

SAFETY EVALUATION REPORT FOR
GENERIC LETTER 83-28, ITEM 1.1 - POST-TRIP REVIEW
(PROGRAM DESCRIPTION AND PROCEDURE)
FORT CALHOUN STATION, UNIT 1
DOCKET NO.: 50-285

I. INTRODUCTION

On February 25, 1983, both of the scram circuit breakers at Unit 1 of the Salem Nuclear Power Plant failed to open upon an automatic reactor trip signal from the reactor protection system. This incident occurred during the plant start-up and the reactor was tripped manually by the operator about 30 seconds after the initiation of the automatic trip signal. The failure of the circuit breakers has been determined to be related to the sticking of the under voltage trip attachment. Prior to this incident, on February 22, 1983, at Unit 1 of the Salem Nuclear Power Plant, an automatic trip signal was generated based on steam generator low-low level during plant start-up. In this case, the reactor was tripped manually by the operator almost coincidentally with the automatic trip. Following these incidents, on February 28, 1983, the NRC Executive Director for Operations (EDO), directed the staff to investigate and report on the generic implications of these occurrences at Unit 1 of the Salem Nuclear Power Plant. The results of the staff's inquiry into the generic implications of the Salem unit incidents are reported in NUREG-1000, "Generic Implications of ATWS Events at the Salem Nuclear Power Plant." As a result of this investigation, the Commission (NRC) requested (by Generic Letter 83-28 dated July 8, 1983) all licensees of operating reactors, applicants for an operating license, and holders of construction permits to respond to certain generic concerns. These concerns are categorized into four areas: (1) Post-Trip Review, (2) Equipment Classification and Vendor Interface, (3) Post-Maintenance Testing, and (4) Reactor Trip System Reliability Improvements.

The first action item, Post-Trip Review, consists of Action Item 1.1, "Program Description and Procedure" and Action Item 1.2, "Data and Information Capability." This safety evaluation report (SER) addresses Action Item 1.1 only.

II. REVIEW GUIDELINES

The following review guidelines were developed after the initial evaluation of various utility responses to Item 1.2 of Generic Letter 83-28 and incorporate the best features of these submittals. As such, these review guidelines in effect represent a "good practices" approach to post-trip review. We have reviewed the licensee's response to Item 1.1 against these guidelines:

- A. The licensee or applicant should have systematic safety assessment procedures established that will ensure that the following restart criteria are met before restart is authorized.
- ° The post-trip review team has determined the root cause and sequence of events resulting in the plant trip.
 - ° Near term corrective actions have been taken to remedy the cause of the trip.
 - ° The post-trip review team has performed an analysis and determined that the major safety systems responded to the event within specified limits of the primary system parameters.
 - ° The post-trip review has not resulted in the discovery of a potential safety concern (e.g., the root cause of the event occurs with a frequency significantly larger than expected).
 - ° If any of the above restart criteria are not met, then an independent assessment of the event is performed by the Plant Operations Review Committee (PORC), or another designated group with similar authority and experience.

- B. The responsibilities and authorities of the personnel who will perform the review and analysis should be well defined.
 - ° The post-trip review team leader should be a member of plant management at the shift supervisor level or above and should hold or should have held an SRO license on the plant. The team leader should be charged with overall responsibility for directing the post-trip review, including data gathering and data assessment and he/she should have the necessary authority to obtain all personnel and data needed for the post-trip review.
 - ° A second person on the review team should be an STA or should hold a relevant engineering degree with special transient analysis training.
 - ° The team leader and the STA (Engineer) should be responsible to concur on a decision/recommendation to restart the plant. A nonconcurrence from either of these persons should be sufficient to prevent restart until the trip has been reviewed by the PORC or equivalent organization.
- C. The licensee or applicant should indicate that the plant response to the trip event will be evaluated and a determination made as to whether the plant response was within acceptable limits. The evaluation should include:
 - ° A verification of the proper operation of plant systems and equipment by comparison of the pertinent data obtained during the post-trip review to the applicable data provided in the FSAR.
 - ° An analysis of the sequence of events to verify the proper functioning of safety related and other important equipment. Where possible, comparisons with previous similar events should be made.

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- D. The licensee or applicant should have procedures to ensure that all physical evidence necessary for an independent assessment is preserved.
- E. Each licensee or applicant should provide in its submittal, copies of the plant procedures which contain the information required in Items A through D. As a minimum, these should include the following:
 - ° The criteria for determining the acceptability of restart
 - ° The qualifications, responsibilities and authorities of key personnel involved in the post-trip review process
 - ° The methods and criteria for determining whether the plant variables and system responses were within the limits as described in the FSAR
 - ° The criteria for determining the need for an independent review.

III. EVALUATION AND CONCLUSION

By letter dated November 4, 1983, the licensee of Fort Calhoun, Unit 1, provided information regarding its Post-Trip Review Program and Procedures. We have evaluated the licensee's program and procedures against the review guidelines developed as described in Section II. A brief description of the licensee's response and the staff's evaluation of the response against each of the review guidelines is provided below:

- A. With regard to the criteria for determining the acceptability of restart for any unscheduled reactor trip, the licensee indicated a post-trip review is conducted to identify the cause of the trip and the subsequent corrective action taken prior to the plant restart. We find that this action taken by the licensee is not sufficient to ensure a safe plant operation. We recommend that prior to the authorization for restart, an analysis should be conducted to verify that systems which are important to reactor safety have performed as required.

DRAFT

-5-

- B. The responsibilities and authorities of the personnel who will perform the review and analysis have not been clearly defined. We recommend that the post-trip review team include a member of plant management at the Shift Supervisor level or above who holds or has held an SRO license on the plant (the Shift Supervisor who was on shift at the time of the event would be acceptable) and who has the responsibility and authority to obtain all necessary personnel and data to ensure a thorough and complete post-trip review. In addition, the post-trip review team should include an STA or an Engineer who has had special transient analysis training. These two people should have a joint responsibility to concur on a decision to restart the plant, and each should have the unilateral authority to prevent a restart.
- C. The licensee has not addressed the methods and criteria for comparing the event information with known or expected plant behavior. We recommend that the pertinent data obtained during the post-trip review be compared to the applicable data provided in the FSAR to verify proper operation of the systems or equipment. Where possible, comparisons with previous similar events should be made.
- D. The licensee has not addressed the criteria for determining the need for independent assessment of an event. We recommend that if any of the review guidelines (as stated in Section II.A of this SER) are not met, an independent assessment of the event should be performed by the PORC or a group with similar authority and experience.
- E. With regard to a systematic safety assessment program to assess unscheduled reactor trips, the licensee referred to plant operating procedure (OP-1), plant operating orders (O-2 and O-5), and report form (FC-96). We have reviewed these plant operating procedures, orders

DRAFT

-6-

and report forms, and have not been able to conclude that the licensee has in place a systematic safety assessment program to assess unscheduled reactor trips. We recommend that the licensee develop a systematic safety assessment program in accordance with the guidelines as described in the above Section II.E to handle unscheduled reactor trips.

Acceptable responses to the above noted deficiencies are required before we can complete our review of the licensee's Post-Trip Review Program and Procedures for Fort Calhoun Station, Unit 1. We will review these responses when received and will report our finding in a supplement to this SER.