

U.S. NUCLEAR REGULATORY COMMISSION

REGION III

SYSTEMATIC ASSESSMENT OF LICENSEE PERFORMANCE

Commonwealth Edison Company

Braidwood Nuclear Generating Station, Units 1 and 2

Docket Nos. 50-456; 50-457

Report Nos. 50-456/82-02; 50-457/82-02

Assessment Period

July 1, 1980 to December 31, 1981

ERRATA SHEET

Facility: Braidwood Nuclear Generating Station
SALP Report Nos. 50-456/82-02; 50-457/82-02

<u>Page</u>	<u>Line</u>	<u>Now Reads</u>	<u>Should Read</u>
10	39	The licensee is rated Category 3 in this area.	The licensee is not rated in this area.
10	39-43	In summary, this is done...	Delete the sentence.

CONTENTS

	<u>Page</u>
1. SALP Board Chairman Letter to Licensee	iii
2. Licensee Comments	vi
I. Introduction	1
II. Criteria	2
III. Summary of Results	3
IV. Performance Analyses	4
V. Supporting Data and Summaries	12
A. Noncompliance Data	12
B. Licensee Report Data	14
C. Licensee Activities	14
D. Inspection Activities	14
E. Investigations and Allegations Review	15
F. Escalated Enforcement Action	15
G. Management Conferences	15

Docket No. 50-456
Docket No. 50-457

Commonwealth Edison Company
ATTN: Mr. Cordell Reed
Vice President
Post Office Box 767
Chicago, IL 60690

Gentlemen:

This is to confirm the conversation between you and Mr. R. C. Knop of the Region III staff scheduling May 18, 1982, at 1:00 p.m. as the date and time for the meeting to discuss the Systematic Assessment of Licensee Performance (SALP) for the Braidwood Nuclear Generating Station. This meeting will be held at the NRC's Region III office in Glen Ellyn, Illinois.

Mr. James G. Keppler, the Regional Administrator, and members of the NRC staff will present the observations and findings of the SALP Board. Since this meeting is intended to be a forum for the mutual understanding of the issues and findings, you are encouraged to have appropriate representation at the meeting. As a minimum we would suggest you, Mr. R. Cosaro, Site Construction Superintendent, T. Sommerfield, Site Quality Assurance Superintendent, and managers for the various functional areas where problems have been identified.

Enclosure 1 to this letter summarizes the more significant findings identified in the SALP Board's evaluation of the Braidwood Nuclear Generating Station for the period July 1, 1980 to December 31, 1981.

Enclosure 2 to this letter is the SALP Report which documents the findings of the SALP Board and is for your review prior to the meeting. Subsequent to the meeting the SALP Report will be issued by the Regional Administrator.

If you desire to make comments concerning our evaluation of your facility, they should be submitted to this office within twenty days of the meeting date; otherwise, it will be assumed that you have no comments.

In accordance with Section 2.790 of the NRC's "Rules of Practice," Part 2, Title 10, Code of Federal Regulations, a copy of this letter, the SALP Report and your comments, if any, will be placed in the NRC's Public Document Room when the SALP Report is issued.

The comments requested by this letter are not subject to the clearance procedures of the Office of Management and Budget as required by the Paperwork Reduction Act of 1980, PL 96-5111.

If you have any questions concerning the SALP Report of the Braidwood Nuclear Generating Station we will be happy to discuss them with you.

Sincerely,

I. A. Hird, Director
Division of Emergency Preparedness
and Operational Support

Enclosures:

1. Summary of Significant Findings
2. Braidwood SALP Report (5 copies)

cc w/encls:
Resident Inspector, RIII

ENCLOSURE 1

SUMMARY OF SIGNIFICANT FINDINGS

Significant SALP Report findings for the Braidwood Nuclear Generating Station, Units 1 and 2 are summarized as follows:

The results of inspections conducted during July 1, 1980, through December 31, 1981, indicate that most activities at the site have been conducted in an acceptable manner. The SALP Board recommends, based on problems identified at other facilities, that the licensee focus additional attention to the areas of Support Systems, Electrical Power Supply and Distribution, and Instrumentation and Control Systems as activities in these areas increase. The SALP Board is concerned about the lack of sufficient management attention to adequately address corrective actions to nonconformances and to recognize the possible significance of nonconformance to the overall QA program. The licensee appears to meet the minimum requirements, but does not appear to take a conservative approach to the resolution of nonconformances.

I. INTRODUCTION

The NRC has established a program for Systematic Assessment of Licensee Performance (SALP). The SALP is an integrated NRC Staff effort to collect available observations and data on a periodic basis and evaluate licensee performance based upon these observations. SALP is supplemental to normal regulatory processes used to ensure compliance to the rules and regulations. SALP is intended from a historical point to be sufficiently diagnostic to provide a rational basis: (1) for allocating future NRC regulatory resources, and (2) for providing meaningful guidance to licensee management to promote quality and safety of plant construction and operation.

A NRC SALP Board composed of managers and inspectors who are knowledgeable of the licensee activities, met on April 15, 1982, to review the collection of performance observations and data to assess the licensee performance in selected functional areas.

This SALP report is the Board's assessment of the licensee safety performance at Commonwealth Edison Company's Fraidwood Units 1 and 2, for the period July 1, 1980 to December 31, 1981.

The results of the SALP Board assessments in the selected functional areas were presented to the licensee at a meeting held May 18, 1982.

II. CRITERIA

The licensee performance is assessed in selected functional areas depending whether the facility is in a construction, pre-operational, or operating phase. Each functional area normally represents areas significant to nuclear safety and the environment, and are normal programmatic areas. Some functional areas may not be assessed because of little or no licensee activities or lack of meaningful observations. Special areas may be added to highlight significant observation.

One or more of the following evaluation criteria were used to assess each functional area.

1. Management involvement in assuring quality
2. Approach to resolution of technical issues from safety standpoint
3. Responsiveness to NRC initiatives
4. Enforcement history
5. Reporting and analysis of reportable events
6. Staffing (including management)
7. Training effectiveness and qualification

However, the SALP Board is not limited to these criteria and others may have been used where appropriate.

Based upon the SALP Board assessment each functional area evaluated is classified into one of three performance categories. The definition of these performance categories is:

Category 1. Reduced NRC attention may be appropriate. Licensee management attention and involvement are aggressive and oriented toward nuclear safety; licensee resources are ample and effectively used such that a high level of performance with respect to operational safety or construction is being achieved.

Category 2. NRC attention should be maintained at normal levels. Licensee management attention and involvement are evident and are concerned with nuclear safety; licensee resources are adequate and are reasonably effective such that satisfactory performance with respect to operational safety or construction is being achieved.

Category 3. Both NRC and licensee attention should be increased. Licensee management attention or involvement is acceptable and considers nuclear safety, but weaknesses are evident; licensee resources appear to be strained or not effectively used such that minimally satisfactory performance with respect to operational safety or construction is being achieved.

III. SUMMARY OF RESULTS

<u>Functional Areas</u>	<u>Category 1</u>	<u>Category 2</u>	<u>Category 3</u>
1. Soils and Foundations		Not Rated	
2. Containment and Other Safety-Related Structures		X	
3. Piping Systems and Supports		X	
4. Safety-Related Components		X	
5. Support Systems		X	
6. Electrical Power Supply and Distribution		X	
7. Instrumentation and Control Systems		X	
8. Licensing Activities		X	
9. Quality Assurance			X

IV. PERFORMANCE ANALYSES

1. Soils and Foundations

The licensee is not rated in this area. No inspections were performed in this area during this SALP period. All major work in this area has been completed.

2. Containment and Other Safety-Related Structures

a. Analysis

Seven inspections were performed and included structural fabrication and installation, containment penetration welding, containment post-tensioning, investigation of failed bearing plate seat V157, and observation of QA program performance. Three items of noncompliance were identified as follows:

- (1) Severity Level VI, failure to install structural steel bolted connections to specification requirements. Three examples of this noncompliance were identified for each unit.
- (2) Severity Level V, failure to inspect tendons for corrosion when they had been installed for over 90 days without having been greased. Furthermore, an inspection instruction/procedure had not been prepared for the inspections addressing the requirements of the Sargent & Lundy (S&L) specification.
- (3) Severity Level IV, the following nonconforming conditions were either not promptly identified or not properly corrected:
 - (a) Although stressing gauges were found to be out of the required accuracy range, corrective action was not taken to identify and correct any potential deficiency caused by the use of the nonconforming gauges.
 - (b) The specified disposition of Nonconformance Report No. 137 did not address the subject of the report (i.e., failure to follow the specified tendon stressing sequence).
 - (c) Seventeen tendons were installed for more than 180 days without being greased. This condition, although not in accordance with S&L specification requirements, was not identified as nonconforming. Discussions with contractor personnel indicated that they misinterpreted the specification requirements.

Required procedures had not been written, and existing procedures were violated. When not in compliance with procedures, the licensee chose to eliminate the requirement rather than adhere to the procedure. This problem is discussed further in Section IV.9 of this report. The control of subcontracted activities requires additional review to assure activities are conducted according to design requirements.

The maintenance of the licensee's records for construction activities in this area is considered adequate.

b. Conclusions

The licensee is rated Category 2 in this area.

c. Board Recommendations

Problems involving QA are discussed in Section IV.9 of this report. Since licensee work has essentially been completed in this area, the NRC inspection effort need not be increased in this area.

3. Piping Systems and Supports

a. Analysis

Seven inspections were performed and included welding; nondestructive examination; certification of welders, NDE personnel, and QC inspectors; fabrication and installation; material control; and observation of QA program performance. During this SALP period two items of noncompliance, both infractions, were identified against Criterion XIII of 10 CFR 50, Appendix B. These were for improper storage of safety-related piping and for inadequate control of welding materials. After receiving these citations the licensee ensured that all safety-related piping was stored correctly, initiated an increased surveillance program to prevent recurrence, instituted welder training programs, and clarified welding instructions. These actions were implemented in a timely manner. The two items of noncompliance which were identified in two separate inspections appear to represent isolated minor problems. A review of records and record control systems indicated that these activities were considered adequate. The personnel qualifications and training program in effect for those areas in which special skills and knowledge are required to assure adherence to the facilities QA program were satisfactory.

b. Conclusion

The licensee is rated Category 2 in this area.

c. Board Recommendations

None.

4. Safety-Related Components

a. Analysis

Seven inspections were performed and included storage of components, steam generator modifications, installation of CRDMs, reactor vessel transport and installation, steam generator transport and installation, installation of tanks and heat exchangers, and observation of QA program performance. During this SALP period one Severity Level VI item of noncompliance was identified against Criterion XIII of 10 CFR 50, Appendix B, and involved inadequate cleanliness of the steam generators. Licensee management and QA personnel immediately implemented corrective actions. The contractor was instructed to remind his personnel of the requirements for cleanliness and closures over openings; the steam generator plenums were cleaned out; and temporary closures were fabricated for the openings. These actions were completed during the inspection which identified the noncompliance. Except for this instance, a review of records, record control systems, personnel qualifications and training indicated that these activities were satisfactory.

b. Conclusion

The licensee is rated Category 2 in this area.

c. Board Recommendations

None.

5. Support Systems

a. Analysis

One inspection was performed in the area of heating, ventilation, and air conditioning (HVAC) systems. Observations of welding activities, painting of installed welds, and storage of HVAC material were made to determine that the installation was in accordance with procedures, drawings, and specifications. In addition, several procedures were reviewed. During this SALP period one item of noncompliance, an infraction, was identified against Criterion XIII of 10 CFR 50, Appendix B, for improper storage of safety-related

HVAC ducts. After receiving this citation, the licensee placed all of the ductwork on cribbing such that water could not accumulate in the ductwork and surveillance checklists were revised. These actions were implemented in a timely manner, and corrective actions were verified to be complete in report 81-06. The licensee's performance appears to be satisfactory, no specific strengths or weaknesses were identified.

b. Conclusion

The licensee is rated Category 2 in this area.

c. Board Recommendations

Additional NRC attention should be given to this area in view of the problems found at other facilities.

6. Electrical Power Supply and Distribution

a. Analysis

Six inspections were performed and included observations of electrical hanger installation activities, storage of electrical equipment, electrical contractor's procedures, diesel generator installation and records, 5KV switchgear installation and records, DC system installation and records, raceway support welding and records, electrical cable installation activities, and QA program performance. During this SALP period one item of noncompliance, an infraction, was identified against Criterion XVI of 10 CFR 50, Appendix B, for failure to determine the cause and take corrective action in regards to the sealing of cable ends on cable reels stored in the cable reel yard. Licensee personnel were cooperative. The licensee was quality oriented; however, the above end cap noncompliance should have been identified by the licensee's surveillance program prior to NRC observations, especially since this matter was identified as an unresolved item in an earlier inspection conducted two months prior to the noncompliance being issued. In that case the licensee instituted corrective actions to correct the problem identified by the NRC inspector, but failed to determine the cause of the problem or take action to prevent its recurrence.

b. Conclusion

The licensee is rated Category 2 in this area.

c. Board Recommendations

Due to the increased activity in this area, increased attention should be given to this area by the NRC and the licensee.

7. Instrumentation and Control Systems

a. Analysis

Three inspections were performed in this area during this SALP period and included observations of cable termination activities, main control board panels (MCBPs), and QA program performance. Very limited licensee activity was conducted in this area. Three items of noncompliance were identified: one Severity Level VI against Criterion VI of 10 CFR 50, Appendix B, and two (a Severity Level VI and an infraction) against Criterion VII. These noncompliances were for failure to implement revisions to specifications for terminal lugs into construction procedures, and twice for failure to assure that MCBPs conformed to procurement requirements; i.e., welds in the MCBPs and failure to install separation barriers between adjacent redundant indicators in the MCBPs. The licensee revised the construction procedures for terminal lugs, committed to install separation barriers by May 1982, inspected all MCBPs to ensure that indicators met separation requirements, and requested the equipment suppliers to perform an engineering analysis to determine the minimum weld criteria. Subsequently, the licensee rewelded all MCBPs to bring them into conformance. This problem of verifying that procurement requirements are met is indicative of a weakness in the vendor and receipt inspection program. As was stated in our reply at that time, it is the licensee's responsibility as the construction permit holder to assure that purchased material conforms to procurement documents whether purchased directly or through a contractor or subcontractor. The control of subcontracted receipt inspection activities requires additional review to assure that these activities are conducted correctly and comprehensively. Licensee personnel were cooperative. QA program records were generally complete, maintained, and available.

b. Conclusion

The licensee is rated Category 2 in this area.

c. Board Recommendations

Due to the increased activity in this area, increased attention should be given to this area by the NRC and the licensee, especially in the area of the vendor and receipt inspection program.

8. Licensing Activities

a. Analysis

Occasional discussions with licensee management indicate that they are aware of the details of licensing activities.

Corporate management is involved with site activities. The licensee generally exhibits conservatism in proposed technical resolutions; however, they have not optimally utilized their previous licensing experience. Additionally, the licensee sometimes took exception to NRC concerns without providing adequate bases for the exceptions. Licensee staff were cooperative at meetings requested by the staff to resolve issues; however, commitments made at those meetings occasionally were not implemented unless formal questions were sent to the licensee. In several instances the initial response to staff questions required supplemental information to adequately resolve staff concerns. Corporate or site personnel who participated in technical meetings were extremely knowledgeable in the subject matter. Corporate licensing and engineering personnel were familiar with plant systems and operations, either due to licensee-provided training or previous plant experience. Staffing for corporate and station organizations involved in licensing activities is strong.

b. Conclusion

The licensee is rated Category 2 in this area. Improvements in the area of responsiveness to NRC initiatives would have resulted in a rating of Category 1.

c. Board Recommendations

None.

9. Quality Assurance

a. Analysis

The overall quality control inspection functions of "measure and report" were performed in an acceptable way by site contractors. The responses and actions by site quality control management, site project construction management, and site quality assurance management were frequently ineffective and unresponsive to the details of specified requirements and the QA Program objectives. The project construction management and the site QA management in several instances did not appear to recognize the potential safety significance and QA program implications of the nonconformances and associated corrective actions. Some indications of QA program weaknesses with some potential for significance were the following:

- (1) Failure to plan ahead for corrosion inspection of post tensioning tendons, and to provide written procedures and checklists in accord with the policies established by the Quality Assurance Topical Report.

- (2) Failure to understand and currently interpret previously established inspection requirement terms such as random sample, monthly, withdrawn, signs of corrosion, and rejected. When an inspection procedure for inspecting tendons installed over 90 days was prepared, the actual inspection included no tendons installed over 90 days, indicating that the most convenient sample was chosen rather than a representative sample.
- (3) Failure to respond in a timely way as the 90 day inspection deadline was reached and exceeded for tendons that had not been greased.
- (4) Failure to get advance approvals of inspection activity actually conducted on tendons and on the acceptability of the inspection records.
- (5) Failure to recognize that they had exceeded the 180 day limit of the specification for tendon greasing and to consider the 50.55(e) implications after exceeding the limit. An extensive review of the results is not yet complete.
- (6) Failure to follow a controlled approach to changes to an audit checklist.

In addition, the licensee's approach to resolving some of the problems identified was to propose and attempt to change the specifications and procedures to reflect the work as completed rather than pursue the overall QA Program objective of corrective action to bring the work and results into conformance. One example of this was the attempt to resolve a QA audit finding regarding safety-related equipment lifting procedures by eliminating the procedure. After complete review and approval by station construction, Sargent & Lundy, and station QA to eliminate the procedure, the identifying auditor pointed out that this procedure is required by ANSI. Problems with verifying that procurement requirements are met is indicative of a weakness in the vendor and receipt inspection program. The licensee appears to meet the minimum requirements, but does not appear to take a conservative approach to the resolution of nonconformances.

b. Conclusion

The licensee is rated Category 3 in this area. In summary, this is due to the lack of sufficient management attention to adequately address corrective actions to nonconformances and to recognize the possible significance of nonconformances to the overall QA Program.

c. Board Recommendations

Licensee attention should be increased in this area. The NRC will be conducting a special team QA inspection. Findings from this inspection will be used to determine where increased inspection effort is needed. Although QA weaknesses were evident and considered in the ratings of Containment and Other Safety-Related Structures and Instrumentation and Control Systems, the Board considered it appropriate to provide a separate rating to direct special attention to QA and provide meaningful guidance to licensee management. The use of the separate rating was intended to highlight the fact that QA weaknesses were evident in more than one functional area. This should not be interpreted as using the same observations twice to downgrade several areas. The Board felt that the other functional areas would have been rated the same had QA aspects been found to be adequate.

V. SUPPORTING DATA AND SUMMARIES

A. Noncompliance Data

Facility Name: Braidwood Unit 1 Docket No. 50-456
 Inspections No. 80-06 through 80-14
 No. 81-01 through 81-14

<u>Functional Areas</u>	Noncompliances and Deviations ¹						Severity Levels			
	I	II	III	IV	V	VI	Viol.	Infr.	Def.	Dev.
1. Soils and Foundations										
2. Containment and other Safety-Related Structures				1	1	(1)				
3. Piping System and Supports								1+(1)		
4. Safety-Related Components						1				
5. Support System									(1)	
6. Electrical Power Supply and Distribution									(1)	
7. Instrumentation and Control Systems						(2)			(1)	
8. Licensing Activities										
9. Quality Assurance										
TOTALS ²				1	1	1+(3)		1+(4)		

¹ Numbers in parenthesis indicate noncompliances common to both units.
² This total does not include two non-radiological environmental monitoring deficiencies applicable to both units which were not included in this SALP evaluation.

Facility Name: Braidwood Unit 2 Docket No. 50-457
 Inspections No. 80-06 through 80-14
 No. 81-01 through 81-14

Functional Areas	Noncompliances and Deviations ¹						Severity Levels			
	I	II	III	IV	V	VI	Viol.	Infr.	Def.	Dev.
1. Soils and Foundations										
2. Containment and other Safety-Related Structures						(1)				
3. Piping System and Supports									(1)	
4. Safety-Related Components										
5. Support System									(1)	
6. Electrical Power Supply and Distribution									(1)	
7. Instrumentation and Control Systems						(2)			(1)	
8. Licensing Activities										
9. Quality Assurance										
TOTALS ²						(3)			(4)	

¹ Numbers in parenthesis indicate noncompliances common to both units.
² This total does not include two non-radiological environmental monitoring deficiencies applicable to both units which were not included in this SALP evaluation.

B. Report Data

1. Construction Deficiency Reports (CDR)

During this SALP period four CDRs were submitted by the licensee under the requirements of 10 CFR 50.55(e). All of these were Part 21 reports issued by the licensee's suppliers concerning the following:

- a. Westinghouse 3-inch, 1500 psi rated, gate valves, used as charging system isolation valves, failed to close at design pressure during tests at the manufacturer's facility.
- b. Breakdown of containment post tensioning supplier's QA/QC program. Post tensioning field bushings received at the Braidwood site were out of tolerance resulting in stripped threads during tensioning.
- c. Westinghouse Electro-Mechanical Division 1500 psi rated gate valves in sizes 3-inch through 18-inch failed to close when subjected to high differential pressures during tests.
- d. The possibility that a single random failure in the volume control tank level control system could, in absence of operator actions, lead to a loss of redundancy in high head injection.

Fewer deficiencies were reported for Braidwood than for similar sites in Region III possibly indicating the reporting threshold is too high.

2. Part 21 Reports

Four Part 21 reports issued by the licensee's suppliers were addressed in CDRs issued by the licensee.

C. Licensee Activities

Unit 1 and Unit 2 were reported by the licensee as being 61% and 49% complete, respectively, as of December 1981. Site manning was at a reduced level during the initial portions of this SALP period, with reductions primarily in crafts personnel and not in the engineering and quality assurance areas. Station construction activities have been increased in the later portions of this SALP period, with construction emphasis being placed on electrical work.

D. Inspection Activities

The routine inspection effort by the NRC consisted of 23 inspections during the SALP period. There were no NRC team inspection

or review efforts. Subsequent to this SALP period a resident inspector was assigned to the site.

E. Investigations and Allegations Review

None.

F. Escalated Enforcement Actions

There were no escalated enforcement actions during this SALP period.

G. Management Conferences

Inspection Report No. 80-07, dated August 15, 1980, documents the management meeting held on July 24, 1980, at NRC's request to elicit a commitment from the licensee to perform an in-depth examination and evaluation of their design/engineering organizations and function, and to provide a comprehensive evaluation of the conditions and circumstances which have led to certain areas of significant construction re-work in part at the Braidwood site. This meeting was held to discuss all three of the licensee's construction sites regarding this subject.

Inspection Report No. 80-14, dated December 2, 1980, documents the management meeting held on November 25, 1980, at NRC's request to discuss the regulatory performance of the activities at Braidwood, as concluded in the Systematic Assessment of Licensee Performance program (SALP-1). The licensee's performance was considered to be average.