

U.S. NUCLEAR REGULATORY COMMISSION  
REGION III

Reports No. 50-456/85-02(DRP); 50-457/85-02(DRP)

Docket Nos. 50-456; 50-457

Licenses No. CPPR-132; CPPR-133

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

Facility Name: Braidwood Nuclear Power Station, Units 1 and 2

Inspection At: Braidwood Site, Braidwood, Illinois

Inspection Conducted: January 2 through February 1, 1985

Inspectors: R. N. Gardner

R. B. Landsman

Approved By: *William L. Storney*  
W. Forney, Chief  
Projects Section 1A

*2/12/85*  
Date

Inspection Summary

Inspection on January 2 through February 1, 1985 (Reports No. 50-456/85-02(DRP); 50-457/85-02(DRP))

Areas Inspected: Special, announced safety inspection of the Braidwood Construction Assessment Program (BCAP) in regards to licensee action on previously identified items, Construction Sample Reinspection (CSR) Reinspection Checklists, CSR Documentation Review Checklists, S&L evaluation of BCAP discrepancies, CSR reinspection activities, and Review of Procedures to Specification Requirements (RPSR) activities. The inspection consisted of 165 inspector-hours onsite by two NRC inspectors.

Results: No items of noncompliance or deviations were identified.

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## DETAILS

### 1. Persons Contacted

#### Commonwealth Edison Company (CECo)

- \*L. DelGeorge, Assistant Vice President
- \*T. Maiman, Manager of Projects
- \*M. Wallace, Project Manager
- \*°E. Fitzpatrick, Assistant Quality Assurance Manager
- \*J. Deress, Byron and Braidwood Projects Engineering Manager
- \*B. Shelton, Projects Engineering Manager
- \*°N. Kaushal, BCAP Director
- \*C. Schroeder, Project Licensing and Compliance
- °L. Kline, Project Licensing and Compliance
- \*°N. Smith, BCAP Quality Assurance Supervisor
- \*D. Shamb!in, Project Construction Superintendent
- \*R. Byers, BCAP Assistant Director
- \*D. Farrar, Nuclear Licensing
- \*I. Johnson, Nuclear Communications Coordinator
- \*P. Lau, Quality Assurance Engineer
- \*G. Orlov, BCAP Assistant Director
- \*A. Scaccia, Offsite Emergency Planner
- \*D. Smith, Nuclear Licensing Administrator

#### Daniel Construction Company

- M. Clinton, BCAP Inspection Supervisor
- E. Shevlin, BCAP Lead Inspector

#### Stone and Webster Engineering Company (S&L)

- \*V. Hoffman, Site Manager
- \*W. Willoughby, BCAP Technical Assistant

#### Sargent and Lundy Engineers (S&L)

- \*D. Leone, Projects Director

#### Evaluation Research Corporation (ERC)

- \*J. Hansel, Project Manager
- \*R. Ham, Assistant Project Manager
- \*W. Chase, Consultant

#### Illinois Department of Nuclear Safety

- \*R. Minue, Nuclear Engineer

Illinois Commerce Commission

\*L. Ferguson, Utility Engineer  
\*J. McDonald, Utility Engineer

Isham, Lincoln and Beale

\*R. Lauer, Attorney

Other

\*D. Cassel, BPI, Attorney

The inspector also contacted and interviewed other licensee and contractor personnel during the course of this inspection.

\*Denotes those present at the January 3, 1985 public meeting on BCAP.

°Denotes those present at exit interview.

2. Licensee Action on Previously Identified Items

(Open) Open Item (50-456/84-32-01; 50-457/84-30-01): BCAP inspectors were determining the acceptability of the elevation and location of installed components by utilizing chalk-marks which were handwritten on plant structures. On January 8, 1985, the inspector attended a training session which was held to provide BCAP inspectors with direction in the use of approved survey marks for BCAP reinspections. The BCAP inspectors were provided with a handout which illustrated approved survey marks. During the training session the BCAP inspectors stated that during previous reinspections the method of dealing with inspection attributes requiring valid survey marks for which the marks were non-existent or were of questionable origin was to N/A the attribute. Subsequent to this training session, the inspector informed the licensee that inspection attributes previously documented as N/A due to the lack of adequate survey marks would require the installation of such survey marks as necessary to allow the completion of the reinspection. This item will remain open until the inspector has verified that required reinspections are completed.

3. Review of CSR Reinspection Checklists

The inspector reviewed the BCAP reinspection checklist for concrete placements delineated in document CSR-I-S-001, approved November 8, 1984. The inspector determined that the checklist was inadequate because it does not address important concrete attributes such as cracking and patch quality. The licensee indicated that the checklist was only meant to address major design deficiencies and not individual discrepancies. In order for a concrete reinspection program to adequately reflect the quality of concrete it should include clearly definitive accept/reject criteria for all concrete attributes.

Additionally, the deletion of the inspection of embedded plates on the non-Q turbine building side of the Q L-line wall as the corrective action taken to ERC observation BCAP-OBS-003 is unacceptable. The licensee indicated that any non-Q attachments to that side of the wall would not jeopardize the integrity of the wall. Any attachments to a solid concrete wall, whether Q or not-Q, will affect the structural integrity of the wall. Therefore, both sides of that wall should be inspected for all attributes.

In summary, the concrete placement reinspection will not be able to determine whether the concrete placed at Braidwood is acceptable. This item remains open pending the licensee's response (50-456/85-02-05; 50-457/85-02-05).

Furthermore, even though it is outside of the BCAP reinspection, the inspector identified a concern with the site concrete patching procedure, "Concrete Finishes, Curing and Protection," Revision 8, dated October 23, 1984. Paragraphs 4.5 and 4.6 are inadequate in that important patching attributes such as the initial preparation of the existing concrete surface, the material to be used for the patch, the method of placing the material and curing of the patch are not addressed. This resulted in the patch for NCR number 213-544 in the auxiliary building appearing to be unacceptable. This item remains open pending the licensee's review (50-456/85-02-06; 50-457/85-02-06).

#### 4. Review of CSR Documentation Review Checklists

The inspector reviewed the documentation review checklist for population AWS D1.1, Electrical Welds. During this review the inspector observed that the BCAP checklist instructions stated that the acceptable certification level for L. K. Comstock electrical weld inspectors who inspected and accepted welds was a minimum of Level I. This does not meet the requirements of ANSI N45.2.6 which requires, as a minimum, a Level II certification for inspection personnel who inspect and accept construction activities. BCAP personnel had previously informed the inspector that the BCAP program had identified a concern with the use of Level I inspectors during past onsite inspection activities. The licensee stated that an observation would be issued to document this matter. Pending a review of the observation and its subsequent disposition, this is an open item (50-456/85-02-01; 50-457/85-02-01).

The inspector subsequently reviewed L. K. Comstock Weld Inspection procedure 4.8.3, revision F, dated May 10, 1984, and revision G, dated December 7, 1984. Revision F to the subject procedure allowed a Level I or Level II inspector to perform weld inspections and determine acceptability of the inspected welds. Revision G now requires a Level II inspector to perform weld inspections. This matter was discussed with the Senior Resident Inspector and is being tracked as an unresolved item in NRC Inspection Report Nos. 50-456/84-42 and 50-457/84-38.

## 5. Review of S&L Evaluation of BCAP Discrepancies

BCAP observations which are deemed valid by BCAP CSR engineering are called discrepancies and are forwarded to S&L for additional validity review and evaluation of design significance. Upon completion of the S&L review and evaluation, the discrepancies are returned to BCAP for review and concurrence.

The inspector reviewed 42 mechanical discrepancies, 39 electrical discrepancies, 25 Heating, Ventilating, and Air Conditioning (HVAC) discrepancies, and 17 civil discrepancies. The discrepancies had been reviewed and evaluated by S&L and returned to BCAP. BCAP CSR engineers had not reviewed and concurred in the returned discrepancies. The review focused on the S&L validation and evaluation of the BCAP discrepancies. During the review the inspector determined the following:

- a. Over 60 percent of the electrical observations identified as valid discrepancies by the BCAP CSR engineers were identified as invalid discrepancies by S&L.
- b. The documented basis for the invalidation of certain discrepancies by S&L did not support the invalidation. This is exemplified by the following examples:
  - (1) Discrepancy number CSR-I-E-CND-012-01 identified conduit C1A2251 as not being attached to conduit hanger CC50. This discrepancy was invalidated on the basis that an Avoid Verbal Orders (AVO) document, identified as AVO-03397, had instructed the electrical contractor to remove the hanger. S&L further stated that the contractor would subsequently be instructed to reinstall the hanger. The inspector determined that an AVO is not a controlled document and the use of AVO's has resulted in the issuance of generic nonconformance report number 1996. Therefore, an AVO cannot be considered as an acceptable basis for invalidating a discrepancy.
  - (2) Discrepancy number CSR-I-E-CND-037-01 identified a cable bushing which fell off when touched by the BCAP inspector. S&L invalidated this discrepancy on the basis that the bushing did not fall off until touched and therefore was in place during cable installations. This is not an acceptable basis for invalidation since there is no assurance that the bushing had not fallen off earlier during cable installation activities.
  - (3) Discrepancy number CSR-I-E-CND-042-01 identified loose flex fittings on the conduit where the conduit was attached to equipment. A cable had been pulled through the conduit and terminated, however, the cable termination had not been inspected. S&L invalidated this discrepancy based on their position that Quality Control (QC) inspectors who inspect cable terminations will inspect for loose flex fittings. The

inspector reviewed the QC inspection procedure for cable terminations and was unable to ascertain where the purported flex fitting inspection was delineated in the procedure.

The inspector discussed the adequacy of the S&L discrepancy review and evaluation with the licensee. This is an unresolved item (50-456/85-02-02; 50-457/85-02-02).

#### 6. CSR Reinspection Activities

a. On January 16, 1985, the inspector witnessed the overinspection of a concrete placement. The overinspection was being performed by an Evaluation Research Corporation (ERC) inspector. The concrete placement had previously been reinspected by the BCAP taskforce. The reinspection package was numbered CSR-I-S-01-120. During the overinspection, the following was observed:

- (1) An embedded plate was observed which had a visible partial identification number which did not match the vendor drawing for that plate. This embedded plate was not identified as an observation by BCAP inspectors.
- (2) Two construction joints were observed which did not appear on design drawings. These construction joints were not identified as observations by BCAP inspectors.
- (3) An embedded plate was observed which had no visible identification numbers. The plate was accepted by BCAP inspectors.
- (4) Two embedded plates were observed which had visible identification numbers which were identified as not verifiable by BCAP inspectors.

The above reinspection deficiencies were subsequently documented in ERC observation 010.

b. On January 23, 1985, the inspector, accompanied by an ERC inspector, performed an overinspection of electrical conduit hanger CC-125. The hanger was previously reinspected by the BCAP taskforce. The reinspection package was numbered CSR-I-E-COH-20. During the overinspection, the following was observed:

- (1) A conduit supported by the conduit hanger was not the conduit identified on the pertinent S&L drawing. This was not identified by the BCAP inspector.
- (2) Two attributes on the reinspection checklist were documented as N/A by the BCAP inspector. These attributes were applicable and should have been reinspected.

- (3) One attribute was documented as accepted by the BCAP inspector which was not applicable to the hanger. This attribute should have been documented as N/A.

The above reinspection deficiencies were subsequently documented in ERC observation 011.

- c. On January 23, 1985, the inspector, accompanied by an ERC inspector, performed an overinspection of electrical conduit hanger CC-512. The hanger was previously reinspected by the BCAP taskforce. The reinspection package was numbered CSR-I-E-COH-12. During the overinspection, the following was observed:

- (1) One attribute on the reinspection checklist was documented as N/A by the BCAP inspector. This attribute was applicable and should have been reinspected.
- (2) Two attributes on the reinspection checklist were documented as acceptable by the BCAP inspector which were not applicable to the subject hanger. These attributes should have been documented as N/A.
- (3) Required back-plates for the subject hanger were not installed. This was not identified by the BCAP inspector.

The above reinspection deficiencies were subsequently documented in ERC observation 011.

The aforementioned overinspections of electrical conduit hangers and the overinspection of the concrete placement created a concern that BCAP reinspections were not adequately identifying construction deficiencies. This concern was reinforced by the Construction Appraisal Team (CAT) findings regarding BCAP reinspection deficiencies in the area of mechanical pipe supports.

On January 23, 1985, the inspector met with the BCAP Director to discuss the need for significant actions to address the issue of BCAP reinspection deficiencies. Subsequent to that discussion the licensee issued BCAP memorandum #546 implementing a midpoint look into the CSR reinspection program. Reinspections were suspended until written authorization was provided to allow resumption. As a result of the identified reinspection deficiencies, the licensee has initiated a program which involves the partial repeat reinspection of 160 previously reinspected mechanical pipe supports, the assessment of the need to repeat reinspections in other BCAP populations, the assessment of additional training requirements, and the assessment of the need to revise reinspection checklists and instructions. Pending a review of the licensee's actions to resolve BCAP reinspection deficiencies, this is an unresolved item (50-456/85-02-03; 50-457/85-02-03).

## 7. Review of RPSR Activities

Initial procedure verifications were initiated on January 31, 1985. The BCAP taskforce had experienced considerable delays in the initiation of the RPSR BCAP element due, in large part, to difficulties encountered in the development of procedure checklists. As this BCAP element will consist of a review of all on-site contractors' installation and inspection procedures for ongoing and future safety-related construction activities as of June 30, 1984, some considerations as to the effects of the delay on the results of the program are in need of assessment.

- a. RPSR was to review "current" installation and inspection procedures. Since June 30, 1984, there have been numerous procedure revisions which means that current installation and inspection procedures will not be reviewed.
- b. Procedures were to be verified for compliance to specification requirements in effect as of June 30, 1984. Since that date numerous specification changes have taken place which will not be used in the RPSR review. Additionally, the spec changes will not be reviewed for conformance to FSAR requirements.

Pending a resolution to the above RPSR concerns, this is an open item (50-456/85-02-04; 50-457/85-02-04).

## 8. Public Meeting to Discuss BCAP

The January public BCAP status meeting was held on January 3, 1985, at the Mazon Emergency Offsite Facility (EOF). Participants in the meeting included Messrs. B. Davis, E. Greenman, W. Forney, and R. Gardner of the NRC staff, M. Wallace, N. Kaushal, and N. Smith of CECo, K. Kostal of S&L and R. Ham of ERC.

Subjects addressed during the meeting included a presentation on the status of BCAP activities, a summary of the S&L review of discrepancies identified to date, the BCAP QA overinspection program, and the status of ERC reviews and observations identified to date.

## 9. Open Items

Open items are matters which have been discussed with the licensee, which will be reviewed further by the inspector, and which involve some action on the part of the NRC or licensee or both. Open items disclosed during the inspection are discussed in Paragraphs 3, 4 and 7.

## 10. Unresolved Items

Unresolved items are matters about which more information is required in order to ascertain whether they are acceptable items, items of noncompliance, or deviations. Unresolved items disclosed during the inspection are discussed in Paragraphs 5 and 6.

11. Exit Interview

The inspector met with licensee representatives (denoted under Persons Contacted) during and at the conclusion of the inspection on February 5, 1985. The inspector summarized the scope and findings of the inspection.

Attachments:

1. Memorandum from C. E. Norelius  
to J. G. Keppler dtd 1/22/85
2. Ltr from CECO to J. G. Keppler  
dtd 1/15/85
3. Memorandum from P. R. Pelke  
to RIII Files dtd 2/07/85