

OP-AP.ZZ-101(Q)

## Remarks:

**DRAFT COPY**

Approved By: Operations Mgr - Hope Creek Date

8511050172 851030  
PDR ADOCK 05000354  
A PDR

# POST REACTOR SCRAM/ECCS ACTUATION REVIEW AND APPROVAL REQUIREMENTS

## TABLE OF CONTENTS

<u>SECTION</u>	<u>TITLE</u>	<u>PAGE</u>
1.0	PURPOSE.....	2
2.0	REFERENCES.....	2
3.0	DEFINITIONS.....	2
4.0	RESPONSIBILITIES.....	2
5.0	PROCEDURE.....	3
5.1	Data Collection.....	3
5.2	Data Evaluation.....	5
5.3	Approval Requirments for Reactor Startup following a Reactor Scram/ECCS Actuation....	6
5.4	Data Filing and Distribution.....	6

## ATTACHMENTS

- |   |                                                 |
|---|-------------------------------------------------|
| 1 | Post Reactor Scram/ECCS Actuation Review        |
| 2 | Fact Finding Questionnaire                      |
| 3 | Sequence of Events Checklists (later)           |
| 4 | Sequence of Events Standards (later)            |
| 5 | Simplified Logics and Instrument Tables (later) |

## POST REACTOR SCRAM/ECCS ACTUATION REVIEW AND APPROVAL REQUIREMENTS

### 1.0 PURPOSE

The purpose of this procedure is to establish the requirements to perform and document a formal review for all Reactor Scram/ECCS Actuation events. It also provides a systematic method for diagnosing the causes of Reactor Scram/ECCS Actuations, ascertaining the proper functioning of safety-related and other important equipment prior to restart, and making the determination that the plant can be restarted safely.

This procedure also establishes the requirements and criteria that must be met prior to startup following any Reactor Scram/ECCS Actuation.

### 2.0 REFERENCES

- 2.1 INPO GOOD PRACTICE, OP-211, POST TRIP REVIEWS. September 1984 (INPO 84-029).
- 2.2 SALEM GENERATING STATION AD-16, Post Reactor Trip/Safety Injection Review, Rev. 5
- 2.3 Generic Letter 83-28, "Required Actions Based on Generic Implications of Salem ATWS Events", July 8, 1983.
- 2.4 SA-AP.22-002(Q), "Station Organization and Operating Practices", Rev. 1.

### 3.0 DEFINITIONS

- 3.1 Data Package - a collection of information used to conduct an investigation and review of any Reactor Scram/ECCS Actuation. The data package includes the completed Post Scram/ECCS Actuation Review Report, and any hard copy recorded data such as strip charts, computer printouts, fact finding questionnaires, etc.

### 4.0 RESPONSIBILITIES

- 4.1 Senior Nuclear Shift Supervisor - Investigates and evaluates the cause of the Reactor Scram/ECCS Actuation and notifies the Operations Manager of his findings.

- 4.2 Shift Technical Advisor - Assists and advises the Senior Nuclear Shift Supervisor in the compiling of the Data Package and evaluation of the report.
- 4.3 Operations Manager - Reviews the findings with the SNSS and presents them to the SORC.
- 4.4 SORC - Reviews the results of the investigation and makes recommendations to the General Manager.
- 4.5 General Manager - After satisfactory completion of SORC recommendations, may either grant or deny approval for reactor startup.
- 4.6 Designees for all positions shall be in accordance with SA-AP.ZZ-002(Q).

## 5.0 PROCEDURE

### 5.1 Data Collection

- 5.1.1 As soon as plant conditions permit, the Senior Nuclear Shift Supervisor shall initiate data collection.
- 5.1.2 The STA is responsible for collecting the data necessary to complete Attachment 1 Post Reactor Scram/ECCS Actuation Review.
- 5.1.3 The STA shall obtain a copy of the sequence of events printout and attach it to the data package.
- 5.1.4 Have the Shift Technician remove any recorder charts that are found to indicate important information with regard to the event. Ensure that all tracings are identified on the charts and the time is clearly marked. Attach the original charts to the data package.
  - 5.1.4.1 Examples of important recorder charts include:
    - a. APRMs
    - b. Reactor Vessel Level
    - c. Recirculation Pump Suction Temperature

- d. Core Flow
- e. Rx Vessel Pressure
- f. Steam Flow
- g. Drywell Pressure
- h. Suppression Chamber Level
- i. Suppression Chamber Water Temperature
- j. Feedwater flow
- k. Condenser Vacuum
- l. S.R.V. Tailpipe Temperature
- m. Drywell Temperature

5.1.5 The STA will conduct fact finding sessions with the appropriate personnel to determine the cause of the event, actions taken, and observed sequence of events. Attachment 2 should be used as a guide for these sessions.

5.1.5.1 Any corrective actions taken during the event to investigate the consequences of the event and bring the unit to a stable condition should be included.

5.1.6 Any corrective actions that are required prior to the units return to service shall be recorded.

5.1.7 Any alarms received which were out of the ordinary for the event and alarms which should have been received but were not have been recorded.

5.1.8 The STA shall confer with the Senior Nuclear Shift Supervisor in order to review and evaluate the report.

## 5.2 Data Evaluation

- 5.2.1 The Senior Nuclear Shift Supervisor shall evaluate the Post Scram/ECCS Actuation Data Package when completed by the STA. The purpose of this evaluation is to determine the following:
  - 5.2.1.1 All major safety-related and other equipment required to function during the event operated as anticipated or expected.
  - 5.2.1.2 The cause of the event has been clearly identified.
  - 5.2.1.3 Any corrective actions that are required prior to the unit's return to service have been identified.
- 5.2.2 The simplified logic diagrams and accompanying instrument tables (Attachment 5) will be used for verification of the Scram and safety-related equipment operation.
- 5.2.3 The verification of performance of safety-related equipment during the Post Scram Review process will be limited to the verification that the equipment did or did not operate. The detailed manner in which the equipment operated is sufficiently verified during surveillance testing.
- 5.2.4 When both the Senior Nuclear Shift Supervisor and the STA are satisfied with the conclusions, each shall sign and date the report.
- 5.2.5 The Senior Nuclear Shift Supervisor shall notify the Operations Manager of the event, and the subsequent findings of the report.
- 5.2.6 The Operations Manager reviews the Post Reactor Scram/ECCS Actuation Review Report with the Senior Nuclear Shift Supervisor. (The Operations Manager may elect to conduct this review by telephone in direct conference with the Senior Nuclear Shift Supervisor). The purpose of the Operations Manager's Review is to verify the following:



- 5.2.6.1 The Post Reactor Scram/ECCS Actuation Report was properly prepared and evaluated.
- 5.2.6.2 The cause of the event has been properly identified.
- 5.2.6.3 All equipment and systems required to function during the event did function as designed.
- 5.2.6.4 Any corrective actions that are required prior to the unit's return to service have been identified, documented, and the required corrective actions have been initiated.

### 5.3 Approval Requirements for Reactor Startup following a Reactor Scram/ECCS Actuation

- 5.3.1 Prior to requesting approval to startup the reactor after any Reactor Scram/ECCS Actuation, the Post Reactor Scram/ECCS Actuation Review must be completed and evaluated.
- 5.3.2 Upon satisfactory review and evaluation of the Post Reactor Scram/ECCS Review, the results shall be presented to the Station Operations Review Committee. Upon completion of the evaluation of the event by the Station Operations Review Committee, the SORC shall make recommendations to the General Manager.
- 5.3.3 Approved for taking the reactor critical shall be granted by the General Manager only after recommendations have been made by the SORC. The Assistant General Manager may grant the necessary approval for taking the reactor critical in the absence of the General Manager but, again, only after recommendations have been made by the SORC.

### 5.4 Data Filing and Distribution

- 5.4.1 When all required reviews and approvals have been completed the data package will be forwarded to the Senior Operating Technical Supervisor (SOTS).

- 5.4.2 The SOTS will incorporate the event into the Post Reactor Scram/ECCS Actuation history file.
- 5.4.3 The original data package will be forwarded to the Technical Document Room.
- 5.4.4 A copy of the data package will remain in the Operations Shift files for future reference.
- 5.4.5 Copies of the data package will be forwarded to the following individuals.
  - 5.4.5.1 The Technical Engineer for assistance in preparing the License Event Report or other reports as appropriate.
  - 5.4.5.2 The Manager Nuclear Training for review and inclusion in the applicable training programs.
  - 5.4.5.3 The General Manager - Nuclear Support in order to conduct an independent review of the event.
- 5.4.6 The SOTS will prepare a summary report on the event and issue it to all pertinent personnel in accordance with OP-AP.ZZ-105 Operations Department Information System.
- 5.4.7 Make the appropriate revisions to any procedure which had deficiencies identified during this event.



**ATTACHMENT 1**  
**POST REACTOR SCRAM/ECCS ACTUATION REVIEW**

Date of Occurrence \_\_\_\_\_  
 Time of Occurrence \_\_\_\_\_

**PART A INITIAL CONDITIONS**

**1. Personnel Assignments**

SNSS _____	NSS _____
NCO(Board) _____	NCO(Desk) _____
Rx Bldg Operator _____	Aux & Services Bldg Operator _____
Turbine Bldg Operator _____	Shift Technician _____
Shift Electrician _____	
Others _____	_____
_____	_____
_____	_____
_____	_____

**2. Plant status**

Reactor Power \_\_\_\_\_ %

Generator Load \_\_\_\_\_ MW

Mode Switch Position \_\_\_\_\_

Reactor Vessel Pressure \_\_\_\_\_ (PR 623B)

Reactor Vessel Level \_\_\_\_\_ (LR 3683B)

Reactor Feed Pumps	AP101 _____	BP101 _____	CP101 _____
Pri Cond Pumps	AP102 _____	BP102 _____	CP102 _____
Sec Cond Pumps	AP137 _____	BP137 _____	CP137 _____

**ATTACHMENT 1**  
**POST REACTOR SCRAM/ECCS ACTUATION REVIEW**

## PART A INITIAL CONDITIONS (cont.)

Circ Wtr Pumps    AP501 \_\_\_\_\_ BP501 \_\_\_\_\_ CP501 \_\_\_\_\_ DP501 \_\_\_\_\_  
Recir Pump Speed AP201 \_\_\_\_\_ % BP201 \_\_\_\_\_ %

## 3. Evolutions in Progress at the onset of the Event.

Surveillance Testing	Yes _____	No _____
Trouble Shooting or Maintenance	Yes _____	No _____
Plant Startup or Shutdown	Yes _____	No _____
Other Activities which could have contributed to the event	Yes _____ No _____	

If the answer to any of the above questions is yes, describe the circumstances in detail.

---

---

---

---

---

---

---

---

**ATTACHMENT 1**  
**POST REACTOR SCRAM/ECCS ACTUATION REVIEW**

**PART A INITIAL CONDITIONS (cont.)**

4. Equipment/systems out of service or inoperable at the onset of the event.

Reactor Protection System	Yes _____	No _____
ECCS Systems	Yes _____	No _____
Control Systems	Yes _____	No _____
Electrical Systems	Yes _____	No _____
Major Equipment	Yes _____	No _____

If the answer to any of the above questions is yes, describe the circumstances in detail.

---

---

---

---

---

---

---

5. Provide any additional information which may have led to the initiation of the event.

---

---

---

---

**ATTACHMENT 1**  
**POST REACTOR SCRAM/ECCS ACTUATION REVIEW**

**PART B DESCRIPTION OF THE EVENT**

1. Reactor Protection System

Type of Scram: Manual \_\_\_\_\_ Automatic \_\_\_\_\_

Actuation Time \_\_\_\_\_

Cause: (if automatic) \_\_\_\_\_

Reason: (if manual) \_\_\_\_\_

a. Verify the following:

(1.) All Rods fully inserted \_\_\_\_\_

(2.) Scram Discharge Volume isolated

\_\_\_\_\_ Inboard \_\_\_\_\_ Outboard

b. From the computer printout, determine the scram initiating signal.

Scram initiated by \_\_\_\_\_

c. Comments: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

ATTACHMENT 1  
POST REACTOR SCRAM/ECCS ACTUATION REVIEW

## 2. ECCS Actuations

a. Were any ECCS System Actuations required during the event

Yes \_\_\_\_\_ No \_\_\_\_\_

b. Provide the actuation signal and time for any ECCS Systems which actuated.

	Actuation Signal	Time
HPCI	_____	_____
RCIC	_____	_____
CS	_____	_____
LPCI	_____	_____
ADS	_____	_____

c. If any discrepancies were noted in the operations of the ECCS Systems, explain in detail. \_\_\_\_\_

---

---

---

---

---

---

---

---

ATTACHMENT 1  
POST REACTOR SCRAM/ECCS ACTUATION REVIEW

## 3. Isolations

- a. Were any PCIS isolations required during the event?

Yes \_\_\_\_\_ No \_\_\_\_\_

Actuation Signal \_\_\_\_\_ Time \_\_\_\_\_

- b. If any discrepancies were noted in the operation of the PCIS isolation, explain in detail. \_\_\_\_\_

---

---

---

---

- c. Were any NSSSS isolations required during the event?

Yes \_\_\_\_\_ No \_\_\_\_\_

Actuation Signal \_\_\_\_\_ Time \_\_\_\_\_

- d. If any discrepancies were noted in the operation of the NSSS isolation, explain in detail. \_\_\_\_\_

---

---

---

---



ATTACHMENT 1  
POST REACTOR SCRAM/ECCS ACTUATION REVIEW

## 4. ATWS Related functions

a. Were any RRCS actuations required during this event?

Yes \_\_\_\_\_ No \_\_\_\_\_

Actuation Signal \_\_\_\_\_ Time \_\_\_\_\_

b. Were any discrepancies noted in the operation of any of the following systems for the given actuation signal?

	Yes	No	N/A
A.R.I.	_____	_____	_____
Rx Feed Pmp Runback	_____	_____	_____
SLC Actuation	_____	_____	_____
RWCU Isolation	_____	_____	_____
RPT Breakers	_____	_____	_____

c. Comments: \_\_\_\_\_

---



---



---



---



---



---

**ATTACHMENT 1**  
**POST REACTOR SCRAM/ECCS ACTUATION REVIEW**

5. What is the classification of the event as defined in the Event Classification Guide?

Time declared \_\_\_\_\_

Time terminated \_\_\_\_\_

- a. Were all of the required notifications made?

Yes \_\_\_\_\_ No \_\_\_\_\_

- b. If no, explain why \_\_\_\_\_
- \_\_\_\_\_
- \_\_\_\_\_
- \_\_\_\_\_
- \_\_\_\_\_

6. Identify any discrepancies noted in the review of the sequence of events print out. \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

ATTACHMENT 1  
POST REACTOR SCRAM/ECCS ACTUATION REVIEW

7. List any alarms received which were out of the ordinary for the event and alarms which should have been received, but were not.

---

---

---

---

---

8. Describe any corrective actions that are required prior to the units return to service.

---

---

---

---

9. Reconstruct the event. Include the plant conditions prior to the event, indications that a problem existed and actions performed to place the plant in a stable condition. Describe any equipment malfunctions or inadequacies noted, and any identified procedure deficiencies. Attach additional pages if required.

---

---

---

---

---

---

---

---

---

ATTACHMENT 1  
POST REACTOR SCRAM/ECCS ACTUATION REVIEW

This image shows a single sheet of white paper with horizontal ruling lines. The lines are evenly spaced and run across the width of the page. There are no margins, text, or other markings on the paper.

**ATTACHMENT 1**  
**POST REACTOR SCRAM/ECCS ACTUATION REVIEW**

10. Identify which strip chart traces are included.

Parameter	Recorder #
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____

11. Transient data for pertinent plant parameters.

	Maximum	Minimum
Steam Dome Pressure	_____	_____
Reactor Vessel Water Level	_____	_____
Reactor Core Flow	_____	_____
Reactor Power	8	N/A
Drywell Pressure	_____	_____
Drywell Temperature	_____	_____
Suppression Chamber Water Level	_____	_____
Suppression Chamber Water Temp.	_____	_____

ATTACHMENT 1  
POST REACTOR SCRAM/ECCS ACTUATION REVIEW

## 12. Final Plant Conditions

Reactor Power	SRM	_____	
	IRM	_____	Range _____
Mode Switch Position		_____	
Reactor Vessel Pressure		_____	
Drywell Temperature		_____	
Drywell Pressure		_____	
Suppression Chamber Water Level		_____	
Suppression Chamber Water Temp.		_____	
Any additional parameters or remarks:			

---

---

---

---

---

---

---

---

---

---

---

---



**ATTACHMENT 1  
POST REACTOR SCRAM/ECCS ACTUATION REVIEW**

Prepared By: \_\_\_\_\_ Date \_\_\_\_\_ Time \_\_\_\_\_

Reviewed and Evaluated By:

STA \_\_\_\_\_ Date \_\_\_\_\_ Time \_\_\_\_\_

SNSS \_\_\_\_\_ Date \_\_\_\_\_ Time \_\_\_\_\_

Reviewed with Operations Manager \_\_\_\_\_ Date \_\_\_\_\_ Time \_\_\_\_\_

Operations Manager \_\_\_\_\_  
(Signature)

**ATTACHMENT 1**  
**POST REACTOR SCRAM/ECCS ACTUATION REVIEW**

SORC and GENERAL MANAGER Review

Major findings of Investigations.

---

---

---

---

---

---

---

---

---

---

(Attach additional sheets if necessary)

Recommendations by SORC.

---

---

---

---

---

---

---

---

(Attach additional sheets if necessary)

Startup Authorization:

SORC Chairman _____	Date _____
General Manager _____	Date _____

**ATTACHMENT 2**  
**FACT FINDING QUESTIONNAIRE**

1. What was the first indication that a problem existed?

---

---

---

---

---

2. What actions did you take as a result of the indications?

---

---

---

---

3. What were the subsequent indications and plant response, including any manual actions taken?

---

---

---

---

4. Were any equipment malfunctions or inadequacies noted?

---

---

---

---

**ATTACHMENT 2**  
**FACT FINDING QUESTIONNAIRE**

5. Were any procedure deficiencies identified during the transient?

6. Additional Questions or Information:

Interviewer \_\_\_\_\_ Title \_\_\_\_\_

Interviewee \_\_\_\_\_ Title \_\_\_\_\_

Date \_\_\_\_\_

ATTACHMENT 3  
SEQUENCE OF EVENTS CHECKLIST

(LATER)

**ATTACHMENT 4**  
**SEQUENCE OF EVENTS STANDARDS**

(LATER)



**ATTACHMENT 5**  
**SIMPLIFIED LOGICS AND INSTRUMENT TABLES**

(LATER)