U. S. NUCLEAR REGULATORY COMMISSION

REGION III

Report Nos. 50-254/84-09(DRSS); 50-265/84-08(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, IL

Inspection Conducted: August 27-30, 1984

Inspectors: T. Ploski — 9/21/84
T. Ploski
Team Leader — Date

for G. Christoffer — 9/21/84
T. Ploski — Date

for W. Snell — 9/21/84
T. Ploski — Date

M. Smith — 9/24/84
Date

Approved By: M. P. Phillips, Chief — 9/22/84
Emergency Preparedness Section — Date

Inspection Summary

Inspection on August 27-30, 1984 (Report Nos. 50-254/84-09[DRSS]; 50-265/84-08 [DRSS])

Areas Inspected: Routine, announced inspection of the Quad-Cities Station emergency preparedness exercise involving observations by nine NRC representatives of key functions and locations during the exercise. The inspection involved 175 inspector-hours onsite by five NRC inspectors and four consultants.

Results: No items of noncompliance or deviations were identified. Exercise weaknesses which require a written response are identified in the report and in the Appendix to the report's transmittal letter.

DETAILS

1. Persons Contacted

NRC Observers and Areas Observed

T. Ploski, Control Room, Technical Support Center (TSC), and Operational Support Center (OSC)
G. Christoffer, Emergency Operations Facility (EOF)
W. Snell, EOF
M. Smith, Joint Public Information Center (JPIC)
F. Hasselberg, OSC and Inplant Health Physics Teams
K. Leposer, TSC
G. Bryan, Control Room
G. Stoetzel, OSC and Inplant Health Physics Teams
P. Roberson, Radiological Environmental Monitoring Teams

Commonwealth Edison and Areas Observed

*N. Kalivianakis, Station Superintendent, Advisory Support Director, EOF
F. Palmer, Recovery Manager, EOF
T. Blackmon, Controller, Control Room
T. Kovack, Controller, Control Room
*R. Bax, Station Director, TSC
J. Schnitzmeyer, Controller, TSC
*D. Jessen, Controller, TSC
T. Ziakis, Controller, OSC
K. Hall, Controller, OSC
C. Bennett, Controller, Environs Team
R. Colglazier, Controller, Environs Team
J. Golden, Controller, Environs Team
R. Dwyer, Lead Controller, TSC/OSC
M. Berlin, Controller, JPIC
*J. Barr, Controller, EOF
B. Schnell, Controller, EOF
M. Vonk, Controller, EOF
*D. Thayer, Controller, OSC
*P. Becknell, Controller, OSC
*D. Visin, Administrative Director, TSC
*L. Butterfield, Stores Director, TSC
*L. Gerner, Assistant Station Director, TSC
*T. Davis, Communicator, Control Room
*K. Leech, Security Director, TSC
*D. Van Pelt, Maintenance Director, TSC
*W. Bielasco, Rad Chem Director, TSC
*R. Carson, Environs Director, TSC
*S. Horvath, Environs Director, TSC
*G. Powell, Inplant Team Leader

*Indicates those present at the August 30, 1984 exit interview.

2. General

An exercise of the licensee's Generating Stations' Emergency Plan (GSEP) and the Quad-Cities Annex was conducted at the Quad-Cities Station on August 28-29, 1984. The exercise tested the licensee's and offsite emergency support organizations' capabilities to respond to a hypothetical accident scenario resulting in a major release. The attachment describes the scenario. The exercise was integrated with a test of the Clinton County (Iowa), Scott County (Iowa), Rock Island County (Illinois), and Whiteside County (Illinois) emergency plans. This was a full-participation exercise for these counties and the States of Illinois and Iowa.

3. General Observations

a. Procedures

The exercise was conducted in accordance with 10 CFR Part 50, Appendix E requirements using the GSEP, Quad Cities Annex, and the Emergency Plan Implementing Procedures (EPIPs) employed by the Station and the Emergency Operations Facility (EOF).

b. Coordination

The licensee's response was generally coordinated, orderly, and timely. If these events had been real, the actions taken by the licensee would have been sufficient to permit State and local authorities to take appropriate actions.

c. Observers

Licensee observers monitored and critiqued this exercise along with nine NRC observers and several dozen observers representing Regions V and VII of the Federal Emergency Management Agency (FEMA). FEMA observations on the responses of the State and local governments will be provided separately from this inspection report.

d. Critique

The licensee held critiques following the exercise on August 29, 1984. The NRC critique was held at the Visitors' Center on August 30, 1984. In addition, a public critique was held on the evening of August 30, 1984, to present the preliminary findings regarding the onsite and offsite activities by the NRC and FEMA exercise observers respectively.

4. Specific Observations

a. Control Room

The on-duty Shift Engineer (SE), Station Control Room Engineer (SCRE), and Shift Overview Supervisor (SOS) functioned as the only Control Room exercise participants until approximately one hour and forty-five minutes after the exercise had begun. At that time, the Station

Director (SD) had relieved the SE of all emergency responsibilities and an Operational Engineer had relieved the SE and SCRE of all exercise involvement by functioning as a data communicator to the Technical Support Center (TSC). As indicated in this paragraph, the decision to utilize the SE and SCRE for both on-shift and exercise roles had an adverse impact on observed Control Room responses to scenario events. The SE and SCRE were unable to devote themselves to the exercise since real plant activities, which included Unit 1 startup, demanded higher priority attention than did the exercise. It was clear to Control Room staff, licensee controllers, and NRC observers that real plant conditions could require the SE's and SCRE's full attention and cause suspension or potential collapse of the exercise.

Upon receiving the bomb threat message, the SE promptly initiated conservative measures to protect onsite personnel. The SCRE notified the NRC Headquarters Duty Officer of the threat within an acceptable time frame. An Unusual Event was classified promptly after the report of an explosion in the switchyard and a review of alarms, from which the SE correctly concluded that all offsite power had been lost to the Station. While the SCRE was engrossed in preparing the Nuclear Accident Reporting System (NARS) form for the Unusual Event and in making the associated offsite notifications, the SE learned that fires had also been reported in the switchyard. After briefly reviewing the Emergency Action Level (EAL) conditions, the SE declared an Alert for a Fire, EAL Condition 5, rather than for an Unplanned Explosion, EAL Condition 4. Since the magnitude of the switchyard fires was still uncertain while the explosion was a certainty, EAL Condition 4 should have also been noted. Later, in the Emergency Operations Facility (EOF), the fact that an explosion had occurred was apparently forgotten until about ten minutes after this facility had been declared operational.

The inspectors noted that the situation may have also fit the description of a Site Area Emergency, not just an Alert, under EAL Condition 4, Unplanned Explosion. For this EAL Condition, both the Alert and Site Area Emergency descriptions made general reference to the Technical Specifications. The former classification is appropriate should equipment described in the specifications be affected such that it is operated in a degraded mode permitted by a Limiting Condition for Operation (LCO), while the latter classification is appropriate if this equipment is degraded such that immediate reactor shutdown is required. Based on discussions between the inspectors and the licensee's lead Control Room controller and principal onsite and offsite scenario authors, the referenced Technical Specification was determined to be 3.9.c.2 which states, in part, that continued reactor operation at 40 percent of rated power is permissible following the loss of offsite power provided that the affected Unit's diesel generator and the shared diesel are both operable and that all core and containment cooling systems are operable. In this scenario's initial conditions, Unit 2's Reactor Core Isolation Cooling (RCIC) System was placed out of service for maintenance. Thus, even though the explosion had not directly damaged a system used to provide core

or containment cooling, not all such systems were available for Unit 2. The SE was also aware that both units had automatically scrammed upon loss of offsite power. No unit was, in fact, being reduced to 40 percent of rated power per the LCO. During discussions with the aforementioned licensee representatives, opinions were voiced that the SE may not have closely examined the Unplanned Explosion EALs since no diesel or core or containment cooling system had been damaged by an explosion and that no manual reactor scram had been necessary. The licensee should re-evaluate the wording and interpretation of the Unplanned Explosion EALs with emphasis on providing more detailed guidance, and addressing situations where equipment described in these specifications are out of service for reasons other than damage from a just-occurring explosion. This is an Open Item. (254/84-09-01; 265/84-08-01)

Timely initial notifications to the corporate duty officer, load dispatcher, States, and the NRC were completed by the SCRE following the Unusual Event and Alert declarations. From the receipt of the bomb threat until about 7:15 p.m., the SCRE was forced by manpower limitations to function as a communicator rather than as a technical advisor to the SE. Between 7:15 p.m. and 8:00 p.m., the SCRE was finally able to participate in several productive discussions with the SE regarding plant status, scenario events, and major decisions.

As in the 1983 exercise, recordkeeping was poor. The SE did not keep a log and no exercise participant was available to assist him in this task. The only records made prior to the relief of the SE and SCRE from exercise participation were the NARS forms and some notes made by the SCRE. The NARS form for the Alert declaration was improperly completed. The form's item 6 indicated that the incident occurred at 1855 hours, while item 7 indicated that the accident was classified at 1845 hours, or ten minutes prior to its occurrence. Control Room habitability monitoring, and the checking and reporting of self-reading dosimeter readings were not observed during this exercise. After 8:00 p.m. Control Room participation was, for all practical purposes, simulated due to involvement of only one communicator. The rest of the Control Room staff was involved in the actual startup of Unit 1.

The individual who became the TSC's Station Director (SD) arrived in the Control Room about 40 minutes after the Alert had been declared. He relieved the SE of all interim SD duties only after having completed a very thorough discussion with the SE on all aspects of plant conditions and ongoing emergency response. Before leaving the Control Room with the SOS, the SD properly called the TSC to ascertain its staff's state of readiness to assume their responsibilities.

In addition to the weakness discussed in this paragraph, the licensee should consider the following items for improvement:

- On duty Control Room staff should not additionally be required to be exercise participants due to the impracticality of their

being able to devote undivided attention to either real plant operations or the exercise.

- Sufficient Control Room personnel should be available as exercise participants so that the SCRE's performance of those responsibilities described in the GSEP can be evaluated, and that the capabilities to conduct recordkeeping, habitability monitoring, and exposure tracking can be demonstrated, as appropriate, during the entire exercise.

- The SE should thoroughly review the NARS form for completeness and accuracy prior to information transmittal.

b. Technical Support Center

The TSC became operational in a timely manner, with all required personnel arriving from their residences and being ready to assume their responsibilities within about sixty-five minutes after Alert declaration. The SD effectively managed his staff throughout the exercise. With the exception of offsite protective actions, TSC personnel were generally well briefed on plant status, emergency classifications, reclassifications, and other decisions made by the SD or EOF's Recovery Manager (RM). However, at times certain personnel not engaged in telephone conversations should have been more attentive to the SD's briefings. The SD delegated assignments properly and ensured that his staff kept him and each other informed of important incoming information and the results of staff analyses. TSC staff quickly adjusted to the simulated loss of certain inplant communications systems, including some telephone lines, the Public Address (PA) systems, and plant sirens. Information transmittal generally was timely and accurate between the Control Room, TSC, and EOF; however, the Control Room was not informed of the Site Area Emergency declaration for almost twenty minutes after it had been declared by the RM. Personnel continuously manning communications lines did exhibit fatigue and some frustration over background noise levels.

Assembly/accountability was accomplished in a timely manner despite the unavailability of the PA system and assembly siren. The guard force and Operational Support Center (OSC) personnel were utilized to seek, assemble, and account for onsite personnel. The Security Director found two missing individuals, who were contractors/observers, in a trailer near the TSC. Station, Rad/Chem, Environs, and Security Directors properly interfaced to ensure that the evacuation of non-essentials was properly completed. After the release had begun, these directors again interfaced appropriately when selecting the optimum route for personnel to leave and enter the site for a simulated shift change. TSC staff also exhibited proper concern for emergency worker exposures when an inplant survey team reported encountering an unexpected area with dose rates of about 20 R/hour. When communications with the team were lost, TSC staff were aggressive in seeking to re-establish contact and preparing to dispatch a search and rescue team.

The SD and RM properly interfaced on several key decisions besides those involving emergency reclassifications. TSC staff proposed that repairs to a High Pressure Coolant Injection (HPCI) valve be undertaken, despite the high exposure risk to emergency workers. Exposure limits, task duration, and the need for the RM to approve high exposures for volunteer workers were recognized. EOF staff correctly decided that the task should not be started since vessel water level would soon reach the top of active fuel and dose rates in the valve location would increase to several thousand R/hour. Later, when one diesel generator returned to service, the SD and RM correctly decided to start the Standby Gas Treatment System so that the release would change from an unfiltered, difficult to quantity ground-level release to an elevated, monitored release from which the bulk of radioactive particulates and volatile radioiodines would be filtered. Finally, both the TSC and EOF staffs recognized the need to conserve DC power. Loads were minimized in accordance with procedures. The TSC staff did a good job in trending key data and in relaying these trends and related forecasts to the EOF. Among the accurately trended and forecasted information were: the decreasing vessel moderator level; when the top of active fuel would be reached; and when DC power would be lost given certain loads.

TSC habitability monitoring was occasionally conducted; however, activation of the facility's emergency ventilation system was not demonstrated or simulated even after the ground-level release had begun. The TSC's primary air sampler was out of service; a backup air sampler was functional, but its chart recorder pen was not inking. In light of the problems with the TSC air sampler, personnel should have periodically checked their dosimeters. This was never observed during the exercise.

Internal message distribution was adequate; however, recordkeeping by individual directors varied from detailed activities logs to scribbled notes. Status boards were generally current; however, present and forecast meteorological and offsite protective action information were not plotted. Although reactor parameter data were periodically reported to the TSC, they were plotted on relatively small, hard to read, portable Sequence of Events status boards rather than on a large, readily available status board on which data could easily have been displayed in a better organized, more legible manner.

Several minor instances of controller prompting were observed in the TSC. Upon hearing that an inplant team had encountered dose rates of 20R/hour, a controller was heard by several participants and NRC observers to say that the report was erroneous. When the SD was told that portable diesel generators had arrived onsite, the same controller asked a participant whether someone had checked if diesel fuel had arrived with the generators. While neither of these instances had a major impact on the participants' actions toward terminating the release, the controller should not have voiced these concerns to participants; instead, he should have waited to see whether participants would address these concerns without his prompting them to do so.

Based on the above findings, the following items should be considered for improvement:

- TSC personnel should make greater efforts to reduce noise levels that interfere with status briefings and communicators' abilities to hear incoming information over dedicated communications lines.

- Headsets should be provided for personnel manning dedicated telephone equipment.

- The TSC's primary and backup air samplers should be repaired and better maintained to ensure proper operation during emergencies.

- Personnel should periodically determine their exposure when a release is taking place.

- All TSC directors should maintain adequately detailed records of their actions.

- Plant parameter data should be plotted on an appropriate status board such that individual parameter trends can be readily deduced.

- Controllers should avoid making comments which lead exercise participants to take actions earlier than would have otherwise been expected.

c. Operational Support Center

Personnel reported to the OSC in a timely manner following its activation; however, the individual assigned as OSC Supervisor did not identify himself as such until about thirty-five minutes after his arrival. During the exercise the OSC Supervisor was overburdened with tasks. Much of his time was spent in discussing plant activities and assignments with TSC staff, briefing inplant teams, and communicating with dispatched teams. While he adequately accomplished these tasks, the OSC Supervisor was not as successful at performing the following duties: maintaining detailed records of individual exposures; keeping assembled personnel informed of scenario events; ensuring that returning teams were checked for contamination upon entering the OSC; ensuring that returning teams submitted written reports; and maintaining a log of OSC activities. While exposure history data were kept, recordskeeping was largely done by personal notes rather than on a well-organized log. Assembled personnel were never verbally briefed on scenario events. The OSC's status board listed only emergency classification and OSC Supervisor identity information. While OSC habitability was monitored, not all returning teams frisked upon entering the room. Not all teams submitted written reports of their findings. A detailed log of OSC activities was not maintained.

The inability of the OSC Supervisor to adequately perform all necessary tasks was largely due to the lack of procedural provisions, and the need for one or more assistants. This is an exercise weakness. (254/84-09-02; 265/84-08-02)

d. Onsite Fire Fighting, Maintenance, and Health Physics Teams

The licensee conducted an unsuccessful fire drill early in the exercise. Upon learning that fires were occurring in the switchyard, the SE ordered security and fire brigade personnel to investigate and take appropriate actions. Only three of the Station's six man fire brigade responded to the fire scene. They were preceded by security officers. Fire fighters walked to the scene without bringing any equipment. Since these personnel also failed to meet at their normal assembly area, a controller awaiting their arrival at that location had to be paged to the fire scene by an NRC observer. Brigade members returned to the Station to obtain a cart containing foam generating equipment. Brigade members dragged this cart to the fire scene rather than procuring a Station vehicle to facilitate hauling the cart and other gear to the fire location. When asked at the exit interview whether the Station had developed procedural provisions and had trained fire brigade members to obtain a suitable vehicle for hauling heavy gear to fire scenes outside the power block, none of the licensee's representatives indicated that such was the case.

All inplant maintenance teams were accompanied by Rad/Chem Technicians (RCTs). Batteries for portable air samplers utilized by some inplant teams could not be found in the OSC. While some RCTs made certain what was the maximum allowable dose their teams could receive, others did not and chose limits that were somewhat lower. The use of hand-held radios by inplant teams was more frequent than observed during the 1983 exercise. The Security Director was instrumental in procuring additional radios needed by inplant teams. Not all teams provided the OSC Supervisor with written survey reports to supplement verbal reports transmitted earlier by radio. This created an additional survey documentation burden for the OSC Supervisor.

A three man team collected a reactor coolant sample under simulated post accident conditions. The team was adequately briefed and followed correct procedures to operate the High Range Sampling System. The sample was collected, diluted, and analyzed in approximately two hours. Technicians demonstrated proper precautions when obtaining and handling the sample, with two exceptions. During sample collection and transport, only one RCT wore finger dosimetry. During sample analysis in the hot lab, another RCT wore finger dosimetry on only one hand.

Several problems were noted regarding the performance of controllers sent with inplant teams. At times no controller was available to accompany teams ready for dispatch, while on other occasions a maintenance and an RCT controller accompanied the same inplant team. On

several occasions, RCTs leaving the OSC with inplant teams were asked by controllers whether or not they had considered certain precautions.

Based on the above findings, the following items should be considered for improvement:

- Briefings provided to RCTs accompanying inplant teams should include information on the maximum allowable exposures team members may receive.

- Replacement batteries for portable air samplers should be available in the OSC.

- Inplant survey teams should always provide adequately detailed survey reports to supplement verbal reports.

- Personnel engaged in collecting and analyzing post accident samples should wear finger dosimetry on both hands.

- Sufficient inplant team controllers should be assigned and adequately trained to issue messages and radiation data while still being able to evaluate tasks described or performed by inplant teams.

- Inplant team controllers should refrain from quizzing team members until teams have had sufficient opportunity to demonstrate their knowledge and understanding of assigned tasks.

e. Emergency Operations Facility

The EOF was activated after the Alert declaration by the individual assigned as Nuclear Duty Officer for the exercise. This individual later functioned as Recovery Manager (RM). Based on information contained in the NARS messages for the Unusual Event and Alert classifications, the duty officer was aware that offsite power had been lost to the Station and that a fire was occurring that would require some equipment to be operated in a degraded mode permitted by a LCO. The decision to activate the EOF based on such information was very conservative.

Information transmitted from the TSC was generally acceptable, with two exceptions. The RM was unaware that offsite power loss had been due to an explosion rather than a fire even after receiving his initial briefing. The RM was also slow to learn that the containment radiation level was significantly increasing until it had risen from about 0.5 R/hour to 900 R/hour. It was not clear to inspectors in the TSC or EOF exactly where these communications breakdowns took place. The Site Area and General Emergency classifications were made by the RM following appropriate discussions with the SD. Associated offsite notifications were properly completed with the exception that the NRC Headquarters Duty Officer was never informed of the General

Emergency. Although exercise controllers delayed participants from declaring the General Emergency for about fifteen minutes, corrective action is needed to ensure that EOF staff complete all initial off-site notifications in a timely manner. This is an Open Item. (254/84-09-03; 265/84-08-03)

Following the General Emergency declaration, the initial and subsequent protective action recommendations were promptly formulated and issued. EOF staff discussed proposed protective action recommendations with State representatives in the facility prior to their issuance. Current and forecast meteorological conditions and evacuation time estimates were correctly factored into the decisionmaking process. This became critical as the wind direction gradually shifted, causing recommendations for newly affected downwind sectors in the two to five mile distance from the Station to change from "evacuate" to "shelter". EOF staff did a good job in acquiring current and forecast meteorological information; however, these data were plotted on three EOF status boards which were not always updated at about the same times.

The RM and Advisory Support Director functioned well as a team, especially in addressing TSC recommendations affecting onsite activities. The RM reviewed and approved all NARS messages and press releases prior to issuance. EOF staff were kept adequately informed by the RM of plant status and emergency response actions. The RM provided his staff ample opportunities to ask questions following his briefings. EOF and TSC staffs utilized checklists entitled "Guidelines for Determining the Recovery Phase" following the scenario time break. Some initial planning of reentry/recovery operations was demonstrated prior to exercise termination. There were no access control problems at the EOF.

In addition to the weakness described in this paragraph, the following items should be considered for improvement:

- TSC and EOF staffs should ensure that all relevant information is communicated between these facilities.

- Information displayed on more than one status board should be promptly updated at all locations; or, duplication of information displayed should be reduced.

f. Joint Public Information Center

The Joint Public Information Center (JPIC) was located in a garage just north of the EOF. Several minor improvements had been made to this facility since the 1983 exercise; however, there were no provisions for adequate ventilation, heating, or air conditioning. Space was very limited in the JPIC. Improvements in the facility since the last exercise included installation of restrooms and provisions for about twenty telephones. Available telephones in the JPIC were functional.

Press briefings were adequate and were conducted at approximately thirty minute intervals. Several visual aids were available in the JPIC and were utilized as needed in the briefings. The licensee spokesperson and counterparts from the State of Illinois and Iowa exchanged information and coordinated news releases. Press packets were available and were distributed.

Based on the above findings, the following item should be considered for improvement:

- The JPIC should be equipped to provide adequate long-term ventilation, heating, and air conditioning comforts for persons in this facility.

g. Offsite Radiological Monitoring Teams

Two teams were dispatched prior to the release. Teams thoroughly checked all equipment prior to leaving the Station. The dedicated GSEP van's radio could not be used to transmit messages. Backup hand-held radios would not work properly in the scramble mode. One air sampler had a broken fuse. An inspector accompanied the three person team sent to Iowa; the second team remained in Illinois. The observed team utilized proper sampling and contamination control techniques when collecting and bagging air, soil, and vegetation samples. All samples were labeled with time, date, and location information; however, only labels used for air samples contained provisions to identify the person who collected the sample, per procedure EG-3. The licensee later stated that labels were being prepared which contained provisions for all identifying information required by procedure EG-3. The team simulated placing film dosimeters at fixed sampling locations without indicating there were any provisions for placing the dosimeters in plastic bags for weather protection. Although the team recorded its activities on note paper, Environmental Assessment Log forms were not utilized to record relevant information per EG-series procedures. The team log was not initialed or signed by any team member.

The licensee's team in Iowa communicated its results and exposures at appropriate times to its EOF controllers. While the team did encounter the State of Iowa's monitoring team, it was not apparent to the inspectors with the team or in the EOF that the movements of State and licensee teams were being coordinated for maximum utilization of available resources. It was not apparent in the EOF that survey results from teams controlled by the State of Illinois or Iowa were being accumulated and evaluated by EOF personnel.

Based on the above findings, the following items should be considered for improvement:

- Radio and survey equipment utilized by offsite monitoring teams should be promptly repaired and surveillance checked at time periods frequent enough to better ensure their operability when needed in an emergency.

- Film dosimeters left in the outdoors should be adequately protected from the weather.

- Records of monitoring team activities should be recorded on appropriate forms per EG-series procedures.

- Movements of licensee and State teams should be better coordinated to provide maximum utilization of available personnel resources.

- The licensee should make an effort to share offsite monitoring team results, and request results obtained from other teams controlled by the state.

5. Exit Interview

On August 30, 1984, the inspectors met with licensee representatives, denoted in Paragraph 1, to discuss the preliminary findings of the NRC. The licensee agreed to consider improvements to the findings discussed.

Attachment: Scenario Outline

Outline for
Quad Cities Exercise

August 28, 1984

PHASE	MSG NO.	TIME ISSUED	TYPE MESSAGE	ISSUED TO	OUTLINE OF CONTENTS
Initial Situation	1	Prior to t-0	Control	Sta.Dir. S. E.	Ground Rules
	2	t=0 (1800)	Control	C. R.	Plant Status: - Unit 1 Normal Operation 1040 MWe - Unit 2 - RCIC out of service (3 day repair estimate) - HPCI is lined up for suction from the suppression pool. - CCST suction valve will not open - Drywell pressure: 1.4psig - Drywell Rad level: 0.18 R/hr - Met Data Wind direction; 255° Wind speed; 3 m/sec Δt = -1.6° c/100m Stability Class: C Bomb threat received by telephone
Alert	3	t+30 (1830)	Control	C.R.	- Plant Status: - Bomb detonates in switchyard destroying transformers 11, 12, 21 and 22. - Both units trip due to loss of offsite power. - All three diesels start and pick up load. - Drywell pressure: 1.4psig Drywell Rad level: 0.18 R/hr

PHASE	MSG NO.	TIME ISSUED	TYPE MESSAGE	ISSUED TO	OUTLINE OF CONTENTS
					- Units are stable and are being cooled with adequate water supply
		t+45 (1845)	Contgy Message	S.E. SCRE	- Declare Alert EAL #4 or #20
			Control	C.R.	- Plant Status: - Drywell pressure: 1.9psig - Drywell Rad Level: 0.18 R/hr - Met Data Wind direction; 255° Wind speed; 3 m/sec Δt = -1.6° c/100m Stability Class: C
		t+60 (1900)	Control	C.R.	- Initial inspection of switchyard shows extensive damage to transformers. - Plant Status: - Drywell pressure: 2.3psig - Drywell Rad Level: 0.18 R/hr - Met data Wind direction; 250° Wind speed; 3 m/sec Δt = -1.5 Stability Class: C
		t+75 (1915)	Control	C.R.	- Plant Status - Drywell pressure: 2.4psig - Drywell Rad Level: 0.19 R/hr
		t+90 (1930)	Control	C.R.	- Plant Status - Drywell pressure: 2.4psig - Drywell Rad Level: 0.19 R/hr
		t+105 (1945)	Control	C.R.	- Plant Status - Drywell pressure: 2.5psig - Drywell Rad Level: 0.20 R/hr

PHASE	MSG NO.	TIME ISSUED	TYPE MESSAGE	ISSUED TO	OUTLINE OF CONTENTS
		t+120 (2000)	Control	C.R.	- Plant Status - Unit 2 diesel generator trips - reason unknown - Drywell pressure: 2.5psig - Drywell Rad Level: 0.20 R/hr - Met Data Wind Direction; 250° Wind Speed; 3 m/sec Δt = -1.4° c/100m Stability Class: D
Site Emergency		t+135 (2015)	Control	C.R.	- Plant Status - The 1/2 diesel generator trips - reason unknown - Drywell pressure: 2.5psig - Drywell Rad Level: 0.20 R/hr
		t+140 (2020)	Control	C.R.	- Unit 1 diesel generator trips.
		t+150 (2030)	Control	C.R.	- Plant Status - Drywell pressure: 2.6psig - Drywell Rad Level: 0.20 R/hr - Met Data Wind Direction; 250° Wind Speed; 4 m/sec Δt = -1° c/100m Stability Class: D
		t+160 (2040)	Control	C.R.	- High water level is noted in the Unit 2 reactor building basement.
		t+165 (2045)	Contgy Message	S.E. SCRE	- Declare Site Emergency EAL #10 - Plant Status - Drywell pressure: 2.6psig - Drywell Rad Level: 0.20 R/hr

PHASE	MSG NO.	TIME ISSUED	TYPE MESSAGE	ISSUED TO	OUTLINE OF CONTENTS
		t+180 (2100)	Control	C.R.	- Report from field on source of water in reactor building basement. Coming from broken HPCI suction line. - Plant Status - Drywell pressure: 2.6psig - Drywell Rad Level: 0.22 R/hr - Met Data Wind Direction; 248° Wind Speed; 4 m/sec Δt = -0.5° c/100m Stability Class: E
		t+195 (2115)	Control	C.R.	- Plant Status Unit 1 is stable with pressure control and water level control being accomplished by RCIC. - Pressure is still being controlled with main steam valves. - No makeup water is being supplied to the reactor vessel, thus vessel water level is dropping as relief valves are opened to control pressure. - The injectors on the engines are fouled and will require cleaning - Drywell pressure: 2.6psig - Drywell Rad Level: 0.22 R/hr - Met Data Wind Direction; 245° Wind Speed; 4 m/sec Δt = -0.3° c/100m Stability Class: E

PHASE	MSG NO.	TIME ISSUED	TYPE MESSAGE	ISSUED TO	OUTLINE OF CONTENTS
		t+210 (2130)	Control	C.R.	- Plant Status - The cause for the diesel generator trips has been determined to be bad fuel - The injectors on the engines are fouled and will require cleaning. - Drywell pressure: 2.7psig - Drywell Rad Level: 0.25 R/hr Met Data Wind Direction; 245° Wind Speed; 4 m/sec $\Delta t = -0.3^{\circ}$ c/100m Stability Class: E
		t+225 (2145)	Control	C.R.	- Plant Status - Drywell pressure: 2.7psig - Drywell Rad Level: 0.30 R/hr
		t+240 (2200)	Control	C.R.	- Plant Status - Maintenance department estimates that it will take about 4 hours to repair the CCST HPCI suction valve to use HPCI for water supply. - Drywell pressure: 2.8psig - Drywell Rad Level: 0.45 R/hr - Met Data Wind Direction; 245° Wind Speed; 4 m/sec $\Delta t = -0.2^{\circ}$ c/100m Stability Class: E
		t+255 (2215)	Control	C.R.	- Plant Status - An increase in drywell and suppression pool pressure indicate that

PHASE	MSG NO.	TIME ISSUED	TYPE MESSAGE	ISSUED TO	OUTLINE OF CONTENTS
					the suppression pool downcomers are uncovered. Drywell and suppression pool radiation levels are showing increases. - Drywell pressure: 2.8psig - Drywell Rad Level: 100 R/hr
		t+270 (2230)	Control	C.R.	- Plant Status - Radiation levels in the reactor building basement are showing increases. - Drywell pressure: 2.8psig - Drywell Rad Level: 100 R/hr - Met Data Wind Direction; 242° Wind Speed; 4 m/sec $\Delta t = -0.6^{\circ}$ c/100 m Stability Class: D
		t+285 (2245)	Control	C.R.	- Plant Status - Drywell pressure: 2.8psig - Drywell Rad Level: 100 R/hr
		t+290 (2250)	Contgy Message	S.E. SCRE	- Notify state(s) of imminent release.
GENERAL EMERGENCY		t+300 (2300)	Control	C.R.	- Plant Status - Reactor water level reaches the top of the active fuel. - In plant radiation monitors indicate continued increase in activity in the reactor building. - Drywell pressure: 6.0psig - Drywell Rad Level: 900 R/hr

PHASE	MSG NO.	TIME ISSUED	TYPE MESSAGE	ISSUED TO	OUTLINE OF CONTENTS
					Met Data Wind Direction; 240° Wind Speed; 4 m/sec Δt = -0.7° c/100 m Stability Class: D
		t+315 (2315)	Control	C.R.	- Plant Status - Substantial increases in drywell and suppression pool radiation levels are noted. - Drywell pressure:14.5psig - Drywell Rad Level: 3000 R/hr - Rad teams indicate that a minor release from the reactor building is taking place. Release rate: 5.0 E+04 µCi/sec
		t+330 (2330)	Control	C.R.	- Plant Status - The HPCI CCST suction valve is opened. Maintenance teams are removed from the building - Drywell pressure:22.3psig - Drywell Rad Level: 1.5 E+04 R/hr - Met Data Wind Direction; 240° Wind Speed; 4 m/sec Δt = -0.8° c/100 m Stability Class: D
		t+335 (2335)	Control	C.R.	- Plant Status Unit 2 suppression pool is completely drained. Steam is being released through the break in containment. The level of radiation in the reactor building increase

PHASE	MSG NO.	TIME ISSUED	TYPE MESSAGE	ISSUED TO	OUTLINE OF CONTENTS
					by a large amount. The magnitude of the ground level release increase significantly. Release rate: 5.5 E06 μCi/sec
			Contgy Message	S.E. SCRE	Declare General Emergency EAL #14 or #20
		t+340 (2340)	Control	C.R.	- Plant Status - Unit 2 HPCI is on. Unit 2 water level is being restored to above the top of active fuel. - Drywell pressure:26.1psig - Drywell Rad Level: 3.0 E+04 R/hr - Release continues to increase due to activity escaping from containment
		t+360 (0000)	Control	C.R.	- Plant Status - Rad field teams provide data for assessment of total activity in containment and reactor building which will be released. - Drywell pressure:25.0psig - Drywell Rad Level: 5.2 E+04 R/hr - Data on approximate release rate is provided to assess duration of release for offsite personnel. (Release rate 8.0 E+07 μCi/sec) Wind Direction; 235° Wind Speed; 5 m/sec Δt = -0.9° c/100m Stability Class: D

PHASE	MSG NO.	TIME ISSUED	TYPE MESSAGE	ISSUED TO	OUTLINE OF CONTENTS
		t+375 (0015)	Control	C.R.	- Plant Update: - Drywell pressure:23.3psig - Drywell Rad Level: 5.1 E+04 R/hr - Release rate: 1.0 E+08 μCi/sec Met Data Wind Direction; 225° Wind Speed; 5 m/sec Δt = -0.9 Stability Class: D
		t+390 (0030)	Control	C.R.	- Plant Status - Temporary fuel supply to the Unit 2 diesel generator is obtained from onsite storage tanks. The Unit 2 generator fuel injectors have been cleaned and the diesel is started. - The release switches from an unmonitored ground level release to a monitored elevated release through Standby Gas Treatment System. (Release Rate: 2.0 E+0.8 μCi/sec) - Drywell pressure:21.0psig - Drywell Rad Level: 5.0 E+04 R/hr - Met Data Wind Direction; 210° Wind Speed; 6 m/sec Δt = -1.0° c/100 m Stability Class: D
		t+405 (0045)	Control	C.R.	- Plant Status - Drywell pressure:19.0psig - Drywell Rad Level: 4.5 E+04 R/hr Release rate: 3.5 E+08 μCi/sec

PHASE	MSG NO.	TIME ISSUED	TYPE MESSAGE	ISSUED TO	OUTLINE OF CONTENTS
					- Met Data Wind Direction; 200° Wind Speed; 8 m/sec Δt = -1.1° c/100 m Stability Class: D
		t+420 (0100)	Control	C.R.	Plant Status - Drywell pressure:17.0psig - Drywell Rad Level: 3.8 E+04 R/hr Release rate: 3.5 E+08 μCi/sec - Met Data Wind Direction; 185° Wind Speed; 7 m/sec Δt = -1.0° c/100 m Stability Class: D
		t+435 (0115)	Control	C.R.	Plant Status - Drywell pressure:14.0psig - Drywell Rad Level: 3.3 E+04 R/hr - A tank truck with a long term supply of diesel fuel arrives on site. Unit 1 diesel generator is operating. - Met Data Wind Direction; 165° Wind Speed; 7 m/sec Δt = -0.8° c/100m Stability Class: D Release rate: 3.5 E+08 μCi/sec
		t+450 (0130)	Control	C.R.	- Plant Status - Drywell pressure:12.0psig - Drywell Rad Level: 2.6 E+04 R/hr - The release rate begins to drop. More accurate projections are made of the total time necessary to release the building inventory. Release rate: 3.0 E+08 μCi/sec

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					Met Data: Wind Direction; 145° Wind Speed; 6 m/sec Δt = -0.7° c/100 m Stability Class: D
		t+465 (0145)	Control	C.R.	- Plant Status - Drywell pressure: 9.0psig - Drywell Rad Level: 2.0 E+04 R/hr (Release rate: 1.5 E08 μCi/sec)
		t+480 (0200)	Control	C.R.	- Plant Status - A 24 hour time break is given here. A temporary repair has been made to the Unit 2 suppression pool and water has been restored to it. The reactor is in cold shutdown. All three diesel generators are operating and supplying power. Edison line crews are working on temporary offsite power feed to the station. Release has been terminated; reentry is possible. Plant status changed to Unusual Event. - Met Data Wind Direction; 140° Wind Speed; 5 m/sec Δt = -0.6° c/100 m Stability Class: D
		t+510 (0230)	Control	C.R.	- Plant Status - Drywell pressure: 0 psig - Drywell Rad Level: 108 R/hr