

U.S. NUCLEAR REGULATORY COMMISSION

REGION III

Report No. 50-315/82-18(DEPOS), 50-316/82-18(DEPOS)

Docket No. 50-315, 50-316

License No. DPR-58, DPR-74

Licensee: American Electric Power Service Corporation
2 Broadway
New York, NY 10004

Facility Name: D. C. Cook Nuclear Power Plant, Unit Nos. 1 & 2

Inspection At: D. C. Cook Plant Site

Inspection Conducted: October 20-22, 1982

Inspectors: *T. J. Ploski*
T. J. Ploski

11/10/82

C. J. Paperiello
for M. J. Smith

11/10/82

Approved By: *W. L. Axelson*
W. L. Axelson, Chief
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11/10/82

C. J. Paperiello
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Operational Support Branch

11/10/82

Inspection Summary:

Inspection on October 20-22, 1982 (Report No. 50-315/82-18(DEPOS);
50-316/82-18(DEPOS))

Areas Inspected: Routine announced inspection of the D.C. Cook Nuclear Plant emergency preparedness exercise involving observations by ten NRC representatives of key functions and locations during the exercise. The inspection involved 118 inspector-hours on site by 4 NRC inspectors and 4 NRC contractors.

Results: No items of noncompliance or deviations were identified. However, exercise weaknesses were identified and are described in Appendix A of the inspection letter.

DETAILS

1. Persons Contacted

NRC Observers and Areas Observed

*W. Axelson, Emergency Operations Facility (EOF)
*N. DuBry, Operations Support Area (OSA) and Offsite Radiation
Monitoring Team
*T. Delgaizo, Control Room
*J. Kaucher, Technical Support Center (TSC)
R. Marabito, Joint Public Information Center (JPIC)
*J. Martin, OSA
*T. Ploski, EOF
*M. Smith, EOF
*E. Swanson, Control Room and TSC
*W. Thomas, OSA and Post Accident Sampling Team

American Electric Power Company Exercise Participants

R. Hunter, Executive Vice President/New York Construction and
Engineering, EOF Recovery Manager
R. Hering, Vice President/Mechanical Engineering
J. Greenwald, EOF Dose Assessment
R. Jurgensen, JPIC Spokesman
W. McCrae, EOF Dose Assessment
S. Milioti, EOF Radiation Control and Waste Handling Manager

Indiana and Michigan Electric Company Key Participants and Exercise Controller/Observers

*W. Smith, Plant Manager, EOF
*B. Svensson, Assistant Plant Manager, EOF
*E. Townley, Assistant Plant Manager, OSA
*E. Abshagen, Outage Coordinator, TSC
*F. Arsenault, Chief Security Supervisor, Secondary Alarm Station
*K. Baker, Operations Superintendent, Control Room
*J. Ersland, Chemical Supervisor, OSA
*J. Fryen, Radiation Protection Supervisor, OSA
*W. Ketchum, Radiation Protection Engineer, TSC
*T. Kriesel, Environmental Coordinator, TSC
*W. MacRae, Rad Support Engineer, TSC
*D. Palmer, Radiation Protection Supervisor, EOF
*V. VanderBerg, Production Supervisor, EOF
*J. Wojcik, Chemical Supervisor, TSC
*J. Dickson, Exercise Director
*R. Begor, Controller, EOF
T. Beilman, Controller, OSA
G. Caple, Controller, EOF
*G. Griffin, Controller, TSC
*M. Horvath, Controller, JPIC

*S. Klementowicz, Controller, EOF
*D. McAlhany, Controller, Post Accident Sampling Team
*D. Nelson, Controller, TSC
*R. Otte, Controller, Offsite Radiation Monitoring Team
J. Warnock, Controller, EOF
*J. Whippo, Controller, Control Room

*Indicates those present at the October 22, 1982, exit interview.

Others Contacted

R. Southwood, Park Manager, Warren Dunes State Park

2. Licensee Action on Previously Identified Items Related to Emergency Preparedness

(Open) Items 315/82-03-01 and 316/82-03-01. Distribution of brochures on licensee's early warning siren system and nuclear plant emergency information at Warren Dunes State Park.

The Park Manager informed the inspectors that nuclear plant emergency information handouts are made available to persons utilizing the park's 200 campsites and to others who seek such information at the manager's office. To avoid compounding littering problems, park staff do not distribute these handouts to all visitors at the park's main entrance. Also, emergency information notices are not posted within the park. The manager estimated that, on favorable weather days during the season from about Memorial Day through Labor Day, up to 30,000 and 18,000 persons utilize park facilities on weekends and weekdays, respectively.

Thus, inadequate measures are presently being taken to provide the park's transient population with information regarding nuclear plant emergency situations.

The 1500 acre park's public address system consists of one vehicle equipped with a loudspeaker, plus a loudspeaker mounted on each of three concession stands located in the beach parking lot area. Should emergency notification be required, the manager stated that the vehicle would initially be dispatched to the campsite area. The manager, who resides on the park grounds, stated to the inspectors that the licensee's sirens are not audible within most of the park, especially during the peak visitor season in the concession stand, beach, and parking lot areas. The inspectors examined these areas and noted the distance and topography between these park areas and the licensee's nearest siren. The manager's concern over siren audibility seems reasonable. The Park Manager agreed to submit his concerns in writing to Region III.

This item will remain open until such time that the licensee can demonstrate that an adequate capability exists to promptly notify the transient population within Warren Dunes State Park of an emergency condition at the D. C. Cook Nuclear Plant that requires their taking protective actions.

In the interim, the NRC staff will request an evaluation of this matter from FEMA Region V with coordination from the State of Michigan.

3. General

An exercise of the licensee's "Donald C. Cook Nuclear Plant Emergency Plan" was conducted at the Cook Nuclear Plant on October 21, 1982.

The exercise tested the response of the licensee to a simulated emergency. The exercise was integrated with a test of the Berrien County and State of Michigan Emergency Plans. Observed weaknesses in the exercise are summarized in Appendix A of the letter. A summary of the scenario is provided as Enclosure 1 of this report.

4. Specific Observations

a. Control Room (CR)

Control Room personnel exhibited an excellent understanding of the technical problems confronting them. Proper emergency procedures were utilized throughout the scenario. Simulated conditions were classified into the appropriate emergency categories in accordance with predetermined Emergency Action Levels (EALs). Dedicated communication links were maintained between the CR, TSC and EOF throughout the exercise.

The Shift Supervisor promptly assumed authority in the CR. However, the transfer of decision making responsibilities from the CR to the TSC was initially confused due to uncertainty regarding the operational status of the TSC. The inspector observed that the CR initially recommended that the TSC declare a Site Emergency condition. Upon learning that the TSC was not yet ready to assume its responsibilities, the CR declared the Site Emergency.

The transfer of responsibilities from the CR to the TSC should be formalized to ensure that the CR is kept aware of the TSC's operational status. Log keeping in the CR needs to be improved to ensure that a complete history of key decisions and communications is available.

b. Technical Support Center (TSC)

The TSC still has working space inadequacies that would reduce the effectiveness of this facility during a prolonged activation. The design of this emergency response facility should be reevaluated by the licensee. During the exercise the inspector noted that prints were draped over CRTs and file cabinets due to insufficient space on the worktable in the TSC's technical support room. The magnitude of this problem may be reduced by relocating the records storage cabinets to the NRC section of the TSC.

A reactor equipment status board is only available in the TSC's communications room. This board cannot be seen by staff in the facility's technical support room without their leaving the latter room. The available reactor equipment status board is inadequate. Space for a number of critical parameters is unavailable on the display, which may be due in part to the limited wall space available for mounting this board. Critical parameters that should be found on this status board include: incore thermocouple readings, primary coolant pressure/temperature indicators, pressurizer level, reactor water level indicator, steam generator status, status of vital AC and DC busses, primary coolant boron analysis, and containment integrity parameters such as pressure, temperature, and status of containment sprays, cooling fans, and containment isolation. Assuming that computerized displays of such parameters will not be available for some months, the licensee should undertake a redesign study of the reactor equipment status board with emphasis on ensuring that all parameters judged critical to decision makers' needs are available. The revised status board should be provided in the technical support room of the TSC. During the exercise, the inspector noted that the frequency of updating the available status boards deteriorated as the exercise progressed. The inspector also noted that initial and updated 15-minute meteorological data and forecast information were not plotted in the TSC's technical support room.

A protective measures status board was not available in the TSC. The licensee should add this display so that in-plant decision makers are aware of the history of the licensee's protective action recommendations and status of protective measures taken by the State.

Communications between the TSC and other emergency response facilities were formal and professional. Internal TSC communications were comparatively informal. A log of key events and decisions should be maintained in the TSC.

c. Emergency Operations Facility (EOF)

The EOF was activated in a timely manner in accordance with the Emergency Plan. Security was well maintained through badging and posting of guards at the entrance to the EOF. Adequate radiological monitoring of the facility's atmosphere was conducted.

Initial EOF Command and Control was established by plant personnel, with a senior manager in charge of the overall licensee response. A scenario "break" was introduced roughly two hours after the exercise began which caused the scenario to jump ahead twelve hours in time. After this time jump an American Electric Power (AEP) senior executive assumed Command and Control of the EOF as Recovery Manager, while additional AEP personnel assumed other

key functions. The Command and Control turnover was unrealistic in this exercise. Several predeployed AEP personnel, who were not intended to arrive at the EOF until the 1000 hour scenario break, were observing EOF activities from the time the facility was activated. Other AEP personnel were observed discussing plotted and hardcopy exercise messages well before their supposed arrival at the EOF. Should the licensee pre-deploy AEP personnel for future exercises, these persons should remain physically outside the EOF until their simulated arrival time.

Good Command and Control were exercised throughout the exercise by plant and AEP management. Messages were transmitted, documented, posted, and distributed in an efficient manner. Key messages were also displayed on a time/event status board. Status boards were promptly updated by personnel versed in nuclear power plant terminology.

In addition to Command and Control, offsite communications, dose assessment, and protective measures recommendation responsibilities were transferred from the TSC to the EOF. Transfer of these functions went smoothly. Protective action recommendations were initially based on both radiological and reactor equipment status conditions. Though not currently incorporated in protective measures procedures, evacuation time estimates were correctly factored into the decision making process during the exercise. Protective measures procedures should be revised to ensure that reactor equipment status, radiological and meteorological information, and evacuation time estimates are all considered when formulating protective action recommendations.

The AEP Recovery Manager was not physically located in the "accident assessment" area of the EOF. Instead, he generally remained in a separate office equipped with direct communication links to the CR, TSC and AEP Engineering EOF. EOF staff reported to him when necessary. While this method of operation appeared awkward to the inspectors, it apparently worked well for the licensee.

After his official arrival, the AEP Rad/Waste Manager appeared to be in-charge of the accident assessment area of the EOF and, in this capacity, approved releases to offsite authorities including protective measures recommendations. At one point during the exercise, the Radiation Assessment Director recommended that the simulated in progress public evacuation be stopped due to calculated low offsite dose rates. This recommendation was initially accepted by the Rad/Waste Manager, but was rejected by the Recovery Manager. This correct decision was based on the degraded status of plant safety systems. Procedure PMP 2081 EPP.022 currently contains no provisions to ensure that critical protective action recommendations or changes to such recommendations are formally approved by the Recovery Manager prior to release to offsite authorities. In view of the importance of protective action recommendations, and the potential adverse impacts on the public and licensee should improper recommendations

be made, the licensee should reevaluate the desirability of having the senior EOF manager formally approve all such releases.

During the exercise, there was some confusion between several EOF key personnel regarding the initial protective action recommendation released to the State. All recommendations were documented on Exhibit C data sheets and were eventually plotted on the event/time status board. The inspectors noted a lack of clarity in the wording of the protective action recommendations released at approximately 0930 and 0955 hours. The recommendation should have specifically stated sheltering in a two mile radius, to avoid misinterpretation as two miles in only certain sectors. Also, the wording of the latter message implied to the inspectors that its author was unaware that the 0930 recommendation had been released.

The licensee's new EOF is located in Benton Harbor, Michigan, approximately ten miles from the plant. This was the first joint exercise of this facility with offsite authorities. Several improvements are needed in this facility. First, no operational emergency organization status board was provided. Position/title name tags for each EOF desk were also not available. These omissions could cause confusion during protracted emergency organization activation, especially during shift turnovers. The deficiencies in the EOF's reactor equipment status board are the same as those discussed in Subsection 4b for the TSC's status board. Also, like the TSC, the EOF should be equipped with a protective measures status board. Finally, the county map utilized in the dose assessment area was inadequately labeled, having no sector (A-R or 22 1/2 degree) nomenclature. The EOF dose assessment area should be provided with a duplicate of the adequately labeled county map that is mounted in the TSC communications room.

During the exercise the licensee demonstrated the capability of obtaining forecast meteorological information from the National Weather Service (NWS). A potential scenario problem was avoided when exercise participants interpreted the actual NWS forecast to imply that the simulated scenario meteorology would not vary during the forecast period. Should the licensee utilize simulated meteorology in future scenarios to assure, for example, interaction with the desired downwind authorities, controllers should provide simulated forecast meteorological data (wind speed, wind direction, stability, and precipitation) when such forecast information is sought by exercise participants. Precipitation occurrence information is needed to determine whether radiation measurements will be influenced by increased deposition of radioactive materials. In addition, simulated meteorological conditions should display more realistic variation than the essentially constant conditions throughout the several days simulated in this scenario.

Overall, the inspectors concluded that the EOF demonstrated its design function. However, the weaknesses described in this

Subsection, particularly those summarized in Appendix A of the letter, must be corrected pursuant to 10 CFR 50, Appendix E, Section F.3.

d. Operations Support Area (OSA)

The inspectors identified no major weaknesses at the OSA. The facility functioned smoothly throughout the exercise. The OSA was adequately staffed in a timely manner. Accountability was completed within the required 30 minutes. The OSA supervisor and staff understood their emergency response functions. Initial crowding in the OSA was alleviated as various teams were dispatched. Teams were promptly formed, adequately staffed, and generally well briefed prior to being dispatched. Adequate health physics support was available. OSA habitability was periodically checked. Personnel monitoring (frisking) was occasionally performed too rapidly.

e. Post-Accident Sampling

Post accident sampling teams were dispatched from the OSA to obtain a primary coolant sample as requested by the TSC. The teams appeared well trained and conducted themselves in a professional manner. Team members dressed in anti-contamination suits and utilized Scott airpicks. Radiation work permits were signed by team members prior to their dispatch. Teams were briefed on simulated radiation levels to be encountered in the Auxiliary Building.

Sampling teams were relieved at approximately twenty minute intervals. Relief teams were briefed by outgoing team members.

Frequent surveys of the sampling panel and surrounding area were conducted. Since the portable radio utilized by the teams was found to be unusable inside the room, technicians used the sampling room telephone for communication with the OSA and CR.

Teams were not briefed on the sample's simulated level of activity which could have been calculated by TSC or CR staffs. The lead pig used to transport the sample afforded about one inch lead shielding. This amount of shielding is inadequate for a 1000:1 diluted 10 Ci/cc (NUREG-0737) source term. The licensee must take appropriate measures to ensure that an adequately shielded container, which can be transported to and from the sampling room, is available.

The primary coolant sample was drawn and diluted within one hour. Transport and counting were completed within three hours of the TSC's request. Both elapsed times are acceptable pursuant to NUREG-0737.

The weaknesses identified in this Subsection are summarized in Appendix A of the letter and must be corrected pursuant to 10 CFR 50, Section F.3.

f. Offsite Monitoring Team (OMT)

An inspector accompanied the offsite monitoring team which was promptly dispatched from the OSA. The two man team performed operability checks on all instruments and communications equipment.

Team movements were in accordance with instructions from the EOF. The team was initially directed to Survey Point B without having received any information on scenario meteorological conditions. The OMT made the required measurements at Point B and reported the data to the EOF. Having received no instructions to conduct plume mapping in the area around Point B or to traverse to another established survey point, the team parked at Point B for approximately one hour and fifteen minutes. In view of the terrain variations in the region enclosed by the survey points, mapping survey techniques are preferable to point measurements to better define plume location and develop a more complete picture of radiation levels representative of a given area. The need to improve instrument portability should, therefore, also be re-evaluated. When the OMT was eventually directed to Point A, it was realized that a key was not available to unlock the licensee-owned gate. Communications loss with the EOF was occasionally experienced by the team. This problem can be reduced by installing a larger antenna on the vehicle.

The team experienced difficulty in calculating activities corresponding to certain simulated radiation level measurements due to the values being off the scale of the available graph. When questioned by the inspector, team members displayed some uncertainty regarding whether a single channel instrument measured total iodine or only iodine-131. Finally, through properly equipped, the OMT failed to utilize a thin window detector to obtain beta/gamma versus gamma measurements of the simulated plume's atmosphere.

The weaknesses described in this Subsection are summarized in Appendix A of the letter and must be corrected pursuant to 10 CFR 50, Appendix E, Section F.3.

5. Joint Public Information Center (JPIC)

The JPIC was established at Lake Michigan Junior College. The facility was well equipped. Security was adequate. A rumor control center was operational. Periodic briefings were videotaped for late media arrivals. The AEP spokesman displayed a good technical understanding of scenario events and measures being employed to mitigate the consequences of the simulated emergency. The spokesman received updated information by commuting between briefings to the nearsite EOF where events were discussed with various technical staff, including the Recovery Manager. Due to the proximity of the JPIC to the EOF, the licensee indicated that the benefits derived from face-to-face communication between the

JPIC spokesman and EOF staff outweigh the inconveniences associated with periodic traveling between these facilities.

Hardcopy press releases were normally available within thirty minutes of each briefing. However, these releases generally contained insufficiently detailed information, which reduced their value to the media.

6. Public Critique

A NRC team spokesperson presented a verbal summary of the inspectors' exercise observations at the public critique held on October 23, 1982. A FEMA spokesperson presented a verbal summary of the offsite exercise observations.

7. Exit Interview

On October 22, 1982, the inspectors held an exit interview, concurrent with the licensee's self-critique, with the licensee representatives denoted in Paragraph 1. The licensee agreed to address the inspector's concerns summarized in Appendix A of the inspection letter.

Enclosure 1

EXERCISE SCENARIO
SUMMARY

DONALD C. COOK PLANT
FEMA/NRC EMERGENCY RESPONSE
FIELD EXERCISE
OCTOBER 21, 1982

NOTE: The information contained in this scenario is completely hypothetical and is not to be thought of as a probable occurrence. A series of incredible events have been combined to fully test the response of various agencies.

A. INITIAL CONDITIONS

Both Units are operating at 100% power. Unit one has been in operation for one (1) month, and Unit two has been in operation for five (5) months. All Unit one parameters are normal and stable. Unit two has a small amount of steam generator tube leakage as R-15 is 1.4×10^4 cpm. A surveillance test was run on Unit 2 turbine driven auxiliary feed pump on 1600-2400 shift last night and vibration was high and smoke was coming from the inboard pump bearing. A surveillance run was started on Unit two AB diesel at 0445 hours with an auxiliary equipment operator and a trainee at the diesel.

B. METEOROLOGICAL CONDITIONS

Wind is from 205° and a speed of 20 miles per hour. The temperature at 180 feet, temperature at 30 feet (ΔT) is equal to -1.1°C .

C. HISTORY FOR PAST 3 HOURS

At 5:00 a.m., during a surveillance run on Unit two AB diesel, an explosion occurred rendering the diesel generator inoperable. The explosion was followed by a fire which was classified as a "SITE EMERGENCY" by the Shift Supervisor. The Shift Supervisor implemented his emergency call list and was directed by the Plant Manager to notify the Berrien County Sherriff's Department, Michigan State Police, Nuclear Regulatory Commission, and other agencies (as directed by PMP 2080.EPP.012) of the condition. At 5:22 a.m. the fire was extinguished. At 5:25 a.m., after arriving at the site, the Plant Manager declassified the condition to "NO EMERGENCY" and so notified all previously notified organizations of the "NO EMERGENCY" condition, and that further emergency actions were unwarranted.

A surveillance run on Unit 2 CD diesel was started at 5:30 a.m. and completed successfully at 6:30 a.m. Plant personnel are attempting to determine the extent of damage to the Unit 2 AB diesel and the availability of spare parts on-site.

At 5:45 a.m. the Michiana Regional Dispatcher reported a "TORNADO WATCH" in effect for the area 20 miles either side of a line from Hammond, Indiana to Kalamazoo, Michigan. The Shift Supervisor notifies persons in the plant of a possible tornado and to be observant for this.

DETAILED SCENARIO TIME

TIME	MESSAGE NUMBER	MESSAGE	EXPECTED LICENSEE ACTIONS	EXPECTED OFF-SITE ACTIONS
0750	1	TO: Shift Supervisor FROM: Michiana Regional Dispatcher		
		This is the Michiana Regional Dispatcher calling to advise you that a water spout has been sighted 10 miles West of D. C. Cook by way of the National Oceanic and Atmospheric Administration. The weather alert, previously issued, has been upgraded to a "tornado warning."	The Shift Supervisor takes steps to test run: 1. U-1 AB and U-1 CD diesel. 2. U-2 CD diesel. 3. The diesel driven fire pumps. The Shift Supervisor also directs the exterior of the plant to be inspected for loose equipment or materials.	Local authorities have taken appropriate actions.
0755	2	TO: Unit Supervisor FROM: Auxiliary Equipment Operator		
		Auxiliary Equipment Operator reports that he saw what he thought was a large funnel cloud out over the lake.	Shift Supervisor advises all persons to come into plant for safety.	
0800	3	TO: Shift Supervisor FROM: Observer/Controller		
		The plant has just experienced a trip with a blackout. U-2 conditions are as follows: 1. All shutdown and control rods are fully inserted. 2. A turbine trip and generator trip have occurred.	Shift Supervisor initiates trip recovery operations. Actions are to be taken to place plant in safe condition.	

DETAILED SCENARIO TIME

TIME	MESSAGE NUMBER	MESSAGE	EXPECTED LICENSEE ACTIONS	EXPECTED OFF-SITE ACTIONS
0800 (CONT)	3 (CONT)	<ol style="list-style-type: none">Both feed pump turbines have tripped.CD diesel has tripped and restarted. It is presently carrying its emergency loads including the U-2 East MDAFP.The West MDAFP is not running and the safeties on S/G numbers 1 & 4 are lifting.	Shift Supervisor initiates trip recovery operations. Actions are to be taken to place plant in a safe condition.	
0801	4	<p>TO: Unit Supervisor FROM: Auxiliary Equipment Operator</p> <p>An Auxiliary Equipment Operator has just called the control room and indicated that he saw a tornado pass by the plant and that:</p> <ol style="list-style-type: none">765 lines from Unit 2 main transformer are on the ground.765 tower near 69 KV yard has fallen on 69 KV yard, damaging 12 EP1 and 12 EP2 transformers, 1 EP and 2 EP breakers and the 69 KV pole by the loop feed enclosure.		
0801	5	<p>TO: Shift Supervisor FROM: Observer/Controller</p> <p>The following alarms are received:</p>		

DETAILED SCENARIO TIME

TIME	MESSAGE NUMBER	MESSAGE	EXPECTED LICENSEE ACTIONS	EXPECTED OFF-SITE ACTIONS
0801 (CONT)	5 (CONT)	<ol style="list-style-type: none">1. Differential has operated on 765 KV buss.2. CB 12 AB & CB 12 CD trip.3. CB BE tripped.4. 34.5 KV TR 201 AB volt low.5. 34.5 KV TR 201 CD volt low.		
0802	6 TO: FROM:	Shift Supervisor Observer/Controller All AC power is lost to U-2 as indicated by zero voltage on the emergency busses. The CD diesel has tripped. The Shift Supervisor called the Auxiliary Equipment Operator at the diesel and was advised that the diesel tripped and that it had been making unusually loud noises while running.	The Shift Supervisor: <ol style="list-style-type: none">1. Requests to have Maintenance check the diesel.2. Declares an "ALERT" and notifies the Operations Superintendent and Plant Manager.3. Activates the Technical Support Center.4. Directs U-1 to prove operability of both their diesels.	
0802	7 TO: FROM:	Shift Supervisor Reactor Operator The Reactor Operator at the steam generator panel reports that the East MDAFP has tripped.	The Plant Manager notifies, according to procedure: <ol style="list-style-type: none">1. Berrien County Sherriff's Department.	The Benton Harbor State Police Post forward a "Post Disaster Report" per procedure.

DETAILED SCENARIO TIME

TIME	MESSAGE NUMBER	MESSAGE	EXPECTED LICENSEE ACTIONS	EXPECTED OFF-SITE ACTIONS
0802 (CONT)	7 (CONT)		<ol style="list-style-type: none">2. Michigan State Police.3. Nuclear Regulatory Commission.4. American Electric Power response personnel. <p>of the "ALERT" condition due to loss of all on-site and off-site AC power. The plant is investigating the condition and further updates will be provided as they become available.</p>	
0804	8	TO: Shift Supervisor FROM: Observer/Controller		
		Steam Generator levels are presently decreasing at the rate of approximately 2% per minute.	Upon the Operations Superintendents arrival in the control room, the Shift Supervisor requests use of the Unit cross tie from a Unit 1 MDAFP, due to loss of heat sink occurring.	
0804	N/A		Upon arrival in the control room, the Plant Manager recognizes the impending "SITE EMERGENCY" and recommends activation of the Emergency Operating Facility and the Joint Public Information Center.	
			The Shift Supervisor should be following the loss of all station AC power procedure.	

DETAILED SCENARIO TIME

TIME	MESSAGE NUMBER	MESSAGE	EXPECTED LICENSEE ACTIONS	EXPECTED OFF-SITE ACTIONS
0815	N/A		<p>The Technical Support Center is essentially fully staffed. They begin coming up to date on events that have occurred and initiating communications with off-site organizations. The Technical Support Center arranges for a radiation monitoring team to check the site boundary due to steam generator safeties blowing.</p>	
0818	N/A		<p>A "SITE EMERGENCY" should be declared, the Nuclear Emergency Alarm sounded, and accountability performed due to being without power for greater than 15 minutes. The Technical Support Center should notify the Berrien County Sherriff's Department and Michigan State Police of this condition.</p> <p>Shift Supervisor should be following the "Loss of all station AC power" procedure where possible.</p>	

DETAILED SCENARIO TIME

TIME	MESSAGE NUMBER	MESSAGE	EXPECTED LICENSEE ACTIONS	EXPECTED OFF-SITE ACTIONS
0819	N/A		<p>The Plant Manager notifies the Benton Harbor State Police that due to time without power, Unit 2 has escalated to a "SITE EMERGENCY". Investigations are now being made to determine if radioactive gases are being released.</p>	<p>Due to the escalating conditions, the Benton Harbor State Police Post sends a followup message to Lansing Operations. Operations again notifies duty staff from the Emergency Service Division/Michigan State Police and Radiological Health Division /Department of Public Health.</p> <p>After conferring with Radiological Health Department/Department Public Health, Emergency Services Division/Michigan State Police recommends that mobilization of State and Local Emergency Operating Centers is advisable due to the nature of the incident.</p>
0820	9	TO: Shift Supervisor FROM: Observer/Controller	<p>The Michiana Regional Dispatcher is notified of damage at the plant, and that restoration of power is critical to the safety of the plant, and to the health and safety of the public. (simulated).</p>	
		Reactor coolant pressure is 1920 psi and decreasing. Containment pressure is 3.8 psi and increasing. Containment area monitor R-2 is increasing.	<p>The Shift Supervisor diagnoses a leak into containment, probably through the reactor coolant pump seals.</p>	

DETAILED SCENARIO TIME

TIME	MESSAGE NUMBER	MESSAGE	EXPECTED LICENSEE ACTIONS	EXPECTED OFF-SITE ACTIONS
0821	N/A		The Shift Supervisor requests the Operations Superintendent or Technical Support Center to determine if anything can be done to provide an electrical tie from Unit 1 to Unit 2 in order to have charging due to the suspected leakage from reactor coolant pump seals.	
0822	10	TO: Operations Support Area Manager FROM: Maintenance Team at Diesel	The Operations Support Area Manager reports this information to the Technical Support Center.	The Emergency Services Division/ Michigan State Police notifies the Governor's Office and recommends at least partial mobilization as per the Radiological Health recommendation. The Governor's Office issues authority to begin "call-up" and declares a "STATE OF DISASTER". Emergency Services Division/ Michigan State Police notifies Berrien County that a "STATE OF DISASTER" has been declared by the Governor and to begin action in accord with the local plan.

DETAILED SCENARIO TIME

TIME	MESSAGE NUMBER	MESSAGE	EXPECTED LICENSEE ACTIONS	EXPECTED OFF-SITE ACTIONS
0825	11 TO: FROM:	Shift Supervisor Operations Superintendent The East Unit 1 motor driven auxiliary feed pump should be used immediately. <u>NOTE:</u> This message is a contingency message and is to be used only if the decision is not made by 0825 to use a U-1 motor driven auxiliary feed pump.	The Shift Supervisor directs that a lineup of auxiliary feed water from Unit 1 East motor driven auxiliary feed pump to Unit 2 steam generators 21 and 24 be performed.	The Berrien County Emergency Operations Center will communicate directly with the State Emergency Operations Center until the on-site Emergency Operations Center is fully activated.
0830	N/A		Technical Support Center should be staffed and operational.	
0840	12 TO: FROM:	Shift Supervisor Auxiliary Equipment Operator The lineup from Unit 1 motor driven auxiliary feed pump to Unit 2 steam generators 21 and 24 is complete.	The Reactor Operator initiates auxiliary feed from Unit 1 to Unit 2 steam generators 21 and 24.	The Technical Support Center is advised of a "STATE OF DISASTER" proclamation and directed to communicate with the State Emergency Operations Center.
0841	13 TO: FROM:	Shift Supervisor Observer/Controller Steam generator safeties reset as feedwater from Unit 1 begins to supply numbers 21 and 24 steam generators.	The Shift Supervisor directs that a reactor coolant system cooldown to 390 psi and 446°F be initiated.	

DETAILED SCENARIO TIME

TIME	MESSAGE NUMBER	MESSAGE	EXPECTED LICENSEE ACTIONS	EXPECTED OFF-SITE ACTIONS
0843	N/A		The Technical Support Center will ensure that communicators maintain full time communications with the assigned locations.	The State Emergency Operations Center Lansing is partially mobilized and direct communication lines are established with the plant and Berrien County.
0850	14	TO: Shift Supervisor FROM: Observer/Controller	The Shift Supervisor directs persons to try to determine reason for adverse conditions in containment. NOTE: The above indications are caused by leaks out the reactor coolant pump seals of 50 gpm each for a total of 200 gpm. This condition will worsen as reactor coolant pump seals deteriorate. The Joint Public Information Center is now operational at Lake Michigan College Community Center.	
0902	N/A		The Technical Support Center establishes communications with the Emergency Operations Facility and begins to transfer Emergency Operations Facility functions to the Emergency	The State Emergency Operations Center Lansing establishes a direct line to the Joint Public Information Center at Lake Michigan College and provides state assessment to same.

DETAILED SCENARIO TIME

TIME	MESSAGE NUMBER	MESSAGE	EXPECTED LICENSEE ACTIONS	EXPECTED OFF-SITE ACTIONS
0902 (CONT)	N/A (CONT)		Operations Facility. The Emergency Operations Facility/Technical Support Center establishes communications with the Joint Public Information Center.	
0904	15 TO: FROM:	Radiation Monitoring Team Observer/Controller The measured dose rate at the site boundary is normal background.	The Radiation Monitoring Team reports this information to the Operations Support Area. The Operations Support Area ensures the Technical Support Center/Emergency Operating Facility also overheard this information. The Technical Support Center requests that they continue to monitor between the plant and site boundary due to a loss of off-site power and monitoring capabilities of Unit 2.	
0907	16 TO: FROM:	Shift Supervisor Benton Harbor Line Crew 12 AB & 12 CD breakers are destroyed, additional phase two of transformer has the bushings broken out.		

DETAILED SCENARIO TIME

TIME	MESSAGE NUMBER	MESSAGE	EXPECTED LICENSEE ACTIONS	EXPECTED OFF-SITE ACTIONS
0910	17	<p>Radiation Monitoring Team Observer/Controller</p> <p>Measured site boundary dose rate remains normal background.</p>	<p>The Radiation Monitoring Team again reports their results to the Radiation Protection Director (in the Operations Support Area) who ensures the Radiation Protection Manager in the Emergency Operating Facility is aware of this data.</p> <p>The Radiation Protection Manager advises the Radiation Monitoring Team to continue monitoring at the site boundary.</p>	
0915	18	<p>Shift Supervisor Observer/Controller</p> <p>Containment pressure is now 8.4 psi and the ice condenser is not in operation.</p> <p>The Benton Harbor Line Crew estimates that it will take 12 hours to restore AC power from off-site. The 69 KV supply appears to be the most promising source.</p>	<p>The Technical Support Center is working on a plan for placing the ice condenser in service.</p> <p>The Technical Support Center should also be considering the possibilities of providing AC power to a Unit 2 charging pump from a Unit 1 diesel.</p>	<p>Benton Harbor Line Crew continue their efforts to establish a power supply from 69 KV.</p>

DETAILED SCENARIO TIME

TIME	MESSAGE NUMBER	MESSAGE	EXPECTED LICENSEE ACTIONS	EXPECTED OFF-SITE ACTIONS
0917	N/A		The Emergency Operations Facility has assumed the communication link to the State Emergency Operations Center.	
0930	19	TO: Operations Support Area Manager FROM: Maintenance Crew	The spare generator for Unit 2 AB diesel is in the warehouse. The estimate on replacement, however, is approximately 3 days. Repair of CD diesel will take at least that long.	The Shift Supervisor continues to make efforts to attain AC power elsewhere.
1000	20	TO: ALL PERSONS INVOLVED IN THE EXERCISE FROM: Observer/Controller	All persons involved in the exercise will be given the following information: The scenario jumps ahead 12 hours at this time. The following is a list of the conditions that presently exist:	

DETAILED SCENARIO TIME

TIME	MESSAGE NUMBER	MESSAGE	EXPECTED LICENSEE ACTIONS	EXPECTED OFF-SITE ACTIONS
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1000 (CONT)	20 (CONT)	The containment pressure is at .1 psi and the temperature is at 115°F, and the containment radiation level is now 7.1×10^5 R/hr.		
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Partial core uncovering has occurred. A post accident sampling team was sent out at 1600 to obtain a RCS sample. The results of this sample indicated approximately 1% failed fuel.

The isotopic measurements were:

<u>Activity of RCS μCi/cc</u>	
Xe - 133	185.6
X - 135	5.19
Kr - 85	3.75
Kr - 87	0.9
I - 131	1.78
I - 133	2.75

Power was restored to U-2 at 2:00 p.m. by tying U-1 to U-2 through the auxiliary power supply breaker and isolating the fault at the loop enclosure.

DETAILED SCENARIO TIME

TIME	MESSAGE NUMBER	MESSAGE	EXPECTED LICENSEE ACTIONS	EXPECTED OFF-SITE ACTIONS
1000 (CONT)	20 (CONT)	<p>The State Radiological Health Monitoring Team are now in the area taking samples.</p> <p>Earlier entry into the lower containment confirmed a large amount of leakage from the reactor coolant pump seals.</p> <p>A second source of power has been restored to Unit 2 via the 69 KV supply at 9:30 p.m. this evening (½ hour ago). Deliberations between the Technical Support Center, American Electric Power Service Corporation Engineering Emergency Operating Facility, and the Emergency Operating Facility have been ongoing concerning cool-down.</p> <p>The decision was made to initiate recovery using procedure 2-OHP 4023.001.018 "Recovery with Safety Injection" required. Completion of this procedure was accomplished and we are now ready to initiate cooldown with the residual heat removal system. The East train of the residual heat removal system is in the process of being placed in service at this time.</p>		<p>The State Radiological Health</p>

DETAILED SCENARIO TIME

TIME	MESSAGE NUMBER	MESSAGE	EXPECTED LICENSEE ACTIONS	EXPECTED OFF-SITE ACTIONS
1000 (CONT)	20 (CONT)	<p>A Radiation Monitoring Team has remained at the site boundary throughout the event, and remains there now, due to the conditions in containment and status of the plant.</p> <p>Wind speed has now dropped to 8 mph. Wind direction remains from 205^o.</p> <p><u>NOTE:</u> All times in parentheses denote real time.</p>		
2220 (1020)	21 TO:	<p>Radiation Protection Director (OSA)</p> <p>FROM: Observer/Controller</p>		
		<p>Radiation Protection personnel in the auxiliary building report frisking stations in the auxiliary building to be alarming. General auxiliary building levels are now approximately 5 mR/hr.</p>	<p>The Technical Support Center should recognize that we are now pumping coolant out of the system. Radiological problems could be significant since some fuel damage has occurred.</p>	
2222 (1022)	22 TO:	<p>Shift Supervisor</p> <p>FROM: Observer/Controller</p>		
		<p>Unit 2 R-26 monitor is increasing from background of 40 counts.</p>	<p>The Shift Supervisor and Technical Support Center should try to come up with reason for this.</p>	

DETAILED SCENARIO TIME

TIME	MESSAGE NUMBER	MESSAGE	EXPECTED LICENSEE ACTIONS	EXPECTED OFF-SITE ACTIONS
2230 (1030)	23	TO: Shift Supervisor FROM: Observer/Controller Unit 2 R-26 is 3×10^4 cpm.	Shift Supervisor directs the in service residual heat removal pump to be removed from service. The Technical Support Center should request team to proceed to R-26 and begin taking readings 6" from R-26 detector.	
2233 (1033)	23a	TO: Technical Support Center Manager FROM: TSC Observer/Controller A Post Accident Sampling Team should be dispatched to obtain a second RCS sample to verify the results of the first sample. <u>NOTE:</u> This message is a contingency message to be used only in the event a Post Accident Sampling Team has not been dispatched by this time.		
2235 (1035)	24	TO: Post Accident Sampling Team FROM: Observer/Controller The following is a list of reactor coolant activity.	The Post Accident Sampling Team reports these results to the Radiation Protection Director who ensures the Technical Support Center receives this data.	
		Activity of RCS $\mu\text{Ci/cc}$ Xe - 133 179.5 X - 135 3.3 Kr - 85 3.7 Kr - 87 0.04 I - 131 1.74 · 122 2.25		

DETAILED SCENARIO TIME

TIME	MESSAGE NUMBER	MESSAGE	EXPECTED LICENSEE ACTIONS	EXPECTED OFF-SITE ACTIONS
2240 (1040)	25	TO: Shift Supervisor FROM: Observer/Controller		
		Unit 2 R-26 is off-scale high. A Maintenance man reports to the control room that he was in the area of IRV-310 (East residual heat removal heat exchanger outlet valve), and water was spraying out of the valve.	The Shift Supervisor instructs the Maintenance man to check with Radiation Protection for possible personnel contamination.	
		<u>NOTE:</u> Data from the unit vent release pathway will be provided to the Radiation Protection Director, as requested, by the observer/controller. This information may include radiation readings at six inches from the unit vent and unit vent sample data. Teams will not be activated to perform these functions.	The Emergency Operations Facility requests Operations Support Area provide on-site monitoring team to determine conditions for entry to residual heat removal exchanger area. Monitor team is dispatched (simulated) from Operations Support Area to provide this information.	
2245 (1045)	26	TO: Site Boundary Monitoring Team FROM: Observer/Controller		
		The readings at the site boundary are as follows: <u>Note:</u> Readings are to be provided by the observer/controller from data included in the plant parameters section. Readings will be provided as a function of time and team location.	The Technical Support Center declares "GENERAL EMERGENCY" classification from information from the Emergency Operating Facility and from the site boundary monitoring team.	

DETAILED SCENARIO TIME

TIME	MESSAGE NUMBER	MESSAGE	EXPECTED LICENSEE ACTIONS	EXPECTED OFF-SITE ACTIONS
2248 (1048)	27	<p>TO: Radiation Protection Director FROM: On-Site Monitoring Team</p> <p>The readings in the auxiliary building are as follows:</p> <p><u>Note:</u> Readings to be provided from data in the plant parameters section and as a function of team location.</p>	<p>The on-site monitor team reports readings to the Emergency Operations Facility then determines the clothing and stay time for persons assigned to isolate the residual heat removal valve IRV-310.</p>	
2300 (1100)	28	<p>TO: Shift Supervisor FROM: Auxiliary Equipment Operator</p> <p>We have isolated the valve and the leak is now stopped.</p>	<p>The Shift Supervisor will direct operators to place West train of residual heat removal in service and continue with cooldown.</p>	
2315 (1115)	29	<p>TO: Shift Supervisor FROM: Observer/Controller</p> <p>R-26 remains off scale.</p>	<p>Shift Supervisor will maintain surveillance on R-26 monitor.</p>	
2325 (1125)	30	<p>TO: Shift Supervisor FROM: Observer/Controller</p> <p>R-26 is 3×10^5 and trending down.</p>	<p>Monitor reduction in R-26 reading.</p>	

DETAILED SCENARIO TIME

TIME	MESSAGE NUMBER	MESSAGE	EXPECTED LICENSEE ACTIONS	EXPECTED OFF-SITE ACTIONS
2345	31	TO: Shift Supervisor FROM: Observer/Controller R-26 reading 3×10^3 cpm.		
1200	32	TO: ALL PERSONS INVOLVED IN THE EXERCISE FROM: Observer/Controller The time is now noon Saturday, October 23. No additional releases have occurred since 12:01 a.m. Friday, October 22. At 1:00 p.m. yesterday (October 22) discussions with State, Radiological Health, County, Federal, and I & M officials concluded with a de-escalation of the event to a "SITE EMERGENCY". At 10:00 a.m. this morning (Saturday, October 23) discussions were again initiated between the above organizations. At 12:00 p.m. the event was de-escalated to an "UNUSUAL EVENT". DATA WILL BE SUPPLIED UNTIL 1:30 P.M. (REAL TIME) TO ALLOW FOR OFF-SITE RECOVERY ACTIONS.	Continue with normal cooldown of Unit to check for fuel damage. Steady state data will be supplied to off-site agencies to support re-entry and recovery operations. Recovery operations have been ongoing at the New York Engineering Emergency Operations Facility. These operations will also close out as problems are resolved.	Re-entry procedures beginning to lift road blocks, close down congregate care facilities, allow for orderly re-entry to area populace, information through the JPIC and EBS as to proper procedures to follow, decontamination of fresh vegetables, etc., assure transportation exists to take evacuees back home, proper patrolling of area by police until residents have returned.

END