US NRC
OFFICE OF INVESTIGATION
DALLAS FIELD OFFICE

REPORT OF INQUIRY

August 5, 1982

SUBJECT: ALLEGED CONSTRUCTION DEFICIENCIES AT WOLF CREEK (50-482)
REPORT NUMBER: Q4-82-015

1. On August 3, 1982, Mr. Roger Duwe, [redacted] was telephonically interviewed. Mr. Duwe stated he worked at Daniel International Corporation (DIC) at Wolf Creek from June 1980, to January 1982. Mr. Dan Tomlinson, of the NRC Region IV staff, was present during the interview.

2. Mr. Duwe provided information concerning a number of technical issues which he considered to be problem areas at Wolf Creek. Mr. Duwe provided no information which was related to new specific willful violations of NRC or site procedures.

3. D. Tomlinson provided Enclosure (1), supporting memo, identifying all purely technical issues associated with the interview of Mr. Duwe.

4. These technical issues will be reviewed as part of the routine inspection program. DFO will provide support as needed.

D. D. Driskill
Investigator

cc: J. Collins
J. Gagliardo
D. Tomlinson

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E. -1-

Summary of Conversation

Statements made by individual "A" were:

1. Certain welds "in primary tension which are only allowed 0.010 inch undercutting" by welding code AWS D1.1 are not being properly inspected. He states that there is no inspection criteria for "welds in primary tension". He further states that "several" inspectors in this area have "little or no weld inspection background or experience".

2. Certain pipe whip restraints for the main steam system were supplied by vendor with "pathetic welding". He stated that "some of these" were repaired by site personnel.

3. Essential Service Water (ESW) piping was welded and buried without repairing or applying the "required dielectric coating" to the carbon steel piping. He stated that he doubts the integrity of this piping as there was no inspection performed for damage that "might have been caused by the back fill crew". He also stated that during the back fill operation he could "hear gravel in hard contact with pipe" and questions the back fill requirements.

4. No cathodic protection was installed for this system as was done at the Callaway site. He states that this concern is for the "uncoated field welds". Some of this piping might still be available for visual inspection at the "valve house west of the diesel generator building".

5. "Some welds" on piping hangers were reworked following final inspection. This allegation is based on his observation that "good inspectors had bought welds that were pathetic". This observation was based on his personal knowledge of the work performed by other inspectors on the BM-01 system hangers.

6. Although "not positive" that it has occurred, individual "A" stated that it is "possible to forge material heat numbers". This was previously discovered during a past investigation and has been documented as a site audit finding.

7. Repairs are made to ASME Section III piping, but the site ANI "is not allowed to review the paperwork". These are "minor repairs such as buffing. No subsequent visual or liquid penetrant inspections are performed after the repairs are made."

Individuals "B", "C", and "D" have knowledge of one or more of these allegations and may be willing to talk with NRC personnel about them.

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Branch

Docket: STN 50-482/82-19

DEC 16 1982

Kansas Gas and Electric Company
ATTN: Mr. Glenn L. Koester
Vice President - Nuclear
Post Office Box 208
Wichita, Kansas 67201

Gentlemen:

This refers to the inspection conducted by Messrs. D. P. Tomlinson and R. P. Mullikin of our staff during the period November 15-19, 1982, of activities authorized by NRC Construction Permit CPPR-147 for the Wolf Creek facility, Unit 1, and to the discussion of our findings with Mr. C. Parry and other members of your staff during the inspection period.

Areas examined during the inspection and our findings are documented in the enclosed inspection report. Within these areas, the inspection consisted of selective examination of procedures and representative records, interviews with personnel, and observations by the inspectors.

Within the scope of the inspection, no violations or deviations were identified.

Two new unresolved items are identified in paragrapn 7 of the enclosed report.

In accordance with 10 CFR 2.790(a), a copy of this letter and the enclosure will be placed in the NRC Public Document Room unless you notify this office, by telephone, within 10 days of the date of this letter and submit written application to withhold information contained therein within 30 days of the date of this letter. Such application must be consistent with the requirements of 2.790(b)(1).

Should you have any questions concerning this inspection, we will be pleased to discuss them with you.

Sincerely,

/S/

W. C. Seidle, Chief
Reactor Project Branch 2

Enclosure:
NRC Inspection Report STN 50-482/82-19

ES	ES	ES	RPB2	DRRP&EP	RA-RIV
DTomlinson:gb	RMullikin	DMHunnicutt	WCSeidle	JEGagliardo	JCollins
12/08/82	12/9/82	12/9/82	12/10/82	12/ /82	12/16/82

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E -2-

bcc to DMB: (IE01)

bcc to RIV:
Resident
Section Chief
Infor Systems
J. Collins
D. Tomlinson
R. Mullikin
RPB2
RIV FIle
C. Wisner
Kansas State Dept. of Health
Myron Karman, ELD, MNBB (2)

APPENDIX

U. S. NUCLEAR REGULATORY COMMISSION
REGION IV

NRC Inspection Report: STN 50-482/82-19

Docket: STN 50-482 Category A2

Licensee: Kansas Gas and Electric Company
P. O. Box 208
Wichita, Kansas 67201

Facility Name: Wolf Creek, Unit 1

Inspection at: Burlington, Coffey County, Kansas

Inspection conducted: November 15-19, 1982

Inspectors: for D. M. Hunnicutt 12/9/82
D. P. Tomlinson, Reactor Inspector, Engineering Section Date
(paragraphs 1, 2, 3, 6, 7, 8, 9)

R. P. Mullikin 12/9/82
R. P. Mullikin, Reactor Inspector, Engineering Section Date
(paragraphs 1, 2, 4, 5, 9)

Reviewed: for D. M. Hunnicutt 12/9/82
W. D. Johnson, Chief, Reactor Project Section C Date

Approved: D. M. Hunnicutt 12/9/82
D. M. Hunnicutt, Chief, Engineering Section Date

Inspection Summary

Inspection conducted November 15-19, 1982 (Report STN 50-482/82-19)

Areas Inspected: Routine, unannounced inspection covering a review of quality related records relative to electric cable terminations and related equipment; review of cable storage; review of actions taken related to vendor supplied control panel welds; review of actions taken related to unresolved item 81-15; investigation of seven allegations made by a former employee. This inspection involved 60 inspector hours by two NRC inspectors.

Results: Within the five areas inspected, no violations or deviations were identified.

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DETAILS

1. Persons Contacted

Principal Licensee Employees

*V. Canalis, Construction Engineer
*L. A. Gabryelski, Quality Control Engineer
*O. L. Thero, QA Surveillance
*C. E. Parry, Supervisor, QA Systems
*D. A. Colwell, QA Systems
R. A. Bird, QA Engineer
C. Ha, QA Engineer

Other Personnel

B. Shinneman, Electrical Quality Inspector (Daniel International Corporation)
*N. A. Schryer, Projects Quality Inspection Manager (Daniel International Corporation)
*C. M. Herbst, Lead Site Liaison Engineer (Bechtel)
*J. S. Newcomer, Assistant Site Liason Engineer (Bechtel)
J. Paxton, Cable Installation Superintendent (Davis Electric)

During this inspection, other site management, engineering, QC, and construction personnel were contacted.

*Denotes those attending the exit interview.

2. Site Tour

The NRC inspectors walked through various construction and storage areas to observe construction activities in progress and to inspect the general state of cleanliness and adherence to housekeeping requirements. The tour included the reactor building, reactor auxiliary building, and several outside storage areas.

No violations or deviations were identified.

3. Licensee Action on Previous Findings

(Closed) Unresolved Item (STN-50-482/81-15).
NRC Inspection Report 50-482/81-15 identified an unresolved item concerning Procedure WP-VII-208 which allowed the alteration and cutting of support material to shape and size by mechanical or thermal means without

engineering approval. Revision 11 to the subject procedure has been issued and clarifies this activity. All hanger drawings now stipulate tolerances for all hanger parts which may require minor modifications of part length at installation. Engineering approval is required only if the part length alteration exceeds these design tolerences. If the part length change is greater than permitted by the drawing, a field change request (FCR) is initiated and approval by Bechtel Engineering is required. In the case of both minor and major alterations, the true conditions and dimensions are recorded on field drawings and are ultimately incorporated into the final "as-built" drawings.

This item is considered closed.

4. Review of Quality Related Records (Electric Cable, Terminations and Related Equipment)

The NRC inspector examined the Daniel International Construction (DIC) QC records and reports dealing with receipt inspection and materials certification, electric cable and raceway installation, cable nondestructive examination (NDE), and nonconformance reports.

a. Receipt Inspection and Materials Certification

Records were examined by the NRC inspector pertaining to electric cable, terminations and related equipment, and receipt inspection and materials certification. The records were inspected to determine whether received material met or failed to meet requirements and whether specifications, including acceptable qualification test results (where applicable), were conformed to.

The following DIC Material Receiving Reports (MRR) (including receiving and storage inspection checklists, purchase orders, receiving QC inspection reports, and test reports) were examined.

MRR #46376 - Connector cables and bars
MRR #50625 - Batteries
MRR #55530 - Lugs
MRR #59162 - 350 MCM compression lugs
MRR #59301 - Pressure terminal connectors
MRR #63840 - Copper connectors
MRR #57304 - Terminal block
MRR #46351 - Heatshrink tubing and terminal lugs
MRR #57707 - Lugs and cable
MRR #37439 - 600 V cable
MRR #37533 - 600 V cable
MRR #44195 - 600 V cable

No violations or deviations were identified in this portion of the inspection.

b. Installation Records

The NRC inspector examined the postinstallation records for selected electric cable, termination components, and raceways (cableways). The examination included whether cable, and termination components were installed as specified, raceways were routed for necessary separation and protection, raceway supports and anchorages were installed as specified, and whether an identification system integrating raceways with routing requirements for cables was in effect. The DIC QC cable termination cards, QC cable termination checklists, and QC cable installation cards were examined for the following safety related power and control cables:

Power	Control
1EFG06AA	1EFG06AB
1EFG03DA	1EFG03DB
1EFG10AA	1EFG10AB
1EFG08AA	1EFG08AB
4EFG02DA	1EFR06AA
1ECY08AA	1EFR08AA
1EGG04AA	1EFR10AA
1EGG04BA	1EFR03DA
1NEK12AG	4EFG02DB
1NFY01AA	4EFR02DA
1EJG08AA	1SAZ04GA
1EMG03AA	1SAZ04LA
1EMY01AA	1ECG01AB
	1ECR08BA
	1NEB10AA
	1NFK01GE
	1EJB01AB

The QC raceway installation cards and QC raceway checklists were examined for the following raceways which are associated with several cables listed previously:

Raceways
1C8G42, 1C8F42, 1C8F50, 1C8F52, 1C8G50, 1C8G52, 1C8J42, 1C8J50, 1C8J52

No violations or deviations were identified in this portion of the inspection.

c. Cable Nondestructive Examination (NDE)

The NRC inspector examined records to determine whether NDE was performed on selected electrical cables and whether requirements were met. The cable NDE included continuity tests and megger tests (cable insulation tests).

The QC cable termination checklists were examined for continuity tests results for the 13 power and 17 control cables listed in the preceding paragraph 4.b.(Installation Records). In addition, the meg insulation test reports were examined for the 13 power cables listed in paragraph 4.b., (Note: only power cables need to be meggered).

No violations or deviations were identified in this portion of the inspection.

d. Nonconformance Records

Selected DIC nonconformance reports (NCR) relative to electrical cables, terminations and related equipment were examined to ascertain whether:

(1) Records are current, legible, complete, reviewed, and readily retrievable

(2) Noncomformances are adequately described in these records and include the status of corrective actions or resolution

(3) Records reflect that appropriate corrective action was taken

The NCR's reviewed by the inspector were precise and easily understood. The following NCR's were examined:

NCR #1SN6675E
NCR #1SN6630E
NCR #1SN6540E
NCR #1SN6532E
NCR #1SN6481E
NCR #1SN6404ER
NCR #1SN6351E
NCR #1SN5787E
NCR #1SN5802E
NCR #1SN5827E
NCR #1SN5829E
NCR #1SN5893E
NCR #1SN5907E
NCR #1SN5932E
NCR #1SN5992E
NCR #1SN6121E
NCR #1SN6237E

No violations or deviations were identified in this portion of the inspection.

5. Inspection of Cable Storage Yard

The NRC inspector examined the cable storage yard and discovered that four reels of nonconforming cable had not been segregated from conforming cable. This condition was brought to the attention of personnel at the storage yard who stated that nonconforming cable was segregated normally. A reinspection of the yard by the inspector showed that the nonconforming cable reels had been segregated in an area roped off and marked with yellow flags. No further action is required on this matter.

The following DIC procedures were examined:

Administrative Procedure AP-VI-02, "Nonconformance Control and Reporting," Revision 15, dated November 15, 1982.

Administrative Procedure AP-VI-08, "Identification and Status of Material, Parts and Components," Revision 11, dated July 26, 1982

No violation or deviations were identified in this portion of this inspection.

6. Review of Actions Taken Related to Vendor Supplied Control Panel Welds

On July 29, 1980, KG&E requested that DIC perform a visual inspection of all welds on the main control panels supplied by Comsip Customline, Inc. After several inspections had been performed by DIC, Comsip, and KG&E one Comsip panel was selected at the suppliers plant for seismic testing. The sample panel was carefully selected to assure that the welds in the sample exhibited defects of at least the same types and magnitudes as those in the actual production panels. The sample was tested on a shaker table at Acton Environmental Testing Corporation on December 9, 1980. The test panel was subjected to five biaxial seismic tests in each 90° angular orientation for a total of twenty tests. One control panel weld failed at a ZPA (zero period acceleration) level between 5 and 6 G's. Based on a ZPA level equal to 4.2 G's, the stresses in the test panel would be approximately 3.4 times higher than the stresses in the "as-built" control panels during a seismic event. Based upon the results of this "Shaker Test" and various stress analyses performed using "worst-case" conditions, it was concluded that the as-built welds were capable of withstanding at least twice the stress levels calculated to occur during a safe shutdown earthquake (SSE).

No further action will be taken on this matter.

7. Investigation of Allegations

On August 3, 1982, the NRC RIV office was contacted by a former site employee who voiced concerns about the construction practices used at the Wolf Creek site. The seven allegations made by this individual and the disposition of each are:

a. The alleger stated that certain welds "in primary tension which are only allowed 0.010 inch undercut" by the American Welding Society (AWS) D1.1 Structural Welding Code are not properly inspected. We stated that there is no inspection criteria for welds "in primary tension." We further stated that "several inspectors in this area have little or no weld inspection background or experience."

The qualification of inspection personnel in all phases of QA/QC is one of the items reviewed in part during almost every NRC inspection. Past inspection reports indicate that the experience and training of inspectors exceeds the requirements of ANSI N45.2.6 and SNT-TC-1A. The training program for inspection personnel is continuous effort and records of all training received are a part of each inspectors personnel folder. This part of the allegation could not be substantiated.

Paragraph 3.6.4, of the AWS Structural Welding Code (paragraph 9.25.1.5 in the 1981 edition) states "Undercut shall be no more than 0.01 inch deep when the weld is transverse to the primary stress in the part that is undercut. Undercut shall be no more than 1/32 inch deep when the weld is parallel to the primary stress in the part that is undercut." In an attempt to streamline the paper work necessary for the construction of a nuclear power plant, Bechtel originated and issued "Technical Specification for Erecting Miscellaneous Metal for the Standardized Nuclear Unit Power Plant System (SNUPPS)." This Specification, Number 10466-C132, was issued and approved for use on SNUPPS sites and is a general Specification referencing a series of welding codes and standards. Rather than individually list the various requirements of each, they were referenced in total and only the exceptions to these codes and standards were listed. Specification 10466-C-132, Revision 4, paragraph 8.5.2, states "Undercut shall not exceed 1/32 inch." Discussions with personnel in the Bechtel engineering department indicate that an exception to the 0.010 inch undercut requirement was taken by the inclusion of this line. To clarify this requirement, Bechtel engineering will generate correspondence specifically stating this exception and the justification for it.

Pending NRC receipt and review of these actions, this will be considered an unresolved item. (482/8219-1)

b. The alleger stated that certain pipe whip restraints for the main steam system were supplied by a vendor with "pathetic welding." He stated that some of these welds were repaired by site personnel.

The NRC inspector contacted the KG&E QA department personnel and questioned them about the status and present location of all vendor-supplied pipe whip restraints for the main steam piping. A KG&E quality engineer accompanied the NRC inspector as the NRC inspector performed a visual inspection of all of the welds on four restraints that were in temporary storage on the turbine deck in the turbine building. While performing this inspection, the QA engineer noted that approximately half of the restraint end pieces had a weld that was not present on the remainder of the end pieces. A telephone conversation between the vendor, Bergen-Paterson, and KG&E revealed this weld was not on the fabrication drawings and should not have been included on the hardware. This condition was not noted or documented by source inspection personnel. A similar inspection of the remaining twelve restraints in the warehouse was performed and identical conditions were noted. During the inspection of the welds on all 16 pipe whip restraints for the main steam system, the NRC inspector saw no evidence that repair welding had occurred on any of the component parts. Porosity and possible nonfusion was noted at some weld ends where minor cosmetic grinding had been performed. Because of these conditions discoverd by the quality engineer, KG&E has requested that (DIC) perform an indepth inspection of the main steam system restraints for total compliance to welding code and drawing requirements.

Pending completion and documentation of this inspection by (DIC), this will be considered an unresolved item. (482/8219-2)

c. The alleger stated that the essential service water (ESW) piping was welded and buried without repairing or applying the "required dielectric coating" to the carbon steel piping. He stated that he doubts the integrity of this piping as there was no inspection performed for damage that "might have been caused by the backfill crew." He also stated that during the backfill operation, he could "hear gravel in hard contact with the pipe" and questions the backfill operation.

The alleger's employment at the Wolf Creek site began in June 1980. NRC ISN-1890-M, dated July 20, 1978, and NCR ISN-0783-M, dated February 21, 1979, were both issued because of discrepancies

in the coating on the ESW system pipe spools and welds. Both had been issued and corrections were being made prior to the alleger's arrival onsite. The actions required by these NCR's included an inspection of each pipe spool for coating integrity, the wrapping of each pipe joint after welding, and an "over-the-ditch" final coating inspection. In addition, the actions required by NCR IDN-ISN-1890-M included an inspection for coating damage when the backfill in the ditch has reached a level six inches below the horizontal center line of the pipe. Any discrepant areas were to be repaired in accordance with WP-VII-202 prior to the completion of the backfill operation. A review of records of the backfill operation and discussions with four persons involved with this work indicate that the coating of the pipe and welded joints was as required when the pipe was placed in the ditch and when the backfill was partially completed. The backfill material below, around, and immediately over the ESW system was a coarse sand material which was compacted into place by the use of one-man tamping machines. As this method was used until the backfill reached a level one foot above the pipe, it is extremely doubtful that anyone "could hear gravel in hard contact" with the piping or that any significant damage could have occurred to the piping or the coating.

This allegation could not be substantiated.

d. The alleger stated that no cathodic protection was installed for this system as was done at the other SNUPPS site. He stated that this concern is for the "uncoated field welds."

The NRC inspector contacted four DIC/engineers in the piping and civil engineering disciplines and discovered from conversations and record review that the required cathodic protection had been provided during the installation of the piping. The anodes were being installed and permanently tied-in at the time of this inspection. Because this installation and tie-in did not occur during the alleger's term of employment, he possibly assumed that it would not occur at all.

This allegation was found to be without merit.

e. The alleger stated that "some welds" on piping hangers were reworked following final inspection. This allegation was based on his "personal knowledge of the work performed by inspectors on the main steam line hangers."

As was stated above in paragraph 7B, the NRC inspector conducted a visual examination of all available permanent restraints and hangers for evidence that any authorized or unauthorized repairs had been made to any of the welds. Repair areas were noted on several of the temporary hangers and supports for these lines. It is possible that the alleger saw these and mistook them for permanent structures.

This allegation could not be substantiated.

f. The alleger stated that, although he is not positive that it has occurred, it is possible to "forge material heat numbers" from one piece of material to another."

This item was previously documented as a site audit finding and is presently the subject of an NRC investigation being conducted by the RIV Office of Investigation. This item will not be addressed in this report.

g. The alleger stated that repairs are being made to ASME, Section III, piping and that the site authorized nuclear inspector (ANI) "is not allowed to review the paperwork." He stated that these are minor repairs such as buffing or sanding and that no subsequent visual of surface inspection are performed after the repairs are made.

The NRC inspector and the KG&E QA supervisor conducted a record review of welding repair instruction sheets selected at random. In all cases it was noted the instructions included a surface inspection (magnetic particle or liquid penetrant) following any metal removal operation. If subsequent welding was necessary, further provisions for a postweld inspection were included. On each of the sheets that included a "hold point" for ANI inspection, the hold points had been acknowledged and signed by an ANI. A discussion with two ANI's disclosed that minor sanding and buffing are being accomplished on numerous components and piping weld surfaces without an immediate surface reinspection but these operations are being performed only on ASME class 1 and class 2 items that will be subjected to preservice inspection (PSI) and future inservice inspections (ISI). A welded joint or component that has been accepted to the requirement of ASME, Section III, may require further surface conditioning prior to performing the ASME B&PV Code, Section XI PSI and ISI examinations. All surfaces affected by this preconditioning will be re-examined as part of the PSI. The NRC inspector, ANI, and KG&E QA found no evidence that any repairs were being made without the proper authorization, documentation, and subsequent surface inspections.

This allegation could not be substantiated.

8. Unresolved Items

Unresolved items are matters about which more information is required in order to ascertain whether they are acceptable items, violations, or deviations. An unresolved item related to the acceptance criteria for weld undercut is discussed in paragraph 7A. A second unresolved item related to vendor-supplied welded components is discussed in paragraph 7B.

9. Exit Interview

The NRC inspectors met with licensee representatives and Mr. T. E. Vandel, NRC Resident Inspector (denoted in paragraph 1) on November 19, 1982, and summarized the scope and findings of the inspection.