U.S. NUCLEAR REGULATORY COMMISSION

REGION III

Reports No. 50-454/85015(DRSS); 50-455/85010(DRSS)

Docket Nos. 50-454; 50-455 Licenses No. NPF-23; CPPR-131

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

Facility Name: Byron Nuclear Generating Station, Units 1 and 2

Inspection At: Byron Site, Byron, Illinois

Inspection Conducted: June 10-13, 1985

Inspectors: T. Ploski
Team Leader — Date: 7/8/85

J. Patterson — Date: 7/8/85

M. Smith — Date: 7/8/85

Approved By: M. P. Phillips, Chief
Emergency Preparedness Section — Date: 7/8/85

Inspection Summary

Inspection on June 10-13, 1985 (Reports No. 50-454/85015(DRSS); 50-455/85010(DRSS)
Areas Inspected: Routine, announced inspection of the Byron Nuclear Generating Station's emergency preparedness exercise, involving observations by seven NRC representatives of key functions and locations during the exercise. The inspection involved 155 inspector-hours onsite by three NRC inspectors and four consultants.
Results: No items of noncompliance, deficiencies, or deviations were identified. However, one exercise weakness was identified as summarized in the Appendix.

DETAILS

1. Persons Contacted

   a. NRC Observers and Areas Observed

   T. Ploski, Control Room, Technical Support Center (TSC)
   J. Patterson, Emergency Operations Facility (EOF)
   M. Smith, EOF and Joint Public Information Center (JPIC)
   K. Loposer, Control Room, Operational Support Center (OSC), Inplant Health Physics Teams
   G. Stoetzel, OSC and Inplant Health Physics Teams
   R. Campbell, TSC
   T. Lonergan, Fire Drill and Radiological Environmental Monitoring Teams

   b. Commonwealth Edison Personnel

   *R. Querio, Station Superintendent, Observer
   *G. Wagner, Power Operations Manager, Recovery Manager
   *R. Pleniewicz, Assistant Superintendent for Operations, Station Director
   *J. Golden, Controller, EOF
   *T. Blackmon, Controller, EOF
   *M. Whitemore, Controller, TSC
   *D. Vestal, Controller, Control Room
   *A. Chomacke, Lead Controller, Control Room
   *B. Schnell, Controller, OSC
   *W. Brenner, Observer, EOF
   *R. Chrzanowski, Security Administrator
   *R. Cassidy, Fire Marshall
   *W. McNeill, Lead Controller, TSC
   *D. Bump, Quality Assurance Staff
   M. Vonk, Controller, TSC
   T. Greene, Controller, Environs Team
   L. Duchek, Controller, Environs Team
   K. Licari, Controller, JPIC
   W. Biskie, Administrative Assistant for Construction

   c. Non-Commonwealth Edison Personnel

   J. Becker, Project Manager
   G. Vanderhei, Project Manager
   R. Weiss, Project Manager

   *Indicates those who attended the June 12, 1985 exit interview.

2. Licensee Action on Previously-Identified Items

(Closed) Open Item Nos. 50-454/85010-01 and 50-455/85007-01: Include in the annual emergency response training provided to those contractor personnel not required to complete NGET training, adequate information regarding the following: the method(s) of transportation to be utilized

by station evacuees to predesignated offsite relocation areas and a brief description of provisions at these relocation areas to perform evacuee monitoring, decontamination, and bioassay, as necessary. The inspector reviewed the May, 1985 revision of the "Byron Station N-GET Site Specific" handout which included "Byron Site Accountability Guidelines" that adequately detailed those actions to be taken by persons within the Owner Controller Area should assembly, accountability, or even site evacuation be ordered during an emergency situation. Evacuation instructions were appropriately kept general in nature so that evacuees would utilize the mode of transportation and evacuation route told them during the emergency, rather than proceeding however they felt was best or most convenient. Assurances were also given that radiation chemistry personnel would be made available at one or more offsite relocation centers to survey evacuees for radioactive contamination and also to perform decontamination and bioassay collection tasks, as needed.

The inspector determined that the revised guidelines had been distributed in May, 1985 to those Commonwealth Edison personnel having unescorted access privileges to the Byron Station and who had, in fact, obtained unescorted access. Adequate provisions had been made to ensure that any badged personnel who had not entered the Protected Area since May, 1985, as well as visitors who would be escorted onsite, would be given a copy of the guidelines upon their first entry into the Protected Area. The inspector also determined that the guidelines would be provided to badged personnel during their annual N-GET requalification training. This item is considered closed.

(Closed) Open Item Nos. 50-455/85010-02 and 50-455/85007-02: Develop, implement, and maintain an administrative system to ensure that all construction workers onsite, but not required to complete NGET training, receive adequate, annual instructions on their required emergency response actions. The inspector determined that the licensee had met with all onsite contractors' security administrators on April 30, 1985 to establish an administrative system to ensure that all construction workers had received the May 1985 revised site accountability guidelines, regardless of whether or not the personnel had been granted unescorted access privileges. Each company was tasked with maintaining an information distribution and recordkeeping system for its own employees, including any new hires. The inspector reviewed correspondence from the offices of the four largest employers of onsite construction personnel which indicated that this distribution had taken place prior to the June 1985 emergency preparedness exercise. The inspector also interviewed onsite project managers, from one large and two smaller contractor organizations, who described how they had handled the information distribution and record-keeping task. The inspector spot-checked employee files at each of the three contractors' offices and verified that adequate documentation existed to show that those employees whose records had been spot-checked had acknowledged receipt of the May 1985 guidelines. The licensee has established a mechanism to remind the GSEP Coordinator to arrange for annual redistribution of the assembly, accountability, site evacuation guidelines. This item is considered closed.

3. General

An exercise of the licensee's Generating Stations Emergency Plan (GSEP) and the Byron Annex was conducted at the Byron Station on June 11-12, 1985, testing the integrated response of licensee, State, and local organizations to a hypothetical accident scenario resulting in a major release of radioactive material. The off-hours exercise was integrated with a test of the Illinois State and Ogle County emergency plans. This was a partial-participation exercise for the State of Illinois. Attachment 1 describes the licensee's scope and objectives for the exercise. Attachment 2 describes the scenario.

4. General Observations

a. Procedures

This exercise was conducted in accordance with 10 CFR Part 50, Appendix E requirements using the GSEP, Byron Annex, and the emergency plan implementing procedures used by the Station and Emergency Operations Facility (EOF).

b. Coordination

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

c. Observers

Licensee observers observed and critiqued this exercise along with seven NRC observers and several Federal Emergency Management Agency (FEMA) observers. FEMA observations on the response of the State and local governments will be provided in a separate report.

d. Critique

The licensee held a critique immediately following the exercise on June 12, 1985. The NRC critique was held at the EOF later that day. In addition, a public critique was held on June 13, 1985, to present both the onsite and offsite preliminary findings by the NRC and FEMA representatives, respectively.

5. Specific Observations

a. Control Room

Exercise participants demonstrated good teamwork and proper use of various emergency procedures throughout the exercise. The Shift Engineer (SE) demonstrated strong leadership by coordinating the efforts of his staff, being decisive, and by keeping his staff informed of changing events and decisions, including the decision

to transfer appropriate emergency responsibilities to the Technical Support Center's (TSC's) Station Director (SD). The SE also maintained an adequately detailed Control Room log.

The SE, as acting-SD, properly classified the Unusual Event and the Alert in a timely manner. Several minutes elapsed, however, before personnel concluded that separate reports of a tornado sighting and the loss of all remaining sources of offsite power were related. The SE classified an Alert after asking for and receiving confirmation that the tornado had struck the station. Between the Unusual Event and Alert declarations, the SE ordered several good onsite protective actions, including a halt to new fuel handling and radwaste processing, activation of the Operational Support Center (OSC), and visual inspection of the emergency diesel generators operational for this exercise. The correct decision to visually inspect the diesels caused some temporary confusion in the Control Room when the operator dispatched for this task reported seeing signs posted by one diesel generator room that indicated there was a fire in the room. Controllers in that area had failed to anticipate this Control Room response to scenario events and had posted these signs over one hour before the simulated fire was to occur. Control Room controllers adjusted to this early fire report by telling the SE that it was false.

The SE kept the Corporate Nuclear Duty Officer and the on-call SD adequately informed of scenario events and onsite emergency response actions. During one of these calls, a decision was made to activate the TSC shortly after the tornado sighting. Timely, initial notifications to State officials, NRC Headquarters, and the licensee's load dispatcher were accomplished despite actual problems with the dedicated Nuclear Accident Reporting System (NARS) used to communicate with the State and load dispatcher. Static on this dedicated line was sufficient to declare the NARS telephones inoperable in both the Control Room and TSC. Control Room communicators quickly adjusted to this problem and utilized commercial telephones to contact the State and another dedicated line to reach the load dispatcher. The NARS malfunction was promptly reported to NRC Headquarters and equipment checks were quickly initiated. All notifications to the State and NRC Headquarters were adequately documented.

Both the station's fire and assembly alarms were sounded during the exercise. Both were very loud in the Control Room and in the TSC and lasted several minutes. The loudness and duration of both alarms disrupted ongoing communications in both facilities.

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

- Audibility of station fire and assembly alarms should not disrupt ongoing communications in onsite emergency response facilities.

b. Technical Support Center (TSC)

The TSC achieved fully operational status with an adequate number of directors and support staff within one hour of the decision to activate this facility. The SD assumed command and control only after several onsite telephone discussions with the SE on scenario events and ongoing response activities. TSC staff performed their duties in a timely and competent manner. The Station, Operations, and Rad/Chem Directors used the facility's public address system to frequently brief TSC personnel of relevant plant status and maintenance activities and activities at the Emergency Operations Facility (EOF), including offsite protective action recommendations.

A contingency message was issued to require that a NARS message be transmitted to report an onsite fire requiring offsite firefighting assistance. Participants expressed some concern for the need to transmit this message, as the emergency classification would be unchanged from that already in effect. This followup notification to State agencies and the load dispatcher was warranted in order to keep them adequately informed of new abnormal conditions onsite and the resulting increased emergency response activities, including the involvement of a local offsite support organization. The Site Area Emergency was promptly classified by the SD after he had confirmed with the SE that the loss of coolant rate exceeded the makeup capabilities of available charging pumps. All initial offsite notifications were completed in a timely manner and adequately documented.

Actual assembly and accountability of all onsite personnel was promptly initiated after the Site Area Emergency declaration. All onsite personnel were accounted for within the thirty minute time goal. Accountability of TSC personnel was accomplished with minimal disruption of their activities. The Station, Security, and Rad/Chem Directors chose the correct mode of transportation and route to be used by nonessential personnel whose evacuation from the Station was simulated after the accountability process. County officials were informed before the simulated evacuation.

With two exceptions, TSC staff did a very good job in trending key plant parameters and monitoring the progress of onsite repair activities. Trending was accomplished either on a status board or on a computerized display, both of which were readily visible to technical personnel. However, status board updating was slow for the first forty-five minutes of TSC operation. At one point, a plotter refused to accept updated meteorological data from a director who recognized that current wind speeds had decreased by almost one order of magnitude from that plotted. The plotter incorrectly waited until an update was available from another director who normally provided him with new information. Later in the exercise, several personnel were slow to recognize and call attention to the rapidly increasing hydrogen gas concentration inside containment. The rate of increase was artificially high for

purposes of the scenario to preclude use of the hydrogen recombiners. In any event, the concentration increased about seven percent in thirty minutes before a director finally called everyone's attention to this critical parameter.

TSC staff generated offsite dose projections and monitored communications with offsite teams even after responsibilities for such actions had been transferred to the EOF. This continued involvement allowed the SD to receive prompt confirmation of the unmonitored release and also to meaningfully discuss proposed offsite protective action recommendations with the Recovery Manager (RM). However, several persons exhibited difficulty when trying to read the reduced-scale protective action flowchart reproduced in procedure BZP 300-A2.

Individual directors maintained adequately detailed records of their actions. Internal message flow was good. Early arrangements were made by the Administrative Director for the relief of onsite emergency workers. Similar arrangements were later made for EOF clerical staff. Contamination control was adequately maintained by a radiation chemistry technician (RCT) at the TSC's entrance. Periodic habitability monitoring was adequate in the TSC.

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

- Followup notifications to State authorities should be made in accordance with the criteria in Section 6 of the GSEP.

- Individuals who first become aware of significant events or other changes in plant conditions should promptly share the information with affected personnel.

- Decisionmakers in the TSC should utilize a legible copy of the offsite protective action flow chart, as found in the GSEP.

c. Operational Support Center (OSC) and Fire Drill

Activation and staffing of the facility was orderly and timely. The OSC Director assumed control of the facility after being briefed in the Control Room by the SE. Assembled technicians were periodically briefed on plant status, emergency classifications, and inplant activities. Records were maintained of radiation exposures supposedly received by individuals assigned to various inplant teams. The OSC supervisor properly coordinated with the TSC to obtain prior authorization of emergency worker exposures in excess of the licensee's quarterly limit, which is less than the regulatory limit. Personnel accountability was established and maintained. An adequately detailed OSC log was kept. Although collection of an air sample was simulated and periodic radiation surveys were conducted in the OSC, no frisker station was established at an OSC entrance to better ensure that radioactive contamination was not brought into the facility by personnel returning from inplant assignments.

Collection of a post-accident reactor coolant sample was accomplished within the time goal with little difficulty. Sampling team members donned only those articles of protective clothing procedurally required for routine sampling tasks. Following sample collection, another technician dispatched from the OSC to the Hot Lab to assist in sample analysis tasks neglected to take a radiation survey instrument. On another occasion, one RCT and two maintenance technicians were in the plant on a maintenance assignment for about forty-five minutes. The team simulated donning protective clothing and respiratory protection. Although each person was equipped with a dosimeter, no one was observed to check their dosimeter while in the plant.

The plant fire brigade, led by the OSC Director, responded from the OSC to a simulated fire in an emergency diesel generator room. Prior to his departure, the OSC Director assigned an assistant to manage the facility during his absence. The local offsite fire department actually responded to the fire as part of this exercise. The station's security force was alerted when these firefighters were enroute. There were no unnecessary delays in getting the firefighters and their vehicles onsite. Security personnel ensured that these personnel were given badges and dosimetry, and directed them to a plant entrance close to the fire scene.

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

- Additional contamination control measures should be implemented at the entrance(s) to the OSC.

- Personnel dispatched from the OSC should be equipped with adequate survey instruments and should periodically check their self-reading dosimetry, per station procedures.

d. Emergency Operations Facility (EOF)

Transfer of overall command and control of the licensee's emergency response from the TSC's Station Director (SD) to the EOF's Recovery Manager (RM) was smooth and timely. The RM effectively managed emergency response activities. He kept well aware of the progress of EOF staff activities; solicited their advice as necessary; and kept them informed of scenario events and decisions. He remained in frequent contact with the SD regarding the status of inplant conditions, onsite corrective and protective actions, and proposed offsite protective action recommendations. EOF staff did an adequate job of trending critical plant parameters and documenting their activities and decisions.

The RM declared the General Emergency promptly after confirming with the SD that a radioactive release had begun following the hydrogen gas explosion in the containment building. The appropriate initial protective action recommendation was given to State and County officials along with the General Emergency declaration. The

recommendation was correctly revised, in a timely manner, after additional plant status information became available in the EOF. The RM took time to discuss these recommendations with State agencies' representatives present in the EOF. Environmental staff were observed to be communicating dose projection, meteorological, and offsite survey data to State agency personnel in Springfield, Illinois.

Minutes before the scenario's 24-hour time advance, but after the release had been terminated, the RM made a hasty decision to reclassify the situation as a Site Area Emergency. State representatives in the EOF were aware of his decisionmaking prior to transmittal of the NARS message. Although a reclassification was made, there were no associated changes to offsite protective action recommendations, onsite corrective actions, or offsite survey activities. Since nothing was to be accomplished by essentially only making a title change to the emergency situation, the reclassification would have been appropriate following completion of additional equipment restoration tasks onsite as well as offsite surveys.

Following the scenario time advance, the EOF staff participated in discussion to identify and prioritize short-term damage assessment, repair tasks and to identify long-term recovery concerns.

e. Radiological Environmental Monitoring Teams

Two teams were assembled and sent from the OSC. Teams had completed checking their equipment, obtained their vehicles, and were ready for dispatch prior to the radioactive release. Due to communications equipment problems in the TSC, a correct decision was made by TSC and EOF environs staffs to transfer control of the teams to the latter several minutes before the EOF was declared fully operational. EOF staff kept the teams appraised of the plant and release status and emergency classification changes during the exercise.

An inspector accompanied one of the monitoring teams once they had left the station. Although EOF personnel controlling the teams habitually repeated messages received from the team to ensure proper understanding, the team neglected to repeat back messages received from the EOF. Problems were noted with the GSEP van's radio communications equipment. Volume and squelch control were erratic and breakup was noted during some transmission receptions. A backup handi-talkie radio was available in the van but was not used in spite of the problems experienced with the principal radio equipment.

Direction of the monitoring teams by EOF environs staff was good. Teams were positioned down wind of the station before the radioactive release began. Proper concern for team exposure control was repeatedly expressed by adv sing the teams to withdraw from the vicinity of the plume once samples and measurements had been taken. Team members properly bagged and labeled soil, vegetation, and air sample filter cartridges for later analyses. However, contamination

control practices by team members were inadequate, as evidenced by the following observations: gloves were not always worn while collecting soil and vegetation samples; gloves were not always changed prior to taking new samples; gloves were not worn by all team members who handled air sample cartridges and filter elements prior to the survey of these items; monitoring instruments were typically set on the ground without being bagged prior to making a survey of the ground; and gloves were not always removed prior to technicians driving or riding in the van to the next sampling location.

Team members also exhibited uncertainty when performing operability checks on the SAM II instrument provided with their other equipment. They did not reference appropriate procedures that were available in the van. The team also appeared unfamiliar with guidance contained in procedure EG-3 regarding use of a Cutie Pie survey instrument to take measurements at 6 foot and 6 inch distances from a potential radiation source. The procedure also required that readings be taken for a 30 second duration. Readings were typically taken for only 1 to 5 seconds.

The offsite monitoring team's inadequate contamination control practices, uncertainty in operating the SAM II, and failure to follow procedure EG-3 together constitute an exercise weakness (50-454/85015-01 and 50-455/85010-01).

In addition to the exercise weakness, the following items should be considered for improvement:

- Persons involved in communications with offsite monitoring teams should ensure that messages have been received and properly understood.

- The GSEP van's radio equipment should be promptly checked and repaired.

f. Joint Public Information Center (JPIC)

Accommodations in the Joint Public Information Center (JPIC) were spartan, but adequate. Licensee spokespersons responded to questions from the media and evaluators from the NRC and FEMA in a timely manner without using excessive technical jargon. An adequate number of press releases (11) were issued during the exercise. The RM's designee, the Advisory Support Director, reviewed all press releases prior to issuance. Though numerous and technically accurate, press releases were too concise, being two to six sentences in length. They did not include explanations or definitions of mentioned emergency classes and plant components.

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

. Press releases should include explanations of technical terminology to improve their understanding by the media.

6. Exit Interview

The inspectors held an exit interview on June 12, 1985 with those individuals identified in Paragraph 1. The inspectors discussed the scope and preliminary findings of the inspection. The licensee agreed to consider the items discussed. The inspectors determined from the licensee that none of the information discussed was proprietary in nature.

Attachments:
1. Exercise Scope and Objectives
2. Scenario Narrative Summary

Byron Station Exercise
1985

"SCOPE OF PARTICIPATION"

Commonwealth Edison will participate in the Byron Station exercise by activating the on-site emergency response organization and the near-site EOF as appropriate, subject to limitations that may become necessary to provide for safe efficient operation of Byron Station and other CECo nuclear generating stations.

Activation of the TSC and other on-site participants will be conducted on a real time basis during the evening time hours. An exercise shift will receive the initial scenario information and respond accordingly.

The Nuclear Duty Person and the balance of the Recovery Group will be prepositioned close to Byron to permit use of Recovery Group personnel from distant locations.

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

On-site assembly and accountability will be conducted during this exercise. A fire drill will also be conducted at this time with off-site assistance being utilized.

Commonwealth Edison will arrange to provide actual transportation and communication support in accordance with existing agreements to the extent specifically prearranged for the exercise.

Byron Station Exercise
1985

OBJECTIVES

Primary Objective:

Demonstrate the capability to implement the Commonwealth Edison Generating Stations Emergency Plan in cooperation with the Illinois Plan for Radiological Accidents to protect the public in the event of a major accident at the Byron Station. Demonstrate this capability during the hours to qualify as a evening time exercise in accordance with NRC guidance.

Supporting Objectives:

1) Incident Assessment and Classification

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

2) Notification and Communication

   a. Demonstrate the capability to notify the principal offsite organizations within 15 minutes of declaring an accident classification.
   - (EOF, TSC, CR)

   b. Demonstrate the capability to notify the NRC within one hour of the initial incident.
   - (EOF, TSC, CR)

   c. Demonstrate the capability to contact organizations that would normally assist in an emergency, but are not participating in this exercise (e.g. INPO, Murray & Trettel, Westinghouse, etc.)
   - (CR, EOF, TSC)

   d. Demonstrate the ability to provide accurate and timely information so that reports may be made to the emergency news center for press releases.
   - (EOF)

3) Radiological Assessment

   a. Demonstrate the capability to calculate off-site dose projections.
   - (EOF, TSC)

   b. Demonstrate the capability of environmental field teams to conduct field radiation surveys and collect air, liquid, vegetation and soil samples when needed.
   - (EOF, TSC, ENV)

c. Demonstrate the capability to conduct in-plant radiation protection activities.
- (HP)

d. Demonstrate the capability to collect and simulate analysis of air or liquid samples on-site.
- (HP, CHEM)

e. Demonstrate the ability to perform calculations with radiological survey information, trend this information, and make appropriate recommendations concerning protective actions.
- (EOF, TSC, HP)

4) Emergency Facilities

a. Demonstrate the capability to activate the emergency organization and staff the nuclear station emergency response facilities in accordance with procedures during a evening time period.
- (EOF, TSC, HP, CHEM)

b. Demonstrate through discussion and staff planning, the ability to perform a shift change in the TSC, EOF and control room.
- (EOF, TSC, CR)

5) Emergency Direction and Control

a. Demonstrate the ability of the directors to manage the emergency organizations in the implementation of the GSEP.
- (EOF, OSC, TSC, CR)

b. Demonstrate the capability of coordinating the direction of emergency response among CECo and Illinois offsite command centers by using Liasion personnel and communicators.
- (EOF)

6) Recovery and Re-entry

a. Demonstrate the capability of the emergency response personnel to identify requirements, programs, and policies governing damage assessments and implementing procedures for recovery and re-entry.
- (EOF, TSC)

- (Groups that are primarily concerned)

Byron Nuclear Power Station
June 11, 1985 Exercise

Narrative Summary

INITIAL SITUATION 1900 - 1915 (Duration of 15 minutes)

o Plant Status

Unit One is operating at full power with a normal at power electrical lineup. Surveillance testing of the Reactor Protection System is in progress.

Unit Two is under construction. Construction of the 2A Diesel Generator is complete to provide reserve feed to Unit One as required by the facility Operating License. Valve lineups are in progress to support the cold hydrostatic test of the Reactor Coolant System. A partial shipment of Unit Two fuel assemblies is undergoing receipt inspection in the Fuel Handling Building.

o Service Report

The Unit One positive displacement charging pump is out-of-service for repair of the hydraulic coupling. The carbon dioxide (CO_2) to the 1A Diesel Generator Room is out-of-service and cannot be actuated electrically or manually.

The Unit Two 2A Diesel Generator is out-of-service for a cylinder liner replacement. Approximately eight hours of repair work remains to be completed before returning the generator to operable status.

o Precursor Event

At 1900 hours, 345KV trasmission Line 0624 trips in the switchyard because of the severe weather at it's point of termination, the Wempletown Transmission Station. This reduces to three the number of transmission lines to the station switchyard. Two lines are required for operation.

UNUSUAL EVENT 1915 - 1945 (Duration of 30 minutes)

EAL 8 - Sustained winds in excess of 60 mph.

At 1915 hours, sustained wind speeds at the site have increased to greater than 60 miles per hour. Unit One continues full power operation but implements precautionary measures for the condition. Subsequently, surveillance testing of the Reactor Protection System and the receipt inspection of Unit Two new fuel assemblies are terminated.

ALERT 1945 - 2100 (Duration of 1 hour and 15 minutes)

EAL 8 - Tornado strikes facility and sustained winds of greater than 75 mph.

EAL 5 - Fire requiring offsite assistance and has degraded equipment described in Technical Specifications.

At 1945 hours, a tornado strikes the southern perimeter of the switchyard destroying the three remaining 345 kilovolt transmission lines connecting the station with the Commonwealth Edison electric grid. Unit One reactor trips on undervoltage to the reactor coolant pumps. A turbine trip and main generator trip follow. The plant automatically responds with a start of the two Unit One Diesel Generators and a sequence loading of the plant Safe Shutdown Equipment. Operators verify the automatic starting of the shutdown equipment and take action to promote natural circulation cooling of the reactor core.

At 2000 hours, stable plant conditions have been established. Unit One reactor core decay heat is being dissipated to atmosphere through the four Steam Generator Pressure Operated Relief Valves. The natural circulation cooling proceeds nominally.

At 2020 hours, the 1A diesel generator turbo-charger fails which deenergizes vital Bus 141 and one-half of the safe shutdown equipment. Missiles, from the failure, penetrate the diesel's local control panel and crank case, setting fire to the engine lube oil. Offsite assistance is required to deal with the 1A Diesel Generator Room fire. Upon arrival, the Byron Fire Department quickly gains control of the fire.

SITE EMERGENCY 2100 - 2300 (Duration of 2 hours)

EAL 16 - Loss of Reactor Coolant greater than charging capability.

At 2100 hours, with stable shutdown cooling of the reactor, the Control Room observes indications of a major loss-of-coolant accident. Train "B" emergency core cooling systems automatically start on the running Diesel Generator. Core cooling is established by pumping water from the 450,000 gallon Reactor Water Storage Tank to the Reactor Pressure Vessel. Conditions proceed nominally.

At 2145 hours, the Containment Sump is full and the RWST low-low level alarm is received. The operators manually switchover from the injection phase to the recirculation phase of core cooling. Only Train "B" valves are energized and are available for the transition.

GENERAL EMERGENCY 2300 - 0101 (Duration of 2 hours and 1 minute)

EAL 16 - Loss of Coolant Accident (LOCA) with no injection possible.

At 2300 hours, the Train "B" Residual Heat Removal pump trips on electrical fault. This results in the total loss of Emergency Core Cooling. Without any source of water makeup to the reactor pressure vessel core, decay heat increases the temperature of the remaining fluid inventory venting steam to the containment atmosphere. The upper core rapidly uncovers the top most fuel rod gas plenums. Containment hydrogen concentration and pressure increase.

At 2350 hours, a containment hydrogen explosion occurs. Status monitor lights indicate the 48" diameter containment purge supply valves are not fully seated.

At 0000 hours, field monitoring teams detect an unmonitored release by the facility. Simultaneously, maintenance returns the 2A Diesel Generator to operable status. The operators manually initiate emergency core cooling and reflood the damaged core.

At 0025 hours, the purge supply dampers are manually forced closed. This isolated the release path.

At 0101 hours, a 24 hour time jump occurs.

RECOVERY/REENTRY 0101