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Licensee: North Atlantic Energy Service Company

Facility: Seabrook Generating Station, Unit 1

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EXECUTIVE SUMMARY

Seabrook Station
Full-Participation Emergency Preparedness Exercise Evaluation
June 2-4, 1998
Inspection Report 50-443/98-03

Overall licensee performance during this exercise was adequate as the licensee demonstrated it could implement the emergency plan. Facilities were activated in a timely manner. Classifications and notifications were accurate and timely. Protective action recommendations were appropriate. However, the licensee did not relay important information promptly and was not aggressive in pursuing issues. There was a three hour delay in initiating actions to secure an open steam generator safety relief valve (which was the radiological release path); there were no discussions that correlated increased radiation monitor readings with fuel damage; and reactor coolant chemistry results, indicative of fuel damage, were not actively sought or disseminated once available.

The licensee's critique process was very good. Post-exercise facility debriefs were candid. At the formal critique, the licensee identified numerous issues, in addition to those identified by the NRC. There were good discussions at the critique to develop solutions for the significant issues. Overall, the critique was balanced with positive and negative findings and was appropriately self-critical.

Report Details

P4 Staff Knowledge and Performance

a. Exercise Evaluation Scope

During this inspection, the inspectors observed and evaluated the licensee's biennial full-participation exercise in the simulator control room, the technical support center, the operations support center, the emergency operations facility, and the media center. The inspectors assessed licensee recognition of abnormal plant conditions, classification of emergency conditions, notification of offsite agencies, development of protective action recommendations, command and control, communications, and the overall implementation of the emergency plan. In addition, the inspectors observed the post-exercise critique to evaluate the licensee's self-assessment of the exercise.

b. Emergency Response Facility Observations and Critique

Simulator Control Room (SCR)

The SCR crew quickly recognized and appropriately classified the simulated increase in radiation levels in the primary auxiliary building (PAB) as an alert. Activation of the emergency response organization (ERO) was performed promptly. The states were notified within 15 minutes of event declaration and the NRC was notified within one hour as required. The crew appropriately activated the emergency response data system at the alert classification. Crew members reviewed the emergency action levels to anticipate potential classification escalation. There was also good discussion about detecting increases in reactor coolant system (RCS) activity since the letdown radiation monitor was being affected by the high radiation levels in the PAB.

Technical Support Center (TSC)

The TSC was staffed in accordance with the emergency plan and activated 40 minutes after the alert declaration. Command and control of the TSC staff was generally good. The technical services coordinator, responsible for overall coordination and prioritization of maintenance activities and radiation protection, showed excellent command and control of the resources at his disposal. The site emergency director (SED) classified emergency conditions, with the counsel of operations department members of his staff, in a timely and accurate manner. The SED appropriately evaluated the possibility of de-escalating the emergency classification. The SED reminded the TSC staff on occasion to keep the noise level to a minimum. He conducted facility briefings at regular intervals and was flexible to interrupt briefings when required by plant conditions and to relax the frequency of briefings when this practice was appropriate. On one occasion, however, he failed to explicitly request a core damage assessment based on available RCS chemistry data.

While adequate protective actions for site workers were automatically taken when the site was evacuated at the alert declaration, the TSC was slow to direct a detailed characterization of the radiological hazards onsite. The TSC did not organize onsite radiological survey teams until three hours after the beginning of the release. Also, the health physics coordinator (HPC) did not update the radiological status boards in the TSC beyond the initially reported radiation levels in the PAB. Only informal habitability surveys in the TSC were conducted. The HPC did not survey the entire area of the TSC and the control room. He did not issue dosimetry until 80 minutes after TSC activation, which was after the initiation of the radiological release. The inspectors noted that a significant portion of the HPC's time was spent communicating with the OSC and analyzing radiation monitor channel readings, such that the above listed tasks were not adequately performed.

There was some confusion on the part of the operations technician as to whether the TSC was responsible for developing a protective action recommendation (PAR) when the site area emergency was declared. Although the other facility managers in the TSC agreed that responsibility for PAR development rested with the response manager in the emergency operations facility, Step 2.1.7 of Technical Support Center Operations, ER 3.1, indicates that PARs to offsite authorities is a SED responsibility that may not be delegated. The inspectors informed the licensee of the procedural discrepancy.

The TSC staff took a protracted amount of time to evaluate the radiological release and formulate a plan to stop it. The release path was via a stuck open safety relief valve (SRV) on the steam line of a steam generator (SG) with a ruptured U-tube. Although the TSC staff received a report that the SRV was open shortly after the release began, a team was not dispatched to verify that the SRV was stuck open until nearly three hours after the release began and nearly one hour after the radiological consequences of the release exceeded the general emergency (GE) threshold. Early confirmation of the release path and timely action to stop the release could have precluded the GE condition. The failure of the TSC staff to take timely action to assess and mitigate the release is considered an exercise weakness (IFI 50-443/98-03-01).

The TSC staff also delayed approximately 45 minutes from the time that RCS radiochemistry results were available until they used that information to calculate a core damage assessment. The HPC had received the information in the TSC but did not announce it until the facility brief was conducted 15 minutes later. When he did announce the information, he did not announce all of the sample results. The SED did not order a core damage assessment as soon as he was informed that the chemistry results were available. The engineering coordinator, also aware that the results were available, did not pursue the data so that a immediate core damage assessment could be performed. Although not a time critical activity, better coordination of the data from the RCS sample would have eliminated the delays in obtaining core damage assessment.

Operations Support Center (OSC)

The OSC was staffed and activated in a timely manner following the alert declaration. Generally there was good command and control demonstrated as repair team status was tracked, priorities were assigned and changed as plant conditions changed, and frequent and informative briefings were provided by the OSC coordinator. Some minor communications discrepancies were observed in the OSC. There was some initial confusion between the OSC and security regarding the number of personnel at the 25 foot level in the PAB shortly after the demineralizer filter was dropped. There was lack of specificity when referring to emergency feedwater pumps (turbine driven versus motor driven) since both had been experiencing problems simultaneously. Finally, no one corrected the OSC communicator when he referred to the SRV valve as the atmospheric dump valve. There were no adverse effects caused by these communications discrepancies.

Emergency Operations Facility (EOF)

The EOF was staffed and activated within 50 minutes of the alert declaration. Throughout the exercise, EOF personnel performed their response duties in a calm and orderly manner. However, discrepancies were observed involving the dissemination, display, and updating of plant process and event information. For example, the radiological conditions status board had not been updated prior to 11:12 a.m. to reflect data gathered by the field survey teams (FSTs). Plant parameters were being manually plotted every 15 minutes on small charts that were difficult to interpret from more than a few feet away. Additionally, the infrequent plotting resulted in a loss of information, for example, plots did not reflect that reactor vessel level had temporarily dropped below 100%. Several of the plant data monitor displays were of poor quality and difficult to interpret. The EOF staff did not display a questioning attitude when reviewing plant data that resulted in one instance where incorrect information was provided to State representatives. Specifically, pressurizer level indication dropped rapidly just prior to the 11:45 a.m. briefing with the States. However, when this data was initially presented at the briefing, the States were informed that "plant conditions were stable." This information was corrected later during the same briefing. Also, when offsite dose projections significantly increased, the EOF staff did not brief the States on the possibility of fuel or cladding damage in a timely manner. There was no significant adverse impact observed as a result of these issues.

Staffing of the dose assessment function and FSTs at the EOF was timely in that they were fully staffed within approximately 35 minutes of the alert declaration. FST preparations were thorough and methodical, and the teams were dispatched within 70 minutes of the alert declaration. Appropriate radiation protection measures were taken for FST members in that they were supplied with protective clothing, radiation exposures were frequently reported and tracked, and use of potassium iodide was appropriately evaluated. Throughout the drill, communications between FSTs and the EOF were clear, frequent, and included proper repeat backs.

The dose assessment specialist (DAS) directed the dose assessment function, evaluated meteorological and radiological conditions, and briefed and advised the EOF coordinator (EOFC). The EOFC informed the response manager (RM) of changing radiological conditions, advised the RM in developing and communicating the PARs to state representatives. The EOFC kept the DAS apprised of changing plant conditions that could affect offsite releases, allowing the meteorological post accident computer (METPAC) operator to perform "what if" dose calculations. In one case, the EOFC informed the DAS that high differential pressure across the SG could result in further U-tube damage and increase the radiological release. The METPAC operator also provided updates of projected off-site dose every 15 minutes.

Some discrepancies were identified. It was observed that dose assessment personnel did not immediately react to an initial increase in the main steam line monitor dose rates at 10:00 a.m. when a SG U-tube rupture occurred, as it was not referenced in logs, discussions were not observed, and no immediate METPAC calculations were initiated. When radiation levels significantly increased at approximately 11:45 a.m., dose assessment personnel appropriately concentrated on METPAC runs but did not specifically inform the EOFC that fuel damage may have occurred. Knowledge of the existence of core damage at that time in the scenario was secondary to responding to its effects (i.e., high radiation monitor readings). However, the EOF staff should have been informed of the possibility of core damage. Finally, it was observed that radiological boundaries established outside of the EOF were sagging which may have been a causal factor for the subsequent radiological boundary violations that licensee personnel observed. However, the overall performance of the dose assessment team was effective in that they were able to make timely projections of offsite dose based on main steam line dose rates, allowing for the proper classification of the exercise event as a GE.

Media Center (MC)

This was the first exercise in which the EOF and the MC were co-located and resulted in some re-arrangement of the EOF to accommodate the MC. The MC was well equipped. For example, in addition to television and radio monitoring capabilities, the licensee has the capability to monitor and to disseminate information via the Internet. The licensee implemented positive measures to restrict media personnel from accessing and interfering with the EOF functions. There was good media simulation observed in the media response room. Overall, the MC functioned well and did not result in overcrowding of the EOF building.

Licensee Exercise Critique

Immediately following the exercise, the licensee began its critique process with players, as well as controllers, providing candid debriefs. At the formal licensee critique on June 4, 1998, the licensee identified issues in addition to the ones identified by the inspectors. Positive and negative items were noted. Discussions regarding solutions to several significant issues took place. Overall, the critique was thorough and appropriately self-critical and was assessed as very good.

c. Overall Exercise Conclusions

Overall licensee performance during this exercise was adequate as the licensee demonstrated it could implement the emergency plan. Facilities were activated in a timely manner. Classifications and notifications were accurate and timely. Protective action recommendations were appropriate. However, the licensee did not relay important information promptly and was not aggressive in pursuing issues. There was a three hour delay in initiating actions to secure an open steam generator safety relief valve (which was the radiological release path); there were no discussions that correlated increased radiation monitor readings with fuel damage; and reactor coolant chemistry results, indicative of fuel damage, were not actively sought or disseminated once available.

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P8 Miscellaneous EP Issues

P8.1 Scenario Preparation and Control

An in-office review of the exercise objectives and scenario was conducted by the inspectors prior to the exercise. It was determined that the scenario supported the demonstration of the stated objectives and satisfactorily exercised a significant portion of the emergency response capabilities.

P8.2 Updated Final Safety Analysis Report (UFSAR) Review

A recent discovery of a licensee operating their facility in a manner contrary to the UFSAR description highlighted the need for a special focused review that compares plant practices, procedures, and/or parameters to the UFSAR or the emergency plan. During this exercise, the inspectors observed the licensee's compliance with the emergency plan regarding ERO staffing, facility activation, procedural usage, classification of simulated events, and notification of offsite agencies. No discrepancies were observed.

P8.3 Review of Licensee Changes to the Emergency Plan and Implementing Procedures

The inspectors conducted an in-office review of changes made to the emergency plan and implementing procedures submitted to the NRC under the provisions of 10 CFR 50.54(q). Based upon the licensee's determination that the changes did not decrease the effectiveness of the emergency plan, no NRC approval is required in accordance with 10 CFR 50.54(q). A list of the changes that were reviewed is included in Attachment 1 to this report.

V. Management Meetings**X1 Exit Meeting**

The inspector presented the inspection results to members of licensee management at the conclusion of the inspection on June 4, 1998. The licensee acknowledged the inspectors' findings.

INSPECTION PROCEDURES USED

82301: Evaluation of Exercises for Power Reactors

82302: Review of Exercise Objectives and Scenarios for Power Reactors

ITEMS OPENED, CLOSED, AND DISCUSSED

Opened

IFI 98-03-01

The TSC did not promptly initiate action to re-seat a stuck open SG safety relief valve which could have precluded a GE condition.

Closed

None

Discussed

None

LIST OF ACRONYMS USED

DAS	Dose Assessment Specialist
EOF	Emergency Operations Facility
EOFC	Emergency Operations Facility Coordinator
ERO	Emergency Response Organization
FST	Field Survey Team
GE	General Emergency
METPAC	Meteorological Post Accident Computer
MC	Media Center
OSC	Operations Support Center
PAB	Primary Auxiliary Building
PAR	Protective Action Recommendation
RCS	Reactor Coolant System
RM	Response Manager
SCR	Simulator Control Room
SED	Site Emergency Director
SG	Steam Generator
SRV	Safety Relief Valve
TSC	Technical Support Center
UFSAR	Update Final Safety Analysis Report

ATTACHMENT 1

EMERGENCY PLAN AND IMPLEMENTING PROCEDURES REVIEWED

Document	Document Title	Revision(s)
	Seabrook Station Radiological Emergency Plan	27
ER 1.1	Classification of Emergencies	27 Change 1
ER 1.2	Emergency Plan Activation	30 Change 1, 31
ER 3.1	Technical Support Center Operations	26 Change 1, 27
ER 3.3	Emergency Operations Facility Operations	21 Changes 1, 2, 3; 22
ER 3.4	Seabrook Station News Services Operations	11
ER 3.5	Media Center/Joint Telephone Information Center	18
ER 3.6	Assembly Area Operations	14
ER 4.3	Radiation Protection During Emergency Conditions	15
ER 5.2	Site Perimeter and Offsite Monitoring and Environmental Sampling	25
ER 5.3	Operation of METPAC System	15