

U.S. NUCLEAR REGULATORY COMMISSION

REGION III

Reports No. 50-315/90003(DRSS); 50-316/90004(DRSS)

Docket Nos. 50-315; 50-316

Licenses No. DPR-58; DPR-74

Licensee: Indiana Michigan Power Company  
1 Riverside Plaza  
Columbus, OH 43216

Facility Name: D.C. Cook Nuclear Plant, Units 1 and 2

Inspection At: D.C. Cook Site, Bridgman, Michigan

Inspection Conducted: April 2-6, 1990

Inspectors: J. Foster *W. Snell for*  
Team Leader  
D. Barss *W. Snell for*

4/20/90  
Date

4/20/90  
Date

Approved By: *W. Snell*  
W. Snell, Chief  
Radiological Controls  
and Emergency Preparedness Section

4/20/90  
Date

Inspection Summary

Inspection on April 2-6, 1990 (Reports No. 50-315/90003(DRSS); 50-316/90004(DRSS))

Areas Inspected: Routine, announced inspection of the D.C. Cook Nuclear Plant annual emergency preparedness exercise involving observations by four NRC representatives of key functions and locations during the exercise (IP 82301), and followup on previous Open Items (IP 92701). Selected portions of the Operational Status of the Emergency Preparedness Program module (IP 82701) were also completed.

Results: No violations, deficiencies or deviations were identified. This was an unannounced, after-hours, offsite partial participation exercise involving a considerable challenge to the licensee's program. The licensee demonstrated good response to a challenging hypothetical scenario involving multiple equipment failures and a large radiological release. Some areas, including timeliness of facility activation, could still be improved.

## DETAILS

### 1. NRC Observers and Areas Observed

J. Foster, Control Room, Technical Support Center (TSC), Operations Support Area (OSA), Emergency Operations Facility (EOF)  
D. Barss, EOF  
D. Passhel, Control Room, TSC  
G. Stoetzel, OSA, In-plant Teams

### 2. Persons Contacted

#### American Electric Power, Indiana Michigan Power Company

\*A. Blind, Plant Manager  
\*J. Rutkowski, Assistant Plant Manager, Production  
\*B. Svensson, Licensing Activity Coordinator  
K. Baker, Operations Superintendent  
\*J. Sampson, Operations Superintendent  
D. Loope, Radiation Protection Supervisor  
\*M. Barfelz, Safety and Assessment Department  
\*L. Bounds, AEPSC, Emergency Planning  
\*B. Burgess, Simulator Coordinator  
\*M. Jury, Security  
\*R. Krieger, Cook Plant Emergency Planning Coordinator  
\*R. Heydenburg, Site Quality Assurance  
\*T. Stephans, Production Supervisor Engineer, Operations  
\*I. Fleetwood, ACC - OPS  
\*G. McCullough, Training, Simulator  
\*C. Ross, Managerial  
\*D. Londut, Managerial  
\*G. Griffin, Stores  
E. Gerschoffer, Security

\*Denotes those attending the NRC exit interview held on April 6, 1990.

The inspectors also contacted other licensee personnel during the course of the inspection.

### 3. Licensee Action on Previously Identified Item (IP 92701)

(Closed) Open Item No. 315/89027-01: During the 1989 annual Exercise, Protective Action Recommendation (PAR) information did not receive adequate review, and there were errors in PAR information transmission to State of Michigan personnel. During the present exercise, PARs were discussed with State officials and background information provided to insure State officials were aware of the reasons for recommended PARs. PARs were clearly communicated to appropriate State officials. Initial and periodic update messages to State officials included PAR information. These messages were reviewed and approved by appropriate senior utility management in the EOF. This item is closed.

4. General

An exercise of the D.C. Cook Nuclear Plant, Units 1 and 2 Emergency Plan was conducted at the D.C. Cook Nuclear Plant site on April 3, 1990. The exercise tested the licensee's and offsite organization's capabilities to respond to a simulated accident scenario resulting in a major release of radioactive effluent. The licensee conducted an off-hours, unannounced exercise. This was a "partial participation" exercise including partial participation by the State of Michigan and full participation by Berrien County. Attachment 1 describes the Scope and Objectives of the exercise and Attachment 2 describes the exercise scenario.

5. General Observations

a. Procedures

This exercise was conducted in accordance with 10 CFR Part 50, Appendix E requirements using the D.C. Cook Nuclear Plant Emergency Plan and Emergency Plan Implementing Procedures.

b. Coordination

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

c. Observers

The licensee's observers monitored and critiqued this exercise along with four NRC observers.

d. Exercise Critiques

A critique was held with the licensee and NRC representatives on April 5, 1990, two days after the exercise. The NRC discussed the observed strengths and weaknesses during the exit interview. On April 6, 1990, a public critique was held where NRC and Federal Emergency Management Agency (FEMA) representatives discussed the tentative findings from the exercise evaluation teams.

6. Specific Observations (IP 82301)

a. Control Room (CR)

This is the second year that the licensee has utilized the Control Room simulator to drive annual Exercise actions. Simulator use greatly enhances the degree of realism involved in an exercise scenario. A simulated Technical Support Center (TSC) was also utilized.

In general, Control Room personnel responded well to the simulated conditions presented to them via the simulator. They promptly recognized the system alarms displayed, classified events and made proceduralized notifications properly. Also, in general, they displayed an excellent knowledge of applicable procedures, and procedure usage was evident.

The public address announcements to plant personnel were considerably improved relative to last year's exercise. Each announcement was clearly audible, and contained the emergency classification, information regarding the reason for the classification, and additional essential information as required.

At 0150 hours, a rough leak rate calculation indicated an Reactor Coolant System (RCS) leakrate of approximately 18 gallons per minute, well above applicable Technical Specifications. An Unusual Event was declared at 0159 hours, utilizing ECC-14, the proper Emergency Action Level (EAL) per the licensee's EAL scheme.

At 0208 hours, an Alert was properly declared, based on the amount of primary to secondary leakage.

During initial notifications of the Alert declaration, at 0218 hours, the communicators were utilizing Procedure PMP 2080 EPP.106 "Initial Offsite Notification." The Controller noticed that the necessary call to the Security organization had not been made, and that the procedure did not include a requirement for such a call. This guidance is contained in the Alert procedure (PMP 2080 EPP.103) itself. To preserve the scenario timeline, the Controller directed the communicators to call the Security organization. This was not a prompt, but a recognition that the procedure in use was either inadequate or inappropriate and would invalidate the scenario timeline.

A procedural error was made by Control Room personnel early in the scenario, forcing a minor modification of the scenario timeline and affecting some later actions. The operators had properly entered Procedure No. 01-OHP 4023.002.003 "Steam Generator Tube Leak", in response to the scenario tube leak. This is a relatively new procedure, still in Revision 0, with an effective date of .. November 20, 1989. Step 3 of the procedure calls for the operators to implement a normal plant shutdown per the guidance in Procedure No. 01-OHP 4021.001.003 "Power Reduction." Step 3.a of the tube leak procedure indicates that the Unit shutdown should be complete, and Step 3.b indicates that when the Unit shutdown is complete, then continue with Step 4, which directs the operator to perform an emergency boration of the Reactor Coolant System. This step insures adequate shutdown margin.

The operators inadvertently initiated Step 4, emergency boration, prior to Unit shutdown. Emergency boration of the operating reactor caused a rapid decrease in reactor power, a primary to secondary

power mismatch, and a rapid primary system cooldown. The resulting rapid Reactor Coolant cooldown reduced primary pressure to the point where the reactor trip setpoint was reached, and a Safety Injection initiated. The reactor trip was several minutes prior to that anticipated in the exercise scenario, and the simulator operators initiated the loss of offsite power earlier (so as to maintain the integrity of other data built into the scenario).

Procedure No. 01-OHP 4023.002.003 "Steam Generator Tube Leak," should be reviewed to determine if appropriate warnings exist regarding emergency boration of the RCS while the Unit is at power. This is an Open Item (No. 315/90003-01).

Additionally, there were few plant status briefings in the Control Room (although the operators appeared to be very aware of overall plant status), and personnel there gave few "repeatbacks" in response to orders from the Unit Supervisor.

"Procedures used" plastic plates are available in the Control Room. These plates are intended to aid in organizing the process of exiting from, and possibly later returning to, a procedure. "Procedure used" plates seemed cumbersome to work with, and since there were only four of them, it would tend to make reconstitution of events more difficult. There was a CR log recorder; however, but information was not as complete as in past exercises. By the end of the drill, a number of procedures were open on the Unit Supervisors desk.

Requests for action by the CR to the Technical Support Center (TSC) need to be more accurate and timely; there was much confusion over the CR's request to send personnel to upper containment to check pressurizer Power Operated Relief Valve (PORV) emergency air bottles and Radiation Protection (RP) coverage. About an hour elapsed from inception of the idea to the TSC response to have personnel enter with only a dose rate meter (There were no more RP Technicians available).

The initial initiating events, (DMIMS) system alarm (suggesting possible mechanical fuel damage including the digital metal impact monitoring system, and high Reactor Coolant Pump vibration, were not communicated to the other emergency facilities. Later in the exercise, participants did not understand the root source of the radioactive releases, but they accepted the fact that a release was taking place.

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

b. Technical Support Center (TSC)

As in last year's exercise, the licensee utilized a simulated Technical Support Center (TSC) located adjacent to the Control Room



Simulator. This facility has displays and layout mimicking the real TSC, and the displays are driven by the simulator. Use of this facility greatly enhanced the realism of the accident scenario. As with the use of any simulated facility, it was recognized that this does introduce "exercise artifacts" or differences in performance, due to the location of the facility differing from the actual facility. (This can affect staffing times and communication flow.)

The TSC was declared "manned" at 0315 hours. Facility activation was delayed while awaiting minimum staffing to be met. While a statement to the effect that "the TSC is manned" was made, a formal announcement of facility activation was not made.

With the exception of the initial scenario events, TSC personnel were very aware of plant status and events, and actively sought methods of halting or mitigating the accident scenario events. Personnel assigned the TSC positions displayed good exercise deportment throughout the exercise. Noise levels in the TSC were good, and the TSC manager periodically cautioned his staff to maintain the noise level needed for communication. Appropriate attention was devoted to reviewing ongoing events to determine if a change in emergency classification was warranted.

Excellent command and control was demonstrated by the TSC manager. He assigned tasks to his staff, prioritized their actions and the actions requested from the Operations Staging Area (OSA) to be performed by in-plant teams. Priorities were revised as the ongoing situations changed. This was excellent.

There were frequent and detailed event status briefings in the TSC. The TSC Manager had TSC personnel thinking about contingency actions (e.g., "what can we do if we loose auxiliary spray"). Excellent technical discussion on reactor coolant system (CRCS) depressurization via auxiliary spray and the effect this might have on pressurizer spray valves were noted.

Status board maintenance got off to a slow start, and some information was initially not available. Status board writers coped with this situation, and kept the boards adequately well maintained throughout the exercise.

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

c. Operational Support Area (OSA)

The on-shift staff assembled in the OSA rather than the cafeteria just above the OSA, as is provided for by Procedure PMP 2081 EPP.103 (Evacuation of Plant Personnel). General Employee Training also states that personnel should assemble in the cafeteria. The Public Address (PA) announcement stated that personnel should report to the basement of the Lakeside Office Building, for accountability.

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This is correct; however, after personnel card-in at the basement they should immediately proceed to the cafeteria (arrows on the floor depict the intended path, but one card reader was out of service). Had this event been during normal work hours, on-shift personnel assembling in the OSA could have slowed OSA activation considerably.

The on-shift Radiation Protection Technician (RPT, the first arriving member of the OSA staff) didn't have a key to the box which contained keys to the radiation protection offices. He had to break the glass window of the box. Licensee personnel indicated that this is the desired sequence of events.

The RPT properly established contamination control points at the North and South entrances to the OSA and initiated habitability surveys.

The OSA was declared operational at 0315 hours. The OSA maintained good communications with in-plant teams during the exercise. Teams used radios as the primary communication means with telephones used as a backup. There were more than an adequate number of phones available in the radiation protection area and the staging area of the OSA.

Briefing, debriefing, and tracking of in-plant teams was good. Response Team Request forms and Team Briefing forms from Procedure PMP 2081 EPP.203 were completed for each team dispatched from the OSA. The Radiation Protection Director (RPD) and the appropriate skill supervisor were involved in the formal team briefings. Debriefings were conducted when key teams returned from the field.

No formal briefings were provided to the OSA staff located in the North staging room. A status board was located in the room for players to obtain information on plant status, and an individual was assigned to maintain the board. However, during the briefing of the offsite field teams, one team member asked what type of accident was occurring. Therefore, the status boards may not have provided sufficient information or been read by the OSA staff. A brief verbal briefing given by the OSA Manager or Assistant Manager, covering topics such as plant status, emergency classification, offsite release potential and high radiation levels in the plant, would be beneficial.

The OSA appeared to be delayed in getting information of the Power Operated Relief Valve (PORV) radiation monitor alarm, which occurred at 0446 hours. It wasn't until approximately 0455 hours that the OSA communicator received this information. The OSA also did not receive word of the General Emergency until approximately 0500 hours, while it was declared at 0450 hours.

Considering the PORV radiation monitor alarm at 0446 hours (indicating elevated radiation levels), it is not clear why



Team 6 (whose mission was to close the PORV, Valve MRV-243) was not issued high range dosimetry and was given a turn-back dose of only 1R. Team 6 was delayed approximately 40 minutes at the Auxiliary Building access control point, awaiting dose extensions, administration of Potassium Iodide, and issuance of high-range Self-Reading Dosimeters (0-100R). It wasn't determined until after the team had been dispatched at 0523 hours that the above precautions would be necessary.

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

- The OSA Manager should periodically conduct short briefings of OSA personnel regarding plant status and ongoing repair efforts.

d. Emergency Operations Facility (EOF)

By 0245 hours, personnel started to arrive at the EOF. Security personnel were in place and checked arriving personnel for proper identification before allowing entry into the EOF.

Personnel began setting up the facility in an orderly manner following established procedural guidance. Communication links were established and meteorological forecast information obtained. The Environmental Assessment Director took charge and briefed arriving staff on known plant conditions.

Throughout the Exercise, status boards were maintained with current available plant information. Information was clearly displayed for all players to review and refer to as needed.

Initial briefings of key personnel upon arrival at the EOF were conducted by appropriate personnel. Current conditions, past occurrences and anticipated actions and projected results were discussed to insure arriving personnel were well informed of plant status and emergency conditions.

Public address briefings of the EOF staff were conducted regularly to ensure personnel were aware of changes in plant conditions and emergency response actions.

The MIDAS terminal/system failed early in the exercise, and EOF personnel initially seemed helpless to do anything to restore its operability. Subsequently, alternate methods for obtaining necessary meteorological data were used. (OTSC computer system)

A phased activation of the EOF was used to assume first responsibility for communications and later Dose Assessment duties as staffing levels permitted. Later, shift staffing plans were developed to insure

personnel would be available for continued long term facility operation.

Protective Action Recommendations (PARs) were initially developed and issued using default values and later confirmed with available dose projection information, and actual field measurements. Good discussions and evaluations of available information, in light of anticipated plant conditions, were conducted by the Site Emergency Coordinator (SEC) and Environmental Assessment Director (EAD). PARs were discussed with State officials and background information provided to insure State officials were aware of the reasons for recommended PARs. PARs were clearly communicated to appropriate State officials. Initial and periodic update messages to State officials included PAR information. These messages were reviewed and approved by appropriate senior management in the EOF.

When plant conditions indicated that parameters could exceed existing limits and go beyond available Emergency Guidance documents, personnel were directed to contact appropriate support contact personnel (Westinghouse) and the NRC to conduct necessary evaluations.

The EAD appropriately evaluated dose projection information and available Field Team measurements and based PARs on actual measured conditions. Field team exposures were evaluated and consideration was given to rotating assignments to limit excessive exposure to any one field team. Both recommended and State ordered Protective Actions were clearly displayed on a color coded status board to clearly illustrate existing conditions.

Notification of State and federal officials was timely, almost immediate, as plant conditions changed and the General Emergency declaration made. Communicators were provided with approved accident notification forms every 15 minutes to supply current, accurate and approved information to appropriate contacts.

Information about the lose parts monitor alarm and potential for mechanical damage to the core and fuel failure were not communicated to EOF personnel.

Activation of the EOF was delayed due to inadequate staffing levels. It took additional time to muster sufficient personnel to accept responsibility for communications and to take charge of Dose Assessment duties.

Field monitoring teams were not dispatched for their first assignment until 2 hours and 15 minutes after declaration of the Site Area Emergency. Only one monitoring team was available.

Field monitoring teams did not have potassium iodide (KI) tablets readily available and needed to interrupt monitoring activities to return to the site to obtain necessary supplies.

Although plant parameter status boards in the EOF contain locations for indicating the trend of several parameters, no trend information was displayed. This information could have been helpful in understanding overall plant status, and been useful in briefing arriving corporate personnel.

Personnel arriving at the EOF were not monitored for potential contamination after having potentially traveled through areas downwind of the site. Contamination survey equipment was not set up at the EOF. This is an Open Item (No. 315/90003-02).

No formal logs were observed to be kept by EOF key personnel. Some communicators did have scribe pads on which chronological information was maintained, but again no formal log was observed.

The field team communicator did not use the phonetic alphabet (Alpha, Bravo, Charlie..) in communications and could have caused confusion of team directions and reported results.

Field team measurement of 4 Rem/hour at the protected area fence was recorded and reported as being at the site boundary fence. This misinformation could have caused confusion and overly conservative protective action recommendations. The EAD was aware of the correct information.

Nuclear Plant Accident Notification forms, Plant Messages Nos. 5, 6, 7, 8, and 9 issued at 15 minute intervals from 0500 hours to 0600 hours contained the incorrect description of the event/initiating condition. "ECC-17 SGTR with loss of all AC" was stated as the reason for the General Emergency when the correct information was "ECC-19 high dose rates at site boundary." This is an Open Item (No. 315/90003-03).

Due to a lack of information regarding the initial incidents (DMIMS system alarm, high reactor coolant pump vibration), and a minor scenario problem (Reactor Coolant System sample information was real data, not scenario data) EOF personnel did not recognize that there had been fuel failure.

Near the conclusion of the exercise, the licensee performed a limited demonstration of the planning needed to recover from the effects of an accident, including long-term planning. While an acceptable performance was observed, the procedure for Recovery or Termination from an actual event does not currently provide sufficient detailed guidance. The procedure (PMP 2081 EPP.306 "De-escalation or Termination of the Emergency and Recovery") allows for entry into a Recovery phase or de-escalation of the emergency classification, but provides little or no guidance. Current NRC philosophy is that events at the Site Area Emergency or General Emergency should be terminated, and a Recovery phase entered. Events at the lower classifications (Unusual Event, Alert) can be terminated. This philosophy follows the concept that an emergency

classification system is intended to activate emergency organizations.

It was observed that the State of Michigan expressed a preference for de-escalation of emergency classifications, and this is acceptable as long as all the involved parties understand the connotations attached to emergency classification de-escalation, and the public can also be advised of such connotations.

With the exception of the above Open Item, this portion of the licensee's program was acceptable. However, the following items are recommended for improvement:

- Field Monitoring Team kits should include supplies of Potassium Iodide.
- Key EOF personnel should keep formal logs of activities and discussions.

e. Joint Public Information Center (JPIC)

The JPIC was not directly observed. A review was made of press releases issued during the exercise.

News release statement #1 was worded in such a way that members of the public would most likely have been confused. The statement indicating "a tube rupture in a steam generator" as the reason for the Site Area Emergency and "a leak in the reactor coolant system" as the reason for the Unusual Event were technically correct, but would not have been clearly understandable to the general public or news media personnel.

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

f. Security

Security personnel were involved with assembly/accountability and completion of the emergency callout list at the same time. These tasks were well performed in a reasonable amount of time.

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

7. Exercise Scenario and Control

The licensee's scenario was quite challenging, including: multiple equipment failures, and assembly/ accountability. The degree of challenge in an exercise scenario is considered when assessing observed exercise weaknesses.

Overall, exercise control was considered adequate. No occurrences of Controller prompting were observed.

A number of minor problems were observed. The tape recording simulating the audio output of the Digital Metal Impact Monitoring System failed.

The duty staff listing, normally available in the Control Room had not been provided to the simulator Control Room. The Control Room crew looked for this listing following the Digital Metal Impact Monitoring System (DMIMS) alarm.

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

8. Licensee Critiques

The licensee held facility exercise critiques immediately following the Exercise, a Controller exercise critique, and a critique where the Controller/Evaluators presented their findings to management personnel. NRC personnel attended these critiques, and determined that significant NRC identified exercise deficiencies had also been identified by licensee personnel.

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

9. Exercise Objective and Scenario Review (IP 82302)

The licensee submitted the draft annual exercise scope and objectives within the timeframe goals established by NRC Region III. Copies of the scenario packages were submitted for review. Scenario review did not indicate any significant problem areas.

The licensee's scenario was considered complex and challenging, including: multiple equipment failures, loss of power, and assembly/accountability. To these were added the additional challenges associated with an unannounced, after-hours exercise. The degree of challenge in an exercise is considered when assessing observed exercise weaknesses. Simulation was reduced to the minimum possible.

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

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

a. Emergency facilities, Equipment, Instrumentation and Supplies

Since exercise activities had been conducted utilizing the plant simulator and a simulated TSC, an inspection was conducted of the actual plant Control Rooms, Technical Support Center, Operational Support Area, and emergency field team counting vehicle.

These facilities were all found to be maintained in an appropriate state of operational readiness. Copies of the Emergency Plan and implementing procedures as well as other appropriate procedures were maintained by controlled distribution and appeared to be current. The facilities were clean and orderly and well stocked with necessary office supplies. Radiological monitoring and protective equipment supplies were adequately stocked and maintained. Survey meters



were found to be calibrated and response checked in accordance with established licensee procedures.

A review of the equipment inventory for the field team counting vehicle as well as discussions with cognizant licensee personnel indicated that a portable "frisker" type survey meter is not routinely considered a part of the equipment supplied with this vehicle. It is recommended that such equipment should be made available as part of the regular inventory for this mobile counting lab.

Additional discussion with cognizant licensee personnel indicated that the following improvements had been made to emergency response facilities since the last routine inspection, completed in March, 1989:

- Status boards have been added to both the TSC and the EOF to indicate both utility recommended and State ordered PARs.
- An additional telephone line has been added to the TSC for use by Security personnel.
- Personal Computers (PCs) have been added to both Control Rooms with the Dose Assessment Program (DAP) installed on each. Operators have received preliminary training on use of this program and appropriate procedural guidance is currently in the last stages of review prior to issuance for incorporating the use of DAP by the Control Room staff. Additionally, station Radiological Protection personnel are currently trained in the use of the DAP.
- The OSA has had several new phones installed with a cascading feature to provide personnel dispatched to inplant assignments with additional communication capabilities (and report back to the OSA as necessary).
- An additional room was added to the OSA complex to provide a area where team briefings could be conducted away from the general assembly area.
- A new State-of-the-Art portal monitor has replaced an older model utilized during accountability and assembly in the OSA.
- A secondary hospital has been added to provide additional medical support facilities.

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

b. Organization and Management Control

A review was conducted of the licensee Emergency Preparedness Administrative Tracking System (EPATS). This tracking system



is maintained in accordance with procedural guidance contained in Section 9 of the licensee's Emergency Preparedness Administrative Manual. This system is utilized to assign and track completion of various EP activities which include, but are not limited to: routine surveillances, NRC Open Item and improvement items, self-identified drill/exercise critique findings, internal audit findings, program improvement suggestions from site personnel and procedure revisions. This tracking system appears to be functional and effective in insuring appropriate items are followed through to completion as well as insuring routine recurring activities are completed in a timely manner.

The licensee is currently a participating member of the Michigan Dose Assessment Committee. This Committee meets regularly to bring together representatives of state governmental agencies and utilities to ensure open dialog and coordination of various activities including dose assessment and other associated emergency response activities.

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

11. Emergency Plan Activations (IP 92700)

Since January of 1989, the licensee has had five actual activations of the Emergency Plan. All of these events were classified as Unusual Events. Four of these events were related to Technical Specification Plant Shutdown requirements and one was a bomb threat. In each incident, licensee personnel correctly classified the event and made appropriate notifications in accordance with approved procedural guidance and within required time limits.

The licensee has prepared and maintains files for each event. These files contain copies of such items as Condition Reports, problem reports, Accident Information Report data sheets, Event Notification worksheets, initial off-site notification lists, control room logs, other applicable logs and data sheets as well as internal memorandas related to the particular event. Adequate information was available to understand the event and corrective action taken to permit exiting from the emergency declaration.

The licensee files did not contain any information regarding post event evaluations of emergency preparedness concerns or self-critiques of the actual events from an emergency planning perspective. It is recommended that the licensee implement the practice of critiquing actual emergency plan activations much the same as they currently do drills and exercises, in order to improve their program with any applicable lessons learned in actual events.

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

12. Open Items

Open items are matters which have been discussed with the licensee which will be reviewed further by the inspector and which involves some actions on the part of the NRC or licensee or both. Open Items disclosed during this inspection are discussed in Sections 6.a and 6.d of this report.

13. Exit Interview (IP 30703)

The inspectors held an exit interview two days after the exercise on April 6, 1990, with the representatives denoted in Section 2. The NRC Team Leader discussed the scope and findings of the inspection. The Team Leader indicated that the unannounced, after-hours exercise had presented a considerable challenge to the licensee's Emergency Preparedness Program. The licensee had demonstrated a good response to a challenging scenario. Some areas, including timeliness of facility activation, could still be improved.

The licensee was also asked if any of the information discussed during the exit interview was proprietary. The licensee responded that none of the information was proprietary.

Attachments:

1. D.C. Cook 1990 Exercise Scope and Objectives
2. D.C. Cook 1990 Exercise Scenario Outline

DONALD C. COOK NUCLEAR PLANTEMERGENCY RESPONSE EXERCISEII. EXERCISE OBJECTIVES

The exercise objectives dictate the scope of the scenario. The objectives for this exercise were developed based upon the Donald C. Cook Nuclear Plant Emergency Plan Administrative Manual, and FEMA Guidance Memorandum EX-3.

Situations will be presented in the scenario to prompt the desired player response for each objective. Where appropriate, specific objectives and criteria for adequate demonstration have been included in the exercise messages for Controller/Observer use.



## DONALD C. COOK NUCLEAR PLANT

1990 EMERGENCY PREPAREDNESS EXERCISE OBJECTIVESOBJECTIVE

## A. OVERALL LICENSEE OBJECTIVES

- A-1 Demonstrate the ability of the emergency response organization to implement DCCNP Emergency Plan Procedures, the IMPCo Emergency Response Manual and the AEPSC Emergency Response Manual.
- A-2 Demonstrate the ability to establish emergency management command and control, and maintain continuity of this function for the duration of the postulated event.
- A-3 Demonstrate the ability to establish communications and information flow between DCCNP emergency response facilities and participating offsite agencies.
- A-4 Demonstrate the ability to designate subsequent shifts of the emergency response organization.
- A-5 Demonstrate the ability to notify and mobilize off-duty personnel during non-working hours

## B. CONTROL ROOM OBJECTIVES

- B-1 Demonstrate the ability to recognize symptoms and parameters indicative of degrading plant conditions and to classify degraded conditions as emergencies.
- B-2 Demonstrate the ability to initiate notification of off-site authorities and plant personnel.
- B-3 Demonstrate communications and information flow to and from the Technical Support Center.
- B-4 Demonstrate the ability to transfer emergency authorities and responsibilities from the on-shift emergency organization to the DCCNP emergency response organization.
- B-5 Demonstrate the ability to implement site assembly and accountability during off-hours (i.e., 1700-0600).

## C. TECHNICAL SUPPORT CENTER OBJECTIVES

- C-1 Demonstrate the ability to activate the facility within one hour of declaration of an emergency requiring facility activation.



OBJECTIVE

## C. TECHNICAL SUPPORT CENTER OBJECTIVES (cont'd.)

- C-2 Demonstrate the ability to provide analytical assistance and operational guidance to the Control Room.
- C-3 Demonstrate the ability to coordinate on-site activities in response to the emergency.
- C-4 Demonstrate the ability to establish and maintain hard copy communications with the EOF and verbal communications with the EOF, OSA, IAG, ENC and/or JPIC.
- C-5 Demonstrate the ability to provide analytical radiological assistance to the OSA and Control Room.
- C-6 Demonstrate the ability to obtain data from the OTSC/PSSD system.
- C-7 Demonstrate the ability to request emergency response teams from the OSA.
- C-8 Demonstrate the ability to designate a second shift for TSC operation.
- C-9 Demonstrate the ability to evaluate the results of TSC/OSA habitability surveys and assess the need to evacuate these facilities.
- C-10 Demonstrate the ability to recognize degrading plant conditions and classify plant conditions as an emergency.
- C-11 Demonstrate the ability to evaluate site evacuation routes and determine an appropriate route based on indicated radiological and meteorological conditions.
- C-12 Demonstrate the actions required to be taken in the TSC if the emergency involves a breach of the reactor coolant system.
- C-13 Demonstrate the ability to determine the level of core damage based on plant parameters provided.
- C-14 Demonstrate the ability to process personnel dose extension request.
- C-15 Demonstrate the ability to assess the need for, and process request for potassium iodide administration.

OBJECTIVE

## D. OPERATIONS STAGING AREA OBJECTIVES

- D-1 Demonstrate the ability to activate the facility within one hour of declaration of an emergency requiring facility activation.
- D-2 Demonstrate the ability to assemble, brief and dispatch the following emergency response team(s):
- a. Damage Control Team
  - b. Post Accident Sampling Team
  - c. On-site Radiation Monitoring Team
  - d. Off-site Radiation Monitoring Team
- D-3 Demonstrate the ability to designate a second shift for OSA operation.
- D-4 Each emergency response team assembled and dispatched shall demonstrate the following actions as applicable to the team type and mission:
- a. Assembly of tools/equipment.
  - b. Preoperation checks of equipment and communications devices.
  - c. Performance of appropriate radiological precautions.
  - d. Performance or simulation of team mission.
  - e. Post-mission debriefing and radiological controls.
- D-5 Demonstrate the ability to provide emergency radiological support. As a minimum the following activities should be demonstrated:
- a. Establishment of emergency dosimetry and exposure tracking system.
  - b. Establishment of emergency control points.
  - c. Performance of habitability surveys prescribed by procedure.
  - d. Analysis of radiological conditions to be encountered by emergency response teams.
  - e. Specification of radiological controls and precautions for emergency response teams.
- D-6 Demonstrate the ability to perform offsite radiological monitoring. As a minimum, two teams should be dispatched and direct radiation monitoring as well as airborne radioactivity analysis should be demonstrated.



OBJECTIVE**D. OPERATIONS STAGING AREA OBJECTIVES (cont'd.)**

- D-7 Demonstrate the ability to implement damage control activities in accordance with applicable Emergency Plan Procedures.
- D-8 Demonstrate the ability to perform onsite radiological monitoring in accordance with applicable Emergency Plan Procedures. This monitoring should include direct radiation surveys and analysis of airborne radioactivity samples.
- D-9 Demonstrate the ability to obtain post accident samples from the RSC Loop and complete appropriate chemical and isotopic analysis within three hours of the sample request.
- D-10 Demonstrate the ability to obtain radiological base data required to evaluate the release level from the secondary plant during a steam generator tube rupture.
- D-11 Demonstrate the ability to respond to a contaminated person. Included in this demonstration, personnel decontamination shall be simulated.
- D-12 Demonstrate the actions required for an individual to exceed the exposure limits of 10CFR20. Included in this demonstration should be a discussion of post exposure actions and limitations.
- D-13 Demonstrate the actions required to administer potassium iodide. This demonstration should include a discussion of the follow-up actions associated with KI administration.
- D-14 Demonstrate a shift turnover.
- D-15 Demonstrate the ability to obtain environmental samples in accordance with applicable Emergency Plan Procedures. The following samples should be obtained:
- a. Vegetation
  - b. Soil

**E. EMERGENCY OPERATIONS FACILITY OBJECTIVES**

- E-1 Demonstrate the ability to activate the facility within one hour of declaration of an emergency requiring facility activation.



OBJECTIVE

## E. EMERGENCY OPERATIONS FACILITY OBJECTIVES (cont'd.)

- E-2 Demonstrate the ability to establish overall command and control of the DCCNP emergency response within one hour of declaration of a site area emergency or general emergency, as applicable.
- E-3 Demonstrate the ability to establish and maintain effective emergency communications with each of the following agencies and facilities:
- a. State of Michigan
  - b. Berrien County
  - c. NRC
  - d. Technical Support Center
  - e. Joint Public Information
  - f. Initial Assessment Group.
- E-4 Demonstrate the ability to establish and maintain hard copy data transmission and reception with each of the following facilities:
- a. Technical Support Center
  - b. Joint Public Information Center
  - c. State of Michigan EOC
- E-5 Demonstrate the ability to direct Offsite Radiation Monitoring Teams in order to determine the geographical location and radiological magnitude of the postulated plume.
- E-6 Demonstrate the ability to designate a second shift for EOF operation.
- E-7 Demonstrate the ability to develop protective action recommendations based on projected dose and/or core and containment status.
- E-8 Demonstrate the ability to update the State of Michigan on the status of the emergency at 15 minute intervals.
- E-9 Demonstrate the ability to respond to inquiries from the TSC, JPIC, IAG and State of Michigan in a timely manner.
- E-10 Demonstrate emergency de-escalation and termination.
- E-11 Demonstrate the ability to project the magnitude of offsite dose using the Dose Assessment Program and the IBM Personal Computer.
- E-12 Demonstrate corporate augmentation of the EOF staff.

OBJECTIVEE. **EMERGENCY OPERATIONS FACILITY OBJECTIVES (cont'd.)**

- E-13 Demonstrate recovery planning associated with emergency termination.
- E-14 Demonstrate the ability to take compensatory action in the event of a failure of the Meteorological Data Terminal.

F. **PUBLIC AFFAIRS OBJECTIVES**

- F-1 Demonstrate activation of the Joint Public Information Center.
- F-2 Demonstrate the ability to conduct media briefings.
- F-3 Demonstrate the ability to respond to actual or simulated inquiries from media representatives.
- F-4 Demonstrate the ability of rumor control personnel to respond to simulated inquiries from the general public.
- F-5 Demonstrate the ability to monitor media transmissions and respond to inaccurate information being transmitted by the media.
- F-6 Demonstrate the ability to designate subsequent shifts for JPIC operations.
- F-7 Demonstrate coordination of news announcement content with State and County representatives.

DONALD C. COOK NUCLEAR PLANTEMERGENCY RESPONSE EXERCISEVI. EXERCISE NARRATIVE SUMMARYINITIAL CONDITIONS:

- Unit 2 at 100% Power
- RCS Boron = 61 ppm
- EOL - 17,500 MWD/MTU
- Days on line = 184
- Power History
  - 100% for 20 days
  - 55% for 2 days
  - 100% for 32 days
- Emergency power out of service due to lightning strike 12 hours earlier
- NRV-151 isolated due to leakby
- NRV-152 isolated due to NMO-152 being stuck closed

NARRATIVE:

The simulated events take place at the Unit 2 end-of-cycle (17,500 MWD/MTU) and begin to unfold in the early hours of April 3, 1990. Shortly after 0100 with initial plant conditions basically unremarkable (with the exception of emergency power being out of service due to lightning) an acoustical monitoring system (DMIMS) alarm is received in the Unit 2 Control Room. The audible "clanging" sounds picked up in three different locations in the Reactor Coolant System (RCS) reasonably indicate the presence of multiple, loose, solid objects ("loose parts") in the RCS that could, and in fact do, prove to be damaging to the system.

Almost simultaneous with that alarm number 4 reactor coolant pump begins to vibrate with ever increasing intensity until an alarm is received for that condition also. Shortly after 0130 secondary system radiation levels increase prompting a decision to begin a 10%/hr. controlled shutdown with a subsequent decision to declare an UNUSUAL EVENT at approximately 0147. All necessary notifications are made.

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DONALD C. COOK NUCLEAR PLANTEMERGENCY RESPONSE EXERCISEVI. EXERCISE NARRATIVE SUMMARY (CONTINUED)

The primary to secondary leakage rate continues to increase and at approximately 0208 the operators are aware that it has become significant and trip the unit at 0210. An ALERT is immediately declared followed by notification of emergency personnel.

Upon unit trip, safety injection occurs, plus reserve feed trips resulting in loss of offsite power. AB diesel generator indicates an incomplete start but CD diesel does start and load.

Shortly thereafter (0223) control air valve XCR-102 will not open effectively eliminating the ability to depressurize.

When the TSC, OSA and EOF become operational teams are dispatched to monitor onsite and offsite radiation levels (none as of yet) and coolant system activity; repair valve XCR-102 and AB diesel generator and; investigate reserve feed problems and a leaking #4 steam generator stop valve.

At approximately 0445 a significant release starts because the #4 Power Operated Relief Valve (PORV) opens. An alarm is immediately received from the PORV radiation monitor.

EOF dose assessment projections indicate Protective Action Recommendations (PAR) leading to a GENERAL EMERGENCY declaration.

During the next two hours electrical power is restored and XCR-102 is repaired. The release rate decreases as the stuck open #4 PORV and restored equipment depressurizes the system. This diminishing release rate is such that ALERT level PARs are reached shortly after 0700 and recovery planning and operations can begin.

The exercise will terminate at approximately 0800.

DONALD C. COOK NUCLEAR PLANTEMERGENCY RESPONSE EXERCISEVI. EXERCISE NARRATIVE SUMMARY (CONTINUED)TIMELINE:

<u>REAL TIME</u>	<u>SCENARIO TIME</u>	<u>EVENT/CONDITION</u>
0100	00:00	Initial Conditions
0115	00:15	DMIMS alarm and #24 RCP vibrations indicating above normal levels (2.4 mils)
0117	00:17	#24 vibrations trending upwards-now at 2.7 mils.
0119	00:19	#24 vibration at 3.2 mils
0122	00:22	#24 vibrations at 5.0 mils. Call is placed to J.R. Sampson, OPS Superintendent informing him of the situation.
0127	00:27	#24 vibrations reach 7.0 mils and alarm is received.
0133	00:33	Steam Jet Air Ejector (SJAE), Gland Steam Leak-off (GSLO) and blowdown RMS alarms are received. Crew begins checking steam generator for signs of leakage.
0135	00:35	Lab sample of secondary side is requested.
0138	00:38	Operations Superintendent is called again and a decision is made to begin controlled shutdown at 10%/hr. unless the situation worsens.
0144	00:44	Increased shutdown rate initiated by indications of increasing primary to secondary leakage.
0147	00:47	SS declares UNUSUAL EVENT based on ECC-14 and 17.



DONALD C. COOK NUCLEAR PLANTEMERGENCY RESPONSE EXERCISEVI. EXERCISE NARRATIVE SUMMARY (CONTINUED)

<u>REAL TIME</u>	<u>SCENARIO TIME</u>	<u>EVENT/CONDITION</u>
0150	00:50	SS calls Unit 1 to request initial notifications be made and to call him back when they are completed. He also requests additional manpower from Unit 1.
0156	00:56	Chem Lab reports that secondary samples have high activity.
0208	01:08	Leak rate now $\geq$ 500 gpm.
0210	01:10	Unit manually tripped; safety injections started and #24 Reactor Coolant Pump is stopped.
0210	01:10	SS declares <u>ALERT</u> based ECC-14 and ECC-17.
0211	01:11	Blackout occurs, train B is lost and AB diesel fails to start.
0223	01:23	Control air valve XCR-102 fails to open resulting in loss of control air to containment.
0217	01:17	Emergency Response Organization call out begins.
0230	01:30	Contingency for declaring ALERT.
0313	02:13	All Emergency Response Facilities activated.
0320	02:20	On-site and off-site radiation monitoring teams dispatched.
0330	02:30	PASS team dispatched.

DONALD C. COOK NUCLEAR PLANTEMERGENCY RESPONSE EXERCISEVI. EXERCISE NARRATIVE SUMMARY (CONTINUED)

<u>REAL TIME</u>	<u>SCENARIO TIME</u>	<u>EVENT/CONDITION</u>
0345	02:45	Teams dispatched from OSA to: Repair XCR-102 Repair AB diesel Find out why #4 S/G stop valve is leaking
0445	03:45	#4 PORV opens.
0446	03:46	PORV radiation monitor MRA-2602 alarms.
0455	03:55	EOF declares <u>GENERAL EMERGENCY</u> based on site boundary dose projections.
0505	04:05	Team dispatched to see if PORV can be closed.
0515	04:15	Contingency - EOF declares <u>GENERAL EMERGENCY</u> if not done at 0455.
0515	04:15	XCR-102 is repaired.
0532	04:32	PORV team encounters turn-back dose.
0540	04:40	AB Diesel is restored.
0550	04:50	RHR is aligned.
0605	05:05	PASS Team returns with results.
0642	05:42	RHR is in service.
0656	05:56	Reserve power is restored.
0715	06:15	Dose projections indicate rad levels below alert PARS. De-escalate to <u>ALERT</u> .
0720	06:20	Begin recovery operations.
0800	07:00	TERMINATE EXERCISE.

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