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A9

NOTE TO: C. Stahle

FROM: Ashok Thadani

We have reviewed the ATWS emergency operating procedure submitted by TVA on October 17, 1979. The enclosed comments on this procedure are written in such a manner as to minimize the TVA effort required to develop acceptable ATWS procedure(s). I recommend that you request the Operator Licensing Branch to review the proposed TVA procedure and our comments. If requested, we will be pleased to discuss these comments with TVA.

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REVIEW OF ATWS PROCEDURES FOR SEQUOYAH 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.

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?

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 scramming the reactor by tripping the breakers powering the control rod 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?

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 valves.

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.

			SUBSEQUENT ACTIONS		
Event & Action Sequence	Transient Initiated Symptoms	Failure to Scram Symptoms	Immediate Operator Actions Two Operators	Verify RCS, Steam Generator, Containment Parameters Values	Long Term Shutdown
General time Sequence	t_0	t_1	t_2	t_3	t_4
			Operator #1 Manual Scram Attempts Operator #2 Assure that a) turbine tripped b) all AFWS providing flow c) HPSI providing flow (shut off head) in that order. What, if any, is the impact of stuck open PORV.	If outside specified limits, describe the operator actions.	Describe special actions to bring plant to a cold shutdown condition and maintain that condition.

Figure 1. Generalized Approach to be followed for writing ATWS procedure(s)