U. S. NUCLEAR REGULATORY COMMISSION

REGION III

Report No. 50-456/84-21(DRP); 50-457/84-20(DRP)

Docket Nos. 50-456; 50-457 Licenses No. CPPR-132; CPPR-133

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

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

Inspection At: Braidwood Site, Braidwood, Illinois

Inspection Conducted: September 4 through October 5, 1984

Inspectors: L. G. McGregor

R. D. Schulz

Approved By: P R Pelke for
W. L. Forney, Chief
Projects Section 1A

11/16/84
Date

Inspection Summary

Inspection on September 4 through October 5, 1984 (Report No. 50-456/84-21(DRP); 50-457/84-20(DRP))

Areas Inspected: Routine, unannounced safety inspection of licensee actions on previous inspection findings; licensee actions on 50.55(e) reports; plant tours; material traceability verification program; welder qualification; heating, ventilation and air conditioning systems; reactor coolant piping; preoperational test procedure reviews; preoperational test performance; radiographic incident; cleanliness inspections of piping and safety-related components; and design changes to reactor coolant pump lateral supports. The inspection consisted of 233 inspector-hours onsite by two NRC inspectors including 28 inspector-hours onsite during offshifts.

Results: Of the twelve areas inspected no items of noncompliance or deviations were identified in eight areas; one item of noncompliance was identified in each of the remaining areas (paragraph 2, failure to properly perform weld inspections and failure to perform visual weld examinations; paragraph 5, failure to report minimum wall defects; paragraph 12, failure to perform cleanliness inspections; and paragraph 13, failure to adequately complete a plant re-design).

DETAILS

1. Persons Contacted

Commonwealth Edison Company (CECo)

*M. Wallace, Project Manager
*C. Schroeder, Licensing and Compliance Superintendent
*D. Shamblin, Construction Superintendent
*T. Quaka, Quality Control Supervisor
*D. O'Brien, Assistant Station Superintendent
G. Groth, Lead Mechanical Engineer
B. Tanouyi, Engineer
S. Hunsader, Quality Assurance Supervisor
*G. Fitzpatrick, Assistant Manager Quality Assurance Corporate
M. Curinka, Engineer
R. Wrucke, Licensing Engineer
*C. Gray, Project Construction Supervisor
M. Gorski, Engineer
*T. Keith, Station Health Physics
R. Tate, Quality Assurance Engineer
*D. Boone, Project Construction Field Engineer
*J. Witherspoon, Project Construction Field Engineer
*C. Mennecke, Project Construction Field Engineer
*E. Wendorf, Project Construction Field Engineer
*W. Bruns, Staff Assistant

Phillips Getschow Company (PGCo)

*T. G. O'Connor, Site Manager
*J. Carlson, Quality Control Supervisor
L. J. Butler, Assistant Quality Control Supervisor
*G. Borski, Quality Assurance Manager
J. Stewart, Project Engineer
*G. Galloway, Assistant Project Engineer
S. Hamilton, NDE - Level II
R. Hamilton, Welding Supervisor

G. K. Newberg Company

*D. Craven, Project Manager
J. Hairston, Quality Assurance Manager
*F. Replogle, Quality Assurance Engineer

L. K. Comstock and Company, Inc. (LKC)

*D. Ovens, Assistant Project Manager
*I. Dewald, Quality Control Manager
L. Seese, Assistant Quality Control Site Manager
K. Worthington, Assistant Quality Control Manager
M. Lechner, Lead Inspector

K. Vilt, Office Manager
T. Voght, Corporate Welding Engineer
T. Simile, Welding Engineer

Pullman Sheet Metal

D. Grant, Site Quality Assurance Manager
G. Minor, Quality Control Supervisor
T. Brooks, Quality Assurance Director
M. Farner, Quality Assurance Supervisor

*Denotes those personnel attending the exit interview.

2. Licensee Action on Previously Identified Items

Two issues (unresolved item 456/84-09-10; 457/84-09-10, and open item 456/84-09-08; 457/84-09-08) were presented to the inspector for closure, but subsequent investigation by the inspector revealed that these items were not ready for closure due to the lack of documentation. The licensee is re-evaluating these two issues.

a. Unresolved Items Resulting in Violations

(Closed) 456/84-08-03; 457/84-08-03: The inspector identified in Inspection Report 84-08, that some visual weld inspections had been performed after the weld joints were painted. The NRC inspector requested the licensee to investigate this issue and determine the number of welds inspected after being painted. Subsequent review determined that 120 fillet welds had been inspected for acceptability after they were painted and were identified in visual inspection reports 709VW, 711VW, 713VW, 716VW, and 717VW. This is a violation of 10 CFR 50, Appendix B, Criterion IX and the AWS D1.1, Structural Welding Code (456/84-21-01; 457/84-20-01). The inspector also stated in Inspection Report 84-08 that when a full penetration weld was nondestructively examined, it appeared that the final visual weld inspection was waived. Subsequent review during this inspection period verified that final visual weld inspections had not been performed for full penetration welds completed prior to May 1, 1984, as required by Structural Steel Specifications F/L-2735 and F/L-2722 and AWS D1.1, 1975; however, the welds were accepted based on other nondestructive examinations such as magnetic particle or liquid penetrant tests. Visual examinations are intended to identify factors such as correct location, size, and length of welds or if any unspecified welds have been added which may not be identified by other methods of nondestructive examination. Furthermore, nondestructive examinations, such as ultrasonic, magnetic particle, or liquid penetrant, do not contain acceptance criteria that meet the requirements of AWS D1.1, Structural Welding Code, Section 3, Section 6, and Section 8.15, with regard to visual inspections. Failure to perform visual inspections is a violation of 10 CFR 50, Appendix B, Criterion IX and the AWS D1.1, Structural Welding Code (456/84-21-02; 457/84-20-02).

b. Open Items

(Closed) 456/84-06-04; 457/84-06-04: Installation and inspection documentation was being recorded on superseded pipe support drawings. Procedure QCP-B23, Installation And Inspection of Pipe Supports, was revised and the revision does not allow the recording of documentation on superseded pipe support drawings. Training was conducted for quality control, engineering, and craft supervisory personnel with regard to the revised procedure.

(Closed) 456/84-13-06; 457/84-13-06: The inspector was unable to identify a weld detail for the spent fuel storage racks. The weld detail has been identified on drawing 5106M2001 Revision 7, and the inspector examined six spent fuel storage racks and found the weldments to be in accordance with the weld detail.

3. Licensee Action on 50.55(e) Items

a. (Closed) 77-03: As a result of tests of Raytheon RC 747D integrated circuits, a failure mechanism was identified by Westinghouse affecting the 7300 Series Process Control System for the Byron and Braidwood Nuclear Stations. The failure mechanism is the result of microscopic conductive particles, attributable to manufacturing processes, that could, during vibration, lodge in a short circuit configuration so as to render the integrated circuit inoperable.

The Braidwood equipment was in storage when this 50.55(e) was issued. Subsequently, Commonwealth Edison requested Westinghouse to undertake a reverification of all affected printed circuit cards for Braidwood with respect to any Raytheon integrated circuits installed thereon. Westinghouse reinspected all of the applicable printed circuit cards and replaced all Raytheon type RC 747D integrated circuits with acceptable integrated circuits. Spare parts have not been received for the 7300 Series Process Control System which should preclude installation of any Raytheon RC 747D integrated circuit cards.

The inspector has reviewed the evaluation and corrective actions by Westinghouse and Commonwealth Edison and determined that these actions appear to be adequate in resolving this potential deficiency.

b. (Closed) 79-03: Westinghouse advised the NRC in November 1979 of a deficiency in the rod drop analyses which had been performed for certain plants. Commonwealth Edison notified the NRC, on November 29, 1979, that this issue was applicable to the Byron and Braidwood Nuclear Stations and was a 10 CFR 50.55(e) reportable item. Since the Byron and Braidwood units were a few years away from receiving their operating licenses, Commonwealth Edison did not take any action on these units prior to the issuance of the Westinghouse topical report (WCAP-10297(P)) containing long term solutions. This topical report on dropped rod methodology for flux rate trip plants was received by the Division of Licensing, Office of Nuclear Reactor Regulation in March 1982. The NRC staff has reviewed this report and issued an SER dated March 1983.

Commonwealth Edison has revised the Byron/Braidwood FSAR pages which incorporate the results of the reanalysis of rod drop transients using the revised methodology. The staff now considers the Westinghouse rod drop issue to be resolved.

c. (Closed) 82-02: Cooper Energy Services has advised the NRC, by letter on February 1, 1982, that the emergency diesel generators at Byron and Braidwood each contain a defective strainer basket located in the lube oil strainers. Performance testing indicated that the strainer mesh disintegrates after it tears and could then pass through the engine bearings. If this were to occur, one or more engine bearings would probably fail and the unit would be incapable of performing. Cooper Energy Services shipped redesigned and qualified replacement baskets to the site.

The Unit 1 diesels have the new baskets installed in accordance with Field Change Orders IDG 534 and IDG 535. The replacement of the diesel lube oil strainer baskets for the Unit 2 diesels has not been completed. The licensee will, however, complete this corrective action before these diesel generators receive their initial test run.

4. Plant Tours

The inspectors observed work activities in-progress, completed work, and plant status during general inspections of the plant. Observation of work included structural high strength bolting, reactor coolant pipe welding, structural welds, flange bolt-ups, and cable trays in the containments and auxiliary building. Particular note was taken of material identification, nonconforming material identification, housekeeping, and equipment preservation. Craft personnel were interviewed as such personnel were available in the work areas.

During one of the tours, it was noted that 1 1/2" S/80 pipe, Heat No. HD7760, was being used as scaffolding braces for the structural steel contractor. Further investigation revealed that the piping contractor had been releasing 1 1/2" S/80 pipe to the structural steel contractor to be used for scaffolding. Heat No. HD7760 was classified as ASME Boiler and Pressure Vessel Code Section III, Subsection NC, Class 2. The inspector discovered that this pipe was recently placed on hold, due to possible minimum wall violations, and was concerned that the pipefitters may obtain this pipe from the structural steel contractor and install it in safety-related systems. Subsequently, the inspector learned that the piping contractor had removed this heat number from their acceptable material logs, which are issued to the piping quality control inspectors who examine and approve the installation of safety-related piping. Therefore, the pipe identified by heat number HD7760 could not be installed in safety-related systems and the inspector considers this issue closed.

No violations or deviations were identified.

5. Material Traceability Verification Program

The material traceability verification program was instituted as a result of an NRC finding identified in Inspection Report Number 83-09, which stated that a documented inspection program to verify correct material installation had not been implemented for 2" and under safety-related piping prior to July 1983, and for over 2" safety-related piping prior to November 1982. As a result of this finding the licensee decided to inspect all the piping installed prior to the above applicable dates in order to determine the acceptability of piping material installations. As of September 24, 1984, 56 percent of the field inspections have been accomplished and 29 percent of the (documentation) office reviews have been done. Completion of the material traceability verification program is expected by February 28, 1985. The program involves the dedication of nine personnel in the office and 24 personnel in the field. Results of the over 2" safety-related piping inspections were not yet available for review but detailed below are the results of the 2" and under safety-related piping inspections as of September 24, 1984:

- Total number of items inspected - 2123
- Total number of items acceptable - 1625
- Total number of items rejectable - 1
- Total number of items requiring further analysis - 497

Of the 497 items requiring further analysis, 463 items do not have any hardware identification markings, but these items are associated with stores requests. The 2123 items represent 16.8% of the small bore piping included in the material traceability verification program.

While reviewing the material traceability verification program the inspector reviewed Phillips Getschow Company Nonconformance Reports Number 1615 and Number 1847. Nonconformance Number 1615 stated that 8" S/120, 7/8" wall, SA-106 Gr. B pipe, heat number 93739, received on Receiving Inspection Report number 15253, was found to be under the minimum wall requirement of .629 inches. Two feet of the ten foot length were found to be .620 inches by digital ultrasonic measurement.

10 CFR 21.21 states in part that each individual, corporation, partnership or other entity subject to the regulations in this part shall adopt appropriate procedures to assure that a director or responsible officer is informed if the construction or operation of a facility, or activity, or a basic component supplied for such facility or activity contains a defect.

Piping Contractor Procedure, QAP-110, Reporting of Defects and Noncompliance, Revision 1, requires that a noncompliance or a basic component or activity supplied to the owner of a licensed facility shall be reported to the owner on Exhibit 1, Form PG/QA-15-7, by the Manager - Quality Assurance under the requirements of 10 CFR 21. The procedure further stated that the scope of the procedure included notifying the owner of a suspected deviation or noncompliance and then the owner had the responsibility for evaluation and corrective action.

The minimum wall defect was not reported to the owner in accordance with Procedure QAP-110. This is in violation of 10 CFR 50, Appendix B, Criterion V (456/84-21-03; 457/84-20-03). The significance of this issue is that the supplier was not notified of the defect and therefore the supplier did not have the information to notify other nuclear facilities which may have received the pipe. After the NRC inspector identified this issue the licensee notified the supplier.

Nonconformance number 1847 stated that a piece of 3 1/2" carbon steel pipe was stamped with two heat numbers, 67343 and 38453. The pipe was classified as ASME Boiler and Pressure Vessel Code, Section III, Subsection NC, Class 2. The piping contractor determined that heat number 67343 was the correct number, but there was no documented evidence justifying heat number 67343. The NRC inspector determined, by measuring the wall thickness and length of the pipe, that heat number 67343 was the correct number. Heat number 38453 was for schedule 40 pipe and heat number 67343 was for schedule 80 pipe and the pipe was schedule 80. The schedule 80 pipe also matched the length of the pipe for heat identified on the receipt inspection report. The inspector considers this issue closed, but advised the piping contractor to document all justifications for accepting material in the material traceability verification program.

Numerous ASME nameplates were found to be missing from piping subassemblies and as a result a 10 CFR 50.55(e) report, assigned number 84-12, was verbally reported to the NRC on July 24, 1984. A thirty day written report, dated August 24, 1984, stated:

"Description of Deficiency

ASME NPT symbol nameplates were removed from piping subassemblies without proper controls and documentation. Nondestructive examinations required by ASME Section III of the nameplate removal areas were not subsequently performed.

Analysis of Safety Implications

The piping systems involved are ASME Section III and are Safety Category I. Lack of required nondestructive surface examinations and wall thickness measurements could potentially result in allowing conditions to exist that do not meet the design requirements. This could potentially allow piping defects to exist which may impact on the safety function of the systems involved.

Corrective Action Taken

Commonwealth Edison Company NCR No. 639 and Phillips Getschow Company NCR No. 1783 have been generated to document this item and track its resolution. Phillips Getschow Company will initiate a program to determine the total number of nameplates removed, identify the spools, locate nameplate removal areas, and perform the required examinations. A followup report concerning this issue will be submitted by October 15, 1984."

Further investigation by the NRC inspector resulted in the discovery of a letter from a quality control engineer to the piping quality control supervisor on July 24, 1984, which stated: "Of the 332 Name Plates in PGCo QC Records Vault, 8 have Field Change Orders (FCO) to remove them, 39 have Nondestructive Evaluation (NDE) Reports. There is no documented evidence of material identity transfer prior to the removal. 30 sample packages were field walked to locate evidence of the removal area, 7 locations were found, 23 had no evident removal location.

It should also be noted that, to date, the on going PGCo Material Traceability Verification Program has identified 60 spools without nameplates of which 34 are in the Records Vault and 26 cannot be located. These spools have not been inspected to locate the area of removal."

The licensee assumed in the 10 CFR 50.55(e) report that all the correct ASME Nameplate Spools were installed and the potential deficiency concerned only nameplate removal areas. It appears that a potential deficiency also exists with regard to some incorrect spools being installed, which never had ASME Nameplates.

The inspector brought this fact to the attention of the licensee for evaluation. This issue will be reviewed by the NRC under the scope of the material traceability verification program.

6. Welder Qualifications - Electrical Contractor

The electrical contractor's welder qualification program was reviewed for compliance with Section 5 of the AWS D1.1, Structural Welding Code, 1975. Ten welders were selected from the welders symbol log. The ten welders randomly selected were identified by the following symbol numbers: #9, #71, #131, #139, #11, #5, #81, #15, #18, and #19. The welders were all qualified to the requirements of AWS D1.1, Section 5, Table 5.26.1, with the exception of #11, and were tested in accordance with at least one of the following approved methods:

Type of Weld	Thickness	Bend of Tes	Macroetch Test
Groove	3/8" plate	(1) face, (1) root	---
Groove	1" plate	(2) side	---
Fillet	3/8" plate	(1) T-joint break	(1)
Groove	6" S/80 pipe	(4) side bend	---

The welder, identified by symbol #11, had failed 4 out of his last 5 qualification tests. The welder had failed shielded metal arc welding tests on May 18, 1981, and May 20, 1981, and finally passed on May 21, 1981, and was then allowed to weld in the field on electrical installations. The welder re-tested on May 24, 1983, and May 25, 1983, for shielded metal arc welding and the records indicate he again failed twice. After failing the second time, the welder terminated his employment. The NRC inspector has requested the licensee to evaluate the electrical contractor's justification for assuming that this welder produced acceptable multi-pass welds. Pending licensee evaluation, this issue will remain open (456/84-21-04; 457/84-20-04).

The welders were all qualified to the proper thickness range in accordance with AWS D1.1, Section 5, with the exception that some of the welders qualified in 1978 were tested on 6" S/80 pipe which qualified the welder for an unlimited maximum thickness, but only a .187 inch minimum thickness range. Numerous electrical welds have been completed on unistrut and cable pan with a thickness of only .105 inches, below the .187 inch minimum. The inspector has requested the licensee to analyze this discrepancy in relation to any safety significance. Pending licensee evaluation and NRC review, this issue will remain unresolved (456/84-21-05; 457/84-20-05).

Based on the findings discovered by the NRC, ten additional welders were randomly selected for review. The welders were identified by symbol numbers: #79, #186, #202, #262, #400, #402, #92, #97, #205, and #438.

All were qualified in accordance with the requirements of AWS D1.1, Section 5, including the proper thickness range.

No violations or deviations were identified.

7. Heating, Ventilation, and Air Conditioning (HVAC)

The HVAC contractor's quality assurance program, with regard to welding and installation controls, was reviewed for compliance to the AWS D1.1, Structural Welding Code and 10 CFR 50, Appendix B, Code of Federal Regulations. Procedures reviewed included:

- B9.2.F, Control of Welding Filler Metal, Revision 2
- B9.4.F, Installation Procedure, Revision 5
- B10.2.F, Visual Weld Inspection, Revision 5
- B10.3.F, Installation Inspection Procedure, Revision 5
- B10.4.F, Final Inspection, Revision 1

An in-process inspection was performed on a welder in the Unit 1 auxiliary building to verify that the welder was following the applicable welding procedure parameters. The welder was welding on the ventilation housing for the control room and was using a flux core arc welding procedure, identified as WPA-BF-12-F, Revision 2. The welder was following all of the welding procedure parameters and was subsequently interviewed by the inspector. The welder was knowlegeable in all aspects of the welding procedure and appeared to be properly trained in the quality assurance program procedures.

Two HVAC installations were examined in the Unit 1 auxiliary building. The installations were control room ventilation housings (Structures 192 and 200) which were identified on drawing M-1328. The NRC inspector checked for dimensional tolerances, correct configuration, acceptable welding, and traceability of components.

No violations or deviations were identified.

8. Reactor Coolant Piping

A reactor coolant piping line was examined in the Unit 1 containment. The line was classified as ASME Boiler and Pressure Vessel Code, Section III, Subsection NB, Class 1 and was a 3" S/160 SA-376 TP304 piping material specification run in accordance with design specification 1540BB. The line was identified on drawing 1C-RC-7 Revision 0 and included spools RC-7-1 and RC-7-2. Field examinations included the identification of welder symbols and weld numbers, material identification markings, configuration, clearances, and line location in accordance with the as-built drawing. The NRC inspector discovered that spool RC-7-2, in the area of field weld #2 and shop weld #9 was in contact with a structural beam. There was not any clearance allowing movement of the line. The inspector brought this issue to the attention of the licensee for evaluation. Pending licensee evaluation and NRC review, this issue will remain open (456/84-21-06; 457/84-20-06).

After the line was walked down the NRC inspector reviewed the following associated documentation to determine compliance with regulatory requirements and agreement with the actual hardware installations.

- Spool, NPP-1 Code Data Reports
- Welding Filler Metal Material Certifications including Ferrite Testing
- Piping Material Certifications
- Weld Numbers and Welder Qualification Records
- Welding Procedure Qualification Records
- Nondestructive Examination Reports
- Nondestructive Inspector Level II and III Qualifications
- Quality Control Inspection Records including Fit-up, Root Weld, Purge, Pre-Heat, Interpass Temperature, and Final Visual Weld Examinations
- Material Requisitions
- Field Change Orders

Four items did not have any material markings and the inspector discovered that all four items had been identified and documented by piping quality control inspectors under the scope of the material traceability verification program.

A rod issue station in the auxiliary building was inspected and all the welding rod was properly stored. The storage ovens were calibrated and thermometers were attached to the ovens. The ovens were monitored by both craft personnel and quality control personnel for assurance of proper temperature maintenance.

No violations or deviations were identified.

9. Preoperational Test Procedure Review

The inspector reviewed the following preoperational test procedures against the FSAR, SER, proposed Technical Specifications and Regulatory Guide 1.68:

. BWPT-CV-11 - Chemical Volume Control, VCT and Charging Pumps
. BWPT-FC-10 - Fuel Pool Cooling and Cleanup
. BWPT-FW-10 - Main Feedwater (Safety Related section)
. BWPT-SI-11 - Safety Injection Accumulators

No violations or deviations were identified

10. Preoperational Test Performance

The inspector witnessed the performance of portions of preoperational test procedure BWPT-SI-11, Safety Injection Accumulators, in order to verify that testing was conducted in accordance with approved procedures, independently verify the acceptability of test results and to evaluate the performance of personnel conducting the test.

The low pressure test (100 to 105 psig nitrogen) was satisfactorily completed on accumulator A with the high pressure test to be accomplished at a later date.

No violations or deviations were identified.

11. Radiographic Incident

On September 10, 1984, between the hours of 6:30 a.m. and 7:00 a.m., three Commonwealth Edison Rad-Chem Technicians violated a posted radiation area by passing through the personnel barriers which encompassed the area in which radiography was being performed. The outer perimeter of the radiation area was roped off and displayed the necessary radiation signs (see attachment 1) at all eight points of entry. The "radiation area" signs are constructed as described in 10 CFR 20.203 and were labeled with bold printing stating: CAUTION RESTRICTED, KEEP OUT RADIATION AREA. Within the radiation area and on the three accessible sides to the radiographers source, high radiation signs were conspicuously placed, (see attachment 1). When the individuals came across the restricted area, they continued through the barrier and on to the Health Physics Office. They returned to the restricted area, again disregarded the radiation barrier, but were challenged and stopped by the radiographers. When questioned as to why they violated a posted restricted area, they questioned the authenticity of the signs because they were not held in place by yellow and magenta rope. A radiation survey was immediately taken of the area where the men had traversed and a maximum reading of 3 mr/hr was obtained. The stay time in this area, which was shortened by the actions of the radiographer was approximately 15 seconds.

The Braidwood Plant Superintendent conducted personal interviews with each of the technicians to evaluate the circumstances and determine appropriate corrective action. The technicians had been recently selected and trained as Rad-Chem technicians and assigned to the Braidwood site. During the

CECO training emphasis was placed on radiologically controlled areas always being posted with signs and yellow/magenta barriers. Since the areas traversed by the technicians were not posted in the manner the technicians were trained the technicians thought someone was fooling around and that a controlled area did not exist. The Plant Superintendent emphasized to the technicians that you always adhere to radiological control signs regardless of the manner in which they are posted. Based upon these interviews and further evaluation it was determined that additional corrective action should be taken as discussed below.

Commonwealth Edison has requested Pittsburgh Testing Laboratory (contractor responsible for NDE testing) to use yellow and magenta rope to suspend their radiation signs when establishing restricted areas. This action will be consistent with material familiar to all Commonwealth Edison/Braidwood Station Employees. The NRC inspector requested Commonwealth Edison to inform their training department to explain the minimum intent of Federal Regulation 10 CFR 20.203 and 10 CFR 34.42 and that the regulations do not require a specific kind or color of material to support radiation exclusion signs or specify the type of material to be used to establish an exclusion perimeter.

Pittsburgh Testing Laboratory is conducting training for all contractor personnel to make them aware of radiation areas and the importance of strictly adhering to the radiation signs. Commonwealth Edison has started its Nuclear General Employee Training (NGET) for all of their employees. This NGET training will be mandatory training for all site workers in the near future.

12. Cleanliness Inspections of Piping and Safety-Related Components

NRC inspections identified safety-related piping systems and components which were completely installed without a quality assurance program to assure system cleanliness. Nonconformance reports identified numerous pieces of equipment which were not inspected, however, the licensee's corrective action was to waive the cleanliness inspections and "flush the system clean". This action resulted in initial flush periods of from three to five minutes because inline protective pump strainers would become completely plugged. A six-month flushing period was necessary to obtain cleanliness conditions for a portion of the Chemical Volume Control System (CVCS) necessary to support cold-hydro testing. Recently, a glass bottle was removed from a three-inch CVCS line, a borescope inspection of Unit 2 RHR cooler identified numerous foreign objects in the inlet water box, safety injection pump 1A has heavy rusting on the diffuser plate in the suction of the pump, safety injection pump 1B has its oil system extremely contaminated, and the diesel driven aux feedwater pump has rust, slag and foreign material in the suction of the pump. The necessary disassembly of these pumps, coolers, and oil systems has impacted the preoperational testing phase and are examples of the licensees failure to implement a quality assurance program to control the handling, storage, shipping, cleaning and preservation of material and equipment in accordance with work and inspection instructions to prevent damage or deterioration.

The failure to implement a Quality Assurance program to inspect safety-related components for internal cleanliness and failure to take corrective action when nonconforming conditions were reported is considered to be an item of noncompliance with 10 CFR 50, Appendix B, Criterion XVI (456/84-21-07; 457/84-20-07).

The licensee, has established an effective inspection program to evaluate these safety-related components. The program includes visible inspection of components where inspection ports are available, or when access can be obtained through a pipe or valve opening. A second visual aid is the use of a flexible borescope to gain access to more difficult areas. Verification of system design pressures and flows will be monitored for indication of potential fouling. Should it become necessary to inspect or clean systems which have been welded together, selective cutting will be used to gain access.

In consideration for the corrective action program established, which will assure system cleanliness and the cooperation extended by the licensee, a response to this item of noncompliance is not necessary.

13. Design Change to Reactor Coolant Pump Lateral Support

In April 1980, during the installation of the reactor coolant pump lateral supports, an interference problem between a box beam (B108BB2) and the embedment, to which the support brace was to be bolted, was documented on Field Change Request (FCR) No. 506. This same interface problem was noted on Engineering Change Notice (ECN) No. 1172 at Byron one year earlier. The interface problem was resolved by coping the bottom side of the box beam enough so that the reactor coolant pump brace No. W8X35 could be attached to its designed embedment. At Braidwood the relationship between the box beam and the embedment is so different, the reactor coolant pump support (W8X35) would virtually pass through the center of the box beam, thus the repair done at Byron could not possibly be duplicated at Braidwood. Because of this incorrect placement of the box beam and/or the embedment, a design change was initiated by Sargent and Lundy. The new design called for a 1 1/2" x 27" x 18" gusset plate to be welded to the lower side of the box beam and the reactor coolant pump support to be bolted to this gusset plate. As stated in the FSAR it was assumed that the massive secondary shield wall is sufficiently rigid, compared to the supports, that the embedments therein may be treated as rigid fixed ends for purposes of the analysis. The support is now attached to the box beam, which has greater temperature gradients than the concrete secondary shield wall and supports other fixed loads. The necessary records to support this design change, i.e. design review and approval; an analysis to support section 3.9.3.4.1.4 of the FSAR; the requirements of construction specifications No. L2797; requirements of the ASME Boiler and Pressure Vessel Code, 1974 Edition, Summer of 1975 addenda; Section III - Division 1, Subsection NA, Appendices I, XVII and F: Section III - Division 1, Subsection NF; material certification; installation procedures; qualified weld procedures; use of qualified welders; type and size of weld filler material; Quality Assurance approval and quality control inspections can be characterized as inadequate and in most areas nonexistent.

The installation of the newly designed reactor coolant pump support without assurance that special processes, including welding, heat treating and nondestructive testing are controlled and accomplished by qualified personnel using qualified procedures in accordance with applicable codes, standards, specificiations, and other special requirements is considered to be an item of noncompliance with 10 CFR 50 Appendix B, Criterion IX (456/84-21-08; 457/84-20-08).

14. Open Items

Open items are matters which have been discussed with the licensee, which will be reviewed further by the inspector, and which involve some action on the part of the NRC or licensee or both. Open items disclosed during the inspection are discussed in Paragraphs 6 and 8.

15. Unresolved Items

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

16. Exit Interview

The inspector met with licensee representatives (denoted under Persons Contacted) during and at the conclusion of the inspection on October 5, 1984. The inspector summarized the scope and findings of the inspection. The licensee acknowledged the information.

Attachment: Pittsburgh Testing Laboratory
Radiation Survey

ATTACHMENT 1

PITTSBURGH TESTING LABORATORY

RADIATION SURVEY

A SURVEY IS TO BE MADE ON EVERY RADIOGRAPHIC OPERATION

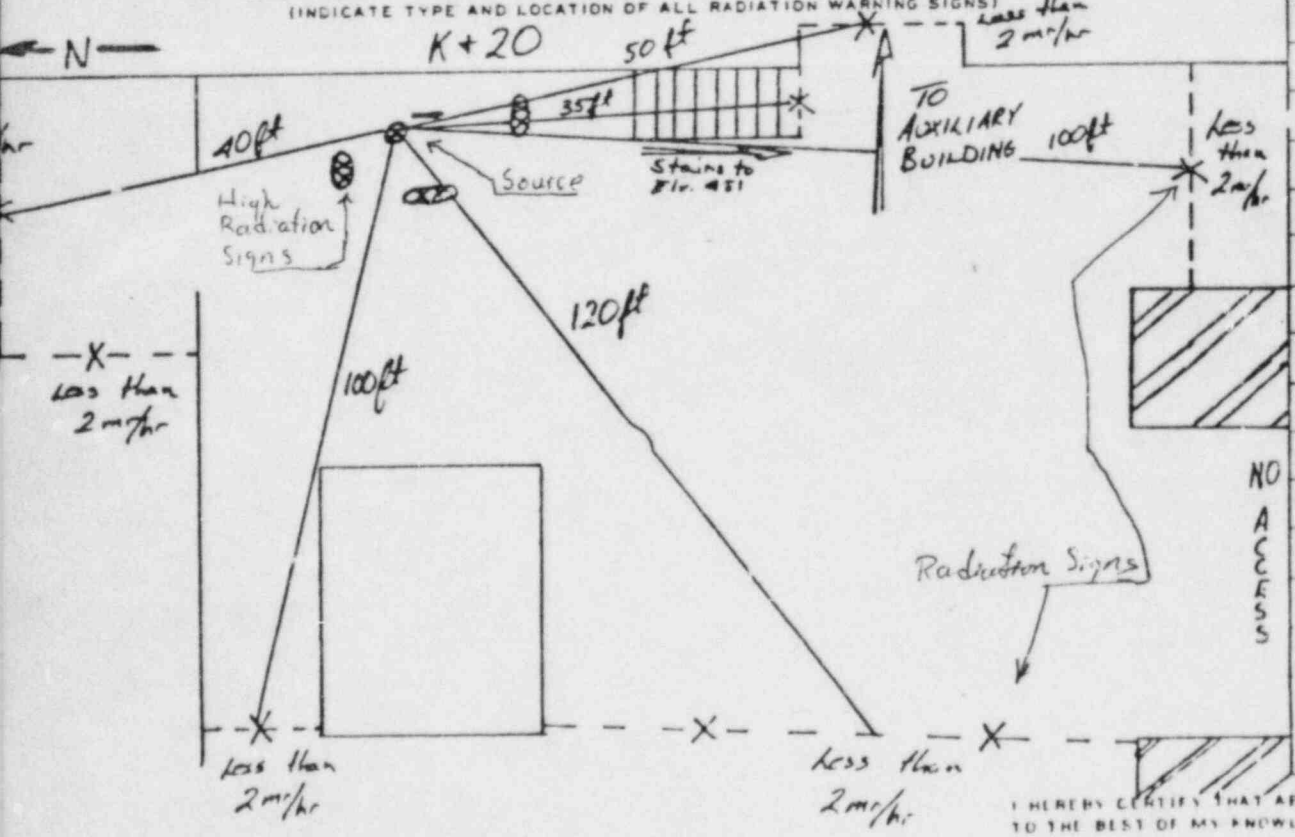
TYPE OF SOURCE: Ir 192
SOURCE STRENGTH: 88 curies
EXPOSURE DEVICE USED
(A) MAKE: Gamma (B) MODEL: Century
(C) SERIAL NO.: 1618
(D) DATE LEAK TESTED: 8-24-84
CALCULATED EXPOSURE TIME PER HR: 5min 30 seconds

SURVEY INSTRUMENT USED:
(A) MAKE: Radector
(B) MODEL: AGB-500 (C) SERIAL NO.: 562
(D) LAST CALIBRATED DATE: 7-24-84
(E) DATE LEAK TESTED: n/a

DATE: 9-10-84
JOB NO.: CH-3175
CLIENT: Ce Co
LOCATION OF RADIOGRAPHIC JOB: Turbine Building Elv 426 K-20
TYPE OF RADIOGRAPHIC JOB: x-ray weld

SURVEYS & SKETCH OF RESTRICTED AREA:

(SHOW READINGS IN MR/HR OR R/HR AND DISTANCE IN FEET FROM SOURCE)
(INDICATE TYPE AND LOCATION OF ALL RADIATION WARNING SIGNS)



DATES OF USE AT THIS LOCATION
9-10-84

I HEREBY CERTIFY THAT ABOVE IS TRUE AND CORRECT TO THE BEST OF MY KNOWLEDGE AND BELIEF

SURVEY BY: [signature] RADIOGRAPHER

BRANCH: Braidwood

DISTRIBUTION:
ORIGINAL - To Radiation Records, Pittsburgh, Pa.
CARBON COPY - To remain at job until completion, then carbon filed at branch office.