



**Commonwealth Edison**

One First National Plaza, Chicago, Illinois

Address Reply to: Post Office Box 767  
Chicago, Illinois 60690

May 7, 1981

Mr. James G. Keppler, Director  
Directorate of Inspection and  
Enforcement - Region III  
U.S. Nuclear Regulatory Commission  
799 Roosevelt Road  
Glen Ellyn, IL 60137

Subject: Byron Station Units 1 and 2  
IE Report No. 50-454/80-25 and  
50-455/80-23  
NRC Docket Nos. 50-454/455

Reference (a): April 17, 1981 letter from James G. Keppler  
to Cordell Reed.

Dear Mr. Keppler:

Reference (a) contained the report of an inspection conducted by Messrs. K. R. Naidu, R. N. Gardner, R. L. Lee, C. Braud, and J. Boone of your office on December 15-19 and 22-23, 1980 at Byron. During that inspection it was determined that certain activities were in noncompliance with NRC requirements. Attachment A to this letter contains Commonwealth Edison's response to the Notice of Violation which was appended to Reference (a).

Your letter requested that special attention be given to the identified failure to apply QA program requirements to the design, construction, purchase and installation of cable entrance frames. As indicated in Attachment A, this problem arose from an error in judgement regarding the safety classification of these particular frames. There was no willful attempt to avoid quality requirements. The surveillance activities of the QA staff were effective in uncovering and correcting this error. No further changes are necessary to avoid repetition.

To the best of my knowledge and belief, the statements contained herein and in Attachment A are true and correct. In some respects these statements are not based on my personal knowledge but upon information furnished by other Commonwealth Edison employees and contractors. Such information has been reviewed in accordance with Company practice and I believe it to be reliable.

Concurrence to postpone this response until May 15, 1981 was received from Mr. D. Hayes by telephone on May 8, 1981.

Please address questions regarding this matter to this office.

Very truly yours,



C. Reed  
Vice President  
Nuclear Operations

Attachment

SUBSCRIBED and SWORN to  
before me this 11<sup>th</sup> day  
of May, 1981

Nancy M. Lawrence  
Notary Public

ATTACHMENT A

Response to Notice of Violation

Violation 1

10 CFR 50 Appendix B, Criterion II, states, in part, "The quality assurance program shall provide control over activities affecting the quality of . . . components . . . to an extent consistent with their importance to safety. Activities affecting quality shall be accomplished under suitably controlled conditions."

Commonwealth Edison Company Topical Report No. CE-1-A, Revision 9, Section 2, states, in part, "The Quality Assurance Program takes into account the need for special control . . . to attain and maintain the required quality and the need for verification of quality by inspection and test."

Contrary to the above, cable entrance frames for seismic category I safety related equipment identified as IPA03J were designed without engineering approval, built without an approved QA Program, and purchased and installed without QA approval.

It is recognized that the licensee's QA organization identified this matter. At the time of this inspection, this matter had not been adequately resolved.

Corrective Action Taken and Results Achieved

As the inspection report identifies (item 5.f) NCR F-578 dated December 10, 1980 was originated to identify and correct the deficiency. Disposition of the NCR was approved by Engineering on March 26, 1981. The disposition required the nonconforming entrance frames to be removed and discarded. It was further determined that a cable entrance frame is not required for the quantity of cables entering panel IPA03J.

Corrective Action Taken To Avoid Further Noncompliance

The personnel involved in this event were cautioned and reinstructed to recognize and comply with instructions in drawing notes exactly so that such noncompliances do not recur.

Date When Full Compliance Will Be Achieved

The entrance frames were removed in mid-February and the NCR was closed on April 14, 1981. We are, effective this date, in full compliance with regard to this item.

Results of Management Examination

The inspection report states that "it appears that Byron Site construction management personnel circumvented quality assurance requirements and directives involving the design, purchase, use and installation of a nonconforming seismic Category I electrical component." This statement resulted from conclusions drawn following discussions with site personnel.

The impression is that the personnel involved willfully violated QA procedures. This is not the case. The personnel involved mistakenly determined that the component was not required to be safety related and hence did not fall under the purview of the QA department. This judgement was erroneous.

The existence of surveillance activities performed by the QA staff and the fact that all purchase orders are distributed to the site QA provide checks and balances to identify improper procurement. It was a result of these activities that the nonconforming condition was identified.

## Violation 2

10 CFR 50 Appendix B, Criterion III, states, in part, "Measures shall be established to assure that applicable regulatory requirements and the design basis, as defined in F2.2 and as specified in the license application . . . are correctly translated into specifications, drawings, procedures, and instructions."

Commonwealth Edison Company Quality Assurance Program CE-1-A Topical Report, Revision 9, Section 3.1, states, in part, ". . . designs and materials will conform to . . . standards, regulatory requirements, SAR commitments, and appropriate quality standards as applicable."

- a. The FSAR in Paragraph 8.3.1.4.2.1 commits to compliance with IEEE 384-1974 which states in Section 4.6.1 that "Non-Class IE circuits shall be separated from Class IE Circuits by the minimum separation requirements specified in Sections 5.1.3, 5.1.4, or 5.6 or they become associated circuits." IEEE 384-1974 Section 4.5 identifies separation requirements for associated circuits. As of December 23, 1980, safety related cables were bundled with non-safety related cables at six locations in the Lower Cable Spreading Room where cables exit trays to enter panels installed directly above in the Control Room.
- b. The commitment in PSAR Paragraph 7.1.2.b is, in part, "Redundant transmitter impulse lines will be physically separated at a minimum distance of eighteen inches (18 in.) in any direction." As of December 23, 1980, this commitment has not been translated into specifications, drawings, procedures, and instructions.

## 2a Corrective Action Taken and Results Achieved

It is our position that our design documents conform to the FSAR commitment to comply with IEEE 384-1974. The only places where the bundling of cables in air is addressed in IEEE 384-1974 are in the definition of "associated circuits" (paragraph 3) and in paragraph 5.6.5. This definition of "associated circuits" does not clearly apply to the specific condition of bundling cables in air.

Hence, we conclude that our design documents conform with our FSAR commitment.

However, our concept of good practice dictates that Class IE and non-Class IE cable should not be bundled if it can be avoided. We have unbundled those cables referred to in the inspection report (paragraph 4.f) and any other such bundling found.

2a Corrective Action Taken To Avoid Further Noncompliance

The installation contractor has been directed by memorandum dated March 24, 1981 to avoid bundling of Class IE and non-Class IE cables, and where the condition occurs to notify us of the condition. Appropriate procedures are being revised to provide higher visibility to the requirements of the memorandum.

2a Date When Full Compliance Will Be Achieved

Procedure revision, review, and approval shall be complete June 1, 1981.

2b Corrective Action and Results Achieved

ECN-1958 was issued January 14, 1981 to provide separation criteria for the installation of redundant transmitter impulse lines. The criteria states in part "... redundant transmitter impulse lines shall be physically separated at a minimum distance of eighteen inches in any direction ... where this condition can be achieved suitable missile barriers shall be employed ...". Impulse lines which have been installed without the benefit of these criteria are being evaluated by Westinghouse Nuclear Technology Division as an extension of the process piping support analyses, and corrective action will be taken as required.

2b Corrective Action Taken To Avoid Further Noncompliance

The appropriate site implementation procedures were revised January 26, 1981 to incorporate the separation criteria and missile barrier criteria.

2b Date When Full Compliance Will Be Achieved

As-built drawings of installed impulse lines are being expedited for review by Westinghouse NTD. The evaluation of installed impulse lines should be complete in August or September. Revisions required as a result of evaluation will be implemented immediately. All other areas are presently in compliance as a result of issuance of criteria and revision of implementation procedures.

### Violation 3

10 CFR 50 Appendix B, Criterion XVI, states, in part, "Measures shall be established to assure that conditions adverse to quality, such as . . . deviations . . . and nonconformances are promptly identified and corrected."

Commonwealth Edison Company Topical Report No. CE-1-A, Revision 9, Section 16, States, in part, "A corrective action system will be used to assure that such items as . . . deviations . . . and nonconformances which are adverse to quality and might affect the safe operation of a nuclear generating station are promptly identified and corrected."

Contrary to the above:

- a. As of December 23, 1980, measures were not established to assure that deviations from cable routing specifications were promptly identified and corrected. This is exemplified by the misinstallation of cable number 1SI257.
- b. As of December 23, 1980, measures were not established to assure that unacceptable welds were not present on installed cable tray stiffeners in that corrective action on NCR F-529 was limited to identified nonconforming welds and did not require inspection of additional welds on cable tray stiffeners to assess the extent of the problem.
- c. As of December 23, 1980, measures were not established to assure that deviations from cable tray filling specifications were promptly identified and corrected. This is exemplified by cables being placed above the side rails of Cable Tray 12015C-C1E in the Upper Cable Spreading Room.

### 3a Corrective Action Taken and Results Achieved

Although the installation contractor's quality control program had established measures to assure that deviations from cable routing specifications were identified and resolved, the routing deviation cited in the inspection report (paragraph 4a(5)) had not been identified. The routing deviation was not significant in that the cable crossed from cable tray 11469VOC2E to cable tray 1146Q-C2E as required by the cable routing card, however the transition occurred one node point, approximately six feet, sooner than specified by the routing card.

A survey was conducted to determine the extent of the routing deviations of this nature. The extent was found to be minimal; all instances were documented. In no instance was the segregation requirement violated.

3a Corrective Action Taken To Avoid Further Noncompliance

Appropriate procedures have been revised to be more explicit to ensure that deviations from specified cable routing are properly documented for resolution. Contractor's personnel have been re-trained in the revised procedure and emphasis has been placed on routing requirements.

3a Date When Full Compliance Will Be Achieved

We are in full compliance as of this date.

3b Corrective Action Taken and Results Achieved

It is our position that this is not an item of noncompliance in that adequate corrective action was taken in a timely manner. Furthermore, measures were established to assure that sufficient welds were present on the cable tray stiffeners and these measures encompassed all welds on the trays and were not "limited to identified nonconforming welds."

The nonconformance of NCR F-529 dated July 9, 1980 was as follows: "Welds on cable pan bent plate stiffeners do not conform to Item 4.3.1, Standard STD-EB-701. Length and spacing do not conform." Due to the lack of specifics, a generalized approach was required to provide engineering disposition of the nonconformities. As a result, in September, 1980, a field survey was initiated to determine the extent of the nonconformance. The results of the field survey were evaluated and the analysis performed which indicated that the actual cable tray stiffener welds meet the design requirements with a 95% confidence level. On December 18, 1980 Sargent & Lundy provided Commonwealth Edison with the field survey data so that we might perform an independent review to insure ourselves of the 95% confidence level. These actions, along with extending the survey to include cable tray fittings, were completed in January, 1981, and the disposition of the NCR F-529 was approved on January 27, 1981 by Engineering and the NCR was closed out onsite on February 3, 1981.

3b Corrective Action Taken To Avoid Further Noncompliance

It is our position that we are in a state of compliance on this issue and no further action should be required to show the presence of sufficient welds to meet design requirements.

Valid statistical sampling techniques were used to determine that the cable trays have sufficient welds to meet design requirements to the 95% confidence level. This data was presented to Region III on February 3, 1981. It was our understanding at the conclusion of that meeting that our approach was acceptable and the results obtained demonstrated that necessary design strengths under the worst postulated event had been validated. In response to Region III's request we furnished the data presented at the February 3, 1981 meeting in our submittal of February 26, 1981. Your letter of April 23, 1981 requires a separate and additional response.

3b Date When Full Compliance Will Be Achieved

We are in full compliance as of this date.

3c Corrective Action Taken and Results Achieved

The installation contractor's procedures have been revised to be more explicit and provide more detail to ensure that deviations from cable tray filling specifications are reported and documented for resolution. Temporary conditions where cables are over the top of cable trays will occur during cable installation; resolution may be accomplished by either re-routing, or by adding side rails. All such conditions will be resolved prior to fuel load.

3c Corrective Action Taken To Avoid Further Noncompliance

As stated above, procedures have been revised, and implementation has been initiated.

3c Date When Full Compliance Will Be Achieved

We are in full compliance as of this date.

Violation 4

10 CFR 50 Appendix B, Criterion V, states, in part, "Activities affecting quality shall be prescribed by documented instructions, procedures, or drawings, of a type appropriate to the circumstances and shall be accomplished in accordance with these instructions, procedures, or drawings."

Commonwealth Edison Company Topical Report No. CE-1-A, Revision 9, Section 5, states, in part, "The quality assurance actions carried out for . . . construction . . . activities will be described in documented instructions, procedures, drawings, specifications, or checklists. These documents will assist personnel in assuring that important activities have been performed."

Contrary to the above, documented instructions, procedures, drawings, specifications, or checklists for certain activities affecting quality were either not developed or implemented as follows:

- a. As of December 23, 1980, appropriate instructions, procedures, drawings, specifications, or checklists had not been developed for temporary storage of partially pulled cables in the Hatfield Electric Company (HEC) Procedure 10, "Class I Cable Installation," Revision 4, Issue 1, dated August 5, 1980, recommended but did not require that care be exercised to assure that the bend radius criteria (Appendix D of HEC Procedure 10) were not exceeded. As a result, five partially pulled cables were coiled such that the bend radii of the inner turns were less than the minimum bend radii criteria.
- b. As of December 23, 1980, appropriate instructions, procedures, drawings, specifications, or checklists had not been developed for cable pulling temperatures in that HEC Procedure 10 did not reflect cable manufacturers' recommendations regarding preconditioning (storage time and temperature) criteria for reels of cable stored outside during cold weather prior to pulling."
- c. Paragraph 8A of Sargent & Lundy (S&L) Standard EA-121 requires, in part, "Cable ends shall not be left unsealed . . . shall be . . . sealed . . . as promptly as possible after being pulled . . ." On December 22, 1980, Cable 1SI042 which was not being pulled was not sealed on one end as required by EA-121.

- d. Paragraph 7.1.4 of S&L Standard EB-146 requires, in part, "Conduit bends shall be supported on each side of the bend." On December 22, 1980, Conduit 1C2E at Cable Tray 11750J-C2E in the Lower Cable Spreading Room had no support between the tray and the conduit bend as required by EB-146.
- e. Paragraph 303.2.b of S&L Specification F-2906 requires, in part, "After installation, all instrument sensing lines shall be identified with color coded metal tags to denote system separation requirements." On December 23, 1980, several safety-related instrument lines were installed which were not identified with color coded metal tags as required by F-2906. Additionally, the contractor's installation procedures did not include this requirement nor were the contractor personnel aware of this requirement.

4a Corrective Action Taken and Results Achieved

The installation contractor's procedures contained parameters to ensure that the minimum bend radii criteria were not violated. In certain instances these instructions were not followed. The coiled cables in these instances have been inspected and found to be undamaged.

4a Corrective Action Taken To Avoid Further Noncompliance

The applicable procedures have been revised to be more explicit and personnel have been retrained to the revised procedure. All coiled cables will be examined for damage prior to pulling.

4a Date When Full Compliance Will Be Achieved

We are in full compliance as of this date.

4b Corrective Action Taken and Results Achieved

The installation contractor's procedures contained requirements to ensure that cable manufacturer's recommendations for cable pulling temperatures were followed. However, the appropriate reference standards and drawings did not identify specific requirements of various manufacturers. A specific criteria has been included in the appropriate design drawing which encompasses the requirements of the various manufacturers. In no instance to date have these recommendations been violated.

4b Corrective Action Taken To Avoid Further Noncompliance

As stated above, the appropriate design drawing has been revised to provide a specific umbrella criteria; and the installation contractor's procedures have been revised to specifically recognize this design drawing.

4b Date When Full Compliance Will Be Achieved

We are in full compliance as of this date.

4c Corrective Action Taken and Results Achieved

Procedures and controls exist to ensure that cable ends are sealed. The cable cited in this item has been identified to be an isolated case and was sealed. The cable was subsequently terminated.

4c Corrective Action Taken To Avoid Further Noncompliance

End sealing is not required for cables of the type cited in the inspection report (paragraph 4.c). However, our concept of good practice dictates that we seal the ends of all cables. Applicable procedures have been revised to be more explicit in the checking for sealing of cable ends.

4c Date When Full Compliance Will Be Achieved

We are in full compliance as of this date.

4d Corrective Action Taken and Results Achieved

The installation contractor's procedures contained requirements to ensure that conduit is properly supported prior to pulling cable. The support deviation cited in the inspection report (paragraph 4.g) was a result of improper interpretation of the necessity for conduit support at the transition between cable pan and conduit run. For this case, the support has been installed and the cable inspected for damage. Additionally, similar installations have been inspected for proper support and corrective action has been initiated when applicable.

4d Corrective Action Taken To Avoid Further Noncompliance

Design drawings have been revised to clarify requirements, and personnel have been retrained in the procedure for checking supports prior to pulling cable.

4d Date When Full Compliance Will Be Achieved

We are in full compliance as of this date.

4e Corrective Action Taken and Results Achieved

The installation contractor's applicable procedures have been revised to incorporate the requirement for installation and verification of installation of permanent color coded metal tags. In the interim, as an aid to allow easy and immediate identification of potential separation criteria violations on partially completed routings and prior to installation of permanent metal tags, we have found a source of supply to provide color coded plastic tape which meets the special chemical requirements of ANSI 45.2.2. We will attach these colored tapes to the lines at set intervals using a set color to define redundancy. After completion of installation and review of compliance to separation criteria the permanent tags will be installed.

4e Corrective Action Taken To Avoid Further Noncompliance

Procedures have been revised and are being implemented, permanent metal tags will be placed upon completion of installation and review of installation for separation requirements.

4.e Date When Full Compliance Will Be Achieved

We are in full compliance as of this date.

#### Violation 5

10 CFR 50 Appendix B, Criterion X, states, in part, "A program for inspection of activities affecting quality shall be established and executed by or for the organization performing the activity to verify conformance with the documented instructions, procedures, and drawings for accomplishing the activity."

Commonwealth Edison Company Topical Report No. CE-1-A, Revision 9, Section 10, states, in part, "Quality Assurance inspection . . . will be conducted . . . during construction . . . to verify conformance to applicable drawings, instructions and procedures as necessary to verify quality."

Contrary to the above, the electrical contractors QC inspections of cable pulling activities on March 7 and 21, 1980, failed to verify conformance to Paragraph 2.1 of S&L Standard EA-122 which states, in part, "Before pulling, the cable trays . . . shall be thoroughly inspected . . . Any sharp edges that might cause damage to cable sheaths or jackets during pulling operations shall be removed." Furthermore, these QC inspections did not verify the quality (i.e., acceptance/rejection criteria for cable jacket damage) of pulled cables 1SI211 and 1CC005. As a result, the damaged conditions of the cables were not identified.

#### Corrective Action Taken and Results Achieved

Cable trays 12015C-C1E and 1920F-C2E cited in the inspection report (paragraph 4.d) have been inspected and repaired. Cables identified as having potential damage have been inspected to an approved cable damage acceptance criteria and found to be acceptable.

#### Corrective Action Taken To Avoid Further Noncompliance

The installation contractor's procedure for inspecting cable trays for sharp edges has been revised to be more explicit, and appropriate procedures have been revised to incorporate cable damage acceptance criteria. Inspection personnel have been retrained in the revised procedures and the level of inspections has been increased.

#### Date When Full Compliance Will Be Achieved

We are in full compliance as of this date.

Violation 6

10 CFR 50, Appendix B, Criteria XV, states, in part, "Measures shall be established to control . . . parts, or components which do not conform to requirements in order to prevent their inadvertent use or installation. These measures shall include, as appropriate, procedures for identification . . ."

Commonwealth Edison Company Topical Report No. CE-1-A, Revision 9, Section 14, states, in part, "Nonconforming material and equipment will be identified through the use of a Quality Assurance "Hold" tag . . . Such "Hold" . . . tags shall only be removed at the direction of Quality Assurance personnel."

Contrary to the above, as of December 23, 1980, measures established by the licensee to identify nonconforming components did not assure the identification of nonconforming equipment as follows:

- a. 480 volt substation 1AP98E and 4160V switchgear buses 141, 142, 241, and 242 identified in NCR F-580 to be in nonconformance with IEEE 384-1974 cable separation criteria were not identified with "Hold" tags and the switchgear buses were energized and being operated for conducting construction tests.
- b. Electrical penetrations which form part of the reactor containment boundary identified in NCR F-562 as having been installed by a non-ASME stamp holder, and therefore, in violation of ASME Section III, were not identified with "Hold" tags.
- c. Main control board panels identified in NCR F-545 as having structural welds unacceptable to American Welding Society Code D1.1 were not identified with "Hold" tags and portions were energized.
- d. Cables numbered 1DC089 and 1DC030 identified in NCR F-539 as having minimum bending radii less than the specified 18 inches were energized and were not identified with "Hold" tags.
- e. Welds on cable tray stiffeners identified in NCR F-529 as being unacceptable were not identified with "Hold" tags.

#### Corrective Action Taken and Results Achieved

Quality Assurance procedures have been revised to clarify that either individual or generic hold tags will be placed for all nonconforming items. In addition, procedures require that for all nonconforming items, the nonconformance report shall indicate the extent to which work may proceed. The new procedure has been applied to the five specific instances cited in the inspection report as follows:

- a. NCR F-580 was initiated in order to obtain clarification of separation criteria inside of switchgear. Individual hold tags were placed on each piece of equipment as status indicators on January 16, 1981. NCR action allowed work to continue and equipment to be used while engineering disposition was being evaluated.
- b. NCR F-562 was initiated in order to obtain clarification as to the requirements for ASME certification for installation of electrical penetrations. Hold tags were placed as status indicators on January 30, 1981.
- c. NCR F-545 was initiated in order to identify the overall questionability of welds on main control boards manufactured by Westinghouse. Hold tags were placed on each main control board as status indicators on January 6, 1981. NCR action allowed work to continue and equipment to be used while engineering disposition was being evaluated.
- d. NCR F-539 was initiated in order to identify deviation from minimum bend radius criteria. Hold tags were placed on each cable as status indicators on January 22, 1981. NCR action allowed work to continue and equipment to be used while engineering disposition was being evaluated.
- e. NCR F-529 was initiated in order to identify the overall questionability of welds on cable pan stiffeners. The disposition of "accept as is" was given by Engineering on January 27, 1981. As a result, the NCR was closed and no hold tags were required.

A review has been made of all NCRs to assure hold tags have been issued and placed on all nonconforming items. Where it is impractical to attach a tag to each item, a generic tag was placed in the area.

#### Corrective Action Taken To Avoid Further Noncompliance

QP 15.1 of the Quality Assurance manual has been revised to more clearly address status indicators, and personnel have been instructed in the revised QP.

Date When Full Compliance Will Be Achieved

We are in full compliance as of this date.

#### Violation 7

10 CFR 50 Appendix B, Criterion XIII, states, in part, "Measures shall be established to control the . . . preservation of . . . equipment in accordance with work and inspection instructions to prevent damage or deterioration."

Commonwealth Edison Company Topical Report No. CE-1-A, Revision 9, Section 13, states, in part, "Written instruction for handling, preservation, storage and shipping will be used to specify special protective conditions necessary to prevent damage or deterioration of materials and equipment."

Contrary to the above, as of December 23, 1980, measures established by the licensee did not control the preservation of equipment to prevent damage or deterioration in that:

- a. Paper cartons, paper, and other combustible material were in the Auxiliary Diesel Generator Cable Tunnel Room.
- b. Two scaffold supports were lying on cables inside Cable Tray 11455Q-C2E at elevation 432 in the Auxiliary Building.
- c. Loose nails were in Cable Tray 12030C-C1E in the Upper Cable Spreading Room.
- d. A chisel was in Cable Tray 1920E-P2E in the Auxiliary Diesel Generator Cable Tunnel Room.
- e. Partially consumed weld rods were in the Cable Tray 11464Q-C2E at elevation 439 in the Auxiliary Building.

#### Corrective Action Taken and Results Achieved

Corrective action to increase the control of cable tray cleanliness had been initiated prior to the date of the subject NRC inspection. The procedure to implement stricter control was completed December 30, 1980. Implementation has been completed, and the specific items cited in the inspection report (paragraph 4.e) have been corrected.

#### Corrective Action Taken To Avoid Further Noncompliance

As stated above, procedure to implement stricter control of cable tray cleanliness has been implemented. This is an area of continuing management attention.

#### Date When Full Compliance Will Be Achieved

We are in full compliance as of this date.