

APPENDIX

U.S. NUCLEAR REGULATORY COMMISSION
REGION IV

Inspection Report: 50-458/95-07

License: NPF-47

Licensee: Entergy Operations, Inc.
P.O. Box 220
St. Francisville, Louisiana

Facility Name: River Bend Station

Inspection At: St. Francisville, Louisiana

Inspection Conducted: January 9-13, 1995

Inspectors: Arthur D. McQueen, Emergency Preparedness Analyst
Reactor Inspection Branch

Ryan E. Lantz, Operations Inspector
Operations Branch

Approved:

Blaine Murray
Blaine Murray, Chief, Reactor Inspection Branch

1/26/95
Date

Inspection Summary

Areas Inspected: Routine, announced inspection of the operational status of the emergency preparedness program including changes to the emergency plan and implementing procedures; emergency facilities, equipment, and supplies; organization and management control; training; internal reviews and audits; effectiveness of licensee controls; and followup on previous inspection findings.

Results:

- A licensee-identified noncited violation was noted involving failure to submit five emergency implementing procedure revisions to the NRC within 30 days, as required (Section 2.1). Otherwise, the licensee had properly reviewed and submitted to NRC changes to the emergency plan and implementing procedures, with one exception.
- The licensee had maintained a close relationship with offsite emergency response organizations (Section 2.1).

- Emergency facilities, equipment, and supplies had been maintained in a proper state of operational readiness (Section 3.1).
- The emergency response organization had been reorganized into three full teams of response personnel. These organizations were consistent with regulatory requirements (Section 4.1).
- An appropriate number of emergency response personnel had been trained and qualified. The emergency planning organization was fully staffed with qualified personnel (Section 4.1).
- The training organization had maintained an effective emergency response training program. All emergency response organization personnel had been trained in accordance with applicable station procedures (Section 5.1.1)
- The performance of operating crews in implementing emergency response actions during walkthrough evaluations was generally good. Several instances of ineffective communications and emergency operating procedure usage resulted in simulated unnecessary plant degradation and radiological release to the environment (Section 5.1.2).
- Comprehensive quality assurance audits and surveillances had been performed by qualified personnel. The audits were of proper scope, depth, and effectiveness (Section 6.1).
- An effective system of controls had been maintained regarding safety issues, events, or problems which emphasizes early detection and elevation to an appropriate management level, thorough root cause analysis, and timely, effective implementation of corrective actions (Section 7.1).
- Since the last emergency preparedness inspection, one Unusual Event was declared and reported to the NRC Headquarters Operations Officer. Timely required notifications were made to the appropriate local and state agencies and to the NRC (Section 9.2).

Summary of Inspection Findings:

- Inspection Followup Item 458/9315-01 was closed (Section 8.1).
- Weakness 458/9315-02 was closed (Section 8.2).

Attachments:

- Attachment 1 - Persons Contacted and Exit Meeting
- Attachment 2 - Emergency Preparedness Inspection Scenario Narrative Summary

DETAILS

1 PLANT STATUS

During this inspection, the reactor operated at full power.

2 EMERGENCY PLAN AND IMPLEMENTING PROCEDURES (82701-02.01)

The inspectors reviewed changes in the licensee's emergency plan and implementing procedures to verify that these changes had not decreased the effectiveness of emergency planning and that the changes had been reviewed properly and submitted to NRC.

2.1 Discussion

Since the previous inspection, four emergency plan revisions (Revisions 9 through 12) had been implemented. The most significant changes in these revisions were to require activation of the Emergency Operations Facility at an Alert instead of a Site Area Emergency and to evacuate the owner-controlled area at a Site Area Emergency instead of a General Emergency. For each emergency plan revision, the licensee had performed a documented review in accordance with 10 CFR 50.54(q) to determine that the revisions did not decrease the effectiveness of emergency preparedness. All four had been submitted to and reviewed by the NRC for acceptability.

The inspectors also reviewed documentation pertaining to selected Emergency Implementing Procedure revisions of the 72 revisions implemented since the last routine inspection. One item was identified which was in apparent violation of 10 CFR Part 50, Appendix E, Section V, which states in part "Licensees who are authorized to operate a nuclear power facility shall submit any changes to the emergency plan or procedures to the Commission, as specified in Section 50.4, within 30 days of such changes." Contrary to this requirement, it was determined on October 8, 1993, by a planner on the emergency planning staff that five Emergency Implementing Procedures dated September 3, 1993, had not been submitted to the NRC as required. Immediate action was taken by initiating a Condition Report (93-0613) to accomplish corrective actions. Emergency Implementing Procedure EIP-2-100, "Procedure Review, Revision and Approval," was revised to require an annual checklist for each emergency implementing procedure to insure its required annual review by the Facilities Review Committee and timely distribution of revisions. This problem has not recurred in the 15 months since its identification, indicating the effectiveness of the corrective actions. This violation will not be subject to enforcement action, because the licensee's efforts in identifying and correcting the violation meet the criteria specified in Section VII.B.2 of the Enforcement Policy. Completed corrective actions taken by the licensee were appropriate. The inspectors reviewed selected changes in procedures and noted that marked changes were consistent with regulatory requirements and the licensee's commitments.

The licensee maintains a close relationship with offsite agencies and coordinates changes in emergency action levels with those agencies annually or as appropriate. Emergency action level changes are also reviewed and

discussed as they occur in the monthly Civil Defense meeting with the states and counties involved with the River Bend Emergency Plan. The inspectors reviewed Letters of Agreement established with support agencies and determined that they were current, had been reviewed annually and updated as required.

2.2 Conclusion

The licensee had reviewed and properly submitted to NRC changes in the emergency plan and implementing procedures with the exception indicated above. The licensee had maintained an effective relationship with offsite radiological emergency response organizations.

3 EMERGENCY FACILITIES, EQUIPMENT, INSTRUMENTATION, AND SUPPLIES (82701-02.02)

The inspectors toured onsite emergency facilities and reviewed the licensee's emergency equipment inventories and maintenance to verify that facilities and equipment had been maintained in a state of operational readiness.

3.1 Discussion

A tour was made of each emergency response facility which included the inspection of various equipment items, instrumentation, and supplies. Facilities inspected were the Control Room, Technical Support Center, Operations Support Center, and the Emergency Operations Facility. The facilities were observed to be well maintained and ready for emergency use. No substantive changes had occurred at any emergency response facility since the last inspection. Random inspections were performed of radiation monitoring and respiratory equipment at each emergency response facility. All selected items were verified as being in calibration or had been appropriately inspected on a scheduled basis. Equipment and supplies placed in response facilities and in emergency equipment lockers matched scheduled inventories. Current copies of the emergency plan, implementing procedures and emergency telephone directories were maintained in all facilities. Primary and backup communications in each facility were as described in the emergency plan. The inspectors reviewed documentation of inventories, testing and maintenance of emergency response facilities and noted that they had been performed as required by procedures.

3.2 Conclusion

Emergency facilities, equipment, and supplies had been maintained in a state of operational readiness.

4 ORGANIZATION AND MANAGEMENT CONTROL (82701-02.03)

The inspectors reviewed the emergency response organization staffing levels to determine whether sufficient personnel resources were available for emergency response. The emergency planning organization was reviewed to ensure that an effective programmatic management system was in place.

4.1 Discussion

Entergy Operations, Inc., involvement with the River Bend facility had resulted in several changes in the emergency response organization. The inspectors reviewed the staffing of the emergency response organization and the selection process for positions. Selections of personnel for positions in the emergency response organization were made by the various managers at the site in coordination with the Emergency Planning Manager. Since the previous routine inspection, the emergency response organization had been reorganized into three teams, each capable of responding to emergency events. A list of alternates trained to function in emergency response organization positions was also maintained by the Emergency Planning Manager. The teams trained as organizational units and each had participated in tabletop exercises and drills. Callout of the emergency response organization were by pager system and occur upon declaration of an Alert.

Overall responsibility for emergency response was assigned to the site Director, Nuclear Safety. The Emergency Planning Manager had a staff of about 7 personnel for emergency preparedness and planning functions. The inspectors found that the emergency planning group was staffed with an appropriate number of qualified personnel. Since the last routine inspection, the Emergency Planning Manager had assumed responsibility for emergency training and the Joint Information Center function, along with two new personnel for training and scenario development.

4.2 Conclusions

The licensee had trained and qualified an appropriate number of emergency response personnel to ensure a good depth in the organization. The emergency planning organization was fully staffed with qualified personnel.

5 TRAINING (82701-02.04)

The inspectors reviewed the emergency response training program and interviewed selected individuals to determine whether emergency response personnel had received the required training and complied with the requirements of the River Bend Station administrative procedures and emergency plan, 10 CFR 50.47(b)(15), and 10 CFR Part 50, Appendix E.IV.F.

5.1 Discussion

5.1.1 Training Program

The program for training and qualification of emergency responders was specified in Emergency Implementing Procedure EIP-2-102, "Training, Drills, and Exercises." Qualification included required classroom training and practical experience provided by required participation in drills and exercises. The inspectors reviewed records of training and determined that they were being maintained current. The current qualification status of individuals in the emergency response organization was maintained in the emergency telephone roster, updated monthly, and in an unofficial list, updated quarterly, and organized by emergency response position. Although

initial, requalification, and drill attendance training records were all maintained in separate data bases, this information was accurately integrated to produce a current qualified list of the emergency response organization. The procedure for updating the emergency telephone roster, Emergency Implementing Procedure EIP-2-104, "Maintenance of Emergency Telephone Numbers," did not direct verification of drill participation prior to designation of an individual as qualified and revision of the emergency telephone roster. The inspectors considered the lack of specific procedural guidance regarding verification of qualification to be a concern regarding the continued accuracy of the qualified emergency response organization list.

The inspectors noted that emergency response training of operating crews had been conducted separately from their dose assessment coordinators and communicators who would respond to the Control Room early in an emergency. This observation was also noted in the last routine inspection of May 1993 and noted that shift supervisors and emergency directors would be more confident in their ability to perform as a unit during emergencies if they could train together. The facility had acknowledged this feedback but has not developed a specific plan for coordinating shift crew and their support elements simulator training.

5.1.2 Walkthroughs with Operating Crews

The inspectors conducted a series of emergency response walkthroughs with operating crews to evaluate the adequacy and retention of skills obtained from the emergency response training program. One walkthrough scenario was developed by the inspectors and administered to the crews to determine, through demonstrated performance, whether Control Room personnel were proficient in their duties and responsibilities as emergency responders during a simulated accident scenario. Attachment 2 to this inspection report contains a narrative summary of walkthrough scenario.

The inspectors observed three crews using the Control Room simulator in the dynamic mode. The scenario consisted of a sequence of events requiring an escalation of emergency classifications, culminating in a General Emergency. The scenario was developed to run approximately 90 minutes. The inspectors observed the interaction of the response crews to verify that authorities and responsibilities were clearly defined and understood. The walkthroughs also allowed the evaluation of the crews' abilities to assess and classify accident conditions, utilize abnormal and emergency operating procedures, perform dose assessments, develop protective action recommendations, and make corresponding notifications to offsite authorities.

The performance of operating crews during walkthrough evaluations was generally good. The following observations were noted in communications and emergency operating procedure usage:

- One crew displayed ineffective communication practices that resulted in further degradation of plant conditions and allowed the offsite radiological release to continue for an additional 30 minutes. The shift supervisor did not acknowledge important reports from the Control

Room supervisor and later had to ask for plant status. The shift supervisor also did not ensure acknowledgement of his General Emergency declaration by the crew, which was missed by the Control Room supervisor and subsequently delayed his entry into Emergency Depressurization. The Control Room supervisor failed to ensure receipt of important information by the shift supervisor, and additionally was slow to question the status of event classification when at a Site Area Emergency with indications of a large offsite release in progress.

- Two crews did not attempt to reduce the release rate by all means permitted by the emergency operating procedures prior to meeting the conditions for Emergency Depressurization, even though clear indications were given that a release offsite was in progress. The emergency operating procedures allowed the Control Room supervisor to establish a reactor pressure vessel pressure band lower limit at 100 psig, but both of the Control Room supervisors in these two crews maintained reactor vessel pressure at greater than 600 psig while attempting to manually isolate the steam break outside containment, which was the source of the release. This unnecessarily prolonged the offsite release for 50 minutes in one crew and 17 minutes in the other.
- After commencing Emergency Depressurization, one crew initiated reactor pressure vessel flooding actions, even though level trend was not lost on the depressurization, a loss of coolant accident was not in progress, and reactor pressure vessel level was well above top of active fuel. The injection that followed filled solid and repressurized the reactor pressure vessel and, subsequently, reinitiated a sporadic offsite release which lasted for 4 minutes until level and pressure control was re-established.
- Following report of main turbine casing penetration, one crew immediately opened the condenser vacuum breaker to attempt to more rapidly reduce main turbine speed, while the other two crews waited for procedural direction of 15 mils sustained turbine vibration, which did not occur. This is noted only for consistency in operations, since the consequences of opening the vacuum breaker included a main steam isolation signal and loss of condenser availability for steam bypass flow.
- One crew took 9 minutes to declare an Alert (Emergency Implementing Procedure EIP-2-003, Section 15.5) after main turbine damage (casing penetration) was reported to the Control Room. This was significantly longer than the other two crews, who took less than one minute. Otherwise, event classification was appropriate and timely for the indicated plant conditions.

The above inspectors' observations were discussed with licensee training personnel. The licensee stated that the observations would be evaluated and improvements would be made to the training program as appropriate.

5.2 Conclusion

The training organization has maintained an effective emergency response training program with minor procedural challenges noted, and all emergency response organization personnel had been trained in accordance with applicable station procedures. The performance of operating crews in implementing emergency response actions during walkthrough evaluations was generally good. Several instances of ineffective communications and emergency operating procedure usage resulted in simulated unnecessary plant degradation and radiological release to the environment.

6 INDEPENDENT AND INTERNAL REVIEWS AND AUDITS (82701-02.05)

The inspectors met with quality assurance personnel and reviewed independent and internal audits of the emergency preparedness program performed since the last inspection to determine compliance with the requirements of 10 CFR 50.54(t).

6.1 Discussion

The inspectors reviewed and discussed with quality assurance personnel the most recent annual audit (94-07-I-FEPL) of the emergency preparedness program which had been performed from July 11 through July 22, 1994. The audit team members appeared to be well qualified. The team leader was a certified auditor with current Lead Auditor Recertification as set forth in the licensee's Quality Assurance Instruction QAI 2.1, Revision 11, dated September 26, 1994, which incorporates certification criteria of ANSI Standards 2.12 and 2.23. The team included personnel familiar with and experienced in emergency planning, including an individual from the emergency planning organization at another reactor site. The inspectors reviewed the audit plan, scope of the audit, and the audit check list. The audit appeared to be thorough and complete.

The audit report was issued to appropriate levels of management. Quality Assurance maintained a tracking system for items identified in a report that required correction or improvement which established suspense dates for response by cognizant managers. Condition Reports were issued for tracking each audit finding and enhancement item. The Quality Assurance organization functions were reviewed, and while the organization reports to the same director in the plant organization as the Emergency Planning organization, the licensee has taken steps to assure its independence in the conduct of emergency preparedness audits and surveillances. (See inspection followup item in Section 8.1 below.)

The quality assurance organization conducted a periodic surveillance of emergency planning related to emergency preparedness exercise activity since the last routine NRC inspection. Results of that surveillance were incorporated into the 1994 annual audit.

6.2 Conclusion

Audits of emergency preparedness had been conducted in accordance with 10 CFR 50.54(t). Quality assurance audits and surveillances of emergency preparedness and planning had been performed by qualified personnel and were of proper scope, depth, and effectiveness.

7 EFFECTIVENESS OF LICENSEE CONTROLS (82701-02.06)

The inspectors reviewed the adequacy of the licensee's controls system pertaining to safety issues, events or problems. The review included discussions with quality assurance and emergency preparedness staff personnel and review of procedures and documentation of problem identification, root cause analysis, management review of problem identification and solution, and corrective actions.

7.1 Discussion

The licensee's controls system was effective in identifying, resolving, and preventing problems by providing for review of such areas as corrective action systems, root cause analyses, safety committees, and self assessment in the area of emergency preparedness. A principal tool in managing corrective actions was the Condition Report system. All personnel are instructed in the use of the Condition Report in their site general employee training. Condition Report forms were made available throughout the site in hard copy and as a computerized form and may be submitted by any employee regarding any item perceived as being a problem or safety issue. The organizational element for managing this program was the Condition Review Group, which includes senior plant management and meets daily. The Condition Review Group was chaired by the Plant Manager. Each Condition Report was screened by the Group to determine priority and urgency. Each report was documented, assigned to a responsible manager, assigned a suspense date, and tracked through action completion. Results were then reviewed by a Corrective Actions Review Group.

The Emergency Planning group also maintained its own internal computer tracking system (EP-TRACT) which tracks items specific to emergency planning and preparedness. This system also tracks and duplicates emergency planning items in the Licensing Research System and Condition Reports under the management of the Condition Review Group. The Licensing Research System tracks all commitments, licensing requirements, regulatory issues, etc., pertaining to the site. Status of all open items in the EP-TRACT program were reviewed as part of this inspection and were noted as current.

7.2 Conclusions

The licensee had maintained an effective system of controls pertaining to safety issues, events, or problems which emphasizes early detection and elevation by an appropriate management level, thorough root cause analysis, and effective implementation of corrective actions. No long-standing, uncorrected Condition Reports existed in the emergency planning and preparedness areas.

8 FOLLOWUP ON PREVIOUS INSPECTION FINDINGS (92702)

8.1 (Closed) Inspection Followup Item 458/9315-01: Emergency Preparedness Audit

Prior to the last routine inspection, an upper-level reorganization was implemented in the licensee's organization placing the Emergency Preparedness function and the Quality Assurance function under a single director, the Director of Nuclear Safety. The inspectors expressed concern to the licensee as to whether the Quality Assurance organization under the new organizational structure would have sufficient independence in conducting audits of emergency preparedness to meet the requirements of 10 CFR 50.54(t). This issue was documented for review during a future inspection. Review of the emergency preparedness annual audit during this inspection, along with discussions with quality assurance managers supervising the process, determined that audit approval and signature authority had been placed two organizational levels below the Director, Nuclear Safety. Audit program managers stated they had no difficulty maintaining independence in performing the audit function regarding emergency preparedness. Audit reports are finalized and signed off prior to presentation to the Director of Nuclear Safety.

8.2 (Closed) Weakness 458/9315-02: Problems Using Emergency State and Parish Notification System

During the walkthroughs in the last routine inspection, notifications were made promptly; however, problems were observed with the Emergency, State, and Parish System notification system. The problems observed with the execution of messages using the Emergency, State, and Parish System notification system were identified collectively as a weakness. In walkthroughs during this inspection, the inspectors paid particular attention to areas where the former problems had occurred. Notifications were again made promptly and, where appropriate, with default protective action recommendations. None of the previously identified problems were repeated, and all notifications were in accordance with emergency implementing procedures.

9 ONSITE FOLLOWUP OF EVENTS AT OPERATING POWER REACTORS (93702)

One licensee event was reviewed during this inspection wherein the licensee had declared an emergency event since the last routine emergency preparedness inspection.

9.1 Event

On September 8, 1994, the licensee telephonically notified the NRC Headquarters Operations Officer that an Unusual Event had been declared at the discretion of the Shift Supervisor at 10:09 p.m. (CDT) when the plant experienced an automatic reactor scram from 97 percent power, with failure of the main generator and the turbine to automatically trip. The Shift Supervisor determined that augmented support was desirable to aid in restoring systems and to ensure no other difficulties were incurred. The plant did not meet any of the emergency action level criteria which would require declaring

an unusual event. The Unusual Event was terminated at 12:55 a.m. (CDT) on September 9, 1994, with the plant stable in hot standby (Event Number 27762).

9.2 Conclusion

A review of this event verified that the Unusual Event was declared at the discretion of the shift supervisor and that timely notifications were made to state and local emergency response agencies and the NRC in accordance with approved procedures.

ATTACHMENT 1

1 PERSONS CONTACTED

1.1 Licensee Personnel

- *D. L. Andrews, Senior Nuclear Engineer
- R. L. Biggs, Supervisor, Quality Systems
- *O. P. Bulich, Manager, Licensing
- *J. J. Fisicaro, Director, Nuclear Safety
- R. W. Frayer, Manager, Materials, Purchasing and Contracting
- *J. Holmes, Superintendent, Chemistry-Environment
- *J. F. Hurst, Senior Emergency Planner
- *R. K. Jobe, Senior Emergency Planner
- *M. N. Jones, Senior Operations Instructor
- *L. G. Lewis, Manager, Training
- *R. L. Love, Senior Emergency Planner
- R. C. Lundholm, Operations Engineering Supervisor
- *J. R. McGaha, Vice President, River Bend Station
- *W. H. Odell, Superintendent, Radiation Control
- B. R. Ricketts, Senior Emergency Planner
- *M. B. Sellman, General Manager
- *W. M. Smith, Manager, Emergency Planning
- *J. Summers, Licensing Specialist
- K. Y. Swanzy, Emergency Planner III
- *W. J. Trudell, Operations Superintendent
- *J. E. Venable, Manager, Operations
- *L. W. Woods, Supervisor, Operations Training
- *G. A. Zinke, Manager, Quality Assurance

1.2 NRC Personnel

- *C. E. Skinner, Resident Inspector

The inspectors also held discussions with and observed the actions of other station and corporate personnel.

*Denotes those present at the exit interview.

2 EXIT MEETING

The inspectors met with the licensee representatives and other personnel indicated in Section 1 of this Attachment on January 13, 1994, and summarized the scope and findings of the inspection as presented in this report. The licensee did not identify as proprietary any of the materials provided to, or reviewed by, the inspection team during the inspection.

ATTACHMENT 2

EMERGENCY PREPAREDNESS INSPECTION SCENARIO NARRATIVE SUMMARY

Simulation Facility: River Bend Station

Initial Conditions: (IC-14) 84% Power, EOL, XE equilibrium, coastdown. The "C" normal and "A" standby SSW, and "A" MFP are out of service. "A" condensate pump tripped last shift; troubleshooting in progress. Initial reports indicate breaker failure. Latest RCS sample results: fuel pin leakage, at .15 microcurie/gram, but below T/S limits; off-gas pretreatment levels are 1000mr/hr. Hydrogen concentration slightly higher than normal. The plant manager has given permission to operate with MFPs above 300 amps. Time is 3:45 AM, Sunday morning.

Sequence of Events: Fire is reported in the vicinity of the "A" MFP. The local operator reports he has discharged one portable extinguisher, but the fire is still not out. The fire brigade is dispatched to the scene. The fire brigade leader calls back after 10 minutes and reports the fire is out. The crew may declare a Notice of Unusual Event based on the fire lasting 10 minutes in the protected area, not endangering safety-related equipment (Emergency Implementing Procedure EIP-2-002, #10.)

High turbine vibrations are noted in the Control Room. The main turbine mechanically fails 30 seconds later, initiating a turbine, generator, and reactor trip, and causing penetration damage to the casing and the turbine biological shield wall. The fire brigade leader, and then the turbine building operator, call in to report an explosive noise from the turbine deck, and the turbine operator reports a large cloud of steam above the turbine that has quickly dissipated. The operator goes to the mezzanine to investigate and calls back to report visible damage to the turbine casing around the HP turbine, and that he can see the spinning turbine. This constitutes an Alert (Emergency Implementing Procedure EIP-2-003, #15.) The crew may break vacuum, which will initiate a main steam isolation; however, the inboard and outboard C MSIV's will not close, and the F098C stop valve will also not close.

A steam line break occurs in steam tunnel C. This is indicated by steam flow in C main steam line, high tunnel temperature and differential temperatures. This constitutes an unisolable steam break outside containment, and is a Site Area Emergency (Emergency Implementing Procedure EIP-2-004, #3.1.). An operator who was nearby when the break occurred is burned, but

he is conscious if not coherent. Another operator informs the control room of the injured man and the location of the steam break, which is continuing. The crew should begin depressurizing by opening an SRV and should dispatch a medical assistance team for the injured man.

At this point, the B recirculation pump seal fails, initiating a small LOCA. This transient worsens the pin failures by several orders of magnitude, and radiation levels are subsequently reported both on and off site. This constitutes a General Emergency (Emergency Implementing Procedure EIP-2-005, #2.1 or #2.5.) The crew continues to depressurize to stop the release and refill the vessel. If the depressurization is complete before the radiation levels in the reactor coolant and on/off site are high enough to classify as a GE, then a large LOCA (DBA) will occur, and multiple injection systems will fail, allowing reactor pressure vessel level to reduce to below TAF (Emergency Implementing Procedure EIP-2-005, #2.2 or #2.3.)

EMERGENCY PREPAREDNESS INSPECTION SCENARIO EVENTS

Simulation Facility: River Bend Station

Specific malfunction codes and scenario timing:

Initial Conditions: 71, 146E2-10, 146F-10, 96-100

Event	Time	Malf.	Description
1	1 min		Fire reported in the vicinity of the A MFP. Fire brigade is dispatched to investigate. Crew may declare a NOUE.
2	6 min 7 min	110 114	High vibrations in the main turbine. After 1 minute, the turbine, generator, and reactor trips. The crew enters the abnormal and conducts immediate actions.
3	15 min	FO-22/28C r-on, s-ost FO-98C g-off, s-o HS24A-D s-bypass	The crew will break vacuum based on reports and indications of a turbine casing failure. The C MSIV's will not close, and C stop valve will not operate. The turbine casing rupture constitutes an ALERT.
4	27 min	99b	A steam leak occurs in the C steam tunnel, outside containment. It is unisolable from the control room. This constitutes a SAE. The crew will commence rapid depressurization using SRVs.
5	32 min	36 142-30% 43-200 146F 44	Recirc Pump seal fails, causing a small LOCA. Fuel pin failures worsen by several orders of magnitude and rad levels are reported on and off site. This constitutes a GE. If the reactor is too depressurized to create a release, then a DBA LOCA occurs, with various injection sources disabled. This will reduce reactor pressure vessel level to TAF and require a GE.

NOTE: Various radiation monitors must be manipulated from the control booth to give readings of high radiation in the main steam lines, turbine building, and plant main stack.