



Commonwealth Edison

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Address Reply to: Post Office Box 767
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June 19, 1984

Mr. James G. Keppler
Regional Administrator
U.S. Nuclear Regulatory Commission
Region III
799 Roosevelt Road
Glen Ellyn, IL 60137

Subject: Braidwood Station Units 1 and 2
Response to IE Inspection Report
Nos. 50-456/84-06 and 50-457/84-06
NRC Docket Nos. 50-456/457

- References (a): R. F. Warnick letter to Cordell Reed
dated April 27, 1984
- (b): R. C. Knop letter to Cordell Reed
dated February 3, 1984
- (c): E. D. Swartz letter to J. G. Keppler
dated February 28, 1984
- (d): B. J. Youngblood letter to D. L. Farrar
dated June 11, 1984

Dear Mr. Keppler:

The Attachments to this letter are submitted in response to the Reference (a) violation and deviation identified during the subject inspection conducted by Messrs. L. G. McGregor and R. Schulz of your staff on February through March 31, 1984 of activities at Braidwood Station Units 1 and 2. An extension of the response period was requested from Messrs. C. E. Norelius and R. F. Warnick of Region III on separate occasions, and extension was granted to June 20, 1984. We appreciate the extension of time given to us to respond to this matter.

Your request for the enclosed design documents, and the bases for the design change along with our approval was originally an unresolved item. We agree that our initial Reference (c) transmittal of information to you on the subject did not completely address your concerns as we now understand them, and we apologize for any inconveniences that may have resulted. We believe that the enclosed information is responsive to your concerns and your request for the design change documents.

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Attachment A to this letter discusses our response to the design control issue concerning battery room design and design changes which your staff believed was in noncompliance with NRC requirements. Attachment B acknowledges the deviation concerning cable separation within the lower cable spreading room and provides the status of our efforts to resolve it.

Commonwealth Edison does not agree that the violation identified in Appendix A to Reference (a) represents a noncompliance with 10 CFR 50 Appendix B, Criterion III Design Control, or that we have failed to comply with the Commonwealth Edison Quality Assurance Manual, Quality Requirement 3.0. We believe that, through our architect-engineer Sargent & Lundy, we have provided the proper design control to provide assurance that applicable regulatory requirements as specified in the design bases and license application were translated into the appropriate drawings issued to construction for the safety-related DC Battery Room design and design changes. The bases for our conclusion is described in Attachment A to this letter and includes the numerous design control measures that were employed surrounding this circumstance.

Section A of Attachment A to this letter discusses the bases used in 1977 to issue the design change which replaced one of the battery room walls with a heavy wire fence. This change was proposed so as to simplify the battery room ventilation system. Section B of Attachment A describes the available documentation of the approval of this change and conclusively demonstrates that multiple level reviews were conducted as prescribed in the Commonwealth Edison Quality Assurance Manual. The chronological list of Exhibits which are enclosed with this letter further demonstrate the widespread review and approval associated with this change. Finally, Section D and Exhibit 10-15 discuss the CECO approval and issuance of the design change.

We acknowledge in Section C of Attachment A that there are discrepancies between certain Sargent and Lundy physical arrangement drawings in this case. S&L issues many types of physical design drawings covering the same plant area. Physical features of the plant may or may not be shown as background information, and their inclusion is primarily for orientation purposes. In such instances, discrepancies in background information contained on physical arrangement drawings are not considered relevant to the performance of installation contractors because the scope of each contractor's work is clearly defined in each construction/installation specification, e.g. the electrical installation contractor knows that he does not install concrete walls because such walls are clearly outside his scope of work. In addition, each S&L physical arrangement drawing when issued for construction or installation is clearly identified in the "Record of Issues" block with the construction/installation specification number for which it is being issued. We acknowledge that there are background information discrepancies between the various types of S&L physical arrangement

drawings relative to the "battery-area-wall/fence" feature, but the concrete walls are correctly shown on the concrete wall design drawing which controls that plant feature (S-1607, Exhibit 10-19) and from which concrete walls are constructed; and the wire mesh door and partition are correctly shown on the architectural drawing which controls that plant feature (A-266, Exhibit 10-18) and from which wire mesh doors and partitions are constructed.

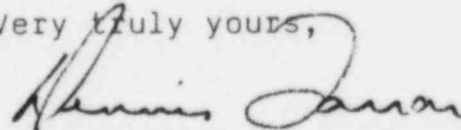
Similarly, the discrepancies on one of the "figures" included in the Fire Protection Report is also not considered relevant because the intent of the figure is clearly to delineate the existing fire zones, and their demarcation is shown by heavy red colored lines. The inclusion or exclusion of the wire fence details on the figure is incidental to the intended purpose of the figure, and we believe that no reviewer was misled in this instance.

We understand that NRR is reviewing the safety-related 125 volt DC system for the Byron and Braidwood facilities at the request of Region III. We are in receipt of Reference (d) requesting additional information regarding your technical concerns in this area and we will provide our response to those technical issues in a subsequent submittal to the NRC in the near future. Therefore, we have not addressed those technical issues in this letter.

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

Please address any questions that you or your staff may have concerning this matter to this office.

Very truly yours,



Dennis L. Farrar
Director of Nuclear Licensing

EDS/rap

Attachments

cc: RIII Inspector - Braidwood w/o att.

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ATTACHMENT A

NOTICE OF VIOLATION

10 CFR 50, Appendix B, Criterion III, Design Control, states in part: "Measures shall be established to assure that applicable regulatory requirements and the design basis as specified in the license application, for those structures, systems, and components to which this appendix applies are correctly translated into specifications, drawings, procedures and instructions. These measures shall include provisions to assure that appropriate quality standards are specified and included in design documents and that deviations from such standards are controlled. Design changes including field changes shall be subject to design control measures commensurate with those applied to the original design and be approved by the organization that performed the original design.

Commonwealth Edison Quality Assurance Manual, Quality Requirement 3.0, states in part: "Design control involves multi-level reviews and/or evaluation of design documents by individuals or groups other than the original designer or designer's immediate supervisor...". Project Engineering or Station Nuclear Engineering Department, as well as other CECO organizations, will assure that designs, specifications and procedures will conform to the ASME and other applicable codes, standards, regulatory requirements, and SAR commitments.

Contrary to the above, the Licensee has failed to provide the proper design control to assure that regulatory requirements and the design basis were properly translated into drawings, issued to construction, for the safety-related D.C. battery room design and design changes.

RESPONSE

The Commonwealth Edison Company originally understood the Reference (b) Inspection Report 83-17 to be concerned with only the removal of the "concrete block" walls on Drawing A-266 and therefore submitted a response quite narrow in scope. The Reference (a) Inspection Report 84-06 addresses the removal of the "concrete" walls more generally. Accordingly, the response provided herein is broader in scope and more comprehensive in nature.

It is our architect-engineer's (Sargent & Lundy) standard practice to show the design of masonry walls (e.g., concrete block) and other non-structural partitions (e.g., wire mesh) on architectural (A-series) drawings, and to show the design of structural walls (e.g., concrete) on structural (S-series) drawings. In Reference (b), the Commission referred to two specific issues of an Architectural Drawing (A-266, dated August 1974, and A-266, Rev. B, dated March 24, 1978), and in paragraph 3.c requested documentation regarding the removal of the

Category I "concrete block" fire wall. Reference (c) provided the Commonwealth Edison Company response to this specific request relative to Drawing A-266 as stated in paragraphs 3.a and 3.c of Reference (b). In the subject Reference (a) Inspection Report 84-06, the Commission requested documentation regarding the removal of a Category I "concrete" fire wall, with no specific drawing identified; i.e., not specifically requesting information relative to Drawing A-266.

The following is provided to describe the relevant history of the battery design, and to address the specific concerns identified in Reference (a) with supporting documentation where available.

SECTION A

BASES FOR DESIGN CHANGE

In a memorandum dated August 4, 1977, Mr. C. L. Tsai (S&L Electrical Engineer) recommended to Mr. J. C. LaVallee (S&L Project Manager) that the battery room wall be replaced with a fence so as to simplify the battery room ventilation system. See Exhibit 10-5B.

On (or about) September 9, 1977, in a meeting attended by S&L Electrical Engineering, S&L HVAC Engineering, and CECo Project Engineering personnel, it was decided that the concrete block wall, as then shown on the preliminary unsigned issue of S&L Drawing A-266, should be removed and replaced with a wire mesh partition.

Although no notes documenting this meeting have been found, the S&L Senior Electrical Project Engineer (B. G. Treece) and the CECo Project Engineer (J. T. Westermeier), both still assigned to the project, concur that the bases for this design decision included the following additional considerations:

1. There was no technical basis for requiring a solid wall. A solid wall (or a barrier with a 3-hour fire rating) was not needed because the battery was not located in a separate fire protection zone; the battery and all other equipment in the Miscellaneous Electric Equipment Room are in the same fire zone. The battery need not be protected from a fire or explosion in the Miscellaneous Electric Equipment Room because such a fire or explosion was postulated to disable the d-c distribution center, without which the battery is useless.

2. There were no industry standards (e.g., IEEE) requiring a solid wall. In fact, IEEE specifically advised the NRC that there was no basis for "prohibiting d-c switch-gear and inverters in the battery rooms" (See Exhibit 10-5C).
3. There were no NRC regulations requiring a solid wall. (Reg. Guide 1.120, Draft 1, rev. 1, dated April 7, 1977, was released "for comment" only, and not for use).
4. The wire mesh partition provided the battery with adequate protection from mechanical damage and from unauthorized personnel.
5. If a failure of the mechanical (forced) ventilation system was postulated, the wire mesh partition provided for improved natural ventilation, (over that provided by a solid wall) and a significantly greater air volume to absorb (and thus dilute) any generated hydrogen.
6. The wire mesh partition permitted frequent observation of the battery by operators and maintenance personnel (who happen to be in the area for other than scheduled battery inspections) from outside the battery enclosure. For example, a leaking cell could be detected much earlier than the next scheduled battery surveillance.
7. The wire mesh partition was adequate for the protection of unauthorized personnel from injury (e.g., electrical shock or acid burns).
8. The impact on the battery area environment (e.g., temperature) was acceptable; i.e., the battery has adequate capacity at minimum temperature and battery life is not adversely affected because the annual average temperature is not changed. (See Exhibit 10-5B).

Exhibit 10-6 documents CEC0/S&L participation in this design decision.

The basis for the approved design was previously discussed in the CEC0 Reference (c) response to paragraph 3.c of the previous Reference (b) Inspection Report 83-17.

SECTION B

DOCUMENTATION OF ENGINEERING REVIEW AND APPROVAL OF DESIGN CHANGE

On March 25, 1977, the S&L Senior Structural Project Engineer issued a memorandum (Exhibit 10-4) advising that, based on a turbine missile concern, the battery area walls should be changed from concrete block to reinforced concrete construction. On May 26, 1977, Drawing S-1607, Rev. G (Exhibit 10-5A) was released for construction showing reinforced concrete walls.

On August 4, 1977, as previously noted, the Electrical Engineer recommended to the Project Manager (with copy to Heating, Ventilating and Air Conditioning personnel) that the wall be replaced with a fence (See Exhibit 10-5B).

The substitution of a wire mesh partition in place of a solid wall was then discussed at two successive S&L Interdepartmental meetings (9/19/77 and 10/3/77) attended by Project Team Members from various disciplines (See Exhibits 10-7 and 10-8).

Drawing S-1607, Rev. M (Exhibit 10-10) was returned to S&L Structural Engineering by S&L Electrical Engineering on October 18, 1977, marked with the comment "Per Mr. B. G. Treece's memo of I.D. Meeting held on October 5, 1977: Walls between each Battery and its associated charger to be removed". Exhibit 10-10 also includes a picture copy of page 3 of the referenced memo (Exhibit 10-9) and documents that the Design Change (removal of the wall) was approved by the Project Manager (J. C. La Vallee) on October 19, 1977. Exhibit 10-13 (aperture card of S-1607, Rev. M) documents that the Design Change (removal of wall) was reviewed/resolved by the Structural Engineer on November 3, 1977.

On October 26, 1977, Drawing S-1607, Rev. P (Exhibit 10-12) was issued for construction with a "Hold" on the concrete wall which was to be removed, and on February 1, 1978 Drawing S-1607, Rev. S (Exhibit 10-14) was issued for construction with the concrete wall removed from the drawing. On March 24, 1978, Drawing A-266, Rev. B was issued for construction of the wire mesh partition.

Structural Standard SAS-27 (Exhibit 10-11) dated 10-21-77 is the review procedure that was in effect at the time of review of S-1607, Rev. M. General Drafting Standard GDS 4.1.1, Rev. 0 (Exhibit 10-20) is the procedure that was in effect during this time frame which controlled the processing of comments on all S&L design drawings. Under this standard, proposed design changes are sent for review and comment to each discipline whose work may be affected by the proposed change. Exhibit 10-21 is an example of the Byron/Braidwood Project Distribution List which controlled the distribution of structural drawings for

comment during this period. The requirements of these procedures provide assurance that this design change was properly distributed for review and comment.

SECTION C

DISCREPANCIES BETWEEN S&L DRAWINGS

S&L issues many types of physical design drawings covering the same plant areas; each with a different installation or information purpose (e.g., for electrical/conduit installation, for HVAC duct installation, for piping installation, for concrete wall installation, for masonry wall installation, for structural floor loading information, for general arrangement information, for structural steel installation, for cable tray installation, for fire zone identification, etc.). None of these drawings show all of the physical features of the plant. Some physical features of the plant may, or may not, be shown (or may not be accurately shown due to the evolving plant design where such background details need not be updated) as background information (e.g., as an aid to the designer) on these many different types of drawings, but the design/construction details for any given feature is accurately shown for installation on one specific type of drawing; i.e., the drawing which controls the installation of the given plant feature.

We acknowledge that there are background information discrepancies between some S&L physical arrangement drawings relative to the "battery-area-wall/fence" feature; but the concrete walls are correctly shown on the concrete wall design drawing which controls that plant feature (S-1607, Exhibit 10-19) and from which concrete walls are constructed; and the wire mesh door and partition are correctly shown on the architectural drawing which controls that plant feature (A-266, Exhibit 10-18) and from which wire mesh doors and partitions are constructed.

In such instances, discrepancies in background information are not considered to be a relevant aspect of "design control" because the S&L designers have been trained to refer to the appropriate (correct) design drawing for the design/construction details (e.g., materials, location, dimensions) of each physical feature. For example, an electrical designer knows to look at the "concrete" drawing for details of a concrete wall, to look at the "architectural" drawing for details of a masonry wall, to look at the "piping" drawing for details of piping, and to look at the "cable tray" drawing for details of cable trays, etc. For example, the S&L Standard (EDSI-16, Rev. 1-29-79) covering the Preparation of Electrical Drawings specifically cautions electrical draftsmen and designers: "Mechanical and Structural drawings must be carefully checked for interferences and all possible interferences should be properly reconciled".

Further, discrepancies in background information are not considered relevant to the performance of installation contractors because the scope of each contractor's work is clearly defined in each specification (e.g., the electrical installation contractor knows that he does not install concrete walls because such walls are clearly outside of his scope of work). In addition, each S&L drawing when issued for construction/installation is clearly identified in the "Record of Issues" block with the construction/installation specification number for which it is being issued.

SECTION D

CECO APPROVAL OF DESIGN CHANGE

Exhibit 10-15 documents that CECo was cognizant of and verbally approved the Design Change (removal of wall) as shown on S-1607, Rev. S via Design Drawing Release (DDR) Nos. SLB-1791 and SLN-1673 for Byron and Braidwood.

SUMMARY

Enclosed is a chronological listing of the major events and documents relating to this battery area partition discussed above. Based upon our detailed review of this matter, it is the Commonwealth Edison Company determination that the above discussion with the enclosed Exhibits document that the present design and the design change were properly reviewed and approved by the appropriate S&L and CECo personnel as required by the procedures, and that CECo and S&L provided the proper design control to assure that applicable requirements were properly translated into drawings issued for construction.

CHRONOLOGICAL LIST OF EVENTS/DOCUMENTATION

<u>Exhibit No.</u>	<u>Date</u>	<u>Event/Document-Description</u>
10-1	8-7-74	Drawing A-266 (Preliminary) issued as "for reference only" for bids. Fire-rated hollow concrete masonry walls indicated for the battery area.
10-2	11-1-76	Drawing S-1607, Rev. A, issued for Construction. No poured concrete walls exist for battery room on drawing.
10-3	11-19-76	Drawing A-266, Rev. A (Preliminary) issued for Material order. Fire-rated North-South block wall for battery rooms divisional separation was added between Col. Rows 7.7 and 10, near Col. Row M.
10-4	3-25-77	Interoffice memorandum (K. T. Kostal to R. J. Netzel, et al) regarding change from concrete blocks to concrete walls.
10-5A	5-26-77	Drawing S-1607, Rev. G, issued for construction. Walls first appeared as concrete, all (4) sides.
10-5B	8-4-77	Interoffice memorandum (C. L. Tsai to J. C. LaVallee) describes basis for change - replacing battery room wall with a fence.
10-5C	5-23-77	Letter (IEEE, Nuclear Power Engineering Committee on NRC-ACRS) - Comments on Regulatory Guide 1.120 - See Page 9 of 9, regarding Safety-Related Battery Rooms.

10-6	9-9-77	Interoffice Memorandum (O. A. Hrynowych to B. G. Treece, et al) documenting meeting with CECO, during which J. T. Westermeier instructed S&L to remove the wall, replace with fence.
10-7	9-19-77	Interdepartmental Meeting (attended by Project Team Members from all disciplines) where Design Change (use of wire mesh partition instead of wall) was discussed. See Item 11 of notes of meeting.
10-8	10-3-77	Interdepartmental Meeting (attended by Project Team Members from various disciplines) where Design Change (use of wire mesh partition instead of a wall) was again discussed. See Item 10 of notes of meeting.
10-9	10-6-77	Interoffice Memorandum (B. G. Treece to M. Y. Chow, et al) See Item 6.
10-10	10-18-77	Structural Department receives comments on Drawing S-1607, Rev. M, from Electrical Department to remove one wall on side which was to receive wire mesh partition.
10-11	10-21-77	Structural Standard SAS-27, Rev. O, Preparation Review and Approval of Structural Department Drawings (Procedure in effect at time of review of S-1607, Rev. M, (Exhibit 10-10).
10-12	10-26-77	Drawing S-1607, Rev. P, issued for Construction. A "Hold" was placed on the walls on side which would be replaced with wire mesh partition.
10-13	11-3-77	Aperture card of Drawing S-1607, Rev. M, (comment print) reviewed/resolved by Structural Engineer.

10-14	2-1-78	Drawing S-1607, Rev. S, Issued for Construction. Concrete walls were removed from the drawing, in order to replace them with wire mesh, and to date is still shown as such.
10-15	2-1-78	Design Drawing Release (DDR) Forms (Nos. SLB-1791 and SLN-1673) which documents CECO verbal approval of the Design Change (removal of wall) as shown on S-1607, Rev. S.
10-16	3-24-78	Drawing A-266, Rev. B, issued for wire mesh partition construction (and for concrete block wall revision information). Byron North wall (Braidwood South wall) fire-rated hollow masonry replaced with wire mesh partition. Byron South and West walls (Braidwood North and East walls) revised to concrete.
10-17	7-21-78	Drawing A-266, Rev. C, issued for masonry construction with wire mesh partition.
10-18	12-29-83	Drawing A-266, Rev. AF (current issue), correctly shows wire mesh partition.
10-19	1-4-84	Drawing S-1607, Rev. BF (current issue), correctly shows concrete walls.
10-20	-	General Drafting Standard GDS 4.1.1, Rev. 0 "Processing of Comments on Sargent & Lundy Design Drawings" (Procedure, applicable to the Mechanical, Electrical, and Structural disciplines, in effect at time wall was removed from S-1607).
10-21	-	Document Transmittal and Distribution Form (Example, showing the Project Distribution List used for distributing Structural drawings "for comments" at time wall was removed from S-1607).

ATTACHMENT B

NOTICE OF DEVIATION

10 CFR 50, Appendix A, General Design Criteria for Nuclear Power Plants, Criterion III, Fire Protection, states in part: Structures, Systems, and components important to safety shall be designed and located to minimize, consistent with other safety requirements, the probability and effect of fires and explosions.

10 CFR 50, Appendix R, Section III G.1, requires that fire protection features shall be provided for structures, systems and components important to safe shutdown. These features shall be capable of limiting fire damage so that one train of systems necessary to achieve and maintain a hot shutdown condition from either the control room or emergency control station(s) is free of fire damage.

Branch Technical Position, BTP-CMEB 9.5-1, the basis for the Byron/Braidwood Stations Fire Protection Reports, requires that: (1) Fire barriers with a minimum fire resistance rating of three hours should be provided to separate redundant divisions or trains of safety-related systems from each other so that both are not subject to damage from a single fire, (2) Each cable spreading room should contain only one redundant safety division. Cable spreading rooms should not be shared between reactors, (3) Separation of cables and equipment and associated circuits of redundant trains by a horizontal distance of more than 20 feet with no intervening combustible or fire hazards.

Contrary to the above, the licensee has failed to insure a 20 foot cable separation between Safety Related D.C. Cables from ESF Division 11 and Division 12 in the lower cable spreading room.

RESPONSE

Commonwealth Edison is aware of this deviation from the requirements of Section III.G of Appendix R to 10 CFR 50. In particular, this deviation was identified during the NRR Fire Protection Site Audit of Byron Station, and at the current time, it is being reviewed and resolved with NRR. A final resolution has not yet been achieved. A revised safe shutdown analysis for Byron Unit 1 is scheduled to be completed by the end of June, 1984. The work in progress has identified the specific cables referred to in Reference (a). When the analysis is complete, redundant safe shutdown cables within the (power) cable spreading room will have been identified. At that time, a final resolution for the specific cables mentioned in Reference (a), and others identified, if any, will be reached with NRR. The resolution for Byron Unit 1 is expected to apply to all other units (Byron Unit 2 and Braidwood Units 1 and 2).