

U. S. NUCLEAR REGULATORY COMMISSION  
OFFICE OF INSPECTION AND ENFORCEMENT  
REGION IV

Report No. 99900507/79-04

Program No. 51200

Company: Sargent & Lundy Engineers  
55 East Monroe Street  
Chicago, Illinois 60603

Inspection at: Chicago, Illinois

Inspection Conducted: October 15-19, 1979

Inspector:

J. R. Costello  
J. R. Costello, Principal Inspector  
Program Evaluation Section  
Vendor Inspection Branch

11/9/79  
Date

J. M. Johnson  
J. M. Johnson, Contractor Auditor  
Program Evaluation Section  
Vendor Inspection Branch

11/9/79  
Date

Approved by:

C. J. Hale  
C. J. Hale, Chief  
Program Evaluation Section  
Vendor Inspection Branch

11-9-79  
Date

Summary

Inspection on October 15-19, 1979 (99900507/79-04)

Areas Inspected: Implementation of Sargent & Lundy Topical Report SL-TR-1A, Revision 5, in the areas of Design Corrective Action, Training, and action on previous inspection findings. The inspection involved sixty-two (62) hours on site by two (2) USNRC inspectors.

Results: In the three (3) areas inspected there were no unresolved items. One (1) deviation was identified in one (1) of the areas.

Deviation: Training - Contrary to procedural requirements, a number of persons performing safety-related work have not received all required QA training.

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DETAILS SECTION I

(Prepared by J. R. Costello)

A. Persons Contacted

J. B. Adee, Jr., Quality Assurance Coordinator  
 S. M. Barraca, Project Coordinator  
 D. J. Cardinale, Supervisor Control & Instrumentation Project Engineering  
 R. F. Carlton, Electrical Project Engineer  
 R. S. Gronowski, Specification Engineer  
 M. L. Jacobs, Project Coordinator  
 R. B. Johnson, Mechanical Project Engineer  
 E. A. Kaczmariski, Control & Instrumentation Engineer  
 C. N. Krishnaswamy, Assistant Chief Structural Engineering Specialist  
 R. G. Kuhne, Supervisor Technical Support Group  
 L. S. Lettow, Head Mechanical Specifications Division  
 J. A. Patel, Supervising Design Engineer  
 T. G. Ryan, Assistant Chief Structural Design Engineering  
 J. M. Scannicchio, Specification Writer Structural  
 H. L. Schmidt, Head Electrical Specification Division  
 G. L. Sensmeier, Control & Instrumentation Project Engineer  
 T. Singh, Supervising Structural Engineering Specialist  
 A. J. Skale, Quality Assurance Coordinator  
 J. P. Wittenauer, Electrical Engineer

B. Action on Previous Inspection Findings

1. (Closed) Unresolved Item (Report No. 79-01): Project procedures for project 4536 do not assign responsibility for resolution and/or close out of suppliers QA Program deficiencies identified by Sargent & Lundy Engineers. Project 4536 Outline of Procedure SL-3356 has been revised to clearly spell out that Baldwin Associates has the responsibility for resolution and/or close out of suppliers QA Program deficiencies identified by Sargent & Lundy Engineers.

C. Design Corrective Action1. Objectives

The objectives of this area of the inspection were to examine and verify that:

- a. Procedures have been established and implemented for identifying deficiencies of a significant or recurring nature, determining the cause of the deficiencies, and initiating corrective action to prevent recurrence.
- b. Deficiencies and the corrective action are reported to appropriate levels of management.

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- c. Followup action is taken to assure timely completion of corrective action of a deficiency when resolution is not completed immediately.
- d. The design process and verification procedures are reviewed and modified as necessary where a significant design change is necessary due to incorrect design, or in the case of recurring deficiencies.

2. Method of Accomplishment

The preceding objectives were accomplished by an examination of:

- a. Sargent & Lundy Topical Report SL-TR-1A, Revision 5.
- b. Chapter 17 of the Preliminary Safety Analysis Report (PSAR) for Clinton Power Station, Amendment 21.
- c. Chapter 17 of the Preliminary Safety Analysis Report (PSAR) for Byron/Braidwood Stations, Amendment 5.
- d. Implementing procedures to satisfy quality assurance program commitments and to satisfy the intent of the objectives section. These procedures are:
  - (1) General Quality Assurance Procedures
    - GQ-3.06, Revision 1, Sargent & Lundy Standards
    - GQ-3.07, Revision 4, Sargent & Lundy Drawings
    - GQ-3.08, Revision 4, Design Calculations
    - GQ-3.13, Revision 5, Engineering Change Notices
    - GQ-4.01, Revision 7, Procurement Specifications
  - (2) Outline of Procedure for Clinton Power Station - Units 1 and 2 - Illinois Power Company, Reference No. SL-3356, Revision 17.
  - (3) Clinton Project Instructions
    - PI-CP-003, Revision 4, Processing a Baldwin Associates Field Change Request (FCR) or Nonconformance Report (NCR).
    - PI-CP-004, Revision 5, Control of Clinton Engineering Change Notice (ECN)
    - PI-CP-005, Revision 0, Control and Processing of a Nonconformance.

- (4) Byron/Braidwood Project Instruction PI-BB-13, Revision 1, Procedure for Processing Commonwealth Edison Company FCR's.
- e. Documents to verify implementation of Quality Assurance Program commitments and to satisfy the intent of the objectives section. The documents are as follows.
- (1) Quality Assurance Active Records Index, Clinton 1, dated 9/27/79.
  - (2) Drawing List Structural Department - Byron/Braidwood Units 1 & 2, dated 8/30/79.
  - (3) Foreign Drawing Status Program, Complete List of Structural Drawings, Project 4391 (Byron), dated 6/30/79.
  - (4) FCR #537 dated 10/2/78 covering drawing M1205 - Byron/Braidwood.
  - (5) FCR #751 dated 4/19/79 covering drawing M543-1 - Byron/Braidwood.
  - (6) FCR #1066 dated 9/8/79 covering drawing 6/208-0-3312M - Byron/Braidwood.
  - (7) FCR #38 dated 8/2/76 covering specification F2722 - Byron/Braidwood.
  - (8) FCR #816 dated 8/11/77 covering drawing A31-1000-13A - Clinton.
  - (9) FCR #1273 dated 12/15/77 covering specification K2882 - Clinton.
  - (10) FCR #1414 dated 4/10/78 covering specification K2864 - Clinton.
  - (11) FCR #2160 dated 4/17/79 covering drawings M06-1052 - and M06-1000 - Clinton.
  - (12) FCR #2911 dated 9/20/79 covering drawing C11-28-R044 - Clinton.
  - (13) FCR #2917 dated 9/21/79 covering specification K2944 - Clinton.
  - (14) NCR #666 dated 8/30/77 covering a LPCS Pump Motor with single phase 115 V heater in place of 3 phase 460 V.
  - (15) NCR #2027 dated 5/1/79 covering an incorrectly installed embedded plate.

- (16) NCR #1885 dated 3/13/79 covering an incorrect installation of two penetrations.
- (17) NCR #2459 dated 9/5/79 covering holes drilled oversized.
- (18) ECN #634 dated 4/30/78 covering a change to specification K2866B.
- (19) ECN #853 dated 10/16/78 covering a change to specification K2904.
- (20) ECN #1001 dated 2/27/79 covering a change to drawing 527-1983L.
- (21) ECN #1204 dated 7/28/79 covering a change to drawing M06-1076-7.
- (22) Design Calculation No. 13-26DG00 - Control Building General Design Main Floor, Revision 0 and Revision 1.
- (23) Calculation No. SD-Q12-RT02 - Information for Suppression Pool Dynamic Loading Analysis, Revision 4 and Revision 5.
- (24) Drawing M-546 Sheet 4, Revision K - Chemical and Volume Control System.
- (25) Drawing M-4037-1AF, Revision B - Control Logic Diagram, Auxiliary Feedwater Pumps.
- (26) Drawing M-2535A, Revision B - Containment Spray Auxiliary Building.

### 3. Findings

- a. There were no deviations or unresolved items in this area of inspection.
- b. A review of the procurement specifications identified in section I.C.3.c of the 79-02 report showed that the present objectives of S&L General Quality Assurance Procedure GQ-4.01 (Procurement Specifications) are being met in regard to assuring that all individuals required to comment have commented.
- c. S&L General Quality Assurance Procedure 3.06 (Standards) has a requirement that Sargent & Lundy standards shall be reviewed at least every five years or as required by changes in government or industry codes and standards. The inspector reviewed the S&L program for assuring these reviews are performed as scheduled. The

program is computerized and readily identifies specifications requiring review. The inspector did not have time to verify that all required safety related reviews were being completed within the five year period. S&L is reviewing this program to assure all safety related standards meet this requirement. The inspector will further review this matter during the next inspection.

D. Exit Meeting

A meeting was conducted with management representatives at the conclusion of the inspection on October 19, 1979. In addition to the individuals indicated by an asterisk in the Details Sections, those in attendance were:

L. E. Ackmann, Director of Services  
W. G. Hegener, Manager Mechanical Department  
D. C. McClintock, Manager Electrical Department  
J. M. McLaughlin, Manager Structural Department  
J. E. McFarland, Head, Quality Assurance Division  
H. S. Taylor, Assistant Head, Quality Assurance Division

The inspector summarized the scope and findings of the inspection for those present at the meeting. Action taken to close a previous inspection finding was also discussed. Management representatives acknowledged the statements of the inspector.

DETAILS SECTION II

(Prepared by J. M. Johnson)

A. Persons Contacted

- A. Ashoff, Administrative Assistant
- R. Barnowski, Training Coordinator, Mechanical Design & Drafting
- P. DeBlake, Senior QA Instructor
- \*A. P. Gillis, Senior QA Coordinator
- J. W. Kamm, Supervisor, Physical Security
- D. C. Kmeic, Personnel Administrator
- T. C. Longlais, Chief Structural Design Engineer
- A. J. Skale, Project Quality Coordinator
- J. J. Talamo, Senior QA Auditor
- \*S. A. Zych, Head, QC Division

\*Denotes those present at exit meeting.

B. Training1. Objectives

The objectives of this area of the inspection were to verify that procedures have been established and implemented that provide for:

- a. Formal indoctrination and training or retraining programs for new employees and reassigned employees.
- b. Training of inspection, examination and testing personnel that provides for:
  - (1) Indoctrination with the technical objectives of the project, the codes and standards to be used; and the quality assurance elements that are to be employed.
  - (2) On the job participation through actual performance of processes, tests, examinations and inspections.
  - (3) Testing the capability and proficiency of personnel who perform nondestructive examinations.
  - (4) Retraining and recertification if evaluation of performance shows individual capabilities are not in accordance with specified qualifications.
  - (5) Records of training received by each person including applicable certification of qualification and results of tests.

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- c. Training of audit personnel, including technical specialists, that provides for:
  - (1) Orientation with applicable standards and procedures.
  - (2) General training in audit performance including fundamentals, objectives, characteristics, organization, performance and results.
  - (3) Specialized training in methods of examining, questioning, evaluating, documenting specific audit items, and methods of closing out audit findings.
  - (4) On the job training, guidance, and counseling under direct supervision of an experienced, qualified auditor to include planning and performing audits; reporting and followup action; and review and study of codes, standards, procedures, instructions, and other documents related to QA and QA program auditing.
- d. Training programs for other personnel performing quality related activities that include:
  - (1) A description of quality assurance material to be presented and method of presentation.
  - (2) Schedules for conducting the training sessions.
  - (3) Identification of individuals by job description or titles or groups required to attend sessions.
- e. Documentation of attendance and retention of other applicable records for all formalized training accomplished.

## 2. Method of Accomplishment

The preceding objectives were accomplished by an examination of:

- a. Sargent & Lundy Topical Report No. SL-TR-1A, Section 00.00, Introduction (including commitments to Regulatory Guides and ANSI Standards), Sections 01.00, Organization and 02.00, Quality Assurance Program (which include indoctrination and training commitments), Section 09.00, Control of Special Processes (requiring training, qualification and certification for personnel reviewing or providing surveillance over special processes), and Section 18.00, Audits (requiring training and experience qualification for auditors). These were examined to determine program commitments.



- b. Sargent & Lundy Quality Assurance Procedures, numbers 1.04 (Employee Experience Records and Qualification Statements), 2.04 (Quality Assurance Training), 2.05 (Technical Training), 2.07 (Project Instruction Training) and 18.02 (Qualification of Auditors) to determine procedural requirements.
- c. Sargent & Lundy Quality Assurance Division Procedures, GQ 2.04 (Quality Assurance Training), GQ 1.03 (Position Descriptions), GQ 2.07 (Project Instructions Training) and GQ 18.02 (Qualification of Auditors) to determine procedural requirements.
- d. QA Division Internal Procedures Manual, Section III, Auditing; also, General Division Internal Procedures numbers GDIP-7 (QA Friday Morning Meetings), GDIP-8 (QA Department Training), and procedures TSIP 1, 2, 3, 4, 5, 6, and 7 concerning QA training of personnel performing quality-affecting activities. These were reviewed to determine detailed instructions and requirements.
- e. Quality Control Procedure 2.1, Non-Destructive Examination (NDE) Qualification, and procedures for qualification for each NDE method to determine requirements for training, testing qualification and certification.
- f. Mechanical Engineering Department Standard, ME 1.14, Technical Training Program, to determine requirements.
- g. Structural Engineering Department Standard, SAS 24, Technical Training, to determine requirements.
- h. QA Auditor training records:
  - (1) Auditor training programs, approved by the Head, QA Division, for two lead auditors.
  - (2) Position descriptions.
  - (3) Records of examinations for two auditors.
  - (4) Records of auditor qualifications for five auditors, including yearly evaluations as applicable.
  - (5) Auditor Experience Records for two auditors.
- i. QA Training records for personnel performing activities affecting quality:
  - (1) Records of training requirements (including procedures identified as applicable to the person's job and requiring

(training), attendance at classes, and examination results for seven quality-affecting personnel.

- (2) Review of examination records for two persons.
  - (3) Review of selected course outlines.
  - (4) Training records for personnel from Electrical Design and Drafting, Mechanical Design and Drafting, and Structural Design and Drafting Divisions. Records show required training, including periodic proficiency testing, classes scheduled and rescheduled as necessary, tests scheduled, results, and rescheduling as necessary, and current training status of each individual.
  - (5) Quarterly training memoranda sent to departments/divisions identifying personnel needing training, delinquent in training, and those who did not take or failed examinations, including the request that those who failed examinations be taken off of safety-related work.
  - (6) Discussion and review of records of work assignments in Mechanical Design and Drafting, Electrical Design and Drafting, and Structural Design and Drafting Divisions for approximately thirty (30) persons who had been scheduled for but had not completed QA training (because of missing scheduled classes, missing exams or failing exams). This was to determine whether these persons had been or still were assigned to nuclear projects and/or performing safety-related work. It was noted that some but not all had not performed safety-related work or had been removed from safety-related work.
- j. Training, qualification and certification records of personnel performing review of Non-Destructive Examination (NDE) procedures and practices:
- (1) Certificates of Qualification to Level III for three (3) persons, in the following NDE methods: RT (Radiography); MT (Magnetic Particle); UT (Ultrasonic Testing) and PT (Liquid Penetrant Testing).
  - (2) Examinations for two of the above persons.
  - (3) Yearly eye examination records for 3 of the above persons.
  - (4) NDE Training Course Rosters.

k. Project Instructions training records:

- (1) Records of training dated April 4, 1979, for one project for Project Instructions numbers PI-CP-003, revision 4, and PI-CP-004, revisions 4 and 5 (differences between), including a list of attendees and records of transmittal of training notes to those who missed the meeting.
- (2) Records of training dated June 28, 1978, for one project for procedure PI-CP-003, revision 3, including attendees and transmittal of training notes to those absent.

1. Records of Technical Training for one department:

- (1) Annual 1979 list of personnel (primarily new employees) in Electrical Department requiring training. This list showed approximately 200 persons, each of whom required only on-the-job training which is not documented. No prior lists were available.
- (2) Course outlines and records of attendees for technical courses available to selected personnel. These courses included: Power Plant Fundamentals; Power Plant Fundamentals for Mechanical Design and Drafting Division; Automatic Controls; Industrial Codes and Standards; Piping Supports; Professional Engineer Refresher Course. It was noted that one of these courses has not been offered since 1977, and several had not been given yet this year.
- (3) Outline and attendees for technically - oriented presentation by a valve manufacturer.

3. Findings

- a. In this area of the inspection, one deviation was identified. (See Notice of Deviation). No unresolved items were identified.
- b. Concerning Notice of Deviation Enclosure, please note the following:
  - (1) Relative to this finding, Quarterly training update memoranda identify personnel who have been indicated as requiring QA training but have missed scheduled sessions, missed exams or failed exams. Further examination indicated that some have

been employees for a substantial period of time and appear to be performing quality-related work.

- (2) A deviation similar in nature was identified in Inspection Report 77-01.
- c. Sargent & Lundy Internal Audit No. G-65 dated November 21, 1978 issued Corrective Action Request (CAR) No. 242, identifying the fact that there is no required documented technical training for Electrical Department new employees and that lists of department personnel requiring training had not been generated annually as required by procedures. Audit No. G-83 dated October 4, 1979 identified the status and actions in progress to correct this deficiency. Because Sargent & Lundy has already identified these problems and corrective action is in process, no deviation was written by the Inspector.
- d. It was noted that the course material for Industrial Codes and Standards is based on the 1974 ASME Code only, and does not include reference to the changes made in the revised 1977 Code. It was indicated to the Inspector that this and other courses are being updated. No deviation was written (although procedures require update of course materials) because the course is optional and has not been offered since 1977.