U.S. NUCLEAR REGULATORY COMMISSION

REGION III

Reports No. 50-454/89011; 50-455/89013(DRS)

Docket Nos. 50-454; 50-455 Licenses No. NPF-37; NPF-66

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

Facility Name: Byron Nuclear Power Station - Units 1 and 2

Inspection At: Byron, IL 61010-9750

Inspection Conducted: December 18, 1989, through January 3, 1990

Inspectors: R. A. Hasse 1/11/90
Date

P. R. Rescheske 01/11/90
Date

Approved By: M. P. Phillips, Chief 1/11/90
Operational Programs Section Date

Inspection Summary

Inspection on December 18, 1989 through January 3, 1990 (Reports No. 50-454/89011(DRS); No. 50-455/89013(DRS))
Areas Inspected: Special, announced safety inspection to verify that the Byron Emergency Operating Procedures (EOPs) are technically correct and usable. The inspection was conducted in accordance with TI 2515/92 (SIMS No. HF 4.1). Credit was taken for the Braidwood EOP inspection (50-456/89011(DRS); 50-457/89011(DRS)) where applicable.
Results: No violations were identified. The licensee showed strength in adherence to the accident mitigation strategy presented in the owners group Emergency Response Guidelines. Programmatic weaknesses in the area of EOP verification and validation identified during the Braidwood inspection had been corrected.

DETAILS

1. Persons Contacted

Commonwealth Edison Co. (CECo)

R. Pleniewicz, Station Manager
G. Schwartz, Production Superintendent
R. Ward, Technical Superintendent
M. Snow, Supervisor, Regulatory Assurance
S. Merrell, Operations Staff
G. Bowers, Operations Staff
E. Zittle, Regulatory Assurance

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W. Kropp, Senior Resident Inspector

Other licensee personnel were contacted/interviewed during the inspection.

All personnel listed above attended the Exit Interview on December 20, 1989.

2. Emergency Operating Procedures

a. Background

Emergency Operating Procedures (EOPs) have undergone significant changes due to the 1979 accident at the Three Mile Island (TMI) facility. The post-TMI procedures are symptom-oriented rather than event-oriented. Symptom-oriented EOPs provide the operator guidance on how to verify the adequacy of critical safety functions and how to restore and maintain these functions when they are degraded. Symptom-oriented EOPs are written in a manner that the operator need not diagnose an event to maintain the plant in a safe shutdown condition for all accidents that are within the scope of the EOPs.

The purpose of this inspection was to verify that the Byron EOPs are technically correct; prepared in accordance with the writer's guide; that their specified actions can be accomplished using existing equipment, controls, and instrumentation; and that the available procedures have the usability necessary to provide the operator with an effective operating tool.

b. Inspection Methodology

The inspection of EOPs conducted under TI 2515/92 consisted of a desktop review of the EOPs against the owners group Emergency Response Guidelines; an in-plant walkdown of selected EOPs;

exercising the EOPs using the plant simulator; and a human factors review. CECo's Byron and Braidwood plants are basically identical with minor plant specific differences. A complete EOP inspection was conducted at Braidwood in May 1989 (see Inspection Report No. 50-456/89011(DRS); No. 50-457/89011(DRS)). Because these plants use standardized EOPs, the Braidwood desktop review, human factors review, and simulator exercises (which used a Byron crew and EOPs) were considered to adequately address these elements for the Byron EOP inspection. In addition, an earlier combined Byron/Braidwood EOP inspection conducted under TI 2515/79 in August 1987 (see Inspection Reports No. 50-454/87032(DRS); No. 50-455/87030(DRS)) made an explicit comparison of the Byron and Braidwood EOPs for accommodation of plant specific differences. On this basis, the current inspection was restricted to in-plant (control room and field) walkdowns.

During this inspection, the status of actions being taken to address the generic issues raised during the Braidwood inspection was reviewed. The items which are still open are listed in the Appendix and assigned Byron open item numbers.

c. Inspection Results

(1) Control Room Walkdown

The inspectors walked down EOP IBEP-0, "Reactor Trip or Safety Injection" in the control room. Control panel labelling was consistent with the EOP equipment designations. Instrument readability was adequate to assess plant conditions. Control equipment was consistent with the EOP. No concerns were identified.

(2) Field Walkdowns

The inspectors walked through the local actions specified in selected EOPs and off-normal procedures referenced in the EOPs. These walkdowns were conducted with non-licensed operators (equipment operators) who would normally perform these tasks. The objective of the walkdowns was to determine if the necessary actions could be performed in a timely manner with a minimum potential for error. The inspectors also assessed equipment labelling and accessibility. The following were included in the local actions walked through:

- local manual operation of the steam generator power operated relief valves as referenced in the EOPs and performed with plant procedure BOP MS-6.

- local actions and verification of breaker positions on a number of motor control centers, such as, pressurizer isolation valves, safety injection valves, and non-ESF busses.

- local manual operation of the reactor coolant pump seal injection valves outside of containment.

- locally crosstie the unit's condensate storage tanks.

- access to the entry for locally closing the steam generator isolation valves.

- local emergency start of a diesel generator (DG) as referenced in the EOPs (e.g., 1(2) BEP-0) and performed with plant abnormal procedures 1(2) BOA ELEC-3.

In general, equipment was accurately labelled and accessible, and procedures for equipment operation were readily available.

During the walkdown of abnormal operating procedure 1(2) BOA ELEC-3, "Local Emergency Start of a Diesel Generator," the inspectors identified two minor weaknesses. In Step 9 of the procedure, six jumpers were required to be installed, with four of the locations in the back cabinet of the DG local control panel. The inspectors observed that the terminals in the back cabinet and the terminal identification numbers were covered with an opaque plastic plate held on with screws. A screwdriver of proper type and size was not readily available for removal of the plate. An equipment locker for each unit was located near each of the DG rooms, which should contain tools, material, equipment and procedures necessary for starting a DG. The inspectors noted the condition and contents of both lockers, and determined that a screwdriver and a sufficient number of jumpers were not available. Discussions with the licensee indicated that a quarterly surveillance/ inspection of certain equipment lockers was performed under procedure OBOS AP-Q2, and a revision was in draft which would include the DG lockers. Subsequent to the discussions, the licensee added a screwdriver to the list of required equipment, and the procedure was approved for use on December 20, 1989 (Revision 2). This surveillance should provide adequate control and inventory of the DG lockers.

Step 6 of 1(2) BOA ELEC-3 required that portable compressed air bottles be connected to the DG air receiver. The inspectors noted that six air bottles on a portable cart were located in both the Unit 1 and Unit 2 DG rooms.

According to the licensee, these air bottles were dedicated for use during emergency DG starts. The bottles were not labelled/tagged to identify their use or indicate empty/full. Discussions with the licensee indicated that control over the bottles was not maintained, other than that they were locked on the cart. Subsequently, the licensee checked each bottle and verified they were full. At the end of the inspection period, the licensee was evaluating the need for a periodic surveillance of the compressed air bottles or other controls to assure availability when required. On January 2, 1990, Revision 3 to the quarterly surveillance procedure OBOS AP-Q2 was approved for use. This revision added references to the Unit 1 and Unit 2 DG emergency air supply bottle carts and a data sheet for quarterly surveillances. Acceptance criteria for minimum air pressure was also stated in the revision. Further, according to the licensee, the air bottles have been tagged with identification numbers.

No violations or deviations were identified. The inspectors' concerns regarding the performance of 1(2) BOA ELEC-3 have been adequately resolved by the licensee.

3. Status of Open Items From Braidwood EOP Inspection

As noted in Paragraph 2.b, the open items resulting from the Braidwood EOP inspection had generic applicability to Byron. The status of these items is summarized below (the open item number designations are for Braidwood Units 1 and 2):

a. Open Item (No. 456/89011-01; No. 457/89011-01)
Procedure Revisions

The licensee plans to complete these revisions by September 1990 at both sites.

b. Open Item (No. 456/89011-02; No. 457/89011-02)
Field Actions

(1) High visibility labelling will be provided for all valves used in the EOPs and referenced procedures by February 28, 1990 at Braidwood and during 1990 at Byron.

(2) The hand pump extenders for steam generator PORV local operation have been provided at both Braidwood and Byron.

(3) A potential modification is in progress to improve the accessibility of RH pump suction isolation valve 2RH8702B. The licensee considered RH suction valve 2RH8701B to be adequately accessible.

(4) Open/close direction indication for valve AF-005F at Braidwood has been completed.

c. Open Item (No. 456/89011-03; No. 457/89011-03)
Other Concerns

(1) The Procedures Generation Package (PGP) has been revised to include off-normal and other EOP referenced procedures in the V&V program for both Braidwood and Byron.

(2) The PGP has been revised to continue to use the walkdown methodology in the V&V program at both Braidwood and Byron.

Those portions of the Braidwood open items applicable to Byron and not already completed are given in the Appendix.

4. Open Items

Open items are matters which have been discussed with the licensee which will be reviewed further by the inspectors or which involve some actions on the part of the NRC or licensee or both. The open items applicable to this inspection are detailed in the Appendix.

5. Exit Interview

The inspectors met with licensee representatives (denoted in Paragraph 1) on December 20, 1989. The inspectors summarized the purpose, scope, and findings of the inspection and the likely informational content of the inspection report. The licensee acknowledged this information and did not identify any proprietary information. Additional inspection effort, including further discussions with the licensee regarding resolution of concerns (discussed in Paragraph 2), was completed on January 3, 1990.

Attachment: Appendix

APPENDIX

Detailed Inspection Findings from Braidwood

EOP Inspection

The following findings from the Braidwood EOP inspection have generic applicability to Byron. They are repeated here with Byron open item numbers.

1. Procedure Revision - Open Item (No. 454/89011-01; No. 455/89013-01)

   The licensee committed to implement the following procedure revisions:

   a. All EOPs - Provide valve number, functional title, and location (level and grid number) for all valves specified in local operations.

   b. BWEP-2, Step 4.c - correct valve numbers for steam generator PORVs.

   c. BWEP-2, Step 4.e - make open and closed bullets consistent between A/EP and RNO columns.

   d. BWEP-3, Step 3.d(2) - change "isolated intact SGs" to "unisolated intact SGs" in the RNO column.

   e. BWCA-2.1, Steps 11.6, 27, and 39 - include explicit instructions for initiating normal pressurizer spray.

   f. BWCA-2.1, Step 15 - change "SI pumps" to "ECCS pumps" in RNO columns.

   g. BWCA-3.1, Step 25.9 - delete the requirement for 50°F subcooling as a prerequisite for isolating SI accumulators (50°F subcooling not consistent with the ERG).

   h. BWCA-3.1, Step 25.a - first sentence of RNO column should direct operator to Step 25.c instead of 25.b.

   i. BWCA-0.0, Step 12 - change identification of ruptured SG "by sampling" to "by radiation survey."

   j. BWCA-0.1 - include actions in Attachment B in body of procedure.

   k. BWCA-0.0, step 19 - correct penetration number for chilled water return isolation valve (or correct penetration label).

l. BWCA-1.1, Step 26 - evaluate need to correct RVLIS reading for number of RCPs running.

m. BWFR-P.1, Step 3.a - make pressurizer pressure for closing PORVs consistent with set point document (reseat vs. lift pressure).

n. BWFR-P.1, Step 6 - insert caution from ERG on loss of offsite power after resetting SI.

o. BWFR-I.2 - add Step 3.b of ERG on establishing instrument air to containment.

p. BWEP-3, Step 9.e - add RNO action to locally open instrument air containment isolation valves.

q. BWEP-3, Step 9.f - add RNO to locally open fire protection containment isolation valves.

r. BWEP-3, Step 17.b - add RNO to direct operator to BWCA-3.3.

s. AM EOPs - Remove action statements from plant specific "cautions" and "notes" and include as procedure steps (to extent practicable) or "facing page aids."

t. BWOP-OG-10 - add reference to the key needed to open the panel.

u. BWOA-PR-5, Attachment E, Step 1 - add reference to key needed to access panel in Step 5.

2. Field Actions - Open Item (No. 454/89011-02; No. 455/89013-02)

The licensee committed to resolve the following field concerns:

a. Provide high visibility labelling for all valves and electrical equipment used in the EOPs and referenced procedures.

b. Provide easier access for RCS loop to RH pump suction isolation valves 2RH8701B and 2RH8702B.

c. Add open/close direction indication on valve AF 005F and others in this area.

3. Concerns to be Addressed by Written Response from Licensee - Open Item (No. 454/89011-03; No. 455/89013-03)

The following are concerns identified by the inspectors for which resolution was not obtained during the inspection (due primarily to the need for Braidwood Station consultation with Byron Station on a unified approach to resolution).

a. BWFR-H.2, Step 8 states: "Consider using SG blowdown . . . ." The step should be changed to direct action.

b. BWFR-H.1, Step 2.a.(2) states: "Consider the following steps . . . ." The language should be changed to direct action.