

U.S. NUCLEAR REGULATORY COMMISSION

REGION III

Report Nos. 50-254/92004(DRSS); 50-265/92004(DRSS)

Docket Nos. 50-254; 50-265

License Nos. DPR-29; DPR-30

Licensee: Commonwealth Edison Company
Opus West III
1400 Opus Place
Downers Grove, IL 60515

Facility Name: Quad Cities Nuclear Generating Station, Units 1
and 2

Inspection At: Quad Cities site, Cordova, IL

Inspection Conducted: April 27-May 1, 1992

Inspectors:

J. McCormick-Barger for
Thomas Ploski

5/19/92
Date

Charles Cox
Charles Cox

5/18/92
Date

Accompanying Personnel: H. Petersen
R. Doornbos
B. Vesper

Approved By:

J. McCormick-Barger
J. W. McCormick-Barger, Chief
Emergency Preparedness Section

5/19/92
Date

Inspection Summary

Inspection on April 27-May 1, 1992 (Report Nos. 50-254/92004(DRSS); 50-265/92004(DRSS))

Areas Inspected: Routine, announced inspection of the Quad Cities Nuclear Generating Station's annual Emergency Preparedness (EP) exercise, involving review of the exercise scenario (IP 82302); observation of key functions and locations during the exercise (IP 82301); review of actual emergency plan activations and other aspects of the operational status of the EP program (IP 82701). Six NRC inspectors observed the exercise. Review of the EP program's operational status involved two inspectors.

Results: No violations, deficiencies, or deviations were identified.

The licensee's overall response to scenario events was adequate. The most challenging aspect of the scenario was that unrelated equipment degradations led to a Site Area Emergency declaration for each unit prior to the General Emergency declaration. Other challenging aspects included the dispatch of over 20 inplant teams from the Operational Support Center; deployment of offsite radiological monitoring teams; and activation of the Joint Public Information Center.

Four exercise performance concerns were identified and discussed in Section 5. The shift engineer initially underclassified degraded plant conditions as warranting an Unusual Event declaration. When advised that an Alert declaration was warranted, he did not halt ongoing preparations to inform State and NRC officials of the erroneous Unusual Event declaration. Control room simulator staff did not initially notify State officials of the Unusual Event and the Alert in a timely manner. Technical Support Center (TSC) staff failed to initially notify State officials in a timely manner following the Site Area Emergency declaration. Status boards in the Emergency Operations Facility were generally not updated in a timely manner and should have included information on offsite protective actions and offsite survey teams' results.

Regarding the operational status of the Emergency Preparedness program, State and NRC officials were initially notified in a timely and adequately detailed manner following the six actual emergency declarations which were correctly made since November 1991. The emergency response facilities remained well maintained. The Operational Support Center was moved to a more suitable location, while several refinements were made to the TSC's layout. The emergency response organization remained well staffed. Personnel were currently trained. Training activities were in excess of the commitments in the emergency plan.

DETAILS

1. NRC Observers and Areas Observed

T. Ploski, Control Room Simulator (CRS), Technical Support Center (TSC), Emergency Operations Facility (EOF)
H. Petersen, TSC
R. Doornbos, CRS, TSC, EOF
C. Cox, EOF
J. McCormick-Barger, EOF
B. Vesper, OSC, Inplant Teams

2. Licensee Representatives

E. Eenigenburg, General Manager, BWR Operations
G. Spedl, Production Superintendent
G. Tietz, Technical Superintendent
J. Sirovy, Services Director
J. Hoeller, Training Supervisor
K. Okland, Nuclear Quality Programs
R. Carson, Corporate Emergency Planning Supervisor
D. Hoogheem, Emergency Planning Coordinator
L. Kreuder, Emergency Planning Coordinator
J. Johnson, Emergency Planning Instructor
D. Kan kares, Regulatory Assurance Coordinator
K. Jackson, Corporate Emergency Planner

The above and 20 other licensee personnel attended the NRC exit interview on April 30, 1992. The inspectors also contacted other licensee personnel during the inspection.

3. General

An announced, daytime exercise of the Quad Cities Nuclear Generating Station's Emergency Plan was conducted at the Quad Cities Station on April 29, 1992. The exercise tested the capabilities of licensee, State and local governments' emergency organizations to respond to an accident scenario resulting in a simulated major release of radioactive effluent. The State of Iowa, as well as Clinton and Scott Counties in Iowa, fully participated in the exercise. Participation in Illinois was limited to the Illinois Department of Nuclear Safety. The Federal Emergency Management Agency (FEMA) granted a request from the Illinois Emergency Management Agency to postpone that agency's partial exercise participation, as well as the full scale participation of Rock Island and Whiteside Counties in Illinois, until a later date in 1992. NRC Region III participated in this exercise activating its Incident Response Center and dispatching a (predeployed) Site Team.

The attachments to this inspection report summarize the licensee's exercise objectives and the exercise scenario.

4. General Observations

a. Procedures

This exercise was conducted in accordance with 10 CFR Part 50, Appendix E requirements, using the licensee's Generating Stations Emergency Plan (GSEP) and related implementing procedures.

b. Coordination

The licensee's response was coordinated, orderly and, with several significant exceptions, timely. If scenario events had been real, the actions taken by the licensee would have been sufficient to mitigate the accident and allow State and local authorities to take appropriate actions to protect the public's health and safety.

c. Observers

The licensee's controllers and evaluators monitored and critiqued this exercise, as was independently done by six NRC observers. The performances of State and local governments' responders in Iowa were evaluated by representatives of FEMA Region VII, who will document their findings in a separate report to be issued by FEMA.

d. Exercise Critique

The licensee held critiques in each facility with the participants immediately following the exercise. The licensee conducted a summary critique on April 30, 1992, in order to present its self-identified strengths and weaknesses. The inspectors presented the NRC's preliminary findings, which were developed independently, during an exit interview with the licensee on April 30, 1992. On May 1, 1992, an inspector summarized the NRC's preliminary inspection findings at a Public Critique hosted by FEMA Region VII in Cordova, Illinois.

5. Specific Observations (IP 82301)

a. Control Room Simulator (CRS)

The CRS was utilized during this exercise to provide a more realistic challenge to the control room crew and to minimize the impact of the exercise on activities in the station's actual control room. Since the CRS was designed to represent the Unit 1 portion of the control room and the exercise scenario involved both units, flip charts and alarm message sheets were used in the CRS to represent Unit 2.

Activities in the CRS were observed until approximately 9:30 a.m. During that time period the Shift Engineer (SE) in charge of CRS personnel effectively directed his staff in responding to the automatic shutdown of Unit 2 and the failure of a transformer associated with Unit 1. CRS personnel demonstrated good teamwork and proper procedure usage from an operations viewpoint when responding to these changes in plant conditions. However, the response of CRS personnel to these events was inadequate in several respects regarding implementation of the Emergency Plan, as described in the following paragraphs.

The scenario postulated that one of Unit 2's low pressure turbines failed, resulting in turbine blades being discharged through the turbine's casing. This damage also caused a release of hydrogen gas. A workman performing maintenance within the nearby exciter's housing was postulated to have been overcome by the release of hydrogen gas into this relatively confined workspace. Hydrogen gas was also released onto the turbine deck.

At 7:43 a.m., CRS personnel received a report from an equipment attendant that an explosion was heard coming from one of the Unit 2 turbines and that a hole was visible in its casing. The SE ordered a shift foreman and a radiation protection technician to proceed to the scene. The SE and Unit 2 operators then focused their attention on responding to the automatic shutdown of Unit 2.

The Shift Control Room Engineer (SCRE) then began reviewing the station's Emergency Action Levels (EALs) used to classify emergency conditions. The SCRE was soon relieved of this task by the SE so that the SCRE could fulfill his shift technical advisor duties for the Unit 2 shutdown. At 7:57 a.m., the SE prudently ordered the precautionary evacuation of the entire

turbine deck, with the exception of the damage assessment team.

By 8:00 a.m., the center desk Nuclear Station Operator (NSO) received and relayed the following reports from the damage assessment team: an 18 inch crack was visible in the turbine's casing; pieces of turbine blades were spread around the area; local radiation levels were slightly elevated; and no injured personnel had been found. Several minutes later, another report was relayed to the SE which indicated the presence of a hydrogen gas leak. The SE verified that the turbine deck was being evacuated.

The SE was soon told that an injured worker had been found somewhere on the turbine deck and that onscene personnel had requested an ambulance. The SE directed his staff to call for an ambulance and to inform station security and radiation protection staff that an ambulance was expected.

The SE then announced that he was declaring an Unusual Event for unspecified "conditions warranting the increased attention of offsite officials". Two communicators quickly arrived in the CRS and began filling out proceduralized message forms to State and NRC officials for the Unusual Event declaration.

The SE was then informed that the victim had no pulse and was not breathing. It was uncertain whether the victim was contaminated by radioactive material. The SE was also told that onscene personnel were beginning attempts to revive the victim. The SE briefly reviewed the EALs and incorrectly concluded that the Unusual Event declaration was still adequate.

About five minutes later, a senior reactor operator scanned the EALs and correctly recommended that an Alert be declared for a "turbine failure causing casing penetration". The SE accepted this recommendation and correctly declared an Alert at 8:10 a.m.

However, the SE failed to recognize that his earlier Unusual Event declaration was an error. No one stopped the two communicators from continuing efforts to complete initial notification message forms for the Unusual Event and then attempting to contact State and NRC officials regarding this "underclassification". No one apparently recognized that the Unusual Event EAL for "conditions warranting increased attention by offsite officials" was not equivalent to the Unusual

Event EAL for "transport of a contaminated injured victim to an offsite medical facility". No one gave the communicators information to relay to offsite officials regarding what were the unspecified "conditions warranting their increased attention". Consequently, the communicators proceeded under the assumption that the discovery of an injured worker requiring offsite transport constituted the basis for the Unusual Event declaration, as indicated by mention of this victim in the notification messages to State and NRC officials.

The failure to halt communicators from continuing efforts to initially notify State and NRC officials of the incorrect Unusual Event declaration was one factor leading to the untimely initial notifications following the correct Alert declaration. Another factor was an actual operability problem with the dedicated Nuclear Accident Reporting System (NARS) telephone equipment linking the CRS with two Illinois agencies, one Iowa agency and the licensee's System Power Supply Office (SPSO). The NARS equipment malfunction caused one communicator to make separate initial notification calls to those four agencies for both the Unusual Event and the Alert declarations. The second communicator focused on initially notifying NRC officials of these declarations and succeeded in completing this notification in a timely manner.

A licensee is required to have the capability to initially notify State and local officials within 15 minutes of any actual emergency declaration. Unusual circumstances, such as a previously undetected operability problem for a dedicated communications system, resulting in notifications in excess of this time limit may be considered acceptable on a case by case basis, providing that the licensee demonstrated best efforts to promptly complete the notifications.

Illinois officials were initially notified 30 minutes after the incorrect Unusual Event declaration, while Iowa officials were not notified for about 34 minutes. Illinois officials were initially notified of the correct Alert declaration about 68 minutes after that declaration, while Iowa officials were not notified of the Alert until about 84 minutes after that declaration. The failure of CRS personnel to initially notify Illinois and Iowa officials in a timely manner following the SE's emergency declarations is an Exercise Weakness (50-254/92004-01 and 50-265/92004-01).

CRS personnel did not seek information from the accident scene regarding the specific location where the victim had been working or what the onscene personnel believed had caused the victim's condition. There was an apparent assumption in the CRS that the victim had been injured by flying debris. The scenario postulated that a Site Area Emergency would be declared per the EAL condition that "toxic or flammable gas (hydrogen, in this case) in life threatening concentration was present in a vital area (within the exciter's housing)". The failures of the SE to correctly assess accident conditions warranting an Alert declaration in a timely manner and to seek additional information from the accident scene in order to determine the potential for an emergency reclassification is an Exercise Weakness (50-254/92004-02 and 50-265/92004-02).

Shortly before 9:00 a.m., the Technical Support Center's (TSC's) Station Director (SD) informed the CRS that he was ready to relieve the SE of overall command of onsite emergency response efforts and that TSC staff were ready to assume their duties. In order to preserve the scenario's timeline and to avoid an artificial delay in having TSC staff begin performing their duties, exercise controllers issued the contingency message for the Site Area Emergency declaration to the SD rather than to the SE.

No violations or deviations were identified; however, two Exercise Weaknesses were identified.

b. Technical Support Center (TSC)

The TSC was activated following the Alert declaration in accordance with procedures. The facility was fully operational within 30 minutes.

After the SD was given the contingency message to declare a Site Area Emergency for "toxic or flammable gas at life threatening levels in a vital area," a communicator was tasked with completing the associated initial notification message to Illinois and Iowa officials. The communicator encountered the same operability problem with the dedicated NARS telephone equipment as did his CRS counterpart. This equipment problem was repaired during the exercise.

Iowa officials were initially notified of the Site Area Emergency declaration for Unit 2 conditions roughly 30 minutes after that declaration, while Illinois officials were initially notified within about 40

minutes. The SD and SE had agreed that the CRS's communicator would complete notifications to both States regarding the Alert, while a TSC communicator would notify the States of the Site Area Emergency. However, Iowa officials were initially notified of the 8:00 a.m. Site Area Emergency declaration several minutes before they were informed of the 8:10 a.m. Alert declaration. Iowa officials were apparently confused by these notification calls coming from the several onsite facilities. It was unclear whether the State's message verification callbacks for one or both notifications should be made to the TSC or to the CRS. The untimely initial notifications of Illinois and Iowa officials following the Site Area Emergency declaration is an Exercise Weakness (50-254/92004-03 and 50-265/92004-03).

The SD ordered that all onsite personnel assemble and be accounted for following the Site Area Emergency declaration. All persons were accounted for within an acceptable 21 minutes of the sounding of the plant's siren. The simulated evacuation of nonessential onsite personnel was then ordered.

At 10:25 a.m., Unit 1 experienced a turbine trip and a reactor trip with the failure of some control rods to fully insert into the reactor core. Key TSC staff promptly recognized that this event warranted a Site Area Emergency declaration for Unit 1. In accordance with procedural guidance, the SD correctly declared a General Emergency at 10:38 a.m. due to unrelated degradations in plant conditions which warranted multiple Site Area Emergency declarations.

The Radiation Protection (RP) Director proposed an offsite Protective Action Recommendation (PAR) for this declaration, which was to take shelter within a two mile radius of the plant and to take shelter in sectors downwind from the plant. Before this recommendation was adopted, the RP Director was told that a radiological release had begun. The RP Director interrupted the SD's teleconference with a counterpart in the Emergency Operations Facility (EOF) to inform both managers of this major development.

The RP Director directed that an offsite dose calculation be immediately performed. He quickly reviewed the calculations and procedural guidance for offsite PARs. The RP Director then correctly recommended that the area within a two mile radius of the plant be evacuated and that downwind sectors be evacuated between two and ten miles from the plant.

The SD accepted this recommendation and so advised his EOF counterpart. An exercise controller then issued a contingency message for an overly conservative PAR deemed necessary to support the exercise objectives of State and county agencies. Illinois and Iowa officials were initially informed of the General Emergency declaration and the associated offsite PAR in a timely manner.

Meanwhile, the Technical Director correctly recognized that Unit 1's release rate satisfied another EAL criterion for a General Emergency declaration.

In general, status boards were updated at about a thirty minute frequency. Updating of at least some status boards should have been more timely. For example, once Unit 1 conditions had degraded further than the relatively stable Unit 2, Unit 1 information on the plant parameter status board should have been promptly posted.

Key TSC staff demonstrated the capability to adequately monitor and distinguish degraded conditions associated with each Unit. The SD conducted periodic discussions with his technical directors, which may have been more beneficial had each director always been required to summarize progress on tasks related to his area of expertise. TSC staff should have further analyzed whether the stuck open reactor building vents were a second release path prior to their closure.

No violations or deviations were identified; however, one Exercise Weakness was identified.

c. Operational Support Center (OSC) and Inplant Teams

The OSC was activated following the Alert declaration and was fully operational within 15 minutes. A contamination control point was established at the entrance to the OSC. Contamination control was effectively maintained within the facility during the exercise.

The OSC Director and the OSC Supervisor effectively managed the maintenance technicians and Radiation Protection Technicians (RPTs) assigned to the facility. Status boards were effectively used to identify individuals having certain areas of expertise who were available for assignment, as well as the persons assigned to teams already dispatched. The simulated radiation exposures of inplant team members were adequately tracked and documented. Teams were quickly

formed; however, several teams could have been dispatched in a more timely manner after being briefed. The director and supervisor maintained adequate communications with TSC decisionmakers and kept OSC staff adequately informed of changing plant conditions.

Approximately 22 inplant teams were dispatched from the OSC during the exercise. An inspector accompanied one inplant repair team and observed a number of other teams as they were being briefed or debriefed in the OSC. Briefings and debriefings were thorough with respect to the repair tasks and simulated radiological conditions. The teams exhibited very good understandings of their assigned tasks. Team members were issued appropriate dosimetry. Teams were accompanied by RPTs whenever appropriate.

Deployed inplant teams were kept adequately informed of changing plant conditions. For example, a team sent to attempt to close several main steam isolation valves was halted when the associated radiation levels were correctly determined to have become prohibitive.

There were many instances where inplant teams simulated the use of protective clothing and self-contained breathing apparatus. The use of protective clothing would have added greater realism to the response effort and allowed a better assessment of the adequacy of available supplies of these items.

No violations or deviations were identified.

d. Emergency Operations Facility (EOF)

The EOF was activated following the Site Area Emergency declaration. Access control was adequately established and maintained. Incoming staff prepared to perform their duties in a very efficient, orderly manner.

The Manager of Emergency Operations (MEO) and his key aides completed a comprehensive briefing with the TSC's SD and NRC Site Team representatives prior to the MEO assuming overall command of the licensee's response. The MEO had been assured by his key aides that their groups were adequately staffed and ready to assume their responsibilities from TSC counterparts by 10:30 a.m; however, the TSC's SD correctly requested to maintain command and control until short term actions associated with the General Emergency reclassification had been completed by TSC staff. These actions included the development of an initial offsite PAR

and the initial notification of State and NRC officials.

Management discussions involving the MEO, his key aides and NRC Site Team counterparts were very good and were an excellent source of current information. The discussions, in conjunction with conference calls with State agencies, were also effectively used to share information and concerns. EOF staff were briefed after each management discussion.

EOF staff experienced problems in obtaining copies of NARS message forms that had earlier been generated by onsite counterparts. For example, as late as 10:30 a.m., the EOF was displaying the first NARS message form regarding the Unusual Event and the Alert, even though a Site Area Emergency had been declared about 90 minutes earlier. This information flow problem did not become significant since the EOF staff was frequently briefed on the current plant status and the corresponding emergency classification. However, the outdated information on a status board replicating a NARS message form could have been misleading to incoming licensee, State and NRC personnel.

Other status boards in the EOF were not well maintained. Most of the information flow within the EOF came from the management discussions that were verbally summarized to the staff within the EOF. The timeliness and overall quality of the verbal information may have contributed to the incomplete and untimely updating of information presented on the status boards. However, the heavy reliance on briefings as the main method of updating the bulk of the EOF staff could have resulted in subsequent errors by individuals who might fail to accurately recall all relevant briefing items.

The licensee's protective measures group in the EOF was efficient in assuming control of the offsite radiological monitoring teams and performing offsite dose assessments. Individuals within the protective measures group maintained records of the locations and survey results of the licensee's monitoring teams', as well as similar information obtained regarding the activities of the State's monitoring teams. However, no status boards were used to display information regarding the locations and results of the monitoring teams. As a result, members of the NRC Site Team found it necessary to disrupt their licensee counterparts in

order to learn about the activities of the offsite survey teams.

The MEO, his key aides and key Site Team personnel were well aware of the TSC SD's offsite PAR and were aware of what protective actions Illinois and Iowa officials had chosen to implement. However, such information was not displayed on an EOF status board for the benefit of other personnel in the facility.

In summary, overall usage of status boards within the EOF was inadequate with respect to both the timely updating of information on those status boards that were used and the failure to use provided status boards to display information on offsite protective actions and the results obtained by offsite survey teams. The inadequate use of status boards is an Inspection Follow-up Item (50-254/92004-04 and 50-265/92004-04).

Radiological measurements near the reactor building indicated to personnel in the EOF that there were two release paths. One release path was through the plant stack, while the other leading to a ground level release, was suspected to be through stuck open reactor building vents. Inplant teams were dispatched to close these vents. This task was accomplished without significant radiation exposure to the team members. The EOF staff should have requested information regarding the simulated exposures received by these teams as one means of assessing whether the building vents were a second release path. This exposure information would have indicated that there was no release through the vents. The mistaken belief in a ground level release path through the building vents persisted into the onsite recovery planning discussions.

After a 24 hour time jump in the scenario, key staff in the EOF and TSC were tasked with performing a preliminary recovery discussion. Following the development of action item lists in both facilities, the MEO held a teleconference involving his key aides, senior NRC Site Team representatives and the TSC's SD. Correct decisions were made to remain in a General Emergency and to not recommend any decrease in offsite protective actions until the potential for an unplanned radiological release had been eliminated and comprehensive offsite surveys had been completed. Proper priority was given to restoration of redundant systems to better assure that both reactors would remain in a stable, cold shutdown condition.

No violations or deviations were identified; however, one Inspection Follow-up Item was identified.

e. Offsite Radiological Survey Teams

The licensee deployed two offsite radiological survey teams during the exercise. These teams were not accompanied by NRC evaluators.

Communications between the teams and staff in the TSC and EOF, who were responsible for directing the teams' activities, were observed. The teams were initially deployed downwind of the plant site and were later able to locate and track the simulated plume. Persons directing the teams' activities kept the teams adequately informed of changing plant conditions and demonstrated proper concern for minimizing the teams' simulated exposures, which were documented.

No violations or deviations were identified.

f. Joint Public Information Center (JPIC)

The licensee activated the JPIC, which was located adjacent to the EOF, following the Site Area Emergency declaration. The performance of licensee staff in this facility was not evaluated during this exercise.

No violations or deviations were identified.

6. Exercise Objectives and Scenario Review (IP 82302)

The licensee submitted its proposed scope of exercise participation, objectives and copies of the scenario within the established deadlines. The licensee was responsive to several concerns identified during NRC staff's review of the objectives and the scenario.

The most challenging aspect of the scenario was that it postulated multiple, unrelated equipment degradations which warranted Site Area Emergency declarations for each of the two operating units prior to a General Emergency declaration. Other challenging aspects of the exercise included: use of the OSC, which had been moved in March 1992 to another onsite location; dispatch of approximately 22 inplant teams from the OSC; use of the CRS; interface with remotely located and onscene NRC incident responders; deployment of offsite radiological survey teams; and activation of the JPIC.

No violations or deviations were identified.

7. Exercise Control (IP 82301)

The overall performance of exercise controllers was good. No instances were identified where controllers improperly prompted participants to initiate activities which they might not otherwise have taken.

There were, however, several occasions where controller intervention was necessary to assure adherence to the scenario's timeline and to support the exercise objectives of participating State and county agencies. As indicated in Section 5.a of this report, information in the CRS regarding the Unit 2 turbine failure was insufficient to allow the SE to classify the Site Area Emergency, which the scenario postulated as being due to the presence of toxic or flammable gas at life threatening levels. The lead controller in the CRS delayed issuing a contingency message for this emergency reclassification as long as was possible to allow CRS staff to seek or receive additional information from the turbine deck. When it became apparent that insufficient information would be obtained and that the TSC's SD was ready to assume command and control of onsite response efforts, a good decision was made to issue the contingency message for the Site Area Emergency declaration in the TSC, so that transfer of command to the TSC's SD would not be delayed.

In order to support offsite agencies' exercise objectives, the scenario included a contingency message for an overly conservative offsite PAR. The TSC's lead controller demonstrated good judgement by waiting until decisionmakers discussed PAR options and formulated a procedurally correct offsite PAR before issuing the contingency message for the overly conservative PAR.

No violations or deviations were identified.

8. Licensee Critiques (IP 82301)

The licensee's controllers held critiques with participants in each facility immediately following the exercise. Participants were also requested to complete critique forms. On April 30, a lead controller summarized the licensee's self-identified performance strengths and weaknesses, which were in good agreement with the NRC inspection teams' independent evaluations.

No violations or deviations were identified.

9. Operational Status of the Emergency Preparedness (EP) Program (IP 82701)

a. Actual Emergency Plan Activations

During the period from November 1991 through April 1992, the licensee activated its emergency plan on six occasions. Based on current regulatory guidance and the corresponding criteria in the plant-specific Emergency Action Levels (EALs), all six situations were correctly classified. Initial notifications to Illinois and Iowa officials were completed in an adequately detailed and timely manner. Comparisons of licensee and NRC records indicated that NRC duty officers were initially notified in a timely and accurate manner following each emergency declaration.

Unusual Events were declared on December 16, 1991 and on January 22, 1992 due to the commencement of reactor shutdown in order to comply with the requirements of the plant's Technical Specifications.

An Alert was declared on January 25, 1992, due to the loss of certain control room annunciators for Unit 2 while modifications to other Unit 2 annunciators were in progress. At this time, Unit 2 was in a refueling outage and no fuel was in the reactor vessel. Current regulatory guidance and the licensee's EALs did not indicate that an Alert declaration was inappropriate if the reactor was not in power operation when electrical power to certain annunciators would be disrupted. Power was restored to the annunciators within about 20 minutes after replacement of a fuse.

At 10:40 p.m. on February 14, 1992, an Alert was declared when power was lost to certain Unit 1 annunciators due to a lightning strike which caused a power surge that affected one main fuse associated with some annunciators. Unit 1 was in cold shutdown at the time. Despite icy road conditions, the TSC was adequately staffed within one hour of the Alert declaration. Electrical power to the annunciators was restored following replacement of the blown fuse and inspection of the other fuses for the Unit 1 annunciators.

On April 7, 1992, an Alert was declared due to a loss of certain control room annunciators for Unit 1, which was in power operation. A workman coming down a ladder inadvertently bumped and tripped open a circuit breaker associated with the power supply to the annunciators as well as a vital electrical bus. The loss of power to

that bus resulted in a loss of power to one recirculation pump so that reactor power decreased from about 100 to about 44 percent. The Alert was terminated after electrical power was restored to the vital bus and the associated control room annunciators.

On April 10, 1992, an Alert was declared due to a loss of all Unit 1 and common panel control room annunciators. A contractor installing scaffolding had inadvertently opened a circuit breaker associated with the power supply to these annunciators as well as a vital bus. The loss of power to that bus resulted in a loss of power to one recirculation pump so that reactor power decreased from about 100 to about 40 percent. The Alert was terminated after power was restored to the vital bus and the associated control room annunciators.

The EP coordinators compiled and thoroughly evaluated all licensee records associated with the six actual emergency plan activations. Corrective actions were initiated on several concerns regarding proper completion of notification message forms to offsite officials.

No violations or deviations were identified.

b. Emergency Plan and Procedures

A selected review of Emergency Plan Implementing Procedures (EPIPs) revisions since November 1991 was conducted. The OSC was relocated in March 1992. Appropriate EPIPs were adequately revised to reflect the relocation of this onsite facility.

The provisions for assembling and accounting for all onsite personnel and for evacuating nonessential onsite personnel were described in several EPIPs and associated checklists. Procedure QEP 400-1, "Plant Assembly", was revised to indicate the location of the new OSC. Procedure QEP 400-2, "Site Evacuation", included good guidance to avoid evacuating nonessential onsite personnel into a greater radiological or environmental hazard than they might encounter by remaining in their onsite assembly areas. QEP 400-S2, "Site Evacuation Checklist", included instructions to have security force personnel patrol the Owner Controlled Area to assure that persons in that area would also evacuate the site in the event that nonessentials within the Protected Area were being evacuated.

The EP aspects of several Operating Abnormal (QOA series) procedures were reviewed. QOA 010-10, "Tornado Warning/Severe Winds", included adequate guidance for utilizing the plant's public address system to warn persons in the Protected and Owner Controlled areas to immediately seek shelter in the nearest predesignated location in the event that a tornado was reported to be approaching the plant site. Subsequent actions listed in the procedure included references to the EIPs for event classification and offsite agency notification, as well as considering the need for a precautionary assembly of onsite personnel as one means of determining whether someone was missing and perhaps injured.

Procedures QOA 010-5, "Plant Operation with the Control Room Inaccessible", and QOA 5750-13, "Toxic Air or Smoke in the Control Room", adequately referenced the EIPs with respect to emergency classification, notification of offsite agencies and activation of the licensee's emergency organization.

No violations or deviations were identified.

a. Emergency Response Facilities, Equipment and Supplies

The onsite Emergency Response Facilities (ERFs) were toured. In March 1992, the OSC was relocated from the old gatehouse building, which also housed the TSC, to a large meeting room in the expanded service building. The new OSC was an improvement with respect to its size and its proximity to the radiologically controlled area's access control point. Relocation of the OSC approximately doubled the amount of floorspace that could be used for the TSC within the old gatehouse building. By the time of this inspection, the licensee had relocated bookcases holding reference documents, file cabinets, and document reproduction equipment from the TSC workspace into the adjacent room which had previously been the OSC. The licensee also created an area in the rear of the former OSC as a private meeting room for NRC Site Team personnel in addition to the existing counterpart seating arrangements. The licensee was considering further modifications of the internal layout of the old gatehouse building in order to create an improved TSC workspace.

Records indicated that all required, periodic inventories of emergency supplies and communications equipment tests had been conducted since September 1990. These inventories and communications equipment tests related to the onsite response facilities, the

control room, the EOF, and the offsite reassembly area. The records indicated that identified problems had been corrected in a timely manner. Current copies of the emergency plan and its implementing procedures were readily available in the TSC, CSC and EOF.

Since the EOF was beyond 10 miles from the plant site, only the onsite TSC was required to have an emergency ventilation system and radiation monitoring equipment. The rooms housing each Unit's High Range Sampling System (HRSS), which was this licensee's post accident sampling system, were also equipped with emergency ventilation systems. Records indicated that these three emergency ventilation systems' particulate and radioiodine filtering components had been tested on approximately an annual frequency since 1984. The most recent testing had been completed during the fourth quarter of 1990. The cognizant systems engineer indicated that the proceduralized inspection and testing program had been changed to an 18 month frequency, which was also the frequency for testing the control room's emergency ventilation system. This change in testing frequency was considered acceptable, since the control room system's testing frequency was specified in the plant's Technical Specifications, while the testing frequency for the TSC's and HRSS rooms' emergency ventilation systems was not specified in the Technical Specifications. The cognizant engineer indicated that ventilation system testing would be performed per the criteria in the relevant American Nuclear Standards Institute (ANSI) guidance. Inspection of the TSC's continuous air monitor and a portable area radiation monitor indicated that both pieces of equipment were operable and currently calibrated.

The onsite meteorological monitoring system was as described in the Quad Cities Station's Annex to the GSEP. Records indicated that the monitoring system had been maintained and calibrated since January 1991 in accordance with the provisions described in the Annex. A vendor was responsible for monitoring system maintenance and calibration, as well as the frequent review of the data outputs from the monitoring system. The vendor's periodic reports to the licensee indicated that there had been no lengthy outages of monitoring equipment and that the data recovery rates for any parameter, which could be utilized in offsite dose calculations, exceeded 98 percent during 1991. These recovery rates were computed after the data had undergone the vendor's quality control reviews. The 1991 data recovery rate statistics exceeded the data

recovery rate criteria found in Regulatory Guide 1.43 (1972) and the relevant ANSI guidance.

No violations or deviations were identified.

d. Organization and Management Control

The licensee's Emergency Response Organization (ERO) was as described in the emergency plan and implementing procedures. Staffing for each position in the onsite ERO remained at least three deep for each position.

The EP coordinators had updated the onsite ERO's call-out roster at a quarterly frequency. Coordination with the EP instructor assured that only currently trained personnel were listed on the call-out roster. Persons on the roster were listed such that the individual considered to be the most qualified for a position would be called first and any person lacking only drill participation to be considered fully trained would be at the bottom of the call-out list. Those personnel lacking drill experience were clearly identified on the current revision of the call-out roster.

Call-out of the onsite ERO would be (by procedure) accomplished by control room personnel initiating a call tree, which was described in an EPIP. Two members of the control room crew would call an "on-call duty person" and several key directors. Those individuals were then responsible for further implementing the call tree scheme encompassing all key and support positions in the onsite ERO. The EP coordinators were responsible for providing each person responsible for implementing the call tree with several copies of each revision to the call-out roster.

The licensee continued to conduct semi-annual, off-hours augmentation drills to demonstrate the capability to adequately staff the onsite ERPs within about one hour. These drills primarily demonstrated the capability to staff the TSC, with only a limited call-out of persons who would staff the OSC. ERO members contacted during these drills were expected to provide estimated arrival time data, rather than physically reporting to their emergency duty stations. Minimum staffing for the TSC for drills conducted during the evenings of June 6 and December 2, 1991 was achieved within 50 minutes. Regarding the first semi-annual augmentation drill in 1992, credit was taken for an actual activation of the onsite ERO following the Alert declaration on February 14, 1992. For that event,

more than the minimum TSC staff had reported to that facility within an hour.

Letters of agreement with offsite support organizations were renewed during 1991. A letter of agreement was terminated with the City of Albany's Fire Department in December 1991. The licensee and representatives of that fire department agreed that the latter's response role was adequately addressed in a mutual support agreement between the fire departments of the cities of Albany and Cordova and the licensee's letter of agreement with the Cordova Fire Department.

An annual meeting with offsite support agencies was held on November 21, 1991.

No violations or deviations were identified.

e. EP Training

Procedures and records related to the EP training program were reviewed and discussed with members of the EP staff. The EP instructor was a full time position, functionally reporting to the EP coordinators and administratively reporting to the training department.

ERO members were required to successfully complete initial training requirements, which included participation in a drill or a tabletop exercise before being considered fully qualified for their assigned positions. Periodic refresher training was required to be successfully completed. Section 8.2.3 of the Generating Stations Emergency Plan (GSEP) defined the periodic training cycle as being the end of the quarter corresponding to that in which the training was completed in the previous year. However, procedure QEP 710-1, "GSEP Position Training Requirements", defined the refresher training cycle as being every 12 months with a 90 day grace period. This inconsistency between the GSEP and procedure QEP 710-1 was eliminated by an April 1992 revision to the procedure.

The EP instructor used a personal computer-based tracking system to ensure that training remained current for most members of the ERO. The tracking of training for other ERO members was done by the training department on a mainframe-based system. A random sample of training records for 41 ERO members were compared to the approved EP training matrix. All of these persons' EP training was complete and within the required requalification training frequency defined in the GSEP.

Lesson plans for licensed operators and for technicians assigned to the OSC were reviewed for adequacy and timeliness of updates. Those lesson plans reviewed were up to date and adequately detailed.

Records indicated that all required EP drills had been conducted and critiqued since the August 1990 inspection. In addition to the required drills, the licensee continued to conduct tabletop drills at about a quarterly frequency. These drills typically involved only TSC staff, although at least one drill involved only OSC supervisory personnel. The licensee also conducted a "practice exercise" prior to each NRC-evaluated exercise. Each practice exercise utilized a modified scenario from a previous year's exercise.

The licensee utilized a manual system for tracking improvement items identified during drills and exercises. The plant's Nuclear Tracking System was utilized to track items requiring corrective actions, which were identified during program audits performed by NRC or the licensee's Nuclear Quality Programs (NQP) staff.

No violations or deviations were identified.

f. Audits

The evaluation of 1991 NQP audits and surveillances of the EP program was documented in NRC Inspection Report Nos. 50-254/91015(DRSS) and 50-265/91011(DRSS). The 1992 audit of the program was in progress at the time of this inspection. This audit included, but was not limited to, evaluation of the 1992 EP exercise performance.

No violations or deviations were identified.

10. Exit Interview (IP 82301, 82302 and 82701)

On April 30, 1992, the inspectors met with those licensee representatives identified in Section 2 of this report in order to present and discuss the preliminary inspection

findings. The licensee indicated that none of the matters discussed were proprietary in nature.

The licensee was informed that its overall response to a challenging accident scenario was adequate. The most challenging aspect of the scenario was that it postulated unrelated degradation in equipment which warranted a Site Area Emergency declaration for each Unit prior to a General

Emergency declaration. Other challenging aspects included the dispatch of over 20 inplant teams; deployment of several offsite survey teams; and activation of the JPIC.

Several exercise performance concerns requiring corrective action were identified. The SE initially "underclassified" degraded conditions as warranting an Unusual Event declaration. When the correct Alert declaration was made, the SE failed to halt preparations to initially notify offsite officials of the incorrect Unusual Event declaration. CRS staff failed to initially notify State officials of the Unusual Event and Alert declarations in a timely manner. TSC staff failed to initially notify State officials of the Site Area Emergency declaration in a timely manner. EOF status boards were not generally updated in a timely manner and did not include information on offsite protective actions or the results of offsite survey teams.

Regarding the operational status of the Emergency Preparedness program, the six actual emergency plan activations since November 1991 were correct and timely. State and NRC officials were initially notified in a timely and adequately detailed manner. The emergency response facilities remained well maintained. The OSC was moved to a more suitable location. Several refinements were made to the layout of the TSC. The ERO remained well staffed. Personnel were currently trained. Training activities remained in excess of commitments in the emergency plan.

Attachments:

1. Licensee's Scope of Participation and Exercise Objectives
2. Scenario Narrative Summary

QUAD CITIES NUCLEAR POWER STATION
1992 GSEP EXERCISE
APRIL 29, 1992

OBJECTIVES LIST

STANDARD OBJECTIVES FOR ANNUAL GSEP EXERCISES AND DRILLS

1. Assessment and Classification

Objectives

- a. Demonstrate the ability to assess, within fifteen (15) minutes, conditions which warrant initiating a GSEP classification. (CR, TSC, EOF, CEOF)
- b. Demonstrate the ability to determine applicable Emergency Action Levels (EALs) within fifteen (15) minutes of initiating classification. (CR, TSC, EOF, CEOF)

2. Notification and Communication

Objectives

- a. Demonstrate the ability to correctly fill out a NARS form. (CR, TSC, EOF, CEOF)
- b. Demonstrate the ability to notify appropriate State and local organizations within fifteen (15) minutes of an Emergency classification or significant change in NARS information. (CR, TSC, EOF, CEOF)
- c. For the initial contact via the ENS, demonstrate the ability to correctly fill out NRC Event Notification Worksheets. (Also applicable for subsequent calls if a continuous line is not maintained). (CR, TSC, EOF, CEOF)
- d. Demonstrate the ability to notify the NRC immediately following State notification and within one (1) hour after making an Emergency classification. (CR, TSC, EOF, CEOF)
- e. Demonstrate the ability to provide hourly information updates to the States and within thirty (30) minutes of changes in latest reported conditions on the State Agency Update Checklist. (CR, TSC, EOF, CEOF)
- f. Demonstrate the ability to contact appropriate support organizations that would be available to assist in an actual emergency within one (1) hour of conditions warranting their assistance. (e.g. M+T, Teledyne) (CR, TSC, EOF, CEOF)
- g. Demonstrate the ability to maintain an open-line of communication with the NRC on ENS upon request. (CR, TSC, EOF, CEOF)
- h. Demonstrate the ability to maintain an open-line of communication with the NRC on HPN upon request. (TSC, EOF, CEOF)

QUAD CITIES NUCLEAR POWER STATION
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- i. Demonstrate the ability to provide information updates to the NRC within thirty (30) minutes of significant changes in reportable conditions when an open-line of communication is not maintained. (ENS and HPN) (CR, TSC, EOF, CEOF)
 - j. Demonstrate the ability to provide adequate informational announcements (e.g. assembly instructions, changes in plant conditions) over the plant public address system. (CR)
3. Radiological Assessment and Protective Actions
- Objectives
- a. Demonstrate the ability to collect and document radiological surveys taken for conditions presented in the scenario. (TSC, OSC, EOF, CEOF)
 - b. Demonstrate the ability to trend radiological information for conditions presented in the scenario. (TSC, OSC, EOF, CEOF)
 - c. Demonstrate the ability to take appropriate protective actions for onsite personnel in accordance with Station procedures. (e.g. respiratory protection, protective clothing, KI) (OSC, TSC)
 - d. Demonstrate the ability to adequately prepare and brief personnel for entry into High Radiation Areas in accordance with Station procedures and policies. (OSC, TSC)
 - e. Demonstrate the ability to issue and administratively control dosimetry issued to teams dispatched from the OSC in accordance with Station procedures. (OSC)
 - f. Demonstrate the ability to establish radiological control in accordance with Health Physics procedures. (TSC, OSC, EOF, CEOF)
 - g. Demonstrate the ability to monitor, track and document radiation exposure for inplant operations and maintenance teams in accordance with plant procedures. (TSC, OSC)

QUAD CITIES NUCLEAR POWER STATION
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APRIL 29, 1992

- h. Demonstrate the ability to perform decontamination of radioactively contaminated individuals and equipment in accordance with Station procedures. (OSC)
- i. Demonstrate the ability to identify appropriate Protective Action Recommendations (PARs) within fifteen (15) minutes of obtaining an Offsite Dose Projection or using a Protective Action Recommendation Flowchart. (TSC, EOF, CEOF)
- j. Demonstrate the ability to calculate Offsite Dose Projection in accordance with appropriate procedures. (TSC, EOF, CEOF)
- k. Demonstrate the ability to perform contamination control onsite in accordance with plant procedures. (e.g. area access control, drinking, water, food supplies, return to normal use criteria) (TSC, OSC)
- l. Demonstrate the ability to collect RCS and Containment Atmosphere samples using Post Accident Sample System (PASS) equipment in accordance with PASS procedures and proper Health Physics controls. (CR, OSC)
- m. Demonstrate the ability to perform Core Damage Assessments in accordance with the EIPs. (TSC, EOF, CEOF)

QUAD CITIES NUCLEAR POWER STATION
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4. Emergency Facilities

Objectives

- a. Demonstrate the ability to establish minimum staffing in the TSC and OSC within thirty (30) minutes of an Alert or higher Classification during a daytime event in accordance with procedures. (TSC, OSC)
- b. Demonstrate the ability to augment the Control Room staff within thirty (30) minutes of an appropriate Emergency Classification in accordance with procedures. (CR)
- c. Demonstrate the ability to transfer Command and Control authority from the Control Room to the TSC. (CR, TSC)
- d. Demonstrate the ability to transfer Command and Control authority from the TSC to the EOF/CEOF. (TSC, EOF, CEOF)
- e. Demonstrate the ability to transfer Command and Control authority from the CEOF to the EOF. (TSC, EOF, CEOF)
- f. Demonstrate the ability to establish minimum staffing in the Emergency Operations Facility and Joint Public Information Center within approximately one (1) hour of the Site Emergency classification in accordance with procedures. (EOF)
- g. Demonstrate the ability to establish minimum staffing in the Corporate Emergency Operations Facility and Joint Public Information Center within approximately one (1) hour of the Site Emergency classification in accordance with EOF and JPIC procedures. (CEOF, JPIC)
- h. Using information supplied by the Exercise scenario, demonstrate the ability to record, track, and update information on the Status Boards at least every thirty (30) minutes. (CR, TSC, OSC, EOF, CEOF)
- i. Demonstrate the ability to document Operations and Maintenance Team activities in logs and on appropriate Status Boards. (OSC)
- j. Demonstrate the ability to track in-plant job status in logs and on appropriate Status Boards. (CR, TSC, OSC, EOF, CEOF)

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- k. Demonstrate the ability to exchange counterpart activity information between the ERFs at least every sixty (60) minutes. (CR, TSC, OSC, EOF, CEOF)
 - l. Demonstrate the ability to update and disseminate information from the Electronic Status Board. (TSC, EOF)
5. Emergency Direction and Control
- Objectives
- a. Demonstrate the ability of the Directors and Managers to exert command and control in their respective area of responsibility as specified in procedures. (CR, OSC, TSC, EOF, CEOF)
 - b. Demonstrate the ability to coordinate and expedite Operations and Maintenance activities during abnormal and emergency situation. (TSC, OSC, EOF, CEOF)
 - c. Demonstrate the ability to prioritize resources for Operations and Maintenance activities during abnormal and emergency situation. (TSC, OSC, EOF, CEOF)
 - d. Demonstrate the ability to acquire and transport emergency equipment and supplies necessary to mitigate or control unsafe or abnormal plant conditions. (TSC, OSC, EOF)
 - e. Demonstrate the ability of the Shift Engineer, Station Director, OSC Director and MEO to provide briefings and update concerning plant status, event classification, and activities in progress at least every sixty (60) minutes. (CR, TSC, OSC, EOF, CEOF)
 - f. Demonstrate the ability to provide access for the NRC Site Team in accordance with Access Control procedures. (TSC, EOF, CEOF)
 - g. Demonstrate the ability to interface with the NRC Site Team. (TSC, EOF, CEOF)
 - h. Demonstrate the ability to identify and designate non-essential personnel within thirty (30) minutes after deciding to evacuate the site. (TSC, EOF, CEOF)
 - i. Demonstrate the ability of individuals in the Emergency Response Organization to perform their assigned duties and responsibilities as specified in Generic GSEP. (CR, TSC, OSC, EOF, CEOF)

QUAD CITIES NUCLEAR POWER STATION
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6. Public Information

Objectives

- a. Demonstrate the ability to respond to Media requests within sixty (60) minutes in accordance with CECO policies and procedures. (JPIC)
- b. Demonstrate the ability to prepare accurate Press Releases within ninety (90) minutes of significant event while in a Site or General Emergency classification. (JPIC)
- c. Demonstrate the ability to present Media Briefing within ninety (90) minutes of significant events while in a Site or General Emergency classification. (JPIC)
- d. Demonstrate the ability to use visual aids to support Media Briefing information in accordance with CECO policies and procedures. (JPIC)
- e. Demonstrate the ability to maintain of CECO representative in the JPIC at all times. (JPIC)

7. Recovery

Objectives

- a. Demonstrate the ability to determine long-term recovery staffing requirements. (TSC, EOF, JPIC)

QUAD CITIES NUCLEAR POWER STATION
1992 GSEP EXERCISE
APRIL 29, 1992

OBJECTIVES TO BE DEMONSTRATED EVERY FIVE YEARS

8. Miscellaneous

Objectives

- a. Demonstrate the backup means of communication for the NARs network. (CR, TSC, EOF, CEOF)
- b. Demonstrate the ability to determine the magnitude of the source term of a release. (TSC, EOF, CEOF)
- c. Demonstrate the ability to establish the relationship between effluent monitor readings and onsite and offsite exposures/contamination for various meteorological conditions. (TSC, EOF, CEOF, Field Teams)
- d. Demonstrate the ability to determine the magnitude of a release based on plant system parameters and effluent monitors. (TSC, EOF, CEOF)
- e. Demonstrate the ability to calculate release rate/projected doses if the primary instrumentation used for assessment is offscale or inoperable. (TSC, EOF, CEOF)
- f. Demonstrate the ability to assemble and account for On-site personnel within 30 minutes of a Site Emergency declaration. (CR, TSC)
- g. Demonstrate the ability to explain the evacuation route, brief personnel and arrange for traffic control within one (1) hour of deciding to evacuate non-essential personnel. (TSC, EOF, CEOF)
- h. Demonstrate the ability to perform dose rate measurements in the environment for conditions presented in the scenario. (Field Teams)
- i. Demonstrate the ability to dispatch the Environs Teams within forty-five (45) minutes of determination of the need for field samples. (TSC, OSC)
- j. Demonstrate the ability to control/coordinate Environs Teams activities in accordance with Corporate EIPs. (TSC, EOF, CEOF, Field Teams)
- k. Demonstrate the ability to transfer control/coordination of Environs Teams activities from the TSC to the EOF in accordance with Station and EOF procedures. (TSC, EOF)

QUAD CITIES NUCLEAR POWER STATION
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- l. Demonstrate the ability of the Security force to respond to an emergency situation in accordance with procedures. (Security)
- m. Demonstrate the ability of the Security force to coordinate actions and interact with the Emergency Response Organization. (Security)

9. Public Information

Objectives

- a. Demonstrate the ability to exchange event information with Non-CECo JPIC representatives for Media Briefings in accordance with CECo policies and procedures. (JPIC)
- b. Demonstrate the ability to coordinate information with Non-CECo JPIC representatives for Media Briefings in accordance with CECo policies and procedures. (JPIC)
- c. Demonstrate the ability to activate Rumor Control. (JPIC)

10. Recovery

Objectives

- a. Demonstrate the ability to identify the criteria to enter a Recovery classification in accordance with procedures. (TSC, EOF)
- b. Demonstrate the ability to generate a Recovery Plan which will return the plant to normal operations in accordance with CECo policies and procedures. (TSC, EOF)
- c. Demonstrate the ability to coordinate recovery actions with the State. (TSC, EOF)
- d. Demonstrate the ability to coordinate recovery actions with the NRC. (TSC, EOF)

QUAD CITIES NUCLEAR POWER STATION
1992 GSEP EXERCISE
APRIL 29, 1992

NARRATIVE SUMMARY

"THIS IS AN EXERCISE"

INITIAL CONDITIONS

UNIT ONE:

Unit One is operating at ~ 100% power at the 100% flow control line, with core flow at ~ 98 Mlbm/hr. The 1A CRD pump is out of service to perform an overhaul of pump. Unit One has been operating at full power for five (5) days. OAD has been performing acetylene gas samples on TR 12, over the past several weeks. Current samples indicate a steady concentration of 22 ppm. The unit is in day two (2) of a seven (7) day LCO (T.S. 3.5.A.5) due to work being performed on the MO 1-1001-19A (RHR Loop Cross Tie) valve on the "A" RHR Loop, and is in day one (1) of a seven (7) day LCO (T.S.3.9.C.1) due to work being performed on the Bus 24-1 tie breaker to Bus 14-1.

UNIT TWO:

Unit Two is operating at 75% power. QOS 5600-4, "Turbine/Generator Weekly" surveillance has been completed on the midnight shift. It was noted that bearing no. eight (8) exhibited abnormally high vibrations while performing the test. The system engineer has been notified and is investigating. Hydrogen (H₂) is being added to the main generator per QOP 5320-7, "Main Generator Hydrogen Addition". The Electrical Maintenance Department (EMD) is working on changing out the main generator brushes.

ALERT (U-2)
(0745 - 0830)

At 0745, U-2 experiences a main turbine trip caused by high turbine vibration. Indications observed from the control room during the resultant turbine trip and reactor scram are as expected with the exception of a decreasing main condenser vacuum and an abnormal decrease in the main generator H₂ gas pressure. An Equipment Attendant, while investigating a problem with the gland water expansion tank, heard an explosive sound from the direction of the U-2 main turbine.

EXPECTED ACTION

He reports to the control room there is visible, structural damage to the north LP turbine hood. A section of the turbine blading is reported to have penetrated the turbine casing. The Shift Engineer should make an Alert declaration based upon EAL 6t (main turbine failure causing casing penetration). The loss of condenser vacuum is due to the casing failure. Control room operators will follow QGP 2-3, "Reactor Scram" procedure. At 0800, the Control Room operator may notice decreasing main generator H₂ pressure. The Control Room operator should attempt to isolate H₂ makeup to the generator by tripping valve SO-5301 per procedure QOP 5320-7, "Main Generator Hydrogen Addition". Operators should be dispatched to investigate any collateral damage caused by the turbine failure.

"THIS IS AN EXERCISE"

QUAD CITIES NUCLEAR POWER STATION
1992 GSEP EXERCISE
APRIL 29, 1992

NARRATIVE SUMMARY

"THIS IS AN EXERCISE"

SITE EMERGENCY (U-2)
(0830 - 1100)

At ~ 0830, it is reported by EMD personnel that one of their workers was overcome by hydrogen gas in the U-2 exciter housing, and appears to be dead.

EXPECTED ACTIONS

Radiation Protection (RP) personnel should be dispatched to attempt to revive the individual, but will be unable to. This should result in a declaration of a Site Area Emergency per EAL 7g (toxic or flammable gas at life threatening levels in a vital area). The deceased worker should be transported offsite.

UNUSUAL EVENT (U-1)
(0910 - 1025)

At 0910, Unit One Transformer TR12 (U-1 Reserve Aux. Transformer) trips and the fire suppression deluge system activates. Auxiliary power successfully transfers to TR-11 (Unit Aux Transformer). At ~ 0935 the Control Room experiences a CRD flow controller problem (fails high).

EXPECTED ACTIONS

An operator should be dispatched to TR-12 to investigate and notices that the transformer has ruptured, the deluge system has been activated (spraying) and NO FIRE is evident. This should result in a declaration of an Unusual Event per EAL 3d (loss of normal power to a units 4kv ECCS busses). The operator should follow actions per QOA 6100-1, "Loss of Transformer 12 During Power Operations". The U-1 operator should take manual control of the CRD Flow Controller and call the OSC to have Instrument Maintenance investigate.

SITE EMERGENCY U-1
(1025 - 1100)

At 1025, Unit One experiences a spurious main turbine trip causing a reactor scram. A hydraulic lock causes the control rods to stop at ~ notch 18, with reactor power at ~20%. At 1027, the main generator trips on reverse power which causes a loss of Auxiliary Power. This loss of power causes the U-1 and U-1/2 Emergency Diesel Generators (EDGs) to start and load to their respective emergency buses. The initial power/pressure spike will cause the safeties to lift one time, and minor fuel damage occurs.

"THIS IS AN EXERCISE"

QUAD CITIES NUCLEAR POWER STATION
1992 GSEP EXERCISE
APRIL 29, 1992

NARRATIVE SUMMARY

"THIS IS AN EXERCISE"

EXPECTED ACTIONS

This should result in the declaration of a Site Emergency per EAL 3k (failure of RPS to initiate a scram, ATWS). QCOP 300-28 directs the operator to attempt to insert rods. Due to the unavailability of normal feedwater makeup to the vessel, the NSO should use HPCI or RCIC to maintain level as directed by the QGA's. The loss of Bus 14 will result in losing the operating CRD Pump. The crew should backfeed Bus 14 from 14-1 to restore CRD and drive rods. Not all rods can be driven in, and HCU venting will be required.

GENERAL EMERGENCY U-1
(1100 - 1300)

At 1040, the Main Steam Line (MSL) breaks at the equalizing header. The fuel damage incurred during the major power spike when the ATWS initially occurred, will propagate. When MSL Radiation levels reach 15x Normal or when reactor level is decreased to -59" IAW QGA 101 (ATWS Power Control), a group I isolation (MSIV Closure) will occur, but MSL C will not completely isolate. High drywell radiation as well as numerous high area radiation conditions in the Reactor Building and Turbine Building will occur. During the reactor scram, the reactor building exhaust dampers will not isolate. An operator investigating that damper failure will be contaminated due to steam leaking in the turbine building. At 1100, the release rate reaches the General Emergency level.

EXPECTED ACTIONS

The EOF should declare a General Emergency per EAL 2v (instantaneous noble gas release rate is $\geq 4.39 \text{ E7 } \mu\text{Ci/sec.}$) The release cannot be isolated prior to the time jump at 1300 hours. To reduce the release, the reactor should be emergency depressurized when the release rate approaches the General Emergency level.

RECOVERY

At 1300, a 24 hour time jump will be introduced. Control Room and OSC participation will terminate. All rods are inserted, and all outboard MSIV's are closed. Bus 13-1 is being supplied by the 1/2 D/G and Bus 14-1 is being supplied via the U-2 cross tie. The B-loop of RHR is in the shutdown cooling mode.

EXPECTED ACTIONS

The EOF is expected to plan recovery for the plant, pursuant to the conditions provided above, as well as plan staffing requirements for Field Teams and the Emergency Response Facilities.

"THIS IS AN EXERCISE"

IFS Data Entry Form

Reviewed By J. McConville
Date 5.14.92

Reactor/Vendor Inspection (IFS Option 1) Docket Related/P21 Items (IFS Option 4)
 Items Opened (Y/N) LER Items (IFS Option 5)
 Material Inspection (IFS Option 2) Non-Docket Related Items (IFS Option 6)
 SRI (Y/N) _____
 LER (Y/N) _____
 Class (Y/N) _____

Site Name QUAD CITIES

Report Transmittal Date 5.24.92

Lead Inspector T E P Responsible Org Code 3412

Report End Date: 05/01/1992

	Report NBR	Docket NBR
A	<u>92004</u>	<u>05000254</u>
B	<u>92004</u>	<u>05000265</u>
C	_____	_____

Materials Only License NBR	*Docket Name
_____	_____
_____	_____
_____	_____

Update? (Y/N): N Opened IR/LER/P21 Number: _____

** Sequence NBR: 1 Item Type: IF1 ** Severity: _____ ** Supplement: _____

Status	*UPD I/R	*Proj. Closeout	*Actual Closeout
A	<u>0</u>	<u>09.30.92</u>	<u>1.1</u>
B	<u>0</u>	<u>09.30.92</u>	<u>1.1</u>
C	_____	<u>1.1</u>	<u>1.1</u>

10 CFR	Materials Only License Cond.	Tie Down
_____	_____	_____
_____	_____	_____
_____	_____	_____

Title: 92 EXERCISE - URGENTLY STATE NOTIFICATIONS BY CRS (55 character width)

*Closeout Org: 3412 *Closeout EMP: TEP *Contact EMP: TEP *Procedure: 12 * Funct Area: _____
 *Cause CD: _____ ** EA Number: _____ ** NOV/NNC Issue Date: 1.1

Text: CRS STAFF FAILED TO INITIALLY NOTIFY IL AND IO OFFICIALS OF UE AND ALERT DURING 92 EXERCISE

Update? (Y/N): N Opened IR/LER/P21 Number: _____

** Sequence NBR: 2 Item Type: IF1 ** Severity: _____ ** Supplement: _____

Status	*UPD I/R	*Proj. Closeout	Actual Closeout
A	<u>0</u>	<u>09.30.92</u>	<u>1.1</u>
B	<u>0</u>	<u>09.30.92</u>	<u>1.1</u>
C	_____	<u>1.1</u>	<u>1.1</u>

10 CFR	Materials Only License Cond.	Tie Down
_____	_____	_____
_____	_____	_____
_____	_____	_____

Title: 92 EXERCISE - INADEQUATE ACCIDENT ASSESS IN CRS (55 character width)

*Closeout Org: 3412 *Closeout EMP: TEP *Contact EMP: TEP *Procedure: _____ * Funct Area: _____
 *Cause CD: _____ ** EA Number: _____ ** NOV/NNC Issue Date: 1.1

Text: DURING 92 EXERCISE, SE FAILED TO ADEQUATELY ASSESS PLANT CONDITIONS WARRANTING EMERGENCY DECLARATIONS

- 3 *** Sequence NRR is not applicable for docket related/P21, LER or non-docket related items
- 2 ** Severity, Supplement and NOV/NNC only applicable for violations; EA Number only applicable for Apparent Violations
- 1 * Optional FIELDS

IFS DATA INPUT FORM - Brief Instructions

SPECIFY CATEGORY (Check only one)

Since IFS supports various items tracking it is important to indicate the type of information being reported. Therefore, a "x" should be placed next to the field for the appropriate item being entered on the form (i.e., Reactor/Vendor, Materials, Docket Related/Part 21, LER, or Non-Docket Related).

DATE ENTRIES

All dates are entered in the MMDDYY (e.g., 05/12/91) format.

REPORT NUMBERS

All Report Numbers are entered as five digit numeric (e.g., 91001) values.

DOCKET NUMBER & LICENSE NUMBER

For reactor/vendor and materials inspections, docket related/part 21 and LER items, the appropriate 8 digit numeric number is entered. For material inspections, either the license number or the docket number must be given. License numbers are entered exactly as they appear on the licenses, including hyphens and leading zeros.

UPDATE

The Update selection is used to indicate that the item being entered is an update to a previously recorded item. If Update is selected, also enter the inspection Report Number (Opened I/R) if the inspection report that originally opened the item.

SEQUENCE NUMBER

For reactor/vendor and material inspections, a sequence number is required for each item identified in the report. For reactor/vendor inspections a sequence number is entered when a "Y" was entered for "OPENED ITEMS (Y/N)". Similarly, a sequence number is required for material inspections if "N" was provided in the "CLEAR (Y/N)" field. Enter an unique sequence number for each open item included in the report. Sequence numbers are only applicable for reactor/vendor and material inspections.

STATUS

For each docket listed on the report, indicate the appropriate status code. It is required that "STATUS" be filled in for each docket. This field is applicable for all items.

ITEM TYPE

Enter the four digit code to indicate the inspection/investigation findings (e.g., APV - apparent violation, DEV - deviation). Item type is applicable for all items. The following item types are permitted:

Item Type	Description
APV	Apparent Violation
DEV	Deviation
IFI	Inspection Follow-up
URI	Unresolved Issue
VI	Violation

Docket Related

CAL	Confimitory Action Letter
ORD	Order to Licensee

Status

O	Open
C	Closed
W	Withdrawn
N	Not Applicable

FUNCTL AREAS

For reactor/vendor inspections, docket related/part 21 or LER items, enter the SALP functional area codes. A maximum of two functional area codes are permitted. Use the list furnished below to obtain the appropriate functional area codes.

Funcnl Area Code	Description
AUX	Auxiliary Systems
CONT	Containment, Major structures, and major steel supports
ELEC	Electrical equipment and cables
EP	Emergency Preparedness
ETS-C	Engineering/Technical Support
ETS-O	Engineering/Technical Support
INST	Instrumentation
MECHC	Mechanical Components
MS	Maintenance/Surveillance
N/A	Not Applicable
OPS	Plant Operations
OTHR-C	Other special area for construction/ preoperational testing
OTHR-O	Other special area for operations/ startup testing
PIPE	Piping Systems and Support
RADCON	Radiological Controls
SAQU-C	Safety assessment/ quality verification
SAQU-O	Safety assessment/ quality verification
SEC	Security
SF	Soils and Foundations

CAUSE CODE

Enter the two digit code describing the cause. A maximum of two cause codes are permitted. Shown below is a listing of the valid cause codes and what they represent.

Cause Code	Meaning
10	Related to procedure, instruction, drawing
11	Lack of procedure
12	Inadequate procedure
20	Engineering or design deficiency
21	Inadequate testing
30	Personnel error
31	Cognitive error (person knowledgeable - just an error)
32	Communication error
33	Potential wrongdoing
34	Personnel error due to lack of/inadequate training
40	Inadequate evaluation / response to problem
41	Inadequate resources - equipment or staffing
50	Inadequate supervision / management control
60	Inadequate resources - equipment
61	Inadequate resources - staffing
70	Other
71	External (Lightning, Ice, etc.)

IFS Data Entry Form

Reviewed By J. Mahmud Bange
Date 5/19/92

Reactor/Vendor Inspection (IFS Option 1) Docket Related/P21 Items (IFS Option 4)
 Items Opened (Y/N) Material Inspection (IFS Option 2) LER Items (IFS Option 5)
 SRI (Y/N) Lener (Y/N) Non-Docket Related Items (IFS Option 6)
 Clear (Y/N)

Site/Name QUAD CITIES

Report Transmittal Date 05/20/92

Lead Inspector TEP Responsible Org Code 3412

Report End Date: 05/01/92

	Report NBR	Docket NBR
A	<u>92004</u>	<u>05000254</u>
B	<u>92004</u>	<u>05000265</u>
C		

Materials Only	*Docket Name
License NBR	

Update? (Y/N): N Opened IR/LER/P21 Number: _____

** Sequence NBR: 3 Item Type: IFI ** Severity: _____ ** Supplement: _____

Status	*UPD I/R	*Proj. Closeout	*Actual Closeout	Materials Only		
				10 CFR	License Cond.	Tie Down
A	<u>0</u>	<u>09/30/92</u>	<u>1/1</u>			
B	<u>0</u>	<u>09/30/92</u>	<u>1/1</u>			
C		<u>1/1</u>	<u>1/1</u>			

Title: 92 EXERCISE - URGENT STATE NOTIFICATIONS BY TSC (55 character width)

*Closeout Org: 3412 *Closeout EMP: TEP *Contact EMP: TEP *Procedure: _____ *Functl Area: _____
 *Cause CD: _____ ** EA Number: _____ ** NOV/NNC Issue Date: 1/1

Text: DURING 92 EXERCISE, TSC FAILED TO INITIALLY NOTIFY IL AND IO OFFICIALS OF SAE DECLARATION

Update? (Y/N): N Opened IR/LER/P21 Number: _____

** Sequence NBR: 4 Item Type: IFI ** Severity: _____ ** Supplement: _____

Status	*UPD I/R	*Proj. Closeout	Actual Closeout	Materials Only		
				10 CFR	License Cond.	Tie Down
A	<u>0</u>	<u>1/1</u>	<u>1/1</u>			
B	<u>0</u>	<u>1/1</u>	<u>1/1</u>			
C		<u>1/1</u>	<u>1/1</u>			

Title: 92 EXERCISE - INADEQUATE STATUS BOARD USE INFO (55 character width)

*Closeout Org: 3412 *Closeout EMP: TEP *Contact EMP: TEP *Procedure: _____ *Functl Area: _____
 *Cause CD: _____ ** EA Number: _____ ** NOV/NNC Issue Date: 1/1

Text: DURING 92 EXERCISE, EDF STATUS BOARDS INADEQUATELY USED WRT. TIMELINESS OF UPDATING AND NON-USE FOR CERTAIN PROTECTIVE MEASURES INFO

3 *** Sequence NRR is not applicable for docket related/P21, LER or non-docket related items
 2 ** Severity, Supplement and NOV/NNC only applicable for violations; EA Number only applicable for Apparent Violations
 1 * Optional FIELDS

IFS DATA INPUT FORM - Brief Instructions

SPECIFY CATEGORY (Check only one)

Since IFS supports various items tracking it is important to indicate the type of information being reported. Therefore, a "x" should be placed next to the field for the appropriate item being entered on the form (i.e., Reactor/Vendor, Materials, Docket Related/Part 21, LER, or Non-Docket Related).

DATE ENTRIES

All dates are entered in the MMDYY (e.g., 05/12/91) format.

REPORT NUMBERS

All Report Numbers are entered as five digit numeric (e.g., 91001) values.

DOCKET NUMBER & LICENSE NUMBER

For reactor/vendor and materials inspections, docket related/part 21 and LER items, the appropriate 8 digit numeric number is entered. For material inspections, either the license number or the docket number must be given. License numbers are entered exactly as they appear on the licenses, including hyphens and leading zeros.

UPDATE

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71	External (Lightning, Ice, etc.)