as high primary pressure or actuation of steam generator safety valves for ATWS events are highly dependent on two major factors: type of initiating event and time in cycle life. For example, pressure would be expected to increase for a loss of main feedwater ATWS and to decrease for a stuck open PORV ATWS. Additionally, for a given ATWS event, such as loss of main feedwater, the plant response is a strong function of the time of cycle life; an end of cycle event would be much less severe than the same event occurring at the beginning of a cycle. Therefore, the best method for determining if an ATWS event has occurred is through the use of rod position indication equipment and/or nuclear power as indicated by NIS readout. This approach for identifying an ATWS event has the benefit of being applicable to all ATWS incidents.

B. Automatic Action

1. This section does not address how the automatic actions relate to ATWS. Some of the automatic actions (e.g., turbine trip) may not even occur after an ATWS. This should be specified in more detail in the procedure.
2. Why is automatic actuation of HPSI not included in this section of the procedure?

Response

1. See our procedure EOI-14.
2. See our procedure EOI-14.

C. Immediate Operator Action

1. The procedure should specify critical indications available to the operator consistent with the initiating event and assumption that the reactor trip has not occurred.
2. The immediate actions that the operators have to take after ATWS has occurred and an attempt to manually scram the reactor from the control room has failed should follow two parallel paths. While one operator should continue the operation of manually scrambling the reactor by tripping the breakers powering the control drive MG sets, the other operator should initiate the other actions leading to safe shutdown of the plant. The procedure should reflect that the actions described in sections A.2.b and A.2.c and those described in sections B.1 and B.2 are to be performed simultaneously. Section B should require sequential actuation of turbine trip, all auxiliary feedwater pumps, and high pressure safety injection system. (See Figure 1).
3. Describe the actions taken by the operator when he discovers, during the verification of reactor coolant system status (section C), that the conditions are not within the prescribed limits. What is the impact of loss of offsite power on availability of those signals to the operator? What is the shutoff head of the HPSI pumps? What provisions are taken to prevent pump damage when HPSI is operating against the RCS pressure which is higher than the shutoff head of the pump?

Response

1. See our response to A.1.
2. The procedure requires the operator following an ATWS event to perform only a limited number of actions. The operator must first attempt to insert the control rods, and if this fails, to initiate emergency boration, turbine trip, and feedwater. All of the initial operator actions can be done from the control room. Since the tasks the operator has to do are straightforward, it is not necessary to have special procedures for different operators. Further, different responsibilities for different operators would be confusing and counterproductive.
3. See our procedure EOI-14 and Sequoyah Nuclear Plant Final Safety Analysis Report sections 7.5 and 6.3.

D. Subsequent Operator Action

1. What is the time frame for these actions?
2. What criteria are provided to verify that:
 - a. The auxiliary feedwater system is providing the necessary flow to the steam generators.
 - b. The HPSI is providing necessary flow to RCS.
 - c. The containment heat removal is being accomplished, if the containment conditions are outside the normally specified values.
3. What additional procedure does the operator have to follow in order to bring the plant to and maintain in a cold shutdown condition after an ATWS? For example, what boron concentration should be maintained in the RCS.

Response

1. The procedure does not specify time frames for the operator to take various actions following an ATWS event, and this is consistent with all other emergency procedures for Sequoyah Nuclear Plant. The change in format in only one procedure would lead to needless confusion of the operator.

Some actions that could be required of the operator would normally be accomplished automatically (i.e., auxiliary feedwater actuation and turbine trip). Other actions that are not automatic can be initiated promptly from the control room.

2. See our new procedure EOI-14.
3. If an ATWS event has occurred, the plant will be placed in a mode consistent with the plant's technical specifications and the relevant operating instructions.