U.S. NUCLEAR REGULATORY COMMISSION

REGION III

Reports No. 50-456/85009(DRS); 50-457/85009(DRS)

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

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

Facility Name: Braidwood Station, Units 1 and 2

Inspection At: Braidwood Site, Braidwood, Illinois

Inspection Conducted: March 5 through November 7, 1985

Inspector: J. F. Schapker 11/19/85
Date

Approved By: D. H. Danielson, Chief 11/19/85
Materials and Processes Section Date

Inspection Summary

Inspection on March 5 through November 7, 1985 (Reports No. 50-456/85009(DRS); No. 50-457/85009(DRS))
Areas Inspected: Special, unannounced safety inspection to review allegations concerning welding deficiencies by the electrical contractor (L. K. Comstock). This inspection involved a total of 192 inspector-hours onsite by one NRC inspector including 30 inspector-hours of in-office review.
Results: Of the areas inspected, one violation was identified (failure to document welder qualification records to procedure requirements - paragraph 2.h and 2.j, allegation 4).

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DETAILS

1. Persons Contacted

Commonwealth Edison Company (CECo)

*M. Wallace, Project Manager
*C. Schroeder, Licensing and Compliance Superintendent
*L. Kline, Licensing and Compliance Supervisor
*G. Groth, Assistant Construction Supervisor
R. Gardner, PSI Coordinator, Level III
C. Mennecke, Lead Electrical Supervisor
P. Berry, QA Inspector
*C. Tomashek, Startup Superintendent
*T. Quaka, QA Superintendent
*D. Smith, Nuclear Licensing
*W. Vahle, Project Field Engineer
*J. Gieseker, Project Construction Engineer
T. Ronkoske, Project Field Engineer

L. K. Comstock Company (LKC)

T. Simile, Welding Engineer
*R. Seltmann, QA Manager
*I. Dewald, QC Manager
*F. Rolan, Project Manager
*J. Klena, Project Engineer

Sargent & Lundy Engineers (S&L)

*G. Jones, Project Manager
*D. Gallagher, Field Engineer
*K. Kostal, Project Director

USNRC

*W. Kropp, Resident Inspector
*L. McGreger, Senior Resident Inspector

The inspector also contacted and interviewed other licensee and contractor personnel.

*Denotes those attending the final exit interview.

2. (Closed) RIII 84-A-0123 Allegations

On August 28, 1984, a former employee of the L. K. Comstock Company (LKC) at the Braidwood Nuclear Station contacted the Senior Resident Inspector - Operations (SRI) Braidwood, with information regarding the L. K. Comstock Company. On August 31, 1984, the former employee telephoned Region III and spoke with the Chief, Plant Systems Section, Division of Reactor Safety (DRS) and provided the following allegations. In reviewing these allegations the NRC, in addition to utilizing information supplied by the alleger, also used a hearing transcript provided by the Department of Labor (DOL) relating to the alleger's complaints with DOL that also identified some apparent technical issues.

a. Allegation

L. K. Comstock Company (LKC) welders have been welding A-446 material to A-36 material; however, a weld procedure was not available. These welds were contrary to AWS D1.1-1975 according to the alleger. A nonconformance report (NCR) was eventually written (NCR No. 3099). The alleger questioned the qualification of the weld when joining A-446 material to A-36 material, as A-446 is not addressed in the AWS code. The alleger also identified that the technique sheet "0" for LKC weld procedure 4.3.3 was a reject.

NRC Review

The electrical contractor (LKC) issued a nonconformance report (NCR No. 3099), and subsequently issued a stop-work order on August 17, 1984, thereby stopping welding activities regarding this problem. The NCR was later dispositioned "Use-As-Is." This disposition was based on the interpretation by the contractor, licensee engineers, and the architect-engineers of the American Welding Society (AWS) Standard D1.1-1975, Section 5.5, that states A36 steel is also qualified for use with welding procedure specification, Attachment H, of LKC Weld Procedure 4.3.3. The procedure was revised to include A-36 to A-446 as part of the qualified base materials. Subsequently, the NCR was closed and the stop-work order was lifted. The technique "0" which was referenced in weld procedure 4.3.3 was requalified on July 2, 1984 with acceptable test results.

Conclusion

This allegation was substantiated with no adverse effect on the quality of the welds. The NRC inspector reviewed the referenced NCR and weld procedure and concurred with the disposition of the NCR; that is, the referenced base material (A-446) although not specifically listed in AWS D1.1-1975 code, is qualified by virtue of qualifications performed in Weld Procedure 4.3.3, Attachment H, wherein A-446 to A-500 was a qualified material combination and A-36 to A-500 was also a qualified combination. The chemical and

mechanical properties of A-446 and A-36 are closely compatible and do not pose a weldability problem. Although A-446 is not listed in the AWS D1.1-1975 code, the code does not require that only materials listed in the code be utilized, other materials are allowed at the discretion of the "Engineer" and can be qualified by weld procedure qualification (PQR). The PQRs for Weld Procedure 4.3.3 fulfill the requirements for qualification of A-36 to A-446 material in accordance with AWS D1.1, Section 5.5, which states in part: "Qualification of a welding procedure established with a base metal included in 10.2 and not listed in 5.5.1.2, having a minimum specified yield point less than 50,000 psi (345 MPa) shall qualify the procedure for welding any other base metal or combination of those base metals included in 10.2 that have a minimum specified yield point equal to or less than that of the base metal used in the test." The weld procedure was in error in that the A-446 base material was not listed as required and that technique sheet "C" was referenced with rejected test results within the procedure. The inspector reviewed the revised procedure and the NCR and found them to be acceptable. This item was satisfactorily resolved.

b. Allegation

The alleger contended the L. K. Comstock Weld Procedure No. 4.3.14 was qualified to the 5G weld position, but the procedure was used to weld all positions. The alleger also stated that language inconsistencies exist within the procedure (e.g., instruction to use magnetic particle testing on stainless steel).

NRC Review

The NRC inspector reviewed the referenced Weld Procedure 4.3.14 and determined that the procedure was qualified to the 5G position as the alleger stated. Some welds were performed in the horizontal welding position (2G) for which the procedure was not qualified. This nonconformance was identified by the electrical contractor in nonconformance report (NCR) No. 3145 dated August 24, 1984. The corrective action disposition of this NCR was to requalify the weld procedure and welders to include the 2G (horizontal) position for welding, and to remove the previously installed horizontal welds and replace them after requalification. The qualification performed to the 5G position qualifies the procedure for positions 1G, 3G, 4G, and 5G.

The language inconsistencies cited by the alleger was the use of a paragraph from the American Welding Society (AWS) D1.1-1975 code, Paragraph 3.7.2.4 concerning, "Cracks in Weld or Base Metal." The statement in this paragraph which caused the concern was: "Ascertain the extent of the crack by use of acid etching, magnetic particle inspection (MT), or other equally positive means." Since weld procedure 4.3.14 is for austenitic stainless steel, magnetic particle examination would not have been effective. The inspector reviewed a sample of quality documentation, in conjunction with allegation RIII-85-A-0005 in Paragraph 3 of this report, to verify the proper utilization of NDE procedures.

Conclusion

The first part of this concern was substantiated. Welds were made utilizing weld procedure 4.3.14 which was not qualified for the horizontal welding position. This nonconformance was identified by the alleger, and L. K. Comstock initiated NCR 3145. The corrective action taken, removal of noncomplying welds and replacement after requalification of the weld procedure and welders was adequate to assure compliance to the AWS D1.1-1975 code.

The alleged language inconsistencies had no detrimental effect to the quality of the welds made with this weld procedure. The quote from AWS D1.1 is a general workmanship requirement for examination of all types of welds, and not specific to stainless steel. Although the statement is misleading, it is not in error. The paragraph states a "suitable method" to assure removal of the crack. MT is not suitable for stainless steel as it is nonferromagnetic; therefore, other suitable means (i.e., liquid penetrant would be utilized). Personnel who perform MT on safety-related components are required to be qualified to perform this examination. Also included as part of the qualification requirements is that the inspector must be knowledgeable of the type of materials that can be examined by the magnetic particle process. The NRC did not find any case where the incorrect NDE method was utilized in the review of the contractor's quality documentation.

c. Allegation

A procedure was used to make bimetallic welds, but the procedure is not a bimetallic procedure. Bimetallic welds have been made, but L. K. Comstock does not have a procedure to qualify its welders for bimetallic welds. Therefore, welders are not qualified to make bimetallic welds.

NRC Review

The NRC inspector interviewed (March 12, 1985) the alleger for specifics in regard to the bimetallic welds. The alleger informed the inspector that the welds he was referring to were stainless steel (SS) junction boxes within the reactor building. The alleger contended the junction boxes were being welded to carbon steel (CS) conduit. The NRC inspector located the junction boxes per the alleger's description and verified that they were stainless steel (out of core neutron detector junction boxes); however, the CS conduit attachment to the junction box is not welded but mechanically attached (Uniseal Hub Appleton). There is, however, an 8" Schedule 40 SS pipe welded within the junction box for supporting cables and thermocouples. All base metal within or attached to the junction boxes by welding is stainless steel, no bimetallic welds were made. (Reference the Architect Engineers [Sargent&Lundy] Drawing 20E-0-3550, Revision R.) The NRC inspector physically examined the referenced junction boxes and verified no carbon steel was welded to them. The

NRC inspector's further inquiry of the Level III welding supervisor and Level II weld inspectors stated they knew of no stainless to carbon steel welds performed by the electrical contractor. The alleger also made reference to welder qualifications being made to SA-312 to SA-312 when SA-240 to SA-312 was being performed in the field. This concern was found to be true; however, this is not a violation of code requirements. The base metals SA-240 and SA-312 are both SS P-8 Group 1 (ASME Section IX) material. SA-240 is plate and SA-312 is pipe. AWS D1.1-1975, paragraph 5.23.2.4 states "Qualification in the 6G (inclined fixed) position qualifies for all positions groove and all positions fillet welding of pipe, tubing, and plate."

Conclusion

No stainless steel to carbon steel welds (bimetallic) were performed by the electrical contractor. The electrical contractor had qualified welding procedures and welders for stainless to stainless steel as required by AWS D1.1-1975.

d. Allegation

In general, the L. K. Comstock weld procedures are filled with errors and inconsistencies (e.g., decimal fraction conversion tables show 0.750 = 32/32).

NRC Review

The NRC inspector reviewed the contractor's weld procedures which were generally accurate and adequate. Minor typographical errors as referenced by the alleger were encountered, but were not prevalent. Further discussion with the alleger (March 12, 1985) disclosed that this allegation was not critical of the weld procedures adequacy but that clerical errors within the procedures needed to be corrected.

Conclusion

The contractor has revised and corrected the clerical errors in subsequent revisions of the weld procedures. The type of errors encountered in the past revisions were minor and did not affect the overall adequacy of the weld procedures or the quality of the welding. Reference allegation b. above for other "inconsistencies," as well as NRC Inspection Reports No. 50-456/84-36(DRS); 50-457/84-34(DRS), Section 3.

e. Weld Filler Material Allegations

Allegation 1

L. K. Comstock Company does not have any weld filler material controls, as the procedure is only now being written.

NRC Review

The L. K. Comstock Procedure 4.3.10, Revision C, dated December 8, 1983, titled, "Storage, Issue and Control of Welding Material," was in effect at the time of the alleger's employment at Braidwood. The alleger may have been referring to weld filler material control problems which were identified in L. K. Comstock nonconformance report (NCR) 3275, which was issued September 12, 1984 as a result of the alleger's concern addressed to L. K Comstock. The NRC inspector reviewed this NCR which identified violations of the referenced procedure. The corrective action taken by this NCR included revision of the procedure to enforce additional requirements in the weld material control area.

Conclusion

The L. K. Comstock Company had adequate weld filler material controls in place. NCR 3275 identified some violations to this procedure which were adequately dispositioned and appropriate corrective action implemented. The revision of the procedure did require additional weld material control measures as corrective action to prevent recurrence as required by 10 CFR 50, Appendix B, Criterion XVI. These controls and corrective actions were found to be acceptable to the NRC inspector.

Allegation 2

Filler material withdrawal forms have inconsistent heat numbers. The alleger could not find any paperwork to backup heat numbers in the possession of either L. K. Comstock or Phillips-Getschow. Phillips-Getschow, the Braidwood Mechanical Contractor, furnishes the filler materials to L. K. Comstock.

NRC Findings

The NRC inspector selected a random sample of weld filler material withdrawal forms (FMWF) from three different time periods, covering a three year time frame. Included in this sample were withdrawal forms for E-7018, E-6013, and E-309-16 weld material of various sizes. The inspector reviewed 50 FMWFs and traced the referenced heat numbers to the appropriate weld material certifications (CMTR). The alleger identified three heat numbers for which he could not locate the applicable CMTRs (reference LKC NCR 3275, Sheet 4). The NRC inspector research for these heats disclosed the following: 40157441 CMTR was located and conformed to the specified material requirements for E-7018 welding electrode; 40159011 was not located but 40259011 for 7018 was on file. The 40159011 is undoubtedly a typing or clerical type error in recording of the heat number on the weld rod issue slip; 3520261 was located as 3S20261 for 6013 weld rod. The "S" was obviously misidentified as a 5.

Conclusion

The NRC inspector's review of FMWFs over a three year period did not disclose a deficiency in this area. In some cases, it was necessary for the NRC inspector to trace the heat numbers to the licensee's quality records vault as the contractor did not have the CMTR in their records vault. The three heats of weld rod which the alleger could not locate were found, two with obvious variations of the recording or interpretation of the numbers/letters of the identifying heat numbers.

f. Allegation

The alleger has found that L. K. Comstock Company (LKC) does not have any control of construction materials in terms of heat numbers or other traceability.

NRC Review

The NRC inspector selected a random sample of LKC construction material to verify traceability. The material inspected was marked with a material receipt number (MRR). LKC performs receiving inspection of all material received (reference LKC Procedure 4.10.2, "Receiving and Storage") and submits the MRR to the licensee's Quality Assurance Department (CECo QA) who is responsible to verify the material meets the requirements of the applicable purchase order. The Quality Assurance group reviews the adequacy of the documentation such as: certified material test reports, certificates of conformance, or any other required documentation. The licensee QA group also performs a physical inspection of the material as required by procedure SQI-06, "Material Receiving Report (MRR) Processing." Upon completion of acceptable review by the CECo QA group, the contractor is authorized for release for installation in safety-related areas. The MRR number is traceable to the applicable purchase order and quality records are initiated and maintained by the licensee. Only safety-related components/material were required to be marked with the MRR identification number and is required to be so identified for use in safety-related construction.

Conclusion

The concern was partially correct as the alleger's contention that transfer of heat numbers is not accomplished for material traceability is accurate. However, transfer of heat numbers is not a requirement to maintain traceability of materials. The use of an approved procedure and the MRR number as a basis to assure adequate material traceability is considered by the NRC to afford proper control.

Thus, the licensee's method of material traceability for the electrical contractor was found to be adequate to assure the material traceability is controlled to the point of installation. A similar concern was previously addressed in NRC Inspection Report No. 50-456/84-23(DRS); 50-457/84-22(DRS), Section 2, Paragraph c.

g. Allegation

Welds were made without the required preheat. A procedure was developed that did not require weld preheat, but quality control did not participate by observing the making of the weld coupon qualifying the procedure.

NRC Review

This allegation was partially correct; however, the contractor took corrective action through nonconformance report (NCR) 3423, dated October 12, 1984. NCR 3423 identified the violation of questionable preheat documentation for welds which required preheat due to the thickness of the members being joined, that is in excess of 1-1/2". The contractor developed weld procedure qualifications (PQR) for those welds from 1" to 3" thickness welded without preheat. The welds to members in the plant in excess of 3" in thickness were removed and replaced utilizing the required preheat and that rework including the preheat was documented accordingly. The alleger's contention that quality control did not participate in the making of the weld coupons qualifying the procedure was not correct. The NRC inspector interviewed the QC inspector who was responsible for surveillance of the PQRs. The QC inspector attested that he witnessed the welding of the test coupons throughout the process.

Conclusion

The concern as stated that quality control did not participate in the welding of the weld procedure qualifications was not substantiated. The implied concern that welds were made without required preheat was substantiated but this problem had been identified and adequately dispositioned by NCR 3423. The NRC found this issue had been adequately resolved.

h. Allegation

Welder qualification records have inconsistencies which make welder qualifications indeterminate.

NRC Review

The NRC inspector selected a random sample of welder qualification records for this review. The sample consisted of 75 past and current welders for the electrical contractor. Some minor discrepancies were noted in the welder qualification records such as typographical and clerical errors which have been addressed in LKC NCR 3710 dated December 8, 1984. Past welder qualification records were revised in error when the electrical contractor was replaced onsite, i.e., white out of "E. C. Ernst" replaced with "LK Comstock"; incorrect changes of material type (A36 for A106); signatures not dated; and type of electrode not documented. The NRC inspector also reviewed welder qualification records which the alleger specified inconsistencies which were not identified in LKC NCR 3710.

Conclusion

The welder qualification records did have some inconsistencies as stated by the alleger. However, none of the inconsistencies observed by the NRC inspector would have made the welders' qualifications indeterminate. The minor clerical errors observed were readily obvious, some were originally correct and had been changed in error. Some of these errors have been documented in LKC NCR 3710 dated December 8, 1984 and dispositioned adequately. There were additional inconsistencies identified by the alleger which were in violation of the LKC welder qualification procedure 4.7.1. This is considered an example of a violation of 10 CFR 50, Appendix B, Criterion V (456/85009-01(DRS); 457/85009-01(DRS)).

i. Allegation

Many of L. K. Comstock field welders are qualified to L. K. Comstock Procedure 4.7.1. However, this procedure is not traceable to L. K. Comstock AWS D1.1 weld procedure qualification records. Some welders were originally tested on Schedule 80 pipe, but the current procedure refers to test on plate. Welder qualification cards stated the welder was qualified to LKC 4.7.1 but the welders were actually qualified to E. C. Ernst Procedure 9.2.

NRC Review

L. K. Comstock Procedure 4.7.1, Revision 6, dated June 22, 1982, titled, "Manual Shielded Metal Arc Welding (SMAW) for Structural Steel and Stainless Steel Qualification Procedure," was reviewed by the NRC inspector. The purpose of this procedure is to qualify welders per AWS D1.1-1975 for groove and fillet welding using the SMAW process. The procedure need not be traceable to L. K. Comstock welding procedures as it is not utilized for construction. The procedure is written to the requirements dictated in Section 5, Part C of AWS D1.1-1975. Accordingly, this procedure was intended for welders' qualifications only. These qualification tests are not intended to be used as a guide for welding during actual construction, but are specially devised tests to determine the welder's ability to produce sound welds.

The NRC inspector reviewed the welder qualification records as described in allegation h. above. During this review it was observed that the welder qualifications were performed on Schedule 80 pipe when E. C. Ernst (ECE) was the electrical contractor (ECE 9.2). L. K. Comstock subsequently revised the procedure to utilize plate in lieu of pipe for welder qualifications. The use of pipe or plate for welder qualifications meets AWS D1.1 for the welding applications by LKC.

Conclusion

This concern was correct in that Weld Procedure 4.7.1 is not traceable to L. K. Comstock weld procedure qualification records. This, however, is not a deficiency. AWS D1.1-1975, Section 5, Part C, describes the welder's ability to produce sound welds. L. K. Comstock Weld Procedure 4.7.1 is the contractor's method of qualifying the welders which is taken from the requirements listed in AWS.

Welders who qualify on Schedule 80 pipe are also qualified to weld plate within the thickness and positions for which they qualify, reference AWS D1.1-1975, Paragraph 5.23.2, Table 5.23 and 5.26.1. Therefore, those who qualified per ECE 9.2 also qualified for LKC 4.7.1 (also reference paragraph 2.j, allegation 2 of this report).

j. Welder Qualification Records Allegations

The alleger submitted a list of welder qualification record deficiencies which was utilized in addition to the referenced random samples.

Allegation 1

Welders were tested on 1/2" thick material, but records showed the welder with an unlimited thickness range.

NRC Review

The NRC inspector reviewed a random sample of 75 welder qualification records for current and past welders. Within the sample reviewed the welder qualifications records defined the limits of the welder's qualification, which referenced fillet weld only for those qualified on 1/2" thick material.

Conclusion

The NRC inspector did not identify any deficiencies as described by the alleger. The alleger could possibly have misinterpreted the qualification of fillet welders on 1/2" plate which complies with AWS D1.1-1975, Table 5.26.1. This test for fillet welder qualification only is performed on 1/2" plate and qualifies the welder to weld fillet welds of unlimited thicknesses. In addition, some welders whose qualifications had expired performed requalification on 3/8" plate but had previously qualified on 1" plate. This requalification on 3/8" plate qualifies the welder to perform welds of unlimited thickness, reference AWS D1.1, Paragraph 5.30 and L. K. Comstock procedure 4.7.1, Revision C, dated November 26, 1984, "Welder Performance Qualification Test."

Allegation 2

Welders were tested on 6" Schedule 80 pipe, but welder records showed an unlimited thickness range. AWS D1.1 shows a lower range of 0.187" thick, but actual welding is down to 0.105".

NRC Review

This finding had been previously identified in NRC Inspection Report No. 50-456/84-21(DRP); 50-457/84-20(DRP) as an unresolved item (456/84-21-05; 457/84-20-05). The NRC inspector interviewed (March 12, 1985) the alleger for additional details in regard to this concern. The alleger stated the thickness of unistrut was approximately 0.105". Review of the AWS D1.1-1975 code identified that Table 5.26.1 does limit the minimum thickness to be qualified with 6" Schedule 80 pipe as .187". However, the AWS D1.1-1976 code added the footnote which qualified the welder for unlimited thickness for fillet welds. This was an obvious oversight in the 1975 code which was subsequently added in the 1976 code, as a welder who demonstrates the ability to weld pipe groove welds would also be capable to weld fillet welds of any thickness. Furthermore, AWS D1.1-1975, Section 5.23.2, "Groove Pipe Test Welds," and Table 5.23 designates welders qualified to weld pipe-groove welds are qualified to weld fillet welds for the position qualified.

The welds utilized on unistrut material in the installation of cable pan are fillet welds.

Conclusion

This concern was correct in that the AWS D1.1-1975 code did specify a minimum thickness qualification for welders who qualify on 6" Schedule 80 pipe. However, this limitation was not intended to include fillet welds as the 1976 code revision clarified by addition of the footnote. The purpose of the welder qualifications is to assure the welder is capable to produce sound welds within a welding process, position and thickness. A welder who qualifies on 6" Schedule 80 piping groove weld demonstrates this ability to perform fillet welds as specified in AWS D1.1, Section 2, Table 5.23. The exclusion of the footnote [3] in Table 5.26.1 1975, in the inspector's opinion, was an obvious oversight which was corrected in the 1976 edition of the code.

Allegation 3

Welders with "rejected positions" only took one test on retesting. The alleger contended that the code required two retests, not one.

NRC Review

The NRC inspector reviewed the AWS D1.1-1975 code. Paragraph 5.29.1.2 of the code states, "A retest may be made provided there is evidence that the welder has had further training or practice. In this case a complete retest shall be made." It is not required by LKC Procedure or the AWS code that the further training or practice be documented, or how much training is required to qualify for this option. This determination is at the discretion of the contractors. The NRC inspector reviewed a random sample of welder qualification records, including those welders referenced by the alleger, for retest of welders who had previously failed the test. No violations of the AWS D1.1 or contractor procedure was apparent.

Conclusion

The AWS code gives two options when a welder fails to meet the requirements of one or more test welds. The first option is stated in Paragraph 5.29.1.1, "An immediate retest may be made consisting of two test welds of each type on which the welder failed. All retest specimens shall meet all the specified requirements." The other option is as stated above in Paragraph 5.29.1.2. Therefore, if this practice was utilized as stated by the alleger it would not necessarily violate the code. The NRC inspector did not find any violations involving the retesting of any welders who had failed a welding test during review of welder qualification records.

Allegation 4

Records showed that an identified welder had a rejected test on a 1" thick plate and that the welder performed two additional tests on the same day. The alleger thought it was impossible and the record was wrong.

NRC Review

The NRC inspector performed a random sample review of welder qualification records, and reviewed one welder's qualification record identified by the alleger with this deficiency. Welder No. 735 identified by the alleger as the welder who, according to the welder qualification records, had welded three 1" coupons in one day. The inspector's review of this person's welding qualification record revealed the following data: A weld test was performed by the welder on February 26, 1981 on 1" plate (LKC Form 88). The lab test for this test coupon was performed on March 5, 1981 per the Pittsburgh Testing Lab (PTL) test report. (PTL is the independent testing lab who performs the physical test [bend test, machros, etc.] of the welder's test coupons for LKC's welders' qualifications.) These test reports dated March 5, 1981, identified as Lab Report BST 5676 testing of coupon for 3G position (failed test), Lab Report BST 5677 for testing of coupon for 4G position was acceptable. PTL Lab Test Reports BST 5683 and 5684 dated March 10, 1981, both for the

3G position retest for the same welder, was acceptable. The LKC Form 88 (welder qualification test record) was signed February 26, 1981, the same date as the original test. This was an obvious error on the Form 88 as the retest by PTL was dated March 10, 1981. The inspector's review of 75 additional welders' qualification records did not reveal any additional record errors of this type.

Conclusion

The contention that the welder's qualification record was in error was correct. However, the PTL test records which accompany the LKC Form 88 provided objective evidence that the test coupons were welded, and tested over a period of two weeks. The error was obvious that the LKC Form 88 was signed prior to the final testing of the weld coupons, which violates the LKC welder qualification Procedure 4.7.1, Revision July 18, 1980, Paragraph 3.10.4, which instructs the QC inspector to sign Form 88 after receipt of the Independent Testing Company report. This is considered an example of a violation of 10 CFR 50, Appendix B, Criterion V (456/85-009-01(DRS); 457/85009-01(DRS)); however, the welder's qualification record was adequate in that there was objective evidence to support the welder had satisfactorily completed the welder qualification in accordance with the requirements of AWS D1.1-1975, Section 5, Part C - Welder Qualification. The inspector's review of the random sample did not disclose any additional violations of this type.

k. Welder Qualification Inconsistencies

Allegation 1

The alleger believes there are many instances of record falsification; for example: An unidentified welder took three test coupons and got the results all in one day. The alleger stated that this was administratively impossible.

NRC Review

This concern was addressed in paragraph 2.j, allegation 4 of this report. However, the NRC inspector reviewed additional welder qualification records, L. K. Comstock Procedure 4.7.1, Revision C, dated November 26,1984, "Welder Performance Qualification Tests," and Procedure 4.3.20, Revision 0, dated February 29, 1980, "Manual Shielded Metal Arc Welding for Structural Steel Qualification Procedure." These procedures establish the method of qualifying welders per AWS D1.1-1975 utilizing Shielded Metal Arc Welding process (SMAW). The procedure requires the QC inspector to initiate the Form 88, "Welder and Welding Operator Qualification Test Record." This record is partially completed during the period that the welder is performing the weld test; however, no dates are required until the completion of the guided bend test or fillet weld test (whichever is required) and the LKC QC manager or his designee sign and date the form. The guided bend test and fillet weld tests are performed by an independent laboratory (Pittsburgh Testing Lab).

Conclusion

The welder qualification records do not reflect the period of time it takes to weld and test welders' coupons. It is possible that a welder performed the three tests over a period of time and were all submitted for testing to PTL on the same day, tested, reviewed, signed, and dated by the QC manager on the same day. The alleger only cited one example which was addressed in paragraph 2.j, allegation 4 of this report. No other evidence of record falsification was identified by the NRC inspector.

Allegation 2

Face bend and root bends were done on 1" thick plate material which the alleger contended was physically impossible.

NRC Review

The NRC inspector performed a random sample review of 100 welder qualification records in addition to the samples previously reviewed. No face or root bends were observed to have been performed on 1" thick plate material. The alleger found one welder with this deficiency. The NRC inspector reviewed this finding and concluded from the records that the plate thickness was actually 3/8" plate and the 1" plate thickness annotated on the Form 88 was a clerical error. This was substantiated through the review of the PTL testing data which identified the plate thickness to be 3/8".

Conclusion

The NRC inspector's review did not disclose the deficiency as stated by the alleger. The incident identified by the alleger was an obvious clerical error; however, the sample of test results observed by the NRC inspector were recorded on the Form 88 for 1" thick test coupons and were tested by PTL as required by AWS D1.1-1975, Table 5.26.1. The tests performed were the required side bend test and were found to be acceptable.

Allegation 3

Overheard that an inspector inspected 1,000 welds in one day.

NRC Review

The NRC inspector reinterviewed the alleger (March 12, 1985) who stated he had no personal knowledge of this concern, but had heard that the inspector was the same person as in paragraph 2.p and that the welds were located on the turbine floor. This concern is addressed in conjunction with the allegation documented in paragraph 2.p of this report.

l. Allegation

"Master Hammer Log" - A welder was assigned welder stamp numbers 23 and 123, but two other welders were also assigned the same stamp numbers. Other inconsistencies in the Master Hammer Log were also found.

NRC Review

The NRC inspector reviewed the welders' Master Hammer Log. The welder assigned welder stamp 23 was also identified with his "brass" or employee identification number 123 in the same record. The brass number is an employee identification number and is not used in identifying the welder's work. The stamp number 23 was used previously by another welder who worked for E. C. Ernst, the previous electrical contractor. However, the dates of stamp issue were recorded and therefore is traceable to the work the welder performed through the inspection records. The issue of a welder's stamp to another individual after the previous welder turned in his stamp (layoff, resignation, change in jobs) is acceptable provided the dates of issue and surrender are maintained and there are records to validate the date when the welds were produced. The NRC inspector sampled the control of 50 additional welders stamps with no adverse findings.

Conclusion

This concern was partially correct, but does not adversely affect the welder's identification records. Although the stamp number may be issued to more than one individual, the Master Hammer Log records the issue and surrender date with the identity of the welder. This, together with the inspection records, makes it possible to trace the individual weld to the appropriate welder. In addition, LKC Procedure 4.8.3, "Weld Inspection," Paragraph 3.11, requires the weld inspector to verify, during his inspection, that welder identification is indicated by assigned stamp near the weld joint.

m. Allegation

A Level 2 Quality Control inspector was responsible for the welder test booth. The Level 2 was also assigned to perform inspections in the fabrication shop and routine field inspections; consequently, no inspectors watched welder testing in the qualification booth. The alleger considered this to be inadequate control of the welder testing program and inadequate or no quality control involvement in the weld qualification test implementation.

NRC Review

The NRC inspector interviewed the welder test booth inspectors named by the alleger who were responsible for inspections to be performed on welder qualification tests required by LKC Procedure 4.7.1, Revision C.

The inspectors interviewed stated that, to their knowledge, in no case that they were aware of was there a welder qualification test performed without the presence of a QC inspector, as required by the referenced procedure. In addition, the NRC inspector reviewed more than 100 welder qualification records which documented that a QC inspector performed the required inspections and recorded the applicable welding data on the welder qualification record. One inspector did indicate that he voiced his displeasure of having to do inspections in the welder qualification area and in the field; however, he did not consider this a safety concern as the required inspections were completed by the QC inspector.

Conclusion

This concern was partially substantiated with no detrimental effect to the welder qualifications. That is, the QC inspectors were also assigned to perform inspections in the fabrication shop and in the field (power plant). This is common practice as welder qualifications are not usually performed 7 days a week but only on an as needed basis. When a welder was performing welder qualification testing the QC inspector was required to be present to witness the welder's performance in accordance with LKC Procedure 4.7.1.

n. Allegation

The L. K. Comstock Company's Corporate Quality Assurance Manager intimidated quality control inspectors during discussions on compensation by telling the inspectors that he had 20 people ready to take the places of the inspectors.

NRC Review

Further discussion with the alleger (March 12, 1985) concerning this allegation revealed that the source of the allegation was hearsay and that the discussions with management concerned the hiring of new inspectors at higher salaries without compensating the other inspectors.

Conclusion

This allegation was previously investigated and closed in NRC Inspection Report No. 456/84-34(DRP); 457/84-32(DRP), Allegation RIII-84-A-0119. The inspection concluded that there was no intimidation.

o. Allegation

Comstock inspection procedures do "not deal with a full penetration weld of any kind," and it's the alleger's understanding that there has been full penetration welds done on the project.

NRC Review

The NRC inspector reinterviewed the alleger (March 12, 1985) who provided further clarification; "he heard the full penetration welds only required visual inspection - no other NDE was performed." The NRC inspector's review of the full penetration welds produced by LKC revealed that the full penetration welds performed by the contractor were on riser collar support assemblies, column bars within the riser cable pans, main control board modifications, and equipment pads. The riser collars provide support for the vertical riser cable pans through floor penetrations. During a CECo audit performed on April 30, 1984, the licensee's Quality Assurance auditors discovered that some of the riser collar assemblies were not installed and fabricated to the applicable design drawings.

LKC issued nonconformance report (NCR) 2648, dated June 19, 1984, to identify the discrepant riser collars and to implement corrective action. The corrective action stated on this NCR was to rework the riser collars to conform to the latest design drawing and Engineering Change Notice (ECN) 24181. The NRC inspector reviewed the referenced NCR and ECN and confirmed the corrective action was adequate to correct the deficiencies. The alleger's contention that the full penetration welds only required visual examination was correct. However, the Architect-Engineer (S&L) specification previously required only visual examination (LKC Procedure 4.8.3, "Weld Inspection") which complies with AWS D1.1-1975. A recent amendment to the S&L specification L-2790, subsequent to NCR 2648, Paragraph 401.19.1, Amendment 42, dated November 9, 1984, requires additional nondestructive examination to be performed on full penetration welds. This change has been implemented on all new fabrication and installation utilizing full penetration welds. The use of only visual inspection for acceptance of full penetration welds prior to November 9, 1984, met the nondestructive testing requirements of AWS D1.1. Based on engineering judgement, as an added measure of assurance, additional NDE (radiographic testing) is currently (post November 9, 1984) being performed.

Conclusion

Although the electrical contractor did not perform nondestructive examination (NDE) other than visual on the full penetration welds, the architect-engineer (AE) specification (L-2790) did not require NDE other than visual examination at the time the welds were made. AWS D1.1-1975 does not require other NDE unless specified by the engineer (AE) or owner, reference Section 6.6 of the code. Discrepancies identified by the licensee in regard to the rise collars have been adequately addressed and corrective action has been implemented.

p. Allegation

The L. K. Comstock Braidwood QC Manager was previously an inspector and passed many welds which should have been rejected.

NRC Review

The NRC inspector reinterviewed the alleger (March 12, 1985) who stated his information "was hearsay and he had no personal knowledge of this concern." The alleger also stated that "he heard that the area of concern was on the turbine floor." The turbine floor is located in the turbine building, a non-safety related area.

The NRC inspector selected a random sample of the welds that had been inspected by this individual in safety-related areas to verify the adequacy of those inspections. The majority of these welds had been painted; therefore, it was not possible to inspect 100% of these welds. Some of the welds were not painted due to reinspection being performed by an independent laboratory (Pittsburgh Testing Lab). Those that the NRC inspector observed met the visual acceptance criteria of AWS D1.1-1975.

Conclusion

The alleger, by his own admission, had no first hand knowledge of this concern. Furthermore, the hearsay information involved a non-safety related area. The NRC inspector's sample in safety-related areas did not reveal any defective welds.

Additionally, the Pittsburgh Testing Laboratory (PTL), an independent laboratory, performed a 10% overinspection of the LKC inspections of welds. These overinspections were documented and included with the weld inspection records. A review of these records by the NRC inspector did not disclose a problem with the QC manager's previous inspections as a weld inspector.

q. Allegation

The Alleger had reviewed weld procedures for L. K. Comstock at Perry and had identified procedure inconsistencies.

NRC Review

This concern was addressed in NRC Inspection Report No. 50-440/85043. The inspector substantiated this allegation and identified the inadequacies of the procedure within the referenced report. Reference violation 440/85043-01(a), (b), (c), and (d)(DRS).

Conclusion

This concern was verified but does not apply to this licensee. The procedural violations identified in NRC Inspection Report No. 50-440/85043 were resolved.

r. Allegation

"Within three days after I started working, I noticed that there was a joint design, a weld being made in the shop that was outside the criteria of the AWS D1.1 code."

NRC Review

The NRC inspector reinterviewed the alleger for specifics (March 12, 1985). The alleger stated he had noticed a weld, 1/4" plate to unistrut, which violated AWS D1.1, Figure 8.8.5.

The NRC inspector performed field and shop welding observations and noted the joint the alleger referred to as a violation of AWS D1.1, Figure 8.8.5. AWS D1.1, Paragraph 8.8.5 states, "Fillet welds deposited on the opposite sides of a common plane of contact shall be interrupted at the corner common to both welds."

The observations the NRC inspector made, in the application of this weld, were in compliance with the Architect Engineer (S&L) Drawing 20-E-0-3393D, Revision AE. In addition, the NRC inspector inspected a sample of 50 cable pan hangers with the referenced weld orientation which complied with the S&L drawing requirements.

Conclusion

AWS D1.1, Section 8.8.5, requires the fillet weld deposited on opposite planes be interrupted at the corner common to both welds. The welds observed by the NRC inspector complied with this requirement. Some of the subject welds butted up against each other, but none of those observed were continuous. The S&L Drawing (20-E-0-3393D) specified 1/8" fillet welds for the full length on both planes. The application of this configuration does not violate the AWS code.

s. Allegation

Noncompliances had been performed by a E. C. Ernst, which was the contractor prior to Comstock, and these were still faulty problems that had not been addressed.

NRC Review

Further discussions with the alleger (March 12, 1985) disclosed that the "no ompliances" he referred to were with the welder qualification records. This concern is addressed in paragraph 2.h.

t. Allegation

L. K. Comstock Company had qualified a General Electric procedure by only doing a tensile test on the coupons when it's customary to do a bend test as well.

NRC Review

The NRC inspector reviewed the referenced procedure which was generated for use on non-safety related aluminum welding (bus bars). The welding performed utilizing this procedure was not safety-related and therefore was not subject to the requirements for qualification specified in AWS D1.1-1975 code.

Conclusion

This concern was not substantiated. The weld procedure is not utilized for safety-related welding and therefore is not required to meet the AWS D1.1-1975 code.

u. Allegation

The alleger stated that he was prevented from making a "formal finding" because he was not certified.

NRC Review

This allegation was correct in that the alleger, because he had not certified as an inspector, could not issue/sign a nonconformance report (NCR). However, during the review of the allegations the NRC inspector noted that several NCRs were prepared by the alleger and signed by a certified inspector. The alleger also supplied documents/memorandums in which he expressed concerns, and for which the contractor took action to address these concerns, i.e., stop work orders, NCRs, memorandums addressed his concerns.

Conclusion

Per the requirements of the LKC Quality program, the issuance/signing of a nonconformance report must be signed/initiated by a certified inspector. This requirement did not prevent the alleger from expressing his concerns, and as evident from the supporting documentation supplied by the alleger to the enclosed allegations, was acted on by the electrical contractor. Other documentation reviewed by the NRC inspector throughout this inspection clearly demonstrated that the alleger's concerns were addressed and resolved when the alleger made them known to the contractor's management. In addition, there were NCRs prepared by the alleger which were issued through a certified inspector (reference LKC NCRs 3099, 3137, and 3145).

One violation with two examples was identified (paragraphs 2.h and 2.j, allegation 4).

3. (Closed) Allegation RIII-85-A-0005

The document reviewer stated that the Comstock Rework Program is "full of loopholes" and that "the documentation flow through QC is not clear in the procedure." As an example, a final inspection will be done, but

"seldomly is there a basemetal inspection." The reviewer continued "the basemetal inspection is required to be done after a defective part is removed, but before the replacement is installed."

NRC Review

The NRC inspector interviewed each L. K. Comstock document reviewer and their supervisor independently. None of the personnel interviewed were knowledgeable of the alleger's concerns. The NRC inspector reviewed L. K. Comstock Procedure 4.13.1.1 titled, "Turnover Document Review." This procedure "prescribes the guidelines for the review of quality control inspection documents to be followed by all Document Review personnel."

The procedure provides a checklist for all quality documents reviewed. The Document Reviewers are required to review the quality document to the applicable checklist in the procedure. None of the checklists reviewed specified a review for base metal inspection but rather to ensure that all records were complete and properly approved in accordance with ANSI N45.2.9. The NRC inspector reviewed a random sample of quality documents with no adverse findings.

Conclusion

This allegation was not substantiated. The Document Reviewers do not review the quality documentation for base metal inspection as it is not part of the procedural requirement. However, base metal inspection is required to be performed as stated by the alleger, when a (defective) part is removed and before the replacement is installed. This is a requirement of LKC Procedure 4.3.12, Revision C, dated February 6, 1985, Paragraph 6.6, which states that QC will be notified to perform a base metal inspection if at any time a hanger/component is to be moved or cut down during or after installation. This is documented on LKC Form 244 and signed by a Level II inspector. Document reviewers are not Level II inspectors and would normally not be knowledgeable of when a base metal inspection is required. This concern was also addressed in NRC Inspection Reports No. 50-456/85044(DRS); No. 50-457/85043(DRS) in conjunction with this review.

No violations or deviations were identified.

4. Exit Interview

The inspector met with site representatives (denoted in Persons Contacted Paragraph) at the conclusion of the inspection. The inspector summarized the scope and findings of the inspection noted in this report. The inspector also discussed the likely informational content of the inspection report with regard to documents or processes reviewed by the inspector during the inspection. The licensee did not identify any such documents/processes as proprietary.