

U. S. NUCLEAR REGULATORY COMMISSION

REGION III

Reports No. 50-254/89007(DRSS); 50-265/89007(DRSS)

Docket Nos. 50-254; 50-265

Licenses No. DPR-29; DPR-30

Licensee: Commonwealth Edison Company
Post Office Box 767
Chicago, IL 60690

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

Inspection At: Quad Cities Station, Cordova, Illinois

Inspection Conducted: April 4-6, 1989

Inspectors: T. Ploski
T. Ploski

4/17/89
Date

M. Smith
M. Smith

4/17/89
Date

Approved By: W. Snell
W. Snell, Chief
Emergency Preparedness
and Effluents Section

4/17/89
Date

Inspection Summary

Inspection on April 4-6, 1989 (Reports No. 50-254/89007(DRSS); No. 50-265/89007(DRSS))

Areas Inspected: Routine, announced inspection (IP 82301) of the Quad Cities Station's annual emergency preparedness exercise involving six NRC representatives.

Results: The licensee's overall exercise performance was good and was improved over the 1988 exercise, with only a few suggested improvements regarding activities in the Technical Support Center (TSC) and the offsite relocation center. The scenario was challenging and creative in several respects, including the dispatch of over thirty inplant or offsite teams and the use of the offsite relocation center for nonessential plant evacuees. The licensee's preliminary exercise critiques were objective. Section 7 contains an update of the status of the Safety Issues Management System (SIMS) items on the Station's emergency preparedness program.

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DETAILS

1. Persons Contacted

a. NRC Representatives and Areas Observed

T. Ploski, Control Room, Technical Support Center (TSC), Operations Support Center (OSC), and Inplant Teams
R. Higgins, Control Room, OSC, Inplant Teams
M. Parker, Control Room, TSC
M. Smith, Emergency Operations Facility (EOF)
A. Morrongiello, Relocation Center
D. Schultz, TSC

b. Licensee Representatives

R. Bax, Station Manager
R. Robey, Services Superintendent
J. Wethington, Quality Assurance Superintendent
L. Petrie, Assistant Superintendent, Maintenance
J. Sirovy, Health Physics Services Supervisor
D. Gibson, Regulatory Assurance Supervisor
C. Brown, GSEP Coordinator
K. Schmidt, GSEP Training Instructor
T. Gilman, Supervising Emergency Planner
T. Lechton, Emergency Planner-Operations Administrator
D. Burkneil, Scenario Development Team Member

These and eight other licensee representatives attended the April 6, 1989, exit interview.

2. Licensee Action On Previously - Identified Items (IP 92701)

(Closed) Open Item No. 265/88019-01: During the 1988 exercise, Control Room (CR) personnel failed to adequately review Emergency Action Levels (EALs) to evaluate degraded plant conditions as requiring more than an Unusual Event declaration.

As indicated in Section 5a of this report, CR staff made good use of the EALs to classify degraded onsite conditions as warranting an Alert declaration. This item is closed.

3. General (IP 82301)

A daytime exercise of the licensee's Generating Stations Emergency Plan (GSEP) and Quad Cities Annex to the GSEP was conducted at the Quad Cities Station on April 5, 1989. The exercise tested the licensee's capabilities to respond to an accident scenario which included a simulated, potential radioactive release. The attachments to this report consist of the licensee's scope of participation and exercise objectives, plus a scenario narrative summary and approximate timeline. This was a licensee-only exercise.



4. General Observations (IP 82301)

a. Procedures

This exercise was conducted in accordance with 10 CFR 50, Appendix E requirements using the GSEP, Quad Cities Annex, and the Emergency Plan Implementing Procedures (EPIPs) of the licensee's onsite and offsite emergency organizations.

b. Observers

Licensee observers monitored and critiqued this exercise, as did six NRC evaluators.

c. Coordination

The licensee's response was coordinated, orderly, and timely. If scenario events had been real, actions taken by the licensee's emergency organization would have been sufficient to allow State and local officials to take appropriate actions to protect public health and safety.

d. Critique

The licensee held preliminary critiques following the exercise. The NRC critique was held on April 6, 1989.

5. Specific Observation (IP 82301)

a. Control Room (CR)

Control Room staff received a number of annunciator alarm messages and verbal damage reports from various onsite areas within several minutes of the simulated earthquake at 8:15 a.m. Preliminary reports included damage to an electrical buss associated with the Reactor Core Isolation Cooling (RCIC) system. The inability of this system to perform its designed function would place Unit 2 in a Limiting Condition for Operation, thereby satisfying an Emergency Action Level's (EAL's) criteria for an Alert declaration. Due to this and other preliminary damage reports and annunciator alarms, the Shift Engineer (SE) in charge of CR activities prudently declared an Alert at 8:25 a.m. after learning that the Station's seismic monitoring equipment confirmed that an earthquake had taken place. During a subsequent CR discussion with the future Station Director (SD), the SE also indicated that the Alert declaration was appropriate due to his desire to activate the onsite Emergency Response Organization (ERO) following the earthquake. Activation of the onsite ERO to staff the Technical Support Center (TSC) and Operations Support Center (OSC) satisfied another Alert EAL's criteria and met the SE's needs for onsite damage assessment and offsite notification support.



Illinois and Iowa officials were initially notified of the Alert declaration over a dedicated communications line within about ten minutes, while the NRC Operations Center was initially notified within thirty minutes. Both initial notifications were well within the regulatory time limits. The proceduralized NRC Event Notification Worksheet was completed and was effectively utilized by CR staff to inform the Headquarters Duty Officer of known onsite conditions associated with the Alert declaration.

The TSC and OSC were promptly activated following the Alert declaration. Several communicators reported to the CR's center desk and quickly established and maintained communications with these facilities using dedicated telephone lines. The future SD was adequately briefed by the SE on plant status and damage assessment activities. He concurred with the Alert classification decision. The future SD correctly left the SE in charge of onsite emergency response activities until he had arrived in the TSC and had assured himself that the TSC's personnel were ready to assume their responsibilities. The SD then assumed command and control of the licensee's emergency response at 9:15 a.m. This transfer of lead responsibility was announced to CR and TSC staffs.

Several prudent actions were ordered by the SE prior to 9:15 a.m. The scheduled testing of the Unit 1 emergency diesel generator was postponed, and two floors of the reactor building were evacuated. Personnel were dispatched to stop water leakage into the cribhouse. CR staff promptly identified a pressure decrease in the instrument air system which soon stabilized. While the SE ordered walkdowns of various plant systems, the air leak in the instrument air system that was postulated by the scenario remained undetected.

Shortly after 9:00 a.m., the SE and the TSC's Operations Director had a good teleconference on the CR's status of implementing procedure QOA-010-9, which covered the onsite response to an earthquake. Both were satisfied that all procedural steps had either been completed or were well underway. The electrical buss associated with the RCIC system was placed back in service within an hour after the Alert declaration. However, the SD and SE prudently decided not to terminate or to downgrade the emergency classification since TSC and OSC staffs were in the midst of performing valuable emergency response functions.

Based on the above findings, this portion of the licensee's program was acceptable.

b. Technical Support Center (TSC)

The TSC's Station Director (SD) assumed command and control of onsite emergency response activities following an initial briefing in the CR and a final telephone conversation with the SE. By that time, the TSC had been fully staffed by personnel who had been initially briefed and were ready to perform their duties. Transfer



of lead responsibility to the Emergency Operations Facility's (EOF's) Manager of Emergency Operations (MEO) was completed in an orderly and timely manner later in the exercise.

The nine TSC directors demonstrated good knowledge of their emergency duties and relevant EPIPs. The six directors having technical responsibilities utilized one or two aides for communications, status board updating, and logkeeping tasks. Such assistance enabled the directors to perform problem-solving and other interactive tasks without unnecessary interruptions. The status board plotter responsible for updating plant parameter and component operability information did a particularly good job of calling the directors' attention to significant changes and adverse trends.

The SD initiated onsite assembly and accountability at about 9:30 a.m. due to concern for possible injuries resulting from the earthquake. Accountability was accomplished within the thirty minute goal with no injured or missing personnel. The SD then ordered the evacuation of nonessential personnel. Evaluation of the actual evacuation of a token number of persons to the offsite relocation center is described in Section 5e of this report.

While accountability was in progress, the SD conservatively declared a Site Area Emergency at 9:48 a.m. due to increasing drywell radiation levels, a Loss of Reactor Coolant Accident (LOCA), and the recent loss of the High Pressure Coolant Injection (HPCI) system and an emergency diesel generator. Initial notifications of State agencies and simulated NRC officials were accurately completed within the regulatory time limits following this reclassification.

The Site Area Emergency declaration was prudent, although it occurred earlier than postulated by the scenario. In contrast, TSC staff did not initiate depressurization of the drywell until about 11:15 a.m., even though abnormal elevated drywell pressure and temperature values had peaked at values well below design values by 10:00 a.m. With drywell radiation levels of about 500R/hour, more timely depressurization should have reduced the environmental impact of a release had primary containment integrity later been lost. Once initiated, drywell depressurization continued at the maximum rate permitted by Technical Specifications. CR, TSC, and OSC staffs generally interfaced very well regarding prioritization and completion of inplant damage assessment and repair tasks. The one exception was that TSC staff did not assign sufficient priority to determining the cause of an air leak in the instrument air system which had been reported by CR staff. TSC staff assumed that the system's reduced but stable air pressure was due to a compressor malfunction, rather than due to a repairable air leak caused by the earthquake. Replacement or repair of the system's compressor became a high priority action item during subsequent onsite recovery planning discussions.



Four licensee staff arrived in the TSC at 11:30 a.m., roleplaying NRC Site Team representatives. The roleplayers had no prior knowledge of scenario details. TSC staff adequately demonstrated their capabilities to satisfy the Site Team's information needs, although plant components were too often described using only site specific alphanumeric identifiers which NRC personnel would not necessarily recognize without further explanation.

Director-level staff in the TSC began detailed recovery planning discussions prior to the twelve hour time jump in the scenario. Their final, prioritized action item list was transmitted to the EOF for review. TSC staff also expressed to EOF counterparts their recommendations regarding a possible change to the offsite protective action recommendation and the potential for emergency reclassification. The SD remained well aware of the MEO's decisions on the TSC's inputs.

Based on the above findings, this portion of the licensee's program was acceptable; however, the following item should be considered for improvement:

- The licensee should review procedural guidance regarding drywell emergency depressurization during a future tabletop drill involving TSC personnel.

c. Operations Support Center (OSC) and Inplant Teams

The OSC was promptly staffed by supervisory personnel and more than forty technicians following the Alert declaration. Dedicated communications lines were established and maintained with the CR and TSC. The OSC Director, OSC Supervisor, and their support staff worked well together to ensure that the teams were quickly formed and dispatched, as well as adequately briefed and debriefed. Over thirty teams were dispatched from the OSC during the exercise, including two offsite survey teams and the offsite relocation center's staff.

The sampling of briefings and debriefings that were observed were well detailed regarding task assignments, exposure limits, protective clothing and dosimetry requirements, reporting requirements, and current Area Radiation Monitor (ARM) data when appropriate. Team briefings and debriefings were adequately documented, while simulated exposures were closely monitored.

Well designed status boards were effectively used to track the teams' assignments, progress, results, and also to display the names of persons having specific areas of expertise who were still available for assignment. The chronology of events status board was well detailed with information including: emergency classification decisions, major events, and emergency response facility activation status. The OSC Director periodically briefed personnel within the facility on work priorities and some teams' results to supplement



the SD's public address announcements and status board information. The OSC Director occasionally visited the adjacent TSC to discuss task priorities and work results with his counterparts.

A portable ARM was operated in the OSC during the exercise. Returning teams went through a contamination control checkpoint before entering the main room of the OSC to better ensure that the facility did not become contaminated.

Inspectors observed several inplant teams. The teams were accompanied by radiation protection technicians having suitable survey instruments. A team sent to repair an air line to an emergency diesel generator adequately demonstrated the capability to efficiently complete the task by working on a realistic mockup of this equipment. Another team adequately demonstrated the capability to change the film of the Unit 1's seismic monitoring equipment. This team brought the necessary procedure and equipment keys to complete the task, and adequately explained the film unloading and loading processes. The radiation protection technician with this team adequately demonstrated taking an air sample and smear samples in the work area. The air sampler's filter and cartridge were bagged separately and adequately labeled for later analysis. The team did not report their results to the OSC until they had simulated taking the time to develop the film they would have removed from the seismic monitoring equipment.

Based on the above findings, this portion of the licensee's program was acceptable.

d. Relocation Center

The licensee recently established a new relocation center at a school in Fulton, Illinois. The center would be used by nonessential personnel who would evacuate the Quad Cities Station in accordance with procedures. Relocation center activation and use were demonstrated when several nonessential personnel proceeded to the facility following the successful completion of onsite assembly and accountability.

The relocation center was activated following the Alert declaration per procedures. Several radiation protection and security personnel were adequately briefed on their responsibilities before proceeding to the facility. The relocation center staff correctly retained their personal dosimetry when leaving the Protected Area. They efficiently prepared the facility for use, established access control, and established communications with TSC staff. While TSC staff notified a school official that the relocation center was being activated in a predesignated portion of the school and its parking lot, procedurally required calls to appropriate State and local agencies were simulated. As the exercise progressed, there was some concern by members of the public about the presence of unfamiliar security guards on the school grounds.



Four nonessential persons evacuated the Station following completion of onsite accountability. Two were simulated to have become contaminated before leaving the Protected Area. The interior of their vehicle was also to have become contaminated when simulated loose contamination from their clothing was transferred to interior surfaces of the vehicle.

Relocation center staff were notified that Station evacuees were enroute to their facility. Due to radio reception problems, relocation center staff relied on a telephone located in a portion of the building remote from their work stations to communicate with TSC staff and later with EOF staff.

In accordance with procedural and step-off pad guidance, the four plant evacuees adequately checked their hands and feet for contamination before entering the building. The two individuals who were simulated to be contaminated were identified during this process, and kept segregated within the building. Further surveys revealed that portions of their clothing were also contaminated, a fact which could have gone undetected prior to entering the building had not their hands or feet also have been contaminated. The more detailed surveys also indicated that at least one individual was simulated to have inhaled airborne contamination. Relocation center and EOF staffs adequately coordinated a plan to have the contaminated individuals transferred to the licensee's Byron Nuclear Generating Station for more thorough evaluation of the internal contamination, after simulating that these individuals had removed their outer clothing and had donned protective clothing. Their vehicle was adequately surveyed for contamination and was adequately segregated from uncontaminated areas of the parking lot. This vehicle would not have been used to transport the contaminated individuals to the Byron Station.

While a procedure contained an adequately detailed layout drawing of the school building and those areas available for use as a relocation center for plant evacuees, the complete address of the building was not listed. The drawing also indicated the location of the telephone within the building that is available for use by relocation center staff. However, the procedures did not include driving instructions from the relocation center to the Byron Station.

Based on the above findings, this portion of the licensee's program was acceptable; however, the following items should be considered for improvement:

- The licensee should notify appropriate offsite officials of any relocation center activation for drill or exercise purposes.
- The licensee should consider installing a telephone communications capability within the relocation center workspace of the building instead of relying on a telephone located in a remote portion of the building.

- Plant evacuees should be required to perform a complete body survey for contamination before entering the building, rather than only a hand and feet survey, to better ensure that all external contamination is detected.
- Relocation center procedures should include driving instructions to the Byron Station, which is apparently the primary location for further evaluation of internally contaminated plant evacuees.

e. Emergency Operation Facility (EOF)

The exercise scenario included simulated earthquake damage in the EOF. Security staff arrived following the Alert classification to prepare the EOF for activation. They immediately assessed the damage, cleaned up simulated broken glass, fallen status boards, fallen procedure manuals, and checked all communications equipment. The facility was ready for use when EOF technical staff began arriving.

EOF staff promptly established and maintained communications with the onsite emergency response facilities, and with State, NRC, and other government agencies' representatives who were simulated by a "response cell" of remotely located exercise controllers. EOF staff demonstrated the capability of adequately updating State and NRC officials at approximately thirty minute intervals.

The EOF was fully staffed and in command and control of the licensee's response efforts within the required time limits following the Site Area Emergency classification. The Manager of Emergency Operations (MEO) and his key aides effectively managed the EOF. Briefings were conducted every half hour. If the Advisory Support Manager responsible for these briefings was busy, he delegated this responsibility to one of his staff. The MEO conducted a few meetings with key staff in his office; however, he appropriately did most of his managing and technical decisionmaking in the major work area of the EOF.

EOF personnel were well trained and knowledgeable of their duties and responsibilities. Procedures were correctly implemented. Checklists were followed. Personnel from various disciplines effectively shared information and coordinated their accident mitigation efforts. Plant status information was frequently updated and adequately trended. Typed copies of status board information were distributed to EOF staff prior to being erased from the boards.

The Technical and Advisory Support groups provided valuable assistance to TSC personnel in their efforts to mitigate onsite consequences of the earthquake. Two diesel generators were ordered, and approval was obtained to transfer this oversized equipment over highways to the site. Helicopters were ordered to assess possible damage to transmission lines. Backup field survey teams were



requested from the Byron Station. The possible effects of earthquake aftershocks were considered. Calls were placed to the response cell, which also simulated the National Earthquake Information Center, for information on the earthquake and the potential for aftershocks.

Protective measures staff adequately demonstrated their capabilities to acquire and trend current onsite meteorological measurements and to incorporate these data into computerized offsite dose calculations due to the potential for a simulated radiological release. The procedurally correct offsite protective action, which was to "prepare for possible action", was recommended to offsite officials for the area within a two mile radius of the site and in the downwind sectors from two to 10 miles from the site. Due to fluctuating wind direction conditions, EOF staff recognized that the affected sectors varied in number from three to five during the exercise.

Two field survey teams were activated and briefed by TSC staff following the Alert declaration in accordance with procedures. Command and control of these teams was smoothly transferred to the EOF from the TSC. Control of field team personnel was well demonstrated by the Radiological Communicator and other members of the protective measures staff. Communications were maintained by the communicator with the "Red Team" after they were accosted by a irate farmer roleplayer who held the team hostage and took over control of their van. However, EOF management left the communicator in charge of the communications with this team without giving the communicator sufficient guidance on how to deal with the farmer in a hostage situation. Licensee exercise controllers identified this insufficient direct management involvement during the critique immediately following the exercise.

Following a twelve hour jump in the scenario timeline, preliminary recovery planning was demonstrated. A correct revision to the offsite protective action recommendation was coordinated with simulated State and NRC staffs. A prioritized list of onsite recovery action items was telecopied from the TSC and incorporated into the EOF staff's list of items. Long-term staffing and equipment needs were addressed. Areas of responsibility were assigned.

Based on the above findings, this portion of the licensee's program was acceptable.

6. Exercise Scenario and Controller Actions (IP 82302)

The exercise objectives and complete scenario manuals were submitted in accordance with the established schedule. The objectives addressed the onsite concerns identified during the 1988 exercise. The licensee was responsive to the few technical questions on the scenario that were raised by NRC staff.

No examples of improper controller prompting of exercise participants were identified. Due to an error in computing decreasing reactor vessel level that did not become apparent until the exercise was in progress, a CR controller appropriately informed CR participants that these data were erroneous and that vessel level would not decrease below the top of the active fuel. Controllers accompanying inplant teams that were observed by the inspectors maintained the proper working relationship with the teams, including adhering to exercise groundrules regarding the acceptable degree of simulation, donning protective clothing, and restraining their teams from reporting results prior to the estimated task completion times. The lead EOF controller in the EOF did a particularly good job of managing the other EOF controllers and in coordinating with controllers in other locations.

A response cell of exercise controllers did a good job in challenging participants by portraying staffs of State and NRC response facilities, the National Earthquake Information Center, and the National Weather Service. Four licensee personnel, including the Station Manager, role-played NRC Site Team representatives to test site access procedures for NRC emergency responders, as well as the interface with TSC staff. These roleplayers had no prior knowledge of the scenario and appropriately limited their activities to information gathering, rather than directing TSC players to take actions which might not otherwise have been initiated.

The scenario was challenging in several respects other than the decisionmaking associated with a response to degraded reactor conditions. Over thirty maintenance and radiological survey teams were dispatched from the OSC, thus providing a good challenge to OSC supervisory personnel. Several mockups of plant components were fabricated to provide additional realism to teams sent to work on these items. Activation and use of an offsite relocation center for plant evacuees was a different exercise experience for this licensee's emergency responders, as was the hostage situation involving one offsite survey team. Variable wind direction conditions challenged TSC and EOF protective measures staffs to keep decisionmakers up to date on affected downwind sectors.

Based on the above findings, this portion of the licensee's program was acceptable.

7. TMI Safety Issues Management System (SIMS) Items

On October 31, 1980, the NRC issued NUREG-0737, which incorporated into one document all TMI-related items approved for implementation by the Commission at that time. On December 17, 1982, the NRC issued Supplement 1 to NUREG-0737 to provide additional clarification regarding Regulatory Guide 1.97 (Revision 2) - Application to Emergency Response Facilities, and Meteorological Data, as well as other areas. The status of the completion of these TMI SIMS items are internally tracked by the NRC.



The July 15, 1988 Inspection Report (Nos. 254/88017; 265/88017) provided a status listing of the SIMS items related to emergency preparedness. The following listing provides an updated status of those SIMS items that were "open" in the July 15, 1988 Report.

III.A Current Status: Closed

This item has been determined to be no longer applicable, and has been administratively closed.

III.A.2.4 Current Status: Closed

This item will be addressed as part of the routine inspection program, and therefore is no longer applicable, and has been administratively closed.

III.A.2.5 Current Status: Closed

This item will be addressed as part of the routine inspection program, and therefore is no longer applicable, and has been administratively closed.

III.A.2.6 Current Status: Closed

This item will be addressed as part of the routine inspection program, and there is no longer applicable, and has been administratively closed.

III.A.2.8 Current Status: Closed

This item will be addressed as part of the routine inspection program, and therefore is no longer applicable, and has been administratively closed.

MPA-F-63 Current Status: Open

This item involves a review of the TSC during a future inspection.

MPA-F-65 Current Status: Open

This item involves a review of the EOF during a future inspection.

8. Exit Interview (IP 30703B)

On April 6, 1989, the inspectors met with those licensee representatives listed in Section 1 to present the preliminary inspection findings. The licensee agreed to consider the improvement items mentioned, and indicated that none of the matters discussed were proprietary.



The licensee was informed that overall exercise performance was good and improved over the previous exercise. The scenario was challenging and creative in several respects. The licensee's preliminary critiques, observed in several locations, were objective.

Attachments:

1. Scope of Participation
2. Exercise Objectives
3. Scenario Narrative
 Summary and Timeline



QUAD CITIES NUCLEAR POWER STATION
GSEP EXERCISE

April 5, 1989

SCOPE OF PARTICIPATION

The April 5, 1989 Quad Cities GSEP Exercise is a daytime event to test the capability of the basic elements within the Commonwealth Edison Company GSEP. The Exercise will include mobilization of CECO personnel and resources adequate to verify their capability to respond to a simulated emergency. The Exercise is a CECO only event and involvement will be not be required by State and local agencies.

Commonwealth Edison will participate in the Quad Cities Exercise by activating the on-site emergency response organization, the Emergency Operations Facility (EOF) and Quad Cities Relocation Center as appropriate, subject to limitations that may become necessary to provide for safe, efficient operation of the Quad Cities Station and other nuclear generating stations. The Joint Public Information Center (JPIC) and the Corporate Command Center (CCC) will not be activated for this Exercise.

Personnel for the TSC and other on-site participants will be on-site at Quad Cities by 0730. The start of the Exercise is 0800. The Exercise shift will receive the initial scenario information and respond accordingly.

The "Exercise" Nuclear Duty Person will be notified of simulated events as appropriate on a real-time basis. The "Exercise" Nuclear Duty Person and the balance of the recovery group will be prepositioned close to the Morrison EOF to permit use of personnel from distant locations.

Commonwealth Edison will demonstrate the capability to make contact with contractors whose assistance would be required by the simulated accident situation, but will not actually incur the expense of using contractor services to simulate emergency response except as prearranged specifically for the Exercise.

Commonwealth Edison will arrange to provide actual transportation and communication support in accordance with existing agreements to the extent specifically prearranged for the Exercise. Commonwealth Edison will provide unforeseen actual assistance only to the extent that the resources are available and do not hinder normal operation of the Company.



QUAD CITIES NUCLEAR POWER STATION
1989 GSEP EXERCISE

April 5, 1989

OBJECTIVES

PRIMARY OBJECTIVE:

Demonstrate the capability to implement the Commonwealth Edison Generating Stations Emergency Plan (GSEP) to protect the public in the event of a major accident at the Quad Cities Nuclear Power Station. Demonstrate this capability during the hours to qualify as a daytime Exercise in accordance with NRC guidelines.

SUPPORTING OBJECTIVES:

1) Incident Assessment and Classification

- a. Demonstrate the capability to assess the accident conditions, to determine which Emergency Action Level (EAL) has been reached and to classify the accident level correctly in accordance with GSEP within 30 minutes of plant conditions warranting classification.
- (CR, TSC)

2) Notification and Communication

- a. Demonstrate the capability to notify the applicable offsite state and local organizations within fifteen (15) minutes of declaring an accident classification.
- (CR, TSC)
- b. Demonstrate the capability to notify the NRC within one (1) hour of the initial incident.
- (CR)
- c. Demonstrate the capability to contact pertinent organizations that would normally assist in an emergency, but are not participating in this Exercise (e.g., INPO, Murraray & Trettel, General Electric.)
- (TSC, EOF)
- d. Demonstrate the ability to provide follow-up information/updates to the State and NRC within 30 minutes of major plant condition changes or at least hourly.
- (TSC, EOF)
- e. Demonstrate the ability to maintain an open-line of communication with the NRC upon request.
- (CR, TSC, EOF)

QUAD CITIES NUCLEAR POWER STATION
1989 GSEP EXERCISE

April 5, 1989

OBJECTIVES (cont'd)

3) Radiological Assessment:

- a. Demonstrate the ability to collect plant radiological survey information, document and trend this information and make appropriate recommendations concerning protective actions for personnel.
- (OSC, TSC, EOF)
- b. Demonstrate the capability of the Operations Support Center to implement proper Health Physics practices and dosimetry issuance for OSC personnel and Maintenance Teams dispatched to radiological areas in-plant.
- (OSC)
- c. Demonstrate the capability of the Operations Support Center to track and document personnel exposures for OSC personnel and Maintenance Teams dispatched from the OSC.
- (OSC)
- d. Demonstrate the capability to calculate offsite dose projections, if applicable.
- (TSC, EOF)
- e. Demonstrate the ability to make Protective Action Recommendations, if applicable.
- (CR, TSC, EOF)
- f. Demonstrate the ability of plant personnel to perform decontamination of radioactivity contaminated individuals.
- (OSC, RC)
- g. Demonstrate the ability to perform or promptly arrange for In Vivo Analysis (whole body counting) for an individual with possible significant internal deposition of radioactive material.
(TSC, EOF, RC)

QUAD CITIES NUCLEAR POWER STATION
1989 GSEP EXERCISE

April 5, 1989

OBJECTIVES (cont'd)

4) Emergency Facilities:

- a. Demonstrate the capability to activate and staff the Emergency Response Facilities in a timely manner (e.g. onsite facilities within 60 mins.) and in accordance with procedures.
- (CR, OSC, TSC, EOF)
- b. Demonstrate the capability to record and track major plant status information relative to changing plant Exercise events using plant status boards.
- (CR, OSC, TSC and EOF)
- c. Demonstrate the capability to track and document, on status boards and logs, all dispatched Operations and Maintenance Team activities and in-plant job statuses.
- (TSC, OSC)
- d. Demonstrate the ability to staff set up and activate the relocation centers in accordance with procedures.
- (TSC, RC)

5) Emergency Direction and Control:

- a. Demonstrate the ability of the individuals in the GSEP organization to perform their assigned duties and responsibilities (e.g. assessment of conditions and initiation of mitigatory or protective actions) as specified in Generic GSEP and position-specific procedures.
- (CR, TSC, OSC, EOF)
- b. Demonstrate the ability of the Managers/Directors to exert command and control in their facilities according to the duties and responsibilities specified in Generic GSEP and position-specific procedures.
- (CR, OSC, TSC, EOF, RC)
- c. Demonstrate the ability of Directors to coordinate and prioritize Maintenance and Operating activities during abnormal and emergency plant operation.
- (CR, TSC, OSC)
- d. Demonstrate/simulate the ability to requisition, acquire and transport emergency equipment and supplies necessary to mitigate or control unsafe or abnormal plant conditions.
- (CR, TSC, OSC, EOF)
- e. Demonstrate the capability to assemble and account for all on-site personnel within 30 minutes.
- (TSC)



QUAD CITIES NUCLEAR POWER STATION
1989 GSEP EXERCISE

April 5, 1989

OBJECTIVES (cont'd)

- f. Demonstrate the capability to relocate on-site personnel in a timely manner after a Site Evacuation is ordered in accordance with procedures.
(TSC, OSC, RC)
- g. Demonstrate the ability of the OSC Director, or designee, to conduct periodic (at least hourly) briefings of OSC staff covering plant status, event classification and plant activities in progress.
- (OSC)
- h. Demonstrate the ability to survey the plant assess damage and plan for maintenance activities following the earthquake.
- (TSC, OSC, CR)
- i. Demonstrate the ability to dispatch communicate with and control environmental field teams.
- (TSC, EOF)

6) Recovery

- a. Demonstrate the capability of the emergency response organization to identify the requirements, criteria and implementing procedures for recovery.
- (TSC, EOF)
- b. Demonstrate the capability to identify work priorities, procedures and programs which would be required to return the plant to a normal operating status.
- (TSC, EOF)

NOTE:

- (CR, TSC)

designates the primary areas where demonstration of the objective may occur. Dependent on exercise conditions and steps taken by the station, not all areas specified may need to demonstrate that objective. Key for abbreviations:

CR = Control Room

TSC = Technical Support Center

OSC = Operations Support Center (including Environmental Field Teams.)

EOF = Emergency Operations Facility

RC = Relocation Center



QUAD CITIES NUCLEAR POWER STATION
1989 GSEP EXERCISE

April 5, 1989

NARRATIVE SUMMARY

INITIAL CONDITIONS

(0800-0815)

UNIT 1

Unit 1 is 45 days into a scheduled 70 day refueling outage. Normal outage activities are underway. The vessel is defueled and open. A chemical decon of recirc and clean up piping has been completed and work is underway in the Unit 1 Drywell. X-raying is in progress on the north bank of the U-1 CRD Accumulators. Mechanical Maintenance will be replacing CRDs this shift. The Condensate System is drained. The "B" recirc pump motor is Out Of Service (OOS) for inspections and live load packing is being installed in Suction Valve 1-202-4B. The main turbine is disassembled for low pressure rotor replacement. Preparation for the U-1 Diesel Out Of Service needs to be done. Painting is in progress inside the Torus. Bus 14 is deenergized to inspect the bus. The 1A Circ Water Bay is dewatered and the 1A Circ Water Pump is open to inspect the discharge valve. Plugs are installed in the 1B and 1C pumps.

UNIT 2

Unit 2 has been operating at 100% power for the last five days after being shutdown for a dual Unit outage for 125V and 250V battery testing and 1/2 Diesel Generator maintenance. The 2A Condensate Pump is OOS to replace mechanical seals, completion is expected in 2 to 3 shifts. The RHR shutdown cooling valve 2-1001-47 is OOS closed per procedure. IMs are scheduled to perform routine ST's 34, 35, 60. Torus cooling is on the "B" loop. The 2A Reactor Building vent fan is OOS for damper repair. Cleanup demin conductivity is slowly coming down from a high of 0.3 micro mho/cm and Chemistry is still trying to determine the problem.

UNUSUAL EVENT

(0815-0930)

Vibration is felt in the Control Room. Several telephone calls are received by the Control Room regarding shaking of equipment. There are indications of Torus level changes and the Seismic Monitor activates. The earthquake damages several pieces of equipment but does not cause any immediate threats to the safety of the plant. System walkdowns will find that Unit 2 Condensate Demin Holding Pumps A and E are leaking, the CRD Repair Room drain line is cracked badly. The 1/2 Diesel Generator air start line has been damaged and depressurizes the Air Pressure Flasks. However, a trouble alarm does not occur due to sticking pressure switches. Bus 25 and other breakers have tripped and fire headers are leaking in various parts of the plant. There is an instrument air leak found which can not be isolated. The Unit 2 Diesel Generator has a cracked cooling water line which is not obvious during the walkdowns.

0115Q/4/wjm
QNPS '89 GSEP Ex.



QUAD CITIES NUCLEAR POWER STATION
1989 GSEP EXERCISE

April 5, 1989

NARRATIVE SUMMARY

Damage reports are called in from the Crib House basement reporting indication of significant water leakage into the 1A Circ Water Pump Bay. Radiography personnel call in with a report that they have lost their source and require assistance to control the area and retrieve the source.

Expected Actions

Declaration of an Unusual Event should be made because of the earthquake (EAL #3). System walkdowns should be organized and initiated to determine the extent of damages. Radiological and Maintenance concerns should begin to be addressed. Immediate actions should start to prevent overexposures from the lost radiography source. An Alert may be declared and/or the TSC and OSC activated depending upon the perceived need for additional resources and damage reports from system walkdowns.

ALERT
(0930-1045)

The Bus 27 Feed Breaker is erroneously racked out instead of the adjacent 2B CRD Pump breaker which should have been pulled. This breaker was five when it was opened which causes major damage to the breaker and takes out Bus 24. The U-2 Diesel Generator auto starts and D/G trouble alarm occurs due to loss of cooling water. A SCRAM occurs on Unit 2 due to low water level. High Pressure Coolant Injection (HPCI) does not initiate due to the HPCI 2-2301-3 Valve failing to operate because of stem binding at the packing gland. The MSIVs are open sending steam to the condenser, bypass valves open as necessary regulating reactor pressure. Reactor water level quickly drops below minus 59 inches and continues to slowly decrease.

Shortly after the SCRAM, Drywell pressure exceeds 2.5 psig and continues to slowly rise. RCIC will initiate and control reactor water level above minus 143 inches. Unit 2 Drywell rad levels begin to increase. The 1/2 Diesel Generator will start only if the starting air system has been repaired. Reactor Building Vents isolate and the Standby Gas Treatment System starts.

Expected Actions

An Alert should be declared based on EAL #16 (RX water level below minus 59 inches and Drywell pressure exceeding 2 psig). The TSC and OSC should be activated if not already done. Maintenance and radiological concerns should continue to be addressed.

0115Q/5/wjm
QNPS '89 GSEP Ex.



QUAD CITIES NUCLEAR POWER STATION
1989 GSEP EXERCISE

April 5, 1989

NARRATIVE SUMMARY

SITE EMERGENCY
(1045-1430)

Corrected containment radiation levels exceed 400 R/Hr and then stabilize around 500 R/hr. Drywell temperature and pressure remain below levels requiring initiation of Drywell sprays. Reactor pressure and temperature continues to decrease. Contamination from the broken CRD drain line spreads and causes loss of the whole body friskers due to monitor contamination. Contaminated individuals are found when surveyed at Site Assembly. An Environmental Field Team is temporarily detained by an irate individual with a shotgun. Earthquake caused damages are found in the EOF upon initial activation of the EOF. An individual is found at the Relocation Center with high levels of facial contamination and positive nasal smears.

Expected Actions

A Site Emergency should be declared due to 400 R/hr in the Drywell. The EOF should be activated and necessary repairs accomplished. Assembly and accountability of the site personnel should be performed and non-essential personnel should be evacuated. The Relocation Center should be activated to perform contamination surveys of personnel since many contaminated individuals were found at the site assembly areas. A whole body count should be arranged for the individual with positive nasal smears. Security considerations should be discussed in response to the Field Team being detained by an individual with a shotgun. Maintenance and Radiological concerns should continue to be addressed.

TIME JUMP
(1300 - 1430)

There has been a twelve (12) hour time jump. It is now 0100. Personnel have had eight (8) hours rest and recently returned to work. The reactor has been placed in cold shutdown. Shutdown cooling is on the RHR "A" loop. Drywell pressure has been reduced to 0 psig by venting and venting has been completed. The problem with the Field Team being detained has been resolved. Elevated radiation levels have not been detected by Environmental Field Teams and Field Team activity was suspended at midnight until sunrise at 5:30 a.m.

During the time jump, the following has been accomplished: The 1/2 Diesel Generator Air System leak has been repaired and the 1/2 D/G is now in standby status. The instrument air leak has been temporarily repaired. The 14-1/24-1 crosstie breaker is closed. Partial decon has been completed in the trackway area and portal monitors, but high loose surface contamination levels still exist in the plant. Walkdowns of the plant have found hair line cracks in the concrete and water is seeping into the basement. The 1A Circ Water Pump Bay is flooded.

01150/6/wjm
QNPS '89 GSEP Ex.

QUAD CITIES NUCLEAR POWER STATION
1989 GSEP EXERCISE

April 5, 1989

NARRATIVE SUMMARY

Expected Action After Time Jump:

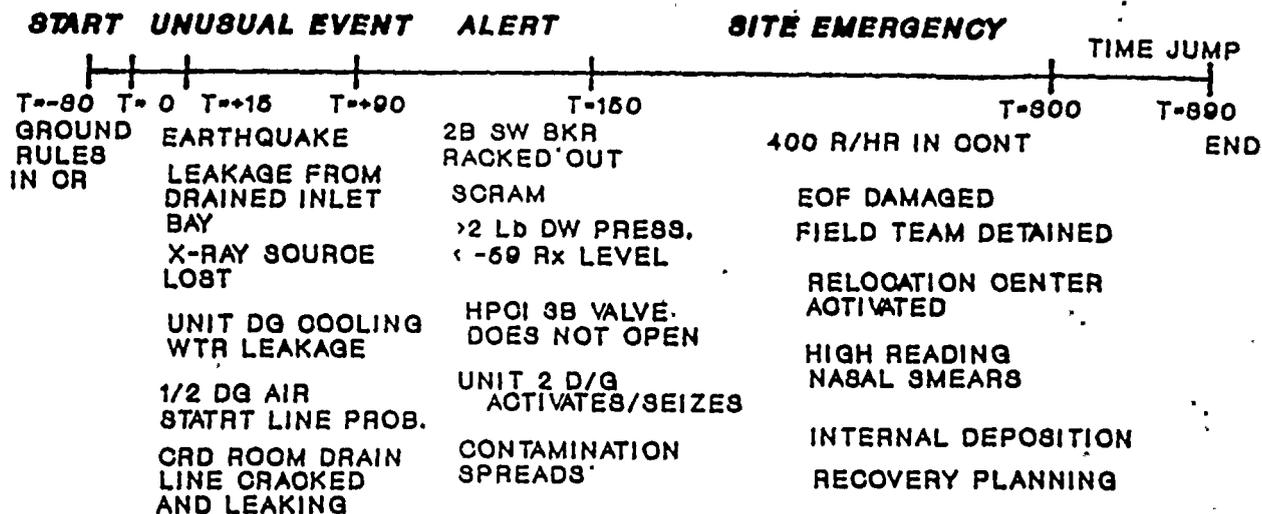
Evaluation should be made of current conditons to determine possibility of entering Recovery Phase. Core damage estimates should be made based on chemistry data, which will show damage is limited to a small percentage of fuel cladding. Planning should start for deinerting and entering the Drywell to identify and correct the leak. Plans for further inspections, walkdowns and systems analysis should be made (e.g. fuel inspections, hydros and snubber inspections) to determine the full extent of earthquake damage. Decontamination of the plant should be continued. Additional environmental monitoring should be planned for when the Field Teams return in the morning. Efforts may be started to get divers for the flooded Circ Water Pump Bay.

0115Q/7/wjm
QNPS '89 GSEP Ex.



QUAD CITIES GSEP EXERCISE
APRIL 5, 1989

SCENARIO TIMELINE



- T = 0
0800 START EXERCISE
- T = +15
0815 UNUSUAL EVENT - EARTHQUAKE OCCURS CAUSING MINOR DAMAGE AT NUMEROUS LOCATIONS THROUGHOUT THE PLANT.
- T = +30
0830 RADIOGRAPHER REPORTS IRIIDIUM SOURCE HAS FALLEN OUT OF CAMBRA. NEEDS HELP.
- T = +90
0930 ALERT - OPERATOR RACKS OUT WRONG BREAKER. UNIT SCRAMS SUCCESSFULLY. HPCI VALVE IS STUCK SHUT.
- T = +93
0933 MINUS 59 INCHES AUTO INITIATION SIGNAL OCCURS. UNIT TWO DIESEL GENERATOR AUTO STARTS.
- T = +108
0948 UNIT 2 DIESEL GENERATOR SIEZES IF NOT SHUT DOWN DUE TO COOLING WATER LEAK.



QUAD CITIES GSEP EXERCISE
APRIL 5, 1989

SCENARIO TIMELINE (CONTINUED)

T = +120 (APPROX.) 1000	SITE ASSEMBLY OCCURS - CONTAMINATION FROM BROKEN CRD ROOM DRAIN LINE SPREADS TO ASSEMBLY AREAS.
T = +150 1030	SITE EMERGENCY - DRYWELL RADIATION LEVELS EXCEED 400 R/HR.
T = +180 (APPROX.) 1100	RELOCATION OF NONESSENTIAL PERSONNEL.
T = +195 1115	FIELD TEAM RETAINED BY IRATE FARMER.
T = +210 (APPROX.) 1130	CONTAMINATED INDIVIDUALS WITH HIGH NASAL SMEARS ARE FOUND IN RELOCATION CENTER.
T = 225 (APPROX.) 1145	EOP PRIME COMPUTER DOES NOT WORK NEEDS TO BE REINITIATED.
T = +240 (APPROX.) 1200	PROBLEMS WITH IRATE FARMER ESCALATE.
T = +300 1300	TWELVE HOUR TIME JUMP OCCURS. RECOVERY PHASE EVALUATION & PLANNING BEGINS.
T = +920 0100	STATUS MESSAGES UPDATING TWELVE HOUR TIME JUMP.
T = +935 0115	SAMPLE DATA FOR LIQUID, GASEOUS AND EFFLUENT SAMPLES TAKEN DURING TIME JUMP ARE RECEIVED IN TSC.
T = +940 0130	UNIT TWO DIESEL INFORMATION RECEIVED.
T = +1000 0230	EXERCISE TERMINATED.

