A-40 Barrett

Louis A. Clark, Director
Government Accountability Project
Institute for Policy Studies
1901 Que Street, NW
Washington, D.C. 20009

Dear Mr. Clark,

This is in response to your letter dated May 11, 1981, requesting on behalf of Mr. Thomas Applegate that I recommend suspension of the construction permit for the William H. Zimmer Nuclear Power Station. The request was based on a study by your organization of the NRC's reports of inspections and investigations since early 1979, as well as on allegations made by Mr. Applegate and others.

The information you submitted has been reviewed by members of my staff involved in the ongoing Zimmer investigation. In our opinion no new information was contained in your letter and, for reasons presented below, we have concluded that there is no basis at the present time to recommend suspension of the Zimmer construction permit.

A significant portion of the current investigation was completed by March 27, 1981. During the remainder of March and the first week of April, Region III management and the investigation team spent considerable time reviewing problems and potential problems identified during the investigation and determining appropriate NRC actions. Recognizing that construction was 95% complete, it was our conclusion that suspension of work was not the most pressing consideration. We felt our primary effort should be devoted to (1)

pressing consideration. We felt our primary effort should be devoted to (1) establishing controls to assure the quality of ongoing and future work; (2) establishing a program to confirm the quality of completed work and correct any identified deficiencies; and (3) assuring ongoing and future work would not preclude item (2).

Ten actions to assure quality of ongoing and future work were documented in our letter to CG&E dated April 8, 1981. A copy of the letter is enclosed. These actions have resulted in delaying much of the safety-related work onsite, elimination of the construction swing shift, changes in plant management personnel, increased numbers of QA/QC personnel onsite, and reduced numbers of construction personnel onsite.

We believe the actions specified in the letter provide assurance that ongoing construction activities are being adequately controlled. Followup inspections by the Senior Resident Inspector and specialist inspectors from our office have confirmed implementation of the requirements of the letter.

The comprehensive program to confirm the adequacy of completed construction was discussed with the licensee in meetings on April 10, April 30, June 2, and June 3, 1981, and is currently being finalized.

In addition to the above actions required of the licensee, the NRC plans to conduct a sampling program of onsite independent measurements to augment the existing NRC inspection program.

As you are aware, we requested and Mr. Devine agreed to provide a list of specific construction items which your sources have lead you to believe are of suspect quality. Your items will be considered in the development of our sampling program.

Should furture inspections show that ongoing work is not being adequately controlled, that identified quality problems are not corrected, or that ongoing work compromises the correction of identified quality problems, the need for stopping work will be reconsidered.

James G. Keppler

Director

Enclosure: Ltr dtd 4/8/81 to CG&E

cc w/enclosure

Thomas Devine, Associate

Director, GAP

E A Borgmann, Senior Vice President, CG&E

J. R. Schott, Plant

Superintendent

DMB/Document Control Desk (RIDS)

Resident Inspector, RIII

Harold W. Kohn, Power

Siting Commission

Citizens Against a Radioactive

Environment

Helen W. Evans, State of Ohio

3.

A-2

1 of 2

4.1 Nonconformance Report Voiding

4.1.1 Allegation

On November 18, 1980, an NRC inspector was contacted by an individual who identified himself as a former QC Inspector at Zimmer. The individual stated that Kaiser QA Manager Phillip Gittings had been improperly voiding Nonconformance Reports (NRs) based on Gittings' reinspection of the nonconforming items.

Between January 13 and July 4, 1981, 31 current and former Kaiser QC Inspectors and QA Engineers were interviewed by NRC regarding the Kaiser nonconformance reporting system. Sixteen of those individuals alleged irregularities in the system. They specifically alleged:

a. The QA Manager was arbitrarily voiding NRs which were not written in error.

b. The QA Manager was ~~diverting NRs~~ not entering them into the Kaiser nonconformance reporting system.

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c. NRs were being voided and their items transferred to Surveillance Reports (SRs).

d. NRs were being improperly dispositioned by the QA Manager and members of the Kaiser Material Review Board (MRB) who frequently dispositioned

them as "Accept-As-Is" when "Repair" or "Rework" was appropriate per Kaiser specifications and industry codes and standards.

e. NRs were voided with the justification "to be reinspected after redesign" or "deficiencies would be rewritten on separate NRs." The nonconforming conditions were not reinspected after redesign, nor were they written on separate NRs.

f. NRs were voided by the QA Manager at the request of the Construction Department to avoid rework and schedule delays.

g. During revisions of an NR, nonconforming items were arbitrarily removed by the QA Manager.

4.1.2 General Background

4.1.2.1 Nonconformance Reporting System

The Kaiser nonconformance reporting system was established to provide control of nonconforming material. Kaiser Quality Assurance-Construction Methods Instruction (QACMI) G-4, Rev. 9, provides the following procedure: The QA Department or Field Engineering may initiate an NR when members identify nonconforming material, equipment, construction work, or a deviation from specified requirements. The Inspector or QA Engineer initiates the NR and then contacts the Site Document Control (SDC) NR Controller who makes a log entry and assigns a KEI Control Number (CN). The NR is reviewed by the Inspector's

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supervisor or cognizant QA Engineer and is forwarded to the SDC NR Controller who issues the NR a KEI Control Number (CN).

NRs written on Essential Systems/Components are given an "E" prefix and Nonessential Systems/Components will be given a "N" prefix. The QA Manager can approve voiding of NRs "in instances where an NR has been initiated in error, due to interpretation or judgement of borderline conditions, duplications, or where a nonconforming condition has been corrected by the Construction Department after a verbal or written communication from the QA Department can be voided by the Site QA Manager." In these cases the NR is stamped "Void" with a brief statement indicating justification for the voiding. A copy of the voided NR is required to be retained in the SDC and a copy returned to the initiator.

The KEI Construction Engineer or his designee dispositions NRs as "Accept-As-Is", "Rework", "Repair", or "Reject". "Accept-As-Is" and "Repair" dispositions require review by the Material Review Board which consists of the KEI Construction Engineer, CG&E QA Engineer, Kaiser QA Engineer, CG&E sponsoring engineer, and the Sargent and Lundy Design Engineer (for essential material or equipment only). In the case of an ASME Section III Code nonconformance, the Authorized Nuclear Inspector must be included on all "Accept-As-Is" dispositions. Records of all open and closed NRs are retained by the SDC NR Controller.

4.1.2.2 Previous Related NRC Inspection Findings

During an NRC inspection conducted December 2-3, 1980, the RIII inspector observed that of twenty NRs written to document American Welding Society (AWS) welding deficiencies on hanger welds, eight had been voided with the notation "based on re-inspection". It was also observed that NRs had been voided by the issuance of Design Document Controls (DDCs). The inspector informed site personnel and CG&E management during the exit interview on December 16, 1980, that these practices were contrary to site procedures and NRC requirements.

The inspection report containing these items of noncompliance was issued on March 2, 1981 (Inspection Report 50-358/80-25). The licensee replied to these items by letter dated March 16, 1981, indicating that a Stop Work Order had been issued prohibiting voiding of NRs, and this order had been subsequently rescinded when improved procedural controls were in place. The improved procedural controls consisted of limiting the authority to void an NR to the Kaiser QA Manager, and the marking of superseded NRs as "Superseded" rather the "Void".

The licensee reply also indicated that Kaiser was performing a complete review of voided NRs in response to a licensee audit finding. The review was expected to be completed by April 30, 1981, and full compliance with NRC requirements was to be achieved by May 5, 1981. Between December 15-19, 1980, and on January 5, 1981, Lon Ludwig, of Nuclear Energy Services, Inc., audited the Kaiser nonconformance reporting system for Kaiser. ?

Should this be a section 4.1.3 on Interviews

4.1.2.3 Interview of William Schwiers

On January 16, February 14, and March 22, 1981, William Schwiers, CG&E QA Manager, was interviewed by NRC. Schwiers stated that during an NRC exit meeting held on January 6, 1980, Eugene Knox, Kaiser Corporate QA Manager, and Phillip Gittings were informed that Kaiser was improperly voiding NRs. Schwiers said he directed Kaiser to audit all the previously voided NRs and present the results of the audit to CG&E by February 16, 1981. Schwiers stated he also directed Gittings to cease improperly voiding NRs. He provided a copy of a memo he wrote to Gittings dated January 14, 1981, in which he requested Kaiser to respond to Field Audit Report No. 340 concerning the voiding of NRs. A copy of the memo and audit report is attached to this report as Exhibit ( ).

4.1.2.4 Interview of Lon Ludwig

On January 14, 1981, Lon Ludwig, Quality Engineering Manager, Nuclear Energy Services, Inc., was interviewed by NRC. He stated that in December 1980 and January 1981 he audited the Kaiser nonconformance reporting system for CG&E after the NRC had identified that NRs were being improperly voided. Ludwig said his audit showed there were approximately 500 voided NRs and between one-third to one-half of these were superseded and written on other NRs. He said some NRs which identified numerous nonconforming conditions were separated and reissued on individual NRs. One-third of the NRs reviewed were voided as "written in error" with no adequate explanation given to justify this comment. Ludwig stated that he recommended Kaiser audit all the voided NRs and provide a better explanation as to why each was voided.

Ludwig stated that the voided NRs he reviewed covered all areas of plant operation and construction, and dated from 1974 to the present.

4.1.2.5 Interviews of Phillip Gittings

4.1.2.5.1 January 13, 1981, Interview

Phillip Gittings, Kaiser QA Manager, was interviewed by NRC. He stated that in October 1980 he voided seven NRs that were written by QC inspectors who were in training. He said he reinspected the welds identified in the NRs and, in his opinion, the welds met American Welding Society (AWS) Code requirements. He said that during an NRC inspection in December 1980, the inspector took exception to this practice and found the licensee in noncompliance with NRC requirements for improperly voiding NRs.

Gittings said that following the NRC inspection the welds identified on the seven NRs were reinspected by Gladstone Laboratories, Inc. He said Gladstone concluded that four of the seven NRs were properly voided and the noted welds conformed to the AWS Code; however, the other three NRs had minor decrepancies which Gladstone concluded did not meet the AWS Code.

Gittings stated that approximately 500 NRs had been voided by Kaiser at the Zimmer project. A number of these NRs were voided and then revised and put on other NRs, or were voided after it was found they duplicated a previously reported nonconforming conditions. He stated that the only NRs he voided for being "written in error" were those from October and November 1980 that were examined during the December 2-3, 1980, NRC inspection.

Gittings stated that during the past six months Kaiser had problems with some of its QC Inspectors overinspecting. Gittings said many of the inspectors were critical of the Kaiser nonconformance reporting system and of the Kaiser weld inspection criteria for pipe support hangers and structural steel. He said there were differences of opinion on various code interpretations, which he felt were common in any weld inspection program.

4.1.2.5.2 July 8, 1981, Interview

Phillip Gittings was re-interviewed by NRC following the NRC investigation of the dispositions of a selected group of twenty NRs. Gittings stated that the voiding of NRs by clerks and by SDC Supervisor Floyd Oltz was improper because neither the clerks nor Oltz were qualified to make engineering judgements concerning deficiencies identified on NRs. After a December 1980 NRC inspection, Gittings said he directed the NR procedure be changed so that only he could void an NR.

Gittings stated that Kaiser procedures allowed any QC Inspector to initiate an NR and the procedures required it be entered into the Kaiser nonconformance reporting system. When questioned about his failure to issue the NRs with Control Numbers 5476, 5477, and 5479 which were written by QC Inspector James Ruiz on February 23, 1981, Gittings said he directed Rex Baker, Inspection Supervisor, to void those NRs. He said his action those on NRs was contrary to the Kaiser procedure which only permitted an NR to be voided if it was "written in error". Gittings said those NRs were not written in error.

Gittings stated that he voided NRs at the request of Construction Department personnel, but added that he made independent evaluations and decisions when doing so and was not compelled by construction personnel to void NRs. Gittings stated he did not know why Christopher Dumford's NR (CN-4309) was not in the Kaiser nonconformance system and denied diverting this NR from the system.

When questioned about specific irregularities found during the NRC investigation, Gittings concurred that the practices of voiding NRs by stating they "would be reinspected after redesign," voiding NRs and transferring the nonconformances to "punch lists," and voiding NRs by placing nonconformances on Surveillance Reports were not in accordance with Kaiser procedures.

Gittings stated that Kaiser QC Inspectors were identifying problems at Zimmer. He said CG&E and Kaiser did not have enough sufficiently qualified inspectors. He said this was evident when Richard Reiter identified a significant traceability problem when reviewing isometric drawings on small bore pipe systems. Gittings said Reiter had initiated a Surveillance Report correctly identifying the problem and he (Gittings) had not adequately answered the report. He said this problem warranted reporting to the NRC; however, Kaiser did not do so. He said that eventually Kaiser hired two QA Engineers to review the documentation and they found that Reiter's analysis was correct. During this investigation the NRC inspectors reviewed the traceability problem and found Reiter's analysis to be correct.

4.1.2.6 Interview of Kathy Faubion

On February 13, 1981, Kathy Faubion, Kaiser NR Controller, was interviewed by NRC. She stated Kaiser procedures permit an inspector to call for a Control Number (CN) for an NR. She is required to issue the inspector a CN, make an entry in the Kaiser Log of Nonconforming Material (NR Log) describing the nonconforming item, and note the initials of the inspector calling for the number. She stated she never "whited out" an entry for a CN in the log.

Faubion indicated that the QA Manager stamps all voided NRs with a red "void" stamp. When she receives a copy of the voided NR she marks through the CN entry in the log with red ink. She said inspectors frequently call for control numbers and do not subsequently send the NR. In these cases, Faubion said she makes the same "void" entry in the NR Log.

She said that prior to December 1980, Floyd Oltz, Kaiser QA Engineer-Records, also had the authority to void NRs; however, William Schwiers, CG&E QA Manager, directed that this authority be vested solely in the Kaiser QA Manager. She said since that time Oltz has not voided any NRs.

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4.1.4 Disposition of Nonconformance Report CN-5412

4.1.4.1 Background Information

On December 29, 1980, Chris Dumford, Kaiser QC Inspector, initiated Surveillance Report (SR) 2886 to document that a suppression pool liner plate

was tensioned before a QC Inspector arrived to verify the initial tensioning. The corrective action to resolve this condition was for an inspector to be present during the seven and thirty day tension checks, to verify that the plate was being tensioned properly.

On February 3, 1981, Dumford initiated a NR (assigned CN-5412) which also reported that a suppression pool liner plate was being tensioned in violation of an applied "hold" tag. The NR states "Hold tag was applied while wall plate 10D was in process of being tensioned. Once hold tag was applied tensioning was continued until tensioning was completed."

4.1.4.2 Investigation

4.1.4.2.1 Interview of Walter Dumford

On February 11, 1981, Walter C. Dumford, Kaiser QC Inspector, was interviewed by NRC. He stated that on February 3, 1981, he was inspecting suppression pool wall plates and noticed that a bolt on a plate was not perpendicular to the plate. He said construction personnel were preparing to tension the plate and when he told them he was going to place a hold tag on it, they responded "try and stop us."

Dumford said he left the area to discuss the matter with his supervisor, Dennis Donovan, who told him to initiate a NR for the nonconforming bolt and to place a hold tag to preclude tensioning of the plate. He said he returned to the suppression pool, placed a hold tag on the plate, and

construction personnel ceased tensioning the plate. He said, however, as he left the area he heard the tensioning machine reactivate, indicating to him that the tensioning crew had ignored his hold tag.

Dumford stated he advised Donovan of the occurence and Donovin told him to write a NR documenting continuation of tensioning after a hold tag had been applied. Dumford called the NR Controller, was issued CN-5412, and documented the violation of the hold tag. He said that a few days later he was called into the Kaiser QA Manager's office and was told by the QA Manager, Phillip Gittings, that the NR should not have been written since it was "a software (procedural) problem and not a hardware problem." He said Gittings then said "I'm going to void this NR because we do not need this kind of paperwork floating around because this is the kind of stuff that causes investigations." Dumford stated that Rex Baker and Dennis Donovin, who were also present at the meeting, disagreed with Gittings conclusion and advised Gittings that they felt it was a valid NR.

Dumford indicated that Dennis Donovin called the NR clerk a few days later and was told CN-5412 had been reassigned to another NR (the original report had not been entered into the NR system). Dumford provided a copy of the original NR CN-5412 which is attached to this report as Exhibit ( ).

Dumford said this incident is an example of Kaiser QA management not supporting the QA program on site and being influenced by construction considerations. Dumford stated that, in his opinion, the Kaiser QA Manager was influenced by construction and QA was not independent at Zimmer.

On February 11, 1981, Dumford provided a written sworn statement attesting to the preceding information, a copy of which is attached as Exhibit ( ).

4.1.4.2.2 Interview of Dennis Donovan

On February 13, 1981, Dennis Donovan, Kaiser QC Inspector, was interviewed by NRC. He stated that on February 3, 1981, Chris Dumford contacted him regarding a Surveillance Report written against tensioning of bolts on a suppression pool plate without QA coverage. Donovan said he called Ken Shinkle, the QA Engineer responsible for the suppression pool area and advised him of the incident. He said Shinkle told him to write a NR. Donovan stated he wrote the NR and instructed Dumford to place a hold tag on the plate. Donavan said Dumford later returned to the trailer and told him that he had placed a hold tag on the plate, but craft personnel had ignored the tag and continued tensioning the plate. Donovan said he told Dumford to write a second NR against the continuation of work after a hold tag had been applied. Donovan stated he initialed the second report and called the NR clerk who assigned it CN 5412. The NR was forwarded directly to Inspection Supervisor Rex Baker for review.

Donovan said that on February 4, 1981, he, Baker, and Dumford were called into Phillip Gittings' office and Baker gave the orginal copy of the NR to Gittings. He said Gittings said "This report is going to be voided because this is the kind of thing that starts investigations." Donovan said that Gittings commented that inspectors should only write NRs against hardware problems and not against software problems, and that ignoring a hold tag was a procedural (software) violation.

Donovan said he and Dumford explained that construction had ignored the hold tag, and Gittings replied "If I was in their position I would have done the same thing." Donovan said he responded that a hold tag is the strongest QA control mechanism on site and if one is ignored a NR should be written. Donovan said he and Baker told Gittings they disagreed with him and the meeting ended.

Donovan said that a few days later he called the NR controller concerning the disposition of CN-5412 and found that the number had been reissued to another NR.

Donovan stated in his opinion this is an example of Kaiser QA management not supporting the inspection program at Zimmer.

On February 13, 1981, Dennis Donovan provided a written sworn statement attesting to the preceding information, a copy of which is attached as Exhibit ( ).

4.1.4.2.3 Interview of Kenneth Shinkle

On February 18, 1981, Kenneth Shinkle, Kaiser QA Engineer, was interviewed by NRC. He stated that on February 2, 1981, he received a phone call from Dennis Donovan regarding a bent bolt on a suppression pool liner plate. Shinkle stated he told Donovan this should be documented on a NR and a hold tag should be placed on the plate to prevent tensioning. Shinkle stated he later learned a NR was written and Chris Dumford had affixed a hold tag to

the plate which was ignored by construction personnel. Shinkle said he also learned a second NR was written by Dumford for violation of the hold tag which he initialed and forwarded to Rex Baker, Inspection Supervisor.

Shinkle stated he later learned Phillip Gittings, after discussions with Dumford, Donovan, and Baker, did not enter the NR into the system. Shinkle said the report had been assigned a CN and the inspectors supervisor had concurred it was a valid NR, yet Gittings told him it was not going to be processed stating "The whole thing has been blown out of proportion."

Shinkle stated, in his opinion, Kaiser management does not support the QC program at Zimmer, construction dominates activity at the site, and QA is not independent of construction influence.

On February 18, 1981, Kenneth Shinkle provided a written sworn statement attesting to the preceding information, a copy of which is attached as Exhibit ( ).

4.1.4.2.4 Interview of Rex Baker

On March 3, 1981, Rex Baker, Kaiser Inspection Supervisor, was interviewed by NRC. He stated that in early February 1981 he attended a meeting in Gittings' office with Dennis Donovan and Chris Dumford. He stated that during this meeting Dumford said construction had continued to tension a suppression pool liner plate after he had placed a hold tag on it.. Baker stated he agreed Dumford was correct in writing an NR for hold tag violation.

He said Gittings disagreed and stated in his opinion construction was right to continue tensioning the plate after a hold tag had been affixed to it. Baker stated he did not know the disposition of the NR and that it was in Gittings' possession the last time he saw it.

4.1.4.2.5 Record Reviews

On February 11, 1981, the NR Log was reviewed. The log indicated CN-5412 (E-2996, Revision 1) was written on February 2, 1981, for welds having lack of penetration. This entry does not reflect that CN-5412 had been assigned to another report written by inspector Dumford on February 3, 1981, for violation of a hold tag. The Equipment Name or Process Entry column in the NR Log and the Specification column showed evidence that "white-out" was used to cover previous entries in the log. A copy of the NR Log page and NR E-2996, Revision 1, is attached to this report as Exhibits ( ), ( ).

4.1.5 Disposition of Nonconformance Report E-5108

4.1.5.1 Background Information

On May 19, 1980, NR E-5108 was issued identifying a four inch long pipe piece installed per DDC M-1108 in a Residual Heat Removal (RHR) System for which material traceability could not be established. The NR also reports that Weld 80 located near this pipe piece was inside of a wall penetration (M-13), in violation of licensee specifications. The NR was stamped "void" on June 20, 1980, by Floyd Oltz, QA Engineer-Records, who added a note

indicating it was voided because "acceptable documentation found" which established material traceability for the pipe piece. A copy of NR E-5108 is attached to this report as Exhibit ( ).

4.1.5.2 Investigation

4.1.5.2.1 Interview of Richard Reiter

On March 25, 1981, Richard L. Reiter, former Kaiser Document Reviewer, was interviewed by NRC., He stated he was employed at Zimmer from November 1978 to November 1980. He indicated his job had been to review isometric drawings and insure that related documentation, such as weld data records, met ASME Code requirements and the drawings were correct. He said he found discrepancies between drawings and associated documentation and conditions in the plant. Reiter stated that numbers for pipe sections and weld data records did not match. He said he wrote NRs on the traceability problem and was so concerned about the dispositions of those NRs that on October 28, 1980, he wrote Surveillance Report (SR) 2819 to Floyd Oltz, his immediate supervisor. He stated in SR 2819 that he questioned the disposition of NRs dealing with lack of material traceability and stated with reference to traceability of small bore piping that "when reviewing isometric drawings he is making assumptions which he felt compromised his integrity". He also asked for a written directive telling him to make these assumptions, or for Kaiser to reevaluate all small bore isometrics to insure that there is adequate documentation to insure traceability of the material.

Reiter stated that Oltz responded to the SR by indicating that all the procedures were approved and were adequate to meet regulatory and ASME Code requirements and that Reiter was to continue using the approved procedures and practices in effect. Reiter stated he disagreed with the disposition of the SR and shortly thereafter terminated his employment with Kaiser, because he felt he was being forced to compromise his integrity. A copy of SR 2819 is attached to this report as Exhibit ( ).

4.1.5.2.2 Record Reviews and Field Observations

RIII personnel examined the four inch section of pipe between Welds 82 and 82a identified on NR E-5108 and on isometric drawing PSK-RH-15. No heat or identification number on the pipe piece was found. KEI-1 weld data sheets were reviewed for welds RH-82 and RH-82a which joined the pipe piece to the RHR system. Both forms had notations initialed and dated "RLR 6/19/80" (The initials "RHR" were determined to be the initials of Richard L. Reiter) identifying the heat number for the pipe piece as Heat No. 232661. The weld records indicated weld dates of June 15, 1976, (Weld RH-82a) and October 14, 1976, (Weld RH-82) four years prior to the heat number being noted.

RIII personnel reviewed the following records related to the disposition of this NR.

NR E-5108, dated May 19, 1980

Kaiser Engineers Weld Data Sheet No. 4826, dated January 21, 1976

Kaiser Engineers Weld Data Sheet No. 1852

Construction Piping Inspection Plan for Residual Heat Removal System, Inspection Plan No. RH-15 dated June 16, 1976

4.1.5.3 Findings and Conclusions

Based on record reviews, interviews of personnel, and field observations, it was established that NR E-5108 was improperly voided since documentation was not found to justify voiding the NR.

4.1.6 Disposition of Nonconformance Report CN-4309

4.1.6.1 Background Information

On Janurary 7, 1980, QC Inspector Michael McCoy obtained NR CN-4309 to identify a deficient weld fitup on a one and three quarter cover plate to Beam W32X260 located on the reactor pedestal support structure. McCoy stated in the NR that parts to be fillet welded were not as close as practical as required, but were separated by more than 3/16 of an inch. A copy of NR CN-4309 is attached to this report as Exhibit ( ).

4.1.6.2 Investigation

4.1.6.2.1 Interview of Michael McCoy

On February 11, 1981, Michael McCoy, Kaiser QC Inspector, was interviewed by NRC. He stated that on January 7, 1980, he initiated a NR for welds on the reactor pedestal support structure which did not meet code requirements. McCoy stated he initiated the NR, his supervisors concurred in his findings, and he received CN-4309 from the NR Controller. He said that after he wrote

the NR it was returned to him without disposition. McCoy stated that in addition to voiding this NR, NRs were frequently inadequately dispositioned. He attributed this to the QA Manager's lack of support for either the Inspectors or the QC program at Zimmer.

On February 11, 1981, Michael McCoy provided a written statement attesting to the preceding information, a copy of which is attached as Exhibit (12).

4.1.6.2.2 Record Review

On February 11, 1981, the Kaiser NR log was reviewed. The log indicated CN-4309 was assigned to NR E-2417 which identified deficiences in electrical conduit bracing in the Control Room. A copy of this NR is attached to this report as Exhibit ( ). During this review it was noted that there was evidence of "white-out" in the Specification and Equipment Name or Process columns of the log. A copy of the NR Log page is attached to this report as Exhibit ( ).

4.1.6.3 Findings and Conclusions

Based on record reviews and interviews of personnel, it was established that NR CN-4309 was never entered into the Kaiser nonconformance reporting system.

4.1.7 Disposition of Nonconformance Reports CN-4955 through 4959, CN-4930, and CN-4931

4.1.7.1 Background Information

On July 9 and 22, 1980, NRs assigned CNs 4955 through 4959, 4930 and 4931 were written by inspectors Joseph Mills and G. McCann. The NRs identified weld deficiences on pipe supports in Diesel Generator (DG) Room A. The seven NRs had been assigned CNs but no NR number. The copies of the seven reports are attached to this report as Exhibit (15).

4.1.7.2 Investigation

4.1.7.2.1 Interview of Joseph Mills

On June 2, 1981, Joseph Mills, Kaiser QC Inspector, was interviewed by NRC. He stated that in July and August of 1980 he identified nonconforming welds while inspecting pipe support hangers in DG Room A. He said he identified these welds on NRs which were assigned CNs 4955 to 4959. He said his supervisor, Rex Baker, concurred the NRs were valid. Mills stated that in August 1980 he was reassigned from pipe support hanger inspection to structural welding inspection, and a week after his reassignment the NRs he wrote were returned to his desk without being processed. Mills stated that other NRs written by Inspector G. McCann were also returned to him.

Mills stated that in March 1981 he learned of an NRC investigation into the NR system and turned in the 7 unproccessed NRs to the NRC Senior Resident Inspector. He said the Senior Resident Inspector asked him to reexamine the welds in DG Room A to see if the nonconforming welds he identified were still

uncorrected. Mills stated his reinspection indicated that in each case the condition that he had previously identified had been repaired, and the welds were now acceptable. Mills stated apparently someone had used the information on the NRs to correct the nonconforming conditions. He said, however, this was not done via the Kaiser NR system since the original NRs and all copies had been returned unprocessed.

On June 2, 1981, Joseph Mills provided a written statement attesting to the preceding information, a copy of which is attached as Exhibit ( ).

4.1.7.2.2 Interview of Floyd Oltz

On June 19, 1981, Floyd Oltz, Kaiser QA Engineer-Records, was interviewed by NRC. He stated that he reviewed the NR Log and found that NRs assigned CNs 4955 to 4959 and 4930 and 4931 had been voided with the comment "VOID-NR not issued." Oltz stated that in these instances Kaiser did not retain a copy of the NR in the voided NR file because reports which are voided as "not issued" are returned to the inspector.

4.1.7.2.3 Interview of Lynn Anderson

On June 9, 1981, Lynn Anderson QC Engineer, Nuclear Energy Services, Inc., was interviewed by NRC. He stated that he is contracted to work as a QC Engineer for CG&E. Anderson stated he is currently conducting an audit of the Kaiser nonconformance reporting system. Anderson said that on June 4, 1981, he checked the disposition of NRs assigned CN-4955 to 4959. Anderson

stated he reviewed the NR log and found that those CNs had been assigned and the reports had been voided on September 30, 1980. Anderson said he checked all of the Kaiser and CG&E NR files and could not locate those NRs. Anderson concluded that although CNs had been issued, the reports had never been entered into the active or voided NR files.

4.1.7.2.4 Record Reviews and Field Observations

On June 10, 1981, the Kaiser NR log was reviewed and it was found CN-4955 to 4959 had been entered into the NR system; however, the entry had been lined through with the comment "VOID-NR not issued" and dated 9/30/80. A review of the NR log for entries CN-4930 and CN-4931 indicated that they had also been entered into the NR system; however, the comment "VOID-NR not issued" and dated September 30, 1980, was entered in the log book page for each entry. Copies of the pertinent NR Log pages are appended to this report as Exhibits ( ) and ( ).

On June 2, 1981, NRC personnel inspected the areas in DG Room A identified on NR CN-5955 through CN-5959, CN-4930, and CN-4931. In two of the seven instances it appeared that the welds had been reworked, but for the other five this could not be determined. However, the nonconforming conditions identified on the NRs were not evident on the welds inspected.

4.1.7.3 Findings and Conclusions

Based on record reviews, interviews of personnel, and field observations, it was established that these NRs were voided but were not retained in

Kaiser files; however, copies of the reports had apparently been returned to the inspector.

4.1.8 Disposition of Nonconformance Report E-2466

4.1.8.1 Background Information

On January 3, 1980, Kaiser QC Inspectors inspected large bore pipe hangers in Diesel Generator (DG) Rooms A, B, and C. They inspected welds on pipe support hangers, concrete embedment bolts, and the configuration and location of pipe support hangers. The inspectors identified nonconforming Kaiser and vendor welds on five hangers, and improperly embedded bolts. They identified a total of 124 nonconforming pipe support hangers, and initiated NR E-2466 to document this condition. On June 30, 1980, NR E-2466 was voided with the comment "each hanger listed will be issued on a separate NR." A copy of the first five pages of this NR is attached to this report as Exhibit ( ).

NRC personnel reviewed the NR Log to ascertain if the hangers identified on NR E-2466 had been issued on separate NRs as stated. This review indicated that of the 124 nonconforming pipe support hangers only 25 had been issued on other NRs. Of these 25, 8 had been reworked, 7 had been voided, and the disposition for the remaining 10 was still open. As of February 12, 1981, the other 99 hangers identified on NR E-2466 had not been reissued.

4.1.8.2 Investigation

4.1.8.2.1 Interview of Rex Baker

On March 3, 1981, Rex Baker, Kaiser Inspection Supervisor, was interviewed by NRC. He stated he was aware that NR in question was voided and said the reason for the voiding was that all hangers were subject to reinspection because of redesign and new seismic safety criteria. Baker said QA Managers Phillip Gittings and Kenneth Bumgartner directed that pipe support hangers which had been previously inspected and not redesigned would not to be re-inspected. He said that, since all hangers were not replaced due to the redesign effort, some of the nonconforming hanger welds identified on the subject NR would not be reinspected. Baker stated that the NR which was voided was not redispositioned or reopened. Baker indicated that, in his opinion, this was not done due to an administrative oversight by the QA Manager.

4.1.8.2.2 Record Reviews

On February 12, 1981, NR E-2466 was reviewed by NRC personnel and it was noted that there was a comment on page 2 of the NR which states that an asterisk identifies "what appears to be vendor supplied welds" on pipe support hangers. In reviewing the 31 page NR it was found that 15 of the 124 pipe hangers identified have an asterisk identifying them as vendor-supplied hangers. These 15 entries on NR E-2466 were crossed out without engineering justification. Examples of the omission of these items from NR E-2466 are included in Exhibit (14).

4.1.8.3 Findings and Conclusions

Based on record reviews and interviews of personnel, it was established that NR E-2466 was improperly voided because the condition (reissuance on other NRs) for the voiding was not fully implemented. It was also established that vendor welds were omitted from the NR without engineering justification.

4.1.9 Disposition of Nonconformance Report E-2836

4.1.9.1 Background Information

On June 22, 1980, NR E-2836 was written by Inspection Supervisor Rex Baker after an audit by Nuclear Energy Service indicated there was no final weld radiograph for Weld WS737 (Service Water System). There was a comment in the "Description of Nonconformance" section of the NR which stated that the only radiograph available was an "information shot of the root layer" of the weld (now buried underground). The NR was dispositioned as "Accept-As-Is" on October 24, 1980, because the KEI-1 form (weld data form) reported that the final weld had been radiographed and accepted by Kaiser personnel on April 5, 1976. This KEI-1 form indicated review and approval of the final radiograph by the Authorized Nuclear Inspector (ANI) on April 15, 1976. The "Accept-As-Is" disposition of NR E-2836 was initially rejected by the ANI on November 7, 1980; however, he approved the disposition on November 11, 1980, based on the entry on the KEI-1 form showing that a final review of the film was performed by the ANI. The NR E-2836 was voided on November 10, 1980, with a comment "see Revision 1 for new disposition." There is a comment on the

original NR which says "VOID stamp in error - Rev. 1 cancelled when ANI accepted disposition on 11/11/80." NR E-2836, Revision 1, shows the same nonconforming item with the disposition to "Accept-As-Is" and the NR is signed by the appropriate members of the Material Review Board. Both the original NR and Revision were closed on November 13, 1980. Copies of NR E-2836 and E-2836, Revision 1, are attached to this report as Exhibits ( ) and ( ).

4.1.9.2 Investigation

4.1.9.2.1 Interview of Rex Baker

On June 4, 1981, Rex Baker, Kaiser Inspection Supervisor, was interviewed by NRC. He stated that on October 22, 1980, he initiated NR E-2836 after an audit found that there was no radiograph of completed Weld WS737. Baker stated he forwarded the NR to Arch Lanham, Kaiser Construction Department, who dispositioned the NR as "Accept-As-Is" based on an entry on the KEI-1 form. The form indicates a final radiograph of this weld was performed on April 5, 1976, and was accepted by both a Kaiser welding engineer and the ANI on April 15, 1976. Baker said the NR was returned to him and he told Lanham the disposition of "Accept-As-Is" was contrary to ASME Code requirements because there was no final radiograph of the weld. Baker said he told Lanham that an entry in a KEI-1 form was insufficient evidence that the weld had been radiographed.

Baker stated he is a Qualified Level III Radiographer and that he had previously reviewed the Kaiser radiographic report and the accompanying film dated

April 17, 1976. He said he told Lanham the film was an "information shot" of the root layer pass and not a radiograph of the final weld. Baker said Lanham indicated the disposition was correct because the radiograph review block on the KEI-1 form was checked and if QA did not have the film he could care less. Baker stated he told Lanham that construction would have to excavate the weld and radiograph it, to which Lanham replied "Bob Marshall would never let us dig it up." Baker stated Lanham dispositioned the NR as "Accept-As-Is" yet he knew there was no radiograph in the record for the final weld.

Baker stated that on November 7, 1980, Lowell Burton, the site ANI, rejected the disposition on NR E-2836 but later rescinded the rejection and agreed with the "Accept-As-Is" disposition based on the KEI-1 form entry that the final review had been performed by the ANI. Baker said the NR was dispositioned as "Accept As-Is," and he refused to concur in the disposition because it was contrary to ASME Code requirements.

4.1.9.2.2. Interview of Lowell Burton

On June 5, 1981, Lowell Burton, ANI (Hartford Steam Boiler and Insurance Company), was interviewed by NRC. He stated that after reviewing NR E-2836 he was in error in having accepted the disposition of the NR on November 11, 1980.

Burton said he reviewed the record radiographs for Weld WS737 and found there was no radiograph of the final weld. He stated he has directed CG&E to reopen the NR to reflect this nonconforming condition. Burton stated he based his

previous acceptance on a review of the KEI-1 form and his personal notes which showed that on April 15, 1976, he reviewed the final weld radiograph and found it to be acceptable. Burton stated that during 1976 he reviewed up to 100 radiographs per day and could have mistakenly entered in his notebook or on the KEI-1 form that he had reviewed the final weld radiograph for Weld WS7370.

4.1.9.2.3 Record Review

RIII personnel reviewed NR E-2836 and associated documentation including the Kaiser Report of Radiographic Examination and accompanying radiograph. There was no final radiograph for Weld WS737. The radiograph referenced as accepted by the ANI on April 15, 1976, is actually a radiograph of a partially completed weld. The radiograph of the incomplete weld dated March 31, 1976, was reviewed by the ANI on April 15, 1976. Apparently, the radiograph of the root pass was mistaken by the ANI to be a radiograph of the final weld.

Between June 2-5, 1981, the following records were reviewed by the RIII inspector.

Kaiser Engineers KEI-1 Forms for Weld WS737, dated April 10, 1976.

Kaiser Engineers Radiographic Examination Report dated April 15, 1976 (and accompanying radiographic film packet).

NRs E-2836 and E-2836, Revision 1.

4.1.9.3 Findings and Conclusions

Based on record reviews, interviews of personnel, and examination of the radiographic film for Weld WS737 it was determined that NR E-2836 was improperly dispositioned as "Accept-As-Is" and closed on November 13, 1980. The proper disposition for this NR would have been "Rework" which would include radiographic examination of the final weld.

4.1.10 Disposition of Nonconformance Report E-1777

4.1.10.1 Background Information

On April 3, 1979, Inspector Terry Dakin wrote NR E-1777 stating that Weld No. 195A2 (isometeric Drawing RI-195) on a pipe support hanger in the primary containment area had been performed without QA documentation. Dakin performed a post-weld inspection and found the weld acceptable; however, no rod slip was found to ensure that the proper filler metal had been used. The disposition of this NR was to "Rework" and cut out the weld. This NR was voided on April 30, 1979, with the comment "rod slip located." A copy of NR E-1777 is attached to this report as Exhibit ( ).

4.1.10.2 Investigation

4.1.10.2.1 Interview of Vincent Ferretti

On June 4, 1981, Vincent Ferretti, Level III Radiographer and QA Engineer, Nuclear Energy Services, Inc. was interviewed by NRC. He stated he had

conducted an audit of the Kaiser nonconformance reporting system. As part of this audit he had reviewed NR E-1777 and the associated isometric drawings. Ferretti stated that the drawing shows four hangers and six field welds for each hanger. The isometric drawing and attached weld rod issue slips show, as stated in the NR, that there is no weld rod issue slip for Weld No. 195A2. Ferretti stated the weld rod slips attached to the drawing should identify particular filler metal used for each weld, but he was unable to ascertain what filler metal was utilized. Ferretti stated the decrepancy identified in the NR was correct and he directed the NR be reopened and redispositioned. Ferretti stated that in his opinion this NR was improperly voided.

4.1.10.2.2 Interview of Floyd Oltz

On June 4, 1981, Floyd Oltz, Kaiser QA Engineer-Records, was interviewed by NRC. He stated that he had reviewed NR E-1777, the weld data sheets, and weld rod issue slips. He said that his review indicated that the NR had been improperly voided. Oltz stated that the disposition "rod slip located" was improper, because the rod slip used to justify the voiding of the NR does not specifically identify the weld in which the weld rod was used. Oltz said he found nothing in the records associated with this weld to justify the voiding of the NR.

4.1.10.2.3 Record Reviews

On June 4, 1981, RIII personnel reviewed the following records while resolving this allegation:

NR E-1777

Isometric Drawing No. N4713 RI-195 for the Reactor Isolation System

Kaiser weld rod issue forms Nos. 111515, 139801, 126964, 126963, 126960, 174535, and 174534

4.1.10.3 Findings and Conclusions

Based on record reviews and interviews of personnel, it was established that there was no justification for the voiding of NR E-1777 because there was no rod issue slip in the weld data package for Weld No. 195A2.

4.1.11 Disposition of Nonconformance Report CN-5122

4.1.11.1 Background Information

On October 16, 1980, Kaiser QC Inspector Mark Priebe wrote NR CN-5122 following the initiation of Surveillance Report (SR) 2800 reporting that the flexible outer coating of conduit installed in the containment building was splitting for an unknown reason. This NR was not assigned a NR number, yet it was voided on January 2, 1981, with the comment "see attached Surveillance Report No. 2800." SR 2800 was the report used to issue the NR. A copy of NR CN-5122 is attached to this report as Exhibit ( ).

4.1.11.2 Investigation

4.1.11.2.1 Interview of Steven Burke

On June 11, 1981, Steven Burke, Kaiser QC Inspector, was interviewed by NRC. Burke stated that the nonconforming items listed in NR CN-5122 "covering splitting and separating from electrical cables in the containment building" still existed. Burke indicated that he concurred with Priebe's report that this problem was serious and warranted the issuance of a NR. Burke said Priebe's NR was not written in error, as he identified the same problem at the same locations identified by Priebe.

4.1.11.2.2. Record Reviews

Kaiser QA SR 2800 dated June 11, 1981, indicates that on October 9, 1980, the outer coating of flexible conduit used in the containment area was splitting for unknown reasons. The corrective action statement in the SR states the deficiency could be serious enough to warrant formal reporting to the NRC. Also in the corrective action section of the SR are comments that NRs CN-5122 and CN-5196 were voided in lieu of this SR. The "corrective action verified" section of the SR is stamped nonapplicable and dated October 14, 1980. An October 15, 1981, memo attached to the SR from Robert P. Ehas (CG&E) to the Kaiser QA Manager reports that in Ehas' opinion this matter did not warrant reporting to the NRC. A copy of SR 2800 and attachments is attached to this report as Exhibit ( ).

4.1.11.3 Findings and Conclusions

Based on record reviews, interviews of personnel, and field observations, it was determined that NR CN-5122 was improperly voided. It appears that the SR used to initiate the NRs was later used as justification to void the NRs. These NRs were never introduced into the Kaiser nonconformance reporting system. The Kaiser nonconformance reporting procedure was not followed, and this report was misfiled in the "Inspection Report" file. It appears that NR CN-5196 was dispositioned in the same manner.

4.1.12 Disposition of Nonconformance Report E-2233

4.1.12.1 Background

On November 21, 1979, QC Inspector L. Wood initiated NR E-2233 documenting nonconforming conditions for Weld WS62GP in the Service Water System. The weld lacked evidence of fitup inspection, welder qualification, and material traceability; however, a final visual inspection of the weld was made and the weld was accepted. On December 21, 1979, M. Feltner, QA Engineer, dispositioned the NR and directed it to be "reworked" and cut out. On January 24, 1980, the NR was voided with the comment "KE1 form corrected" which was initialed by Floyd Oltz.

The KEI-1 form, appended to this report as Exhibit ( ) was initially anotated to reflect that weld procedure, weld qualifications, heat numbers, and fit up would be verified by the QC inspector during inprocess inspection of this

weld. The form was anotated with a "NA" superimposed over an mark previously made by a Welding Engineer.

NR E-2237, dated November 23, 1979, also for the Closed Cooling Water System, reports the same nonconforming condition (i.e., lack of weld traceability and welder qualification) on another weld. The disposition for this report was "Rework" however, it was also voided by Floyd Oltz on December 19, 1979, with a comment "void rod slip found". This disposition was identical to that of NR E-2233. Copies of NR E-2233 and E-2237 are attached to this report as Exhibits ( ).

4.1.12.2 Investigation

4.1.12.2.1 Record Reviews

On February 13, 1981, NRC personnel reviewed NR E-2233 and related documentation. This NR was voided after the weld data record (KEI-1) form was "corrected." The correction was actually a deletion of previous stipulated hold points, and there is no documentation included to support the engineering basis for deleting the hold points.

During the course of this investigation the following records were reviewed in tracking the dispositions of these NRs.

NR E-2237.

NR No. E-2233.

Kaiser weld data sheet (KEI-1) No. 18391 and associated weld rod issue forms.

Kaiser weld data sheets (KEI-1) Nos. 2554, 2552 and 2560.

During the review of records, Floyd Oltz said he had deleted the hold points from the KEI-1 form; however, no signature or date of deletion was noted on the form.

4.1.12.3 Findings and Conclusions

Based on the record reviews and interviews of personnel it was established that NRs E-2233 and E-2237 were improperly voided. The NRs was improperly voided because previously stipulated hold points were deleted by a document reviewer without engineering justification.

4.1.14 Disposition of Nonconformance Report NRC-0001

4.1.14.1 Background Information

On February 11, 1981, QC Inspector James Ruiz initiated a NR (given identifer NRC-0001 for this investigation report) identifying nonconforming welds on drywell steel in the primary containment. Ruiz described the nonconforming condition as an electrode weave exceeding 3/4 inch. The NR was not assigned

a CN or NR number. The NR had a comment written in the "Disposition" section which states "sent back with no reply". This NR was provided to the NRC by Inspector Ruiz. A copy of NRC-0001 is attached to this report as Exhibit ( ).

4.1.14.2 Investigation

4.1.14.2.1 Interview of James Ruiz

On February 25, 1981, James Ruiz, Kaiser QC Inspector, was interviewed by NRC. He stated that on February 11, 1981, he performed an inspection of a beam located in the Primary Containment Building and noted a nonconforming condition on a weld. Ruiz stated he wrote a NR on this condition and submitted it to his supervisor, Dennis Donovan, who concurred and forwarded it to Rex Baker, Inspection Supervisor, who also concurred.

Ruiz stated that the next day Baker informed him the QA Manager had returned the report saying that inspectors were not to write a report against a procedural violation. The NR was then returned to him, without assignment of a CN. Ruiz stated he took exception to Gittings' decision prohibiting inspectors from writing reports against procedural violations. He said the welding procedures delineated the welding specifications, parameters, dimensions, and other inspection criteria for judging whether a weld is acceptable. Ruiz provided a sworn statement attesting to the preceding information, a copy of which is attached as Exhibit (27).

4.1.14.2.2 Interview of Phillip Norman

On June 3, 1981, Phillip Norman, Kaiser QC Inspector, was interviewed by NRC. He stated that on this date he accompanied the NRC Inspector to the Primary Containment Building during his inspection of drywell steel Beam 81. Norman stated he concurred that the electrode weave on a weld on Beam 81 exceeded 3/4 inch.

4.1.14.2.3 Record Reviews and Field Observations

RIII personnel visually examined the weld inspected by Ruiz on drywell steel Beam 81 located in the Primary Containment Building. The weld displayed an electrode weave in excess of 3/4 inch.

On June 30, 1981 the NR Log and all Kaiser NRs initiated between February 11 and February 20, 1981, were reviewed. The NR written by Ruiz on February 11, 1981, was not found and apparently was not entered into the Kaiser nonconformance reporting system.

4.1.14.3 Findings and Conclusions

Based on record reviews, interviews of personnel, and field observations it was established that NR NRC-0001 was never entered into the Kaiser nonconformance reporting system. The questioned weld on Beam 81 in the primary containment drywell area was visually inspected by NRC personnel and the deficiency identified by Ruiz and reported in the NR was confirmed. The

weld is not necessarily defective; however, it did exceed specifications as stated by Ruiz in the NR. The nonconforming condition identified in the NR had not been corrected.

4.1.15 Disposition of Nonconformance Report E-1661 and E-1662

4.1.15.1 Background Information

On February 8, 1979, Kaiser QC Inspector David Painter initiated NR E-1661 and E-1662 which identified nonconforming welds on pipe support hangers in the drywell pneumatic system. Both of the NR were dispositioned as "Rework" on May 2, 1979. On November 11, 1980, the NR were voided by Floyd Oltz with a comment that the nonconforming hangers will be reinspected after design analysis. A copy of NR E-1661 and E-1662 are appended to this report as Exhibits ( ) and ( ).

4.1.15.2 Investigation

4.1.15.2.1 Interview of David Painter

On January 14 and June 4, 1981, David Painter, Kaiser QC Inspector, was interviewed by NRC. He stated that as a lead inspector he supervises three other inspectors involved in the inspection of pipe support hangers at Zimmer. Painter stated that inspectors wrote a group of NRs identifying nonconforming conditions in pipe support hangers which have been dispositioned as "VOID - will be reinspected after design analysis." Painter

indicated that when this comment was made, a 100% reinspection was planned for all pipe support hangers. He said that plan was rescinded and hangers are now being inspected according to a M-12 checklist which only checks for configuration and location of the hanger after it is redesigned. Painter indicated the QA Manager said that any hangers previously accepted prior to design changes and which were not affected by the design changes were not to be reinspected. Painter said this negated the earlier commitment used as justification for voiding the NRs, and now inspectors were finding nonconforming welds on hangers that had previously been inspected and accepted. Painter stated Gittings was told about this, and he repeated that if a pipe support hanger had been previously inspected and accepted he was not initiating a NR for reinspection findings.

4.1.15.2.2 Record Reviews

The following records were reviewed during the resolution of this NR:

NRs E-1661, E-1662

Kaiser isometric drawing for Line No. RYIB2BA34 .

Kaiser isometric drawing for Line No. 1IN61AC34 (Drywell Pneumatic System Reactor Containment)

4.1.15.3 Findings and Conclusions

Based on record reviews and interviews of personnel it was determined that NRs E-1661 and E-1662 were improperly voided because the condition (reinspection after design analysis) for the voiding was not fully implemented.

4.1.16 Disposition of Nonconformance Report E-2996

4.1.16.1 Background Information

On February 2, 1981, Rex Baker, Kaiser Inspection Supervisor, initiated NR E-2996, Revision 1, which reported that full penetration welds on T-Quenchers Serial Nos. 001, 003, 007, 0011, and 0012, were found to have a lack of penetration at the backing ring (i.e., split backing ring). However, the rest of the weld was acceptable. The nonconforming T-Quenchers are located in the suppression pool Main Steam Relief System. The NR was dispositioned on February 9, 1981, as "Accept-As-Is" by Arch Lanham, KEI Construction Department. Lanham's justification for acceptance was that a split backing ring does not affect the integrity of the weld.

The licensee's architect-engineer, Sargent and Lundy (S&L), took exception to this disposition and directed that the T-Quencher welds be ultrasonically examined. On February 24, 1981, all the T-Quenchers were ultrasonically examined and found acceptable with the exception of No. 007. S&L dispositioned the NR as acceptable, with the exception of No. 007, indicating that additional data was required to resolve 007 because it was not ultrasonically tested as

directed. The Kaiser Material Review Board (MRB) agreed with S&L's disposition and granted conditional approval of the disposition of the NR in March 1981.

NR E-2996, Revision 1, was dispositioned as closed on March 17, 1981. This NR was closed without any evidence that the required additional examination of T-Quencher No. 007 had been completed. A copy of NR E-2996, Revision 1, is attached to this report as Exhibit ( ).

4.1.16.2 Investigation

4.1.16.2.1 Interview of Rex Baker

On June 3, 1981, Rex Baker, Inspection Supervisor, was interviewed by NRC. He stated that he wrote NR E-2996, Revision 1, on February 2, 1981, and it was improperly closed on March 17, 1981. Baker stated that T-Quencher No. 007 was not ultrasonically examined as directed by S&L. Baker said the NR was improperly closed by a clerk in the Document Control office on March 17, 1981. Baker related that when he learned E-2996, Revision 1, was closed he initiated NR E-3172 which references E-2996 and addresses the issue that T-Quencher No. 007 was not adequately tested as directed in NR E-2996.

4.1.16.2.2 Interview of Floyd Oltz

On June 3, 1981, Floyd Oltz, Kaiser QA Engineer-Records, was interviewed by NRC. He stated that NR E-2996, Revision 1 was initiated by Baker on February 2, 1981, for nonconforming welds on in T-Quenchers. Oltz stated

that S&L directed the T-Quenchers be ultrasonically examined to establish their acceptability. He said that apparently T-Quencer No. 007 could not be ultrasonically examined so S&L dispositioned the report as acceptable, with the exception of T-Quencher No. 007.

Oltz stated he gave the NR to Kathy Faubion, NR Controller, who read the initial disposition of "Accept-As-Is" on the NR and did not read the exceptions placed in the rest of the disposition column by the architect-engineer. Oltz said she mistakenly closed the NR because she assumed the condition was "Accept-As-Is" when in fact S&L had only granted partial acceptance. Oltz concluded this NR was improperly closed due to a clerical error.

4.1.16.2. iew of Kathy Faubion

On June 4, 1981, Kathy Faubion, Kaiser NR Controller was interviewed by NRC. She stated she closed NR E-2996, Revision 1, on March 17, 1981, because the top of the disposition block on the NR had the comment "Accept-As-Is." Faubion said she closed the NR but did not read the additional comments in the Disposition column. Faubion stated that in May 1981 Rex Baker told her she had improperly closed this NR. She said Baker then initiated NR E-3172 which documented the nonconforming condition for T-Quencher No. 007.

4.1.16.2.4 Record Review

RIII personnel reviewed documentation and radiographs associated with NR E-2996, Revision 1. The deficiency, (i.e., split backing ring) is permissible

under ASME Codes for Class C welds and the condition was not nonconforming. However, in order to verify that the split was in the backing ring and not in the weld, an ultrasonic examination was performed to verify the location of the split. Records indicated that on February 24, 1981, the questioned T-Quenchers were ultrasonically examined (with the exception of Quencher No. 007 and found to be acceptable. It appeared that further UT or other nondestructive examination should have been conducted on T-Quencher No. 007; however, NR E-2997, Revision 1, was mistakenly closed on March 17, 1981, with no examination of T-Quencher No. 007.

During the course of this investigation the following records were reviewed to track the resolution of this NR:

NR E-2996, Revision 1

Nuclear Energy Services, Report of Ultrasonic Examination, dated February 14, 1981

Sargent and Lundy, Engineers, memo dated March 5, 1981

NR E-3172, dated May 11, 1981

Kaiser weld data sheets (KEI-1 form) for T-Quenchers 011, 003, 007, 009, 011, and 012

4.1.16.3 Findings and Conclusions

Based on record reviews, interviews of personnel, and review of radiographs by RIII personnel, it was established that this NR was improperly closed on March 17, 1981, because the required ultrasonic testing of T-Quencer No. 007 was not performed.

4.1.17 Disposition of Nonconformance Report CN 4389

4.1.17.1 Background Information

On January 3, 1980, D. J. Luttmann, Kaiser QC Inspector, initiated a 33 page NR which was assigned CN-4389. This NR reported various nonconforming conditions in electrical cable, trays and hangers in the Auxilary Building. The NR was voided by Kyle Burgess on December 2, 1980, because the "NR was initiated just prior to [the] inspector leaving the job. A lot of the items listed were acceptable in this area. Some items needed reinspection." This NR was recovered from the Site Document Control Vault on June 4, 1980, apparently having been misfiled with "Inspection Reports" which identify nonconforming material found during receipt inspections. Although the NR was "voided", it was stamped "Inspection Report" in the block reserved for assignment of the NR number. A copy of the first five pages of NR CN-4389 is attached to this report as Exhibit ( ).

4.1.17.2 Investigation

4.1.17.2.1 Interview of Kyle Burgess

On June 18, 1980, Kyle Burgess, Kaiser Inspection Supervisor, was interviewed by NRC. He stated that he voided the NR assigned Control Number CN-4389 on December 2, 1980. Burgess stated that inspector D. J. Luttmann was an electrical inspector who had reported various nonconforming conditions in the electrical area. He indicated that he voided this NR because Luttmann had left the site and some of the items had been found to be acceptable; however, some were valid nonconforming conditions. Burgess could give no reason why the voided NR had been placed in the Inspection Report file.

4.1.17.2.2 Record Reviews

The following records were reviewed in tracking the resolution of this NR.

Kaiser Log of Nonconforming Material NR CN-4389 dated January 23, 1980.

Kaiser Procedure QACMI G-4, Revision 7, dated April 7, 1980.

4.1.17.3 Findings and Conclusions

Based on record reviews and intervies of personnel it was established that there was no sufficient reason to justify the voiding of NR CN-4389.

4.1.18 Disposition of Nonconformance Report E-2191

4.1.18.1 Background Information

On November 2, 1979, NR E-2191 was initiated by Richard L. Reiter, to report that the consumable insert in a weld in the Closed Cooling Water System was not traceable. Reiter said there was no heat number on the weld rod slip for the consumable insert in Weld WR-523 on Drawing PSK WR-9. Reiter commented in the text of the NR that he confirmed this by looking at the original copy of the weld rod issue slip. The initial disposition of this report was "Accept-As-Is" with the reason being that all consumable inserts are purchased as Class I (safety-related) traceable materials. The NR was closed on November 8, 1979, and was reopened after the Authorized Nuclear Inspector (ANI) rejected this disposition on January 7, 1980. On February 19, 1980, NR E-2191 was voided with the comment that it was redispositioned on NR E-2191, Revison 1. NR E-2191, Revision 1, was voided on February 22, 1980, by Floyd Oltz, with a comment that the weld rod issue slip had been found. There was no engineering or Material Review Board concurrences on this disposition. Copies of NR E-2191 and E-2191, Revision 1 are attached to this report as Exhibits ( ).

4.1.18.2 Investigation

4.1.18.2.1 Interview of Richard L. Reiter

On March 25, 1981, Richard L. Reiter, former Kaiser Document Reviewer, was interviewed by NRC. He stated that on November 2, 1981, he initiated NR E-2191 after he observed that Kaiser weld data form (KEI-1) No. 23037 for Weld WR-523 did not have a heat number for the consumable insert utilized.

Reiter stated he checked the weld rod issue form, Kaiser warehouse files, and identical copies of the weld rod issue forms, and found no record of the heat number. Reiter stated if an entry was found on any of the weld rod issue forms, they are false and were made after November 2, 1979. Reiter provided a written statement attesting to the preceding information, a copy of which is attached as Exhibit ( ).

4.1.18.2.2 Interview of Floyd Oltz

On February 25, 1981, Floyd Oltz, Kaiser QA Engineer-Records, was interviewed by NRC. He stated that NR E-2191 was written by Reiter when he found no heat number for the consumable insert on Weld WR-523. The NR was dispositioned by Louis Boetger with a disposition of "Accept-As-Is" because all consumable inserts are purchased as Class 1 nuclear grade material. Oltz stated that the ANI disapproved this disposition on January 7, 1980. This NR was voided on February 19, 1980, and was redispositioned on NR E-2191, Revision 1. Oltz stated that he voided NR E-2191, Revision 1 on February 22, 1980, with a comment that a weld rod issue slip with a heat number for the consumable insert was found. Oltz stated that Arch Lanham had found the rod slip for the weld with a heat number for the consumable insert.

4.1.18.2.3 Interview of Arch Lanham

On March 25, 1981, Arch Lanham, Kaiser Senior Engineer, was interviewed by NRC. He stated that he dispositions NRs for the Construction Department at Zimmer. Lanham stated he frequently searches for lost documentation,

such as rod slips, when resolving NRs in which a lack of adequate documentation was cited as the nonconforming condition. He stated that in the case of NR E-2191, the nonconforming condition was lack of a heat number for the consumable insert for weld WR-523. Lanham provided his copy of NR E-2191 with field notes he wrote when dispositioning the NR.

Lanham stated the original disposition of the NR was "Accept-As-Is"; however on December 17, 1979, he noted that Floyd Oltz had the original copy of the NR and he noted on his copy "could there be more than one rod slip for insert?". Lanham stated there is also a notation that on January 22, 1980, the NR was still not back from the architect-engineer. After reviewing his notes, Lanham stated that it appeared he reviewed the KEI-1 form and original rod slip and found that he had inspected Weld WR-523 on October 17, 1977. He stated there was no heat number for the consumable insert on the KEI-1 form; however he had reviewed weld rod issue form No. 97957 and found a heat number for the consumable insert.

Lanham indicated that the heat number for the consumable insert was marked in ink on the carbon form (gold copy of form No. 97957) and was circled in red with his initials. Lanham stated he recalls that he made this entry on the gold copy of the form in October 1977 while inspecting the weld. He said there was no heat number on the weld rod issue form, and called the weld rod shack to obtain a proper heat number for the consumable insert. Lanham said he did not make the entry on the form during November 1979 through February 1980 while dispositioning this NR.

4.1.18.2.4 Record Reviews

On March 24, 1981, Kaiser isometric Drawing PSK WR-9 for the Closed Cooling Water System was reviewed for line No. 1WR17AB 2-1/2, Weld WR-523. The Kaiser KEI-1 form shows a notation that the heat number for the consumable insert is No. 6059491. Weld rod issue slip No. 97957 (gold copy) shows that heat Number 6059491 is written in ink on an otherwise carbon form. Two other copies of Kaiser weld issue slips No. 97959 (white copy and blue copy) do not have similar entries for the heat number. Copies of the weld data sheet and accompanying weld issue forms are attached to this report as Exhibits ( ), ( ), ( ), ( ).

4.1.18.3 Findings and Conclusions

Based on record reviews and interviews of personnel it was established that NR E-2191, Revision 1 was improperly dispositioned because there was no review by the Kaiser Material Review Board and because information from a KEI-2 weld rod issue form, which is a non-QA document was used to disposition a QA document (NR).

4.1.19 Disposition of Nonconformance Reports CN-5476, CN-5477, CN-5479

4.1.19.1 Background Information

On February 23, 1981, Inspector James Ruiz initiated three NRs which were assigned Control Nos. CN-5476, CN-5477, CN-5479, reporting nonconforming

conditions on drywell support steel in the Primary Containment Building. Ruiz stated that Weld Nos. 63, 58, and 3 were full penetration groove welds which require 100% coverage by nondestructive examination by either radiography, magnetic particle, or ultrasonic testing but no tests had been documented. He also found that all three welds lacked documentation for the backing strips, filler metal, welder qualifications, or welding procedure. The NR Log shows that NRs CN-5477 to CN-5479 were voided with the notation "VOID-NR not issued" on February 27, 1981. Copies of these NRs were not retained in the Kaiser SDC files. Copies of NRs CN-5476, CN-5477, and CN-5479 are attached to this report as Exhibit ( ), ( ), ( ).

4.1.19.2 Investigation

4.1.19.2.1 Interview of James Ruiz

On February 25, 1981, James Ruiz, Kaiser QC Inspector, was interviewed by NRC. He stated that the Kaiser QA Manager was arbitrarily voiding NRs and he had no assurance that reports he initiated would be entered into the Kaiser nonconformance reporting system or that the conditions he identified would be corrected. Ruiz provided NRs CN 5476, CN-5477, and CN-5479 and stated these had been initiated by him on February 23, 1981. He indicated he did not think they would be processed properly by the nonconformance reporting system.

Ruiz provided a written statement attesting to the preceding information, a copy of which is attached as Exhibit ( ).

4.1.19.2.2 Interview of Dennis Donovan

On June 10, 1981, Dennis Donovan, Kaiser QC Inspector, was interviewed by NRC. He stated that he had reviewed nonconformance reports CN-5476, CN-5477, and CN-5479 and concurred with them. Donovan stated that Ruiz erred in his identification of one deficency on these NRs, because a Design Document Change (DDC) had been written by S&L which eliminated the NDE requirement for welds on these beams. Donovan questioned S&L's waiver of this requirement and said it was contrary to S&L Specification H2174 which requires 100% nondestructive examination coverage on all Class 1 welds. Donovan stated he had reviewed the DDC and found out that S&L waived the nondestructive examination for "ease of construction." He said that, in his opinion, this was not an adequate justification for the noted disposition. Donovan advised that the Kaiser construction department is repairing these and other cantilever beams in the Primary Containment Building.

4.1.19.2.3 Interview of Rex Baker

On June 10, 1981, Rex Baker, Kaiser Inspection Supervisor, was interviewed by NRC. He stated that on February 23, 1981, inspector James Ruiz identified nonconforming welds on some cantilever beams located in the Primary Containment Building. Baker stated Ruiz initiated and he concurred in NRs CN-5476, CN-5477, and CN-5479. Baker stated Ruiz documented nonconforming conditions such as lack of nondestructive examination of full pentration welds, material traceabilty and welder qualifications.

Baker stated that on February 27, 1981, he voided these NRs with the comment "VOID, NR not issued." He stated he voided these NRs after a February 1981 meeting with Phillip Gittings, Kenneth Shinkle, and Robert Marshall, in which the nonconforming conditions identified by Ruiz were discussed. Baker said that during the meeting Marshall stated that the welds on these cantilever beams were to be cut out by Kaiser so these nonconformance reports should be voided. Baker stated that he voided these NRs on Gittings' instructions and gave Gittings all four of the original copies of the NRs.

4.1.19.2.4 Interview of Kenneth Shinkle

On June 11, 1981, Kenneth Shinkle, Kaiser Mechanical/Civil/Structural QA Engineer, was interviewed by NRC. He stated that on February 23 QC Inspector James Ruiz, initiated NRs CN-5476, CN-5477, and CN-5479.

Shinkle stated he reviewed these NRs and found that inspector Ruiz had erred in identification of one nonconforming condition. He stated that a DDC had been issued by licensee's architect-engineer which waived NDE requirements for the nonconforming beams identified by Ruiz.

Shinkle stated that he questioned the justification for this DDC because the text of the DDC said "for ease of construction" NDE is waived. Shinkle said that the welds identified in the NRs are Class 1 welds because they are welded to the containment liner plate and both S&L specifications and ASME Code requirements require 100% NDE for any Class 1 welds.

Shinkle stated Ruiz did no err in identifying the remaining nonconforming conditions such as lack of material traceability and welder qualifications. Shinkle advised that the cantilever beams in question hold up walkways, pipe support hangers, and heating and ventiliation ducts in the primary Containment Building.

Shinkle stated that in February 1981 he attended a meeting with Rex Baker, Phillip Gittings, and Robert Marshall, reguarding Ruiz's NRs. Shinkle stated that Marshall wanted to repair the beams on a case-by-case basis and do a visual inspection of the welds. Shinkle stated that Gittings agreed with this approach and told him to work with the Construction Department to rework the welds using KEI 1 repair cards without processing the NRs Ruiz had written.

Shinkle stated that to the best of his knowledge the nonconformances written by Ruiz were never entered into the Kaiser nonconformance reporting system. He stated that this was especially significant in light of the fact that in February 1981 there was an NRC investigation into irregularities in the Kaiser nonconformance reporting system.

Shinkle stated that after Gittings directed him to resolve the issues identified, he conducted an inspection of cantilever beams located at the 572' elevation of the Primary Containment Building. Shinkle indicated he found that there was no final QC inspection on any of the 27 beams and four had no record of fitup inspection. Shinkle stated he identified the same nonconforming conditions, lack of weld filler metal and backing strip

traceability and lack of evidence of welder qualification for these welds. In addition, Shinkle stated he conducted a visual examination of the welds and in many cases the welds did not appear to meet Code requirements.

Shinkle stated he advised Robert Marshall of the above and Marshall stated he did not want to repair the nonconforming conditions because modifications had been made to the beams to add side plates and those plates would have to be removed to conduct inspections of the affected welds. Shinkle advised that the Construction Department is now in the process of removing the questioned beams.

4.1.19.2.5 Record Reviews

On June 6, 1981, Regina Rudd, Kaiser NR Controller, was contacted and asked to retrieve NRs CN-5476, CN-5477, and CN-5479 from the Kaiser Site Document Control Center. Rudd stated that she conducted a search of the open, closed, and voided nonconformance report files and could not locate the nonconformance reports assigned these numbers. Rudd provided a copy of the NR Log page which reflects that on February 27, 1981, NRs CN-5476, CN-5477, and CN-5479 were voided with a comment "VOID-NR not issued." A copy of the NR Log page is attached to this report as a Exhibit (42).

4.1.19.3 Findings and Conclusions

Based on record reviewsand interviews of personnel it was established the NRs CN-5476, CN-5477 and CN-5479 were not entered into the Kaiser nonconformance reporting system.

4.1.20 Summary Findings and Conclusions

All of the allegations made by the QC inspectors were substantiated. It was found there were wide-spread irregularities in the system. Kaiser procedures permit voiding of a NR only if the NR was "written in error, duplicated, or the nonconforming conditions has been corrected . . . . by construction." It was found that between January 1, 1978, and March 31, 1981, 1,031 NRs were voided. Some were voided by the QA Manager, some by the QA Engineer-Records, and some by a clerk. A chronological breakdown of the number of voided NRs per month is appended to this report as Exhibit ( ). The dispositions of a selected group of 20 of the voided NRs were reviewed and it was found that in 15 cases the NRs were voided improperly by the QA Manager or another individual. In ten cases the justification used for voiding the NR was erroneous, e.g. it was found the QA Manager was voiding NRs which were not written in error. In some cases the NRs had been reviewed by a Construction Engineer and "Rework" was ordered, yet the NR was later "voided." It was found that some of this activity occurred after an NRC inspection on December 2-3, 1980, in which the licensee and the Kaiser QA Manager were told that this activity was contrary to NRC requirements. It was also established that following the NRC inspection the Kaiser QA Manager had on three occasions diverted NRs (CN-4309, NRC-0001, CN-5412) from the Kaiser nonconformance reporting system.

This investigation also disclosed that an NR was improperly dispositioned as "Accept-As-Is" when "Rework" was appropriate. In one case (NR E-2836) the "Accept-As Is" disposition of a nonconforming condition was contrary to ASME Code requirements.

NRs which identified multiple nonconforming conditions were voided improperly with a comment that the NR was being "revised" or that "each deficiency would be issued on a separate NR" or items would be "reinspected". It was determined that nonconforming items were not reissued on separate NRs, and were not re-inspected as stated on the NR at the time of voiding. It was also found that during "revisions" some nonconforming items were removed from NRs without justification.

The allegation that the Kaiser QA Manager voided NRs at the request of the Construction Department was correct; however, the QA Manager stated that he made an independent decision when doing so.

This investigation established that nonconforming conditions which had been identified by Quality Control Inspectors were improperly dispositioned. It was also established that the licensee failed to take effective corrective action following the December 1980 NRC inspection when the Kaiser QA Manager continued to void NRs and also diverted NRs from the Kaiser nonconforming system. Examples of this are NRs CN-5412, NRC-0001 and E-5471.

This widespread problem of improper voiding of NRs is addressed in the Quality Confirmation Program. The matter will be resolved prior to fuel loading.

Appendix

NOTICE OF VIOLATION

AND

PROPOSED IMPOSITION OF CIVIL PENALTY

Cincinnati Gas and Electric Company
Wm. H. Zimmer Nuclear Power Station

Docket No. 50-358
Construction Permit No. CPPR-88
EA No. 81-

As a result of the investigation conducted at the Wm. H. Zimmer Nuclear Power Station in Moscow, Ohio, on January 12 - July 14, 1981, the violation listed below with multiple examples was identified. The numerous examples of the violation demonstrate a significant deficiency ~~you failed to detect~~ in the implementation of your quality assurance program. That breakdown of your quality assurance program was widespread ~~and related to many areas~~ and ~~resulted in the need for the~~ extensive quality confirmation program ~~that has been initiated by you~~ to provide confidence that safety-related structures, systems, and components will perform satisfactorily in service. Because of the safety significance of this quality assurance program breakdown, in accordance with the Interim Enforcement Policy, 45 FR 66754 (October 7, 1980), the Nuclear Regulatory Commission proposes to impose a civil penalty pursuant to Section 234 of the Atomic Energy Act of 1954, as amended, ("Act"), 42 U.S.C. 2282, PL 96-295, and 10 CFR 2.205 in the amount set forth for the violation listed below.

~~Based on an inspection of approximately 25 structural beams located in the Blue Switchgear Room and the Cable Spreading Room, the identification of the material in 9 of those beams was not maintained to enable verification of quality.~~

10 CFR 50, Appendix B, Criterion II requires holders of construction permits for nuclear powerplants to document, by written policies, procedures, or instructions, ~~and~~ a quality assurance program which complies with the requirements of Appendix B and to implement that program in accordance with those documents.

Contrary to the above, the licensee and Kaiser Engineers, Incorporated, did not adequately document and implement a quality assurance program which complied with the requirements of Appendix B as evidenced by numerous examples of noncompliance as follows:

A. 10 CFR 50, Appendix B, Criterion VIII states, in part, "Measures shall be established for the identification and control of materials.... These measures shall assure that identification of the item is maintained.... These identification and control measures shall be designed to prevent the use of incorrect or defective materials, parts, components."

The Wm. H. Zimmer QA Manual, Section 8.2 states, in part, "Identification and control measures are established to prevent the use of incorrect or defective materials...H. J. Kaiser Company procedures provide that within the H. J. Kaiser Company jurisdiction the identification of items will be maintained by the method specified on the drawings, such as heat number, part number, serial number, or other appropriate means. This identification may be on the item or on records traceable to the item. The identification is maintained throughout fabrication, erection, and installation. The identification is maintained and usable in the operation and maintenance program."

1. Based on an inspection of approximately 25 structural beams located in the Blue Switchgear Room and the Cable Spreading Room, the identification of the material in 9 of those beams was not maintained to enable verification of quality.

2. Based on an inspection of the supporting systems (i.e., cooling water, starting air, and fuel oil) for Diesel Generators A and C, the identification of the material of 12 pipe pieces in those systems was not maintained to enable verification of quality. (The Diesel Generator supporting systems were selected for review because they were part of the only ASME Code Data Package which had been final accepted by Kaiser Quality Assurance. The discrepancies identified by the inspector were not identified by the final Kaiser QA review.)

B. 10 CFR 50, Appendix B, Criterion XVI states, in part, "Measures shall be established to assure that conditions adverse to quality, such as failures, malfunctions, deficiencies, deviations, defective material and equipment, and nonconformances are promptly identified and corrected. In the case of significant conditions adverse to quality, the measures shall assure that the cause of the condition is determined and corrective action taken to preclude repetition."

The Wm. H. Zimmer QA Manual, Section 15.2.2 states, "HJK is responsible for identifying and reporting nonconformance in...construction... activities which are delegated to HJK."

The Wm. H. Zimmer QA Manual, Section 16.5 states, in part, "Vendors, contractors, and subcontractors are required to determine cause and corrective action to prevent recurrence of errors which could result in significant conditions adverse to quality."

AWS Code D1.1-1972, Sections 3 and 8.1.5 defines requirements for weld quality and addresses slag, weld profiles, blowholes, porosity, and undercut.

AISC, Seventh Edition (1969), Page 4.113, requires 1/2 inch minimum radius for re-entrant corners.

Contrary to the above, the NRC inspectors identified the following nonconforming conditions that either had not been identified and corrected by the licensee or action to preclude repetition had not been taken:

1. Based on an inspection of the 25 structural beams described in Item A.1 above,

   a. Of approximately 75 beam welds inspected, welds in one or more areas on each of 9 beams did not conform to AWS D1.1-1972 requirements in that they contained unacceptable slag, weld profiles, blowholes, porosity, and/or undercut.

   b. Five beams did not conform to AISC requirements in that they had notches for re-entrant corners instead of radii.

   c. Four beams, 2 of which had unacceptable welds as described in Item B.1.a above, did not conform to design documents in that they were not specified on any design document. There were no QA records related to the 2 beams which appeared to have acceptable welds.

2. Based on an inspection of about 100 cable tray hangers in the Cable Spreading Room, 4 did not conform to AWS D1.1-1972 requirements in that they contained unacceptable slag, weld profiles, blowholes, porosity, and/or undercut.

3. Five licensee QA audits (audit performed 8/8-9/79 - no number, and Audit Nos. 78/07, 78/09, 78/10, 80/04) of Sargent & Lundy identified repetitive problems concerning S&L not performing certain design calculations, reviews, and verifications and action was not taken to preclude repetition.

4. The licensee identified that the socket engagement for more than 400 socket welds was not verified in accordance with ASME Code, Section III-1971 Edition, Article NB-3661.5(b) and the condition was not corrected in that the corrective action was not commensurate with the ASME Code. The corrective action was to radiograph 20 of the socket engagements and then accept the remaining 380 based on those radiographs. The welds dated back to 1979.

5. The licensee identified that the inprocess inspections for more than 24 welds in the Diesel Generator cooling water, starting air, and fuel oil piping systems were not performed by Kaiser in accordance with ASME Code, Section III-1971 Edition, Article NB-3661.5(b), et. al., and the condition was not corrected.

C. 10 CFR 50, Appendix B, Criterion XV states, in part, "Nonconforming items shall be reviewed and accepted, rejected, repaired or reworked in accordance with documented procedures."

Kaiser Procedure QACMI G-4, "Nonconforming Material Control," provides detailed instructions for the review and disposition of reports (Nonconformance Reports) of nonconforming items. Procedure QACMI G-4 contains the following requirements:

Paragraph 3.3 - Requires QA Site Document Center NR Controller to log NRs generated by QC Inspectors or Quality Assurance Engineers in the Site Document Log and assign NRs a KEI Control Number (CN).

Paragraph 3.6 - Restricts voiding of NRs to those initiated in error or those relating to nonconforming conditions which have been corrected by the Construction Department after verbal or written communication from the QA Department. Requires an explanatory entry for voided NRs be made next to the CN in the Site Document Log. Requires a copy of voided NRs be retained in the Site Document Center.

Paragraph 4.1.2 - Requires the disposition of NRs be categorized as "Rework" when the NRs require reprocessing to bring the nonconformance into conformance with specification requirements.

Paragraph 4.3 - Requires Material Review Board action for NRs dispositioned "Accept-As-Is."

Contrary to the above, of the approximately 100 NRs reviewed, the following deficiencies in the review of nonconforming items were identified:

1. An NR initiated by a QC Inspector February 3, 1981, regarding the violation of a QC "Hold" tag attached to a suppression pool liner plate did not have a KEI CN assigned. CN-5412 was initially assigned to this NR but CN-5412 was subsequently reassigned to another unrelated NR without the NR originally assigned CN-5412 being assigned a replacement CN. References in the Site Document Log to the original NR assigned CN-5412 were covered over with "Wite-Out", a copy was not retained in the Site Document Center, and the NR was deleted from the NR control system. The NR had not been stamped "Void." (The copy of the NR reviewed by the investigator was provided by an alleger.)

2. An NR initiated by a QC Inspector February 11, 1981, regarding excessive weave in a primary containment structural steel weld did not have a KEI CN assigned nor was it entered in the Site Document Log. The NR was simply never entered into the NR control system. (The copy of the NR reviewed by the investigator was provided by an alleger.)

3. The following NRs were voided yet they had not been initiated in error nor did they relate to nonconforming conditions which had been corrected by the Construction Department:

E-1661	E-2233
E-1662	E-2466
E-1777	CN-4389
E-2191	E-5108
CN-2196	CN-5122

4. Copies of the following NRs were not retained in the Site Document Center:

CN-4930	CN-4958
CN-4931	CN-4959
CN-4955	CN-5476
CN-4956	CN-5477
CN-4957	CN-5479

(The copies of the NRs reviewed by the investigator were provided by an alleger.)

5. NR E-2996, Revision 1, which was categorized as "Accept-As-Is" was closed out March 17, 1981, without Material Review Board approval in that final disposition action (UT of T-Quencher No. 007) which was part of the basis for conditional approval by the Material Review Board was not taken.

6. NR E-2836 was incorrectly categorized by the KEI Construction Engineer as "Accept-As-Is" when sufficient information had been provided by the KEI QA Engineer to clearly indicate the NR should have been categorized as "Rework" in that reprocessing (radiography of the final weld) was required to bring the weld into conformance with the requirement of ASME Section III and Kaiser Specification H-2256.

This matter is repetitive of similar violations identified in Inspection Reports 50-358/80-05 and 50-358/80-25. (The improper action on CN-5412, CN-5476, CN-5477, CN-5479, E-2996, and the NR identified in Item 2 above occurred after corrective action (Stop Work Order 80-13 and revision of Procedure QACMI G-4) was taken in response to Inspection No. 50-358/80-35.)

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D. 10 CFR 50, Appendix B, Criterion III states, in part, "Measures shall be established to assure that applicable regulatory requirements and the design basis...are translated into...drawings..."

The Wm. H. Zimmer FSAR, Section 8, provides the design basis for electrical cable separation which includes the following:

Associated cables (Green/White, Blue/White, and Yellow/White) from more than one Division can not be routed in the same raceway. (FSAR Paragraph 8.3.1.13.2)

Vertical separation of three feet or more must be maintained between cables from different Divisions. (FSAR Paragraph 8.3.1.11.2.1.d)

Instrument (low-level signal) cables cannot be routed in the same raceway with power and control cables. (FSAR Paragraph 8.3.1.23.1.3)

The Wm. H. Zimmer QA Manual, Section 3.3.2. states, "Composite...drawings are prepared, translating the design concepts into layouts of structures, systems, and components necessary for the construction of the plant."

Contrary to the above, as of March 1981, the FSAR design basis as noted above for electrical cable separation had not been translated into the drawings which governed the following cable installation deficiencies in the Cable Spreading Room:

1. Associated Cable (Yellow/White) No. RE053 for Division 1 was routed in the same raceway (two inch conduit and Class IE Sleeve No. 79) as Associated Cable (Blue/White) No. RE058 for Division 2.

2. Associated Cable RE053 for Division 1 was routed such that there was only a vertical separation of four inches between it and cables (Blue) in Tray No. 2072C for Division 2.

3. Instrument Cable (Green) No. WS714 and others for Division 3 were routed in the same raceway (Tray No. 4638B) as Associated Control Cables (Blue/White and Yellow/White) for Divisions 2 and 1. (These deficiencies partially resulted from a design which specified the installation of a Green tray inside a White tray.)

4. Associated Cables for all three Divisions were routed in the same raceway (White Tray No. 4080K) including Cable (Blue/White) No. TI192, Cable (Yellow/White) No. RR781, and Cable (Green/White) No. TI316.

The above installation deficiencies were noted during brief tours of the Cable Spreading Room while pursuing other unrelated matters.

E. 10 CFR 50, Appendix B, Criterion III states, in part, "Design control measures shall be applied to...the delineation of acceptance criteria for inspections and tests."

The Wm. H. Zimmer QA Manual, Section 3.13.1 states, in part, "Design control measures also apply to delineation of acceptable criteria for inspections and tests."

Weld acceptance criteria are required by the ASME, Section III-1971 and AWS D1.1-1972 Codes.

Contrary to the above:

1. The weld acceptance criteria used by H. J. Kaiser Company from July 1980 to January 1981 were not applied to weld inspections during that period in that the weld acceptance criteria for such items as the drywell support steel were deleted.

2. The acceptance criteria for a weld performed on Service Water System Line No. 1WS71A18 by H. J. Kaiser Company in November 1979 were not applied in that the acceptance criteria were designated as not applicable.

F. 10 CFR 50, Appendix B, Criterion XI states, in part, "Test procedures shall include provisions for assuring that all prerequisites for the given test have been met... Test results shall be evaluated to assure that test requirements have been satisfied."

The Wm. H. Zimmer QA Manual, Section 11.1 states, in part, "Test programs to assure that essential components, systems, and structures will perform satisfactorily in service are planned and performed in accordance with written procedures and instructions at vendor shops and at the construction site."

M. W. Kellogg Co. (pipe manufacturer and agency performing the pre-fabricated pipe weld radiography in question) Radiographic Procedure No. ES-414, dated September 26, 1972, Paragraph 4.1.8, states, "Wherever required, shims shall be used to produce a total thickness under the penetrameter equal to the nominal thickness of the base metal plus the height of the crown or reinforcement."

ASME Section III-1971 Edition, Winter 1972 Addenda, Appendix IX, Paragraph IX-3334.4 states, in part, "The shim thickness shall be selected so that the total thickness being radiographed under the penetrameter is the same as the total weld thickness..."

Contrary to the above, the NRC inspectors reviewed 700 radiographs involving 206 welds and determined that 187 of the radiographs did not comply with the ASME ~~Section III 1971~~ Code, ~~Winter 1972 Addenda~~, in that there was insufficient shimming of the penetrameter. The radiographed welds were prefabricated pipe welds in such systems as feedwater, diesel generator, and main steam.

G. 10 CFR 50, Appendix B, Criterion III states, in part, "These measures [design control] shall include provisions to assure that appropriate quality standards are specified...and that deviations from such standards are controlled."

The Wm. H. Zimmer QA Manual, Section 3.6 states, "Measures are established to assure that any deviations from the applicable standards are controlled."

Contrary to the above, as of March 1981, design control measures had not been established to assure that deviations from design conditions identified by Sargent & Lundy engineers (quality standards) were controlled. For example, Sargent & Lundy noted on a calculation sheet dated December 27, 1979, that the design thermal loading for two power cables (VC016 and VC073) in Yellow Tray No. 1057A would allow the cables to be thermally overloaded and no program existed to control those design deviations.

H. 10 CFR 50, Appendix B, Criterion X states, in part, "A program for inspection of activities affecting quality shall be established and executed by or for the organization performing the activity to verify conformance with the documented instructions, procedures, and drawings for accomplishing the activity."

The Wm. H. Zimmer QA Manual, Section 10.1.2 states, in part, "Inspections are performed in accordance with written procedures which include requirements for check lists and other appropriate documentation of the inspections and tests performed."

AWS D1.1-1972 Code, Section 3.10.1, requires work to be completed and accepted before painting.

Contrary to the above:

1. As of March 1981, a QC inspection program had not been established to require verification of separation of electrical cables routed from the Cable Spreading Room to the Control Room. An example of a nonconforming condition that should have been identified by such a program was two Blue Cables RI103 and CM111 that had been routed into ~~Green~~ Tray Riser No. 3025A, which extended from ~~Blue~~ Tray No. 2077A in the Cable Spreading Room to the Control Room.

2. ~~Contrary to the above~~, the program established for inprocess inspections of welds on 180 cable tray hangers located in the Cable Spreading Room were not executed as required in the AWS D1.1-1972 Code. Specifically, the final weld inspections ~~had been~~ made after ~~rather than before~~ the welds were painted (Galvanox).

I. 10 CFR 50, Appendix B, Criterion III states, in part, "The design control measures shall provide for verifying or checking the adequacy of design, such as by the performance of design reviews, by the use of alternate or simplified calculational methods, or by the performance of a suitable testing program."

The Wm. H. Zimmer QA Manual, Section 3.11.2 states, in part, "At S&L, design verification reviews are performed...."

Contrary to the above, as of March 1981 design control measures had not been established by Sargent & Lundy to provide for verifying or checking the adequacy of the design for the thermal loading of power cable sleeves and the physical weight loading of cable trays.

J. 10 CFR 50, Appendix B, Criterion III states, in part, "These measures [design control] shall include provisions to assure that appropriate quality standards are specified and included in design documents..."

The Wm. H. Zimmer QA Manual, Section 3.4 states, in part, "Design reviews are conducted to assure that the appropriate quality standards are specified and included in design documents."

The Wm. H. Zimmer FSAR states that cable ampacity is based on IPCEA Publication No. P-46-426. Also regarding cable ampacity, the FSAR states the summation of the cross-sectional areas of the cables shall not exceed 50% of the tray usable cross-sectional area or two layers of cables, whichever is larger, but not to exceed 60% of the cross-sectional area in any case."

AWS D1.1-1972 Code, Section 3.6.4, states, "For building and tubular structures, undercut shall be no more than 0.01 inch deep when its direction is transverse to primary tensile stress in the part that is undercut, nor more than 1/32 inch for all other situations."

Contrary to the above:

1. As of March 1981, the cable ampacity design by Sargent & Lundy was not based on IPCEA P-46-426. The cable ampacity was instead based on IEEE Paper 70TP557-PWR (1970), IPCEA P-54-440, and Sargent & Lundy Standard ESA-114a.

2. As of March 1981, the design control measures did not include provisions to assure that appropriate quality standards (allowable undercut on cable tray hanger welds) were specified in that Sargent & Lundy Specification H-2713, Supplement 7, Sargent & Lundy Standard EB-117, and H. J. Kaiser Procedure SPPM No. 4.6, "Visual Examination," Revision 8, Paragraph 5.2.9, allowed up to 1/16 inch undercut on cable tray hanger welds.

K. 10 CFR 50, Appendix B, Criterion V states, in part, "Activities affecting quality...shall be accomplished in accordance with...procedures...."

The Wm. H. Zimmer QA Manual, Section 5.1 states, "Construction, fabrication, and manufacturing activities which affect the quality of the facility are accomplished in accordance with written instructions, procedures, and drawings which prescribe acceptable methods of carrying out those activities."

The H. J. Kaiser Procedure SPPM No. 3.3, Revision 6, Paragraph 6.4, states, "The Weld Rod Clerk shall issue all filler material on a weight basis. He shall record on the KEI Weld 2 form the weight of all bare rod and covered electrodes issued."

"He shall also, record on the KEI Weld 2 form the heat number and/or lot number for bare rods, consumable inserts and backing rings, and the heat number and lot number for covered electrodes prior to use."

Contrary to the above, weld rod was issued and information was recorded on weld rod issue slips (KEI Weld 2 forms) by someone other than the Weld Rod Clerks assigned on the second shift during September and October 1979. Specifically, for welds made on the suppression pool wall plate (a) 25 weld rod issue slips showed representations of the initials of Weld Rod Clerks who were not assigned as Weld Rod Clerks on the days indicated on the weld rod issue slips, and (b) one weld rod issue slip did not show a Weld Rod Clerk signature or initials.

L. 10 CFR 50, Appendix B, Criterion VII states, in part, "The effectiveness of the control of quality by contractors and subcontractors shall be assessed by the applicant or designee...."

The Wm. H. Zimmer QA Manual, Section 7.3.1 states, in part, "As part of the vendor selection process, S&L makes an independent evaluation of the bidders' QA programs as a part of their total bid evaluation."

Contrary to the above, as of March 1981, neither the licensee nor designee (Sargent & Lundy) had assessed the effectiveness of the control of quality by vendors who supplied structural beams. Specifically, evaluations of the vendors' (U.S. Steel Supply, PBI Steel Exchange, and Frank Adams Company) quality assurance programs for control of mill certifications and structural beams were not performed.

N. 10 CFR 50, Appendix B, Criterion XVIII states, in part, "A comprehensive system of planned and periodic audits shall be carried out to verify compliance with all aspects of the quality assurance program and to determine the effectiveness of the progam."

The Wm. H. Zimmer QA Manual, Section 18.1 states, in part, "QA Division conducts a comprehensive system of planned and periodic audits of S&L, HJK ~~and GE~~$_A$ to verify compliance with all aspects of the quality assurance program." ...

Contrary to the above, during the past 9 years the CG&E QA Division did not perform an audit of the Sargent & Lundy nonconformance program.

This is a Severity Level II violation (Supplement II).

(Civil Penalty - $250,000)

Pursuant to the provisions of 10 CFR 2.201, Cincinnati Gas and Electric Company is hereby required to submit to this office within 30 days of the date of this Notice a written statement or explanation, including for each example of the alleged violation: (1) admission or denial; (2) the reasons for the violation if admitted; (3) the corrective steps which have been taken and the results achieved; (4) the corrective steps which will be taken to avoid further violations; and (5) the date when full compliance will be achieved. Any statement or explanation may incorporate by specific reference (e.g., giving page and paragraph numbers) the provisions of your Quality Confirmation Program and your actions in response to our Immediate Action Letter of April 8, 1981. Consideration may be given to extending the response time for good cause shown. Under the authority of Section 182 of the Act, 42 U.S.C. 2232, this response shall be submitted under oath or affirmation.

Within the same time as provided for the response required above under 10 CFR 2.201, Cincinnati Gas and Electric Company may pay the civil penalty in the amount of Two Hundred and Fifty Thousand Dollars or may protest imposition of the civil penalty in whole or in part by a written answer. Should Cincinnati Gas and Electric Company fail to answer within the time specified, this office will issue an Order imposing the civil penalty in the amount proposed above. Should Cincinnati Gas and Electric Company elect to file an answer in accordance

with 10 CFR 2.205 protesting the civil penalty, such answer may: (1) deny the violation listed in this Notice in whole or in part; (2) demonstrate extenuating circumstances; (3) show error in this Notice; or (4) show other reasons why the penalty should not be imposed. In addition to protesting the civil penalty in whole or in part, such answer may request remission or mitigation of the penalty. Any answer in accordance with 10 CFR 2.205 should be set forth separately from the statement or explanation in reply pursuant to 10 CFR 2.201, but may incorporate by specific reference (e.g., giving page and paragraph numbers) to avoid repetition. Cincinnati Gas and Electric Company's attention is directed to the other provisions of 10 CFR 2.205, regarding the procedure for imposing a civil penalty.

Upon failure to pay any civil penalty due, which has been subsequently determined in accordance with the applicable provisions of 10 CFR 2.205, this matter may be referred to the Attorney General, and the penalty, unless compromised, remitted, or mitigated, may be collected by civil action pursuant to Section 234c of the Act, 42 U.S.C. 2282.

The responses directed by this Notice are not subject to the clearance procedures of the Office of Management and Budget as required by the Paperwork Reduction Act of 1980, PL 96-511.

FOR THE NUCLEAR REGULATORY COMMISSION

Victor J. Stello, Director
Office of Inspection and Enforcement

Dated at Bethesda, Maryland
this day of , 1981

7.2 Steel Erection Quality Control Program

The licensee initially (February 1981) indicated that Bristol Steel and Iron Works, Inc. was the erection contractor responsible for the unacceptable welds identified on the beams addressed in section 7.1 of this report. Therefore, the RIII inspector decided to review the quality assurance measures which should have identified the unacceptable welds. The licensee later (March 1981) indicated that H. J. Kaiser, Co., not Bristol, was responsible for the unacceptable welds.

7.2.1 Records Reviews

The Region III inspector reviewed the Bristol Steel and Iron Works QA Manual, Appendix B, Section 1.0, entitled "Erection Quality Control." Paragraph 1.1 states that "The Erection Quality Control ... is the responsibility of the Project Superintendent, who reports to the Project Manager."

Both the Bristol Project Superintendent and the Project Manager had cost and scheduling responsibilities. Since the contractor had left the Zimmer site approximately four years ago. The RIII inspector could not readily determined if the Project Superintendent and Project Manager had sufficient independence from cost and schudule when apposed to safety considerations, as required by 10 CFR 50, Appendix B, Criterion I. Therefore, this item is unresolved pending the determination of the quality of Bristol welds, which is addressed by the licensee's Quality Confirmation Program and the NRC's Independent Measurement Program. (358/81-13-)

McFarlen Q.C. Add to 5.16 ~~5.17 to 5.16~~

Interview of Anthony Pallon

On August 13, 1981, Anthony Pallon, Sr. was interviewed by the NRC. Pallon stated he was employed at Zimmer as a Quality Assurance Engineer, Welding/Nondestructive Examination from April 1, 1977 to July 8, 1980. He stated his position involved the review of PM radiographic reports of examination for pipe welds at the plant. Pallon stated he did not consistently over-ride PM ~~for~~ in their weld determination at Zimmer, and on the contrary, frequently rejected welds that PM found acceptable. He said, on less than ten occasions PM radiographers identified nonconforming vendor welds while examining an adjacent Kaiser weld. He said in each instance he directed the nonconforming weld to be repaired or replaced. He stated he could not make a determination ~~that~~ ABOUT twenty percent of the prefabricated pipe welds in the plant ~~are~~ BEING defective, since PM did not radiograph them, ~~and therefore~~ he did not review the radiographs ~~for these welds~~ and ~~could~~ WOULD not make a statement about their acceptability. ~~GEM~~ AN UNQUALIFIED

Pallon said IN APRIL 1980 PM's contract at Zimmer was not renewed ~~in April 1980~~ and Nuclear Energy Services (NES) took control of the radiography work at Zimmer, ~~at that time~~ He attributed this to poor management of the PM operation at Zimmer, coupled with equipment problems which affected PM's ability to perform the required amount of radiographic examinations. He said he privately told PM personnel about this months before the contract was terminated, but they took no action (i.e. hiring of additional personnel and repair of the film processing machine) to increase THEIR production at the site.

Report No. 50-358/81-13

Docket No. 50-358 License No. CPPR-88

Licensee: Cincinnati Gas and Electric Company
139 East 4th Street
Cincinnati, OH 45201

Facility: William H. Zimmer Nuclear Power Station

Investigation At: William H. Zimmer Site, Moscow, Ohio
Cincinnati and vicinity
North Anna Nuclear Power Station
Chicago, Illinois

Dates of Investigation: January 12-15, 26-30, February 9-13, 16-20, 23-27, March 5, 9-13, 17, 20, 23-27, April 14-17, 20-23, 30, May 18-22, 31, June 1-5, 8-12, 17-19, 29-31, July 1-2, 6-7, and 12-16.

Investigation Team Members: P. A. Barrett _____
Reactor Inspector

J. B. McCarten _____
Investigator

R. M. Burton _____

Investigator

E. C. Gilbert _____

Investigator

P. E. Baci _____

Investigator

K. D. Ward _____

Reactor Inspector

C. Erb _____

Reactor Inspector

J. F. Schapker _____

Reactor Inspector

F. A. Maura _____

Reactor Inspector

J. J. Harrison _____
Senior Resident Inspector,
Marble Hill

F. T. Daniels _____
Senior Resident Inspector,
Zimmer

P. Gwyn _____
Resident Inspector,
Zimmer

Reviewed By: R. F. Warnick, Chief _____
Reactor Projects Section 2B

J. F. Streeter _____
Assistant to the Director

Investigation Summary:

Investigation from January 12 thru July 16, 1981 (Report No. 50-358/81-13)

Areas Investigated:

Results:

100% reinspection by the licensee or contractor QC inspections, and other QC and QA program improvements, were confirmed in an Immediate Action Letter to the licensee on April 8, 1981.

By letter dated May 11, 1981, the Government Accountability Project requested the Regional Director to recommend suspension of the construction permit because of repeated noncompliances with NRC regulations and numberous allegations of inadequate construction practices. The information provided was carefully considered; however, it was concluded that there was no basis at the present time to recommend such action.

A comprehensive program has been developed by the licensee, with input from NRC, to confirm the adequacy of completed construction. This program must be completed and identified problem areas resolved before an Operating License will be granted. In addition to witnessing and reviewing portions of the confirmation program conducted by the licensee and its contractors, the NRC will be conducting a program of independent measurements to further evaluate the adequacy of construction.

II	R
III	D, E, H, K, L, M, N
V	O
VII	P
VIII	A
X	I, J
XI	F
XV	C
XVI	B, G
XVII	Q

Appendix

NOTICE OF VIOLATION

AND

PROPOSED IMPOSITION OF CIVIL PENALTIES

Cincinnati Gas and Electric Company
Wm. H. Zimmer Nuclear Power Station

Docket No. 50-358
Construction Permit No. CPPR-88
EA No. 81-

As a result of the investigation conducted at the Wm. H. Zimmer Nuclear Power Station in Moscow, Ohio, on January 12 - July 14, 1981, the violations listed below were identified. These violations are evidence of a major breakdown of the quality assurance program in several areas to the extent that an extensive quality confirmation program must be conducted to provide confidence that safety-related structures, systems, and components will perform satisfactory in service. Because of the safety significance of this quality assurance program breakdown and in accordance with the Interim Enforcement Policy, 45 FR 66754 (October 7, 1980), the Nuclear Regulatory Commission proposes to impose civil penalties pursuant to Section 234 of the Atomic Energy Act of 1954, as amended, ("Act"), 42 U.S.C. 2282, PL 96-295, and 10 CFR 2.205 in the amounts set forth below for the violations listed below.

A. 10 CFR 50, Appendix B, Criterion VIII states, in part, "Measures shall be established for the identification and control of materials... These measures shall assure that identification of the item is maintained... These identification and control measures shall be designed to prevent the use of incorrect or defective materials, parts, components."

The Wm. H. Zimmer QA Manual, Section 8.2 states, in part, "Identification and control measures are established to prevent the use of incorrect or defective materials...H. J. Kaiser Company procedures provide that within the H. J. Kaiser Company jurisdiction the identification of items will be maintained by the method specified on the drawings, such as heat number, part number, serial number, or other appropriate means. This identification may be on the item or on records traceable to the item. The identification is maintained throughout fabrication, erection, and installation. The identification is maintained and usable in the operation and maintenance program."

Contrary to the above, as of March 1981, the material identification (traceability) of nine structural beams in such areas as the Blue Switchgear Room and the Cable Spreading Room and twelve pipe lines in the diesel generator cooling water, starting air, and fuel oil systems was not maintained.

This is a Severity Level II violation (Supplement II).

(Civil Penalty - $,000)

B. 10 CFR 50, Appendix B, Criterion XVI states, in part, "Measures shall be established to assure that conditions adverse to quality such as...nonconformances are promptly identified and corrected."

The Wm. H. Zimmer QA Manual, Section 15.2.2 states, "HJK is responsible for identifying and reporting nonconformance in...construction...activities which are delegated to HJK."

Contrary to the above, the NRC inspectors indentified the following nonconforming conditions which had not been identified by the licensee or designee:

1. Welds on nine structural beams in such areas as the Blue Switchgear Room and the Cable Spreading Room and four cable tray hangers in the Cable Spreading Room did not conform to requirements in that they contained unacceptable slag, weld profiles, blowholes, porosity, and/or undercut.

2. Five structural beams in the Blue Switchgear Room did not conform to requirements in that they had notches for reentrant corners instead of radii.

3. Four structural beams installed in the Blue Switchgear Room did not conform to requirements in that they were not specified on any design document.

This is a Severity Level II violation (Supplement II).

(Civil Penalty - $,000)

C. 10 CFR 50, Appendix B, Criterion XV states, in part, "Nonconforming items shall be reviewed and accepted, rejected, repaired or reworked in accordance with documented procedures."

Kaiser Procedure QACMI G-4, "Nonconforming Material Control," provides detailed instructions for the review and disposition of reports (Nonconformance Reports) of nonconforming items. Procedure QACMI G-4 contains the following requirements:

Paragraph 3.3 - Requires QA Site Document Center NR Controller to log NRs generated by QC Inspectors or Quality Assurance Engineers in the Site Document Log and assign NRs a KEI Control Number (CN).

Paragraph 3.6 - Restricts voiding of NRs to those initiated in error or those relating to nonconforming conditions which have been corrected by the Construction Department after verbal or written communication from the QA Department. Requires voided NRs to be stamped "Void." Requires an explanatory entry for voided NRs be made next to the CN in the Site Document Log. Requires a copy of voided NRs be retained in the Site Document Center.

Paragraph 4.1.2 - Requires the disposition of NRs be categorized as "Rework" when the NRs require reprocessing to bring the nonconformance into conformance with specification requirements.

Paragraph 4.3 - Requires Material Review Board action for NRs dispositioned "Accept-As-Is."

Contrary to the above:

1. An NR initiated by a QC Inspector February 3, 1981, regarding the violation of a QC "Hold" tag attached to a suppression pool liner plate did not have a KEI CN assigned. CN 5412 was initially assigned to this NR but CN 5412 was subsequently reassigned to another unrelated NR without the NR originally assigned CN 5412 being assigned a replacement CN. References in the Site Document Log to the original NR assigned CN 5412 were covered over with "Wite-Out", a copy was not retained in the Site Document Center, and the NR was deleted from the NR control system. The NR had not been stamped "Void." (The copy of the NR reviewed by the investigator was provided by an alleger.)

2. An NR initiated by a QC Inspector February 11, 1981, regarding excessive weave in a primary containment structural steel weld did not have a KEI CN assigned nor was it entered in the Site Document Log. The NR was simply never entered into the NR control system. (The copy of the NR reviewed by the investigator was provided by an alleger.)

3. The following NRs were voided yet they had not been initiated in error nor did they relate to nonconforming conditions which had been corrected by the Construction Department:

E-1661	E-2233
E-1662	E-2466
E-1777	CN-4389
E-2191	E-5108
CN-2196	CN-5122

4. Copies of the following NRs were not retained in the Site Document Center:

CN-4930*	CN-4958*
CN-4931*	CN-4959*
CN-4955*	CN-5476
CN-4956*	CN-5477
CN-4957*	CN-5479

(The copies of the NRs reviewed by the investigator were provided by an alleger. The copies marked with an asterisk were not stamped "Void" although there was a notation on each NR indicating it was voided and not issued.)

5. NR E-2996, Revision 1, which was categorized as "Accept-As-Is" was closed out March 17, 1981, without Material Review Board approval in that final disposition action (UT of T-Quencher No. 007) which was part of the basis for conditional approval by the Material Review Board was not taken.

6. NR E-2836 was incorrectly categorized by the KEI Construction Engineer as "Accept-As-Is" when sufficient information had been provided by the KEI QA Engineer to clearly indicate the NR should have been categorized as "Rework" in that reprocessing (radiography of the final weld) was required to bring the weld into conformance with the requirement of ASME Section III and Kaiser Specification H-2256.

This violation is a repeat of similar violations identified in Inspection Report Nos. 50-358/80-05 and 50-358/80-25. (The improper action on CN-5412, CN-5476, CN-5477, CN-5479, E-2996, and the NR identified in Item 2 above occurred after corrective action (Stop Work Order 80-13 and revision of QACMI G-4) taken in response to Inspection No. 50-358/80-35.)

This is a Severity Level II violation (Supplement II).

(Civil Penalty - $,000)

D. 10 CFR 50, Appendix B, Criterion III states, in part, "Measures shall be established to assure that applicable regulatory requirements and the design basis...are translated into...drawings..."

The Wm. H. Zimmer FSAR, Section 8, provides the design basis for electrical cable separation which includes the following:

*Associated cables (Green/White, Blue/White, and Yellow/White) from more than one Division can not be routed in the same raceway.

*Vertical separation of three feet or more must be maintained between cables from different Divisions.

The Wm. H. Zimmer QA Manual, Section 3.3.2. states, "Composite...drawings are prepared, translating the design concepts into layouts of structures, systems, and components necessary for the construction of the plant."

Contrary to the above, as of March 1981, the FSAR design basis for electrical cable separation had not been translated in drawings related to the following cable installation deficiencies in the Cable Spreading Room:

1. Associated Cable (Yellow/White) No. RE053 for Division 1 was routed in the same raceway (two inch conduit and Class IE Sleeve No. 79) as Associated Cable (Blue/White) No. RE058 for Division 2.

2. Associated Cable RE053 for Division 1 was routed such that there was only a vertical separation of four inches between it and cables (Blue) 2 in Tray No. 2072C for Division.

3. Cable (Green) No. WS714 and others for Division 3 were routed in the same raceway (Tray No. 4638B) as Associated Cables (Blue/White and Yellow/White) for Divisions 2 and 1.

4. One raceway (White Tray No. 4080K) contained Associated Cables from all three Divisions including Cable (Blue/White) No. TI192, Cable (Yellow/White) No. RR781, and Cable (Green/White) No. TI816.

This is a Severity Level IV violation (Supplement II).

(Civil Penalty - $,000)

E. 10 CFR 50, Appendix B, Criterion III states, in part, "Design control measures shall be applied to...the delineation of acceptance criteria for inspections and tests."

The Wm. H. Zimmer QA Manual, Section 3.13.1 states, in part, "Design control measures also apply to delineation of acceptable criteria for inspections and tests."

Weld acceptance criteria are required by the ASME, Section III-1971 and AWS D1.1-1972 Codes.

Contrary to the above:

1. The weld acceptance criteria used by H. J. Kaiser Company from July 1980 to January 1981 were not applied for weld inspections in that the weld acceptance criteria for such items as the drywell support steel were deleted.

2. The acceptance criteria for a weld performed on Service Water System Line No. 1WS71A18 by H. J. Kaiser Company in November 1979 were not applied in that the acceptance criteria were designated as not applicable.

This is a Severity Level IV violation (Supplement II).

(Civil Penalty - $,000)

F. 10 CFR 50, Appendix B, Criterion XI states, in part, "Test procedures shall include provisions for assuring that all prerequisites for the given test have been met... Test results shall be evaluated to assure that test requirements have been satisfied."

The Wm. H. Zimmer QA Manual, Section 11.1 states, in part, "Test programs to assure that essential components, systems, and structures will perform satisfactorily in service are planned and performed in accordance with written procedures and instructions at vendor shops and at the construction site."

M. W. Kellogg Co. (pipe manufacturer and agency performing the prefabricated pipe weld radiography in question) Radiographic Procedure No. ES-414, dated September 26, 1972, Paragraph 4.1.8, states, "Wherever required, shims shall be used to produce a total thickness under the penetrameter equal to the nominal thickness of the base metal plus the height of the crown or reinforcement."

ASME Section III-1971 Edition, Winter 1972 Addenda, Appendix IX, Paragraph IX-3334.4 states, in part, "The shim thickness shall be selected so that the total thickness being radiographed under the penetrameter is the same as the total weld thickness..."

Contrary to the above, the NRC inspectors identified 187 radiographs of prefabricated pipe welds in such systems as feedwater, diesel generator, and main steam which did not comply with the ASME Section III-1971 Code, Winter 1972 Addenda, in that there was insufficient shimming of the penetrameter.

This is a Severity Level IV violation (Supplement II).

(Civil Penalty $,000)

G. 10 CFR 50, Appendix B, Criterion XVI states, in part, "Measures shall be established to assure that conditions adverse to quality, such as failures, malfunctions, deficiencies, deviations, defective material and equipment, and nonconformances are promptly identified and corrected. In the case of significant conditions adverse to quality, the measures shall assure that the cause of the condition is determined and corrective action taken to preclude repetition."

The Wm. H. Zimmer QA Manual, Section 16.5 states, in part, "Vendors, contractors, and subcontractors are required to determine cause and corrective action to prevent recurrence of errors which could result in significant conditions adverse to quality."

Contrary to the above:

1. As of March 1981 Sargent and Lundy was not performing design calculations, reviews, and verifications and action was not taken to correct the condition and to preclude repetition. This was identified as a repetitive problem in five licensee QA audits (audit performed 8/8-9/79 - no number, and Audit Nos. 78/07, 78/09, 78/10, 80/04) of Sargent & Lundy.

2. As of March 1981 the socket engagement for more than 400 socket welds in such systems as the diesel generator cooling water, starting air, and fuel oil systems was not verified by Kaiser in accordance with ASME Code, Section III-1971 Edition, Article NB-3661.5(b) and the condition was not corrected. The welds dated back to 1979.

3. As of March 1981 the inprocess inspections for more than 24 welds in the diesel generator cooling water, starting air, and fuel oil piping systems were not performed by Kaiser in accordance with ASME Code, Section III-1971 Edition, Article NB-3661.5(b) et al., and the condition was not corrected.

This is a Severity Level IV violation (Supplement II).

(Civil Penalty - $,000)

H. 10 CFR 50, Appendix B, Criterion III states, in part, "These measures [design control] shall include provisions to assure that appropriate quality standards are specified...and that deviations from such standards are controlled."

The Wm. H. Zimmer QA Manual, Section 3.6 states, "Measures are established to assure that any deviations from the applicable standards are controlled."

Contrary to the above, as of March 1981 design control measures had not been established to assure that deviations from design conditions (quality standards) were controlled. For example, Sargent & Lundy determined, as noted on a calculation sheet dated December 27, 1979, that the design thermal loading for two power cables (VC016 and VC073) in Yellow Tray No. 1057A would allow the cables to be thermally overloaded and no program existed to control those design deviations.

This is a Severity Level IV violation (Supplement II).

(Civil Penalty - $,000)

I. 10 CFR 50, Appendix B, Criterion X states, in part, "A program for inspection of activities affecting quality shall be established and executed by or for the organization performing the activity to verify conformance with the documented instructions, procedures, and drawings for accomplishing the activity."

The Wm. H. Zimmer QA Manual, Section 10.1.2 states, in part, "Inspections are performed in accordance with written procedures which include requirements for check lists and other appropriate documentation of the inspections and tests performed."

Contrary to the above, as of March 1981 a QC inspection program had not been established to require verification of separation of electrical cables routed from the Cable Spreading Room to the Control Room. An example of a nonconforming condition which should have been identified by such a program was two cables (RI103 and CM111) of the Blue Division which had been routed into Green Division Tray Riser No. 3025A which extended from Blue Tray No. 2077A in the Cable Spreading Room to the Control Room.

This is a Severity Level V violation (Supplement II).

Civil Penalty - $,000)

J. 10 CFR 50, Appendix B, Criterion X states, in part, "A program for inspection of activities affecting quality shall be established and executed by or for the organization performing the activity to verify conformance with the documented instructions, procedures, and drawings for accomplishing the activity."

The Wm. H. Zimmer QA Manual, Section 10.1.2 states, in part, "Inspections are performed in accordance with written procedures which include requirements for check lists and other appropriate documentation of the inspections and tests performed."

Contrary to the above, the program established for inprocess inspections of welds on 180 cable tray hangers located in the Cable Spreading Room were not executed as required in the AWS D1.1-1972 Code. Specifically, the final weld inspections had been made after rather than before the welds were painted (galvanox).

This is a Severity Level V violation (Supplement II).

(Civil Penalty - $,000)

K. 10 CFR 50, Appendix B, Criterion III states, in part, "The design control measures shall provide for verifying or checking the adequacy of design, such as by the performance of design reviews, by the use of alternate or simplified calculational methods, or by the performance of a suitable testing program."

The Wm. H. Zimmer QA Manual, Section 3.11.2 states, in part, "At S&L, design verification reviews are performed..."

Contrary to the above, as of March 1981 design control measures had not been established by Sargent & Lundy to provide for verifying or checking the adequacy of the design for the thermal loading of power cable sleeves and the physical weight loading of cable trays.

This is a Severity Level V violation (Supplement II).

(Civil Penalty - $,000)

L. 10 CFR 50, Appendix B, Criterion III states, in part, "Measures shall be established to assure that applicable regulatory requirements...are correctly translated into...procedures..." Criterion III, an applicable regulatory requirement, further states "Design changes, including field changes, shall be subject to design control measures commensurate with those applied to the original design.."

The Wm. H. Zimmer QA Manual, Section 3.12 states, in part, "Design changes...including field changes, are subject to design change control measures commensurate with those applied to the original design."

Contrary to the above, measures were not established to assure that inprocess nonconformances (which constitute field changes) documented in eighteen Surveillance Reports were subject to design control measures commensurate with those applied to the original design. Specifically, H. J. Kaiser Company Procedure QACMI No. G-14, "QA Surveillance Report," Revision 3, allowed such inprocess nonconformances to be dispositioned without design control measures commensurate with those applied to the original design if the nonconformances were dispositioned within 30 days of identification.

This is a Severity Level V violation (Supplement II).

(Civil Penalty - $,000)

M. 10 CFR 50, Appendix B, Criterion III states, in part, "These measures [design control] shall include provisions to assure that appropriate quality standards are specified and included in design documents..."

The Wm. H. Zimmer QA Manual, Section 3.4 states, in part, "Design reviews are conducted to assure that the appropriate quality standards are specified and included in design documents."

The Wm. H. Zimmer FSAR states that cable ampacity is based on IPCEA Publication No. P-46-426. Also regarding cable ampacity, the FSAR states the summation of the cross-sectional areas of the cables shall not exceed 50% of the tray usable cross-sectional area or two layers of cables, whichever is larger, but not to exceed 60% of the cross-sectional area in any case."

Contrary to the above, as of March 1981 the cable ampacity design by Sargent & Lundy was not based on IPCEA P-46-426. The cable ampacity was instead based on IEEE Paper 70TP557-PWR (1970), IPCEA P-54-440, and Sargent & Lundy Standard ESA-114a.

This is a Severity Level VI violation (Supplement II).

(Civil Penalty - $,000)

N. 10 CFR 50, Appendix B, Criterion III states, in part, "These measures [design control] shall include provisions to assure that appropriate quality standards are specified and included in design documents..."

The Wm. H. Zimmer QA Manual, Section 3.4 states, in part, "Design reviews are conducted to assure that the appropriate quality standards are specified and included in design documents."

AWS D1.1-1972 Code, Section 3.6.4, states, "For building and tubular structures, undercut shall be no more than 0.01 inch deep when its direction is transverse to primary tensile stress in the part that is undercut, nor more than 1/32 inch for all other situations."

Contrary to the above, as of March 1981, the design control measures did not include provisions to assure that appropriate quality standards (allowable undercut on cable tray hanger welds) were specified in that Sargent & Lundy Specification H-2713, Supplement 7, Sargent & Lundy Standard EB-117, and H. J. Kaiser Procedure SPPM No. 4.6, "Visual Examination," Revision 8, Paragraph 5.2.9, allowed up to 1/16 inch undercut on cable tray hanger welds.

This is a Severity Level V violation (Supplement II).

(Civil Penalty - $,000)

O. 10 CFR 50, Appendix B, Criterion V states, in part, "Activities affecting quality...shall be accomplished in accordance with...procedures..."

The Wm. H. Zimmer QA Manual, Section 5.1 states, "Construction, fabrication, and manufacturing activities which affect the quality of the facility are accomplished in accordance with written instructions, procedures, and drawings which prescribe acceptable methods of carrying out those activities."

The H. J. Kaiser Procedure SPPM No. 3.3, Revision 6, Paragraph 6.4, states, "The Weld Rod Clerk shall issue all filler material on a weight basis. He shall record on the KEI Weld 2 form the weight of all bare rod and covered electrodes issued."

"He shall also, record on the KEI Weld 2 form the heat number and/or lot number for bare rods, consumable inserts and backing rings, and the heat number and lot number for covered electrodes prior to use."

Contrary to the above, weld rod was issued and information was recorded on weld rod issue slips (KEI Weld 2 forms) by someone other than the Weld Rod Clerks assigned during the second shift during September and October 1979. Specifically, for welds made on the suppression pool wall plate (a) twenty-five weld rod issue slips showed representations of the initials of Weld Rod Clerks who were not assigned as Weld Rod Clerks on the days indicated on the weld rod issue slips, and (b) one weld rod issue slip did not show a Weld Rod Clerk signature or initials.

This is a Severity Level V violation (Supplement II).

(Civil Penalty -$,000)

P. 10 CFR 50, Appendix B, Criterion VII states, in part, "The effectiveness of the control of quality by contractors and subcontractors shall be assessed by the applicant or designee..."

The Wm. H. Zimmer QA Manual, Section 7.3.1 states, in part, "As part of the vendor selection process, S&L makes an independent evaluation of the bidders' QA programs as a part of their total bid evaluation."

Contrary to the above, as of March 1981 neither the licensee nor designee (Sargent & Lundy) had assessed the effectiveness of the control of quality by vendors who supplied structural beams. Specifically, evaluations of the vendors' (U.S. Steel Supply, PBI Steel Exchange, and Frank Adams Company) quality assurance programs for control of mill certifications and structural beams were not performed.

This is a Severity Level V violation (Supplement II).

(Civil Penalty - $,000).

Q. 10 CFR 50, Appendix B, Criterion XVII states, in part, "Sufficient records shall be maintained to furnish evidence of activities affecting quality. The records shall include...monitoring of work performance, and...include closely-related data such as qualifications of personnel, procedures, and equipment."

The Wm. H. Zimmer QA Manual, Section 17.1.4 states, in part, "Documentation of all performance surveillance includes personnel identification and qualification, procedure, type observation, date of performance, person or organization monitored, results and corrective action if required."

Contrary to the above, the Bristol Steel and Iron Works Quality Control Steel Erection Report, which was a generic boilerplate form for monitoring inprocess steel erection, did not identify closely-related data such as weld procedure numbers, types of welding material, welder identification, and specific welds inspected.

This is a Severity Level VI violation (Supplement II).

(Civil Penalty - $,000)

R. 10 CFR 50, Appendix B, Criterion II states, in part, "The applicant shall establish...a quality assurance program which complies with the requirements of this appendix."

10 CFR 50, Appendix B, Criterion I requires persons and organizations performing quality assurance functions to be provided sufficient independence from cost and schedule when opposed to safety considerations.

Contrary to the above, the quality assurance program of the company (Bristol Steel and Iron Works) contracted by the licensee to install the structural steel of the plant did not provide sufficient independence of certain members the QA staff from cost and schedule. Specifically, the Bristol Steel and Iron Works QA Manual, Appendix B, Section 1.0, Paragraph 1.1, states "The Erection Quality Control...is the responsibility of the Project Superintendent, who reports to the Project Manager." Both the Project Superintendent and the Project Manager had cost and scheduling responsibilities.

This is a Severity Level VI violation (Supplement II).

(Civil Penalty - $,000)

Pursuant to the provisions of 10 CFR 2.201, Cincinnati Gas and Electric Company is hereby required to submit to this office within 30 days of the date of this Notice a written statement or explanation, including for each alleged violation: (1) admission or denial of the alleged violation; (2) the reasons for the violation if admitted; (3) the corrective steps which have been taken and the results achieved; (4) the corrective steps which will be taken to avoid further violations; and (5) the date when full compliance will be achieved. Consideration may be given to extending the response time for good cause shown. Under the authority of Section 182 of the Act, 42 U.S.C. 2232, this response shall be submitted under oath or affirmation.

Within the same time as provided for the response required above under 10 CFR 2.201, Cincinnati Gas and Electric Company may pay the civil penalties in the cumulative amount of Thousand Dollars or may protest imposition of the civil penalties in whole or in part by a written answer. Should Cincinnati Gas and Electric Company fail to answer within the time specified, this office will issue an Order imposing the civil penalties in the amount proposed above. Should Cincinnati Gas and Electric Company

elect to file an answer in accordance with 10 CFR 2.205 protesting the civil penalties, such answer may: (1) deny the violations listed in this Notice in whole or in part; (2) demonstrate extenuating circumstances; (3) show error in this Notice; or (4) show other reasons why the penalties should not be imposed. In addition to protesting the civil penalties in whole or in part, such answer may request remission or mitigation of the penalties. Any answer in accordance with 10 CFR 2.205 should be set forth separately from the statement or explanation in reply pursuant to 10 CFR 2.201, but may incorporate by specific reference (e.g., giving page and paragraph numbers) to avoid repetition. Cincinnati Gas and Electric Company's attention is directed to the other provisions of 10 CFR 2.205, regarding the procedure for imposing a civil penalty.

Upon failure to pay any civil penalties dues, which have been subsequently determined in accordance with the applicable provisions of 10 CFR 2.205, this matter may be referred to the Attorney General, and the penalties, unless compromised, remitted, or mitigated, may be collected by civil action pursuant to Section 234c of the Act, 42 U.S.C. 2282.

The responses directed by this Notice are not subject to the clearance procedures of the Office of Management and Budget as required by the Paperwork Reduction Act of 1980, PL 96-511.

FOR THE NUCLEAR REGULATORY COMMISSION

Victor Stello, Jr., Director
Office of Inspection and Enforcement

Dated at Bethesda, Maryland
this day of , 1981

RFU 8/11/82

7.1 Control of Structural Steel Beams and Beam Welds

During the investigation of the allegations addressed in Sections 4 and 5, the RIII inspector identified a beam with an unacceptable weld and two beams that were only tack welded into place. Therefore, the RIII inspector decided to make a more in-depth inspection and review the controls of structural beams and beam welds. The inspections and reviews included visual examinations of structural steel beams in the blue switchgear and cable spreading rooms, and reviews of related documentation.

How many Inspec ?

7.1.1 Beam Observed in Blue Switchgear Room

The area observed in the blue switchgear room (elevation 546 ft) was 8 ft 3 in. west of workline G, 16 ft 6 in. east of workline H and between columns 22 and 54 of S&L drawing No. S-546, Revision AB.

The following six discrepancies were identified:

1. A W8 x 17 beam (8 ft 3 in. long), positioned east to west and located 1 ft 9 in. south of column 24 and 10 in. below elevation 546 ft, was not specified on any pertinent design drawing. The beam appeared to be permanently installed and traceability of the beam heat number was not maintained. After extensive and unsuccessful retrieval efforts by QA personnel, construction personnel were requested to identify any document that would control the unspecified beam. Construction personnel provided Design Document Change (DDC) No. S-2050, dated May 29, 1980, containing only the signatures of two site construction engineers,

who were identifying some of the additional W8 x 17 beams in the area covered by S&L drawing No. S-546. The DDC had no S&L architectural engineering signatures of approval as of March 27, 1981. The DDC did not identify any specific beams.

The licensee identified S&L drawing E-189, Sheet 3, Revision H, Note No. 17, which allows W8 x 17 beams to be installed and then be submitted on a DDC for S&L approval.

2. A W8 x 17 beam (6 ft 3 in. long), positioned north to south and located 13 ft 8 in. west of workline G and 1 in. below elevation 546 ft, was not specified on any pertinent design drawing, was not documented on any QC record, and had unacceptable welds.

3. A W8 x 17 beam (5 ft 5 in. long), positioned east to west and located 8 ft 10 in. south of column 24 and 1 in. below elevation 546 ft, was not specified on any pertinent design drawing, was not documented on any QC record, and had unacceptable welds.

4. A W8 x 17 beam (2 ft 8 in. long), positioned north to south and located 9 ft 6 in. west of workline G and attached to the beam addressed in paragraph 7.1.1.3 and extending north, was not specified on any pertinent design drawing and was not documented on any QC record.

5. Two W8 x 17 beams (8 ft 3 in. long), positioned east to west, with one located 5 ft 3 3/8 in. and the other located 9 ft 7 7/8 in. south of column 24, were only tack welded in place. They displayed no identi-

fication or heat numbers and were not documented on any QC record which indicated in-process weld inspections were not performed. The beams were identified on DDC-2087, which was incorporated into S&L drawing No. S-546, Revision AB. DDCs and S&L drawings by themselves do not assure QC verification.

The W8 x 17 beam was not identified on any QC inspection record, which indicated in-process weld inspections were not performed.

6. Re-entrant corners on several W8 x 17 beams had notches instead of the 1/2 in. minimum radius required by the American Institute of Steel Construction (AISC), seventh edition (1969), page 4.113. The locations of these unacceptable beam corners are shown in Figure A of this section and are noted by (7) in Figure A.

The location of the above discrepancies, additional unacceptable welds, unacceptable re-entrant corners, and nontraceable beams are shown in Figure A of this section.

The welds identified in the preceding paragraphs 25 unacceptable do not comply with the requirements of the AWS D1.1-1972 Code for one or more of the following reasons: slag was not removed; weld profiles had excessive convexity or concavity, blowholes, porosity and/or undercut.

7.1.2 Beams Observed in Cable Spreading Rooms

The inspectors identified the following discrepancies in the cable spreading rooms:

1. A W12 X14 beam No. F2500/8-66B4 had a weld that ~~contained gross porosity.~~ was incomplete. This beam was directly above cable tray hanger No. 4HV8FEC231, which was attached. The beam was located approximately 11 ft south of the north wall at the stairwell.

2. The traceability of the heat numbers was not maintained for two W8 x 17 beams, located south of and parallel to beam No. F2500/8-66B4 (above).

   The first beam was located immediately adjacent to beam F2500/8-66B4. The second beam was the fourth beam south of beam F2500/8-66B4. The first beam was installed flush to the ceiling of the cable spreading room. S&L drawing No. S-546, Revision AB, specifies the first beam to be installed 1 in. below the ceiling.

3. A weld on the 5 in. channel beam ~~that was~~ supporting HVAC hanger No. 2071 had irregular weld profile, excessive undercut, porosity, and craters that were not filled. The channel beam was located 2 ft north and 1 ft west of the cable tray hanger No. 13H2FEC008. The Waldinger, Young and Bertke (W-Y and B) Inspection Report, dated February 19, 1980, indicated that the weld was acceptable.

4. Two W8 x 17 beams, located in the northeast corner (north of WL-16 and east of WL-K), were only tack-welded into place. The beams were specified on DDC No. E-3834 dated October 20, 1978. DDC E-3834, which affected eight drawings, was posted on, but had not been incorporated into, S&L drawing No. S-546, Revision AB, dated October 22, 1980.

Heat No. 72161 (purchase order No. 31134) was marked on the southern beam. The traceability of the heat number of the northern beam was not maintained.

The beams were not identified on any QA inspection record, which would have indicated their status. In-process inspections were not performed on the tack welds.

NOTE: Some of the welds inspected by the RIII inspectors were painted. Therefore, the inspections were for relatively large deficiencies.

7.1.3 Installation Deficiencies

1. For the beams identified on DDCs and addressed in paragraphs 7.1.1 (items 1 and 5, and 7.1.2 (item 4) above, no measures existed that would identify to QA, the installations and work that was done by construction before the DDC was incorporated into the drawings. Thus, no measures existed to assure that all of the required QA inspections related to DDCs (e.g., welder qualification, proper filler metal, traceability of materials, etc.) would be performed. This condition was previously identified in IE Report Item No. 358/80-15-04. The corrective actions taken, which had not yet been reviewed by the NRC, with regard to Item No. 358/80-15-04 did not include the DDCs written prior to the implementation of those corrective actions and did not include the DDCs that are and have been implemented prior to receiving the S&L approvals. This item is unresolved pending the complete resolution of IE Item No. 358/80-15-04 (358/81-13-63).

2. Failure to control unacceptable welds (addressed in Sections 7.1.1 and 7.1.2), the five beams with unacceptable re-entrant corners, and the four beams that were installed and not identified as a requirement on any design document is contrary to 10 CFR 50, Appendix B, Criterion XV, and the Wm. H. Zimmer QA Manual, Section 15.2.2, as described in Appendix A to the report transmittal letter (50-358/81-13-03).

3. Failure to maintain the traceability of the nine structural beams, addressed in Section 7.1.1 and 7.1.2, is contrary to 10 CFR 50, Appendix B, Criterion VIII, and the Wm. H. Zimmer QA Manual, Section 8.2, as described in Appendix A to the report transmittal letter (50-358/81-13-04).

7.1.4 Unapproved Structural Beam Vendors

~~Purchase~~, Several thousand feet of W8 x 17 beam were purchased on the following order numbers from vendors not on the approved vendor list, which means the respective vendor QA programs had not been evaluated for compliance with 10 CFR 50, Appendix B.

P.O. No. 10275, PBI Steel Exchange, 2400 ft

P.O. No. 12868, U.S. Steel Supply, 1500 ft

P.O. No. 16321, Frank Adams Co., 1012 ft

P.O. No. 10009, Frank Adams Co., 1024 ft

P.O. No. 9761, Frank Adams Co., 1472 ft

P.O. No. 9628, Frank Adams Co., 450 ft

P.O. No. 9872, U.S. Steel Supply, 300 ft

These beams were not controlled to prevent their use in safety-related systems. The licensee stated that these beams had been made available for installation in safety-related systems based on the mill certifications and without regard to the vendors not being approved. Mill certifications were available for these beams. The licensee stated that the credibility of the mill certifications would be established. Failure to assess the effectiveness of the controls to assure the quality of the mill certifications and structural beams, supplied by the above vendors, is contrary to 10 CFR 50, Appendix B, Criterion VII, and the Wm. H. Zimmer QA Manual, Section 7.3.1, as described in Appendix A of the report transmittal letter (50-358/81-13-06).

7.1.5 Findings and Conclusions

Welds on nine structural beams were unacceptable. Measures had not been established to assure that required QA in-process inspections, related to Design Document Changes, would be performed. Five beams had unacceptable (notched) re-entrant corners. Four beams were installed which were not specified on any design document. The traceability of nine structural beams W25 [redacted] not maintained. And the licensee did not assess the effectiveness of the controls to assure the quality of the mill certifications and structural beams supplied by three vendors.

7.1.6 Items of Noncompliance

Three items of noncompliance were identified (failure to control unacceptable welds, unacceptable re-entrant corners on beams, and unspecified beams; failure to maintain traceability of beams; and failure to assess the effectiveness of vendor quality assurance).

RFW 8/12/81

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7.4 CG&E Audits of Sargent & Lundy

During the investigation of allegation 5.10, the RIII inspector identified that Sargent & Lundy did not have a program to control design deviations (nonconforming designs) when identified by the S&L engineers. Therefore, the RIII inspector requested for review all of the CG&E audits of S&L to determine if CG&E had assessed the effectiveness of the S&L nonconformance program.

7.4.1 Audits of the S&L Nonconformance Program

The Region III inspector reviewed the following CG&E audits of S&L.

	Audit Dates	Audit Number When Noted
(1)	2/15-16/72	
(2)	8/8-9/74	
(3)	8/7-8/75	
(4)	7/28-19/76	
(5)	11/14-15/77	77/24
(6)	9/6-7/78	78/07
(7)	10/16-17/78	78/09
(8)	11/27-30/78	78/10
(9)	1/30-31/79	79/01
(10)	12/18-19/79	79/07
(11)	3/5-6/80	80/01
(12)	10/21-22/80	80/04

The RIII inspector did not observe any portions ~~of any~~ of the audits that really addressed ~~would have represented a comprehensive system of planned audits to determine~~ the effectiveness of the nonconformance program. The audits of the nonconformance program should have addressed such things as implementation, design reviews, identification of acceptance or rejection, disposition control, and notification of affected organizations.

The RIII inspector observed only two items in all of the above audits, covering a 9-year period, that concerned the S&L nonconformance program. These two items, identified in one audit, were designated as deficiencies, which concerned distribution and logging of nonconformance reports. The deficiencies appeared to have been identified during audit activities which were not directed at the nonconformance program. The deficiencies were apparently resolved in Audit 77/24 which indicated that S&L Project Procedure #PIZI-8.1, Revision 0, had been prepared to describe responsibilities and instructions, and to require a log and a file of nonconformance reports.

Failure by CG&E to perform an audit to determine the effectiveness of the S&L nonconformance program during the past 9 years is contrary to 10 CFR 50, Appendix B, Criterion XVIII, and the Wm. H. Zimmer QA Manual, Section 18.1. (50-358/81-13-23).

7.4.2 General Audit Context

The audits generally appeared to be reactive in nature in that specific problems, which had been previously identified, were audited. The audits

did not appear to be progressive and programmatic, or directed toward identification of new and generic problems. The audits appeared to identify adverse findings for which there were no corrective action taken or follow-up audits. This matter is unresolved pending a review, by ~~the~~ CG&E of their audits of Sargent and Lundy, General Electric, HJ Kaiser, and four ~~which will define its respective adverse findings, the corrective actions, and the follow-up audits~~ (358/81-13-80)

7.4.3 Recurrences of Problems with Design Calculations, Reviews, and Verifications

During the review of the CG&E audits of S&L, the Region III inspector noted that the audits were identifying a recurring problem. This problem concerned the performance of design calculation, reviews, and verifications by S&L. The specific problems identified in each audit are as follows:

	Audit Date or No.	Problems
1.	8/8-9/74	(a) ITE Imperial drawings of essential equipment had not been signed and bore no evidence of a design review.
		(b) There were inadequacies in documenting design reviews.

	Audit Date or No.	Problems
		(c) Structural design calculation were not in accordance with new procedures.
		(d) No direct evidence was available of the S&L review of vendor design calculations.
2.	78/07	(a) S&L had not maintained a record of support design calculations.
		(b) DDC #2973 was approved without review by EMD even though a major support location change was clearly identified on the DDC. (This item was identified in the details of the audit report, but was not cited and had no apparent followup on subsequent audits.)
3.	78/09	(a) Very little data was available to justify the embedment criteria of 4.5 times the normal diameter of concrete expansion anchors.

	Audit Date or No.	Problems
		(b) Calculations could not be located which would verify that a structured review was performed to show that no reinforcement was needed for a 24 x 68 radial beam which was cut at both flanges.
4.	78/10	(a) Calculations were not available for all walls to substantiate the statement that block walls were "judged to be OK."
		(b) Calculations were not available to back up design signatures which indicated design verification for five design changes approving core bores.
		(c) No approval signatures were found on any calculations for structural steel modifications (including Beam #86) due to pool hydrodynamic loads. The modification had been released for construction.

	Audit Date or No.	Problems
		(d) Audit finding was closed based on calculations which were in progress but not yet complete. The calculations were for beams (embedded plates) in the primary containment to verify that the plates can support additional loads.
5.	80/04	(a) (1) The calculation required to evaluate the clamp deflection on a pipe support was not performed.
		(2) Also, the weld calculation was not performed on the most critical weld.
		(b) Calculations performed by NPS were incomplete in that the deflection due to torsional rotation of the beam was not included.
		(c) Calculations performed by NPS were not in reasonable order, which made them difficult to follow.

None of the audits or corrective actions, which identified the above problems, addressed or determined the generic and programmatic cause of design calculations, reviews, and verifications not being performed to preclude repetition. Failure to determine the cause and to take corrective action to preclude repetition is contrary to 10 CFR 50, Appendix B, Criterion XVI and the Wm. H. Zimmer QA Manual, Section 16.5. (50-358/81-13-24).

7.4.3 Findings and Conclusions

CG&E has ~~not~~ performed a comprehensive audit to determine the effectiveness of the Sargent & Lundy nonconformance program. ~~CG&E will perform a review of CG&E audits to define the respective adverse findings, the corrective actions, and the follow-up audits.~~ The audits identified a recurring problem involving design for which the cause was not determined and corrective action was not taken to preclude repetition. CG&E will undertake a re-review of all past audits of Sargent and Lundy, General Electric, HJ Kaiser, and four internal departments as a part of the Quality Confirmation Program.

7.4.4 Items of Noncompliance

Two items of noncompliance were identified (failure to perform comprehensive audits of the S&L nonconformance program, and failure to determine the cause and preclude repetition of a recurring problem).

calculations, reviews, and verifications

4.1 Nonconformance Report Voiding

4.1.1 Allegation

On November 18, 1980, J. Harrison, Resident Inspector at the Marble Hill Nuclear Power Station, was contacted by an individual who identified himself as a former Quality Control (QC) Inspector at Zimmer. The individual stated that Kaiser Quality Assurance (QA) Manager Phillip Gittings had been improperly voiding Nonconformance Reports (NRs) based on Gittings' reinspection of the nonconforming items.

Between January 13 and July 4, 1981, thirty-one current and former Kaiser QC Inspectors and Quality Assurance Engineers (QAEs) were interviewed by NRC regarding the Kaiser nonconformance reporting system. Sixteen of those individuals alleged irregularities in the system. They specifically alleged:

a. The QA Manager was arbitrarily voiding NRs which were not written in error.

b. The QA Manager was diverting NRs (not entering them into the Kaiser nonconformance reporting system).

c. NRs were being voided and their items transferred to Surveillance Reports (SRs).

d. NRs were being improperly dispositioned by the QA Manager and members of the Kaiser Material Review Board (MRB) who frequently dispositioned

them as "Accept-As-Is" when "Repair" or "Rework" was appropriate per Kaiser specifications and industry codes and standards.

e. NRs were voided with the justification "to be reinspected after redesign" or "deficiencies would be rewritten on separate NRs." The nonconforming conditions were not reinspected after redesign, nor were they written on separate NRs.

f. NRs were voided by the QA Manager at the request of the Construction Department to avoid rework and schedule delays.

g. During revisions of an NR, nonconforming items were arbitrarily removed by the QA Manager.

4.1.2 General Background

4.1.2.1 Nonconformance Reporting System

The Kaiser nonconformance reporting system was established to provide control of nonconforming material. Kaiser Quality Assurance-Construction Methods Instruction (QACMI) G-4, Rev. 9, provides the following procedure: The QA Department or Field Engineering may initiate an NR when members identify nonconforming material, equipment, construction work, or a deviation from specified requirements. The Inspector or QA Engineer initiates the NR and then contacts the Site Document Control (SDC) NR Controller, who makes a log entry and assigns a KEI Control Number (CN). The NR is reviewed by the Inspector's

supervisor or cognizant QA Engineer and is forwarded to the SDC NR Controller who issues a NR Control Number.

NRs written on Essential Systems/Components will be given an "E" prefix and Nonessential Systems will be given a "N" prefix number. The procedure states the QA Manager can approve voiding of NRs "in instances where an NR has been initiated in error, due to interpretation or judgement of borderline conditions, duplications, or where a nonconforming condition has been corrected by the Construction Department after a verbal or written communication from the QA Department can be voided by the Site QA Manager." The procedure states that in these cases the NR will be stamped "Void" with a brief statement indicating justification for the voiding. A copy of the voided NR is required to be retained in the SDC and a copy returned to the initiator.

QACMI G-4, Rev. 9, states that the KEI Construction Engineer or his designee will disposition NRs as "Accept-As-Is", "Rework", "Repair", or "Reject". The Construction Engineer reviews and approves all dispositions, and "Accept-As-Is" and "Repair" dispositions require review by the Material Review Board which consists of the KEI Construction Engineer, CG&E QA Engineer, Kaiser QA Engineer, CG&E sponsoring engineer, and the Sargent and Lundy Design Engineer (for essential material or equipment only). In the case of an ASME Section III Code nonconformance, the Authorized Nuclear Inspector must be included on all "Accept-As-Is" dispositions which will be closed after MRB review. NRs dispositioned as "Rework" or "Repair" will be closed after the Inspector or QA Engineer signs the NR verifying that the repair or rework was completed. Records of all open and closed NRs are retained by the SDC NR Controller.

During a routine NRC inspection conducted during December 2-3, 1980, the RIII inspector observed that of twenty NRs written to document American Welding Society (AWS) welding deficiencies on hanger welds, eight had been voided with the notation "based on re-inspection". Also, it was observed that NRs had been voided by the issuance of Design Document Controls (DDCs). The inspector advised site personnel and CG&E management (during an exit interview on December 16, 1980) that these practices were contrary to site procedures and NRC requirements.

The inspection report containing these items of noncompliance was issued on March 2, 1981 (I&E Inspection Report 50-358/80-25). The licensee replied to these items by letter dated March 16, 1981, indicating that a Stop Work Order had been issued prohibiting voiding of NRs, and this order had been subsequently rescinded when improved procedural controls were in place. The improved procedural controls consisted of limiting the authority to void an NR to the Kaiser QA Manager, and the marking of superseded NRs as "Superseded" rather the "Void".

The CG&E letter also indicated that Kaiser was performing a complete review of voided NRs, in response to a CG&E Audit finding. The review was expected to be completed by April 30, 1981, and full compliance with NRC requirements was to be achieved by May 5, 1981. Between December 15-19, 1980, and on January 5, 1981, Lon Ludwig, of Nuclear Energy Services, Inc., audited the Kaiser nonconformance reporting system.

Interview of CG&E Quality Assurance Manager

On January 16, February 14, and March 22, 1981, William Schwiers, CG&E QA Manager, was interviewed by NRC. Schwiers stated that during an NRC exit meeting held on January 6, 1980, Eugene Knox, Kaiser Corporate QA Manager, and Phillip Gittings were informed that Kaiser was improperly voiding NRs. He then directed Kaiser to audit all the previously voided NRs and present the results of this audit to CG&E by February 16, 1981. Schwiers stated he also directed Gittings to cease improperly voiding NRs. He provided a copy of a memo to Gittings dated January 14, 1981, which requested Kaiser respond to Field Audit Report No. 340 concerning the voiding of NRs. A copy of the memo and Field Audit Report 340 is appended to this report as EXHIBIT ( ).

4.1.2.2 Interview of Lon Ludwig

On January 14, 1981, Lon Ludwig, Nuclear Energy Services, Inc., Manager, Quality Engineering, was interviewed by NRC. He stated that in December and January 1980 he audited the Kaiser nonconformance reporting system after the NRC had identified that NRs were being improperly voided. Ludwig indicated his audit showed there were approximately 500 voided NRs and between one third to one half of these were superceded and written on other NRs. He said some NRs which identified numerous nonconforming conditions were separated and reissued on individual NRs. One third of the NRs reviewed were voided as "written in error" with no adequate explaination given to justify this comment. Ludwig stated that he recommended Kaiser audit all the voided NRs and provide a better explaination as to why each was voided.

Ludwig stated that there are in excess of 500 voided NRs, covering all areas of plant operation and construction, dating from 1974 to the present.

4.1.2.3 Interviews of Phillip Gittings

On January 13, 1981, Phillip Gittings, Kaiser Quality Assurance Manager, was interviewed by NRC. He stated that in October 1980 he voided seven NRs that were written by QC inspectors who were in training. He said he reinspected the welds identified in the seven NRs and, in his opinion, the welds met American Welding Society (AWS) Code requirements. He indicated that during an NRC inspection in December 1980, the inspector took exception to this practice and found the licensee in noncompliance with NRC requirements for improperly voiding NRs.

Gittings said that following the NRC inspection the welds identified on the seven NRs were reinspected by Gladstone Laboratories, Inc. He said Gladstone found that four of the seven NRs were voided properly as the noted welds conformed to the AWS Code. He said the three other NRs had minor decrepancies which Gladstone personnel considered unacceptable per AWS Code requirements.

Gittings stated that approximately 500 NRs had been voided by Kaiser at the Zimmer project. A number of these NRs were voided and then revised and put on another NR, or were voided after it was found they duplicated a previously reported nonconforming condition. He stated the only NRs he voided for being "written in error" were those from October and November 1980 that were examined during the December 2-3, 1980, NRC inspection.

Gittings stated during the past six months Kaiser has had problems with some of its QC inspectors "over inspecting." He stated that contract inspectors hired from Butler Services, Inc., frequently objected to Kaiser management's implementation of the QA program and were critical of Kaiser inspection procedures and techniques. He indicated that Kaiser had terminated all contract inspectors and offered some of them jobs in the Kaiser QA organization at Zimmer.

Gittings related that many of the inspectors were critical of the Kaiser nonconformance reporting system and of the Kaiser weld inspection criteria for pipe support hangers and structural steel. He said there were differences of opinion on various code interpretations, which he felt were common in any weld inspection program.

On July 8, 1981, Phillip Gittings was re-interviewed by NRC following the investigation of the dispositions of a selective group of twenty NRs. Gittings stated that the voiding of NRs by clerks and by SDC Supervisor Floyd Oltz, was improper because neither Oltz nor members of his staff were qualified to make engineering judgements concerning deficiencies identified on NRs. Gittings said that he directed the NR procedure be changed so that only he could void an NR after a December 1980 NRC inspection.

Gittings indicated that according to Kaiser procedures any QC inspector has the authority to initiate an NR and it should then be entered into the Kaiser nonconformance reporting system. When questioned about his failure to issue NR control numbers 4975-79 to reports written by Inspector James Ruiz on February 23, 1981, Gittings said he directed Rex Baker, Inspection Supervisor,

to void those NRs. He said that his action on these NRs was contrary to the Kaiser procedure which only permitted an NR to be voided if it was "written in error". Gittings said those NRs were not erroneously written.

Gittings stated that he did void NRs at the request of Construction Department personnel, but added that he made independent decisions when doing so and was not compelled by construction personnel to void NRs. Gittings stated he did not know why Christopher Dumford's NR (Control No. 4309) was not in the Kaiser nonconformance system and denied diverting this NR from the system.

When questioned about specific irregularities found during the present NRC investigation, Gittings concurred that the practices of voiding NRs by stating they "would be reinspected after redesign", voiding NRs and transferring the nonconformances to "punch lists", and voiding NRs by placing nonconformances on surveillance reports were not in accordance with Kaiser procedures.

Gittings stated that Kaiser's QC inspectors were identifying problems at Zimmer, however, CG&E and Kaiser did not have enough sufficiently qualified people to build the plant and still inspect to industry codes and standards. He said this was evident when Richard Reiter identified a significant traceability problem when reviewing isometric drawings on small bore pipe systems. Gittings said Reiter had initiated a surveillance report correctly identifying the problem, and he (Gittings) had not adequately answered the report. He said this problem warranted reporting to the NRC; however, Kaiser did not do so. He said that eventually Kaiser hired two Quality Assurance Engineers to review the documentation and they (and the NRC) found that Reiter's analysis was correct.

4.1.2.4 Interview of Kathy Faubion

On February 13, 1981, Kathy Faubion, Kaiser NR Controller, was interviewed by NRC. She stated Kaiser procedures permit an inspector to call for a NR Control Number. She then issues the individual inspector a control number (CN), makes an entry in the Kaiser Log of Nonconforming Material, describes the nonconforming item, and notes the initials of the inspector calling for the number. She stated she has never "whited out" an entry for a control number in the log.

Faubion indicated that the QA Manager stamps all voided NRs with a red "void" stamp. She then gets a copy of the voided NR and marks through the NR Control Number entry in the log with red ink. Inspectors frequently call for control numbers and do not subsequently send the NR. In these cases, Faubion makes the same "void" entry in the NR Log.

Prior to December 1980, Floyd Oltz, Kaiser QA Engineer Records, also had the authority to void NRs. However, William Schwiers, CG&E QA Manager, directed that this authority be vested solely in the Kaiser QA Manager. Since then Oltz has not voided any NRs.

4.1.4 Disposition of Nonconformance Report Control No. 5412

4.1.4.1 Background Information

On December 29, 1980, Chris Dumford, Kaiser QC Inspector, initiated Surveillance Report No. (SR) 2886, to document that a suppression pool liner

plate was tensioned before a QC inspector arrived to verify the initial tensioning. The corrective action to resolve this condition was for an inspector to be present during the seven and thirty day tension checks, to verify that the plate was being tensioned properly.

On February 3, 1981, Dumford initiated a NR (assigned Control No. 5412) which also reported that a suppression pool liner plate was being tensioned in an violation of an applied hold tag. The NR states "hold tag was applied while a wall plate 1000 was in process of being tensioned." Once hold tag was applied tensioning was continued until tensioning was completed."

4.1.4.2 Investigation

4.1.4.2.1 Interview of Walter C. Dumford

On February 11, 1981, Walter C. Dumford, Kaiser Quality Control Inspector, was interviewed by NRC. He stated that on February 3, 1981, he was inspecting suppression pool wall plates and noticed that a bolt on a plate was not perpendicular to the plate. He indicated construction personnel were preparing to tension the plate in question and when he told them he was going to place a hold tag on it, they responded, "try and stop us."

Dumford said he left the area to discuss the matter with his supervisor, Dennis Donovan, who told him to initiate a NR for the nonconforming bolt and to place a hold tag to preclude tensioning of the plate. He indicated that he returned to the suppression pool, placed a hold tag on the plate, and

construction personnel ceased tensioning the plate. However, as he left the area he heard the tensioning machine reactivate, indicating that the tensioning crew had ignored his hold tag.

Dumford stated he advised Donovan of the occurence and Donovin told him to write a NR documenting continuation of tensioning after a hold tag had been applied. Dumford called the NR Controller, was issued NR CN 5412, and documented the violation of the hold tag. He said that a few days later he was called into the Kaiser QA Manager's office and was told by the QA Manager, Phillip Gittings that the NR should not have been written since it was "a software (procedural) problem and not a hardware problem." He said Gittings then said "I'm going to void this NR because we do not need this kind of paperwork floating around because this is the kind of stuff that causes investigations." Dumford stated that Rex Baker and Dennis Donovin, who were also present at the meeting, disagreed with Gittings conclusion and advised Gittings that they felt it was a valid NR.

Dumford indicated that Dennis Donovin called the NR clerk a few days later and was told CN 5412 had been reassigned to another NR (the original report had not been entered into the NR system). Dumford provided a copy of the origional NR CN 5412 which is attached to this report as Exhibit ( ).

Dumford indicated this incident is an example of Kaiser QA management not supporting the QA program on site, and being influenced by construction considerations. Dumford stated that, in his opinion the Kaiser QA Manager was influenced by construction, and QA was not independent at Zimmer.

On February 11, 1981, Dumford provided a written sworn statement attesting to the preceding information, a copy of which is attached as Exhibit ( ).

4.1.4.2.2 Interview of Dennis Donovan

On February 13, 1981, Dennis Donovan, Kaiser QC Inspector, was interviewed by NRC. He stated that on February 3, 1981, Chris Dumford contacted him regarding a Surveillance Report written against tensioning of bolts on a suppression pool plate without QA coverage. Donovan said he called Ken Shinkle, the QA Engineer responsible for the suppression pool area, advised him of the incident and Shinkle told him to write a NR. Donovan stated he wrote the NR and instructed Dumford to go down and place a hold tag on the plate. Dumford subsequently returned to the trailer and told him that he had placed a hold tag on the plate, but craft personnel had ignored the tag and continued tensioning the plate. Donovan indicated that he told Dumford to write a second NR against the continuation of work after a hold tag had been applied (a procedural violation).

Donovan stated he initialed the second report and called the NR clerk who assigned it CN 5412. The NR was forwarded directly to Inspection Supervisor Rex Baker for review.

Donovan said that on February 4, 1981, he, Baker, and Dumford were called into Phillip Gittings office and Baker gave the orginal copy of the NR to Gittings. He said Gittings said "This report is going to be voided because this is the kind of thing that starts investigations." Donovan said that

Gittings commented that inspectors should not write NRs against software problems, but only against hardware problems, and that ignoring a hold tag was a procedural (software) violation.

Donovan said he and Dumford explained that construction had ignored the hold tag, and Gittings replied "If I was in their position I would have done the same thing." Donovan responded and said a hold tag is the strongest QA control mechanism on site and if one is ignored a NR should be written. Donovan said he and Baker told Gittings they disagreed and the meeting ended.

A few days later Donovan said he called the NR controller concerning the disposition of control No. 5412 and found that the number had been reissued to another NR.

Donovan stated in his opinion this is an example of Kaiser QA management not supporting the inspection program at Zimmer.

On February 13, 1981, Dennis Donovan provided a written sworn statement attesting to the preceding information, a copy of which is attached as Exhibit ( ).

4.1.4.2.3 Interview of Kenneth Shinkle

On February 18, 1981, Kenneth Shinkle, Kaiser Quality Assurance Engineer, was interviewed by NRC. He stated that on February 2, 1981, he received a phone call from Dennis Donovan regarding a bent bolt on a suppression

pool liner plate. Shinkle stated he told Donovan this should be documented on a NR and a hold tag should be placed on the plate in question, to prevent tensioning. Shinkle stated he later learned a NR was written, and Chris Dumford had affixed a hold tag to the plate which was ignored by construction personnel, who tensioned the plate. Shinkle said he also learned a second NR was written by Dumford for violation of the hold tag, which he later initialed and forwarded to Rex Baker, Inspection Supervisor.

Shinkle stated he later learned Phillip Gittings, after discussions with Dumford, Donovan, and Baker, did not enter the NR into the system. Shinkle said the report had been assigned a control number and the inspectors supervisor had concurred it was a valid NR, yet Gittings told him it was not going to be processed, stating "The whole thing has been blown out of proportion."

Shinkle stated in his opinion Kaiser management does not support the QC program at Zimmer, construction dominates activity at the site, and QA is not independent of construction influence.

On February 18, 1981, Kenneth Shinkle provided a written sworn statement attesting to the preceding information, a copy of which is attached as Exhibit ( ).

4.1.4.2.4 Interview of Rex Baker

On March 3, 1981, Rex Baker, Kaiser Inspection Supervisor, was interviewed by NRC. He stated that in early February 1981 he attended a meeting in

Gittings office with Dennis Donovan and Chris Dumford. He stated during this meeting Dumford said construction had continued to tension a suppression pool liner plate after he had placed a hold tag on it. Baker stated he agreed Dumford was correct in writing an NR for hold tag violation. He said Gittings disagreed and stated in his opinion construction was right to continue tensioning the plate after a hold tag had been affixed to it. Baker stated he did not know the disposition of the NR, but the last time he saw it, it was in Gittings' possession.

4.1.4.2.5 Record Reviews

On February 11, 1981, the Kaiser Log of Nonconforming Material reports was reviewed; the log reflects Control No. 5412 NR No. 2996 Revision 1 was written on February 2, 1981, for welds having lack of penetration. This entry does not reflect that Control No. 5412 had been assigned to the report by inspector Dumford on February 3, 1981, for violation of a hold tag. The equipment name or process entry columns in the log and the specification entry showed evidence that "white-out" ink was used to cover writing that had been made previously in the log. A copy of the log page and actual NR issued is appended to this report as Exhibit ( ), ( ).

4.1.5 Disposition of Nonconformance Report E-5108

4.1.5.1 Background Information

On May 19, 1980, NR No. E-5108 was issued identifying a four foot long pipe piece installed per DDC M-1108 in a Residual Heat Removal System (RHR) for

which no material traceability could be established. The NR also reports that a weld located near this pipe piece was inside of a penetration, in violation of licensee specifications. The NR was stamped void on June 20, 1980, by Floyd Oltz, QA Engineer, who added a note indicating it was voided because "acceptable documentation found which established material traceability for the pipe piece". A copy on NR E-5108 is appended to this report as Exhibit ( ).

RIII personnel examined the four foot section of pipe between welds 82 and 82a identified on NR 5108 and on isometric drawing PSK-RH-15. No heat or identification number on the pipe piece in question was found. KE-1 weld data sheets for welds RH-82 and RH-82a, joining the pipe piece to the RHR system were reviewed. Both forms had notations identifying the heat number for the pipe piece as Heat No. 232661, initialed and dated "RLR 6/19/80." The weld records indicated weld dates of June 15, 1976, (weld RH-82a) and on October 14, 1976, (weld RH-82) four years prior to the heat number being noted.

The RIII inspector reviewed the isometeric drawing and construction piping inspection plan, along with other related documentation for the pipe and welds. No reliable documentation to justify the questioned heat number to the the weld data form could be located. This appeared to be an intentional fraudulent entry.

4.1.5.2 Interview of Richard Reiter

On March 25, 198, Richard L. Reiter, former Kaiser Document Reviewer, was interviewed by NRC. He stated he was employed at Zimmer from November, 1978

to November, 1980. He indicated his job had been to review isometric drawings and insure that related documentation, such as weld data records, met ASME Code Requirements, and the drawings were correct. During his reviews he found discrepencies in drawings and associated documentation which did not match conditions in the plant. Reiter stated that numbers for pipe sections and weld data records did not match. He said he had been concerned about this and on October 28, 1980, wrote Surveillance Report (SR) 2819 to Floyd Oltz, his immediate supervisor, stating "when reviewing isometric drawings he is making assumptions which he felt compromised his integrity". He also asked for a written directive telling him to make these assumptions, or for Kaiser to reevaluate all small bore isometrics to insure that there is adequate documentation to insure traceability of the material. He stated that in the SR he also questioned the disposition of NR's dealing with lack of material traceability.

Reiter stated that Oltz responded to the SR by indicating that all the procedures were approved and were adequate to meet regulatory and ASME Code requirements. Oltz wrote that Reiter was to continue using the approved procedures and practices in effect. Reiter stated he disagreed with the disposition of the SR and shortly thereafter terminated his employment with Kaiser, because he felt he was being forced to compromise his integrity. A copy of the SR authored by Reiter on October 28, 1980 is attached to this report as Exhibit ( ).

4.1.5.2.2 Record Reviews

During the week of June 8-12, 1981, RIII personnel reviewed the following records of the disposition of this NR.

NR E-5108, dated May 19, 1980

Kaiser Engineers, Weld Data Sheet No. 4826, dated January 21, 1976

Kaiser Engineers, Weld Data Sheet No. 1852

Construction Piping Inspection Plan for Residual Heat Removal System, Inspection Plan No. RH-15 dated June 16, 1976

4.1.5.2 Finding and Conclusions

Based on record reviews and field observations, it was established that NR 5108 was improperly voided, as acceptable documentation was not found to justify voiding the report.

4.1.6 Disposition of Nonconformance Report Control No. 4309

4.1.6.1 Background Information

On Janurary 7, 1980, Inspector Michael McCoy obtained NR Control No. 4309 to identify deficient weld fitup on a one and three quarter cover plate to beam W32X260 located on the reactor pedistal support structure. McCoy stated in the NR that parts to be fillet welded were not brought in as close contact as practical as required, but were separated by more than 3/16 of

an inch. A copy of NR Control No. 4309 is attached to this report as Exhibit ( ).

4.1.6.2 Investigation

4.1.6.2.1 Interview of Michael McCoy

On February 11, 1981, Michael McCoy, Kaiser Quality Control Inspector, was interviewed by NRC. He stated that on January 7, 1980, he obtained NR Control No. 4309 for a report on welds on the reactor pedestal support structure which did not meet code requirements. McCoy stated he initiated the NR, his supervisors concurred in his findings, and he received a control number from the NR controller. He said that after he wrote the NR it was returned to him without disposition. McCoy stated that in addition to voiding this NR, NRs were frequently inadequately dispositioned. He attributed this to a QA Manager's lack of support for either the Inspectors or the QC program at Zimmer.

On February 11, 1981, Michael McCoy provided a written statement attesting to the preceding information, a copy of which is attached as Exhibit (12).

4.1.6.2.2 Record Review

On February 11, 1981, the Kaiser NR log was reviewed. It was found Control No. 4309 was assigned to NR No. E2417 which identified deficiences in electrical conduit bracing in the control room. A copy of this NR is attached to this report as Exhibit ( ). During this review it was noted that there was evidence

of white-out in the "specification" and "equipment name or process" section of the NR log. A copy of the NR log page is appended to this report as Exhibit ( ).

4.1.6.3 Findings and Conclusions

It was determined that Inspector McCoy's NR was never entered into the Kaiser nonconformance reporting system.

4.1.7 Disposition of Nonconformance Reports CN 4955-9, CN 4930-1

4.1.7.1 Background Information

On July 9, and 22, 1980, NRs assigned Control Numbers 4955-59, 4930 and 4931 were written by inspectors Joseph Mills and G. McCann. The NRs identified weld deficiences on pipe supports in diesel generator (DG) Room A. The seven NRs had been assigned control numbers, but no NR number. The copies of the seven reports are appended to this report as Exhibit (15).

4.1.7.2 Investigation

4.1.7.2.1 Interview of Joseph Mills

On June 2, 1981, Joseph Mills, Kaiser Quality Control Inspector, was interviewed by NRC. He stated that in July and August of 1980 he identified nonconforming welds while inspecting pipe support hangers in DG Room A. He said he identified these welds on NRs which were assigned control numbers 4955 to

4959. He said his supervisor, Rex Baker, concurred the NRs were valid. Mills stated that in August 1980 he was reassigned from pipe support hanger inspection to structural welding inspection, and a week after his reassignment the five above NRs were returned to his desk without being processed. Mills stated that two other NRs written by Inspector G. McCann were also returned to him.

Mills stated that in March 1981 he learned of an NRC investigation into the NR System and turned in the seven unproccessed NRs to the NRC Senior Resident Inspector. The Senior Resident Inspector asked him to reexamine the welds in DG Room A to see if the nonconforming welds he identified earlier were still uncorrected. Mills stated his reinspection indicated that in each case the condition that he had previously identified had been repaired, and the welds were now acceptable. Mills stated apparently someone had used the information on the NRs to correct the nonconforming conditions. He said, however, this was not done via the Kaiser NR system since the original NRs and all copies had been returned unprocessed.

On June 2, 1981, Joseph Mills provided a written statement attesting to the preceding information, a copy of which is attached as Exhibit ( ).

4.1.7.2.2 Interview of Floyd Oltz

On June 19, 1981, Floyd Oltz, Kaiser QAE, Records, was interviewed by NRC. He stated that he reviewed the Kaiser NR Log and found that NRs assigned Control Nos. 4955 to 4959 and 4930 and 4931 had been voided with the comment

"NR not issued." Oltz stated that in these instances Kaiser did not retain a copy of the NR in the voided NR file, because reports which are voided as "Not Issued" are returned to the inspector.

4.1.7.2.3 Interview of Lynn Anderson

On June 9, 1981, Lynn Anderson was interviewed by NRC. He stated that he is employed by Nuclear Energy Services Inc. and is contracted to work as a Quality Control Engineer for CG&E. Anderson stated currently he is conducting an audit of the Kaiser nonconformance reporting system. Anderson said that on June 4, 1981, he checked the disposition of NRs assigned CN 4955 and 4959. Anderson stated he reviewed the NR log and found that those CN had been assigned and the reports had been voided on September 30, 1980. Anderson said he checked all of the Kaiser and CG&E NR files and could not locate these NRs. Anderson concluded that although a CN had been issued, the reports had never been entered into the active or voided NR files.

4.1.7.2.4 Record Reviews and Field Observations

On June 10, 1981, the Kaiser NR log was reviewed and it was found CN 4955 to 4959 had been entered into the NR system; however, the entry had been lined through with the comment, "VOID NR not issued" and dated 9/30/80." A review of the NR log for entries CN 4930-31 indicated that they had also been entered into the NR system; however, the comment "VOID NR not issued and dated September 30, 1980 was entered in the log book page for each entry. Copies of the pertinent NR Log Book pages are appended to this report as Exhibits ( ) and ( ).

On June 2, 1981, NRC personnel inspected the areas in DG Room A identified on NR CN 5955-59, 4930, and 4931. In two of the seven instances it appeared that the welds had been reworked, but for the other five this could not be determined. However, the nonconforming conditions identified on the NRs were not evident on the welds inspected.

4.1.7.3 Finding and Conclusions

Based on the preceding interviews, record reviews and field observations by NRC personnel it was determined that although these six NRs were voided, and copies of the reports had apparently been returned to the inspector.

4.1.8 Disposition of Nonconformance Report E-2466

4.1.8.1 Background Information

On January 3, 1980, Kaiser Quality Control Inspectors inspected large bore pipe hangers in Diesel Generator (DG) Rooms A, B, and C. They inspected welds on pipe support hangers, concrete embedment bolts, and the configuration and location of pipe support hangers. The inspectors identified nonconforming Kaiser and vendor welds on five hangers, and improperly embedded bolts. They identified a total of 124 nonconforming pipe support hangers, and intiated NR E-2466 to document this condition. On June 30, 1980, NR E-2466 was voided with the comment, "each hanger listed will be issued on a separate NR." A copy of the first five pages of this NR is attached to this report as Exhibit ( ).

During the week of February 9-11, 1981, NRC personnel reviewed the Kaiser Log of Nonconforming Material to ascertain if the hangers identified on NR No. E-2466 had been issued on seperate NRs as stated. This review indicated that of the 124 pipe support hangers in which nonconforming welds or embedment bolts were identified only 25 had been redispositioned on other NRs. Of these 25, 8 had been reworked, 7 had been voided, and there is no disposition for the remaining 10. As of February 12, 1981, 99 of the 124 hangers identified on NR 2466 had not been reissued as stated on June 3, 1980.

4.1.8.2 Investigation

4.1.8.2.1 Interview of Rex Baker

On March 3, 1981, Rex Baker, Kaiser Inspection Supervisor, was interviewed by NRC. He stated he was aware that various NRs which identified nonconforming conditions on pipe support hangers were voided with the stipulation that they would be "reinspected after redesign." Baker stated he directed a 100% re-inspection of all pipe support hangers be conducted as stated in the earlier committment. However, QA Managers Phillip Gittings and Kenneth Bumgartner, directed that pipe support hangers which had been previously inspected and not redesigned, would not to be reinspected. Baker stated that to the best of his knowledge the NRs which were voided on this basis were not redispositioned or reopened. Baker indicated that, in his opinion, this was not done to avoid reworking the welds, but was an administrative oversight by the QA manager.

4.1.8.2.2 Record Reviews

On February 12, 1981, NR E-2466 was reviwed by NRC personnel and it was noted that there was a comment on page two of the NR which states that an asterisk identifies "what appears to be vendor supplied welds" on pipe support hangers. In reviewing the thirty-one page NR it was found that 15 of 124 pipe hangers identified have an asterisk identifying them as vendor supplied hangers. These 15 entries on NR E-2466 were crossed out. Examples of the ommission of these items from NR E-2466 are included in Exhibit (14).

4.1.8.3 Findings and Conclusions

Based on interviews and record reviews it was concluded that NR E-2466 was not properly voided in that the justification for the voiding was never fully implemented.

4.1.9 Disposition of Nonconformance Report E-2836

4.1.9.1 Background Information

On June 22, 1980, NR E-2836 was written by Inspection Supervisor Rex Baker, after an audit by Nuclear Energy Service indicated there was no final weld radiograph for weld WS737 (service water system). There was a comment in the "description of nonconformance" section of the NR which stated that the only radiograph available was an "information shot of the root layer" of the

weld (now buried underground). The NR was dispositioned as "accept as is" on October 24, 1980, because the KE1 (weld data form) reported that the final weld had been radiographed and accepted by Kaiser personnel on April 5, 1976. This KE1-1 form indicated review and approval of the final radiograph by the Authorized Nuclear Inspector (ANI) on April 15, 1976. The "accept as is" disposition of NR E-2836 was initially rejected by the Authorized Nuclear Inspector (ANI) on November 7, 1980; however, he approved the disposition on November 11, 1980, based on the entry in the weld data form showing that a final review of the film was performed. The NR was voided on November 10, 1980, with a comment "see Revision 1 for new disposition." There is a another comment on the NR which says, "VOID stamp in error - Rev. 1 cancelled when ANI accepted disposition on 11/11/80." A review of NR E-2836, Revision 1, shows the same nonconforming item is identified with the disposition to "accept as is," and the NR is signed by the appropriate members of the material review board. The NR was closed on November 13, 1980. There is third typed copy of E-2836, Revision 1, date November 11, 1980, which has the comment "VOID written in error - NR resolved on original issue." The Kaiser NR Log Reports that NR E-2836, Rev. 1, was closed on November 11, 1980. Copies of NR E-2836 and E-2836 Rev. 1 are attached to this report as Exhibit ( ) and ( ).

4.1.9.2 Investigation

4.1.9.2.1 Interview of Rex Baker

On June 4, 1981, Rex Baker, Kaiser Inspection Supervisor, was interviewed by NRC. He stated that on October 22, 1980, he initiated NR E-2836 after

an audit found that there was no radiograph of completed weld WS737. Baker stated he forwarded the NR to Arch Lanham, Kaiser Construction Department, who dispositioned the NR as "accept as is" based on an entry on the KE1 form. The form indicates a final radiograph of this weld was performed on April 5, 1976, was accepted by both a Kaiser welding engineer and the ANI on April 15, 1976. Baker said the NR was returned to him, and he told Lanham the disposition of "accept as is" was contrary to ASME code requirements, because there was no final radiograph of the questioned weld. He told Lanham that to that rely on an entry in a KE1 form was not sufficient evidence that the weld had been radiographed.

Baker stated he is a Qualified Level III Radiographer and that he had previously reviewed the Kaiser radiographic report and the accompanying film, dated April 17, 1976. He indicated that he told Lanham the film was an "information shot" of the root layer pass not a radiograph of the final weld pass. Baker said Lanham indicated the disposition was correct because the radiograph review block on the KE1 form is checked, and if QA did not have the film he could care less. Baker stated he told Lanham that construction would have to excavate the weld and radiograph it, to which Lanham replied, "Bob Marshall would never let us dig it up." Baker stated Lanham dispositioned the NR as "accept as is" yet he knew there was no record radiograph for the final weld.

Baker also stated that on November 7, 1980, Lowell Burton, the site ANI, rejected the disposition on NR E2836 but later rescinded the rejection and agreed with the "accept as is" disposition based on the final review by ANI entry on the KE1 form. Baker said the NR was dispositioned as "accept

as is," and he refused to concur in the disposition because it was contrary to ASME code requirements.

4.1.9.2.2. Interview of Lowell Burton

On June 5, 1981, Lowell Burton, Authorized Nuclear Inspector (Hartford Steam Boiler and Insurance Company), was interviewed by NRC. He stated that, after reviewing NR E2836, he was in error in having accepted the disposition of this NR on November 11, 1980.

Burton said he reviewed the record radiographs for weld WS737, and found there was no radiograph of the final weld. He stated he has directed CG&E to reopen the NR to reflect this nonconforming condition. Burton stated he based his previous acceptance on a review of the KE1 Form and his personal notes, which showed that on April 15, 1976 he reviewed the final weld radiograph and found it to be acceptable. Burton stated that during 1976 he reviewed up to 100 radiographs per day and could have mistakenly entered in his notebook or on the KE1 Form that he had reviewed the final weld radiograph for weld WS7370.

4.1.9.2.3 Record Review

RIII personnel reviewed NR E-2836 and associated documentation including the Kaiser Report of Radiographic Examination and accompanying radiograph. It appeared that NR E-2836 was improperly voided because there was no final radiograph for weld WS737. The radiograph referenced as accepted by the ANI on April 15, 1976, is actually a radiograph of a partially completed weld.

The radiograph of the incomplete weld is dated March 31, 1976, and was reviewed by the ANI on April 15, 1976. Apparently, the radiograph of the rootpass was mistaken to be a radiograph of the final weld. The proper disposition for this NR would have been "rework" which would include excavation of the weld and radiographic examination.

Between June 2-5, 1981, the following records were reviewed by the RIII inspector.

Kaiser Engineers KE1 Forms for weld WS737, dated April 10, 1976.

Kaiser Engineers Radiographic Examination Report dated April 15, 1976 (and accompanying radiographic film packet).

NRs E-2836 and E-2836, Revision 1.

4.1.9.3 Findings and Conclusions

Based on the preceeding interviews, record reviews, and examination of the radiographic film for weld WS 737 it was determined that NR E-2836 was improperly dispositioned as "accept as is" and closed on November 13, 1980.

4.1.10 Disposition of Nonconformance Report E-1777

4.1.10.1 Background Information

On April 3, 1979, Inspector Terry Dakin wrote NR E-1777, stating that weld A2 on isometeric drawing R1-195 on a pipe support hanger in the primary containment area had been performed without QA documentation. Dakin performed a post weld inspection and found the weld acceptable; however, no rod slip was found to ensure that the proper filler metal had been used. The disposition of this NR was to "rework" and cut out the weld. This NR was voided on April 30, 1979, with the comment "rod slip located." A copy on NR E-1777 is appended to this report as Exhibit ( ).

4.1.10.2 Investigation

4.1.10.2.1 Interview of Vincent Ferretti

On June 4, 1981, Vicent Ferretti, Level III, Nuclear Energy Services, Inc. Quality Assurance Engineer, (QAE) was interviewed by NRC. He stated he had conducted an audit of the Kaiser nonconformance reporting system. As part of this audit he had reviewed NR No. E1777, and the associated isometric drawings. Frerretti stated that the drawing shows four hangers, with six field welds for all of the hangers. The isometric drawing and attached weld rod issue slips show, as stated in the NR, that there is no weld rod issue slip for weld No. 195A2. Frerretti stated the weld rod slips attached to the drawing should identify what particular filler metal was used for each weld, but he was unable to ascertain what filler metal went was utilized. Frerretti stated the decrepancy identified in the NR was correct, and he directed the NR be

reopened and redispositioned. Frerretti stated that in his opinion this NR was improperly voided.

4.1.10.2.2 Interview of Floyd Oltz

On June 4, 1981 Floyd Oltz, Kaiser QAE, Records, was interviewed by NRC. He stated that he had reviewed NR E-1777, the weld data sheets, and weld rod issue slips. He said that this review indicated that NR had been improperly voided. Oltz stated the disposition "rod slip located" was improper, because the rod slip used to justify the voiding of NR does not specifically identify the weld in which the weld rod was used. Oltz concluded that he found nothing in the records associated with this weld to justify the voiding of this NR.

4.1.10.2.3 Record Reviews

On June 4, 1981, RIII personnel reviewed the following records while resolving this allegation:

Nonconformance Report E-1777
Isometric Drawing No. N4713 RI-195 for the Reactor Isolation System
Kaiser weld rod issue form Nos. 111515, 139801, 126964, 126963, 126960, 174535, and 174534

4.1.10.3 Findings and Conclusions

From a review of NR E-1777, weld data records, and weld rod issue forms, there is no justification for the voiding of this NR because there was no rod issue slip in the weld data package for weld A2.

4.1.11 Disposition of Nonconformance Report CN-5122

4.1.11.1 Background Information

On October 16, 1980, Kaiser QC Inspector Mark Priebe, wrote NR Control No. (CN) 5122 following the initiation of surveillance report (SR) 2800 which reports that the flexible outer coating of conduit installed in the containment building is splitting for an unknown reason. This NR was not assigned a NR number, yet it was voided on January 2, 1981, with the comment in the void stamp block "see attached surveillance report No. 2800." Surveillance report 2800 was the report used to issue the NR. A copy of NR CN 5122 is appended to this report as Exhibit ( ).

4.1.11.2 Investigation

4.1.11.2.1 Interview of Steven Burke

On June 11, 1981, Steven Burke, Kaiser QC Inspector, was interviewed by NRC following inspection of the areas identified on NR CN 5122. Burke stated that the nonconforming items listed in the NR on October 16, 1980, "covering

spliting and separating from electrical cables in the containment building" were still apparent on the conduit he inspected. Burke indicated that he concurred with Priebe's report that this problem was serious, and warranted reporting via the Kaiser nonconformance reporting system. Burke concluded that Priebe's NR was not written in error, as he identified the same problem at the same locations identified by Priebe.

4.1.11.2.2. Record Reviews

Kaiser Quality Assurance Surveillance Report (SR) No. 2800, dated June 11, 1981, indicates that on October 9, 1980, it was observed that the outer coating of flexible conduit used in the containment area was spliting for some unknown reason. The corrective action statement in the report states this deficiency could be serious enough to warrant formal reporting to the NRC. Also in the corrective action section of the report are comments that NRs CN 5122 and CN 5196 are voided in lieu of this SR. The "corrective action verified" section of the SR is stamped nonapplicable and dated October 14, 1980. An October 15, 1981 memo attached to the SR from Robert P. Ehas (CG&E) to he Kaiser QA Manager, dated October 15, 1980, reports that in Ehas's opinion this matter does not warrant reporting to the NRC. A copy of SR 2800 and attachments is appended to this report as Exhibit ( ).

4.1.11.3 Findings and Conclusions

Based on interviews, record reviews, and field observations by licensee inspectors, it was determined that NR CN 5122 was improperly voided. It

appears that the SR used to initiate the NR was later used as justification to void the NR. This NR was never introduced into the Kaiser nonconformance reporting system. The Kaiser nonconformance reporting procedure was not followed, and this report was misfiled in the "inspection report" file. It appears that NR CN 2196 was dispositioned in the same manner.

4.1.12 Disposition of Nonconformance Report E-2233

4.1.12.1 Background

On November 21, 1979, QC Inspector L. Wood initiated NR No. E-2233 documenting nonconforming conditions for weld WS62GP in the service water system. The weld lacked evidence of fitup inspection, welder qualification, and material traceability; however, a final visual inspection of the weld was made and the weld was accepted. On December 21, 1979, M. Feltner, QA Engineer, dispositioned the NR and directed it to be "reworked" and cut out. On January 24, 1980, the NR was voided with the comment "KE1 form corrected", initialed by Floyd Oltz. A copy of NR E-2233 is attached to this report as Exhibit ( ).

On February 13, 1981, NRC personnel reviewed NR No. E-2233 and related documentation. This NR was voided after the weld data record (KE-1) form was "corrected." The correction is actually a deletion of previous stipulated hold points, and there is no documentation included to support the engineering basis for deleting the hold points.

Floyd Oltz advised that he had deleted the hold points from the KE-1 Form; however, no signature or date of deletion was noted on the form.

The KE-1 Form, appended to this report as Exhibit ( ) was initially anotated to reflect that weld procedure, weld qualifications, heat numbers, and fit up would be verified by the QC inspector during in-process inspection of this weld. The form was anotated with a "NA" superimposed over an "x" mark previously made by a Welding Engineer.

While investigating the disposition of NR E-2233 the NRC inspector found that KE-1 forms 2552, 2553, and 2560 did not provide material traceability for the gamma plugs welded to piping installed in the service water system.

The KE1 Forms identify the mark numbers for the pipes, but not the heat numbers for the gamma plugs welded to these pipes. The gamma plugs were stamped with a heat number, however, this heat number is not entered on the KE-1 Form.

NR No. E2233, dated November 23, 1979, also for the closed cooling water System, reports the same nonconforming condition on another weld (i.e lack of weld traceability and welder qualification). The disposition for this report was "rework" however, it was also voided by Floyd Oltz on December 19, 1979, with a comment "void rod slip found". This NRs disposition was identical to of NR Report E-2233, when previously stipulated hold points were deleted without engineering concurrence. A copy of NR E-2233 is attached to this report as Exhibit ( ).

4.1.12.2 Investigation

4.1.12.2.1 Record Reviews

During the course of this investigation the following records were reviewed in tracking the dispositions of these NRs.

Nonconformance Report E-2237.

Nonconformance Report No. E-2233.

Weld Data Sheet (KE-1) No. 18391 and associated weld-rod issue forms.

Kaiser weld data sheets (KE-1) No. 2554, 2552 and 2560.

4.1.12.3 Findings and Conclusions

Based on the interviews and record reviews it was determined that NR Nos. 2237 and 2233 were improperly voided. NR E-2233 was improperly voided because previously stipulated hold points were deleted by a document reviewer without engineering justification.

4.1.14 Disposition of Nonconformance Report NRC-001

4.1.14.1 Background Information

On February 11, 1981, QC Inspector James Ruiz initiated a NR (given identifer NRC-0001 for this report) identifying nonconforming welds on drywell steel in the Primary Containment building. Ruiz described the nonconforming condition as an electrode weave exceeding 3/4 inch. The NR in question was not assigned a control number or a NR number. The report had a comment written in the "disposition" section which states, "sent back with no reply". This particular NR was provided to the NRC by Inspector Ruiz. A copy of the NRC-0001 is appended to this report as Exhibit ( ).

4.1.14.2 Investigation

4.1.14.2.1 Interview of James Ruiz

On February 25, 1981 James Ruiz, Kaiser QC Inspector, was interviewed by NRC. He stated that on February 11, 1981 he performed an inspection of a beam located in the primary containment building and noted a nonconforming condition on a weld. Ruiz stated he wrote a NR on this condition and submitted it to his supervisor, Dennis Donovan, who concurred and forwarded it to Rex Baker, Inspection Supervisor, who also concurred.

Ruiz stated that the next day Baker informed him the QA Managerhad returned the report saying that inspectors were not to write a report against a procedural violation. The NR was then returned to him, without assignment of a control number. Ruiz stated he took exception to Gittings' decision pro-

hibiting inspectors from writing reports against procedural violations; he said the welding procedures deliniated the welding specifications, parameters, dimensions, and other inspection criteria for judging whether a weld is acceptable or unacceptable. Ruiz provided a sworn statement attesting to the preceding information, a copy of which is attached as Exhibit (27).

RIII personnel visually examined the weld inspected by Ruiz, on drywell steel beam 81, located in the primary containment building. The weld displayed an electrode weave in excess of 3/4 inch. A photograph of the questioned weld is appended to this report as Exhibit ( ). The weld is not necessarily defective; however, it did exceed specifications as stated by Ruiz in the NR.

4.1.14.2.2 Interview of Phillip Norman

On June 3, 1981 Phillip Norman, Kaiser QC Inspector, was interviewed by NRC. He stated that on this date he accompanied the NRC Inspector to the Primary Containment Building during his inspection of drywell steel beam No. 81. Norman stated he concurred that the electrode weave on a weld to beam No. 81 exceeded 3/4 inch.

4.1.14.2.3 Record Reviews

On June 30, 1981 the Kaiser NR log, and all Kaiser NRs initiated between February 11, 1981 to February 20, 1981 were reviewed. The NR written by Ruiz on February 11, 1981 was not found, and apparently was not entered into the Kaiser nonconformance reporting system.

4.1.14.3 Findings and Conclusions

The questioned weld on beam 81 in the Primary Containment drywell area was visually inspected by NRC personnel and the deficiency identified by Ruiz and reported in the NR was confirmed.

Based on interviews, record reviews, and field observations by NRC personnel, it was determined that NR NRC-0001 was never entered into the Kaiser nonconformance reporting system. The nonconforming condition identified in the NR had not been corrected.

4.1.15 Disposition of Nonconformance Report 1661 and 1662

4.1.15.1 Background Information

On February 8, 1979, Kaiser QC Inspector David Painter initiated NR's No. E-1661 and E-1662, which identified nonconforming welds on pipe support hangers in the drywell pneumatic system. Both of the NR's were dispositioned as "rework" on May 2, 1979. On November 11, 1980, the NR's were voided by Floyd Oltz with a comment that the nonconforming hangers will be reinspected after design analysis. A copy of NR's No. E-1661 and E-1662 are appended to this report as Exhibits ( ) and ( ).

4.1.15.2 Investigation

4.1.15.2.1 Interview of David Painter

On January 14, 1981, and on June 4, 1981, David Painter, Kaiser QC Inspector, was interviewed by NRC. He stated that as a lead inspector he supervises three other inspectors involved in the inspection of pipe support hangers at Zimmer. Painter stated that inspectors wrote a group of NRs identifying nonconforming conditions in pipe support hangers which have been dispositioned as "VOID - will be reinspected after design analysis." Painter indicated that when this comment was made, a 100% reinspection was planned for all pipe support hangers. This plan was rescinded, and hangers are now being inspected according to a M-12 checklist which only checks for configuration and location of the hanger after it is redesigned. Painter indicated the QA Manager said that any hangers inspectors previously accepted prior to design changes and which were not effected by the design changes were not to be reinspected. Painter said this negated the earlier commitment used as justification for voiding the NR's, and now inspectors were finding nonconforming welds on hangers that had previously been inspected and accepted. Painter stated Gittings was told about this, and he repeated that if a pipe support hanger had been previously inspected and accepted he was not initiating a NR for reinspection findings.

4.1.15.2.2 Record Reviews

The following records were reviewed during the resolution of this NR:

NR's No. E-1661, E-1662

Kaiser Isometric Drawing for Line No. RYIB2BA34

Kaiser Isometric Drawing for Line No. 1IN61AC34 (Drywell Pneumatic System Reactor Containment)

4.1.15.3 Findings and Conclusions

Based on record reviews and interviews of personnel it was determined that NR's E-1661 and E-1662 were improperly voided resulting in loss of control of previously identified nonconforming items.

4.1.16 the Disposition of Nonconformance Report 2996

4.1.16.1 Background Information

On February 2, 1981, Rex Baker, Kaiser Inspection Supervisor, initiated NR E-2996, Rev. 1, which reported that full penetration welds on T-quenchers Serial Nos. N001, N003, N007, N0011, and N0012, were found to have a lack of penetration at the backing ring (ie: split backing ring). However, the rest of the weld was acceptable. The nonconforming T-Quenchers are located in the Suppression Pool Main Steam Relief System. The NR was dispositioned on February 9, 1981 as "accept as is" by Arch Lanham, KEI Construction Department. Lanham's justification for acceptance was that a split backing ring does not affect the integrity of the weld.

The licensee's architect-engineer, Sargent and Lundy (S&L), took exception to this disposition and directed that the T-quencher welds be ultrasonically examined. On February 24, 1981, all the T-quenchers were ultrasonically examined and found acceptable with the exception of Quencher No. 007. S&L dispositioned the NR as acceptable, with the exception of No. 007, indicating that additional data is required to resolve 007 because it was not ultrasonically tested as directed. The Kaiser Material Review Board (MRB) agreed with S&L's disposition and granted conditional approval of the disposition of the NR in March of 1981.

NR E2996, Rev. 1, was dispositioned as closed on March 17, 1981. This NR was closed without any evidence that the required additional examination of T-quencher No. 007 had been completed. A copy of NR E-2996, Rev. 1 is attached to this report as Exhibit ( ).

4.1.16.2 Investigation

4.1.16.2.1 Interview of Rex Baker

On June 3, 1981, Rex Baker, Inspection Supervisor, was interviewed by NRC. He stated that he wrote NR E2996, Rev. 1, on February 2, 1981, and it was improperly closed on March 17, 1981. Baker stated that T-quencher No. 007 was not ultrasonically examined as directed by Sargent and Lundy. Baker said the NR was improperly closed by a clerk in the Doument Control office on March 17, 1981. Baker related that when he learned E-2996 Rev. 1 was closed he initiated NR E-3172 which references E-2996 and address the issue that T-quencher No. 007 was not adequately tested as directed in earlier NR.

4.1.16.2.2 Interview of Floyd Oltz

On June 3, 1981, Floyd Oltz, Kaiser QA Engineer-Records, was interviewed by NRC. He stated that NR E-2996, Rev. 1 was initiated by Baker on February 2, 1981, for nonconforming welds on in T-Quenchers. Oltz stated that S&L directed the T-quenchers be ultrasonically examined to establish their acceptability. He said that apparently T-quencer No. 007 could not be ultrasonically examined so S&L dispositioned the report as acceptable, with the exception of T-quencher No. 007.

Oltz stated he gave the NR to Kathy Faubion, NR Controller, who read the initial disposition of "accept as is" on the NR, and did not read the exceptions placed in the rest of the disposition column by the architect-engineer. Oltz said she mistakenly closed the NR because she assumed the condition was "accept as is" when in fact S&L had only granted partial acceptance. Oltz concluded this NR was improperly closed, due to a clerical error.

4.1.16.2.3 Interview of Kathy Faubion

On June 4, 1981, Kathy Faubion, Kaiser NR Controller was interviewed by NRC. She stated she closed NR E-2996, Rev. 1, on March 17, 1981, because the top of the disposition block on the NR had the comment "accept as is." Faubion said she closed the NR but did not read the additional comments in the disposition column. Faubion stated that in May of 1981, Rex Baker told her she had improperly closed this NR. She said Baker then initiated NR No. E-3172, which documented the nonconforming condition for T-quencher No. 007.

4.1.16.2.4 Record Review

RIII personnel reviewed documentation and radiographs associated with NR No. 2996, Rev. 1. The deficiency, (ie: a split backing ring,) is permissible under ASME Codes for Class C welds and the condition issue was not nonconforming. However, in order to verify that the split was in the backing ring and not in the weld, an ultrasonic resting cut) exam was performed to verify the location of the split. Records indicated that on February 24, 1981, the questioned T-quenchers were ultrasonically examined (with the exception of Quencher No. 007, which was not examined) and found to be acceptable. It appeared that a further UT or other nondestructive examination should have been conducted on Quencher No. 007; however, NR E-2997, Rev. 1, was mistakenly closed on March 17, 1981 with no examination of Quencher No. 007.

During the course of this investigation the following records were reviewed to track the resolution of this NR:

Nonconformance Report No. R-2996, Rev. 1

Nuclear Energy Services, Report of Ultrasonic Examination, dated February 14, 1981

Sargent and Lundy, Engineers, memo dated March 5, 1981

Nonconformance Report No. E-3172, dated May 11, 1981

Kaiser weld data sheets (RE-1 Form) for T-Quenchers 011, 003, 007, 009, 011, and 012

4.1.16.3 Findings and Conclusions

Based on interviews, record reviews and review of radiographs by RIII personnel, it was determined that this NR was improperly closed on March 17, 1981.

4.1.17 Disposition of Nonconformance Report CN 4389

4.1.17.1 Background Information

On January 3, 1980, D. J. Luttmann, Kaiser QC Inspector, initiated a 33 page NR which was assigned Control No. 4389. This NR reported various nonconforming conditions in electrical cable, trays and hangers in the Auxillary Building. The NR was voided by Kyle Burgess on December 2, 1980, because the "NR was initiated just prior to [the] inspector leaving the job. A lot of the items listed were acceptable in this area. Some items needed reinspection." This NR was recovered from the Site Document Control Vault on June 4, 1980, apparently having been misfiled with "Inspection Reports" which identify nonconforming material found during receipt inspections. Although the NR was "voided", it was stamped "Inspection Report" in the block reserved for assignment of the NR number. A copy of the first five pages of NR N4389 is appended to this report as Exhibit ( ).

4.1.17.2 Investigation

4.1.17.2.1 Interview of Kyle Burgess

On June 18, 1980, Kyle Burgess, Kaiser Inspection Supervisor, was interviewed by NRC. He stated that he voided the NR assigned Control No. 4389 on December 2, 1980. Burgess stated that inspector D. J. Luttmann was an electrical inspector who had reported various nonconforming conditions in the electrical area. He indicated that he voided this NR because Luttmann had left the site and some of the items had been found to be acceptable; however, some were valid nonconforming conditions. Burgess could give no reason why the voided NR had been placed in the Inspection Report file.

4.1.17.2.2 Record Reviews

The following records were reviewed in tracking the resolution of this NR.

Kaiser Log of Nonconforming Material NR CN 4389 dated January 23, 1980.
Kaiser procedure QACMI G-4, Revision 7, dated April 7, 1980.

4.1.17.3 Findings and Conclusions

RIII personnel reviewed NR CN 4389 and found no sufficient reason to justify it's voiding.

4.1.18 Disposition of Nonconformance Report 2191

4.1.18.1 Background Information

On November 2, 1979, NR No. E-2191 was initiated by Richard L. Reiter, to report that the consumable insert in a weld in the Closed Cooling Water System was not traceable. Reiter said there was no heat number on the weld rod slip for the consumable insert in weld K253 on drawing PSKWR9. Reiter commented in the text of the NR that he confirmed this by looking at the original copy of the weld rod issue slip. The intial disposition of this report was "accept as is" with the reason being that all consumable inserts are purchased as Class I (safety related) traceable materials. The NR was closed on November 8, 1979, and was reopened after the Authorized Nuclear Inspector (ANI) rejected this disposition on January 7, 1980. On February 19, 1980, NR E-2191 was voided with the comment that it was redispositioned on NR No. E-2191, Rev. 1. Nonconformance Report No. E-2191, Rev. 1 was voided on February 22, 1980, by Floyd Oltz, with a comment that the weld rod issue slip had been found. There was no engineering or Material Review Board concurrences on this disposition. A copy of NR E-2191 and E-2191, Rev. 1 is attached to this report as Exhibit ( ).

4.1.18.2 Investigation

4.1.18.2.1 Interview of Richard L. Reiter

On March 25, 1981, Richard L. Reiter, former Kaiser Document Reviewer, was interviewed by NRC. He stated that on November 2, 1981, he initiated NR No. E-2191 after he observed that Kaiser weld data form (KE1) No. 23037 for weld WRK-523 did not have a heat number for the consumable insert utilized.

Reiter stated that he checked the weld rod issue form, Kaiser warehouse files, and identical copies of the weld rod issue forms, and found no record of the heat number. Reiter stated if an entry was found on any of the weld rod issue forms, they are false and were made after November 2, 1979. Reiter also stated he suspected that Arch Lanhm, Nonconformance Report expediter, falsified records in order to resolve NRs rather than have the Construction Department repair or rework the nonconforming item. Reiter provided a written statement attesting to the preceding information, a copy of which is attached as Exhibit ( ).

4.1.18.2.2 Interview of Floyd Oltz

On February 25, 1981, Floyd Oltz, Records, Kaiser QA Engineer-Records, was interviewed by NRC. He stated that NR E-2191 was written by Reiter when he found no heat number for the consumable insert on weld No. WR-523. The NR was dispositioned by Louis Boetger with a disposition of "accept as is" because all consumable inserts are purchased as Class 1 nuclear grade material. Oltz stated that the ANI disapproved this disposition on January 7, 1980. This NR was voided on February 19, 1980, and was redispositioned on NR E-2191, Rev. 1. Oltz stated that he voided NR E-2191, Rev. 1 on February 22, 1980 with a comment that a weld rod issue slip with a heat number for the consumable insert was found. Oltz stated that Arch Lanham, NR Expediter, had found a rod slip for the weld with a heat number for the consumable insert, so he he voided the NR.

4.1.18.2.3 Interview of Arch Lanham

On March 25, 1981, Arch Lanham, Kaiser Senior Engineer, was interviewed by NRC. He stated that he dispositions NRs for the construction department at Zimmer. Lanham stated he frequently searches for lost documentation, such as rod slips, when resolving NRs in which a lack of adequate documentation was cited as the nonconforming condition. He stated that in the case of NR E-2191, the nonconforming condition was lack of a heat number for the consumable insert for weld WR-523. Lanham provided his copy of NR E-2191 with field notes he wrote when dispositioning the NR.

Lanham stated the original disposition of the NR was "accept as is"; however on December 17, 1979 he noted that Floyd Oltz had the original copy of the NR and he noted on his copy "could there be more than one rod slip for insert?" Lanham stated there is also a notation that on January 22, 1980 the NR was still not back from the architect-engineer. After reviewing his notes Lanham stated that it appears he reviewed the KE1 data form and original rod slip and found that he had inspected weld No. WR-523 on October 17, 1977. He stated there was no heat number for the consumeable insert on the KE-1 form; however he had reviewed weld rod issue form No. 97957 and found a heat number for the consumable insert.

Lanham indicated that the heat number for the consumeable insert was marked in ink on the carbon form (gold copy of Form 97957) and was circled in red with his initials. Lanham stated he recalls that he made this entry on the gold copy of the form in October of 1977 while inspecting the weld. He said

there was no heat number on the weld rod issue form, and called the weld rod shack to obtain a proper heat number for the consumable insert. Lanham said he did not make the entry on the form during November 1979 through February 1980 while dispositioning this NR.

4.1.18.2.4 Record Reviews

On March 24, 1981, the Kaiser isometric drawing for the closed cooling water system PSK-1WR-9 was reviewed for line No. 1WR17AB 2-1/2, weld No. WR523. The Kaiser KE-1 Form shows a notation that the heat number for the consumeable insert is No. 6059491. Weld rod issue slip No. 97957 (gold copy) shows that heat Number 6059491 is written in ink on an otherwise carbon form. Two other copies of Kaiser weld issue slips No. 97959 (white copy and blue copy) were reviewed. These forms do not have similar entries for the heat number. A copy of the weld data sheet and accompanying weld issue forms are attached to this report as Exhibit ( ), ( ), ( ), ( ).

4.1.18.3 Findings and Conclusions

Based on the results of interviews and record reviews it was found that NR E-2191, Rev. 1 was improperly dispositioned with no review by members of the Kaiser Materials Review Board.

4.1.19 Disposition of Nonconformance Reports 5467, 5477,5479

4.1.19.1 Background Information

On February 23, 1981, Inspector James Ruiz initiated three NR's which were assigned Control Nos. 5476, 5477, 5479, reporting nonconforming conditions on drywell support steel in the Primary Containment Building. Ruiz stated that welds Nos. 63, 58, and 3 were full penetration welds which require 100% coverage by nondestructive examination either radiography, magnetic particle, or ultrasonic testing but no tests had been documented. He also found that all three welds lacked documentation for the backing strips, filler metal, welder qualifications, or welding procedure. The Kaiser NR Log shows that NR Nos. 5477 to 5479, were voided with the notation void, "NR not issued" on February 27, 1981. Copies of these NR's were not retained in the Kaiser SDC files. A copy of NR's CN 5476, 5477, and 5479 are attached to this report as Exhibit ( ), ( ), ( ).

4.1.19.2 Investigation

4.1.19.2.1 Interview of James Ruiz

On February 25, 1981, James Ruiz, Kaiser QC Inspector, was interviewed by NRC. He stated that the Kaiser QA Manager was arbitrarily voiding NR's and he had no assurance that reports he initiated would be entered into the Kaiser nonconformance reporting system or that the conditions he identified would be corrected. Ruiz provided NR's CN 54776, 5477, and 5479, and stated these had been initiated by him on February 23, 1981. He indicated he did not think they would be processed properly by the nonconformance reporting system. Ruiz

provided a written statement attesting to the preceding information, a copy of which is attached as Exhibit ( ).

4.1.19.2.2 Interview of Dennis Donovan

On June 10, 1981, Dennis Donovan, Kaiser QC Inspector, was interviewed by NRC. He stated that he had reviewed nonconformance reports Nos. 5476, 5477, and 5479 and concurred with them. Donovan stated that Ruiz errored in his identification of one deficency on these NR's, because a Design Document Change (DDC) had been written by S&L which eliminated the NDE requirement for welds on these beams. Donovan questioned S&L's waiver of this requirement and said it was contrary to S&L Specification H2174 which requires 100% nondestructive examination coverage on all Class 1 welds. Donovan stated he had reviewed the DDC in question and found out that S&L waived the nondestructive examination for "ease of construction." He said that, in his opinion, this was not an adequate justification for the noted disposition. Donovan advised that the Kaiser construction department is repairing these and other cantilever beams in the primary containment building.

4.1.19.2.3 Interview of Rex Baker

On June 10, 1981, Rex Baker, Kaiser Inspection Supervisor, was interviewed by NRC. He stated that on February 23, 1981, inspector James Ruiz identified nonconforming welds on some cantilever beams located in the primary containment building. Baker stated Ruiz initiated and he concurred in NR Nos. 5476, 5477, and 5479. Baker stated Ruiz documented nonconforming conditions such as

lack of nondestructive examination of full pentration welds, material traceabilty and welder qualifications.

Baker stated that on February 27, 1981, he voided these NR's with the comment "Void, NR not issued." He stated he voided these NR's after a February 1981 meeting with Phillip Gittings in which he, (Gittings) Kenneth Shinkle, QAC, and Robert Marshall, construction manager discussed the nonconforming conditions identified by Ruiz. During the meeting Marshall stated that the welds on these cantilever beams were to be cut out by Kaiser so these nonconformance reports should be voided. Baker stated that he voided these NR's on Gittings instructions and gave Gittings all four of the original copies of the NR's.

4.1.19.2.4 Interview of Kenneth Shinkle

On June 11, 1981, Kenneth Shinkle, Kaiser Mechanical Civil Structual, Quality Engineer, was interviewed by NRC. He stated that on February 23 QC inspector James Ruiz, initiated NRs 5476, 5477, and 5479.

Shinkle stated he reviewed these NR's and found that inspector Ruiz had erred in identification of one nonconforming condition. He stated that a DDC had been issued by licensee's architect-engineer which waived NDE requirements for the nonconforming beams identified by Ruiz.

Shinkle stated that he questioned the justification for this DDC because the text of the DDC said "for ease of construction," NDE is wiaved. Shinkle said that the welds identified in the NR's are Class 1 welds because they

are welded to the containment liner plate and both S&L specifications and ASME Code requirements require 100% NDE for any Class 1 welds.

Shinkle stated Ruiz erred in identifying; however, the remaining nonconforming conditions, such as lack of material traceability, and welder qualifications were correct. Shinkle advised that the cantilever beams in question hold up walkways, pipe support hangers, and heating and ventiliation ducts in the primary containment building.

Shinkle stated that in February 1981, he attended a meeting with Rex Baker, Phillip Gittings, and Robert Marshall, reguarding Ruiz's NR's. Shinkle stated that Marshall wanted to repair the beams on a case-by-case basis, and do a visual inspection of the welds.

Shinkle stated that the QA Manager, Phillip Gittings, agreed with this approach and told him to work with the construction department to rework the welds using KE 1 repair cards without processing the NR's Ruiz had written.

Shinkle stated that to the best of his knowledge the nonconformances written by Ruiz were never entered into the Kaiser nonconformance reporting system. He stated that this was especially significant in light of the fact that in February 1981, there was an NRC investigation into irregularies in the Kaiser nonconformance reporting system.

Shinkle stated that after Gittings directed him to resolve the issues identified, he conducted an inspection of cantilever beams located at the 572' elevation of the primary containment building. Shinkle indicated he found that there was no final QC inspection on any of the 27 beams and four had no record of fit up inspection. Shinkle stated he identified the same nonconforming conditions, lack of weld filler metal and backing strip traceability, and lack of evidence of welder qualification for these welds. In addition, Shinkle stated he conducted a visual examination of the welds, and in, many cases the welds did not appear to meet Code standards.

Shinkle stated he advised Robert Marshall of the above and Marshall stated he did not want to repair the nonconforming conditions because modifications had been made to the beams in which side plates had been added, and these plates would have to be removed to conduct inspections of the affected welds. Shinkle advised that the construction department is now in the process of removing the questioned beams.

4.1.19.2.5 Record Reviews

On June 6, 1981, Regina Rudd, Kaiser NR Controller, was contacted and asked to retrieve NRs, CN 5476, 5477, and 5479 from the Kaiser Site Document Control Center. Rudd stated that she conducted a search of the open, closed, and voided nonconformance report files and could not locate the nonconformance reports assigned these numbers. Rudd provided a copy of the NR log page which reflects that on February 27, 1981, NR's 5476, 5477, and 5479 were voided with a comment "NR not issued." A copy of the NR log page is appended to this report as a Exhibit (42).

4.1.19.3 Findings and Conclusions

NR's CN 5476, 5477 and 5479 were not entered into the Kaiser nonconformance reporting system.

All of the allegations made by the QC inspectors were substantiated. A review of the Kaiser nonconformance reporting system was conducted. It was found there were wide-spread irregularities in the system. Kaiser procedures permit voiding of a NR if the NR was "written in error, duplicated, or the nonconforming conditions has been corrected . . . . by construction." It was found that between January 1, 1978 and March 31, 1981, 1,031 NRs were voided. Some were voided by the QA Manager, some by the QA Engineer-Records, and some by a clerk. A chronological breakdown of the number of voided NRs per month is appended to this report as EXHIBIT ( ). The disposition of a selected group of 20 voided NRs was audited and it was found that in 15 cases the NRs were voided improperly by the QA Manager or another individual. In ten cases the justification used for voiding the NR was erroneous e.g. it was found the QA Manager was voiding NRs which were not written in error. In some cases the NR had been reviewed by a Construction Engineer and "rework" was ordered, yet the NR was later "voided." It was found that some of this activity occurred after an NRC inspection on December 2-3, 1980, in which the licensee and the Kaiser QA Manager were told that this activity was contrary to NRC requirements. It was also established that following the NRC inspection the Kaiser QA Manager had on three occasions diverted NRs (CN 4309, NRC 0001, CN 5412).

This investigation also disclosed that an NR was improperly dispositioned as "accept as is" when "rework" was appropriate. In one examined case (NR E-2836) the "accept as is" disposition of a nonconforming condition was contrarty to ASME Code requirements.

The allegation that NRs which identified multiple nonconforming conditions were voided improperly with a comment that the NR was being "revised" or that "each deficiency would be issued on a separate NR" or items would be "reinspected" was substantiated. It was determined that nonconforming items were not reissued on separate NRs, and were not reinspected as stated on the NR at the time of voiding. It was also found that during "revision" some nonconforming items were removed from NRs without justification.

The allegation that the Kaiser QA Manager NRs voided at the request of the Construction Department was conrrect; however, he stated that he made an independent decision when doing so.

This investigation established that nonconforming conditions which had been identified by Quality Control Inspectors were improperly dispositioned. It was also established that the licensee failed to take effective corrective action following the December 1980 NRC inspection when the Kaiser QA Manager continued to void NRs, and also diverted NRs from the Kaiser nonconforming system following the January 5, 1981. NRC Inspection Examples of this are NRs No. (CN 5412), No. (NRC-001) and No. (E-5471)

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7.3 Cable Separation

During the investigation of the allegation addressed in Section 5.10, the RIII inspector identified two cable installations that did not comply with the cable separation criteria defined in the Wm. H. Zimmer FSAR. Therefore, the RIII inspector informed the site Resident Inspector, who included checks for cable separation on his routine plant tours. The inspector identified the following cable separation violations and additional violations addressed in the Resident's Inspection Report 81-15.

7.3.1 Cable Separation Requirements

The Region III inspectors observed five installed conditions that did not comply with one or more of the following FSAR criteria concerning cable separation:

1. IEEE Std. 383-1974 defines Class 1E as: "The safety classification of the electric equipment and systems that are essential to emergency reactor shutdown, containment isolation, reactor core cooling and containment, and reactor heat removal or otherwise are essential in preventing significant release of radioactive material to the environment."

2. The Zimmer FSAR, Section 8.3.1.12.2, states, "Class 1E cable is assigned to a division according to Table 8.3-19."

The divisions are comprised of the systems addressed in the Class 1E definitions.

"A Class 1E cable is routed only in its division tray conduit, etc."

"Each non-Class 1E cable which has any part of its length in a division tray, conduit, etc., or which connects to a Class 1E power system is a division-associated cable and is not routed in tray, conduit, etc. of another division."

The terms "division-associated," "associated," "non-Class 1E," "balance-of-plant," "nonessential," and "non-ESF (non-engineered safety features)" are all used interchangeably.

3. FSAR Section 8.3.1.13 states:

.2"...Balance-of plant cables not associated with reactor protection or engineered safety features systems, when assigned to a tray section with a Class 1E segregation code, are routed only in trays with that segregation code."

.3"...Cables will have either green, yellow, or blue identification for ESF cable; orange for reactor protection system cable; white for balance-of-plant cables; and white with another color for associated cables."

4. FSAR Table 8.3-16 states, "A nonessential cable may be run in nonessential or ESF tray, but shall not occupy more than one tray system."

5. FSAR Section 8.3.1.11.2.1.d. states, "In the cable spreading room, cable tray risers (chutes) are used to route the cables into the bottom of control panels located in the control room above. Here a 1-foot horizontal, 3 foot vertical separation is maintained."

6. FSAR Section 8.3.1.12.1.3, which addresses instrument cables states, "Low-level signal cables are run in trays and/or conduits separate from all power and control cables."

7.3.2 Observed Cable Separation Violations

The RIII inspectors observed the following five installed conditions:

1. On the east side of the cable spreading room, at approximately WL 26, yellow/white (associated) cable No. RE053 extends from a 2-in. conduit (which also contains blue/white cable No. RE058), passes approximately 4 in. vertically above the blue Class 1E cables contained in tray No. 2072C, and enters blue/white sleeve No. 79.

   Contrary to the above FSAR criteria, cables No. RE053 and RE058 were routed in the same raceway and cable No. RE053 was not installed a minimum of 3 ft above tray 2072C.

2. On the south side of the cable spreading room, green instrument tray No. 3029K, which was 6 in. wide and approximately 50 ft long, was installed inside white control tray No. 4638B. The installation was in accordance with S&L drawings E-223, Revision G, and E-224, Revision F. Green cable No. WS714, green/white cable No. TI725, and other cables were installed in the green tray. Blue/white and yellow/white cables were installed in the remaining white tray.

   Contrary to the FSAR criteria, the green and green/white cables were essentially installed in th white tray; the green, green/white, blue/white and yellow/white cables were not separated by a minimum of 1 ft horizontally; and the green tray containing instrument cables was not separate from the white tray containing control cables.

3. Near the stairwell at the center of the cable spreading room, two blue cables, No. RI103 and CM111, were routed from blue tray No. 2077A into green tray riser (chute) No. 3025A, which extended up to the control room. Green cables No. HP073 and HP096 were among the cables installed in riser 3025A.

   Contrary to the FSAR criteria, the blue cables were routed in the green division riser and were not horizontally separated from the green cables by at least 1 ft.

The licensee documented blue cables No. RI103 and CM111 on Nonconformance Report No. 7549, dated March 18, 1981, as a result of the NRC finding.

No QC inspection requirements existed to verify separation criteria for cables extending up and out of raceways located in the cable spreading room to the control room.

4. The following conditions existed in the cable spreading room:

   a. White tray No. 4080K contained many different division-associated cables including blue/white cable No. TI192, yellow/white cable No. RR781, and green/white cable No. TI816.

   b. White tray riser No. RK4627 contained yellow/white cables No. TI942 and No. TI943, and blue/white cables No. TI808 and TI760.

   c. White tray riser No. 4139 contained many blue/white and yellow/white cables.

   The routing of blue/white, yellow/white, and/or green/white cables together in white trays appeared to be a widespread design practice. This design is contrary to the FSAR Section 8.3.1.13.2 as previously stated above.

5. In the instrument-relay room, yellow/white conduit No. RR199 extended from white tray No. 4157A to yellow tray No. 1040B. The conduit and trays contained yellow/white cable No. RR199 and white cable No. DC258 (also mislabelled DC257). Following the cable installation (pull) card, cable No. DC258 was designed to be routed through tray No. 4157A, but not tray 1040B. Since cable No. DC258 was a nonsafety-related cable there were no QC inspection requirements to verify the routing.

The installed conditions identified in paragraphs ~~7.3.2~~.1, ~~7.3.2~~.2, and ~~7.3.2~~.4 apparently resulted from designs that deviate from the FSAR. These deviations are contrary to 10 CFR 50, Appendix B, Criterion III, and the Wm. H. Zimmer QA Manual, Section 3.1 and 3.6 (50-358/81-13-21).

The installed condition identified in paragraph ~~7.3.2~~.3 apparently resulted from construction activities for which required QC inspection verifications had not been translated into an inspection procedure. The lack of QC inspection for the installed condition in paragraph 3 is contrary to 10 CFR 50, Appendix B, Criterion X, and the Wm. H. Zimmer QA Manual, Section 10.1.2 (50-358/81-13-22).

The misrouted cable identified in paragraph ~~7.3.2~~.5 of the installed conditions apparently resulted from contruction activities for which the FSAR does not require QC inspection verification. The misrouted cable does influence cable separation and tray loading and, therefore, will have to be appropriately dispositioned. This item will be reviewed during a subsequent inspection (50-358/81-13-23).

7.3.3 Cable Tray Riser Chutes

With the exception of the green tray riser identified in paragraph ~~7.3.2~~.3, above, of the installed conditions, the RIII inspector did not observe any other risers (chutes) installed in the cable spreading room. The licensee stated that only eight chutes had been designed and installed in the spreading room and that alternate methods for achieving cable separation were being considered. S&L drawing No. E-98-FB, Revision D, Note 4, required that the

portions of cables in the cable spreading room not enclosed or protected by sheel chutes be coated with a 1/8 in. (after dry) application of fireproofing material. During a telephone conversation on May 7, 1981, the licensee stated that the design identified on drawing No. E-98-FB was being reconsidered for alterations. This item is unresolved pending implementation of the final separation design requirements for cable risers in the cable spreading room (358/81-13-49).

The licensee stated that ~~the following~~ actions would be taken with regard to the installed conditions identified in paragraphs ~~7.3.2~~.1, ~~7.3.2~~.2, ~~7.3.2~~ and .4, of 7.3.2, and 7.3.3. Either the field installations would be changed to comply with the FSAR or appropriate changes to the FSAR with engineering justifications would be submitted to NRR.

7.3.4 Findings and Conclusions

Four locations were identified in which the cable ~~spreading~~ separation requirements had not been maintained as specified in the FSAR. Two unresolved matters which impact cable separation requirements were identified. Other cable separation concerns, addressed in IE Inspection Report 81-15, were identified as followup to this section.

7.3.5 Items of Noncompliance

Two items of noncompliance were identified (failure to establish measures to assure that the design basis for cable separation as set forth in the FSAR was translated into drawings, and failure to establish a program to require verification of cable separation in the cable spreading room).

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6.2 Inconsistencies in Weld Inspection Records

6.2.1 Allegation

ASME and AWS inspection criteria have been deleted or designated as "not applicable" (N/A) for certain systems. Affected systems were provided.

?

6.2.2 Background Information

None

6.2.3 Deleted ASME and AWS Inspection Criteria

The Region III inspectors observed that weld inspection criteria used to verify weld procedure, welder qualification, filler material, joint cleanliness, bevels, and damage had been deleted or designated as not applicable (N/A) on the ~~following~~ weld inspection records (KEI-1 forms), For the following:

	System or Component	ISO Dwg. No.	Beam or Mark No.	Other Information
(1)	Drywell support steel	S398B	29	Detail E of S-437

	System or Component	ISO Dwg. No.	Beam or Mark No.	Other Information
(2)	Drywell support steel	S398B	2 stiffeners 1/2 x 6-3/4 x 25-1/8	Line No. MKC 17S493
(3)	Drywell support steel	S398A	125	Line No. EL-535 191
(4)	Drywell support steel	S398B	67	Detail 13 of 493 Detail 2 of 447
(5)	Drywell support steel	S398A	C-63 (W8 x 10)	Bottom plate
(6)	Drywell support steel	S398A	W8 x 17	Com lugs
(7)	Service water system	PSK1WS32	55H	Line No. 1WS17A18

The records for drywell support steel indicated that the deleted criteria existed at least from July 1980 to January 1981. The record for the service water system indicated the criteria was designated as not applicable in November 1979.

The inspection criteria used to verify proper fitup and tack welds was also designated N/A for the preceding weld activities on the service water system.

6.2.3 Inconsistent Weld Rod Numbers

The licensee could not readily determine if the ASME Code Section III 1971 or if the AWS D1.1-1972 Code inspection criteria governed some of the preceding activities.

6.2.3.1 ASME Code Requirements

The ASME Code states the following:

1. NA-4130(a) -- "As used in this Section of the Code, Quality Assurance comprises all those planned and systematic actions necessary to provide adequate confidence that all components, parts, or appurtenances are manufactured and/or installed (as applicable) in accordance with the rules of this Section."

2. NA-4420 -- "The manufacturer and/or Installer shall maintain a written description of the procedures used by his organization for control of

quality and examinations, showing in detail the implementation of the quality assurance requirements of this Section of the Code."

3. NA-4510 -- "Inprocess and final examinations and tests shall be established to assure conformance with documented instructions, procedures, and drawings."

4. NA-4442.1 -- "Welding and brazing materials for all classes of construction shall be controlled in accordance with NB-4122...."

   NB-4122 -- "Welding and brazing materials shall be identified and controlled so that they can be traced to each component and/or installation of a piping system, or else a control procedure shall be employed which ensures that the specified materials are used."

5. NA-4451 -- "...Measures shall be established to assure that processes including welding and heat-treating are controlled in accordance with the rules of this Section of the Code and are accomplished by qualified personnel using qualified procedures."

6. NB-4230 -- identifies specific requirements for fitting and aligning weld joints that must be verified.

6.2.3.2 AWS Code Requirements

The AWS D1.1-1972 Code states:

1. Section 3.1.1 -- "All applicable paragraphs of this section shall be observed in the production and inspection of welded assemblies and structures produced by any of the processes acceptable under this Code."

2. Section 3.2.1 -- "Surfaces and edges to be welded shall be smooth, uniform, and free from fins, tears, cracks, or other defects which would adversely affect the quality or strength of the weld. Surfaces to be welded and surfaces adjacent to a weld shall also be free from loose or thick scale, slag, rust, moisture, grease, or other foreign material that will prevent proper welding..."

3. Section 3.3.1 -- "The parts to be joined by fillet welds shall be brought into as close contact as practicable. The gap between parts shall normally not exceed 3/16 inch...."

4. Section 3.3.7 -- addresses tack weld requirements that must be verified.

5. Section 6.1.1 -- "The inspector designated by the Engineer shall ascertain that all fabrication by welding is performed in accordance with the requirements of this Code.

6. Section 6.1.3 -- "He [the inspector] shall be notified, in advance, of the start of any welding operations."

7. Section 6.2 -- "The Inspector shall make certain that only materials conforming to the requirements of this Code are used."

8. Section 6.4.1 -- "The inspector shall permit welding to be performed only by welders, welding operators, and tackers who are qualified in accordance with the requirements of 5.3."

9. Section 6.5.2 -- "The Inspector shall make certain that only welding procedures that meet the provisions of 5.1 and 5.2 are employed."

10. Section 6.5.3 -- "The Inspector shall make certain that electrodes are used only in the positions and with the type of welding current and polarity for which they are classified."

11. Section 6.5.4 -- "The inspector shall, at suitable intervals, observe the technique and performance of each welder, welding operator, and tacker to make certain that the applicable requirements of Section 4 are met."

Tie into QCP

6.2.4 Findings and Conclusions

The investigation determined that ~~The allegation was substantiated.~~ Appropriate inspection criteria had been deleted or designated as "not applicable" in the inspection records for certain systems.

6.2.5 Items of Noncompliance

The weld inspection criteria that were deleted or designated as not applicable are contrary to 10 CFR 50 Appendix B, Criterion III, and the Wm. H. Zimmer QA Manual, Sections 3.3 and 3.13.1. (50-358/81-13-26).

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Appendix

NOTICE OF VIOLATION

AND

PROPOSED IMPOSITION OF CIVIL PENALTY

Cincinnati Gas and Electric Company
Wm. H. Zimmer Nuclear Power Station

Docket No. 50-358
Construction Permit No. CPPR-88
EA No. 81-

As a result of the investigation conducted at the Wm. H. Zimmer Nuclear Power Station in Moscow, Ohio, on January 12 - August 10, 1981, the violation listed below with multiple examples was identified. The numerous examples of the violation demonstrate a significant deficiency in the implementation of your quality assurance program. That breakdown of your quality assurance program was widespread and caused the NRC to require an extensive quality confirmation program to provide confidence that safety-related structures, systems, and components will perform satisfactorily in service. Because of the safety significance of that quality assurance program breakdown, in accordance with the Interim Enforcement Policy, 45 FR 66754 (October 7, 1980), the Nuclear Regulatory Commission proposes to impose a civil penalty pursuant to Section 234 of the Atomic Energy Act of 1954, as amended, ("Act"), 42 U.S.C. 2282, PL 96-295, and 10 CFR 2.205 in the amount set forth for the violation listed below.

10 CFR 50, Appendix B, Criterion II requires holders of construction permits for nuclear powerplant to document, by written policies, procedures, or instructions, a quality assurance program which complies with the requirements of Appendix B for all activities affecting the quality of safety-related structures, systems, and components and to implement that program in accordance with those documents.

Contrary to the above, Cincinnati Gas and Electric Company and its contractors did not adequately document and implement a quality assurance program to comply with the requirements of Appendix B as evidenced by numerous examples of that noncompliance as follows:

A. 10 CFR 50, Appendix B, Criterion VIII states, in part, "Measures shall be established for the identification and control of materials... These measures shall assure that identification of the item is maintained..."

The Wm. H. Zimmer QA Manual, Section 8.2 states, in part, "H. J. Kaiser Company procedures provide that within the H. J. Kaiser Company jurisdiction the identification of items will be maintained by the method specified on the drawings, such as heat number, part number, serial number, or other appropriate means. This identification may be on the item or on records traceable to the item. The identification is maintained throughout fabrication, erection, and installation. The identification is maintained and usable in the operation and maintenance program."

Contrary to the above:

1. Based on an inspection of approximately 25 structural beams located in the Blue Switchgear Room and the Cable Spreading Room, the identification of the material in 9 of those beams was not maintained to enable verification of quality.

2. Based on an inspection of the supporting systems (i.e., cooling water, starting air, and fuel oil) for Diesel Generators A and C, the identification of the material an 12 pipelines in those systems was not maintained to enable verification of quality. Included in the problem were heat numbers on 3 pipe pieces which were not on an approved heat number list. (The Diesel Generator supporting systems were selected for review because they were part of the only ASME Code Data Package which had been final accepted by Kaiser Quality Assurance. The discrepancies identified by the inspector were not identified by the final Kaiser QA review.)

The above examples raise questions about the adequacy of the quality of installed materials as well as the obvious paperwork deficiencies.

B. 10 CFR 50, Appendix B, Criterion XVI states, in part, "Measures shall be established to assure that conditions adverse to quality, such as... deviations...and nonconformances are promptly identified and corrected. In the case of significant conditions adverse to quality, the measures shall assure that the cause of the condition is determined and corrective action taken to preclude repetition."

The Wm. H. Zimmer QA Manual, Section 15.2.2 states, "HJK is responsible for identifying and reporting nonconformance in...construction... activities which are delegated to HJK."

The Wm. H. Zimmer QA Manual, Section 16.5 states, in part, "Vendors, contractors, and subcontractors are required to determine cause and corrective action to prevent recurrence of errors which could result in significant conditions adverse to quality."

AWS Code D1.1-1972, Sections 3 and 8.1.5 define requirements for weld quality and address slag, weld profiles, blowholes, porosity, and undercut.

AISC, Seventh Edition (1969), Page 4.113 requires 1/2 inch minimum radius for re-entrant corners.

ASME Code, Section III-1971 Edition, Article NB-3661.5(b) states, in part, "...a gap of approximately 1/16 in. shall be provided between the end of the pipe and the bottom of the socket before welding."

ASME Code, Section III-1971 Edition , Winter 1972 Addenda, Articles NA-4130(a), NA-4420, NA-4510, NA-4442.1, NB-4122, NA-4451, NB-4230, and NB-3661.5(b) require, in part, in-process inspections for pipe fitup, weld procedure, weld filler metal traceability, and welder qualifications...

Contrary to the above, the NRC inspectors identified the following nonconforming conditions that either had not been identified and corrected by the licensee or action had not been taken to preclude repetition:

1. Based on an inspection of the 25 structural beams described in Item A.1 above,

   a. Several welds on 9 beams did not conform with AWS D1.1-1972 requirements in that they contained unacceptable slag, weld profiles, blowholes, porosity, and/or undercut.

   b. Five beams did not conform with AISC requirements in that they had notches for re-entrant corners instead of radii creating potential stress risers.

   c. Four beams, 2 of which had unacceptable welds as described in Item B.1.a above, did not conform with design documents in that they were not specified on any design document. There were no QA records related to the 2 beams which appeared to have acceptable welds.

2. The licensee identified that the socket engagement for more than 400 socket welds was not verified in accordance with ASME Code, Section III-1971 Edition, Article NB-3661.5(b) and the condition was not corrected in that the corrective action was not commensurate with the ASME Code. The welds dated back to 1979.

3. The licensee was aware that the in-process inspections for more than 24 welds in the Diesel Generator cooling water, starting air, and fuel oil piping systems were not performed by Kaiser in accordance with ASME Code, Section III-1971 Edition, Article NB-3661.5(b), et. al., and the condition was not corrected in that the corrective action was not commensurate with the ASME Code.

4. Five licensee QA audits (audit performed 8/8-9/79 - no number, and Audit Nos. 78/07, 78/09, 78/10, 80/04) of Sargent & Lundy identified repetitive problems concerning S&L not performing certain design calculations, reviews, and verifications and action was not taken to preclude repetition.

5. Based on an inspection of about 100 cable tray hangers in the Cable Spreading Room, 4 did not conform with AWS D1.1-1972 requirements in that they contained unacceptable slag, weld profiles, blowholes, porosity, and/or undercut.

C. 10 CFR 50, Appendix B, Criterion XV states, in part, "Nonconforming items shall be reviewed and accepted, rejected, repaired or reworked in accordance with documented procedures."

Kaiser Procedure QACMI G-4, "Nonconforming Material Control," provides detailed instructions for the review and disposition of reports (Nonconformance Reports) of nonconforming items. Procedure QACMI G-4 contains the following requirements:

Paragraph 3.3 - Requires QA Site Document Center NR Controller to log NRs generated by QC Inspectors or Quality Assurance Engineers in the Site Document Log and assign NRs a KEI Control Number (CN).

Paragraph 3.6 - Restricts voiding of NRs to those initiated in error or those relating to nonconforming conditions that have been corrected by the Construction Department after verbal or written communication from the QA Department. Requires an explanatory entry for voided NRs to be made next to the CN in the Site Document Log. Requires a copy of voided NRs to be retained in the Site Document Center.

Paragraph 4.3 - Requires Material Review Board action for NRs to be dispositioned "accept as is."

Contrary to the above, the sample of NRs reviewed indicate significant deficiencies with the nonconformance reporting system in the areas of voiding of reports, not entering reports into the system, improper dispositioning of reports, and incomplete report files. The deficiencies identified in the sample reviewed were as follows:

1. An NR initiated by a QC Inspector on February 3, 1981, regarding the violation of a QC "Hold" tag attached to a suppression pool plate did not have a KEI CN assigned. CN-5412 was initially assigned to this NR but CN-5412 was subsequently reassigned to another unrelated NR without the NR originally assigned CN-5412 being assigned a replacement CN. References in the Site Document Log to the original NR assigned CN-5412 were covered over with "Wite-Out," a copy was not retained in the Site Document Center, and the NR was deleted from the NR control system. (The copy of the NR reviewed by the investigator was provided by an alleger.)

2. An NR initiated by a QC Inspector on February 11, 1981, regarding excessive weave in a primary containment structural steel weld, did not have a KEI CN assigned and was not entered in the Site Document Log. The NR was simply never entered into the NR control system. (The copy of the NR reviewed by the investigator was provided by an alleger.)

3. The following NRs were voided yet they had not been initiated in error and did not relate to nonconforming conditions that had been corrected by the Construction Department:

E-1661	E-2233
E-1662	E-2466
E-1777	CN-4389
E-2191	E-5108
CN-2196	CN-5122

4. Copies of the following NRs were not retained in the Site Document Center:

CN-4930	CN-4958
CN-4931	CN-4959
CN-4955	CN-5476
CN-4956	CN-5477
CN-4957	CN-5479

(The copies of the NRs reviewed by the investigator were provided by an alleger.)

5. NR E-2996, Revision 1, which was categorized as "accept as is" was closed out March 17, 1981, without Material Review Board approval in that final disposition action (UT of T-Quencher No. 007), that was part of the basis for conditional approval by the Material Review Board, was not taken.

6. NR E-2836 was incorrectly categorized by the KEI Construction Engineer as "Accept-As-Is" when sufficient information had been provided by the KEI QA Engineer to clearly indicate the NR should have been categorized differently, because reprocessing (radiography of the final weld) was required to bring the weld into conformance with the requirements of ASME Section III and Kaiser Specification H-2256.

This matter is repetition of similar violations identified in Inspection Reports 50-358/80-05 and 50-358/80-25. [The improper action on CN-5412, CN-5476, CN-5477, CN-5479, E-2996, and the NR identified in Item 2 above occurred after corrective action (Stop Work Order 80-13 and revision of Procedure QACMI G-4) was taken in response to IE Inspection No. 50-358/80-25.]

D. 10 CFR 50, Appendix B, Criterion III states, in part, "Measures shall be established to assure that applicable regulatory requirements and the design basis...are translated into...drawings..."

The Wm. H. Zimmer FSAR, Section 8, provides the design basis for electrical cable separation that includes the following:

> Associated cables (Green/White, Blue/White, and Yellow/White) from more than one Division cannot be routed in the same raceway. (FSAR Paragraph 8.3.1.13.2)
>
> Vertical separation of three feet or more must be maintained between cables from different Divisions. (FSAR Paragraph 8.3.1.11.2.1.d)
>
> Instrument (low-level signal) cables cannot be routed in the same raceway with power and control cables. (FSAR Paragraph 8.3.1.23.1.3)

The Wm. H. Zimmer QA Manual, Section 3.3.2. states, "Composite...drawings are prepared, translating the design concepts into layouts of structures, systems, and components necessary for the construction of the plant."

Contrary to the above, as of March 1981, the FSAR design basis for electrical cable separation had not been translated into the drawings which governed the following cable installation deficiencies in the Cable Spreading Room:

1. Associated Cable (Yellow/White) No. RE053 for Division 1 was routed in the same raceway (two-inch conduit and Class IE Sleeve No. 79) as Associated Cable (Blue/White) No. RE058 for Division 2. Also, associated Cable RE053 for Division 1 was routed so that in places there was only a vertical separation of four inches between it and cables (Blue) in Tray No. 2072C for Division 2.

2. Instrument Cable (Green) No. WS714 and others for Division 3 were routed in the same raceway (Tray No. 4638B) as Associated Control Cables (Blue/White and Yellow/White) for Divisions 2 and 1. (This deficiency was due, in part, to a design which specified the installation of a Green tray inside a White tray.)

3. Several Associated Cables from all three Divisions were routed in the same raceway (White Tray No. 4080K) including Cable (Blue/White) No. TI192, Cable (Yellow/White) No. RR781, and Cable (Green/White) No. TI816.

The above installation deficiencies were noted during brief tours of the Cable Spreading Room while pursuing other unrelated matters.

E. 10 CFR 50, Appendix B, Criterion III states, in part, "Design control measures shall be applied to...the delineation of acceptance criteria for inspections and tests."

The Wm. H. Zimmer QA Manual, Section 3.13.1 states, in part, "Design control measures also apply to delineation of acceptable criteria for inspections and tests."

Weld acceptance criteria are required by the ASME Code, Section III-1971 Edition and AWS D1.1-1972 Code.

Contrary to the above:

1. The weld acceptance criteria used by H. J. Kaiser Company from July 1980 to January 1981 were not applied to weld inspections during that period in that the weld acceptance criteria for such items as the drywell support steel were deleted.

2. The acceptance criteria for Weld 55H (isometric drawing PSK-1WS-32) performed on Service Water System Line No. 1WS71A18 by H. J. Kaiser Company in November 1979 were not applied in that they were designated as not applicable.

F. 10 CFR 50, Appendix B, Criterion XI states, in part, "Test procedures shall include provisions for assuring that all prerequisites for the given test have been met... Test results shall be evaluated to assure that test requirements have been satisfied."

The Wm. H. Zimmer QA Manual, Section 11.1 states, in part, "Test programs to assure that essential components, systems, and structures will perform satisfactorily in service are planned and performed in accordance with written procedures and instructions at vendor shops and at the construction site."

M. W. Kellogg Co. (pipe manufacturer and agency performing the prefabricated pipe weld radiography in question) Radiographic Procedure No. ES-414, dated September 26, 1972, Paragraph 4.1.8, states, "Wherever required, shims shall be used to produce a total thickness under the penetrameter equal to the nominal thickness of the base metal plus the height of the crown or reinforcement."

ASME Section III-1971 Edition, Winter 1972 Addenda, Appendix IX, Paragraph IX-3334.4 states, in part, "The shim thickness shall be selected so that the total thickness being radiographed under the penetrameter is the same as the total weld thickness..."

Contrary to the above, the NRC inspectors reviewed 700 radiographs involving 206 welds and determined that 187 of the radiographs did not comply with the ASME Code in that there was insufficient shimming of the penetrameter. The radiographed welds were prefabricated pipe welds in such systems as feedwater, diesel generator support systems, and main steam.

G. 10 CFR 50, Appendix B, Criterion III states, in part, "These measures [design control] shall include provisions to assure that appropriate quality standards are specified and included in design documents and that deviations from such standards are controlled...The design control measures shall provide for verifying or checking the adequacy of design."

The Wm. H. Zimmer QA Manual, Section 3.4 states, in part, "Design reviews are conducted to assure that the appropriate quality standards are specified and included in design documents."

The Wm. H. Zimmer QA Manual, Section 3.6 states, "Measures are established to assure that any deviations from the applicable standards are controlled."

Wm. H. Zimmer QA Manual, Section 3.11.2 states, in part, "At S&L, design verification reviews are performed...."

The Wm. H. Zimmer FSAR states that cable ampacity is based on IPCEA Publication No. P-46-426. Also regarding cable ampacity, the FSAR states "the summation of the cross-sectional areas of the cables shall not exceed 50% of the tray usable cross-sectional area or two layers of cables, whichever is larger, but not to exceed 60% of the cross-sectional area in any case."

AWS D1.1-1972 Code, Section 3.6.4, states, "For building and tubular structures, undercut shall be no more than 0.01 inch deep when its direction is transverse to primary tensile stress in the part that is undercut, nor more than 1/32 inch for all other situations."

Contrary to the above:

1. As of March 1981, design control measures had not been established to assure that deviations from design conditions (quality standards) identified by Sargent & Lundy engineers were controlled. For example, Sargent & Lundy noted on a calculation sheet dated December 27, 1979, that the design thermal loading for two power cables (VC016 and VC073) in Yellow Tray No. 1057A would allow the cables to be thermally overloaded and no program existed to control those design deviations.

2. As of March 1981, design control measures had not been established by Sargent & Lundy to provide for verifying or checking the adequacy of the design for the thermal loading of power cable sleeves and the physical weight loading of cable trays.

3. As of March 1981, the cable ampacity design by Sargent & Lundy was not based on IPCEA P-46-426 (appropriate quality standard). The cable ampacity was instead based on IEEE Paper 70TP557-PWR (1970), IPCEA P-54-440, and Sargent & Lundy Standard ESA-114a.

4. As of March 1981, the design allowable undercut on cable tray hanger welds was not based on AWS D1.1-1972 Code (appropriate quality standard). The design undercut was instead based on Sargent & Lundy Specification H-2713, Supplement 7, Sargent & Lundy Standard EB-117, and H. J. Kaiser Procedure SPPM No. 4.6, "Visual Examination," Revision 8, Paragraph 5.2.9, allowed up to 1/16 inch undercut.

H. 10 CFR 50, Appendix B, Criterion X states, in part, "A program for inspection of activities affecting quality shall be established and executed by or for the organization performing the activity to verify conformance with the documented instructions, procedures, and drawings for accomplishing the activity."

The Wm. H. Zimmer QA Manual, Section 10.1.2 states, in part, "Inspections are performed in accordance with written procedures which include requirements for check lists and other appropriate documentation of the inspections and tests performed."

AWS D1.1-1972 Code, Section 3.10.1, requires work to be completed and accepted before painting.

Contrary to the above:

1. As of March 1981, a QC inspection program had not been established to require verification of separation of electrical cables routed from the Cable Spreading Room to the Control Room. An example of a nonconforming condition that should have been identified by such a program was Blue Cables RI103 and CM111 that had been routed into Tray Riser (Green) No. 3025A, which extended from Tray (Blue) No. 2077A in the Cable Spreading Room to the Control Room.

2. The programs established for in-process and final inspections of welds on 180 cable tray hangers located in the Cable Spreading Room were not executed as required in the AWS D1.1-1972 Code. Specifically, the final weld inspections were made after the welds were painted (Galvanox).

I. 10 CFR 50, Appendix B, Criterion V states, in part, "Activities affecting quality shall be prescribed by documented instructions, procedures, or drawings, of a type appropriate to the circumstances and shall be accomplished in accordance with these instructions, procedures, or drawings."

The Wm. H. Zimmer QA Manual, Section 5.1 states, "Construction, fabrication, and manufacturing activities which affect the quality of the facility are accomplished in accordance with written instructions, procedures, and drawings which prescribe acceptable methods of carrying out those activities."

The Wm. H. Zimmer QA Manual, Section 3.12 states, in part, "Design changes...including field changes, are subject to design change control measures commensurate with those applied to the original design."

Contrary to the above:

1. Kaiser Procedure QACMI G-14, "Surveillance Reports," was not appropriate to the circumstances in that it allowed in-process nonconformances which constitute field changes to be dispositioned within 30 days without being subjected to design control measures commensurate with those applied to the original design.

Examples of nonconformances so dispositioned were identified in SRs F-2899, F-2903, and F-2914.

2. Kaiser Procedure QACMI G-14 was not followed in that SRs F-2909, F-3070, F-3071, F-3072, F-3073, F-3074, F-3075, F-3076, F-3083, and F-7019 were not dispositioned within 30 days and were not transferred to Nonconformance Reports as required by Paragraph 5 of QACMI G-14.

J. 10 CFR 50, Appendix B, Criterion VII states, in part, "The effectiveness of the control of quality by contractors and subcontractors shall be assessed by the applicant or designee...."

The Wm. H. Zimmer QA Manual, Section 7.3.1 states, in part, "As part of the vendor selection process, S&L makes an independent evaluation of the bidders' QA programs as a part of their total bid evaluation."

Contrary to the above, as of March 1981, neither the licensee nor designee (Sargent & Lundy) had assessed the effectiveness of the control of quality by vendors who had supplied structural beams. Specifically, evaluations of the vendor (U.S. Steel Supply, PBI Steel Exchange, and Frank Adams Company) quality assurance programs for control of mill certifications and structural beams were not performed.

K. 10 CFR 50, Appendix B, Criterion XVII states, in part, "Sufficient records shall be maintained to furnish evidence of activities affecting quality. The records shall include...monitoring of work performance, and...include closely-related data such as qualifications of personnel, procedures, and equipment."

The Wm. H. Zimmer QA Manual, Section 17.1.4 states, in part, "Documentation of all performance surveillance includes personnel identification and qualification, procedure, type observation, date of performance, person or organization monitored, results and corrective action if required."

Contrary to the above, the Bristol Steel and Iron Works Quality Control Steel Erection Report, which was a generic boilerplate form for monitoring in-process steel erection, did not identify closely related data such as weld procedure numbers, types of welding material, welder identification, and specific welds inspected.

L. 10 CFR 50, Appendix B, Criterion XVIII states, in part, "A comprehensive system of planned and periodic audits shall be carried out to verify compliance with all aspects of the quality assurance program and to determine the effectiveness of the progam."

The Wm. H. Zimmer QA Manual, Section 18.1 states, in part, "QA Division conducts a comprehensive system of planned and periodic audits of S&L, HJK...to verify compliance with all aspects of the quality assurance program."

Contrary to the above, during the past 9 years the licensee's QA Division did not perform an audit of the Sargent & Lundy nonconformance program.

This is a Severity Level II violation (Supplement II).

(Civil Penalty - $100,000)

Some of the examples of the violation continued during a period that spanned both the old and new enforcement policies. Application of either policy or a combination of both would result in a very large civil penalty that could be imposed. However, after weighing this matter relative to other civil penalties that have been issued to licensees of plants under construction and considering the financial impact and the potential construction schedule impact of the Quality Confirmation Program, we believe a civil penalty in the amount proposed to be appropriate. All things considered, we believe this exercise of discretion in determining the amount of the civil penalty results in assurance that the licensee fully appreciates the significance of the violation and results in an adequate deterrent against future similar violations by licensees of plants under construction.

Pursuant to the provisions of 10 CFR 2.201, Cincinnati Gas and Electric Company is hereby required to submit to this office within 30 days of the date of this Notice a written statement or explanation, including for each example of the alleged violation: (1) admission or denial; (2) the reasons for the violation if admitted; (3) the corrective steps which have been taken and the results achieved; (4) the corrective steps which will be taken to avoid further violations; and (5) the date when full compliance will be achieved. Any statement or explanation may incorporate by specific reference (e.g., giving page and paragraph numbers) the provisions of your Quality Confirmation Program and your actions in response to our Immediate Action Letter of April 8, 1981. Consideration may be given to extending the response time for good cause shown. Under the authority of Section 182 of the Act, 42 U.S.C. 2232, this response shall be submitted under oath or affirmation.

Within the same time as provided for the response required above under 10 CFR 2.201, Cincinnati Gas and Electric Company may pay the civil penalty in the amount of One Hundred Thousand Dollars or may protest imposition of the civil penalty in whole or in part by a written answer. Should Cincinnati Gas and Electric Company fail to answer within the time specified, this office will issue an Order imposing the civil penalty in the amount proposed above. Should Cincinnati Gas and Electric Company elect to file an answer in accordance with 10 CFR 2.205 protesting the civil penalty, such answer may: (1) deny the

violation listed in this Notice in whole or in part; (2) demonstrate extenuating circumstances; (3) show error in this Notice; or (4) show other reasons why the penalty should not be imposed. In addition to protesting the civil penalty in whole or in part, such answer may request remission or mitigation of the penalty. Any answer in accordance with 10 CFR 2.205 should be set forth separately from the statement or explanation in reply pursuant to 10 CFR 2.201, but may incorporate by specific reference (e.g., giving page and paragraph numbers) to avoid repetition. Cincinnati Gas and Electric Company's attention is directed to the other provisions of 10 CFR 2.205, regarding the procedure for imposing a civil penalty.

Upon failure to pay any civil penalty due, which has been subsequently determined in accordance with the applicable provisions of 10 CFR 2.205, this matter may be referred to the Attorney General, and the penalty, unless compromised, remitted, or mitigated, may be collected by civil action pursuant to Section 234c of the Act, 42 U.S.C. 2282.

The responses directed by this Notice are not subject to the clearance procedures of the Office of Management and Budget as required by the Paperwork Reduction Act of 1980, PL 96-511.

FOR THE NUCLEAR REGULATORY COMMISSION

Victor J. Stello, Director
Office of Inspection and Enforcement

Dated at Bethesda, Maryland
this day of , 1981

U.S. NUCLEAR REGULATORY COMMISSION

OFFICE OF INSPECTION AND ENFORCEMENT

REGION III

Report No. 50-358/81-13

Docket No. 50-358 License No. CPPR-88

Licensee: Cincinnati Gas and Electric Company
139 East 4th Street
Cincinnati, OH 45201

Facility: William H. Zimmer Nuclear Power Station

Investigation At: William H. Zimmer Site, Moscow, Ohio,
Cincinnati and vicinity,
Sargent & Lundy, Chicago, Illinois,
and Other Locations

Dates of Investigation: January 12-15, 26-30, February 9-13, 16-20, 23-27, March 5, 9-13, 17, 20, 23-27, April 14-17, 20-23, 30, May 18-22, 31, June 1-5, 8-12, 17-19, 29-31, July 1-2, 6-7, 12-16, and August 10, 1981.

Investigation Team Members: P. A. Barrett _____

Reactor Inspector

J. B. McCarten _____

Investigator

R. M. Burton _____

Investigator

E. C. Gilbert _____

Investigator

P. E. Baci _____

Investigator

K. D. Ward _____

Reactor Inspector

C. Erb _____

Reactor Inspector

J. F. Schapker _____

Reactor Inspector

F. A. Maura _____

Reactor Inspector

J. J. Harrison _____

Senior Resident Inspector,

Marble Hill

F. T. Daniels _____

Senior Resident Inspector,

Zimmer

P. Gwynn _____

Resident Inspector,

Zimmer

Reviewed By: R. F. Warnick, Chief _____

Reactor Projects Section 2B

J. F. Streeter, Acting Director

Enforcement and Investigation Staff

Investigation Summary: Investigation from January 12 through August 10, 1981 (Report No. 50-358/81-13)

Areas Investigated: The NRC is investigating quality assurance and quality control problems at the Zimmer nuclear facility as a result of (1) allegations received on November 18, 1980, from an ex-quality control inspector working at another construction site; (2) allegations received on January, 1981, from the Government Accountability Project of the Institute for Policy Studies on behalf of Mr. Thomas Applegate; (3) allegations received from numerous plant workers and ex-plant workers during the course of the investigation; and (4) concerns independently identified by NRC inspectors during the course of the investigaiton.

Results: This investigation has identified a number of quality related problems at the Zimmer site. While some actual construction deficiencies have been identified, the majority of the problems identified to date focus on the effectiveness of controls implemented by the licensee and its contractors for assuring the quality of work performed. In that regard, numerous deficiencies have been found concerning: traceability of materials, control of weld rod, handling of nonconformances, interface between construction and quality control, quality records, and the licensee's overview of ongoing work.

U.S. NUCLEAR REGULATORY COMMISSION

OFFICE OF INSPECTION AND ENFORCEMENT

REGION III

Report No. 50-358/81-13

Docket No. 50-358 License No. CPPR-88

Licensee: Cincinnati Gas and Electric Company
139 East 4th Street
Cincinnati, OH 45201

Facility: William H. Zimmer Nuclear Power Station

Investigation At: William H. Zimmer Site, Moscow, Ohio,
Cincinnati and vicinity,
Sargent & Lundy, Chicago, Illinois,
and other locations

Dates of Investigation: January 12-15, 26-30, February 9-13, 16-20, 23-27, March 5, 9-13, 17, 20, 23-27, April 14-17, 20-23, 30, May 18-22, 31, June 1-5, 8-12, 17-19, 29-31, July 1-2, 6-7, 12-16, and August 10, 1981.

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Senior Resident Inspector,

Zimmer

P. Gwynn _____

Resident Inspector,

Zimmer

Reviewed By: R. F. Warnick, Chief _____

Reactor Projects Section 2B

J. F. Streeter, Acting Director

Enforcement and Investigation Staff

Investigation Summary: Investigation from January 12 through August 10, 1981 (Report No. 50-358/81-13)

Areas Investigated: The NRC is investigating quality assurance and quality control problems related to the Zimmer Nuclear Power Station facility as a result of (1) allegations received on November 18, 1980, from a former quality control inspector at Zimmer who is now working at another construction site; (2) allegations received on January, 1981, from the Government Accountability Project of the Institute for Policy Studies on behalf of Mr. Thomas Applegate; (3) allegations received from numerous plant workers and former plant workers during the course of the investigation; and (4) concerns independently identified by NRC inspectors during the course of the investigaiton.

Results: This investigation has identified a number of quality-related problems at the Zimmer site. While some actual construction deficiencies have been identified, the majority of the problems identified to date are related to programmatic deficiencies in the implementation of a quality assurance program by the licensee and its contractors for assuring the quality of work performed. In that regard, numerous deficiencies have been found concerning: traceability of materials, control of weld rod, handling of nonconformances, interface between construction and quality control, quality records, and the licensee's overview of ongoing work.

RFL 7/1/81

Report No. 50-358/81-13

Docket No. 50-358 License No. CPPR-88

Licensee: Cincinnati Gas and Electric Company
139 East 4th Street
Cincinnati, OH 45201

Facility: William H. Zimmer Nuclear Power Station

Investigation At: William H. Zimmer Site, Moscow, Ohio,
Cincinnati and vicinity,
Sargent and Lundy, Chicago, Illinois,
~~North Anna Nuclear Power Station~~
And Other ~~Construction~~ Locations.
~~Chicago, Illinois~~

Dates of Investigation: January 12-15, 26-30, February 9-13, 16-20, 23-27, March 5, 9-13, 17, 20, 23-27, April 14-17, 20-23, 30, May 18-22, 31, June 1-5, 8-12, 17-19, 29-31, July 1-2, 6-7, ~~and~~ 12-16, and August 10, 1981.

Investigation Team Members: P. A. Barrett _____
Reactor Inspector ~~RIII~~

J. B. McCarten _____
Investigator ~~RIII~~

R. M. Burton _____

Investigator, RIII

E. C. Gilbert _____

Investigator, IE:HQ

P. E. Baci _____

Investigator, IE:HQ

K. D. Ward _____

Reactor Inspector, RIII

J. F. Schapker _____

Reactor Inspector, RIII

C M Erb _____ (?)

Reactor Inspector

F. A. Maura _____

Reactor Inspector, RIII

T F Gwynn _____

Resident Inspector, Zimmer

J. J. Harrison _____

Senior Resident Inspector,

Marble Hill

Typist

leave names as presently on diskette

F. T. Daniels

Senior Resident Inspector,

Zimmer

Reviewed By: R. F. Warnick, Chief

Reactor Projects Section 2B

J. F. Streeter

Assistant to the Director

Investigation Summary:

Investigation from January 12 thru August 10, 1981 (Report No. 50-358/81-13)

Areas Investigated:

~~Since January 19, 1981~~, The NRC is investigating quality assurance and quality control problems at the Zimmer nuclear facility. As a result of ~~this investigation effort is comprised of four areas as follows~~: (1) allegations received on November 18, 1980, from an ex-quality control inspector working at another construction site; (2) allegations received on January, 1981, from the Government Accountability Project of the Institute for Policy Studies on behalf of Mr. Thomas Applegate; (3) allegations received from numerous plant workers and ex-plant workers during the course of the investigation; and (4) concerns independently identified by NRC inspectors during the course of the investigation.

This investigation has identified a number of quality related problems at the Zimmer site. While some actual construction deficiencies have been identified, the majority of the problems identified to date focus on the ineffectiveness of controls implemented by the licensee and its contractors for assuring the quality of work performed. In that regard, numerous deficiencies have been found concerning: traceablity of materials, control of weld rod, handling of nonconformances, interfac en construction and quality control, quality records, and the lic view of ongoing work.

K. D. Ward
Reactor Inspector — Date

C. Erb
Reactor Inspector — Date

J. F. Schapker
Reactor Inspector — Date

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J. J. Harrison
Senior Resident Inspector
Marble Hill — Date

F. T. Daniels
Senior Resident Inspector
Zimmer — Date

P. Gwynn
Resident Inspector
Zimmer — Date

Reviewed By:

R. F. Warnick, Chief
Reactor Projects Section 2B — Date

J. F. Streeter, Acting Director
Enforcement and Investigation Staff — Date

Add Davis & Kepler →

Investigation Summary: Investigation from January 12 through August 10, 1981 (Report No. 50-358/81-13)
Areas Investigated: The NRC is investigating quality assurance and quality control problems at the Zimmer nuclear facility as a result of (1) allegations

REASON FOR INVESTIGATION

On November 18, 1980, a former quality control (QC) inspector for the Wm. H. Zimmer Nuclear Power Station contacted NRC Region III (RIII) and provided allegations concerning the Zimmer quality assurance (QA) program. The individual was interviewed, and the investigation of the allegations received began in early 1981.

On January 5, 1981, the Government Accountability Project of the Institute for Policy Studies (as nongovernment agency), representing Thomas Applegate, requested that the Merit Systems Protection Board investigate the conduct of an earlier investigation of allegations provided by Applegate. A list of nineteen allegations was included in the request. An NRC investigation was initiated into these matters.

8/7/81 RFW mhs

REASON FOR INVESTIGATION

On November 18, 1980, a former Quality Control (QC) inspector for the Wm. H. Zimmer Nuclear Power Station ~~site~~ contacted NRC Region III (RIII) and provided allegations concerning ~~the function of~~ the Zimmer Quality Assurance (QA) program. The individual was interviewed, and the investigation of the allegations received ~~was scheduled to begin~~ began in early 1981.

On January 5, 1981, the Government Accountability Project of the Institute for Policy Studies (2 non-government agency), representing ~~Mr.~~ Thomas Applegate, requested that the Merit Systems Protection Board investigate the conduct of an earlier investigation of allegations provided by Applegate. A list of nineteen allegations was included in the request.

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On January 5, 1981, the Government Accountability Project of the Institute for Policy Studies (a non-government agency), ~~representing~~ on behalf of Thomas Applegate, ~~in a letter to the Office of Personnel Management~~ requested ~~that~~ that the Merit Systems Protection Board investigate the conduct of an earlier investigation by RIII of allegations provided by Applegate. A list of nineteen allegations was included in the ~~request~~ GAP letter. ~~An NRC~~ This investigation was initiated into ~~these~~ the above matters. (The NRC's Office of Inspector and Auditor was assigned the task of determining the quality of the earlier investigation by RIII.)

SUMMARY OF FACTS

Since January 12, 1981, the U.S. Nuclear Regulatory Commission (NRC) has been investigating alleged quality assurance and quality control irregularities at the Zimmer nuclear facility. This investigative effort is comprised of four areas as follows: (1) allegations received on November 18, 1980, from an former quality control inspector working at another construction site; (2) allegations received in January 1981 from the Government Accountability Project of the Institute for Policy Studies on behalf of Thomas Applegate; (3) allegations received from numerous contractor workers and former plant workers during the course of the investigation; and (4) other problems independently identified by NRC inspectors during the course of the investigation. The investigative effort, which is still ongoing, has thus far resulted in the interviews of over 90 individuals and the expenditure of approximately 182 staff days onsite by NRC inspectors and investigators. Although the investigation is continuing, a report covering efforts to date is being issued at this time in recognition of the significant public interest in this matter.

In a related matter, the Government Accountability Project, in a letter to the Merit Systems Protection Board of the U.S. Office of Personnel Management, dated December 10, 1980, charged that NRC had failed to perform a thorough and complete investigation into allegations made in February 1980 by Applegate and requested a separate investigation into that matter. An investigation has been performed by the NRC Office of Inspector and Auditor to review those charges.

The current investigation has identified a number of quality-related problems at the Zimmer site. Although some actual construction deficiencies have been identified, the majority of the problems identified to date focus on the ineffectiveness of controls implemented by the licensee and its contractors for assuring the quality of work performed. In that regard, numerous deficiencies have been found concerning: traceability of materials, control of weld rod, handling of nonconformances, interface between construction and quality control, quality records, and the licensee's overview of ongoing work. The total impact of these quality assurance deficiencies on the actual quality of construction has yet to be determined.

In addition to the previously discussed quality deficiencies, numerous problems have been identifed with respect to the accuracy of quality-related records. This matter is being reviewed by the NRC Office of Inspection and Auditor for possible criminal considerations.

Based on these findings, consideration was given to the need to suspend construction activities. However, recognizing the nature of the problems disclosed (largely programmatic), and the fact that ongoing work would not compromise the ability to accurately determine the quality of completed work, it was concluded that halting construction activities was not required. Rather, attention was placed on establishing controls to assure the quality of ongoing and future work and to define a program to both confirm the quality of completed work and correct any identified deficiencies.

Following a meeting with NRC on March 31, 1981, the utility implemented several actions to correct identified quality assurance weaknesses and to preclude their recurrence. These actions, which included augmented QA staffing, upgraded procedures, improved training of QC inspectors, a 100% reinspection by the licensee of contractor QC inspections, and other QC and QA program improvements, were confirmed in an Immediate Action Letter to the licensee on April 8, 1981.

By letter dated May 11, 1981, the Government Accountability Project requested the Regional Director to recommend suspension of the construction permit because of repeated noncompliances with NRC regulations and numerous allegations of inadequate construction practices. The information provided was carefully considered; however, it was concluded that there was no basis at the present time to recommend such action.

A comprehensive program has been developed by the licensee and NRC to confirm the adequacy of completed construction. This program must be completed and identified problem areas resolved before an Operating License will be granted. In addition to witnessing and reviewing portions of the confirmation program conducted by the licensee and its contractors, NRC will be conducting a program of independent measurements to further evaluate the adequacy of construction.

A table of allegations and investigation findings follows:

SUMMARY OF FACTS

Since January 12, 1981, the U.S. Nuclear Regulatory Commission (NRC) has been investigating alleged quality assurance and quality control irregularities at the Zimmer nuclear facility. This investigative effort is comprised of four areas as follows: (1) allegations received on November 18, 1980, from a former Quality Control Inspector working at another construction site; (2) allegations received in January 1981 from the Government Accountability Project of the Institute for Policy Studies on behalf of Thomas Applegate; (3) allegations received from numerous contractor workers and former plant workers during the course of the investigation; and (4) other problems independently identified by NRC inspectors during the course of the investigation. The investigative effort, which is still ongoing, has thus far resulted in the interviews of over 90 individuals and the expenditure of approximately 182 staff days onsite by NRC inspectors and investigators. Although the investigation is continuing, a report covering efforts to date is being issued at this time in recognition of the significant public interest in this matter.

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Following a meeting with NRC on March 31, 1981, the utility implemented several actions to correct identified quality assurance weaknesses and to preclude their recurrence. These actions, which included augmented QA staffing, upgraded procedures, improved training of QC Inspectors, ~~a 100%~~ reinspection (100%) by the licensee of contractor QC inspections, and other QC and QA program improvements were confirmed in an Immediate Action Letter to the licensee on April 8, 1981.

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A comprehensive program has been developed by the licensee and NRC to confirm the adequacy of completed construction. This program must be completed and identified problem areas resolved before an Operating License will be granted. In addition to witnessing and reviewing portions of the Quality Confirmation Program conducted by the licensee and its contractors, NRC will be conducting a program of independent measurements to further evaluate the adequacy of construction.

~~A table of allegations and investigation findings follows.~~

3. Background

In late 1979, while involved in a domestic investigation, Private Investigator Thomas Applegate (Confidential Service) found that one of the individuals was employed at the Zimmer construction site, and was involved in "timecard cheating." Applegate approached CG&E and his employer with this information, and was awarded a thirty-day contract to investigate onsite timecard cheating. Timecard cheaters were identified and documented within two weeks, and Applegate began to pursue rumors on his own of improper site construction. CG&E, when told of the information gathered by Applegate, indicated that they were aware of the situations described. The thirty-day contract (December 10, 1979 through January 4, 1980) was not extended despite objections.

In February 1980, Applegate contacted the NRC Office of Inspector and Auditor. On February 28, 1980, he subsequently contacted the office of NRC Chairman Ahearne and was referred to the Office of Inspection and Enforcement. Personnel from Region III contacted Applegate by telephone on February 28, 1980, and he was interviewed in person on March 3, 1980. He provided a number of allegations, several of which did not relate to the safe construction of the plant. A letter was sent to Applegate on March 11, 1980, detailing three allegations that were considered appropriate for investigation. The investigation of the three allegations took place during April 7-9 and 30, May 1-2, 1980, and is documented in IE Investigation Report 50-358/80-09, which was issued on July 7, 1980. During the investigation period, Applegate approached the Government Accountability Project (GAP), and he requested NRC to send a copy of the investigation report to GAP when publicly available.

On November 18, 1980, a former QC inspector at Zimmer approached the Resident Inspector at another construction site. He indicated concerns relative to the adequacy of the QC program at Zimmer, and indicated that the Kaiser QA Manager was improperly handling nonconformance reports, transferring QC inspectors, allowing improper QC inspections, and not adequately supporting the QC staff. This individual was contacted on December 9, 1980. Investigation of these allegations began on January 12, 1981.

On January 5, 1981, GAP sent a letter to the Merit Systems Protection Board alleging that the RIII Investigator was negligent in the scope and manner of his performance of the earlier investigation of the Applegate concerns, and requesting an investigation of the conduct of the earlier investigation. This letter contained a listing of nineteen allegations that Applegate/GAP felt should be investigated.

Onsite investigation of the Applegate/GAP allegations was initiated on January 27, 1981. Due to the need for a response to the accusations that the previous RIII investigation had been inadequate, early emphasis and priority was placed on the development of information relative to the nineteen allegations and concerns of the former QC inspectors. During the investigation, Applegate and GAP personnel communicated with the RIII office on several occasions. They also provided affidavits from former contractor employees expressing concerns relative to site construction. Some of these affidavits contained new information, and others dealt with past problems or issues. (Some are the same affidavits as those presented at the Atomic Safety and Licensing Board Hearings.) Additional items appeared to have been summarized from past RIII inspection report findings.

Also during the investigation, several present QC inspectors approached NRC personnel onsite and expressed concerns relative to the functioning of the QC program. Some of these concerns coincided with those expressed by the former QC inspector, as outlined above, and some concerns related to new information.

Because the allegations and concerns related to various areas of plant construction, several RIII inspectors were involved in inspections, interviews, and document reviews at the site during the investigation. Those allegations and concerns that appeared to be most significant and most likely to produce substantive findings were given investigative priority.

In the course of pursuing the items alleged, RIII inspectors performed inspections of areas of construction alleged to be deficient. In some cases, they observed conditions violating NRC requirements that had not been provided as allegations or concerns. Those findings are therefore considered as independently developed.

3. Background

In late 1979, while involved in a domestic investigation, Private Investigator Thomas Applegate (Confidential Service) found that one of the ~~involved~~ individuals was employed at the Zimmer construction site, and was involved in "timecard cheating". Applegate approached CG&E and his employer with this information, ~~resulting in~~ and was awarded a thirty-day contract to investigate onsite timecard cheating. Timecard cheaters were identified and documented within two weeks, ~~and Applegate began to pursue rumors of identified and documented within two weeks~~ and Applegate began to pursue rumors on his own of improper site construction. CG&E, when ~~informed~~ told of the information ~~developed~~ gathered by Applegate, indicated that they were aware of the situations described. The thirty-day contract (December 10, 1979 through January 4, 1980) was not extended ~~over~~ despite Applegate's objections.

In February, 1980, Applegate contacted the NRC's Office of Inspector and Auditor. On February 28, 1980, he subsequently contacted the office of NRC Chairman Ahearne and was referred to the Office of Inspection and Enforcement. ~~RIII~~ personnel from Region III contacted Applegate by telephone on February 28, 1980, and he was interviewed in person on March 3, 1980. He provided a number of allegations, ~~a number of which were not within the jurisdiction of the NRC, or did not appear to be adequate material for investigation.~~ several of which did relate to the site construction of the plant. A letter was sent to Applegate on March 11, 1980, detailing three allegations ~~which appeared~~ that were considered appropriate for investigation. The investigation of the three allegations took place during April 7-9 and 30, May 1-2, 1980, and is documented in I&E Investigation Report 50-358/80-09, which was ~~made public~~ issued on July 7,

1980. During the investigation period, Applegate ~~has~~ approached the Government Accountability Project (GAP), and he requested ~~that~~ NRC to send a copy of the investigation report ~~be sent~~ to ~~them~~ GAP when publicly available.

On November 18, 1980, a former QC inspector at Zimmer approached the Resident Inspector at ~~the Marble Hill~~ another construction site. He indicated concerns relative to the ~~adequate function~~ adequacy of the QC program at Zimmer, and indicated that the Kaiser QA Manager was improperly handling nonconformance reports, transferring QC inspectors, allowing improper QC inspections, and not adequately supporting the QC staff. This individual was contacted on December 9, 1980. ~~investigation of these allegations was scheduled to begin in the near future~~ began on January 22, 1981.

On January 5, 1981, GAP sent a ~~lengthy~~ letter to the Merit Systems Protection Board, alleging that the RIII Investigator was negligent in the scope and manner of his performance of the earlier investigation of the Applegate concerns, and requesting an investigation of the conduct of the earlier investigation. This letter contained a listing of nineteen allegations ~~which~~ that Applegate/GAP felt should be investigated.

Onsite investigation of the Applegate/GAP allegations was ~~begun in~~ initiated on January 27, 1981. Due to the need for a response to the accusations that the previous RIII investigation had been inadequate, early emphasis and priority was placed on the development of information relative to the nineteen allegations and ~~Investigation of~~ concerns of the former QC inspectors ~~concerns were begun when investigation of the majority of the nineteen concerns near completion.~~

During the investigation, Applegate and GAP personnel communicated with the RIII office on several occasions. They also provided affidavits from former ~~site~~ contractor employees expressing concerns relative to site construction. Some of these affidavits contained new information, and ~~some affidavits~~ others dealt ~~concerned~~ with past problems or issues (some are the same affidavits as those presented ~~to~~ at the Atomic Safety and Licensing Board Hearings.) Additional items appeared to have been summarized from past RIII inspection report findings.

Also, during the investigation, ~~a number of~~ several present QC inspectors approached NRC personnel onsite and expressed concerns relative to the functioning of the QC program. Some of these concerns coincided with those expressed by the former QC inspector, as outlined above, and some concerns related to new information.

~~As~~ Because the allegations and concerns related to various areas of plant construction, several RIII inspectors were involved in inspections, interviews, and document reviews at the site during the investigation. Those allegations and concerns ~~which~~ that appeared to be most significant and most likely to produce substantive findings were given investigative priority.

In the course of pursuing the items alleged, RIII inspectors performed inspections of areas of construction alleged to be deficient. In some cases, they observed conditions violating NRC requirements ~~which~~ that had not been provided as allegations or concerns. Those findings are therefore considered as independently developed.

As the investigation progressed, sufficient findings were developed to suggest that the site QC function was not operating satisfactorily, although sufficient information had not been developed to confirm that conclusion. Meetings were held with CG&E management officials, ~~and~~ at which the conclusions of the investigation team were discussed. Based on these discussions, the licensee committed to upgrade and revise the site QC program considerably. These commitments were confirmed ~~via~~ in an Immediate Action Letter to the licensee on April 8, 1981.

A comprehensive Corrective Action Program was developed by the licensee to confirm the quality of construction and NRC ~~approved by RIII personnel. As a part of~~ In addition to this program, NRC inspectors will monitor the program and perform independent examinations of selected installations to verify that the program is being adequately ~~controlling~~ implemented and that completed construction is ~~adequacy. A reinspection program, to identify possibly deficient past installations, will also be implemented.~~ satisfactory

~~Those allegations and inspections which are~~ The effort to date is documented completed ~~are reported~~ in this report. Allegations which were assigned lesser investigative priority, and have not yet been reviewed will be the subject of special inspections or investigation, and will be documented in subsequent reports.

3. Background

In late 1979, while involved in ~~a domestic~~ investigation for a client of a personnel nature, Private Investigator Thomas Applegate (Confidential Service) found that one of the individuals was employed at the Zimmer construction site and was involved in "timecard cheating." Applegate approached ~~CG&E~~ and Cincinnati Gas and Electric Company (owner of Zimmer) and his employer with this information and was awarded a thirty-day contract to investigate onsite timecard cheating. Timecard cheaters were identified and documented within two weeks, and ~~then~~ Applegate on his own decision began to pursue rumors ~~on his own~~ of improper site construction. CG&E, when told of the information gathered by Applegate, indicated that they were aware of the situations described. The thirty-day contract (December 10, 1979 through January 4, 1980) was not extended despite objections by Applegate.

In February 1980, Applegate contacted the NRC Office of Inspector and Auditor. Subsequent On February 28, 1980, he ~~subsequently~~ contacted the office of NRC Chairman Ahearne and was referred to the Office of Inspection and Enforcement. Personnel from Region III contacted Applegate by telephone on February 28, 1980, and he was interviewed in person on March 3, 1980. He provided a number of allegations, several of which did not relate to activities within the NRC jurisdiction. ~~the safe construction of the plant.~~ A letter was sent to Applegate on March 11, 1980, detailing three allegations that were considered appropriate for investigation. The investigation of the three allegations took place during April 7-9 and 30, May 1-2, 1980, and is documented in IE Investigation Report 50-358/80-09 which was issued on July 7, 1980.

~~During the investigation period, Applegate approached the Government Accountability Project (GAP), and he requested NRC to send a copy of the investigation report to GAP when publicly available.~~

On November 18, 1980, a former QC Inspector at Zimmer approached the Resident Inspector at another construction site. He indicated concerns relative to the adequacy of the QC program at Zimmer and indicated that the Kaiser QA Manager was improperly handling nonconformance reports, transferring QC Inspectors, allowing improper QC inspections, and not adequately supporting the QC staff. This individual was contacted on December 9, 1980. Investigation of these allegations began on January 12, 1981.

On January 5, 1981, GAP sent a letter to the Merit Systems Protection Board alleging that the RIII Investigator was negligent in the scope and manner of his performance of the earlier investigation of the Applegate concerns, and requesting an investigation of the conduct of the earlier investigation. This letter contained a listing of nineteen allegations that Applegate/GAP felt should be investigated.

Onsite investigation of the Applegate/GAP allegations was initiated on January 27, 1981. ~~Due to the need for a response to the accusations that the previous RIII investigation had been inadequate, early emphasis and priority was placed on the development of information relative to the nineteen allegations and concerns of the former QC inspectors.~~ During the investigation, Applegate and GAP personnel communicated with the RIII office on several occasions. They also provided affidavits from former contractor employees expressing concerns relative to site construction. Some of these affidavits contained new information, and others dealt with ~~past~~ problems ~~or and~~ already investigated issues. (Some are the same affidavits as those presented at the Atomic Safety and Licensing Board Hearings.) ~~Additional items appeared to have been summarized from past RIII inspection report findings.~~

~~Also~~ During the investigation, several present QC Inspectors approached NRC personnel onsite and expressed concerns relative to the functioning of the QC program. Some of these concerns coincided with those expressed by the former QC ~~I~~nspector, as outlined above, and some concerns related to new information.

~~Because the allegations and concerns related to various areas of plant construction, several RIII inspectors were involved in inspections, interviews, and document reviews at the site during the investigation.~~ Those allegations and concerns that appeared to be most significant and most likely to produce substantive findings were given investigative priority.

In the course of pursuing the items alleged, RIII inspectors performed inspections of areas of construction alleged to be deficient. In some cases, they observed conditions violating NRC requirements that had not been provided as allegations or concerns. Those findings are therefore considered as independently developed.

4.2 Bolt Hole Preparation

4.2.1 Allegation

Bolt holes for large bore pipe support hangers are required to be made by drilling rather than burning (flame cutting). Although some instances of burned bolt holes have been identified, there is no inspection program to assure the bolt holes are inspected.

4.2.2 Investigation

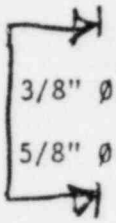
4.2.2.1 Review of Procedures

H. J. Kaiser Co. Instruction ~~No.~~ M-12, ~~entitled~~ "Inspection Instructions for Pipe Hangers, Support and Restraint Installation," Revisions 9, 10, and 11, states the following in Paragraph 3.0:

> "Any essential hanger base plate installed by HJK shall require the removal of at least one (1) nut/washer in order that the HJK Quality Inspector may verify the correct bolt hole size in the plate.
>
> "During inspections, if the HJK Quality Inspectors observe the bolt hole size to be incorrect (or eccentric), the inspector shall issue a Nonconformance Report (NR)."

In paragraph 4.4.9.d, it states:

"The tolerance for base plate bolt holes is as follows:



3/8" Ø and 1/2" Ø - 1/8" larger than nominal bolt Ø. ⌖ is symbol used for bolt hole diameter

5/8" Ø and larger - 3/16" larger than nominal bolt Ø.

"Torch cut holes that have not been reamed are unacceptable.

(Use QACMI M-15 checklist to identify.)"

The procedure requires inspection of the baseplate bolt hole location, bolt hole sizes, tolerances, eccentricity, and location of baseplate based on a single sample per plate. The CG&E QA Manager indicated in a telephone conversation that the procedure was being revised to require inspection of all bolt holes.

4.2.2.2 FSAR Requirements

The Zimmer FSAR, Table 3.8.2, commits to ANSI N45.2.5-1972 (Draft), ~~entitled~~ "Supplementary Quality Assurance Requirements for Installation, Inspection, and Testing of Structural Concrete and Structural Steel During the Construction Phase of Nuclear Power Plants." Paragraph 5.3 of ANSI N45.2.5 states, in part, that burning of bolt holes is not permitted.

4.2.2.3 Licensee Position

During a telephone conversation on July 23, 1981, the licensee stated that the materials affected by Instruction M-12 were not composed of structural steel as defined by the American Institute of Steel Construction (AISC) Manual, Seventh Edition. Therefore, the licensee's position was that the requirement not permitting burning of bolt holes does not apply.

In a subsequent telephone conversation on , 1981, the CG&E QA Manager indicated that NRC appeared to be taking the no-burning requirement out of context. He indicated the paragraph containing the no-burning requirement refers to the condition of contact surfaces of friction types of connections, bolt hole alignment, and the correction of fabrication errors. It did apply specifically to burning.

what did? whose position is this?

This is an unresloved item and will be reviewed during a subsequent inspection (50-358/81-13-).

4.2.3 Findings and Conclusions

The acceptability of torch cutting bolt holes (the applicability of ANSI Standard N 45.2.5 prohibiting burning of bolt holes) is unresolved and will be reviewed during a subsequent inspection. The licensee's past inspection program for examining bolt holes was in compliance with IE Bulletin 79.02, "Pipe Support Base Plant Designs Using Concrete Expansion Anchor Bolts." The licensee is currently inspecting all bolt holes.

4.2.4 Items of Noncompliance

Two items of noncompliance were identified. ~~(failure to provide adequate justification for the sample size and selection process used in hanger base plate bolt hole inspections).~~

4.2 Bolt Hole Preparation

4.2.1 Allegation

Bolt holes for large bore pipe support hangers are required to be made by drilling rather than burning (flame cutting). Although some instances of burned bolt holes have been identified, there is no inspection program to assure the bolt holes are inspected.

4.2.2 Investigation

Review of Procedures

4.2.2.1 ~~Background Information~~

H. J. Kaiser Co. Instruction No. M-12, entitled "Inspection Instructions for Pipe Hangers, Support and Restraint Installation," Revisions 9, 10, and 11, states the following in paragraph 3.0:

~~Paragraph 3.0~~

"Any essential hanger base plate installed by HJK shall require the removal of at least one (1) nut/washer in order that the HJK Quality Inspector may verify the correct bolt hole size in the plate.

"During inspections, if the HJK Quality Inspectors observe the bolt hole size to be incorrect (or eccentric), the inspector shall issue a Nonconformance Report (NR)."

In Paragraph 4.4.9.d, it states:

"The tolerance for base plate bolt holes is as follows:

3/8" Ø and 1/2" Ø - 1/8" larger than nominal bolt Ø.

5/8" Ø and larger - 3/16" larger than nominal bolt Ø.

"Torch cut holes that have not been reamed are unacceptable.

(Use QACMI M-15 checklist to identify.)"

Final Inspection Record/Piping Supports

The procedure
Requires inspection of the baseplate bolt hole location, bolt hole sizes, tolerances, eccentricity, and location of baseplate based on a single sample per plate.

4.2.3 Investigation

In a telephone conversation with the CQAE QA manager, he indicated the procedure was being revised to require inspection of all bolt holes.

4.2.3.1 Review of Procedures

Site Instruction M-12 (4.4.9.d) allowed bolt holes to be burned (torch cut) only if they were reamed afterward.

4.2.3.2 FSAR Requirements

The Zimmer FSAR, Table 3.8.2, commits to ANSI N45.2.5-1972 (Draft) entitled "Supplementary Quality Assurance Requirements for Installation, Inspection, and Testing of Structural Concrete and Structural Steel During the Construction Phase of Nuclear Power Plants." Paragraph 5.3 of ANSI N45.2.5 states, in part, that burning of bolt holes is not permitted.

4.2.2.3 Licensee Position

During a telephone conversation on July 23, 1981, the licensee stated that the materials affected by Instruction M-12 were not composed of structural steel as defined by the American Institute of Steel Construction (AISC) Manual, Seventh Edition. Therefore, the licensee's position was that the requirement ~~that does~~ not permitting burning of bolt holes does not apply.

In a subsequent telephone conversation, ~~with~~ the CGE QA manager ~~the~~ indicated ~~this position~~ that the NRC appeared to be taking the no-burning requirement out of context. He indicated the paragraph ~~applies~~ containing the no-burning requirement refers to ~~fabrication~~ the condition of contact surfaces of ~~friction~~ types of connections, ~~and~~ bolt hole alignment and the correction of fabrication errors. It did apply specifically to burning. ~~It does not apply to burning per se.~~

This is an unresolved item and will be reviewed during a subsequent inspection (50-358/81-13-___)

~~This is contrary to 10 CFR 50, Appendix B, Criterion and the Wm. H. Zimmer QA Manual, Section 5.3, as described in Appendix A to the report transmittal letter (50-358/81-13-41). The applicability of ANSI standard N45.2.5 (prohibiting burning of bolt holes) is unresolved, and will be reviewed during a subsequent inspection (50-358/81-13-40).~~

Move to Finding

4.2.4 Findings and Conclusions

The acceptability of ~~burning~~ torch cutting bolt holes ~~is~~ (the applicability of ANSI Standard N 45.2.5 prohibiting burning of bolt holes) is unresolved and will be reviewed during a subsequent inspection. The licensee's past ~~existing~~ inspection program for examining bolt holes was ~~deficient in that the basis for the sample size selected was not supported~~ consistent ~~compliance~~ with IE Bulletin 79-02. The licensee is currently inspecting all bolt holes.

4.2.5 Items of Noncompliance

One item of noncompliance was identified (Failure to provide adequate justification for the sample size and selection process used in hanger base plate bolt hole inspections).

"Pipe Support Base Plate Designs Using Concrete Expansion Anchor Bolts"

Weld

516.

5.2 Improper Fittings

5.2.1 Allegation

"2000 pound fittings were installed in 1979 on residue head valves, although 5000 pound fittings are required."

An interview with the individual originating this allegation revealed that the "residue head valves" or "residue heat valves" were not the components of concern. The components involved in both allegations 5.2 and 5.4 were the hydraulic actuators for the recirculation flow control valves.

Allegations 5.2 and 5.4 are both addressed in this section because the investigation determined that both allegations were addressing the same component by statements from the same allegor.

5.2.2 Background Information

Hydraulic actuators are used to open and close some plant valves. Actuators on the Reactor Recirculation system are provided with drain lines in case hydraulic seals in the actuator should leak. These drain lines are not pressurized (open to atmospheric pressure) and only serve to contain possible leaking hydraulic fluid.

5.2.3 Investigation

5.2.3.1 Interview of Individual A

On February 24, 1981, Individual A, who was previously interviewed by representatives of GAP, was interviewed by NRC. Individual A stated that Individual F had told him that 6000-lb pressure fittings were required on the hydraulic lines in the residual heat removal system, but Individual F was told by a supervisor to install 3000-lb fittings.

On April 22, 1981, Individual A provided a written statement attesting to the preceding information; however, he requested the statement not be attached to this report.

5.2.3.2 Interview of Individual F

On March 20, 1981, Individual F was interviewed by telephone. Individual F stated that he had heard about a valve that had been broken, but he did not have any firsthand knowledge of the incident. Individual F said he knew of cases in which "half-life" (3000-lb in place of 6000-lb) fittings were used. Two specific cases recalled by Individual F ~~were the following~~: will be followed up in a subsequent inspection of (IE-35/81-17

~~1. 3/4-in. pneumatic lines (carrying dry nitrogen) that actuate the control rods.~~

~~2. A set of 2-in. black iron lines inside containment, which could have been hydraulic lines.~~

Individual F repeatedly stated that it had been three years since he had been at Zimmer and that he could not remember further specifics.

The two preceding cases are not addressed in this report. They will be resolved in a subsequent report (50-358/81-13-).

5.2.3.3 Interview of Individual B

On February 10, 1981, Individual B, who had been previously interviewed by representatives of GAP, was interviewed by NRC. Individual B stated that 3000-lb fittings were installed on two recirculation flow control valves when 6000-lb fittings were required. He identified the fittings as being socket welded to two small hydraulic lines on the valves in question. Individual B stated that, to the best of his knowledge, this deficiency has not been corrected.

Individual B stated that in 1979 it was reported to him that a pipefitter bumped into the valve and a small hydraulic fitting on the valve fell off. He said the fitting was later identified as a nonconforming item by Kaiser, and a design document change (DDC) was issued directing the fitting be repaired. He stated the valve in question was manufactured by General Electric, and General Electric later repaired the broken fitting on the valve.

On April 14, 1981, Individual B provided a written statement attesting to the preceding information; however, he requested the statement not be attached to this report.

5.2.3.4 Interview of T. F. Van Natta

On June 25, 1981, T. F. Van Natta, Site Control and Instrument Engineer for General Electric, was interviewed by telephone. Van Natta stated that the adaptor connecting the drain line to the hydraulic actuator body on a recirculation flow control valve had been broken off. He said that he did not know whether or not a pipefitter had broken the adaptor.

Van Natta indicated that the originally installed adaptor was adequate for the designed service, but it was susceptible to mechanical damage from adjacent construction activities that were being performed. Therefore, the decision was made to replace the original adaptor design with the stronger flange design defined in General Electric Field Deviation Disposition Request No. KN-1-299, dated December 18, 1978.

Van Natta said that the actuator and three of the four hydraulic lines connecting to the actuator had a design test pressure of 3000 psig. He said the fourth line, which was addressed in Field Deviation Disposition Request (FDDR) No. KN-1-299, was the drain line to the hydraulic system, which has a design test pressure of 200 psig and normal operating pressure of 14.7 psig since the drain line is open to the atmosphere at the drain tank.

Van Natta stated that the actuator drain ports and lines were separated from the relatively high-pressure (3000 psig) side of the actuator by two seals (a main seal and a backup seal), each of which have a design pressure of 3000 psig.

5.2.3.5 Interview of T. E. Bloom

On June 30, 1981, T. E. Bloom, a General Electric employee, was interviewed by NRC. Bloom stated that the nipple (adaptor) on the hydraulic actuator to the recirculation flow control valve for recirculation Loop A had been broken.

5.2.3.6 Record Review

1. The RIII inspector reviewed General Electric FDDR No. KN-1-299 (designated as nonconformance request) dated December 18, 1978, which addressed the recirculation system flow control valve actuator. The FDDR indicated that the following had occurred:

   "The threaded adaptor which connects the drain port on the actuator body was broken off during installation of the 1/2" NPT [National Pipe Thread] hydraulic piping. This adaptor is not suitable for this application where the connection is susceptible to damage and does not provide take down capability."

   The final disposition of the FDDR was as follows:

   "Replace the defective adaptor with short tube threaded to the actuator and socket weld to a special flange attached to the actuator mount ledge. A mating flange with a Viton "O" ring joint is also provided similar to the other actuation piping connections."

The FDDR indicated that the flange modification was complete on July 13, 1979. The FDDR did not identify the specific actuator (Loop A or Loop B) that had the defective adaptor.

2. The hydraulic actuators for the two recirculation flow control valves and their respective piping, components, locations, and classifications were identified on the following drawings (Table ~~5.1~~ 5.2-1):

Table ~~5.3~~ 5.2-1 Hydraulic Actuator Data

Components	Sargent & Lundy Piping and Instrumentation Drawings	Kaiser Engineers Isometric Drawings
Recirculation Loop A		
1. Actuator No. 1B33F060A-- Rucker drawing #81999-F-402 Revision M; Rucker Control S/N SP19025	M-47 Sheet 1 of 2 Revision T	
2. Piping (lines), components (fittings), welds, classifications, and locations	M-47 Sheet 1 of 2 Revision T	

5.2-1
Table ~~5.1~~ (continued)

Components	Sargent & Lundy Piping and Instrumentation Drawings	Kaiser Engineers Isometric Drawings
a. Line #1RR39AD 3/4" (and low point drain 1RR41AD*)	M-47 Sheet 1 of 2 Revision T	M-464-3-RR-243 and M-464-3-RR-245
b. **Line #1RR39AC 1/2" hydraulic system drain line (and low point drain line 1RR41AC*)	M-47 Sheet 1 of 2 Revision T	M-464-3-RR-241, M-464-3-RR-244 and M-464-3-RR-247
c. Line #1RR39AB 1/2" (and low point drain line 1RR41AB*)	M-47 Sheet 1 of 2 Revision T	M-464-3-RR-242 and M-464-3-RR-246

*Low point drain lines are installed in the lowest points of each hydraulic line to provide system maintenance. Low point drain lines are not the same as the hydraulic system drain lines (1RR39AC and 1RR40AC), which are functional parts of the hydraulic system.

**

more from next page !

5.2-1
Table ~~5.1~~ (continued)

Components	Sargent & Lundy Piping and Instrumentation Drawings	Kaiser Engineers Isometric Drawings
d. Line #1RR39AA 3/4" (and low point drain line 1RR41AA*)	M-47 Sheet 1 of 2 Revision T	M-464-3-RR-239 and M-464-3-RR-240
Recirculation Loop B		
1. Actuator No. 1B33F060B Rucker Control S/N 19028	M-47 Sheet 2 of 2 Revision P	
2. Piping (lines), components (fittings), welds, classifications, and locations	M-47 Sheet 2 of 2 Revision P	
a. Line #1RR40AD 3/4" (and low point drain line 1RR43AD*)	M-47 Sheet 2 of 2 Revision P	M-464-4-RR-263 and M-464-4-RR-259

Put on p. 7

**The disposition to FDDR No. KN-1-299 was applied to both drain lines #1RR39AC and #1RR40AC.

Table ~~5.1~~ 5.2-1 (continued)

Components	Sargent & Lundy Piping and Instrumentation Drawings	Kaiser Engineers Isometric Drawings
b. **Line #1RR40AC 1/2" hydraulic system drain line (and low point drain line 1RR43AC*)	M-47 Sheet 2 of 2 Revision P	M-464-4-RR-262 and M-464-4-RR-257
c. Line #1RR40AB 1/2" (and low point drain line 1RR43AB*)	M-47 Sheet 2 of 2 Revision P	M-464-4-RR-261 and M-464-4-RR-258
d. Line #1RR40AA 3/4" (and low point drain line 1RR43AA*)	M-47 Sheet 2 of 2 Revision P	M-464-4-RR-260 and M-464-4-RR-256

The drawings indicated that the actuators and the portions of the respective piping located inside the drywell were classified as ASME Section III Class B. The portions of the respective piping located outside the drywell and past the the isolation valves were classified as ASME Section III Class D (nonsafety related).

3. The RIII inspector reviewed an S&L design document change that specified a change in design pressure for three hydraulic lines from 6000 psig to 3000 psig and for the drain line from 3000 psig to 150 psig for the actuators for the two flow control valves. The Kaiser isometric drawings reflected the design pressure changes specified in the DDC. [Note: Revision 5 to the drawing M-464-4RR-257 (Exhibit) reflects an example of the specified change.]

4. The RIII inspector reviewed the S&L Mechanical Department Piping Line List dated May 29, 1981, which specified the following conditions for the hydraulic lines (Table 5.2):

Table 5.2 Hydraulic Line Conditions

Line No.	Maximum Operating Pressure (psig)	Designed Operating Pressure (psig)	Field Test Pressure (psig)
1RR39AA	2200	3000	3000
1RR39AB	2200	3000	3000
1RR39AC*	100	150	200
1RR39AD	2200	3000	3000

*These were the drain lines affected by FDDR No. KN-1-299.

†All exhibits in this report have been grouped by the major allegation sections and are included in Appendix B. (For example, exhibits in Allegation 5.1 are grouped in order of reference and are identified by allegation number.)

Table ~~5.2~~ 5.2-2 (continued)

Line No.	Maximum Operating Pressure (psig)	Designed Operating Pressure (psig)	Field Test Pressure (psig)
1RR40AC*	100	150	200
1RR40AD	2200	3000	3000
1RR40AA	2200	3000	3000
1RR40AB	2200	3000	3000

The RIII inspector reviewed the material-takeoff record listed on each of the respective Kaiser isometric drawings indicating that all the material and components (piping, fittings, and valves) met or exceeded the design conditions identified on the S&L Mechanical Department Piping Line List.

The RIII inspector reviewed the KEI-1 weld data records listed on each of the respective Kaiser isometric drawings. The records indicated that welds had been made in accordance with the ASME Code Section III-1971 Edition, with the following exceptions:

*These were the drain lines affected by FDDR No. KN-1-299.

a. Line #1RR39AA (Drawing No. M-464-3-RR-239, Revision 3)-- Records do not reflect dates when welds were made for any of the welds.

Line #1RR39AA (Drawing No. M-464-3-RR-240, Revision 7)-- Recorded dates for welds A-1, A-2, A-3, C-2 and C-5 indicate the welds were dye penetrant tested (PT) before they were made.

b. Line #1RR39AC (Drawing No. M-464-3-RR-244, Revision 4)-- Records do not reflect dates when welds were made for any of the welds.

Line #1RR39AC (Drawing No. M-464-3-RR-241, Revision 4)-- Records do not reflect dates when welds C-6, C-7, C-8, C-9, C-10, and C-11 were made.

c. Line #1RR39AD (Drawing No. M-464-3-RR-243, Revision 4)-- Records do not reflect dates for any of the welds.

Line #1RR39AD (Drawing No. M-464-3-RR-245, Revision 5)-- Records do not reflect dates when welds C-5 (rework), C-6, C-7, C-8, and C-9 were made.

d. Line #1RR40AB (Drawing No. M-464-4-RR-257, Revision 8)-- Record reflects QC verification of weld A-1 with written signoff instead of required QC stamp; weld test (PT) records not available for welds A-2, A-3, and B-2.

e. Line #1RR40AC (Drawing No. M-464-4-RR-262, Revision 7)-- Weld data records written to replace lost weld records for welds E-2 and E-4, without justification to assure in-process inspections were performed.

f. Line #1RR40AD (Drawing No. M-464-4-RR-259, Revision 6)-- Records do not reflect dates when welds B-2, B-5, and B-6 were made; weld test (PT) record was not available for weld B-2.

Line #1RR40AD (Drawing No. M-464-4-RR-263, Revision 7)-- Weld test record was not available for welds A-1 and A-7.

The final quality assurance engineer's review of the preceding KEI-1 weld data records had not been performed as of June 29, 1981. Therefore, the listed exceptions are unresolved pending the final QA engineer's review and completion of appropriate dispositions (50-358/81-13-32).

5. The RIII inspector reviewed Kaiser Engineers, Inc., Quality Assurance Construction Methods Instruction (QACMI) No. M-10, Revision 6 (dated November 16, 1978), and Revision 7 (dated September 13, 1979). Both revisions of QACMI M-10, entitled "Pressure Testing of Piping Systems," complied with ASME Code Section III, 1971 Edition, Article NB-6000.

The RIII inspector reviewed the following hydrostatic test reports for the respective hydraulic lines (Table ~~5.3~~ 5.2-3):

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Table ~~5.3~~ 5.2-3 Hydrostatic Test Results

	Test Pressure (psig)				
Line No.	Design Max.	Max. Allow.	Actual Initial	Actual 10-Min. Holding	Report No.
1RR39AA	3000	3180	3010	3000	RR-28 3/2/79 Retest 9/27/79
1RR39AB	3000	3180	3010	3000	RR-27 3/1/79 Retest 9/27/79

5.2-3

Table ~~5.3~~ 7 (continued)

Line No.	Test Pressure (psig) Design Max ⊙	Max. Allow.	Actual Initial	Actual 10-Min. Holding	Report No.
1RR39AC (Drawings 241, 244)	200	225	215	150	RR-53 9/27/79
(Drawing 247)	200	215	210	160	RR-26 2/26/79
1RR39AD	3000	3180	3010	3000	RR-25 3/5/79 Retest 9/27/79
1RR40AA	3000	3180	3010	3000	RR-32 3/6/79 Retest 10/4/79
1RR40AB	3000	3180	3010	3000	RR-31 3/14/79 Retest 10/4/79

5.2-3

Table ~~5.3~~ (continued)

Line No.	Test Pressure (psig) Design Max.	Max. Allow.	Actual Initial	Actual 10-Min. Holding	Report No.
1RR40AC	200	215	210	160	RR-30 3/2/79 Retest 10/4/79
1RR40AD	3000	3180	3010	3000	RR-29 3/5/79 Retest 10/4/79

The preceding hydrostatic pressure tests were performed by using the system power unit to pressurize the lines through the actuators, as described in General Electric File No. VPF 3300-111-1 (Rucker Control Technical Manual No. TM 81999, paragraphs 5.7.3.1 through 5.7.3.9). Therefore, the actuators as well as the lines (pipes, fittings, valves, etc.) were subjected to the test pressures. The hydrostatic test reports indicated that the tests had been performed in accordance with QACMI No. M-10, Revision 6 and Revision 7, according to the effective dates.

5.2.3.7 Field Observations

On June 29 and 30, 1981, the RIII inspector visually inspected both of the hydraulic actuators and all of the attached lines (from the actuators to the penetrations leading out of the drywell). The inspector identified no unacceptable weld indications in any of the welds connecting the actuator, flange, or piping. The inspector noted that all of the welds were socket welds. The general piping installation, routing, material identification, and welds were as specified on the respective isometric drawings. The hydraulic system drain lines connected to the actuators for both of the recirculation flow control valves were installed in accordance with FDDR No. KN-1-299 dated December 18, 1978.

5.2.4 Findings and Conclusions

The investigation revealed that the design pressure rating of three hydraulic lines connected to the recirculation flow control valve actuators had been changed from 6000 psig to 3000 psig, and the design pressure rating of the drain line had been changed from 3000 to 150 psig. These design changes are considered acceptable by the NRC and the licensee.

An adaptor to a drain line on a hydraulic actuator to a recirculation flow control valve (not the valve itself) was broken, and a site control document was written that identified this condition. The cause of the broken adaptor was not documented and could not be determined. The item was ~~redesigned~~ modified to be less prone to damage.

The material used in the connections to the actuator was as specified on the installation drawings. The hydraulic systems were satisfactorily pressure tested.

The concern identified by the allegation, though not known previously by the NRC, had been adequately addressed by the licensee.

5.2.5 Items of Noncompliance

No items of noncompliance were identified.

5.3 Clogged Drains

5.3.1 Allegation

"A radioactive waste drain is clogged with concrete which carelessly was poured into the drain."

5.3.2 Background Information

Plant procedures require drains to be flushed with water prior to plant operation to confirm that the drains are clear of all restricting debris. The radwaste floor drains, ~~which are nonsafety-related (not necessary for safe operation and shutdown of the reactor),~~ will not handle any radioactive liquid until such material is generated following the start of plant operations.

The terms "radwaste drains" and "radioactive waste drains," as used by interviewed individuals, are synonymous terms for these floor drains, which normally drain small amounts of radioactive water that can leak from such sources as valve packings. The drains are designed to carry potentially radioactively contaminated water to the waste treatment facility.

5.3.3 Investigation

5.3.3.1 Interview of Individual A

On February 24, 1981, Individual A, who was previously interviewed by representatives of GAP, was interviewed by NRC. Individual A stated

that, while concrete finishing work was under way in the radioactive waste disposal area, he suggested to Kaiser construction personnel that a pipefitter be assigned to the concrete finishing crew to assure concrete did not enter and clog the floor drains. However, they disagreed with this suggestion and, instead, directed the floor drains be covered with duct tape to prevent concrete from entering and clogging the drains. Individual A stated that concrete did enter the lines and clog the radioactive waste drains.

On April 22, 1981, Individual A provided a written statement attesting to the preceding information; however, he requested that the statement not be attached to this report.

5.3.3.2 Interview of Individual B

Individual B stated that he worked as a pipefitter during 1976-1977, and worked with the drain flushing crew for the radwaste system. Individual B stated that during this period he observed floor drains in the system that were clogged with concrete, which he and others unsuccessfully tried to remove.

5.3.3.3 Interview of Test Coordinator and Startup Engineer

Telephone interviews were conducted by the Senior Resident Inspector on February 12, 1981 with the Test Coordinator, who was responsible for the radwaste building drain flushing activities, and on February 13, 1981 with the Startup Engineer, who was responsible for drain system flushes. Both

individuals indicated that some drains were found to be plugged with unspecified debris. In all of those cases, the drains were cleared and flow was verified.

5.3.3.4 Record Review and Onsite Observation

The Senior Resident Inspector reviewed CG&E Flushing Procedure No. DR, Rev. 0, for the drain system, approved on September 23, 1977. The purpose of this procedure was stated as follows: "This document details the procedure for cleaning the liquid radwaste floor drain and equipment drain piping to the various plant sumps and drain tanks. The floor drain and equipment drain piping shall be flushed until they flow freely and all large particulate matter is removed."

Appendices to the Flushing Procedure indicated that 152 of a total of 169 of the potential radioactive waste drains related to the radwaste building floor drain tank, the floor drain sludge tank, the radwaste floor drain sump, the floor drain collector tank, and the chemical waste tank had been flushed and verified in accordance with the procedure. The appendices indicated that the verifications had been made in 1979. The licensee stated that the flushing activities were continuing.

5.3.3.5 Field Observations

The Senior Resident Inspector made visual inspections of all of the accessible radwaste drain ports identified on Sargent & Lundy drawings A-533 Rev. F, A-534 Rev. F, and A-515 Rev. N. These drawings identified the drains in the radwaste building (elevations 496 ft, 527 ft, 513 ft, and 511 ft) and in the auxiliary building (elevations 567 ft 5 in., and 547 ft). None of

the observed drain ports were visibly plugged. The following floor drains were covered with tape at the time of the inspection and were therefore not inspected:

1. Radwaste Building--elevation 527 ft

   a. Drain Y-20

   b. Drain Y-17

2. Auxiliary Building--elevation 567 ft

   a. Drain L-26

   b. Drain G-26 (elevation 562 ft 5 1/4 in.)

   c. Drain G-22

   d. Drain G-20

   e. Drain G/H-20 (elevation 562 ft 6 3/4 in.)

   f. Drain H-22 (elevation 562 ft 7 5/8 in.)

   g. Drain H/J-24

   h. Drain G/H-22

5.3.4 Findings and Conclusions

Neither the flushing records, the personnel interviews, nor the Resident Inspector's observations confirmed or denied that drains had been clogged with concrete. NRC interviews with site personnel indicated that some drains had been clogged with unspecified debris. However, the investigation

confirmed that 152 out of a total of 169 of the potential radioactive waste drains, all of which are non-safety-related, were cleared of all restricting debris. The 17 drains that remain to be flushed are identified in the same controlled flushing procedure as the 152 that have already been flushed. RIII will determine the status of the remaining 17 drains prior to authorizing plant operation (50-358/81-13-).

5.3.5 Items of Noncompliance

No items of noncompliance were identified.

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5.4 Weak Valve Materials

5.4.1 Allegation

"A residue heat valve broke when a pipefitter bumped into it, raising new questions about the quality of metal used for valves."

An interview with the individual originating this allegation revealed that the "residue head valves" or "residue heat valves" were not the components of concern. The components involved in both allegations 5.2 and 5.4 were the hydraulic actuators for recirculation flow control valves.

Allegation 5.4 is addressed in allegation 5.2 because the investigation determined that both allegations were addressing the same component~~, by statements from the same alleger.~~

5.5 Weld Rod Control

5.5.1 Allegation

"Sensitive parts on welding rods are possibly damaged through storage at improper temperatures and possibly lost through failure to follow proper paperwork and labeling requirements."

This allegation addresses two weld rod concerns:

1. Weld rods were possibly absorbing moisture due to improperly controlled rod temperatures prior to consumption, which resulted in unacceptable welds.

2. Weld rods were not controlled because the paperwork and labeling requirements were not being properly followed. Therefore, welds may have been made with incorrect weld rods.

5.5.2 Background Information

For pressure boundary (pipe) welds, the ASME Code, Section III-1971 Edition Article NB-2440 states, "Suitable storage and handling of electrodes, flux and other welding materials shall be maintained. Precautions shall be taken to minimize absorption of moisture by fluxes and cored, fabricated and coated eleetrodes."

ASME Code, Section III-1971 Edition, Article NA-4460, states, "Measures shall be established to provide work and examination instructions for handling, storage, shipping and preservation of materials, parts, components, and appurtenances to prevent damage or deterioration. When necessary for particular products, special protective environments, such as inert gas atmospheres, specific moisture content levels and temperatures, shall be provided and their existence verified."

For structural welds, the AWS D1.1-1972 Code, Section 4.9.2, states, "All electrodes having low-hydrogen coverings conforming to AWS A5.1 shall be purchased in hermetically-sealed containers or shall be dried at least one hour at temperatures between 700°F and 800°F before being used. Electrodes shall be dried prior to use if the hermetically-sealed container shows evidence of damage. Immediately after removal from hermetically-sealed containers or from drying ovens, electrodes shall be stored in ovens held at a temperature of at least 250°F. E70XX electrodes that are not used within four hours, E80XX within two hours, E90XX within one hour, and E100XX and E110XX within one-half hour after removal from hermetically-sealed containers or removal from a drying or storage oven shall be redried before use. Electrodes which have been wet shall not be used."

The covering of low-hydrogen weld rods is hygroscopic (attracts moisture) when not heated or otherwise protected from moisture-containing air. Water contains hydrogen, so moisture absorption is undesirable.

If a low-hydrogen weld rod is allowed to cool below approximately 100 to 125°F and is not protected from normal atmosphere, it will begin to

attract moisture. The longer the rod is exposed, the more moisture will be absorbed. If a significant amount of moisture is absorbed, the resulting weld will contain porosity (gas pockets or voids). Such porosity will be evident in visual inspections of root or filler passes of weld metal, and will be visible in radiographs of the weld. In practice, an experienced welder will recognize that a rod has absorbed significant moisture by the way the weld is progressing, and will return or discard the affected rods.

If a low-hydrogen weld rod has absorbed very slight amounts of moisture, it will not have a significant effect on the resulting weld, its strength, or anticipated service life.

Kaiser Procedure SPPM No. 3.3, Revision 6, dated June 25, 1979 which was effective during September and October 1979, states the following:

"6.4 The Weld Rod Clerk shall issue all filler material on a weight basis. He shall record on the KEI Weld 2 form the weight of all bare rod and covered electrodes issued.

"He shall also, record on the KEI Weld 2 form the heat number and/or lot number for bare rods, consumable inserts and backing rings, and the heat number and lot number for covered electrodes prior to use.

"7.3 The Weld Rod Clerk shall weigh all bare rod and covered electrodes returned to Central Storage and record the weight on the KEI Weld 2 form. A new KEI Weld 2 form will be made out for each new issue of electrodes to and for each welder."

5.5.3 Investigation

5.5.3.1 Interview with Individual A

On February 24, 1981, Individual A, who was previously interviewed by representatives of GAP, was interviewed by NRC. He stated that he had observed unaccounted for weld rods (weld rods without accompanying KEI-2 weld rod issue forms) and had seen weld rod warming ovens unplugged and not being maintained at the proper temperature.

Individual A also stated that during September and October 1979 a pipefitter was not assigned to the weld rod issue point to account for weld rods during the evening shift. He stated that weld rod and weld rod issue slips were left out unattended for anyone to pick up and use.

On April 22, 1981, Individual A provided a written statement attesting to the preceding information; however, he requested the statement not be attached to this report.

5.5.3.2 Interview with Individual B

On April 14, 1981, Individual B, who was previously interviewed by representatives of GAP, was interviewed by NRC. He stated that Kaiser required weld rod ovens be maintained at the proper temperatures at all times. He said he could not state that every welder maintained his oven at the right temperature, but as a supervisor he assured his own men did.

He stated that weld rod issue forms (KEI-2) were occasionally lost and, in those cases, it was a common practice for welders to get a blank issue form, falsify it, and present it to the Kaiser Quality Control Inspectors in order for the weld to pass inspection. He said this was often done months after the fact by Kaiser construction supervisors who falsified weld rod issue forms to complete weld documentation packages. He indicated that, by doing this, they did not have to cut out and rework welds. [Note: Statements alleging falsification have been forwarded to the NRC Office of Inspector and Auditor for investigation.]

On April 14, 1981, Individual B provided a written statement attesting to the preceding information; however, he requested the statement not be attached to this report.

5.5.3.3 Record Review and Inspection

The Resident Inspector reviewed the receipt documentation for E7018 (low hydrogen) weld rods purchased on orders No. 34356, 35720, 37587, 39075, 39382, 39556, 39971, and 40318. The receipt documentation indicated that the E7018 rod had been received in sealed moisture-proof containers.

The Resident Inspector also verified that low-hydrogen electrodes (rods) that had not been issued to the field were clearly identified and stored in a clean, limited access, and dry area. In addition, in the field issue rooms (rod shacks), the low-hydrogen rods were either in sealed containers or in holding ovens at temperatures above 250°F.

The licensee provides portable rod warmers to be used near the work activities to maintain the weld rods in a dry condition until used. KEI Welding Filler Materials Control Procedure No. SPPM 3.3, Revision 7, paragraphs 3.5.4.2 and 3.5.4.3, respectively, state:

> "When covered electrodes are removed from a holding oven to be issued to welders they shall be placed in a portable rod warmer. Only one classification and heat or lot of electrodes shall be stored in each individual portable rod warmer. Each portable rod warmer shall be uniquely marked for identification purposes and shall be checked on a monthly basis to assure that each rod warmer maintains a correct temperature between 175°F and 400°F.
>
> "All covered electrodes exposed to ambient conditions for more than four hours without coming in direct contact with water shall be returned to central storage for rebaking..."

The Resident Inspector reviewed the December 1980 record for the Daily Temperature Check of holding ovens W50, W27, W38, W25, W39, W19, W11, and W26. The record indicates that oven W50 was 5°F under the specified 250°F on 3 of the 22 days checked; oven W25 was 5°F under the specified 250°F 1 of the 22 days; oven W39 was [illegible]°F under the specified 250°F on 1 day out of 22; and oven W26 was [illegible] under the specified 250°F on 1 day out of 22. Although these instances violated the letter of the procedure, the rods were still hot enough to ensure no moisture was absorbed. An

item of noncompliance was not issued because of the lack of significance of this observation.

The Resident Inspector reviewed the record for the monthly check of portable rod ovens (warmers). The record indicated that the temperatures of 209 warmers were checked on January 3, 1981 and that all were within the required range of 175° to 400°F.

The Resident Inspector also observed that unacceptable rod warmers in the field issue rooms were properly tagged to preclude their use and were segregated in a clearly marked area.

A review of reports of past NRC inspections disclosed instances when (1) weld rod has been found lying outside containers or ovens, (2) portable ovens were not plugged in, (3) oven temperature indicators were not calibrated at the specified frequency, (4) holding ovens containing different type rods, and (5) other control procedure requirements were not adhered to. These items are documented in Inspection Reports No. 75-05, 76-07 76-11, 77-02, 79-07, 79-15, 80-07, 80-14, and 80-19.

The portable rod warmers not being plugged in and holding ovens containing different types of rods were not violations of the ASME or AWS Codes.

5.5.3.4 Physical Control of Weld Rods

The paperwork used to account for weld rod is the weld rod issue form (KEI-2). The weld rod issue form requires signatures from the welder, the welder's foreman, and the weld rod issuer permitting the welder to obtain weld rods for a specific weld from the rod shack (field storeroom).

5.5.3.4.1 Review of Timecards

The RIII inspectors reviewed KEI Daily Timecards (personnel time records) for 21 different days, and some respective weld rod issue forms (KEI-2 forms), to determine if a weld rod clerk was assigned to the field and rod shack during the second shift for September and October 1979. The timecards indicated that two individuals (K. Kern and G. Jones) had worked overtime (after 4:00 p.m.) in the rod shack for 1 to 4 1/2 hr on 20 of the 21 days (1 hr for 10 days, 1.3 hr for 2 days, 2 hr for 3 days, 2.5 hr for 2 days, 3.5 hr for 2 days, and 4.5 hr for 1 day).

The following inconsistencies were identified between the timecards and the weld rod issue forms:

1. On September 5, 1979, only Kern was assigned to the rod shack for 1 hr during the second shift, but the signature mark on weld form 200379 did not appear to resemble Kern's signature mark and there was no signature mark for the rod clerk on weld form 200380.

2. On September 10, 1979, no one was assigned to the rod shack during the second shift, but weld rod issue forms 200431 and 200432 had scribbled marks indicating a rod clerk's signature.

3. On September 11, 14, 18, and 28, 1979, Kern was the only one assigned to the rod shack for 1 hr during the second shift, but the signature on forms 200465, 200485, 200486, 200458, 185618, 185617, 185732, 185745, and 185733 appeared to be representations of Jones' initials.

4. On September 17 and October 18, 1979, only Jones was assigned to the rod shack for 1 hr during the second shift, but the scribbled signature on forms 200487, 185614, and 184744 appeared to be representations of Kern's signature.

5. On September 19 and 26, 1979, only Kern was recorded as being assigned to the rod shack for 3 1/2 hr during the second shift, but the signature on forms 185630, 185631, 185712, and 185713 appeared to be representations of Jones' initials.

6. On October 3 and 5, 1979, only Kern was recorded as being assigned to the rod shack for 2 hr during the second shift, but the signature on forms 184690, 184662, 184661, and 184660 appeared to be a representation of Jones' initials.

7. On October 4, 1979, only Jones was recorded as being assigned to the rod shack for 1 hr 18 min during the second shift, but the scribbled signature on forms 184710, 184711, and 184712 appeared to be a representation of Kern's signature.

The welders identified on the above weld rod issue forms were pipefitters and boilermakers working on the second shift during September and October 1979. The RIII inspector noted that the alleger was one of the assigned pipefitters and boilermakers.

The issuance of weld rod was to be performed by the weld rod clerk as described in H. J. Kaiser Procedure SPPM #3.3, Revision 6. This procedure also specified requirements to control weld rod temperature and traceability at the rod shack.

The CG&E QA Manager informed ~~[illegible]~~ by telephone on August 13, 1981, that the licensee's review of time cards for the dates in question showed the appropriate weld rod clerks were ~~[illegible]~~ working on days in question. He indicated the NRC did not review the time cards. This is considered to be an unresolved item and will be reviewed during a subsequent inspection (50-358/81-13-)

In addition ~~to the above lack of physical control of weld rods~~, RIII inspectors on numerous occasions have observed weld rods lying uncontrolled in the construction area.

5.5.4 Findings and Conclusions

Based on the findings of this investigation, there have been instances when (1) weld rods have been stored at improper temperatures, (2) portable ovens were not plugged in, (3) oven temperature indicators were not calibrated at

the specified frequency, (4) weld rod issuance has not been controlled, and (5) welds rods were observed lying uncontolled in the construction area.

The concerns identified by this and other allegations and by previous inspection findings collectively are viewed to be significant and have potential safety importance. These concerns are being addressed by the licensee in the Quality Confirmation Program and by NRC in followup inspections.

5.5.5 Items of Noncompliance

No new
~~One~~ items of noncompliance ~~concerning failure to maintain control of weld rod~~ were ~~was~~ identified.

5.5 Weld Rod Control

5.5.1 Allegation

"Sensitive parts on welding rods are possibly damaged through storage at improper temperatures and possibly lost through failure to follow proper paperwork and labeling requirements."

This allegation addresses two weld rod concerns:

1. Weld rods were possibly absorbing moisture due to improperly controlled rod temperatures prior to consumption, which resulted in unacceptable welds.

2. Weld rods were not controlled because the paperwork and labeling requirements were not being properly followed. Therefore, welds may have been made with incorrect weld rods.

5.5.2 Background Information

For pressure boundary (pipe) welds, the ASME Code, Section III-1971 Edition Article NB-2440 states, "Suitable storage and handling of electrodes, flux and other welding materials shall be maintained. Precautions shall be taken to minimize absorption of moisture by fluxes and cored, fabricated and coated electrodes."

ASME Code, Section III-1971 Edition, Article NA-4460, states, "Measures shall be established to provide work and examination instructions for handling, storage, shipping and preservation of materials, parts, components, and appurtenances to prevent damage or deterioration. When necessary for particular products, special protective environments, such as inert gas atmospheres, specific moisture content levels and temperatures, shall be provided and their existence verified."

For structural welds, the AWS D1.1-1972 Code, Section 4.9.2, states, "All electrodes having low-hydrogen coverings conforming to AWS A5.1 shall be purchased in hermetically-sealed containers or shall be dried at least one hour at temperatures between 700°F and 800°F before being used. Electrodes shall be dried prior to use if the hermetically-sealed container shows evidence of damage. Immediately after removal from hermetically-sealed containers or from drying ovens, electrodes shall be stored in ovens held at a temperature of at least 250°F. E70XX electrodes that are not used within four hours, E80XX within two hours, E90XX within one hour, and E100XX and E110XX within one-half hour after removal from hermetically-sealed containers or removal from a drying or storage oven shall be redried before use. Electrodes which have been wet shall not be used."

The covering of low-hydrogen weld rods is hygroscopic (attracts moisture) when not heated or otherwise protected from moisture-containing air. Water contains hydrogen, so moisture absorption is undesirable.

If a low-hydrogen weld rod is allowed to cool below approximately 100 to 125°F and is not protected from normal atmosphere, it will begin to

attract moisture. The longer the rod is exposed, the more moisture will be absorbed. If a significant amount of moisture is absorbed, the resulting weld will contain porosity (gas pockets or voids). Such porosity will be evident in visual inspections of root or filler passes of weld metal, and will be visible in radiographs of the weld. In practice, an experienced welder will recognize that a rod has absorbed significant moisture by the way the weld is progressing, and will return or discard the affected rods.

If a low-hydrogen weld rod has absorbed very slight amounts of moisture, it will not have a significant effect on the resulting weld, its strength, or anticipated service life.

Kaiser Procedure SPPM No. 3.3, Revision 6, dated June 25, 1979 which was effective during September and October 1979, states the following:

"6.4 The Weld Rod Clerk shall issue all filler material on a weight basis. He shall record on the KEI Weld 2 form the weight of all bare rod and covered electrodes issued.

"He shall also, record on the KEI Weld 2 form the heat number and/or lot number for bare rods, consumable inserts and backing rings, and the heat number and lot number for covered electrodes prior to use.

"7.3 The Weld Rod Clerk shall weigh all bare rod and covered electrodes returned to Central Storage and record the weight on the KEI Weld 2 form. A new KEI Weld 2 form will be made out for each new issue of electrodes to and for each welder."

5.5.3 Investigation

5.5.3.1 Interview with Individual A

On February 24, 1981, Individual A, who was previously interviewed by representatives of GAP, was interviewed by NRC. He stated that he had observed unaccounted for weld rods (weld rods without accompanying KEI-2 weld rod issue forms) and had seen weld rod warming ovens unplugged and not being maintained at the proper temperature.

Individual A also stated that during September and October 1979 a pipefitter was not assigned to the weld rod issue point to account for weld rods during the evening shift. He stated that weld rod and weld rod issue slips were left out unattended for anyone to pick up and use.

On April 22, 1981, Individual A provided a written statement attesting to the preceding information; however, he requested the statement not be attached to this report.

5.5.3.2 Interview with Individual B

On April 14, 1981, Individual B, who was previously interviewed by representatives of GAP, was interviewed by NRC. He stated that Kaiser required weld rod ovens be maintained at the proper temperatures at all times. He said he could not state that every welder maintained his oven at the right temperature, but as a supervisor he assured his own men did.

He stated that weld rod issue forms (KEI-2) were occasionally lost and, in those cases, it was a common practice for welders to get a blank issue form, falsify it, and present it to the Kaiser Quality Control Inspectors in order for the weld to pass inspection. He said this was often done months after the fact by Kaiser construction supervisors who falsified weld rod issue forms to complete weld documentation packages. He indicated that, by doing this, they did not have to cut out and rework welds. [Note: Statements alleging falsification have been forwarded to the NRC Office of Inspector and Auditor for investigation.]

On April 14, 1981, Individual B provided a written statement attesting to the preceding information; however, he requested the statement not be attached to this report.

5.5.3.3 Record Review and Inspection

The Resident Inspector reviewed the receipt documentation for E7018 (low hydrogen) weld rods purchased on orders No. 34356, 35720, 37587, 39075, 39382, 39556, 39971, and 40318. The receipt documentation indicated that the E7018 rod had been received in sealed moisture-proof containers.

The Resident Inspector also verified that low-hydrogen electrodes (rods) that had not been issued to the field were clearly identified and stored in a clean, limited access, and dry area. In addition, in the field issue rooms (rod shacks), the low-hydrogen rods were either in sealed containers or in holding ovens at temperatures above 250°F.

The licensee provides portable rod warmers to be used near the work activities to maintain the weld rods in a dry condition until used. KEI Welding Filler Materials Control Procedure No. SPPM 3.3, Revision 7, paragraphs 3.5.4.2 and 3.5.4.3, respectively, state:

> "When covered electrodes are removed from a holding oven to be issued to welders they shall be placed in a portable rod warmer. Only one classification and heat or lot of electrodes shall be stored in each individual portable rod warmer. Each portable rod warmer shall be uniquely marked for identification purposes and shall be checked on a monthly basis to assure that each rod warmer maintains a correct temperature between 175°F and 400°F.
>
> "All covered electrodes exposed to ambient conditions for more than four hours without coming in direct contact with water shall be returned to central storage for rebaking..."

The Resident Inspector reviewed the December 1980 record for the Daily Temperature Check of holding ovens W50, W27, W38, W25, W39, W19, W11, and W26. The record indicates that oven W50 was 5°F under the specified 250°F on 3 of the 22 days checked; oven W25 was 5°F under the specified 250°F 1 of the 22 days; oven W39 was 15°F under the specified 250°F on 1 day out of 22; and oven W26 was 10°F under the specified 250°F on 1 day out of 22. Although these instances violated the letter of the procedure, the rods were still hot enough to ensure no moisture was absorbed. An

item of noncompliance was not issued because of the lack of significance of this observation.

The Resident Inspector reviewed the record for the monthly check of portable rod ovens (warmers). The record indicated that the temperatures of 209 warmers were checked on January 3, 1981 and that all were within the required range of 175° to 400°F.

The Resident Inspector also observed that unacceptable rod warmers in the field issue rooms were properly tagged to preclude their use and were segregated in a clearly marked area.

A review of reports of past NRC inspections disclosed instances when (1) weld rod has been found lying outside containers or ovens, (2) portable ovens were not plugged in, (3) oven temperature indicators were not calibrated at the specified frequency, (4) holding ovens containing different type rods, and (5) other control procedure requirements were not adhered to. These items are documented in Inspection Reports No. 75-05, 76-07, 76-11, 77-02, 79-07, 79-15, 80-07, 80-14, and 80-19.

The portable rod warmers not being plugged in and holding ovens containing different types of rods were not violations of the ASME or AWS Codes.

5.5.3.4 Physical Control of Weld Rods

The paperwork used to account for weld rod is the weld rod issue form (KEI-2). The weld rod issue form requires signatures from the welder, the welder's foreman, and the weld rod issuer permitting the welder to obtain weld rods for a specific weld from the rod shack (field storeroom).

5.5.3.4.1 Review of Timecards

The RIII inspectors reviewed KEI Daily Timecards (personnel time records) for 21 different days, and some respective weld rod issue forms (KEI-2 forms), to determine if a weld rod clerk was assigned to the field and rod shack during the second shift for September and October 1979. The timecards indicated that two individuals (K. Kern and G. Jones) had worked overtime (after 4:00 p.m.) in the rod shack for 1 to 4 1/2 hr on 20 of the 21 days (1 hr for 10 days, 1.3 hr for 2 days, 2 hr for 3 days, 2.5 hr for 2 days, 3.5 hr for 2 days, and 4.5 hr for 1 day).

The following inconsistencies were identified between the timecards and the weld rod issue forms:

1. On September 5, 1979, only Kern was assigned to the rod shack for 1 hr during the second shift, but the signature mark on weld form 200379 did not appear to resemble Kern's signature mark and there was no signature mark for the rod clerk on weld form 200380.

2. On September 10, 1979, no one was assigned to the rod shack during the second shift, but weld rod issue forms 200431 and 200432 had scribbled marks indicating a rod clerk's signature.

3. On September 11, 14, 18, and 28, 1979, Kern was the only one assigned to the rod shack for 1 hr during the second shift, but the signature on forms 200465, 200485, 200486, 200458, 185618, 185617, 185732, 185745, and 185733 appeared to be representations of Jones' initials.

4. On September 17 and October 18, 1979, only Jones was assigned to the rod shack for 1 hr during the second shift, but the scribbled signature on forms 200487, 185614, and 184744 appeared to be representations of Kern's signature.

5. On September 19 and 26, 1979, only Kern was recorded as being assigned to the rod shack for 3 1/2 hr during the second shift, but the signature on forms 185630, 185631, 185712, and 185713 appeared to be representations of Jones' initials.

6. On October 3 and 5, 1979, only Kern was recorded as being assigned to the rod shack for 2 hr during the second shift, but the signature on forms 184690, 184662, 184661, and 184660 appeared to be a representation of Jones' initials.

7. On October 4, 1979, only Jones was recorded as being assigned to the rod shack for 1 hr 18 min during the second shift, but the scribbled signature on forms 184710, 184711, and 184712 appeared to be a representation of Kern's signature.

The welders identified on the above weld rod issue forms were pipefitters and boilermakers working on the second shift during September and October 1979. The RIII inspector noted that the alleger was one of the assigned pipefitters and boilermakers.

The issuance of weld rod was to be performed by the weld rod clerk as described in H. J. Kaiser Procedure SPPM #3.3, Revision 6. This procedure also specified requirements to control weld rod temperature and traceability at the rod shack.

The previously noted inconsistencies indicate that the weld rod was removed from the rod shack by individuals other than the assigned weld rod clerk. Thus, the control of the weld rod at the rod shack was not maintained by the weld rod clerk as required by H. J. Kaiser Procedure SPPM 3.3. This is contrary to 10 CFR 50, Appendix B, Criterion V and the Zimmer QA Manual, Section 5.

In addition to the above lack of physical control of weld rods, RIII inspectors on numerous occasions have observed weld rods lying uncontrolled in the construction area.

5.5.4 Findings and Conclusions

Based on the findings of this investigation, there have been instances when (1) weld rods have been stored at improper temperatures, (2) portable ovens were not plugged in, (3) oven temperature indicators were not calibrated at

the specified frequency, (4) weld rod issuance has not been controlled, and (5) welds rods were observed lying uncontolled in the construction area.

The concerns identified by this and other allegations and by previous inspection findings collectively are viewed to be significant and have potential safety importance. These concerns are being addressed by the licensee in the Quality Confirmation Program and by NRC in followup inspections.

5.5.5 Items of Noncompliance

One item of noncompliance concerning failure to maintain control of weld rod was identified.

INSERT 1 (NOTE TABLE MAY BE ON SYSTEM...).

Piping$U

The traceability of some of the piping components comprising the lines in the diesel generator cooling water, starting air, and fuel oil systems was not maintained. The discrepancies were as follows:

(1) Some The heat numbers recorded on thsiso<<the isometric drawings did not match the heat numbers on the installed components. These piping components are documented on Attachment C to this report.

(2) Some The heat numbers recorded on the isometric drawings dh<<had been marked or whited out and then an incorrect heat number recorded. For example, ISK M-242-2-DG-53 was apparently changed to indicate heat number HA-001 for the 3/4 inch and 1/2 inch installed piping. Based on the records for accepted heat numbers, number HA-001 represented 1 1/4 inch piping.

4

INSERT 1 (NOTE TABLE MAY BE ON SYSTEM...).

4. Piping$U

The traceability of some of the piping components comprising the lines in the diesel generator cooling water, starting air, and fuel oil systems was not maintained. The discrepancies were as follows:

(1) Some heat numbers recorded on thsiso<<the isometric drawings did not match the heat numbers on the installed components. These piping components are documented on Attachment C to this report.

(2) Some heat numbers recorded on the isometric drawings dh<<had been marked or whited out and then an incorrect heat number recorded. For example, ISK M-242-2-DG-53 was apparently changed to indicate heat number HA-001 for the 3/4 inch and 1/2 inch installed piping. Based on the records for accepted heat numbers, number HA-001 represented 1 1/4 inch piping.

4

~~Appendix~~ ~~Table X~~ ⇒ Discrepancies Between Installed Piping and Traceability Records

~~Attachment 1~~ Table 4.3-1

Isometric Drawing No.	Line No.	Item in Question	Heat Number or Part Identification Number	
			According to Mtrg.	Actually Installed
ISK M-428-6-DG-19	1DG28AB1	90° ell	M 276	M 267
		Tee	M 315	M 274
		Pipe	HE 6247	8464
ISK M-428-6-DG-103	1DG28AB1	flange	RVA	CB8
JSK M-428-6-DG-16	1DG27AB1	pipe	HE6247	16E4
				16D2
ISK M-428-8-DG-68	1DG01AB1	pipe	HE6247	3416
ISK M-767-4-DG-113	1DGF2AA ½	90° ells	M395	M252
	1DGF2BA ½			
ISK M-428-6-DG-24	1DG27AE1			
	1DG28AE1	pipe	HD7123	TW24402
ISK M-428-6-DG-105	1DG28AE1	flange	RD2Y	CB8
ISK M-242-2-DG-53	1DG C5AA ¾	pipe	HA001	JE9922
		90 ell	M262	M87
	1DGF6AA ½	pipe	HA001	HA0170
	1DG C5BA ¾	pipe	HA001	JE9922
		90 ell	M262	M87
	1DGF6BA ½	pipe	HA001	HA0171

Drawing No.	Line No.	Item in Question	Heat Number or Part I.D. Number	
			According to Dwg.	Actually Installed
ISK M-428-6-DG-26	10G 25AC2	pipe	516405	502891
				415007
		90 ell	M287	M273
ISK M-428-6-DG-27	10G 25AC2	pipe	516405	502891
				415007

(c)
(3) Three heat numbers (HA-0170, TW 24402, and 502891) found on the installed piping, do not appear on the records of accepted heat numbers.

In many instances, heat numbers could not be found on the installed component. Therefore, a comparison could not be made to the number recorded on the drawings.

6 5A

B. heat number

Failure to maintain identification ~~either on~~ of for the above beams, piping, and weld rod is contrary to 10CFR50 Appendix B Criterion VIII and the Wm. H. Zimmer QA Manual, Section 8a as described in the Appendix A to the report transmittal letter. (353/81-13-07)

8/7/81 RFW mtg

SUMMARY OF FACTS

Since January 12, 1981, the U.S. Nuclear Regulatory Commission (NRC) has been investigating alleged quality assurance and quality control irregularities at the Zimmer nuclear facility. This investigative effort is comprised of four areas as follows: (1) allegations received on November 18, 1980, from an ~~ex~~ former quality control inspector working at another construction site; (2) allegations received ~~on~~ in January 1981, from the Government Accountability Project of the Institute for Policy Studies on behalf of ~~Mr.~~ Thomas Applegate; (3) allegations received from numerous ~~plant~~ contractor workers and ~~ex-plant~~ former plant workers during the course of the investigation; and (4) other problems independently identified by NRC inspectors during the course of the investigation. The investigative effort, which is still ongoing, has thus far resulted in the interviews of over ~~100~~ 90 individuals and the expenditure of approximately 182 staff days ~~75 mandays~~ onsite by NRC inspectors and investigators. Although the investigation is continuing, a report covering efforts to date is being issued at this time in recognition of the significant public interest in this matter.

In a related matter, the Government Accountability Project, in a letter to the Merit Systems Protection Board of the U.S. Office of Personnel Management, dated December 10, 1980, charged that the NRC had failed to perform a thorough and complete investigation into allegations made in February 1980 by ~~Mr.~~ Applegate and requested a separate investigation into that matter. An investigation has been performed by the NRC's Office of Inspector and Auditor to review those charges. ~~The results of that investigation will be reported to the Commission.~~

The current ~~subject~~

This investigation has identified a number of quality-related problems at the Zimmer site. ~~While~~ Although some actual construction deficiencies have been identified, the majority of the problems identified to date focus on the ineffectiveness of controls implemented by the licensee and its contractors

Insert on page 2

In addition to the previously discussed quality deficiencies ~~discussed above~~, numerous problems have been identified with respect to the accuracy of the quality-related records. This matter is being reviewed by the NRC's Office of Inspector and Auditor for possible criminal considerations.

deficiencies.

Following a meeting with NRC on March 31, 1981, the utility implemented several actions to correct identified quality assurance weaknesses and to preclude their recurrence. These actions, which included augmented QA staffing, upgraded procedures, improved training of QC inspectors, and a

100% reinspection by the licensee of contractor QC inspections, and other QC and QA program improvements, were confirmed in an Immediate Action Letter to the licensee on April 8, 1981.

By letter dated May 11, 1981, the Government Accountability Project requested the Regional Director to recommend suspension of the construction permit because of repeated noncompliances with NRC regulations and numberous allegations of inadequate construction practices. The information provided was carefully considered; however, it was concluded that there was no basis at the present time to recommend such action.

A comprehensive program has been developed by the licensee and the ~~with input from~~ NRC, to confirm the adequacy of completed construction. This program must be completed and identified problem areas resolved before an Operating License will be granted. In addition to witnessing and reviewing portions of the confirmation program conducted by the licensee and its contractors, ~~the~~ NRC will be conducting a program of independent measurements to further evaluate the adequacy of construction.

A table of allegations and investigation Findings follows:

Insert A

5.13.3.9 Review of Unattended Fuel

Fuel ~~apparently~~ was left unattended for short periods of time (up to ~~ten~~ 10 minutes) while at ground level during receipt and transfer to the fuel pool storage area (627 ft. level). There is no evidence that the fuel was left unattended, except during authorized evacuations, while in permanent storage. In view of the protection afforded the fuel by the shipping container and the fact that there was no evidence that the shipping containers had been opened, this matter is not viewed as significant.

5.13.3.10 Review of Storage Area Wall Design

The Zimmer FSAR, Section 3.3.2, "Tornado Loadings," states that "all siding and roof decking of any superstructure is designed and detailed to blow off when the design tornado approaches the station, and the bare frame is designed to resist tornado wind forces". A design wind velocity of 90 mph was utilized.

The design has been reviewed by NRC and judged acceptable. In this regard, ~~these are noted~~ three points are important.

1. The blow-out design feature is to protect ~~the spent~~ safety ~~systems~~ structures from collapse, and to provide adequate protection against missiles.

2. The spent fuel storage facility, which will ~~designed~~ ~~to~~ store the fuel once it becomes radioactive, is designed to ~~prevent~~ prevent

significant loss of watertight integrity of the pool and to prevent missiles from contacting fuel within the pool,

(unirradiated)
(c) New fuel, if ejected during a tornado, does not pose a radiological hazard to the public.
(significant.

6.3 QA Surveillance Reports

An allegation was received by the NRC during this investigation from a site employee concerning a surveillance report procedure violation. The allegation stated that surveillance reports were not being transferred to Nonconformance Reports in 30 days as required by procedure. Upon initiating the investigation of the alleged concern, the RIII inspector identified an inadequacy in the procedure which would require corrective actions that would resolve the alleged concern.

6.3.1 Record Reviews

The Region III inspectors reviewed the H. J. Kaiser Company Instruction No. QACMI G-14, Revision 3, for initiating and documenting QA Surveillance Reports (SR), QACMI G-14, page 1, paragraph 2, states that..."surveillance reports will be used to identify...an in-process nonconformance which can be corrected without processing a Nonconformance Report (NR)." QACMI G-14, page 2, paragraph 5 states "Except in extenuating circumstances, QA surveillance reports which identify in-process nonconformances will be transferred to a NR when the non-complying condition has not been acceptably corrected within 30 calendar days."

The following QA Surveillance Reports ~~have been initiated to~~ identify in-process nonconformances (deficiencies):

No. 2899 dated December 18, 1980--bolt torque verification missed

No. 2903 dated January 14, 1981--weld verifications missed

No. F-2909 dated Janaury 16, 1981--bolts missing or loose

No. 2914 dated Janaury 15, 1981--NDE hold points bypassed

No. F-2941 dated January 28, 1981--broken flex, bolts fail to torque, etc.

No. F-3070 dated March 24, 1981--bolt installation not verified

No. F-3071 dated March 24, 1981--elongated holes in baseplate

No. F-3072 dated March 24, 1981--elongated holes in baseplate

No. F-3073 dated March 24, 1981--bolts do not meet torque requirements

No. F-3074 dated March 24, 1981--bolts stripped

No. F-3075 dated March 24, 1981--bolt holes elongated

No. F-3076 dated March 24, 1981--hanger needs shimming and spalling repair

No. F-3082 dated March 25, 1981--cable is too short

No. F-3083 dated March 26, 1981--unacceptable welds

No. F-3099 dated March 27, 1981--bolt deficiencies

No. F-7000 dated March 30, 1981--weld deficiencies, missing braces, etc.

No. F-7006 dated April 1, 1981--weld deficiencies

No. F-7019 dated April 6, 1981--weld deficiencies

The RIII inspector made no attempt to determine the disposition of the above SRs or to determine if the SRs had been transferred to a NR within 30 calendar days. The SRs were reviewed to determine if the identified in-process nonconformances would effect the original design. All of the above 10 SRs do effect the original design.

The disposition on S.R.# 2899, indicated that based on a rejection rate of less than 1% of the verified torque on other bolts, the bolts on approximately 10% of (conduit straps, non engineered hangers, etc) the attachments in various areas (Plan No. 1 of EI drawing 150-2 revision D for example) were acceptable without required torque verifications (one bolt per attachment). The disposition dated 11/5/81 was made only by a H. J. Kaiser Assurance Quality Engineer and not by design control measures commensurate with those applied to the original design. If S.R.# 2899 had been documented on an NCR as specified in H. J. Kaiser Co. Instruction (QAC MI) # G-4 for controlling nonconformances, would have been required to make the disposition. The Review Board comprised of the KEL Construction Engineer, CGE QA and Standards Engineer, KEL QA Engineer, the CGE Sponsor Engineer, and

F3099

dated 1/14/31

d The disposition on S.R. # 2903 indicated that welds A3 and A4 on ~~the~~ pipe line ISK RR-298 were acceptable-as-is based on normal ambient temperature ~~radiographic~~ ~~simple verification (20 of approximately 400) of~~ the plus proper fit-up ~~of~~ on other welds which ~~were~~ plus the sample verification by radiography of fit-ups on 20 out of approximately 400 other welds.

The disposition was made only by the H.V. Kaiser QA Manager and not by design control measures commensurate with those applied to the original design.

dated

d ~~as~~ The disposition ~~dated~~ 1/23/31 on S.R. # 2914 indicated that the welds (DB 177 to DCS 80) were ~~was~~ acceptable ~~based~~ based on visual examination ~~(VT)~~ (VT) of weld DB177 and the magnetic particle testing (MT) of the ~~weld~~ root pass connecting DB 177 to DCS 80. Thus the final M.T. was waived.

The disposition was made only by a H. J. Kaiser Quality Assurance Engineer and not by design control measures commensurate with those applied to the original design.

If the items addressed on SRs # 2899, 2903, and # 2914 would have been documented on Nonconformance Reports (NRs), H. J. Kaiser Instruction (QACMI) # G-4 would have required ~~the dispositions~~ dispositions to have been made by a Review Board. The Review Board would have been comprised of the KEI Construction Engineer, CG&E QA and Standards Engineer, KEI QA Engineer, CG&E Sponsor Engineer, and the SAL Design Engineer.

4 The accepted in SRs 2899, 2903, and 2914

Nonconforming items ~~would~~ represent changes to the original design, ~~when accepted-as-is or dispositioned in any other manner except as specified by the design.~~ The 30 day period specified in Instruction QAMCI G-14, Revision 3, in essence, permitted nonconforming items to be dispositioned without design control measures commensurate with those applied to the original design if the SR was dispositioned without being transferred to an NR. This is contrary to 10 CFR 50, Appendix B, Criterion XV, and the Wm. H. Zimmer QA Manual, Section 15.9. (50-358/81-13-08)

4 The in process nonconformances identified on SRs F-2909, F-3070, F-3071, F-3072, F-3073, F-3074, F-3075, & F-3076, F-3083, and F-7019 or acceptably corrected were not dispositioned as of August 12, 1981, and were not transferred to NRs within 30 calendar days. This is contrary to 10 CFR 50 Appendix B Criterion V and the Wm. H. Zimmer QA Manual, Section 5 as described in Appendix A to the report Transmittal letter (353/81-13-09).

dispositions to the

4 The in process nonconformances identified on SRs F-2941, and F-3099, indicated that some of items had been acceptably corrected, ~~some~~ and the others had been transferred to NRs, ~~and the others had not been dispositioned as of August 12, 1991.~~

4 The dispositions to the in-process nonconformances identified on SRs ~~F-7006~~ F-3032, F-7000, and F-7006 ~~had been~~ indicated that all of the items had been transferred to NRs.

6.3.2 Findings and Conclusions

The site Instruction (QACMI G-14) which only required in-process nonconformance to be transferred from surveillance reports to nonconformance reports if not acceptably corrected within 30 days, was inadequate. The 30 day period did not assure that all nonconformances, which ~~in effort essence~~ constituted design changes if dispositioned other than specified by the original design, would be subjected to design control measures commensurate with the original design. ~~The corrective actions to this inadequacy will require the licensee to review all surveillance reports to assure that the identified nonconformances are subjected to design control measures commensurate with the original design.~~ These design control measures would have been required if the in-process nonconformances were documented on nonconformance reports. ~~In light of the required corrective actions, the alleged concern will be resolved without the need for further investigation.~~

Some of the SRs were not transferred to NRs as required by ~~QAMI~~ QACMI G-14.

6.3.3 Items of Noncompliance

~~Two~~ One item of noncompliance ~~was~~ were identified. (Failure to establish measures to assure nonconformances are subjected to design control measures commensurate with those applied to the original design and failure to follow procedure to transfer ~~SR~~ ~~SRs~~ inprocess nonconformances identified on surveillance reports to nonconformance reports in 30 days).

7.0 Independent NRC Inspection Findings

During the course of the investigation, ~~several~~ RIII inspectors performed independent inspections of various plant areas during allegation reviews. ~~In the course of these inspections, observations were made of equipment which appeared to be deficient.~~ In those areas where deficient conditions were observed, ~~In those cases,~~ further inspection ~~effort~~ was undertaken ~~expended~~ to determine ~~if~~ the extent of the deficient conditions. ~~observed defects were singular or represented systematic deficiencies.~~

7.3 QA Surveillance Reports

The Region III inspectors reviewed the H. J. Kaiser Company Procedure No. QACMI G-14, Revision 3, for initiating and documenting QA Surveillance Reports (SR) QACMI G-14, page 1, paragraph 2, states that surveillance reports will be used to identify in-process nonconformances that can be corrected without processing a Nonconformance Report (NR). The QA Surveillance Report form provides a checkpoint to identify in-process deficiencies.

The following QA Surveillance Reports have been initiated to identify deficiencies or nonconforming items:

No. 2899 dated December 18, 1980--bolt torque verification missed

No. 2903 dated January 14, 1981--weld verifications missed

No. F-2909 dated Janaury 16, 1981--bolts missing or loose

No. 2914 dated Janaury 15, 1981--NDE hold points bypassed

No. F-2941 dated January 28, 1981--broken flex, bolts fail to torque, etc.

No. F-3070 dated March 24, 1981--bolt installation not verified

No. F-3071 dated March 24, 1981--elongated holes in baseplate

No. F-3072 dated March 24, 1981--elongated holes in baseplate

No. F-3073 dated March 24, 1981--bolts do not meet torque requirements

No. F-3074 dated March 24, 1981--bolts stripped

No. F-3075 dated March 24, 1981--bolt holes elongated

No. F-3076 dated March 24, 1981--hanger needs shimming and spalling repair

No. F-3082 dated March 25, 1981--cable is too short

No. F-3083 dated March 26, 1981--unacceptable welds

No. F-3099 dated March 27, 1981--bolt deficiencies

No. F-7000 dated March 30, 1981--weld deficiencies, missing braces, etc.

No. F-7006 dated April 1, 1981--weld deficiencies

No. F-7019 dated April 6, 1981--weld deficiencies

Following the directions given in QACMI G-14, Revision 3, page 2, paragraph 5, a surveillance report identifying an in-process nonconformance, will be transferred to an NR when the nonconforming condition has not been acceptably corrected.

Nonconforming items would, in effect, represent changes to the original design, when acceptable-as-is." Surveillance reports that identified nonconforming items and were not transferred to an NR did not require reviews by appropriate engineers. Therefore, measures were not established to assure that all in-process deficiency dispositions are reviewed and approved by appropriate design and QA engineers. This is contrary to 10 CFR 50, Appendix B, Criterion XV, and the Wm. H. Zimmer QA Manual, Section 15.9. (50-358/81-13-08).

6.3 QA Surveillance Reports

An allegation was received by the NRC from a site employee during this investigation concerning Surveillance Report procedure violations. The allegation stated that Surveillance Reports were not being transferred to Nonconformance Reports in 30 days as required by procedure.

6.3.1 Record Reviews

The Region III inspectors reviewed the H. J. Kaiser Company Instruction ~~No.~~ QACMI G-14, Revision 3, for initiating and documenting QA Surveillance Reports (SR). ~~QACMI G-14,~~ Page 1, paragraph 2, of the procedure states that..."surveillance reports will be used to identify...an in-process nonconformance which can be corrected without processing a Nonconformance Report (NR)." ~~QACMI G-14,~~ Page 2, paragraph 5 of the procedure states "Except in extenuating circumstances, QA surveillance reports which identify in-process nonconformances will be transferred to a NR when the non-complying condition has not been acceptably corrected within 30 calendar days."

The following QA Surveillance Reports identify in-process nonconformances (deficiencies):

No. 2899 dated December 18, 1980--bolt torque verification missed

No. 2903 dated January 14, 1981--weld (fitup and preheat of 60°) verifications missed

No. F-2909 dated Janaury 16, 1981--bolts missing or loose

No. 2914 dated Janaury 15, 1981--NDE weld hold points (MT and VT) bypassed

No. F-2941 dated January 28, 1981--broken flex, bolts fail to torque, etc.

No. F-3070 dated March 24, 1981--bolt installation not verified

No. F-3071 dated March 24, 1981--elongated holes in baseplate

No. F-3072 dated March 24, 1981--elongated holes in baseplate

No. F-3073 dated March 24, 1981--bolts do not meet torque requirements

No. F-3074 dated March 24, 1981--bolts stripped

No. F-3075 dated March 24, 1981--bolt holes elongated

No. F-3076 dated March 24, 1981--hanger needs shimming and spalling repair

No. F-3082 dated March 25, 1981--cable is too short

No. F-3083 dated March 26, 1981--unacceptable welds

No. F-3099 dated March 27, 198 -- bolt deficiencies

No. F-7000 dated March 30, 1981--weld deficiencies, missing braces, etc.

No. F-7006 dated April 1, 1981--weld deficiencies

No. F-7019 dated April 6, 1981--weld deficiencies

The disposition of SR #2899 indicated that based on a rejection rate of less than 1% of the verified torque on other bolts, the bolts on approximately 10% of the attachments (conduit straps, non-engineered hangers, etc.) in various areas (Plan No. 1 of EI drawing 150-2, Revision D, for example) were acceptable without required torque verifications (one bolt per attachment). The disposition, dated January 15, 1981, was made by a H. J. Kaiser Quality Assurance Engineer and not by design control measures commensurate with those applied to the original design.

The disposition dated January 14, 1981, on SR #2903 indicated that welds A3 and A4 on pipe line ISK RR-298 were acceptable-as-is based on normal ambient temperature plus the sample verification by radiography of fitups on 20 out of approximately 400 other welds. The disposition was made only by the H. J. Kaiser QA Manager and not by design control measures commensurate with those applied to the original design.

The disposition dated January 25, 1981 on SR #2914 indicated that the welds (DB 177 to DCS 80) were acceptable based on visual examination (VT) of weld DB 177 and the magnetic particle testing (MT) of the root pass connecting DB 177 to DCS 80. Thus the final MT was waived. The disposition was made

only by a H. J. Kaiser Quality Assurance Engineer and not by design control measures commensurate with those applied to the original design.

If the items addressed on SRs F-2899, F-2903, and F-2914 would have been documented on nonconformance reports (NRs), H. J. Kaiser Company Instruction QAMCI G-4 would have required dispositions to have been made by the Material Review Board. The Material Review Board ~~would have been~~ is comprised of the KEI Construction Engineer, CG&E QA and Standards Engineer, KEI QA Engineer, CG&E Sponsor Engineer, and the S&I Design Engineer.

The nonconforming items accepted in SRs F-2899, F-2903, and F-2914 represent changes to the original design. The 30-day period specified in Instruction QAMCI G-14, Revision 3, in essence, permitted nonconforming items to be dispositioned without design control measures commensurate with those applied to the original design if the SR was dispositioned without being transferred to an NR. This is contrary to 10 CFR 50, Appendix B, Criterion ~~XV~~ V, and the Wm. H. Zimmer QA Manual, Section 15.9 (358/81-13-08).

The inprocess nonconformances identified on SRs F-2909, F-3070, F-3071, F-3072, F-3073, F-3074, F-3075, F-3076, F-3083, and F-7019, were not dispositioned or acceptably corrected as of August 12, 1981, and were not transferred to NRs within 30 calendar days. This is contrary to 10 CFR 50, Appendix B, Criterion V, and the Wm. H. Zimmer QA Manual, Section 5 (358/81-13-09).

The dispositions to the inprocess nonconformances identified on SRs F-2941 and F-3099 indicated that some of the items had been acceptably corrected and the others had been transferred to NRs.

The dispositions to the inprocess nonconformances identified on SRs F-3082, F-7000, and F-7006 indicated that all of the items had been transferred to NRs. # The concern of nonconforming items being documented on Surveillance Reports is addressed in the licensee's Quality Conformation Program

6.3.2 Findings and Conclusions

~~The site~~ Instruction QACMI G-14 which only required in-process nonconformance to be transferred from Surveillance Reports to Nonconformance Reports if not acceptably corrected within 30 days, was inadequate. The 30-day period did not assure that all nonconformances which constituted design changes ~~if dispositioned other than specified by the original design, would be~~ were subjected to design control measures commensurate with the original design. These design control measures would have been required if the in-process nonconformances were documented on Nonconformance Reports. Some of the SRs were not transferred to NRs as required by QACMI G-14. This concern is address in the licensee's Quality Conformation Program.

6.3.3 Items of Noncompliance

Two items of noncompliance were identified (Inadequate procedures ~~(Failure to establish measures~~ to assure nonconformances are subjected to design control measures commensurate with those applied to the original design, and failure to follow procedure to transfer inprocess nonconformances identified on Surveillance Reports to Nonconformance Reports in 30 days).

Revised 8/8. add.

7.3 QA Surveillance Reports

State why

The Region III inspectors reviewed the H. J. Kaiser Company Procedure No. QACMI G-14, Revision 3, for initiating and documenting QA Surveillance Reports (SR). QACMI G-14, page 1, paragraph 2, states that surveillance reports will be used to identify in-process nonconformances that can be corrected without processing a Nonconformance Report (NR). The QA Surveillance Report form provides a checkpoint to identify in-process deficiencies.

The following QA Surveillance Reports have been initiated to identify deficiencies or nonconforming items:

No. 2899 dated December 18, 1980--bolt torque verification missed

No. 2903 dated January 14, 1981--weld verifications missed

No. F-2909 dated Janaury 16, 1981--bolts missing or loose

No. 2914 dated Janaury 15, 1981--NDE hold points bypassed

No. F-2941 dated January 28, 1981--broken flex, bolts fail to torque, etc.

No. F-3070 dated March 24, 1981--bolt installation not verified

No. F-3071 dated March 24, 1981--elongated holes in baseplate

No. F-3072 dated March 24, 1981--elongated holes in baseplate

No. F-3073 dated March 24, 1981--bolts do not meet torque requirements

No. F-3074 dated March 24, 1981--bolts stripped

No. F-3075 dated March 24, 1981--bolt holes elongated

No. F-3076 dated March 24, 1981--hanger needs shimming and spalling repair

No. F-3082 dated March 25, 1981--cable is too short

No. F-3083 dated March 26, 1981--unacceptable welds

No. F-3099 dated March 27, 1981--bolt deficiencies

No. F-7000 dated March 30, 1981--weld deficiencies, missing braces, etc.

No. F-7006 dated April 1, 1981--weld deficiencies

No. F-7019 dated April 6, 1981--weld deficiencies

Following the directions given in QACMI G-14, Revision 3, page 2, paragraph 5, a surveillance report identifying an in-process nonconformance, will be transferred to an NR when the nonconforming condition has not been acceptably corrected. The above listed items were not acceptably corrected, yet they were not transferred to a NRs.

Nonconforming items ~~would~~, in effect, represent changes to the original design, when acceptable-as-is." Surveillance reports that identified nonconforming items and were not transferred to ~~an~~ NR did not require reviews by appropriate ~~engineers~~. Therefore, measures were not established to assure that all in-process deficiency dispositions are reviewed and approved by appropriate design and QA engineers. This is contrary to 10 CFR 50, Appendix B, Criterion XV, and the Wm. H. Zimmer QA Manual, Section 15.9. (50-358/81-13-08).

Some of the above listed items were accepted-as-is, which represents a change to the original design. Since these SRs were not converted to NRs, they did not ~~require~~ receive required reviews by appropriate engineers.

Findings & Conclusions

7.1 Control of Structural Steel Beams and Beam Welds

During the investigation of the allegations addressed in Sections 4 and 5, the RIII inspector identified a beam with an unacceptable weld and two beams that were only tack welded into place. Therefore, the RIII inspector decided to make a more in-depth inspection and review the controls of structural beams and beam welds. The inspections and reviews included visual examinations of approximately ~~twenty~~ twenty five structural steel beams in the blue switchgear and cable spreading rooms, and reviews of related documentation.

7.1.1 Beam Observed in Blue Switchgear Room

The area observed in the blue switchgear room (elevation 546 ft) was 8 ft 3 in. west of workline G, 16 ft 6 in. east of workline H and between columns 22 and 54 of S&L drawing No. S-546, Revision AB.

The following six discrepancies were identified:

1. A W8 x 17 beam (8 ft 3 in. long), positioned east to west and located 1 ft 9 in. south of column 24 and 10 in. below elevation 546 ft, was not specified on any pertinent design drawing. The beam appeared to be permanently installed and traceability of the beam heat number was not maintained. After extensive and unsuccessful retrieval efforts by QA personnel, construction personnel were requested to identify any document that would control the unspecified beam. Construction personnel provided Design Document Change (DDC) No. S-2050, dated May 29, 1980, containing only the signatures of two site construction engineers,

who were identifying some of the additional W8 x 17 beams in the area covered by S&L drawing No. S-546. The DDC had no S&L architectural engineering signatures of approval as of March 27, 1981. The DDC did not identify any specific beams.

The licensee identified S&L drawing E-189, Sheet 3, Revision H, Note No. 17, which allows W8 x 17 beams to be installed and then be submitted on a DDC for S&L approval.

2. A W8 x 17 beam (6 ft 3 in. long), positioned north to south and located 13 ft 8 in. west of workline G and 1 in. below elevation 546 ft, was not specified on any pertinent design drawing, was not documented on any QC record, and had unacceptable welds.

3. A W8 x 17 beam (5 ft 5 in. long), positioned east to west and located 8 ft 10 in. south of column 24 and 1 in. below elevation 546 ft, was not specified on any pertinent design drawing, was not documented on any QC record, and had unacceptable welds.

4. A W8 x 17 beam (2 ft 8 in. long), positioned north to south and located 9 ft 6 in. west of workline G and attached to the beam addressed in paragraph 7.1.1.3 and extending north, was not specified on any pertinent design drawing and was not documented on any QC record.

5. Two W8 x 17 beams (8 ft 3 in. long), positioned east to west, with one located 5 ft 3 3/8 in. and the other located 9 ft 7 7/8 in. south of column 24, were only tack welded in place. They displayed no identi-

fication or heat numbers and were not documented on any QC record which indicated in-process weld inspections were not performed. The beams were identified on DDC-2087, which was incorporated into S&L drawing No. S-546, Revision AB. DDCs and S&L drawings by themselves do not assure QC verification.

~~The W8 x 17 beam was not identified on any QC inspection record, which indicated in-process weld inspections were not performed.~~ duplicate of above

6. Re-entrant corners on several W8 x 17 beams had notches instead of the 1/2 in. minimum radius required by the American Institute of Steel Construction (AISC), seventh edition (1969), page 4.113. The locations of these unacceptable beam corners are shown in Figure ~~X~~ 7.1 of this section and are noted by (7) in Figure ~~X~~ 7.1.

The location of the above discrepancies, additional unacceptable welds, unacceptable re-entrant corners, and nontraceable beams are shown in Figure ~~X~~ 7.1 of this section.

The welds identified in the preceding paragraphs as unacceptable do not comply with the requirements of the AWS D1.1-1972 Code for one or more of the following reasons: slag was not removed; weld profiles had excessive convexity or concavity, blowholes, porosity and/or undercut.

7.1.2 Beams Observed in Cable Spreading Rooms

The inspectors identified the following discrepancies in the cable spreading rooms:

1. A W12 X14 beam No. F2500/8-66B4 had a weld that ~~contained gross porosity~~ was incomplete. This beam was directly above cable tray hanger No. 4HV8FEC231, which was attached. The beam was located approximately 11 ft south of the north wall at the stairwell.

2. The traceability of the heat numbers was not maintained for two W8 x 17 beams, located south of and parallel to beam No. F2500/8-66B4 (above).

   The first beam was located immediately adjacent to beam F2500/8-66B4. The second beam was the fourth beam south of beam F2500/8-66B4. The first beam was installed flush to the ceiling of the cable spreading room. S&L drawing No. S-546, Revision AB, specifies the first beam to be installed 1 in. below the ceiling.

3. A weld on the 5 in. channel beam that was supporting HVAC hanger No. 2071 had irregular weld profile, excessive undercut, porosity, and craters that were not filled. The channel beam was located 2 ft north and 1 ft west of the cable tray hanger No. 13H2FEC008. The Waldinger, Young and Bertke (W-Y and B) Inspection Report, dated February 19, 1980, indicated that the weld was acceptable.

4. Two W8 x 17 beams, located in the northeast corner (north of WL-16 and east of WL-K), were only tack-welded into place. The beams were specified on DDC No. E-3834 dated October 20, 1978. DDC E-3834, which affected eight drawings, was posted on, but had not been incorporated into, S&L drawing No. S-546, Revision AB, dated October 22, 1980.

Heat No. 72161 (purchase order No. 31134) was marked on the southern beam. The traceability of the heat number of the northern beam was not maintained.

The beams were not identified on any QA inspection record, which would have indicated their status. In-process inspections were not performed on the tack welds.

NOTE: Some of the welds inspected by the RIII inspectors were painted. Therefore, the inspections were for relatively large deficiencies.

7.1.3 Installation Deficiencies

1. For the beams identified on DDCs and addressed in paragraphs 7.1.1 items 1 and 5, and 7.1.2 item 4, above, no measures existed that would identify to QA, the installations and work that was done by construction before the DDC was incorporated into the drawings. Thus, no measures existed to assure that all of the required QA inspections related to DDCs (e.g., welder qualification, proper filler metal, traceability of materials, etc.) would be performed. This condition was previously identified in IE Report Item No. 358/80-15-04. The corrective actions taken, which had not yet been reviewed by the NRC, with regard to Item No. 358/80-15-04 did not include the DDCs written prior to the implementation of those corrective actions and did not include the DDCs that are and have been implemented prior to receiving the S&L approvals. This item is unresolved pending the complete resolution of IE Item No. 358/80-15-04 (358/81-13-63).

2. Failure to control unacceptable welds (addressed in Sections 7.1.1 and 7.1.2), the five beams with unacceptable re-entrant corners, and the four beams that were installed and not identified as a requirement on any design document is contrary to 10 CFR 50, Appendix B, Criterion XV, and the Wm. H. Zimmer QA Manual, Section 15.2.2, as described in Appendix A to the report transmittal letter (50-358/81-13-03).

3. Failure to maintain the traceability of the nine structural beams, addressed in Section 7.1.1 and 7.1.2, is contrary to 10 CFR 50, Appendix B, Criterion VIII, and the Wm. H. Zimmer QA Manual, Section 8.2, as described in Appendix A to the report transmittal letter (50-358/81-13-04).

These problems and the adequacy of the structural steel are addressed in the licensees Quality Confirmation Program.

7.1.4 Unapproved Structural Beam Vendors

~~Furthermore,~~ Several thousand feet of W8 x 17 beam were purchased on the following order numbers from vendors not on the approved vendor list, which means the respective vendor QA programs had not been evaluated for compliance with 10 CFR 50, Appendix B.

P.O. No. 10275, PBI Steel Exchange, 2400 ft

P.O. No. 12868, U.S. Steel Supply, 1500 ft

P.O. No. 16321, Frank Adams Co., 1012 ft

P.O. No. 10009, Frank Adams Co., 1024 ft

P.O. No. 9761, Frank Adams Co., 1472 ft

P.O. No. 9628, Frank Adams Co., 450 ft

P.O. No. 9872, U.S. Steel Supply, 300 ft

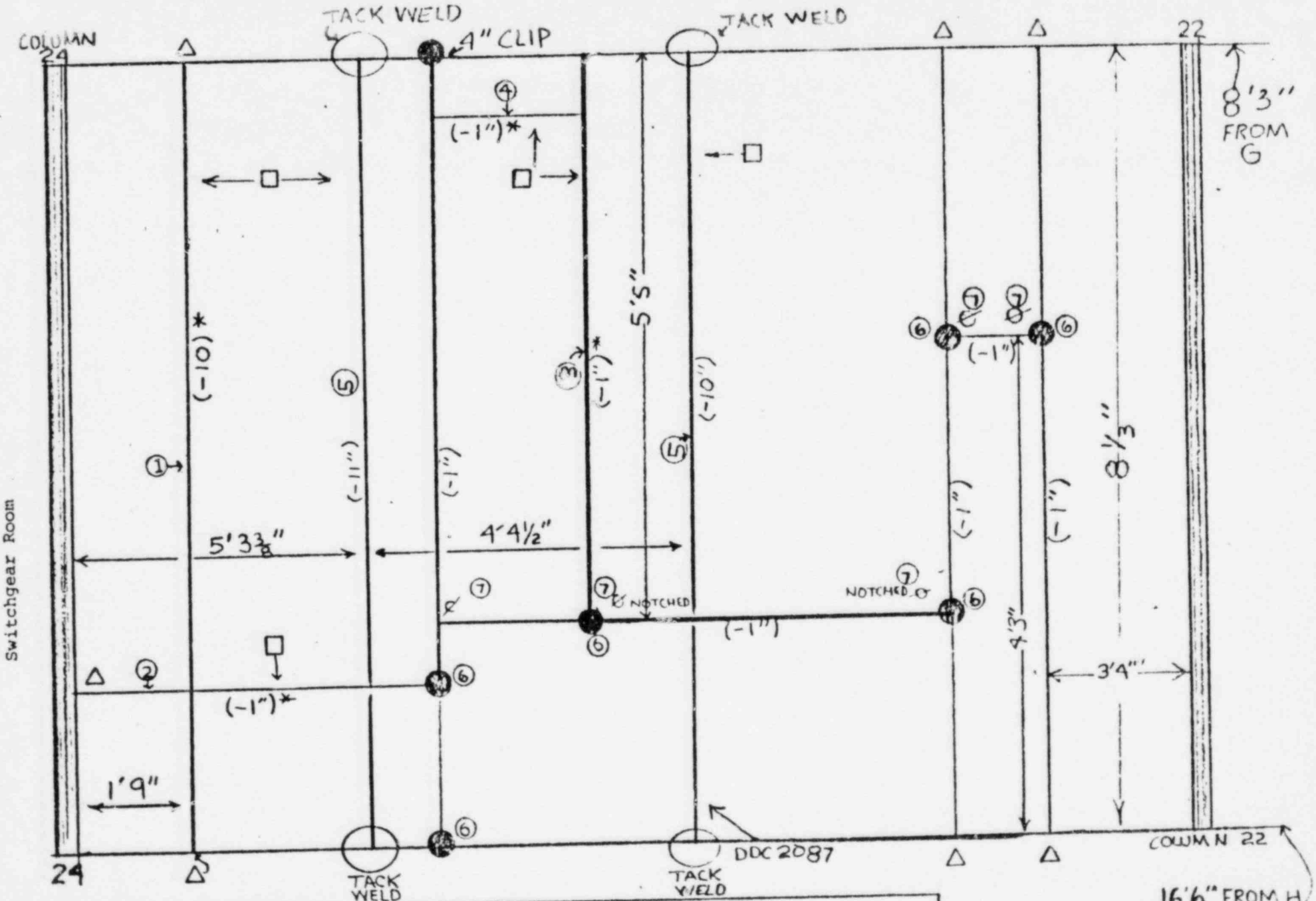
These beams were not controlled to prevent their use in safety-related systems. The licensee stated that these beams had been made available for installation in safety-related systems based on the mill certifications and without regard to the vendors not being approved. Mill certifications were available for these beams. The licensee stated that the credibility of the mill certifications would be established. Failure to assess the effectiveness of the controls to assure the quality of the mill certifications and structural beams, supplied by the above vendors, is contrary to 10 CFR 50, Appendix B, Criterion VII, and the Wm. H. Zimmer QA Manual, Section 7.3.1, as described in Appendix A of the report transmittal letter (50-358/81-13-06).

11.5 Bristol Steel [illegible]

The RIII inspector reviewed the Bristol Quality Control Steel Erection Report Inspection Report Q-7, dated July 14, 1975, for the inspection of the beams installed on elevation 546 ft between column rows 15-22 and F-L. The RIII inspector determined that the Bristol Steel and Iron Works, Inc. QC inspector failed to document details of his inspections such as the welding materials (rod type) used, the welder, the specific weld activities inspected, and/or bolting or welding procedure number when applicable. This is contrary to 10 CFR 50, Appendix B, Criterion XVII and the Wm. H. Zimmer QA Manual, Section 17.1.1. (358/81-13-52)

Licensee [illegible]

These problems and the adequacy of the structural steel are addressed in the licensee's Quality Confirmation Program


W8 X 17's - Elevation 546 Auxiliary Building
Switchgear Room
COLUMN 24
TACK WELD
4" CLIP
TACK WELD
22
8'3" FROM G
(-1")*
(-10")*
(-11")
(-1")
5'5"
(-10")
(-1")*
(-1")
(-1")
(-1")
8 1/3"
5'3 3/8"
4'4 1/2"
NOTCHED
NOTCHED
(-1")
4'3"
3'4"
(-1")*
1'9"
DDC 2087
TACK WELD
TACK WELD
COLUMN 22
16'6" FROM H
NORTH
24
* --- Not shown on S&L DWG. #S-546, Rev. AB or DDC's listed.
Ø --- Re-entrant corners not coped.
△ --- Welds or connections covered with fire proofing unable to evaluate.
□ --- No identification on W8X17's or records to support tracibility of material.

7.1 Control of Structural Steel Beams and Beam Welds

During the investigation of the allegations addressed in Sections 4 and 5, the RIII inspector identified a beam with an unacceptable weld and two beams that were only tack welded into place. Therefore, the RIII inspector decided to make a more in-depth inspection and review the controls of structural beams and beam welds. The inspections and reviews included visual examinations of approximately twenty-five structural steel beams in the blue switchgear and cable spreading rooms, and reviews of related documentation.

7.1.1 Beam Observed in Blue Switchgear Room

The area observed in the blue switchgear room (elevation 546 ft) was 8 ft 3 in. west of workline G, 16 ft 6 in. east of workline H and between columns 22 and 54 of S&L drawing No. S-546, Revision AB.

The following six discrepancies were identified:

1. A W8 x 17 beam (8 ft 3 in. long), positioned east to west and located 1 ft 9 in. south of column 24 and 10 in. below elevation 546 ft, was not specified on any [redacted] design drawing. The beam appeared to be permanently installed and traceability of the beam heat number was not maintained. After extensive and unsuccessful [redacted] efforts by QA personnel, construction personnel were requested to identify any document that would control the unspecified beam. Construction personnel provided Design Document Change (DDC) No. S-2050, dated May 29, 1980, containing only the signatures of two site construction engineers,

who were identifying some of the additional W8 x 17 beams in the area covered by S&L drawing No. S-546. The DDC had no S&L architectural engineering signatures of approval as of March 27, 1981. The DDC did not identify any specific beams.

The licensee identified S&L drawing E-189, Sheet 3, Revision H, Note No. 17, which allows W8 x 17 beams to be installed and then be submitted on a DDC for S&L approval.

2. A W8 x 17 beam (6 ft 3 in. long), positioned north to south and located 13 ft 8 in. west of workline G and 1 in. below elevation 546 ft, was not specified on any pertinent design drawing, was not documented on any QC record, and had unacceptable welds.

3. A W8 x 17 beam (5 ft 5 in. long), positioned east to west and located 8 ft 10 in. south of column 24 and 1 in. below elevation 546 ft, was not specified on any pertinent design drawing, was not documented on any QC record, and had unacceptable welds.

4. A W8 x 17 beam (2 ft 8 in. long), positioned north to south and located 9 ft 6 in. west of workline G and attached to the beam addressed in paragraph 7.1.1.3 and extending north, was not specified on any pertinent design drawing and was not documented on any QC record.

5. Two W8 x 17 beams (8 ft 3 in. long), positioned east to west, with one located 5 ft 3 3/8 in. and the other located 9 ft 7 7/8 in. south of column 24, were only tack welded in place. They displayed no identi-

fication or heat numbers and were not documented on any QC record which indicated in-process weld inspections were not performed. The beams were identified on DDC-2087, which was incorporated into S&L drawing No. S-546, Revision AB. DDCs and S&L drawings by themselves do not assure QC verification.

6. Re-entrant corners on several W8 x 17 beams had notches instead of the 1/2 in. minimum radius required by the American Institute of Steel Construction (AISC), seventh edition (1969), page 4.113. The locations of these unacceptable beam corners are shown in Figure 7.1 of this section and are noted by (7) in Figure 7.1.

The location of the above discrepancies, additional unacceptable welds, unacceptable re-entrant corners, and nontraceable beams are shown in Figure 7.1 of this section.

The welds identified in the preceding paragraphs as unacceptable do not comply with the requirements of the AWS D1.1-1972 Code for one or more of the following reasons: slag was not removed; weld profiles had excessive convexity or concavity, blowholes, porosity and/or undercut.

7.1.2 Beams Observed in Cable Spreading Rooms

The inspectors identified the following discrepancies in the cable spreading rooms:

1. A W12 X14 beam No. F2500/8-66B4 had a weld that was incomplete. This beam was directly above cable tray hanger No. 4HV8FEC231, which was attached. The beam was located approximately 11 ft south of the north wall at the stairwell.

2. The traceability of the heat numbers was not maintained for two W8 x 17 beams, located south of and parallel to beam No. F2500/8-66B4 (above).

   The first beam was located immediately adjacent to beam F2500/8-66B4. The second beam was the fourth beam south of beam F2500/8-66B4. The first beam was installed flush to the ceiling of the cable spreading room. S&L drawing No. S-546, Revision AB, specifies the first beam to be installed 1 in. below the ceiling.

3. A weld on the 5 in. channel beam that was supporting HVAC hanger No. 2071 had irregular weld profile, excessive undercut, porosity, and craters that were not filled. The channel beam was located 2 ft north and 1 ft west of the cable tray hanger No. 13H2FEC008. The Waldinger, Young and Bertke (W-Y and B) Inspection Report, dated February 19, 1980, indicated that the weld was acceptable.

4. Two W8 x 17 beams, located in the northeast corner (north of WL-16 and east of WL-K), were only tack-welded into place. The beams were specified on DDC No. E-3834 dated October 20, 1978. DDC E-3834, which affected eight drawings, was posted on, but had not been incorporated into, S&L drawing No. S-546, Revision AB, dated October 22, 1980.

Heat No. 72161 (purchase order No. 31134) was marked on the southern beam. The traceability of the heat number of the northern beam was not maintained.

The beams were not identified on any QA inspection record, which would have indicated their status. In-process inspections were not performed on the tack welds.

[INSPECTOR NOTE: Some of the welds inspected by the RIII inspectors were painted. Therefore, the inspections were for relatively large deficiencies.]

7.1.3 Installation Deficiencies

1. For the beams identified on DDCs and addressed in paragraphs 7.1.1, items 1 and 5, and 7.1.2, item 4 above, no measures existed that would identify to QA the installations and work that was done by construction before the DDC was incorporated into the drawings. Thus, no measures existed to assure that all of the required QA inspections related to DDCs (e.g., welder qualification, proper filler metal, traceability of materials, etc.) would be performed. This condition was previously identified in IE Report Item No. 358/80-15-04. The corrective actions taken, which had not yet been reviewed by the NRC, with regard to Item No. 358/80-15-04 did not include the DDCs written prior to the implementation of those corrective actions and did not include the DDCs that are and have been implemented prior to receiving the S&L approvals. This item is unresolved pending the complete resolution of IE Item No. 358/80-15-04 (358/81-13-63).

2. Failure to control unacceptable welds (addressed in Sections 7.1.1 and 7.1.2), the five beams with unacceptable re-entrant corners, and the four beams that were installed and not identified as a requirement on any design document is contrary to 10 CFR 50, Appendix B, Criterion XV, and the Wm. H. Zimmer QA Manual, Section 15.2.1, ~~as described in Appendix A to the report transmittal letter~~ (50-358/81-13-03).

3. Failure to maintain the traceability of the nine structural beams, addressed in Section 7.1.1 and 7.1.2, is contrary to 10 CFR 50, Appendix B, Criterion VIII, and the Wm. H. Zimmer QA Manual, Section 8.2, ~~as described in Appendix A to the report transmittal letter~~ (50-358/81-13-04).

These problems and the adequacy of the structural steel are addressed in the licensee's Quality Confirmation Program.

7.1.4 Unapproved Structural Beam Vendors

Several thousand feet of W8 x 17 beam were purchased on the following order numbers from vendors not on the approved vendor list, which means the respective vendor QA programs had not been evaluated for compliance with 10 CFR 50, Appendix B.

P.O. No. 10275, PBI Steel Exchange, 2400 ft

P.O. No. 12868, U.S. Steel Supply, 1500 ft

P.O. No. 16321, Frank Adams Co., 1012 ft

P.O. No. 10009, Frank Adams Co., 1024 ft

P.O. No. 9761, Frank Adams Co., 1472 ft

P.O. No. 9628, Frank Adams Co., 450 ft

P.O. No. 9872, U.S. Steel Supply, 300 ft

These beams were not controlled to prevent their use in safety-related systems. The licensee stated that these beams had been made available for installation in safety-related systems based on the mill certifications and without regard to the vendors not being approved. Mill certifications were available for these beams. The licensee stated that the credibility of the mill certifications would be established. Failure to assess the effectiveness of the controls to assure the quality of the mill certifications and structural beams, supplied by the above vendors, is contrary to 10 CFR 50, Appendix B, Criterion VII, and the Wm. H. Zimmer QA Manual, Section 7.3.1 ~~as described in Appendix A of the report transmittal letter~~ (50-358/81-13-06).

This concern is addressed in the licensees Quality Confirmation Program.

7.1.5 Bristol Steel Erection Inspections

The RIII inspector reviewed the Bristol Quality Control Steel Erection Report Inspection Report Q-7, dated July 14, 1975, for the inspection of the beams installed on elevation 546 ft between column rows 15-22 and F-L. The RIII inspector determined that the Bristol Steel and Iron Works, Inc. QC inspector failed to document details of his inspections, such as the welding materials (rod type) used, the welder, the specific weld activities inspected, and/or bolting or welding procedure number when applicable. This is contrary to 10 CFR 50, Appendix B, Criterion XVII and the Wm. H. Zimmer QA Manual, Section 17.1.1 (358/81-13-52).

~~7.1.6 Licensee Corrective Action~~

This concern is ~~These problems and the adequacy of the structural steel are~~ addressed in the licensee's Quality Confirmation Program.

7.1.6 Findings and Conclusions

In their examination of approximately 25 structural steel beams, the NRC inspectors identified significant problems.

Welds on nine structural beams were unacceptable. Five beams had unacceptable (notched) re-entrant corners. Four beams were installed which were not specified on any design document. The traceability of nine structural beams was not maintained. In addition, measures had not been established to assure that required QA in-process inspections related to Design Document Changes would be performed; ~~and~~ the licensee did not assess the effectiveness of the controls to assure the quality of mill certifications and structural steel beams supplied by three vendors; and details of steel erection inspections were not documented. These concerns are addressed in the licensee's Quality Confirmation Program.

7.1.7 Items of Noncompliance

Four items of noncompliance were identified (failure to control unacceptable welds, unacceptable re-entrant corners on beams, and unspecified beams; failure to maintain traceability of beams; failure to assess the effectiveness of vendor quality assurance; and failure to maintain sufficient documentation of steel erection inspections).

Need to Attach Figure

Need Figure #

7.4 Cable Separation

The Region III inspectors observed six installed conditions that did not comply with one or more of the following FSAR criteria concerning cable separation:

1. IEEE Std. 383-1974 defines Class IE as: "The safety classification of the electric equipment and systems that are essential to emergency reactor shutdown, containment isolation, reactor core cooling and containment, and reactor heat removal or otherwise are essential in preventing significant release of radioactive material to the environment."

2. The Zimmer FSAR, Section 8.3.1.12.2, states, "Class IE cable is assigned to a division according to Table 8.3-19."

The divisions are comprised of the systems addressed in the Class IE definitions.

"A Class IE cable is routed only in its division tray conduit, etc."

"Each non-Class IE cable which has any part of its length in a division tray, conduit, etc., or which connects to a Class IE power system is a division-associated cable and is not routed in tray, conduit, etc. of another division."

The terms "division-associated," "associated," "non-Class IE," "balance-of-plant," "nonessential," and "non-ESF (non-engineered safety features)" are all used interchangeably.

3. FSAR Section 8.3.1.13 states:

.2"...Balance-of plant cables not associated with reactor protection or engineered safety features systems, when assigned to a tray section with a Class IE segregation code, are routed only in trays with that segregation code."

.3"...Cables will have either green, yellow, or blue identification for ESF cable; orange for reactor protection system cable; white for balance-of-plant cables; and white with another color for associated cables."

4. FSAR Table 8.3-16 states, "A nonessential cable may be run in nonessential or ESF tray, but shall not occupy more than one tray system."

5. FSAR Section 8.3.1.11.2.1.d. states, "In the cable spreading room, cable tray risers (chutes) are used to route the cables into the bottom of control panels located in the control room above. Here a 1-foot horizontal, 3 foot vertical separation is maintained."

6. FSAR Section 8.3.1.12.1.3, which addresses instrument cables states, "Low-level signal cables are run in trays and/or conduits separate from all power and control cables."

The six installed conditions were as follows:

1. On the east side of the cable spreading room, at approximately WL 26, yellow/white (associated) cable No. RE053 extends from a 2-in. conduit (which also contains blue/white cable No. RE058), passes approximately 4 in. vertically above the blue Class IE cables contained in tray No. 2072C, and enters blue/white sleeve No. 79.

   Contrary to the above FSAR criteria, cables No. RE053 and RE058 were routed in the same raceway and cable No. RE053 was not installed a minimum of 3 ft above tray 2072C.

2. On the south side of the cable spreading room, green instrument tray No. 3029K, which was 6 in. wide and approximately 50 ft long, was installed inside white control tray No. 4638B. The installation was in accordance with S&L drawings E-223, Revision G, and E-224, Revision F. Green cable No. WS714, green/white cable No. TI725, and other cables were installed in the green tray. Blue/white and yellow/white cables were installed in the remaining white tray.

   Contrary to the FSAR criteria, the green and green/white cables were essentially installed in the white tray; the green, green/white, blue/white and yellow/white cables were not separated by a minimum of 1 ft horizontally; and the green tray containing instrument cables was not separate from the white tray containing control cables.

3. Near the stairwell at the center of the cable spreading room, two blue cables, No. RI103 and CM111, were routed from blue tray No. 2077A into green tray riser No. 3025A, which extended up to the control room. Green cables No. HP073 and HP096 were among the cables installed in riser 3025A.

Contrary to the FSAR criteria, the blue cables were routed in the green division riser and were not horizontally separated from the green cables by at least 1 ft.

The licensee documented blue cables No. RI103 and CM111 on Nonconformance Report No. 7549, dated March 18, 1981, as a result of the NRC finding.

No QC inspection requirements existed to verify separation criteria for cables extending up and out of raceway located in the cable spreading room to the control room.

4. The following conditions existed in the cable spreading room:

a. White tray No. 4080K contained many different division-associated cables including blue/white cable No. TI192, yellow/white cable No. RR781, and green/white cable No. TI816.

b. White tray riser No. RK4627 contained yellow/white cables No. TI942 and No. TI943, and blue/white cables No. TI808 and TI760.

c. White tray riser No. 4139 contained many blue/white and yellow/white cables.

The routing of blue/white, yellow/white, and/or green/white cables together in white trays appeared to be a widespread design practice. This design is contrary to the FSAR Section 8.3.1.13.2 as previously stated above.

5. In the instrument-relay room, yellow/white conduit No. RR199 extended from white tray No. 4157A to yellow tray No. 1040B. The conduit and trays contained yellow/white cable No. RR199 and white cable No. DC258 (also mislabelled DC257). Following the cable installation (pull) card, cable No. DC258 was designed to be routed through tray No. 4157A, but not tray 1040B. Since cable No. DC258 was a nonsafety-related cable there were no QC inspection requirements to verify the routing.

6. With the exception of the green tray riser identified in paragraph 3 of the installed conditions, the RIII inspector did not observe any other risers (chutes) installed in the cable spreading room. The licensee stated that only eight chutes had been designed and installed in the spreading room and that alternate methods for achieving cable separation were being considered. S&L drawing No. E-98-FB, Revision D, Note 4, required that the portions of cables in the cable spreading room not enclosed or protected by steel chutes be coated with a 1/8 in. (after dry) application of fireproofing material. During a telephone conversation on May 7, 1981, the licensee stated that the design identified on drawing No. E-98-FB was being reconsidered for alterations.

The installed conditions identified in paragraphs 1, 2, 4, and 6 above apparently resulted from designs that deviate from the FSAR. These deviations are contrary to 10 CFR 50, Appendix B, Criterion III, and the Wm. H. Zimmer QA Manual, Section 3.1 and 3.6. (50-358/81-13-21).

The licensee stated that the following actions would be taken with regard to the installed conditions identified in paragraphs 1, 2, 4, and 6. Either the field installations would be changed to comply with the FSAR or appropriate changes to the FSAR with engineering justifications would be submitted to NRR.

The installed condition identified in paragraph 3 above apparently resulted from construction activities for which required QC inspection verifications had not been translated into an inspection procedure. The lack of QC inspection for the installed condition in paragraph 3 is contrary to 10 CFR 50, Appendix B, Criterion X, and the Wm. H. Zimmer QA Manual, Section 10.1.2. (50-358/81-13-22)

3. The misrouted cable identified in paragraph 5 of the installed conditions apparently resulted from contruction activities for which the FSAR does not require QC inspection verification. The misrouted cable does influence cable separation and tray loading and, therefore, will have to be appropriately dispositioned. This item will be reviewed during a subsequent inspection (50-358/81-13-23).

7.2 Cable Separation

During the investigation of the allegation addressed in Section 5.10, the RIII inspectors identified two cable installations that did not comply with the cable separation criteria defined in the Wm. H. Zimmer FSAR. ~~Therefore, the RIII inspector informed the site Resident Inspector, who included~~ During checks for cable separation on ~~his~~ routine plant tours, the inspectors identified additional cable separation violations.

7.2.1 Cable Separation Requirements

The applicable cable separation requirements for the Zimmer facility are as follows:

1. IEEE Std. 383-1974 defines Class 1E as: "The safety classification of the electric equipment and systems that are essential to emergency reactor shutdown, containment isolation, reactor core cooling and containment, and reactor heat removal or otherwise are essential in preventing significant release of radioactive material to the environment."

2. The Zimmer FSAR, Section 8.3.1.12.2, states, "Class 1E cable is assigned to a division according to Table 8.3-19."

The divisions are comprised of the systems addressed in the Class 1E definitions.

"A Class 1E cable is routed only in its division tray conduit, etc."

"Each non-Class 1E cable which has any part of its length in a division tray, conduit, etc., or which connects to a Class 1E power system is a division-associated cable and is not routed in tray, conduit, etc. of another division."

The terms "division-associated," "associated," "non-Class 1E," "balance-of-plant," "nonessential," and "non-ESF (non-engineered safety features)" are all used interchangeably.

3. FSAR Section 8.3.1.13 states:

.2"...Balance-of plant cables not associated with reactor protection or engineered safety features systems, when assigned to a tray section with a Class 1E segregation code, are routed only in trays with that segregation code."

.3"...Cables will have either green, yellow, or blue identification for ESF cable; orange for reactor protection system cable; white for balance-of-plant cables; and white with another color for associated cables."

4. FSAR Table 8.3-16 states, "A nonessential cable may be run in nonessential or ESF tray, but shall not occupy more than one tray system."

5. FSAR Section 8.3.1.11.2.1.d. states, "In the cable spreading room, cable tray risers (chutes) are used to route the cables into the bottom of control panels located in the control room above. Here a 1-foot horizontal, 3 foot vertical separation is maintained."

6. FSAR Section 8.3.1.12.1.3, which addresses instrument cables states, "Low-level signal cables are run in trays and/or conduits separate from all power and control cables."

7.2.2 Observed Cable Separation Violations

During a [redacted] brief tour while inspecting others matters, of the cable spreading room, the RIII inspectors observed four violations of cable separation criteria, as follows:

1. On the east side of the cable spreading room, at approximately WL 26, yellow/white (associated) cable No. RE053 extends from a 2-in. conduit (which also contains blue/white cable No. RE058), passes approximately 4 in. vertically above the blue Class 1E cables contained in tray No. 2072C, and enters blue/white sleeve No. 79.

   Contrary to the above FSAR criteria, cables No. RE053 and RE058 were routed in the same raceway and cable No. RE053 was not installed a minimum of 3 ft above tray 2072C.

2. On the south side of the cable spreading room, green instrument tray No. 3029K, which was 6 in. wide and approximately 50 ft long, was installed inside white control tray No. 4638B. The installation was

in accordance with S&L drawings E-223, Revision G, and E-224, Revision F. Green cable No. WS714, green/white cable No. TI725, and other cables were installed in the green tray. Blue/white and yellow/white cables were installed in the remaining white tray.

Contrary to the FSAR criteria, the green and green/white cables were essentially installed in the white tray; the green, green/white, blue/white and yellow/white cables were not separated by a minimum of 1 ft horizontally; and the green tray containing instrument cables was not separate from the white tray containing control cables.

3. Near the stairwell at the center of the cable spreading room, two blue cables, No. RI103 and CM111, were routed from blue tray No. 2077A into green tray riser (chute) No. 3025A, which extended up to the control room. Green cables No. HP073 and HP096 were among the cables installed in riser 3025A.

Contrary to the FSAR criteria, the blue cables were routed in the green division riser and were not horizontally separated from the green cables by at least 1 ft.

The licensee documented blue cables No. RI103 and CM111 on Nonconformance Report No. 7549, dated March 18, 1981, as a result of the NRC finding.

No QC inspection requirements existed to verify separation criteria for cables extending up and out of raceway located in the cable spreading room to the control room.

4. ~~The following conditions existed~~ In other areas of the cable spreading room:

a. White tray No. 4080K contained many different division-associated cables including blue/white cable No. TI192, yellow/white cable No. RR781, and green/white cable No. TI816.

b. White tray riser No. RK4627 contained yellow/white cables No. TI942 and No. TI943, and blue/white cables No. TI808 and TI760.

c. White tray riser No. 4139 contained many blue/white and yellow/white cables.

The routing of blue/white, yellow/white, and/or green/white cables together in white trays appeared to be a widespread design practice. This design is contrary to the FSAR Section 8.3.1.13.2 as previously stated above.

The installed conditions identified in paragraphs 1, 2, and 4 of 7.2.2 apparently resulted from designs that deviate from the FSAR. These deviations are contrary to 10 CFR 50, Appendix B, Criterion III, and the Wm. H. Zimmer QA Manual, Section 3.1 and 3.6 (~~50-~~358/81-13-21).

The installed condition identified in paragraph 3 of 7.3.2 apparently resulted from construction activities for which required QC inspection verifications had not been translated into an inspection procedure. The lack of QC inspection for the installed condition in paragraph 3 is contrary to 10 CFR 50, Appendix B, Criterion X, and the Wm. H. Zimmer QA Manual, Section 10.1.2 (~~50-~~358/81-13-22).

The adequacy of cable separation is addressed in the licensee's Quality Confirmation Program.

7.3.3 Misrouted Nonsafety Related Cable

In the instrument-relay room, yellow/white conduit No. RR199 extended from white tray No. 4157A to yellow tray No. 1040B. The conduit and trays contained yellow/white cable No. RR199 and white cable No. DC258 (also mislabelled DC257). Following the cable installation (pull) card, cable No. DC258 was designed to be routed through tray No. 4157A, but not tray 1040B. Since cable No. DC258 was a nonsafety-related cable there were no QC inspection requirements to verify the routing. The misrouted cable identified in paragraph 7.3.2.5 of the installed conditions apparently resulted from contruction activities for which the FSAR does not require QC inspection verification. The misrouted cable does influence cable separation and tray loading and, therefore, will have to be appropriately dispositioned. This item will be reviewed during a subsequent inspection (50-358/81-13-23).

7.3.4 Cable Tray Riser Chutes

With the exception of the green tray riser, identified in paragraph 3 of 7.2.2, the RIII inspector did not observe any other risers (chutes) installed in the cable spreading room. The licensee stated that only eight chutes had been designed and installed in the spreading room and that alternate methods for achieving cable separation were being considered. S&L drawing No. E-98-FB, Revision D, Note 4, required that the portions of cables in the cable spreading room not enclosed or protected by sheel chutes be coated with a 1/8 in. (after dry) application of fireproofing material. During a telephone conversation on May 7, 1981, the licensee stated that the design identified on drawing

No. E-98-FB was being reconsidered for alterations. This item is unresolved pending implementation of the final separation design requirements for cable risers in the cable spreading room (358/81-13-49).

~~7.3.4 Licensee Actions~~

~~The licensee stated that the following actions would be taken~~ With regard to the installed conditions identified in paragraph 7.3.2, ~~7.3.2.2, 7.3.2.3, 7.3.2.4,~~ items 1, 2, and 4, and and 7.3.3, the licensee stated that either the field installations would be changed to comply with the FSAR or appropriate changes to the FSAR with engineering justifications would be submitted to NRR.

7.3.5 Findings and Conclusions

Four locations were identified in which the cable separation requirements had not been maintained as specified in the FSAR. ~~One unresolved matter, relating to the lack of one foot separation of cables in a riser was identified.~~ The adequacy of cable separation is addressed in the licensee's Quality Confirmation Program.

7.3.6 Items of Noncompliance

Two items of noncompliance were identified (failure to establish measures to assure that the design basis for cable separation as set forth in the FSAR was translated into drawings, and failure to establish a program to require verification of cable separation in the cable spreading room).

7.2 Cable Separation

During the investigation of the allegation addressed in Section 5.10, the RIII inspector identified two cable installations that did not comply with the cable separation criteria defined in the Wm. H. Zimmer FSAR. Therefore, the RIII inspector informed the site Resident Inspector, who included checks for cable separation on his routine plant tours. The inspector identified ~~the following~~ additional cable separation violations, ~~and additional violations addressed in the Resident's Inspection Report 81-15~~.

7.2.1 Cable Separation Requirements

The applicable cable separation requirements for the Zimmer facility are as follows.

~~The Region III inspectors observed five installed conditions that did not comply with one or more of the following FSAR criteria concerning cable separations.~~

1. IEEE Std. 383-1974 defines Class 1E as: "The safety classification of the electric equipment and systems that are essential to emergency reactor shutdown, containment isolation, reactor core cooling and containment, and reactor heat removal or otherwise are essential in preventing significant release of radioactive material to the environment."

2. The Zimmer FSAR, Section 8.3.1.12.2, states, "Class 1E cable is assigned to a division according to Table 8.3-19."

The divisions are comprised of the systems addressed in the Class 1E definitions.

"A Class 1E cable is routed only in its division tray conduit, etc."

"Each non-Class 1E cable which has any part of its length in a division tray, conduit, etc., or which connects to a Class 1E power system is a division-associated cable and is not routed in tray, conduit, etc. of another division."

The terms "division-associated," "associated," "non-Class 1E," "balance-of-plant," "nonessential," and "non-ESF (non-engineered safety features)" are all used interchangeably.

3. FSAR Section 8.3.1.13 states:

.2"...Balance-of plant cables not associated with reactor protection or engineered safety features systems, when assigned to a tray section with a Class 1E segregation code, are routed only in trays with that segregation code."

.3"...Cables will have either green, yellow, or blue identification for ESF cable; orange for reactor protection system cable; white for balance-of-plant cables; and white with another color for associated cables."

4. FSAR Table 8.3-16 states, "A nonessential cable may be run in nonessential or ESF tray, but shall not occupy more than one tray system."

5. FSAR Section 8.3.1.11.2.1.d. states, "In the cable spreading room, cable tray risers (chutes) are used to route the cables into the bottom of control panels located in the control room above. Here a 1-foot horizontal, 3 foot vertical separation is maintained."

6. FSAR Section 8.3.1.12.1.3, which addresses instrument cables states, "Low-level signal cables are run in trays and/or conduits separate from all power and control cables."

7.2.2 Observed Cable Separation Violations

During a walkthrough of the cable spreading room, the RIII inspectors observed four violations of cable separation criteria.

1. On the east side of the cable spreading room, at approximately WL 26, yellow/white (associated) cable No. RE053 extends from a 2-in. conduit (which also contains blue/white cable No. RE058), passes approximately 4 in. vertically above the blue Class 1E cables contained in tray No. 2072C, and enters blue/white sleeve No. 79.

   Contrary to the above FSAR criteria, cables No. RE053 and RE058 were routed in the same raceway and cable No. RE053 was not installed a minimum of 3 ft above tray 2072C.

2. On the south side of the cable spreading room, green instrument tray No. 3029K, which was 6 in. wide and approximately 50 ft long, was installed inside white control tray No. 4638B. The installation was in accordance with S&L drawings E-223, Revision G, and E-224, Revision F. Green cable No. WS714, green/white cable No. TI725, and other cables were installed in the green tray. Blue/white and yellow/white cables were installed in the remaining white tray.

   Contrary to the FSAR criteria, the green and green/white cables were essentially installed in the white tray; the green, green/white, blue/white and yellow/white cables were not separated by a minimum of 1 ft horizontally; and the green tray containing instrument cables was not separate from the white tray containing control cables.

3. Near the stairwell at the center of the cable spreading room, two blue cables, No. RI103 and CM111, were routed from blue tray No. 2077A into green tray riser (chute) No. 3025A, which extended up to the control room. Green cables No. HP073 and HP096 were among the cables installed in riser 3025A.

   Contrary to the FSAR criteria, the blue cables were routed in the green division riser and were not horizontally separated from the green cables by at least 1 ft.

   The licensee documented blue cables No. RI103 and CM111 on Nonconformance Report No. 7549, dated March 18, 1981, as a result of the NRC finding.

No QC inspection requirements existed to verify separation criteria for cables extending up and out of raceways located in the cable spreading room to the control room.

4. The following conditions existed in the cable spreading room:

   a. White tray No. 4080K contained many different division-associated cables including blue/white cable No. TI192, yellow/white cable No. RR781, and green/white cable No. TI816.

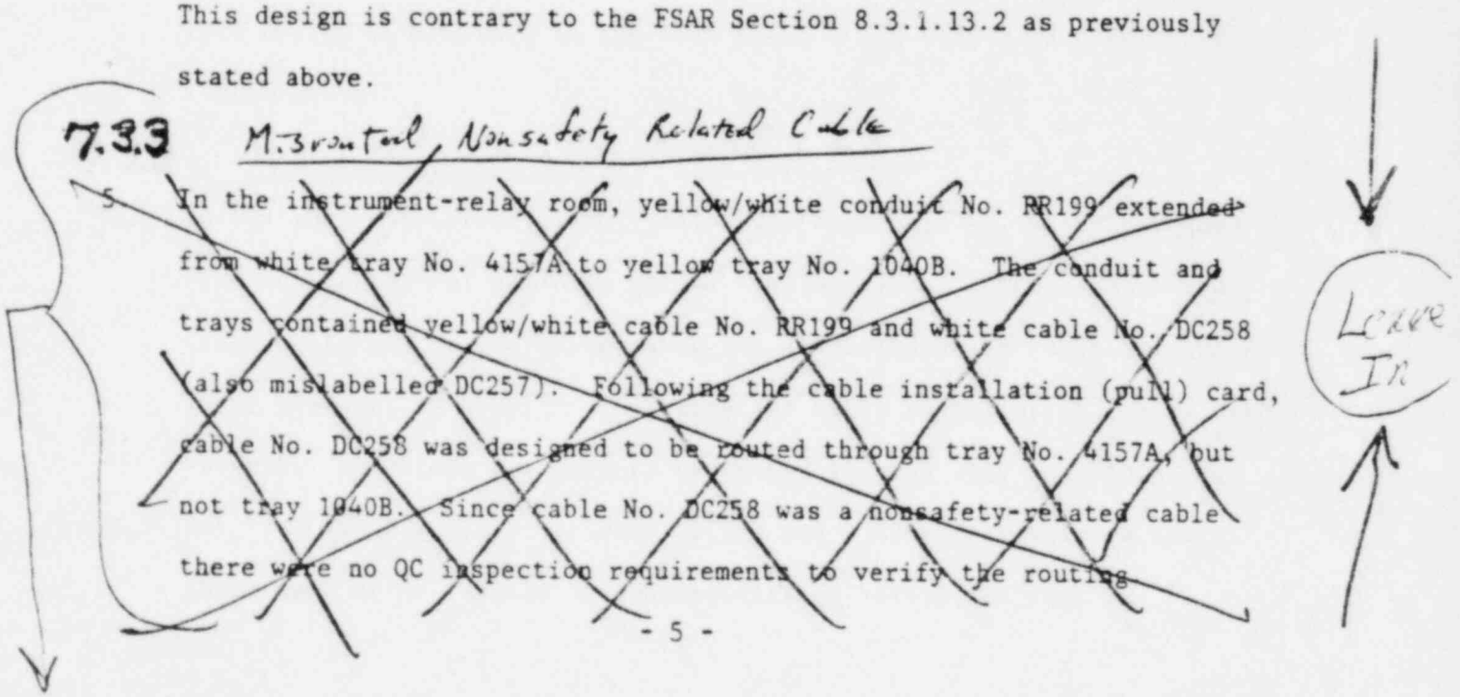
   b. White tray riser No. RK4627 contained yellow/white cables No. TI942 and No. TI943, and blue/white cables No. TI808 and TI760.

   c. White tray riser No. 4139 contained many blue/white and yellow/white cables.

The routing of blue/white, yellow/white, and/or green/white cables together in white trays appeared to be a widespread design practice. This design is contrary to the FSAR Section 8.3.1.13.2 as previously stated above.

7.3.3 Horizontal, Nonsafety Related Cable

5. In the instrument-relay room, yellow/white conduit No. RR199 extended from white tray No. 4157A to yellow tray No. 1040B. The conduit and trays contained yellow/white cable No. RR199 and white cable No. DC258 (also mislabelled DC257). Following the cable installation (pull) card, cable No. DC258 was designed to be routed through tray No. 4157A, but not tray 1040B. Since cable No. DC258 was a nonsafety-related cable there were no QC inspection requirements to verify the routing.



The installed conditions identified in paragraphs 1, 2, and 4 of 7.2.2 apparently resulted from designs that deviate from the FSAR. These deviations are contrary to 10 CFR 50, Appendix B, Criterion III, and the Wm. H. Zimmer QA Manual, Section 3.1 and 3.6 (50-358/81-13-21).

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The installed condition identified in paragraph 3 of 7.2.2 apparently resulted from construction activities for which required QC inspection verifications had not been translated into an inspection procedure. The lack of QC inspection for the installed condition in paragraph 3 is contrary to 10 CFR 50, Appendix B, Criterion X, and the Wm. H. Zimmer QA Manual, Section 10.1.2 (50-358/81-13-22).

The misrouted cable identified in paragraph 7.3.3 of the inventory apparently resulted from contruction activities for which the FSAR does not require QC inspection verification. The misrouted cable does influence cable separation and tray loading and, therefore, will have to be appropriately dispositioned. This item will be reviewed during a subsequent inspection (50-358/81-13-23).

Leave IN

7.3.4 Cable Tray Riser Chutes

With the exception of the green tray riser, identified in paragraph 3 of 7.2.2, the RIII inspector did not observe any other risers (chutes) installed in the cable spreading room. The licensee stated that only eight chutes had been designed and installed in the spreading room and that alternate methods for achieving cable separation were being considered. S&L drawing No. E-98-FB, Revision D, Note 4, required that the

portions of cables in the cable spreading room not enclosed or protected by sheel chutes be coated with a 1/8 in. (after dry) application of fireproofing material. During a telephone conversation on May 7, 1981, the licensee stated that the design identified on drawing No. E-98-FB was being reconsidered for alterations. This item is unresolved pending implementation of the final separation design requirements for cable risers in the cable spreading room (358/81-13-49).

The licensee stated that the following actions would be taken with regard to the installed conditions identified in paragraphs 7.3.2.1, 7.3.2.2, 7.3.2.4, and 7.3.3. Either the field installations would be changed to comply with the FSAR or appropriate changes to the FSAR with engineering justifications would be submitted to NRR.

7.3.4 Findings and Conclusions

Four locations were identified in which the cable ~~spreading~~ separation requirements had not been maintained as specified in the FSAR. ~~Two~~ One unresolved matter relating to the lack of one hour separation of cables in a riser was identified. ~~which impacts cable separation requirements was identified. Other cable separation concerns, addressed in IE Inspection Report 81-15, were identified as followup on this section.~~ Adequacy of cable separation will be addressed in the Quality Confirmation Program

7.3.5 Items of Noncompliance

Two items of noncompliance were identified (failure to establish measures to assure that the design basis for cable separation as set forth in the FSAR was translated into drawings, and failure to establish a program to require verification of cable separation in the cable spreading room).

7.5 CG&E Audits of S&L

The Region III inspector requested for review all of the CG&E audits of S&L. The following audits were provided and reviewed to determine if CG&E was assessing the effectiveness of the S&L nonconformance program and to determine the general nature of the audits.

	Audit Dates	Audit Number When Noted
(1)	2/15-16/72	
(2)	8/8-9/74	
(3)	8/7-8/75	
(4)	7/28-19/76	
(5)	11/14-15/77	77/24
(6)	9/6-7/78	78/07
(7)	10/16-17/78	78/09
(8)	11/27-30/78	78/10
(9)	1/30-31/79	79/01
(10)	12/18-19/79	79/07
(11)	3/5-6/80	80/01
(12)	10/21-22/80	80/04

The RIII inspector observed only two items (deficiencies) in all of the above audits, covering a 9-year period, that addressed the S&L nonconformance program. These deficiencies, which addressed distribution and logging of nonconformance reports, were closed in Audit 77/24.

Audit 77/24 indicated that S&L Project Procedure #PIZI-8.1, Revision 0, had been prepared to describe responsibilities and instructions, and to require a log and a file of nonconformance reports.

The RIII inspector did not observe any other portions in the audits that would have represented comprehensive and planned audits of the nonconformance program. Comprehensive and planned audits are required to verify compliance with the QA program and determine the effectiveness of the nonconformance program. The audits of the nonconformance program should address such things as implementation, design reviews, identification of acceptance or rejection, disposition control, and notification of affected organizations.

The audits generally appeared to be reactive in nature in that specific problems, which had been previously identified, were audited. The audits did not appear to be progressive and programmatic, or directed toward identification of new and generic problems.

Failure by CG&E to perform a comprehensive audit of the S&L nonconformance program during the past 9 years is contrary to 10 CFR 50, Appendix B, Criterion XVIII, and the Wm. H. Zimmer QA Manual, Section 18.1. (50-358/81-13-23).

Reviewed 8/8 RSD.

7.5 CG&E Audits of S&L

State why reviewed

The Region III inspector requested for review all of the CG&E audits of S&L. The following audits were provided and reviewed to determine if CG&E was assessing the effectiveness of the S&L nonconformance program and to determine the general nature of the audits.

	Audit Dates	Audit Number When Noted
(1)	2/15-16/72	
(2)	8/8-9/74	
(3)	8/7-8/75	
(4)	7/28-19/76	
(5)	11/14-15/77	77/24
(6)	9/6-7/78	78/07
(7)	10/16-17/78	78/09
(8)	11/27-30/78	78/10
(9)	1/30-31/79	79/01
(10)	12/18-19/79	79/07
(11)	3/5-6/80	80/01
(12)	10/21-22/80	80/04

The RIII inspector observed only two items (deficiencies) in all of the above audits, covering a 9-year period, that addressed the S&L nonconformance program. These deficiencies, which addressed distribution and logging of nonconformance reports, were closed in Audit 77/24.

The fact that there were no findings does not mean audits weren't comprehensive. You haven't proven your point! (over)

Audit 77/24 indicated that S&L Project Procedure #PIZI-8.1, Revision 0, had been prepared to describe responsibilities and instructions, and to require a log and a file of nonconformance reports.

The RIII inspector did not observe any other portions in the audits that would have represented comprehensive and planned audits of the nonconformance program. Comprehensive and planned audits are required to verify compliance with the QA program and determine the effectiveness of the nonconformance program. The audits of the nonconformance program should address such things as implementation, design reviews, identification of acceptance or rejection, disposition control, and notification of affected organizations.

The audits generally appeared to be reactive in nature in that specific problems, which had been previously identified, were audited. The audits did not appear to be progressive and programmatic, or directed toward identication of new and generic problems.

Failure by CG&E to perform a comprehensive audit of the S&L nonconformance program during the past 9 years is contrary to 10 CFR 50, Appendix B, Criterion XVIII, and the Wm. H. Zimmer QA Manual, Section 18.1. (50-358/81-13-23).

Findings & Conclusions

INC

Compare with one I gave to [illegible].

7.3 CG&E Audits of Sargent & Lundy

During the investigation of allegation 5.10, the RIII inspector identified that Sargent & Lundy did not have a program to control design deviations (nonconforming designs) when identified by the S&L engineers. Therefore, the RIII inspector requested for review all of the CG&E audits of S&L to determine if CG&E had assessed the effectiveness of the S&L nonconformance program.

7.3.1 Audits of the S&L Nonconformance Program

The Region III inspector reviewed the following CG&E audits of S&L:

	Audit Dates	Audit Number When Noted
(1)	2/15-16/72	
(2)	8/8-9/74	
(3)	8/7-8/75	
(4)	7/28-19/76	
(5)	11/14-15/77	77/24
(6)	9/6-7/78	78/07
(7)	10/16-17/78	78/09
(8)	11/27-30/78	78/10
(9)	1/30-31/79	79/01
(10)	12/18-19/79	79/07
(11)	3/5-6/80	80/01
(12)	10/21-22/80	80/04

The RIII inspector did not observe any portions ~~of~~ of the audits that ~~would have represented comprehensive system of planned audits to determine~~ only addressed the effectiveness of the nonconformance program. The audits of the nonconformance program should have addressed such things as implementation, design reviews, identification of acceptance or rejection, disposition control, and notification of affected organizations.

The RIII inspector observed only two items in all of the above audits, covering a 9-year period, that concerned the S&L nonconformance program. These two items, identified in one audit, were designated as deficiencies, which concerned distribution and logging of nonconformance reports. The deficiencies appeared to have been identified during audit activities which were not directed at the nonconformance program. The deficiencies were apparently resolved in Audit 77/24 which indicated that S&L Project Procedure #PIZI-8.1, Revision 0, had been prepared to describe responsibilities and instructions, and to require a log and a file of nonconformance reports.

Failure by CG&E to perform an audit to determine the effectiveness of the S&L nonconformance program during the past 9 years is contrary to 10 CFR 50, Appendix B, Criterion XVIII, and the Wm. H. Zimmer QA Manual, Section 18.1. (50-358/81-13-23).

7.~~4~~3.2 General Audit Context

The audits generally appeared to be reactive in nature in that specific problems, which had been previously identified, were audited. The audits

did not appear to be progressive and programmatic, or directed toward identification of new and generic problems. The audits ~~approved~~ [appeared] to identify adverse findings for which there were no corrective action taken or follow-up audits. This matter is unresolved pending a ~~review, by the licensee of CG&E~~ [re-review by CG&E of then past] audits~~, which will define the respective adverse findings, the corrective actions, and the follow-up audits.~~ [audits of Sargent & Lundy, General Electric, H.J. Kaiser and for CG&E internal departments] (358/81-13-80)

7.~~X~~3.3 Recurrences of Problems with Design Calculations, Reviews, and Verifications

During the review of the CG&E audits of S&L, the Region III inspector noted that the audits were identifying a recurring problem. This problem concerned the performance of design calculation, reviews, and verifications by S&L. The specific problems identified in each audit are as follows:

Audit Date or No.	Problems
1. 8/8-9/74	(a) ITE Imperial drawings of essential equipment had not been signed and bore no evidence of a design review.
	(b) There were inadequacies in documenting design reviews.

	Audit Date or No.	Problems
		(c) Structural design calculation were not in accordance with new procedures.
		(d) No direct evidence was available of the S&L review of vendor design calculations.
2.	78/07	(a) S&L had not maintained a record of support design calculations.
		(b) DDC #2973 was approved without review by EMD even though a major support location change was clearly identified on the DDC. (This item was identified in the details of the audit report, but was not cited and had no apparent followup on subsequent audits.)
3.	78/09	(a) Very little data was available to justify the embedment criteria of 4.5 times the normal diameter of concrete expansion anchors.

	Audit Date or No.	Problems
		(b) Calculations could not be located which would verify that a structured review was performed to show that no reinforcement was needed for a 24 x 68 radial beam which was cut at both flanges.
4.	78/10	(a) Calculations were not available for all walls to substantiate the statement that block walls were "judged to be OK."
		(b) Calculations were not available to back up design signatures which indicated design verification for five design changes approving core bores.
		(c) No approval signatures were found on any calculations for structural steel modifications (including Beam #86) due to pool hydrodynamic loads. The modification had been released for construction.

Audit Date or No.	Problems
	(d) Audit finding was closed based on calculations which were in progress but not yet complete. The calculations were for beams (embedded plates) in the primary containment to verify that the plates can support additional loads.
5. 80/04	(a) (1) The calculation required to evaluate the clamp deflection on a pipe support was not performed.
	(2) Also, the weld calculation was not performed on the most critical weld.
	(b) Calculations performed by NPS were incomplete in that the deflection due to torsional rotation of the beam was not included.
	(c) Calculations performed by NPS were not in reasonable order, which made them difficult to follow.

None of the audits or corrective actions, which identified the above problems, addressed or determined the generic and programmatic cause of design calculations, reviews, and verifications not being performed to preclude repetition. Failure to determine the cause and to take corrective action to preclude repetition is contrary to 10 CFR 50, Appendix B, Criterion XVI and the Wm. H. Zimmer QA Manual, Section 16.5. (50-358/81-13-24).

7.3.3 Findings and Conclusions

CG&E has ~~never~~ not performed a comprehensive audit to determine the effectiveness of the Sargent & Lundy nonconformance program. ~~CG&E will perform a review of CG&E audits to define the respective adverse findings, the corrective actions, and the follow-up audits.~~ Past audits identified a recurring problem involving design calculations, reviews and verifications for which the cause was not determined and corrective action was not taken to preclude repetition. CG&E will undertake a re-review of all past audits of Sargent & Lundy, General Electric, Kaiser, and four internal departments as a part of the Quality Confirmation Program.

7.3.4 Items of Noncompliance

Two items of noncompliance were identified (failure to perform a comprehensive audit of the S&L nonconformance program, and failure to determine the cause and preclude repetition of a recurring problem).

7.3 CG&E Audits of Sargent & Lundy

During the investigation of allegation 5.10, the RIII inspector identified that Sargent & Lundy did not have a program to control design deviations (nonconforming designs) when identified by the S&L engineers. Therefore, the RIII inspector requested for review all of the CG&E audits of S&L to determine if CG&E had assessed the effectiveness of the S&L nonconformance program.

7.3.1 CG&E Audits of the S&L ~~Nonconformance Program~~

The Region III inspector reviewed the following CG&E audits of S&L:

	Audit Dates	Audit Number When Noted
(1)	2/15-16/72	
(2)	8/8-9/74	
(3)	8/7-8/75	
(4)	7/28-19/76	
(5)	11/14-15/77	77/24
(6)	9/6-7/78	78/07
(7)	10/16-17/78	78/09
(8)	11/27-30/78	78/10
(9)	1/30-31/79	79/01
(10)	12/18-19/79	79/07
(11)	3/5-6/80	80/01
(12)	10/21-22/80	80/04

Center

~~The RIII inspector did not observe any portions of~~ The audits ~~that~~ did not address in depth the effectiveness of the nonconformance program. The audits of the nonconformance program should have addressed such things as implementation, design reviews, identification of acceptance or rejection, disposition control, and notification of affected organizations.

No ff The RIII inspector observed only two items in all of the ~~above~~ audits, covering a 9-year period, that concerned the S&L nonconformance program. These two items, identified in one audit, were designated as deficiencies, which concerned distribution and logging of nonconformance reports. The deficiencies appeared to have been identified during audit activities which were not directed at the nonconformance program. (The deficiencies were apparently resolved in Audit 77/24 which indicated that S&L Project Procedure #PIZI-8.1, Revision 0, had been prepared to describe responsibilities and instructions, and to require a log and a file of nonconformance reports).

Failure by CG&E to perform an audit to determine the effectiveness of the S&L nonconformance program during the past 9 years is contrary to 10 CFR 50, Appendix B, Criterion XVIII, and the Wm. H. Zimmer QA Manual, Section 18.1/ ([redacted]358/81-13-23).

This concern is addressed in the licensee's Quality Confirmation Program.

7.3.2 General Audit Context

The audits generally appeared to be reactive in nature in that specific problems, which had been previously identified, were audited. The audits did not appear to be ~~progressive and programmatic~~ directed toward identification of new and generic problems. The audits appeared to identify

adverse findings for which there were no corrective action taken or follow-up audits. This matter is unresolved pending a re-review by CG&E of their past audits of Sargent & Lundy, General Electric, H. J. Kaiser and four CG&E internal departments (358/81-13-80).

7.3.3 Recurrences of Problems with Design Calculations, Reviews, and Verifications

~~During the review of~~ The CG&E audits of S&L ~~the Region III inspector noted that the audits~~ were identifying a recurring problem. ~~This problem~~ concerning the performance of design calculation, reviews, and verifications by S&L. The specific problems identified in each audit are ~~as follows:~~ described in Table 7.3-1

Table 7.3-1 CG&E Audit Findings

Audit Date or No.	Problems (Center heading)
8/8-9/74	(a) ITE Imperial drawings of essential equipment had not been signed and bore no evidence of a design review. (b) There were inadequacies in documenting design reviews.

Table 7.3-1 (continued)

Audit Date or No.	Problems
	(c) Structural design calculation were not in accordance with new procedures.
	(d) No direct evidence was available of the S&L review of vendor design calculations.
78/07	(a) S&L had not maintained a record of support design calculations.
	(b) DDC #2973 was approved without review by EMD even though a major support location change was clearly identified on the DDC. (This item was identified in the details of the audit report, but was not cited and had no apparent followup on subsequent audits.)
78/09	(a) Very little data was available to justify the embedment criteria of 4.5 times the normal diameter of concrete expansion anchors.

Table 7.3-1 (continued)

Audit Date or No.	Problems
	(b) Calculations could not be located which would verify that a structured review was performed to show that no reinforcement was needed for a 24 x 68 radial beam which was cut at both flanges.
78/10	(a) Calculations were not available for all walls to substantiate the statement that block walls were "judged to be OK."
	(b) Calculations were not available to back up design signatures which indicated design verification for five design changes approving core bores.
	(c) No approval signatures were found on any calculations for structural steel modifications (including Beam #86) due to pool hydrodynamic loads. The modification had been released for construction.

Table 7.3-1 (Continued)

Audit Date or No.	Problems
	(d) Audit finding was closed based on calculations which were in progress but not yet complete. The calculations were for beams (embedded plates) in the primary containment to verify that the plates can support additional loads.
80/04	(a) (1) The calculation required to evaluate the clamp deflection on a pipe support was not performed.
	(2) Also, the weld calculation was not performed on the most critical weld.
	(b) Calculations performed by NPS were incomplete in that the deflection due to torsional rotation of the beam was not included.
	(c) Calculations performed by NPS were not in reasonable order, which made them difficult to follow.

None of the audits ~~or corrective actions~~ which identified the above problems or corrective actions instituted addressed ~~determined~~ the generic and programmatic cause of design calculations, reviews, and verifications not being performed to preclude repetition. Failure to determine the cause and to take corrective action to preclude repetition is contrary to 10 CFR 50, Appendix B, Criterion XVI and the Wm. H. Zimmer QA Manual, Section 16.5 (~~A~~ 358/81-13-24). This concern is addressed in the licensee's Quality Confirmation Program

7.3 Findings and Conclusions

CG&E has not performed a comprehensive audit to determine the effectiveness of the Sargent & Lundy nonconformance program. Past audits identified a recurring problem involving design calculations, reviews, and verifications for which the cause was not determined and corrective action was not taken to preclude repetition. CG&E will undertake a re-review of all past audits of Sargent & Lundy, General Electric, Kaiser and four internal departments as a part of the Quality Confirmation Program.

7.3 Items of Noncompliance

Two items of noncompliance were identified (failure to perform a comprehensive audit of the S&L nonconformance program, and failure to determine the cause and preclude repetition of a recurring problem).

8. 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. Unresolved items are identified in paragraphs 4.1.8.2.1, 4.2.2.3, 5.2.3.2, 5.2.3.6, 5.3.4, 5.5.3.4.1, 5.5.10.3.2, 5.10.3.3, 5.10.3.3 ~~(second item)~~, 5.10.3.3 ~~(third item)~~, 5.11.3, 4.1.8.2.1, 7.1.3, 7.2.3, 7.2.4, 7.3.2.

7.1.7 Findings and Conclusions

In their examination of approximately 25 structural steel beams, the NRC inspectors identified the following significant problems.

Welds on nine structural beams were unacceptable. Five beams had unacceptable (notched) re-entrant corners. Four beams were installed which were not specified on any design document. The traceability of nine structural beams was not maintained. In addition, measures had not been established to assure that required QA in-process inspections related to Design Document Changes would be performed; and the licensee did not assess the effectiveness of controls to assure the quality of mill certifications and structural steel beams supplied by three vendors.

7.1.8 Items of Noncompliance

Four items of noncompliance were identified (failure to control unacceptable welds, unacceptable re-entrant corners on beams, and unspecified beams; failure to maintain traceability of beams; failure to assess the effectiveness of vendor quality assurance; and failure to maintain sufficient documentation of steel erection inspections).

8. Open Items

This investigation is not complete. Results of the continuing inspection and investigation effort will be documented in future reports.

When this investigation was initiated, the NRC interviewed numerous quality control inspectors and construction craftsmen in addition to management personnel and received many statements that deserved followup. Based on initial information gathered by the investigation team, the detailed plant knowledge of the resident and other inspections, and knowledge of previously identified findings, the concerns received were prioritized. Highest priority was given to the initial four allegations received from an ex-Zimmer contractor employee (Section 4), the 19 allegations received from GAP/Applegate (Section 5), and the more significant of the statements and allegations received from Zimmer contractor employees and ex-employees (Section 6). Other allegations and statements were given lower priority. These concerns will be investigated and/or inspected and the findings and conclusions will be documented in future reports.

INSERT 1

Since the prioritizing effort included assigning first priority to those allegations and concerns received onsite which appeared to have the most significance to safety, the remaining work should not appreciably alter assessments made to date or plans for verifying the quality of construction. However, should future inspection findings (either by the licensee or the NRC) reveal significant construction deficiencies, these will be addressed in revisions to the quality conformation program and independent the NRC measurements program as appropriate.

INSERT 1

AS NOTED IN SECTION 3, GAP PROVIDED A NUMBER OF AFFIDAVITS FROM VARIOUS INDIVIDUALS.

In those cases where an individual's concerns or allegations have previously been reviewed by NRC, they will be contacted to determine:

1. If they have information not previously provided.

2. If they have significant details to add to information previously provided.

3. If they believe their concerns/allegations have been inadequately addressed, and the specific reasons for their beliefs.

This information will be evaluated to determine if additional review is warranted.

9. Open Items

~~This investigation is not complete.~~ Results of the continuing inspection and investigation effort will be documented in future reports, until the investigation is complete.

When this investigation was initiated, the NRC interviewed numerous quality control inspectors, ~~and~~ construction craftsmen, ~~in addition to~~ and management personnel ~~and received many statements~~ who provided information that deserved ~~followup~~ review by the NRC. ~~Based on initial information gathered by the investigation team, the detailed plant knowledge of the resident and other inspectors, and knowledge of previously identified findings the concerns received were prioritized.~~ The information provided was prioritized with the highest priority ~~was~~ given to the initial four allegations received from a former Zimmer contractor ~~QC Inspector ex-employee~~ (Section 4), the 19 allegations received from GAP/Applegate (Section 5), and the most significant ~~of the~~ statements and allegations received from contractor employees and ex-employees (Section 6). Other allegations and statements were given lower priority. These concerns will be investigated and/or inspected and the findings and conclusions will be documented in future reports, until the investigation is complete.

As noted in Section 3, GAP provided a number of affidavits from various individuals. In those cases where an individual's concerns or allegations have previously been reviewed by NRC, ~~they~~ those individuals will be contacted to determine:

1. If they have information not previously provided.

2. If they have significant details to add to information previously provided.

3. If they believe their concerns/allegations have been inadequately addressed, ~~and the specific reason for their beliefs.~~

~~Since the prioritizing effort included assigning first priority to those allegations and concerns received onsite which appeared to have the most significance to safety, the remaining work should not appreciably alter assessments made to date or plans for verifying the quality of construction. However, should~~ If future inspection findings (either by the licensee or the NRC) reveal significant construction deficiencies, these will be addressed in revisions to the quality conformation program and the NRC independent measurement program as appropriate.

10. Exit Interview

In addition to the management meetings and enforcement conferences held as described in Section 10, the inspectors and investigators met with licensee representatives periodically during the investigation and on March 26, 1981. Attendees at the March 26 meeting ~~other than NRC representatives~~ are designated in Section 1, Personnel Contacted. NRC attendees at the meeting are designated at the end of this section. At that meeting the NRC investigation team described the reasons for the investigation; the findings regarding each completed allegation; and safety concerns identified during the investigation, which are described below. The team leader indicated that the investigation was not yet complete, that the findings would be reviewed with NRC Regional and Headquarters Management, and that enforcement action would be discussed in subsequent enforcement meetings. At the NRC's request, the licensee agreed to meet with Region III representatives on April 10, 1981, in the Regional Office to discuss identified concerns and proposed corrective actions.

The inspectors identified the following concerns:

a. Structural beams with unacceptable welds and re-entrant corners with notches.

b. Inadequacies in the QA program of the structural steel erector (Bristol).

c. Lack of traceability of material in structural beams, small bore piping, and weld rod.

d. Surveillance reports not being converted to nonconformance reports in 30 days.

e. Structural welds inspected after painting.

f. Radiograph technique inadequate on 25% of the prefabricated welds reviewed by NRC. (Penetrameters were not adequately shimmed.)

g. Nonconformance reports being improperly voided.

h. A green cable tray was designed and installed inside a white tray.

i. Lack of inspection control to verify cable separation. (Three examples of failure to maintain cable separation were identified.)

j. Lack of design controls by Sargent and Lundy to require verification calculations for thermal loading of power sleeves and dead weight loading of all trays, to document design deviations identified by engineers, and to document deviations from the FSAR.

k. Inadequate action taken by CG&E to obtain correction of repetitive problems identified by CG&E in audits of Sargent & Lundy.

l. Lack of audits of the Sargent & Lundy nonconformance program.

m. Weld inspection criteria was deleted from the weld data sheet (KEI-1 form) from approximately July 1980 to February 1981.

n. Lack of socket weld fitup verification on numerous small bore pipes.

o. Installation of structural beams which were not required on any design documents.

p. Doubts about the accuracy of weld records. Information from the weld rod issue slips was being transferred to the weld data sheets.

q. Lack of control of design document changes.

r. Site procedures allowed more weld undercut than AWS D1.1-1972.

NRC Personnel Attending Exit Interview March 26, 1981

P. A. Barrett, Reactor Inspector

R. M. Burton, Investigator

F. T. Daniels, Senior Resident Inspector

E. C. Gilbert, Investigator, IE:HQ

T. P. Gwyn, Resident Inspector

F. A. Maura, Reactor Inspector

J. B. McCarten, Investigator

J. F. Schapker, Reactor Inspector

K. D. Ward, Reactor Inspector

R. F. Warnick, Chief, Reactor Projects Section 2B

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The inspectors identified the following concerns:

a. Structural beams with unacceptable welds and re-entrant corners with notches.

b. Inadequacies in the QA program of the structural steel erector (Bristol).

c. Lack of traceability of material in structural beams, small bore piping, and weld rod.

d. Surveillance reports not being converted to nonconformance reports in 30 days.

e. Structural welds inspected after painting.

f. Radiograph technique inadequate on 25% of the prefabricated welds reviewed by NRC. (Penetrameters were not adequately shimmed.)

g. Nonconformance reports being improperly voided.

h. A green cable tray was designed and installed inside a white tray.

i. Lack of inspection control to verify cable separation. (Three examples of failure to maintain cable separation were identified.)

j. Lack of design controls by Sargent and Lundy to require verification calculations for thermal loading of power sleeves and dead weight loading of all trays, to document design deviations identified by engineers, and to document deviations from the FSAR.

k. Inadequate action taken by CG&E to obtain correction of repetitive problems identified by CG&E in audits of Sargent & Lundy.

l. Lack of audits of the Sargent & Lundy nonconformance program.

m. Weld inspection criteria was deleted from the weld data sheet (KEI-1 form) from approximately July 1980 to February 1981.

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o. Installation of structural beams which were not required on any design documents.

p. Doubts about the accuracy of weld records, Information from the weld rod issue slips was being transferred to the weld data sheets.

q. Lack of control of design document changes.

r. Site procedures allowed more weld undercut than AWS D1.1-1972.

NRC Personnel

~~Persons~~ Attending Exit Interview March 26, 1981

Cincinnati Gas and Electric Company

E. A. Borgman, Senior Vice President

H. C. Brinkman, Principle Mechanical Engineer - Nuclear

B. K. Culver, Manager, Generation Construction

R. P. Ehas, Quality Engineer

J. R. Schott, Plant Manager

W. W. Schwiers, Manager, Quality Assurance

S. C. Swain, Site Construction Manager

W. D. Waymire, Manager, General Engineering

Henry J. Kaiser Company

P. S. Gittings, Site QA Manager

E. V. Knox, Corporate QA Manager

R. Marshall, Site Manager

C. H. Stanfield, Construction Manager

U. S. Nuclear Regulatory Commission

P. A. Barrett, Reactor Inspector

R. M. Burton, Investigator

F. T. Daniels, Senior Resident Inspector

E. C. Gilbert, Investigator, IE:HQ (OIA)

T. P. Gwyn, Resident Inspector

F. A. Maura, Reactor Inspector

J. B. McCarten, Investigator

J. F. Schapker, Reactor Inspector

K. D. Ward, Reactor Inspector

R. F. Warnick, Chief, Reactor Projects Section 2B

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~~10~~. Management Meetings

In addition to the exit meeting held at the site on March 26, 1981, meetings involving licensee and RIII senior and/or middle management were held on March 31, April 10, April 30, June 2, June 3, and August 5, 1981. These meetings are summarized below.

Following the exit meeting held at the Zimmer site on March 26, 1981, Mr. E. A. Borgmann met with J. G. Keppler and R. F. Warnick on the afternoon of March 31, 1981, in the Region III office to discuss the significance of the NRC investigation findings and required corrective actions. As a result of this meeting,

On April 8, 1981, Region III sent an Immediate Action Letter (IAL) to the licensee documenting ten corrective measures that CG&E had initiated or were planning to take concerning the problems identified by the NRC investigation team. The ten measures were established to provide assurance that similar problems do not recur during ongoing and future construction activities. The IAL and the required corrective measures are described in Section 11, NRC Actions and Licensee Commitments.

An enforcement conference was held in the Region III office on April 10, 1981, between E. A. Borgmann and others of his staff and J. G. Keppler and other NRC personnel to discuss CG&E's proposed corrective action program for deficiencies identified in the NRC investigation and the measures to be taken to assure acceptable quality of future activities. This enforcement conference is documented in IE Inspection Report No. 50-358/81-14.

A followup meeting was held in the RIII office on April 30, 1981, between W. D. Waymire and others representing CG&E and R. F. Warnick and others of the NRC staff, to discuss the status of measures being taken to assure acceptable quality of ongoing activities at the Zimmer project and to discuss the latest draft of the licensee's proposed corrective action program for deficiencies identified. Details of this meeting are documented in IE Meeting Report No. 50-358/81-16.

A working level meeting was held on June 2, 1981, between W. D. Waymire and others representing CG&E and R. F. Warnick and others from the NRC at the Zimmer site to discuss the licensee's proposed quality confirmation program and the additional measures required to identify and correct construction deficiencies, to establish confidence in quality records, and to verify the quality of existing construction. This meeting is documented in IE Meeting Report No. 50-358/81-20.

The Region III Director, Deputy Director, and the Section Chief met with CG&E's President, Senior Vice President of Engineering Services and Electrical Production, and the Manager of the General Engineering Department (Acting Manager of Quality Assurance) on June 3, 1981, to discuss matters relating to NRC's Zimmer investigation. Topics discussed included the originating allegations; NRC findings relative to the allegations; problems identified during the investigation; the NRC's Immediate Action Letter of April 8, 1981, establishing controls to assure the quality of ongoing and future work; the program to confirm the quality of completed work; the licensee's internal problem identification and resolution system; status of the NRC's investigation; the

role of NRC's Office of Inspector and Auditor in the investigation; and public and congressional interest in the Zimmer project. This meeting is documented in IE Meeting Report No. 50-358/81-20.

An enforcement conference was held on August 5, 1981, in the Regional Office between J. G. Keppler, RIII Regional Director, and others of his staff and W. H. Dickhoner, CG&E President, and others of his staff. Topics discussed included the NRC investigation, the findings of the investigation, items of noncompliance resulting from the investigation, escalated enforcement action being considered, the status of the investigation, the release of the report and a possible public meeting in Cincinnati, the status of the licensees quality confirmation program, CG&E organization changes, and other corrective actions being taken by the licensee. This meeting is documented in IE Meeting Report No. 50-358/81-11.

10. Management Meetings

In addition to the exit meeting held at the site on March 26, 1981, meetings involving licensee and RIII senior and/or middle management were held on March 31, April 10, April 30, June 2, June 3, and August 5, 1981. These meetings are summarized below.

Following the exit meeting held at the Zimmer site on March 26, 1981, Mr. E. A. Borgman met with J. G. Keppler and R. F. Warnick on the afternoon of March 31, 1981, in the Region III office to discuss the significance of the NRC investigation findings and required corrective actions.

On April 8, 1981, Region III sent an Immediate Action Letter (IAL) to the licensee documenting ten corrective measures that CG&E had initiated or were planning to take concerning the problems identified by the NRC investigation team. The ten measures were established to provide assurance that similar problems do not recur during ongoing and future construction activities. The IAL and the required corrective measures are described in Section 11, NRC Actions and Licensee Commitments, ~~and Corrective Actions.~~

An enforcement conference was held in the Region III office on April 10, 1981, between E. A. Borgman and others of his staff and J. G. Keppler and other NRC personnel to discuss CG&E's proposed corrective action program for deficiencies identified in the NRC investigation and the measures to be taken to assure acceptable quality of future activities. This enforcement conference is documented in IE Inspection Report No. 50-358/81-14.

A followup meeting was held in the RIII office on April 30, 1981, between W. D. Waymire and others representing CG&E and R. F. Warnick and others of the NRC staff, to discuss the status of measures being taken to assure acceptable quality of ongoing activities at the Zimmer project and to discuss the latest draft of the licensee's proposed corrective action program for deficiencies identified. Details of this meeting are documented in IE Meeting Report No. 50-358/81-16.

A working level meeting was held on June 2, 1981, between W. D. Waymire and others representing CG&E and R. F. Warnick and others from the NRC at the Zimmer site to discuss the licensee's proposed quality confirmation program and the additional measures required to identify and correct construction deficiencies, to establish confidence in quality records, and to verify the quality of existing construction. This meeting is documented in IE Meeting Report No. 50-358/81-20.

The Region III Director, Deputy Director, and the Section Chief in charge of the investigation, R. Warnick met with CG&E's President, Senior Vice President of Engineering Services and Electrical Production, and the Manager of the General Engineering Department (Acting Manager of Quality Assurance) on June 3, 1981, to discuss matters relating to NRC's Zimmer investigation. Topics discussed included the originating allegations; NRC findings relative to the allegations; problems identified during the investigation; the NRC's Immediate Action Letter of April 8, 1981, establishing controls to assure the quality of ongoing and future work; the program to confirm the quality of completed work; the licensee's internal problem identifi-

cation and resolution system; status of the NRC's investigation; the role of NRC's Office of Inspector and Auditor in the investigation; and public and congressional interest in the Zimmer project. This meeting is documented in IE Meeting Report No. 50-358/81-20.

An enforcement conference was held on August 5, 1981, in the Regional Office between J. G. Keppler, RIII Regional Director, and others of his staff and W. H. Dickhoner, CG&E President, and others of his staff. Topics discussed included the NRC investigation, the findings of the investigation, items of noncompliance resulting from the investigation, escalated enforcement action being considered, the status of the investigation, the release of the report and a possible public meeting in Cincinnati, the status of the licensees quality confirmation program, CG&E organization changes, and other corrective actions being taken by the licensee. This meeting is documented in IE Meeting Report No. 50-358/81-//.

7.1 Visual Examinations of Structural Steel Beams

Region III inspectors made visual examinations of structural steel beams in the blue switchgear and cable spreading rooms.

7.1.1 Beams Observed in Blue Switchgear Room

The area observed in the blue switchgear room (elevation 546 ft) was 8 ft 3 in. west of workline G, 16 ft 6 in. east of workline H and between columns 22 and 54 of S&L drawing No. S-546, Revision AB.

The following six discrepancies were identified:

1. A W8 x 17 beam (8 ft 3 in. long), positioned east to west and located 1 ft 9 in. south of column 24 and 10 in. below elevation 546 ft, was not specified on any pertinent design drawing. The beam appeared to be permanently installed, but traceability of the beam heat number was not maintained. After extensive and unsuccessful retrieval efforts by QA personnel, construction personnel were requested to identify any document that would control the unspecified beam. Construction personnel provided Design Document Change (DDC) No. S-2050, dated May 29, 1980, containing only the signatures of two site construction engineers, who were identifying some of the additional W8 x 17 beams in the area covered by S&L drawing No. S-546. The DDC had no S&L architectural engineering signatures of approval as of March 27, 1981. The DDC did not identify any specific beams.

The licensee identified S&L drawing E-189, Sheet 3, Revision H, Note No. 17, which allows W8 x 17 beams to be installed and then be submitted on a DDC for S&L approval.

The W8 x 17 beam was not identified on any QC inspection record, which indicated in-process weld inspections were not performed.

2. A W8 x 17 beam (6 ft 3 in. in length), positioned north to south and located 13 ft 8 in. west of workline G and 1 in. below elevation 546 ft, was not specified on any pertinent design drawing, was not documented on any QC record, and had unacceptable welds.

3. A W8 x 17 beam (5 ft 5 in. in length), positioned east to west and located 8 ft 10 in. south of column 24 and 1 in. below elevation 546 ft, was not specified on any pertinent design drawing, was not documented on any QC record, and had unacceptable welds.

4. A W8 x 17 beam (2 ft 8 in. in length), positioned north to south and located 9 ft 6 in. west of workline G and attached to the beam addressed in paragraph 1.a.(1)(c), and extending north, was not specified on any pertinent design drawing and was not documented on any QC record.

5. Two W8 x 17 beams (8 ft 3 in. in length), positioned east to west, with one located 5 ft 3 3/8 in. and the other located 9 ft 7 7/8 in. south of column 24, are only tack welded in place. They display no identification or heat numbers and are not documented in a weld inspection record (KEI-1

form) or any other QC control document. The beams were identified on DDC-2087, which was incorporated into S&L drawing No. S-546, Revision AB. DDCs and S&L drawings by themselves do not assure QC verification. The beams were not identified in any QC inspection record, which indicated in-process weld inspections were not performed.

The location of the above discrepancies, additional unacceptable welds, unacceptable re-entrant corners, and nontraceable beams are shown in Figure A of this section. Furthermore, several thousand feet of W8 x 17 beam were purchased on the following order numbers from vendors not on the approved vendor list, which means the respective vendor QA programs had not been evaluated for compliance with 10 CFR 50, Appendix B.

Where Fig. A

P.O. No. 10275, PBI Steel Exchange, 2400 ft

P.O. No. 12868, U.S. Steel Supply, 1500 ft

P.O. No. 16321, Frank Adams Co., 1012 ft

P.O. No. 10009, Frank Adams Co., 1024 ft

P.O. No. 9761, Frank Adams Co., 1472 ft

P.O. No. 9628, Frank Adams Co., 450 ft

P.O. No. 9872, U.S. Steel Supply, 300 ft

These beams were not controlled to prevent their use in safety-related systems. On April 10, 1981, the licensee stated that these beams had been made available for installation in safety-related systems based on the mill certifications and regardless of the vendor not being approved. Mill certifications were available for these beams. The licensee stated that the credibility of the mill

certifications would be established. Failure to determine that the vendor had controls to assure the credibility of the mill certifications for these beams is contrary to 10 CFR 50, Appendix B, Criterion VII, and the Wm. H. Zimmer QA Manual, Section 7.3.1, as described in Appendix A of the report transmittal letter (50-358/81-13-D6).

The welds identified in the preceding paragraphs do not comply with the requirements of the AWS D1.1-1972 Code for one or more of the following reasons: slag was not removed; weld profiles had excessive convexity or concavity, blowholes, porosity, and/or undercut.

Is this an item of noncomp.?

6. Re-entrant corners of several W8 x 17 beams had notches instead of the 1/2 in. minimum radius required by the American Institute of Steel Construction (AISC), seventh edition (1969), page 4.113. The locations of these unacceptable beam corners are shown in Figure A of this section and are noted by (7) in Figure A.

?

7.1.2 Beams Observed in Cable Spreading Rooms

The inspectors identified the following discrepancies in the cable spreading rooms:

1. A W12 X14 beam No. F2500/8-66B4 had a weld that contained gross porosity. This beam was directly above cable tray hanger No. 4HV8FEC231, which was attached. The beam was located approximately 11 ft south of the north wall at the stairwell.

2. The traceability of the heat numbers was not maintained for two W8 x 17 beams, located south of and parallel to beam No. F2500/8-66B4. Do we need more detail?

The first beam was located immediately adjacent to beam F2500/8-66B4. The second beam was the fourth beam south of beam F2500/8-66B4. The first beam was installed flush to the ceiling of the cable spreading room. S&L drawing No. S-546, Revision AB, specifies the beam to be 1 in. below the ceiling.

3. A weld on the 5 in. channel beam ~~that~~ supporting HVAC hanger No. 2071 had an excessively irregular weld profile, ~~was~~ had excessively undercut, and had porosity and craters that were not filled. The channel beam is located 2 ft north and 1 ft west of the cable tray hanger No. 13H2FEC008. The Waldinger, Young and Bertke (W-Y and B) Inspection Report, dated February 19, 1980, indicated that the weld was acceptable.

4. Two W8 x 17 beams, located in the northeast corner (north of WL-16 and east of WL-K), were only tack-welded into place.

   a. The beams were specified on DDC No. E-3834 dated October 20, 1978. DDC E-3834 was posted on, but had not been incorporated into, S&L drawing No. S-546, Revision AB, dated October 22, 1980, and affected eight drawings. A cancellation stamp on the DDC indicated that the applicable portions of DDC No. 3834 had been incorporated into some of the respective drawings. The cancellation stamp did not include drawing No. S-546 as of October 22, 1980 (Revision AB).

The beams were not identified on any QC inspection record, which indicated in-process weld inspections were not performed.

b. Heat No. 72161 (purchase order No. 31134) was marked on the southern beam. The traceability of the heat number of the northern beam was not maintained.

The beams were not identified on any QA inspection record, which would have indicated their status.

NOTE: Some of the welds inspected by the RIII inspectors were painted. Therefore, the inspections were for relatively large deficiencies.

The previously identified unacceptable welds are contrary to 10 CFR 50, Appendix B, Criterion XV, and the Wm. H. Zimmer QA Manual, Section 15, as described in Appendix A to the report transmittal letter (50-358/81-13-01).

For the beams addressed in paragraphs 7.1.1.1, 7.1.1.5, and 7.1.2.4 above, no measures existed for DDCs that would identify QA, installations, and work that was done by construction before receiving S&L approval. Thus, no measures existed to assure that all of the required QA inspections related to DDCs (e.g., welder qualification, proper filler metal, traceability of materials, etc.) would be accomplished.

This condition was previously identified in IE Report Item No. 80-15-04. The corrective actions taken with regard to Item No. 80-15-04 did not ?

include the DDCs written prior to the implementation of the corrective actions and the DDCs that are and have been implemented prior to receiving the S&L approvals.

These inadequate corrective actions are contrary to 10 CFR 50, Appendix B, Criterion XVI, and the Wm. H. Zimmer QA Manual, Section 16.5, as described in Appendix A to the report transmittal letter (50-358/81-13-02).

The beams with unacceptable re-entrant corners and the beams that were installed and not identified as a requirement on any design document are contrary to 10 CFR 50, Appendix B, Criterion XV, and the Wm. H. Zimmer QA Manual, Section 15.2.2, as described in Appendix A to the report transmittal letter (50-358/81-13-03)

The beams for which the traceability of the heat numbers was not maintained is contrary to 10 CFR 50, Appendix B, Criterion VIII, and the Wm. H. Zimmer QA Manual, Section 8.2, as described in Appendix A to the report transmittal letter (50-358/81-13-04).

Need Item
② Need Findings & Conclusions
③ Need Items of Noncompliance

7.2 Steel Erection Quality Control Program

7.2.1

7.2.2 Record Reviews

The Region III inspector reviewed the Bristol Steel and Iron Works QA Manual, Appendix B, Section 1.0, entitled "Erection Quality Control." Paragraph 1.1 states that "The Erection Quality Control . . . is the responsibility of the Project Superintendent, who reports to the Project Manager."

Both the Project Superintendent and the Project Manager had cost and scheduling responsibilities. This is contrary to 10 CFR 50, Appendix B, Criterion I. (358/81-13-51).

The RIII inspector reviewed the Bristol Quality Control Steel Erection Report inspection report Q-7 dated July 14, 1975 for the inspection of the beams installed on elevation 546 ft between column rows 15-22 and F-L. The report was a "boilerplate" that did not ~~identify~~ document any of the following specifics: weld procedure numbers, welding materials (types), welder identifications, bolting procedure numbers, or beam heat numbers. The report only indicated acceptance (by signature) of general categories including those listed above and others. Failure to maintain sufficient records to furnish evidence of activities affecting quality ~~This~~ is contrary to 10 CFR 50, Appendix B, Criterion XVII and the Wm. H. Zimmer QA Manual, Section 17.1.1. (358/81-13-52).

7.2.3 Findings and Conclusions

7.2.4 Items of Noncompliance

12
~~11.~~ NRC Actions and Licensee Commitments

12.1
~~11.1~~ Concerning Ongoing and Future Work

Based on the investigation findings, consideration was given to the need to suspend construction activities. However, in recognition of the nature of the problems (largely programmatic), the status of the project (95% complete), and the fact that ongoing work would not compromise the ability to accurately determine the quality of completed work, it was decided that stopping construction work was not required at that time. Rather, attention was placed on establishing controls to assure the quality of ongoing and future work.

Following a meeting with NRC on March 31, 1981, the utility committed to implement ten specific actions to correct identified quality assurance weaknesses and to preclude their recurrence. These action were confirmed in an Immediate Action Letter (IAL) dated April 8, 1981. These actions were:

1. Concerning QA Staffing

CG&E will increase the size and technical expertise of the CG&E QA organization by adding individuals qualified in the areas of radiography and nondestructive testing, piping supports and hangers, welding, structural design and fabrication, electrical design and construction, and metallurgy. (CG&E will utilize temporary personnel qualified in these area until premanent staff members have been hired.)

2. Concerning Independence and Separation Between Kaiser Construction and Kaiser QA/QC

CG&E will take action by April 15, 1981, to assure independence and separation of the QA/QC function performed by Kaiser from the construction function.

3. Concerning QC Inspections

Using the personnel described in item 1 above, CG&E will conduct 100% reinspections of QC inspections conducted by Kaiser and other contractors after the date of the IAL. This will continue until the revised CG&E audit program as described in item 10, below, is implemented by these qualified individuals and RIII releases this requirement.

4. Concerning QC Inspection Procedures

All QC inspection procedures will be reviewed and revised (where appropriate) by qualified design engineers and QA personnel. These reviews will be conducted by personnel independent of the construction organization to confirm that the procedures include appropriate inspection requirements and applicable hold points. The construction activities controlled by these QC inspection procedures will not be performed after the date of the IAL until the applicable procedure has been reviewed and approved.

5. Concerning Training

QA/QC personnel at the Zimmer site will receive training on any new procedures and practices resulting from actions taken to fulfill provisions of the IAL prior to implementation of the procedures. In addition, refresher training will be given prior to June 1, 1981, on (1) the identification and documentation of nonconformances, deficiencies, and problems, (b) the procedure for resolving nonconformances, deficiencies, and problems, (c) the feedback mechanism for informing the identifying individual of the resolution of the nonconformance, deficiency, or problem, (d) the avenue of appeal should the identifying individual disagree with the adequacy of the resolution.

6. Concerning Deviations from Codes and FSAR Statements

Prior to May 1, 1981, the procedures governing the identification, reporting, and resolution of deviations from Codes and FSAR statements will be reviewed for adequacy and revised as appropriate. The procedures will require CG&E to review and approve the resolution of any such deviations.

7. Concerning the Voiding of Nonconformance Reports

The procedures governing nonconformance reporting will be reviewed for adequacy. The review will be accomplished not later than April 10, 1981. The disposition of each nonconformance report together with appropriate justification will be documented.

8. Concerning QA/QC Records

The review and alteration of existing QA and QC records has been stopped. These records will be controlled by CG&E until a program defining records control, usage, and adequacy has been prepared by CG&E and agreed to by RIII.

9. Concerning Conditions Adverse to Quality

CG&E will perform a 100% review of all surveillance and nonconformance reports written by contractor personnel after the date of this letter. This program will continue until RIII releases this requirement.

10. Concerning the Audit Program

The exisiting CG&E audit program will be reviewed and revised by June 1, 1981, to include technical audits of construction work and more comprehensive and effective programmatic audits.

Follow up inspections by the Senior Resident Inspector and specialist inspectors from the Region III office have confirmed implementation of the requirements of the letter. Details of these follow up inspections are documented in IE Inspection Reports No. 50-358/81-15, 50-358/81-18, and 50-358/81-19.

12.2
~~11.2~~ Concerning Existing Construction Work

Because of the problems identified during the NRC investigation, Region III had taken the position that a comprehensive review and reinspection effort by the licensee must be accomplished to confirm the quality of the existing construction work. This quality confirmation program addresses the problems identified in the investigation and includes the following:

1. Concerning Structural Steel

Problem:

- Some unacceptable welds have been identified.
- Some beams have unacceptable re-entrant corners.
- Some beams have been installed but did not show on design drawings.
- Several hundred feet of beams were received from an unapproved vendor and can not be accounted for as to where installed or other disposition. (However, mill certs are available).
- Heat number traceability has not been maintained for some beams and steel plate.
- Some structural welds were painted before they were inspected.

. Cable tray foot connections have not been inspected and they are covered with fire-proofing.

Action:

1. Compare structural steel drawings against plant as-built conditions.

2. Determine which welds were not inspected or were inspected after the weld was painted or coated.

3. For embedments, uncover one end of beam. If bolted, and drawing shows welded, do not assume other end is bolted. Uncover other end also. If welded and drawings shows bolted, uncover the other end also.

4. Remove paint and other material from the welds that may preclude proper weld inspection. If weld coating can not be removed without affecting the surface of the weld, quantify the number of such welds and propose an alternative program for confirming the quality of these welds. The NRC/Region III must approve the alternate program.

5. Conduct a 100% visual inspection of accessible structural steel field welds or justify less.

6. Conduct 100% visual inspection of accessible Bristol shop welds or justify less.

7. Perform 100% inspection of field cut re-entrant corners on beams which could affect safety related systems or equipment or justify less.

8. Determine the acceptability of welding procedures and welder qualification used on the job, special requirements called out in these procedures, and types of weld rod specified for field welding.

9. Determine the acceptability of all field procured steel plate and structural shapes received onsite.

10. To ensure that the structural steel problems are not generic within Zimmer, determine the acceptability of other field procured essential material, i.e.: piping, weld rod, fittings, cable, etc.

11. Write nonconformance reports on all unacceptable welds, unacceptable re-entrant corners, unacceptable materials, drawings errors or omissions, etc. Propose disposition to NRC/Region III for approval before starting corrective action.

2. Concerning Weld Quality

Problem: . In-process inspections were not performed for some welds (cable tray hangers and beam welds).

. Because of previous inspection findings indicating continuing problems with weld rod control (storage, temperature, issuance, documentation), there are questions as to whether or not field welds have been made using improper or unacceptable weld rod.

. Weld rod heat numbers have been transferred to the Weld Data Sheet from the Weld 2 Form by individuals other than the QC inspector who inspected the weld.

. Weld inspection criteria deleted from the Weld Data Sheets from approximately July 1980 - February 1981.

Action: 1. Identify code welds for which traceability of a credible weld rod heat number was required but not maintained (failure to perform required inspection or failure to maintain required documentation) or for which there is questionable traceability. Justify less than 100% determination.

2. Identify all Weld Data Sheets that were altered by transcribing information from Weld 2 Forms. If the original entry on the Weld Data Sheet indicates an adequate weld, the NRC will accept that weld provided the welder's stamp on the material corresponds to the Weld Data Sheet entry.

3. For all AWS structural steel Weld Data Sheets from 7/80-2/81 for which criteria were deleted on Weld Data Sheets for code welds made in the field, check to ensure that no hold points were violated. Review all Weld Data Sheets for the time frame established (7/80-2/81) and identify those with deletions, omissions, obvious errors, and applicable items marked "Not Applicable."

4. Verify proper weld procedure, welder's qualification, fitup, and proper filler metal verification/control. Determine if any hold points were violated. For those code welds for which this information has not been adequately maintained, demonstrate that those welds are acceptable or provide justification for accepting the welds. Such demonstration or justification must be approved by RIII.

5. For all code welds which lack traceability and quality documentation and for all code welds with questionable traceability and quality documentation, identify on a nonconformance report. Quantify the number of such welds and propose a program to determine the acceptability of the welds and the acceptability of the material in the welds. The NRC/Region must approve the program.

6. Review other in-process inspection records for possible alteration.

3. Concerning Traceability of Heat Numbers on Piping

Problem:

- Some heat numbers found on installed small bore piping do not appear on the records of accepted heat numbers.

- Some heat numbers recorded on isometric drawings do not match the heat numbers on installed piping.

- Heat numbers could not be found on some installed small bore piping.

- Some heat numbers recorded on the isometric drawings had been marked out and incorrect numbers recorded. (Heat number for a different size pipe).

Action:

1. Conduct an inspection of 100% of the accessible field installed small bore piping identified on attached Enclosure 1 for traceability in accordance with ASME Code requirements.

2. For systems on Enclosure 2, attached, compare existing documentation against accessible field installed small bore piping for traceability in accordance with applicable code requirements. Conduct a sampling program utilizing lot sizes sufficiently large to statistically demonstrate a 95% confidence factor that 95% of the sample is acceptable.

3. Provide justification for acceptability of inaccessible small bore piping.

4. For large bore piping designated on Enclosures 1 and 2:

   a. Identify all field modifications.

   b. Walkdown 100% of the large bore piping involved in the field modifications. Compare documentation against the installed large bore piping for traceability in accordance with ASME requirements.

   c. Justify less than 100% identification and walkdown of large bore piping involved in field modifications.

5. If heat number traceability on ASME work can only be established by the Weld Data Sheet, then it will be necessary to establish the credibility of the heat number on the Weld Data Sheet.

6. Write nonconformance reports on all heat number deficiencies found, propose disposition to NRC/Region III for approval, proceed with disposition after NRC concurrence.

4. Concerning Socket Weld Fitups

Problem: . Socket weld fitup to assure disengagement was not verified on some small bore piping.

Actions: 1. Identify all small bore piping socket welds for which verification for disengagement does not exist as documented on QC inspection records.

2. In all ASME Class I, II, and III systems, radiograph 100% of accessible welds not having verification of disengagement or justify less. Provide justification for radiographing less than 100% of the inaccessible socket welds for which verification of disengagement does not exist.

3. Write Nonconformance Reports on all unacceptable socket weld fitups, propose disposition to NRC/Region III for approval, proceed with disposition after NRC concurrence.

5. Concerning Radiographs

Problem: . Radiograph technique did not meet the ASME code in that the penetrameters were not adequately shimmed in approximately 180 out of 700 radiographs reviewed by the NRC.

Action: 1. Demonstrate that the existing radiographs of large piping supplied by the CG&E piping fabricator are adequate to identify weld deficiencies by:

(a) Review the shop radiographs to identify those that are either not shimmed or that are inadequately shimmed to determine, for each pipe size and thickness, the films which contain the least sensitive penetrameter image (essential hole or slit) where the density of the penetrameter is greater than the density of the area of interest.

(b) Reradiograph the welds identifed above, if accessible, using as nearly as possible the original technique plus the penetrameter shimmed to at least the total weld thickness including reinforcement on the same film, all in accordance with the code.

(c) If the essential hole or slit in the penetrameter is visible after shimming to at least the total thickness of the weld including reinforcement, all radiographs of that pipe size and thickness will be determined to be acceptable.

2. This program must be acceptable to the National Board of Boiler and Pressure Vessel Inspectors and the State of Ohio.

6. Concerning Cable Separation

Problem: The NRC identified six examples of failure to meet cable separation criteria.

Note: The original FSAR criteria did not stipulate separation requirements from an essential cable tray to a non-essential tray. The FSAR criteria is to be clarified for separation of essential, associated and non-essential cable in both cable trays and conduits.

Action:

1. Conduct a 100% inspection for separation of essential and associated cable (a) which are installed between the cable spreading room and the control panels in the main control room, and (b) at all penetrations (walls or floor).

2. Perform a 100% computer assisted analysis of associated cables to provide assurance that separation criteria for Class 1E circuits have been met.

3. Using the clarified separation criteria, conduct an inspection of associated cables to arrive at a 95% confidence level that 95% of associated cables are properly separated in trays and conduits.

4. The six examples are to corrected.

5. Any problems identified in the above inspections and review are to be documented on nonconformance reports. Proposed disposition to be reviewed and concurred in by NRC/Region III prior to initiating action to accomplish the disposition.

Note: If there are conflicts between these commitments and new requirements imposed by NRR, the more conservative requirements will be applicable.

7. Concerning Nonconformance

Problem:
- Nonconformances documented on surveillance reports.
- Nonconformances documented on punchlists.
- Nonconformances documented on exception lists.
- Nonconformances not documented.
- Nonconformances documented but not entered into the system.
- Nonconformances voided rather than being dispositioned.

Action: 1. Review all surveillance reports and identify all that should have been nonconformance reports.

2. Review QA pre-op turnover punchlists and exception lists to identify any items that should have been documented on nonconformance reports.

3. By letter to each past and present QC inspector, solicit nonconformance reports that were not entered into the system.

4. Write nonconformance reports for each such nonconformance identified.

5. Review all previously voided nonconformance reports. Proposed disposition to be reviewed and concurred in by NRC/Region III. Proceed with disposition after NRC concurrence.

6. Review at least 300 previously dispositioned nonconformance reports to assure proper disposition. If this review discloses any that have been improperly dispositioned, additional nonconformance reports (the number to be agreed to by the NRC/Region III) will be reviewed.

8. Concerning Design Control and Verification

Problem: . S&L had no formal procedure requiring verification of design calculations for thermal loading of power sleeves and dead weight loading of all trays.

- Three examples were identified in which S&L design deviated from the FSAR:

  (a) Cable Tray Loading: The actual design basis differed from that stated in the FSAR.

  (b) Cable Separation: (See Item 6, "Concerning Cable Separation").

  (c) Weld Acceptance Criteria: Site procedures take exception to AWS D1.1-1972 inspection acceptance criteria for undercut. The FSAR does not stipulate the exception.

- S&L had no formal procedure for documenting design deviations when identified by engineers.

Action: 1. Considering all disciplines, determine that procedures exist requiring design calculations for those items requiring a final verification after fabrication and/or installation. Items to include such areas as piping, pipe supports, electrical cable and cable trays, and structures. Define the items that have not been completed relative to final design calculations, verifications, and reviews and establish measures to assure their completion.

2. Review the adequacy of S&L's program for controlling deviations from the FSAR.

3. Review the FSAR for correctness and consistency with respect to the design by the responsible system engineers.

4. For item c. above, meet AWS code or change FSAR commitement to reflect the way the plant is built.

5. Designers shall review their files to identify all design deviations. These deviations shall be documented and properly dispositioned.

9. Concerning Design Document Changes

Problem: . Some design document changes (DDCs) have not been adequately controlled through distribution and inspection.

Action: 1. Establish an accurate and complete computer listing of DDCs. The list when finalized shall contain the status of every DDC including the status of construction.

2. Review each essential DDC and applicable QC records to determine if all in-process and final inspections have been performed. Justify less than 100%.

3. Document all deficiencies identified.

4. Take appropriate corrective action to resolve all deficiencies.

10. Concerning Subcontractor QA Programs

Problem: . The Bristol Project Superintendent was responsible for both the steel erection and the erection quality control.

. The Bristol field inspection program failed to document specific welds inspected and details of the inspection.

Action: 1. The quality of the Bristol work will be confirmed under Item 1, "Concerning Structural Steel."

2. For all safety related activities performed by other than Kaiser and GE, provide assurance that QA programs were acceptable or that work is acceptable.

11. Concerning Audits

Problem: . Past audits by CG&E identified repetitive problems regarding design calculations and verifications not being performed. Corrective action by S&L and followup by CG&E was not adequate.

. CG&E had not audited S&L to verify compliance with and the effectiveness of the S&L nonconformance program.

Action: 1. Past CG&E audits of HJK, S&L, GE, EPD, EODT, GED, and GCD are to be reviewed to determine the depth and adequacy of these audits particularly with respect to the 18 criteria of Appendix B to 10 CFR 50. Assure appropriate closeout of audit findings.

2. Identify deficiencies in the past audit program. (Applicable Appendix B Criterion not audited.)

3. Justify acceptability of areas not audited and provide this justification to RIII.

The licensees quality confirmation program will be revised as necessary in the event additional adverse conditions are found. This program must be completed and identified problem areas resolved before an Operating License will be granted.

11.3 Proposed Independent Measurements by NRC

In addition to witnessing and reviewing portions of the confirmation program conducted by the licensee and its contractors, the NRC will be conducting a sampling program of independent measurements to provide further confidence as to the adequacy of construction. ~~The NRC~~ This program ~~includes the following:~~ will independently verify on a sampling basis the licensee's Quality Confirmation Program.

a. Structural Beams

1. Inspect sample of Bristol welds accepted by licensee (both shop welds and field weld).

2. Inspect sample of other welds accepted by licensee.

3. Inspect sample of reworked welds.

b. Traceability of Heat Numbers

1. Inspect traceability of heat numbers in a sample of small bore piping in systems inspected and accepted by licensee.

2. Inspect traceability of heat numbers in a sample of large bore piping in systems inspected and accepted by licensee.

3 Inspect traceability of heat numbers in a sample of beams.

c. Welds Inspected After Painting

Inspect a sample of structural and cable tray hanger welds. Determine paint was removed for CG&E inspection and that weld is visually acceptable. NRC to verify acceptability of welds licensee has accepted.

d. Unacceptable Techniques for Radiographs of Prefabricated Piping

A sampling of licensee new radiographs will be read.

e. Cable Separation

Additional inspections will be made to determine if any more cable separation problems exist.

f. Nonverified Socket Weld Fit-Ups

Read sampling of radiographs to confirm disengagement exists.

g. Uncontolled Design Document Changes

Inspect sampling of as-built prints and compare with field to assure accuracy and completeness of prints.

h. Pipe Welds

NRC will contract with radiographer to shoot sample of field and shop welds to determine acceptability.

i. Voided RN's

Review new dispositions to determine acceptability.

j. Cable Tray Loading

Review design calculations for thermal and physical loading.

ENCLOSURE 1

1. CY-01 Cycle Condensate System - Essential Portions
2. DG-01 Diesel Generators
3. DO-01 Diesel Fuel Oil Systems
4. RD-02 Control Rod Drive Hydraulic System
5. RH-01 Residual Heat Removal System - Essential Portions
6. RI-01 Reactor Core Isolation Cooling System
7. SC-01 Stand-by Liquid Control System
8. Containment Isolation - Valves and Connecting Piping
9. HG-01 Primary Containment Combustible Gas Control System
10. HP-01 High Pressure Core Spray System
11. LP-01 Low Pressure Core Spray System
12. MS-01 Main Steam System to Second Isolation Valve
13. NB-02 Nuclear Boiler System - Automatic Depressurization
14. NB-04 Nuclear Boiler System - Reactor Pressure Vessel
15. VY-02 Core Stand-by Cooling - Equipment Cooling South
16. VY-03 Core Stand-by Cooling - Equipment Cooling North
17. WR-01 Reactor Building Closed Cooling Water System
18. WR-02 Reactor Water Closed Cooling Water System (Inside Containment)
19. WS-01 Service Water System - Essential Portions
20. Stand-by Gas Treatment
21. Feedwater - Essential Portions
22. Piping that comes into contact with the primary coolant up to the first containment isolation valve outside containment.

ENCLOSURE 2

1. CM-01 Containment Monitoring System (Possible Code Requirements)
2. FC-01 Fuel Pool Cooling and Clean-up System
3. PR-04 Liquid Process Radiation Monitoring System
4. PR-06 Off Gas Post Treatment Radwaste Monitoring System
5. RR-03 Reactor Recirculation Pumping System
6. RT-01 Reactor Water Clean-up System
7. IN-01 Dry Well Pneumatic System
8. LC-01 Leakage Control System
9. NB-01 Nuclear Boiler System - Jet Pump Instrumentation
10. OG-01 Off Gas Processing System
11. VR-02 Reactor Building Ventilation System
12. Reactor Building Equipment Drain
13. Dry Well Floor Drain and Equipment Drains
14. Reactor Water Sample
15. Radwaste Collection
16. Recirculation Pump Seals System
17. Fire Protection
18. VP - Primary Containment Ventilation
19. VC - Control Room Ventilation
20. VX - Switchgear Rooms Ventilation

11. NRC Actions and Licensee Commitments

11.1 Concerning Ongoing and Future Work

Based on the investigation findings, consideration was given to the need to suspend construction activities. However, in recognition of the nature of the problems (largely programmatic), the status of the project (95% complete), and the fact that ongoing work would not compromise the ability to accurately determine the quality of completed work, it was decided that stopping construction work was not required at that time. Rather, attention was placed on establishing controls to assure the quality of ongoing and future work, and defining a program to confirm the quality of completed work and correct any identified deficiencies.

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graphy and nondestructive testing, piping supports and hangers, welding, structural design and fabrication, electrical design and construction, and metallurgy. We understand (CG&E will utilize temporary personnel qualified in these area until premanent staff members have been hired.)

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CG&E will take action by April 15, 1981, to assure independence and separation of the QA/QC function performed by Kaiser from the construction function. ~~Region III will be informed of actions taken.~~

3. Concerning QC Inspections

Using the personnel described in item 1 above, CG&E will conduct 100% reinspections of QC inspections conducted by Kaiser and other contractors after the date of ~~this letter.~~ the IAL. This will continue until the revised CG&E audit program as described in item 10, below, is implemented by these qualified individuals and RIII releases this requirement.

4. Concerning QC Inspection Procedures

All QC inspection procedures will be reviewed and revised (where appropriate) by qualified design engineers and QA personnel. These reviews will be conducted by personnel independent of the construction

organization to confirm that the procedures include appropriate inspection requirements and applicable hold points. The construction activities controlled by these QC inspection procedures will not be performed after the date of ~~this letter~~ the IAL until the applicable procedure has been reviewed and approved.

5. Concerning Training

QA/QC personnel at the Zimmer site will receive training on any new procedures and practices resulting from actions taken to fulfill provisions of ~~this letter~~ the IAL prior to implementation of the procedures. In addition, refresher training will be given prior to June 1, 1981, on (1) the identification and documentation of nonconformances, deficiencies, and problems, (b) the procedure for resolving nonconformances, deficiencies, and problems, (c) the feedback mechanism for informing the identifying individual of the resolution of the nonconformance, deficiency, or problem, (d) the avenue of appeal should the identifying individual disagree with the adequacy of the resolution.

6. Concerning Deviations from Codes and FSAR Statements

Prior to May 1, 1981, the procedures governing the identification, reporting, and resolution of deviations from Codes and FSAR statements will be reviewed for adequacy and revised as appropriate. The procedures will require CG&E to review and approve the resolution of any such deviations.

7. Concerning the Voiding of Nonconformance Reports

The procedures governing nonconformance reporting will be reviewed for adequacy. The review will be accomplished not later than April 10, 1981. The disposition of each nonconformance report together with appropriate justification will be documented.

8. Concerning QA/QC Records

The review and alteration of existing QA and QC records has been stopped. These records will be controlled by CG&E until a program defining records control, usage, and adequacy has been prepared by CG&E and agreed to by RIII.

9. Concerning Conditions Adverse to Quality

CG&E will perform a 100% review of all surveillance and nonconformance reports written by contractor personnel after the date of this letter. This program will continue until RIII releases this requirement.

10. Concerning the Audit Program

The exisiting CG&E audit program will be reviewed and revised by June 1, 1981, to include technical audits of construction work and more comprehensive and effective programmatic audits. Follow up inspections by the Senior Resident Inspector and specialist inspectors from the Region III

office have confirmed implementation of the requirements of the letter. Details of these follow up inspections are documented in IE Inspection Reports No. 50-358/81-15, 50-358/81-18, and 50-358/81-19.

11.2 Concerning Existing Construction Work

Because of the problems identified during the NRC investigation, Region III had taken the position that a comprehensive review and reinspection effort by the licensee must be accomplished to confirm the quality of the existing construction work. This quality confirmation program addresses the problems identified ~~to date~~ in the investigation, and includes the following:

1. Concerning Structural Steel

Problem:

- Some unacceptable welds have been identified.
- Some beams have unacceptable re-entrant corners.
- Some beams have been installed but did not show on design drawings.
- Several hundred feet of beams were received from an unapproved vendor and can not be accounted for as to where installed or other disposition. (However, mill certs are available).

. Heat number traceability has not been maintained for some beams and steel plate.

. Some structural welds were painted before they were inspected.

. Cable tray foot connections have not been inspected and they are covered with fire-proofing.

Action: 1. Compare structural steel drawings against plant as-built conditions.

2. Determine which welds were not inspected or were inspected after the weld was painted or coated.

3. For embedments, uncover one end of beam. If bolted, and drawing shows welded, do not assume other end is bolted. Uncover other end also. If welded and drawings shows bolted, uncover the other end also.

4. Remove paint and other material from the welds that may preclude proper weld inspection. If weld coating can not be removed without affecting the surface of the weld, quantify the number of such welds and propose an alternative program for confirming the quality of these welds. The NRC/Region III must approve the alternate program.

5. Conduct a 100% visual inspection of accessible structural steel field welds or justify less.

6. Conduct 100% visual inspection of accessible Bristol shop welds or justify less.

7. Perform 100% inspection of field cut re-entrant corners on beams which could affect safety related systems or equipment or justify less.

8. Determine the acceptability of welding procedures and welder qualification used on the job, special requirements called out in these procedures, and types of weld rod specified for field welding.

9. Determine the acceptability of all field procured steel plate and structural shapes received onsite.

10. To ensure that the structural steel problems are not generic within Zimmer, determine the acceptability of other field procured essential material, i.e.: piping, weld rod, fittings, cable, etc.

11. Write nonconformance reports on all unacceptable welds, unacceptable re-entrant corners, unacceptable materials, drawings errors or omissions, etc. Propose disposition to NRC/Region III for approval before starting corrective action.

2. Concerning Weld Quality

Problem: . In-Process inspections were not performed for some welds (cable tray hangers and beam welds).

. Because of previous inspection findings indicating continuing problems with weld rod control (storage, temperature, issuance, documentation), there are questions as to whether or not field welds have been made using improper or unacceptable weld rod.

. Weld rod heat numbers have been transferred to the Weld Data Sheet from the Weld 2 Form by individuals other than the QC inspector who inspected the weld.

. Weld inspection criteria deleted from the Weld Data Sheets from approximately July 1980 - February 1981.

Action: 1. Identify code welds for which traceability of a credible weld rod heat number was required but not maintained (failure to perform required inspection or failure to maintain required documentation) or for which there is questionable traceability. Justify less than 100% determination.

2. Identify all Weld Data Sheets that were altered by transcribing information from Weld 2 Forms. If the original entry on the Weld Data Sheet indicates an adequate weld, the NRC will accept that weld provided the welder's stamp on the material corresponds to the Weld Data Sheet entry.

3. For all AWS structural steel Weld Data Sheets from 7/80-2/81 for which criteria were deleted on Weld Data Sheets for code welds made in the field, check to ensure that no hold points were violated. Review all Weld Data Sheets for the time frame established (7/80-2/81) and identify those with deletions, omissions, obvious errors, and applicable items marked "Not Applicable."

4. Verify proper weld procedure, welder's qualification, fitup, and proper filler metal verification/control. Determine if any hold points were violated. For those code welds for which this information has not been adequately maintained, demonstrate that those welds are acceptable or provide justification for accepting the welds. Such demonstration or justification must be approved by RIII.

5. For all code welds which lack traceability and quality documentation and for all code welds with questionable

traceability and quality documentation, identify on a nonconformance report. Quantify the number of such welds and propose a program to determine the acceptability of the welds and the acceptability of the material in the welds. The NRC/Region must approve the program.

6. Review other in-process inspection records for possible alteration.

3. Concerning Traceability of Heat Numbers on Piping

Problem: . Some heat numbers found on installed small bore piping do not appear on the records of accepted heat numbers.

. Some heat numbers recorded on isometric drawings do not match the heat numbers on installed piping.

. Heat numbers could not be found on some installed small bore piping.

. Some heat numbers recorded on the isometric drawings had been marked out and incorrect numbers recorded. (Heat number for a different size pipe).

Action: 1. Conduct an inspection of 100% of the accessible field installed small bore piping identified on attached Enclosure 1 for traceability in accordance with ASME Code requirements.

2. For systems on Enclosure 2, attached, compare existing documentation against accessible field installed small bore piping for traceability in accordance with applicable code requirements. Conduct a sampling program utilizing lot sizes sufficiently large to statistically demonstrate a 95% confidence factor that 95% of the sample is acceptable.

3. Provide justification for acceptability of inaccessible small bore piping.

4. For large bore piping designated on Enclosures 1 and 2:

ENCLOSURE 1

1. CY-01 Cycle Condensate System - Essential Portions
2. DG-01 Diesel Generators
3. DO-01 Diesel Fuel Oil Systems
4. RD-02 Control Rod Drive Hydraulic System
5. RH-01 Residual Heat Removal System - Essential Portions
6. RI-01 Reactor Core Isolation Cooling System

7. SC-01 Stand-by Liquid Control System
8. Containment Isolation - Valves and Connecting Piping
9. HG-01 Primary Containment Combustible Gas Control System
10. HP-01 High Pressure Core Spray System
11. LP-01 Low Pressure Core Spray System
12. MS-01 Main Steam System to Second Isolation Valve
13. NB-02 Nuclear Boiler System - Automatic Depressurization
14. NB-04 Nuclear Boiler System - Reactor Pressure Vessel
15. VY-02 Core Stand-by Cooling - Equipment Cooling South
16. VY-03 Core Stand-by Cooling - Equipment Cooling North
17. WR-01 Reactor Building Closed Cooling Water System
18. WR-02 Reactor Water Closed Cooling Water System (Inside Containment)
19. WS-01 Service Water System - Essential Portions
20. Stand-by Gas Treatment
21. Feedwater - Essential Portions
22. Piping that comes into contact with the primary coolant (out to the first containment isolation valve) & outside containment.

ENCLOSURE 2

1. CM-01 Containment Monitoring System (Possible Code Requirements)
2. FC-01 Fuel Pool Cooling and Clean-up System
3. PR-04 Liquid Process Radiation Monitoring System
4. PR-06 Off Gas Post Treatment Radwaste Monitoring System
5. RR-03 Reactor Recirculation Pumping System
6. RT-01 Reactor Water Clean-up System

7. IN-01 Dry Well Pneumatic System
8. LC-01 Leakage Control System
9. NB-01 Nuclear Boiler System - Jet Pump Instrumentation
10. OG-01 Off Gas Processing System
11. VR-02 Reactor Building Ventilation System
12. Reactor Building Equipment Drain
13. Dry Well Floor Drain and Equipment Drains
14. Reactor Water Sample
15. Radwaste Collection
16. Positive Seals System ~~(Definition Needed)~~
17. Fire Protection
18. VP - Primary Containment Ventilation
19. VC - Control Room Ventilation
20. VX - Switchgear & Rooms Ventilation

a. Identify all field modifications.

b. Walkdown 100% of the large bore piping involved in the field modifications. Compare documentation against the installed large bore piping for traceability in accordance with ASME requirements.

c. Justify less than 100% identification and walkdown of large bore piping involved in field modifications.

5. If heat number traceability on ASME work can only be established by the Weld Data Sheet, then it will be necessary to establish the credibility of the heat number on the Weld Data Sheet.

6. Write nonconformance reports on all heat number deficiencies found, propose disposition to NRC/Region III for approval, proceed with disposition after NRC concurrence.

4. Concerning Socket Weld Fitups

Problem: . Socket weld fitup to assure disengagement was not verified on some small bore piping.

Actions: 1. Identify all small bore piping socket welds for which verification for disengagement does not exist as documented on QC inspection records.

2. In all ASME Class I, II, and III systems, radiograph 100% of accessible welds not having verification of disengagement or justify less. Provide justification for radiographing less than 100% of the inaccessible socket welds. for which verification of disengagement does not exist.

3. Write Nonconformance Reports on all unacceptable socket weld fitups, propose disposition to NRC/Region III for approval, proceed with disposition after NRC concurrence.

5. Concerning Radiographs

Problem: . Radiograph technique did not meet the ASME code in that the penetrameters were not adequately shimmed in approximately 180 out of ~~600~~ 700 radiographs reviewed by the NRC.

Action: 1. Demonstrate that the existing radiographs of large piping supplied by the CG&E piping fabricator are adequate to identify weld deficiencies by:

(a) Review the shop radiographs to identify those that are either not shimmed or that are inadequately shimmed to determine, for each pipe size and thickness, the films which contain the least sensitive penetrameter images (essential hole or slit) where the density of the penetrameter is greater than the density of the area of interest.

(b) Reradiograph the welds identifed above, if accessible, using as nearly as possible the original technique plus the penetrameter shimmed to at least the total weld thickness including reinforcement on the same film, all in accordance with the code.

(c) If the essential hole or slit in the penetrameter is visible after shimming to at least the total thickness of the weld including reinforcement, all radiographs of that pipe size and thickness will be determined to be acceptable.

2. This program must be acceptable to the National Board of Boiler and Pressure Vessel Inspectors and the State of Ohio.

6. Concerning Cable Separation

Problem: . The NRC identified six examples of failure to meet cable separation criteria.

Note: The original FSAR criteria did not stipulate separation requirements from an essential cable tray to a non-essential tray. The FSAR criteria is to be clarified for separation of essential, associated and non-essential cable in both cable trays and conduits.

Action: 1. Conduct a 100% inspection for separation of essential and associated cable (a) which are installed between the cable spreading room and the control panels in the main control room, and (b) at all penetrations (walls or floor).

2. Perform a 100% computer assisted analysis of associated cables to provide assurance that separation criteria for Class 1E circuits have been met.

3. Using the clarified separation criteria, conduct an inspection of associated cables to arrive at a 95% confidence level that 95% of associated cables are properly separated in trays and conduits.

4. The six examples are to corrected.

5. Any problems identified in the above inspections and review are to be documented on nonconformance reports. Proposed disposition to be reviewed and concurred in by NRC/Region III prior to initiating action to accomplish the disposition.

Note: If there are conflicts between these commitments and new requirements imposed by NRR, the more conservative requirements will be applicable.

7. Concerning Nonconformance

Problem:
- Nonconformances documented on surveillance reports.
- Nonconformances documented on punchlists.
- Nonconformances documented on exception lists.

. Nonconformances not documented.

. Nonconformances documented but not entered into the system.

. Nonconformances voided rather than being dispositioned.

_ Action: 1. Review all surveillance reports and identify all that should have been nonconformance reports.

2. Review QA pre-op turnover punchlists and exception lists to identify any items that should have been documented on nonconformance reports.

3. By letter to each past and present QC inspector, solicit nonconformance reports that were not entered into the system.

4. Write nonconformance reports for each such nonconformance identified.

5. Review all previously voided nonconformance reports. Proposed disposition to be reviewed and concurred in by NRC/Region III. Proceed with disposition after NRC concurrence.

6. Review at least 300 previously dispositioned nonconformance reports to assure proper disposition. If this review discloses any that have been improperly

dispositioned, additional nonconformance reports (the number to be agreed to by the NRC/Region III) will be reviewed.

8. _ Concerning Design Control and Verification

Problem: . S&L had no formal procedure requiring verification of design calculations for thermal loading of power sleeves and dead weight loading of all trays.

. Three examples were identified in which S&L design deviated from the FSAR:

(a) Cable Tray Loading: The actual design basis differed from that stated in the FSAR.

(b) Cable Separation: (See Item 6, "Concerning Cable Separation").

(c) Weld Acceptance Criteria: Site procedures take exception to AWS D1.1-1972 inspection acceptance criteria for undercut. The FSAR does not stipulate the exception.

. S&L had no formal procedure for documenting design deviations when identified by engineers.

Action:

1. Considering all disciplines, determine that procedures exist requiring design calculations for those items requiring a final verification after fabrication and/or installation. Items to include such areas as piping, pipe supports, electrical cable and cable trays, and structures. Define the items that have not been completed relative to final design calculations, verifications, and reviews and establish measures to assure their completion.

2. Review the adequacy of S&L's program for controlling deviations from the FSAR.

3. Review the FSAR for correctness and consistency with respect to the design by the responsible system engineers.

4. For item c. above, meet AWS code or change FSAR commitement to reflect the way the plant is built.

5. Designers shall review their files to identify all design deviations. These deviations shall be documented and properly dispositioned.

9. Concerning Design Document Changes

Problem: . Some design document changes (DDCs) have not been adequately controlled through distribution and inspection.

Action: 1. Establish an accurate and complete computer listing of DDCs. The list when finalized shall contain the status of every DDC including the status of construction.

2. Review each essential DDC and applicable QC records to determine if all in-process and final inspections have been performed. Justify less than 100%.

3. Document all deficiencies identified.

4. Take appropriate corrective action to resolve all deficiencies.

10. Concerning Subcontractor QA Programs

Problem: . The Bristol Project Superintendent was responsible for both the steel erection and the erection quality control.

. The Bristol field inspection program failed to document specific welds inspected and details of the inspection.

Action: 1. The quality of the Bristol work will be confirmed under Item 1, "Concerning Structural Steel."

2. For all safety related activities performed by other than Kaiser and GE, provide assurance that QA programs were acceptable or that work is acceptable.

11. Concerning Audits

Problem: . Past audits by CG&E identified repetitive problems regarding design calculations and verifications not being performed. Corrective action by S&L and followup by CG&E was not adequate.

. CG&E had not audited S&L to verify compliance with and the effectiveness of the S&L nonconformance program.

Action: 1. Past CG&E audits of HJK, S&L, GE, EPD, EODT, GED, and GCD are to be reviewed to determine the depth and adequacy of these audits particularly with respect to the 18 criteria of Appendix B to 10 CFR 50. Assure appropriate closeout of audit findings.

2. Identify deficiencies in the past audit program. (Applicable Appendix B Criterion not audited.)

3. Justify acceptability of areas not audited and provide this justification to RIII.

The licensees quality confirmation program will be ~~reviewed~~ revised as necessary in the event additional adverse conditions are found. This program must be completed and identified problem areas resolved before an Operating License will be granted. In addition to witnessing and reviewing portions of the confirmation program conducted by the licensee and its contractors, the NRC will be conducting a sampling program of independent measurements to provide further confidence as to the adequacy of construction. The NRC program includes the following:

11.3 Proposed Independent Measurements by NRC

a. Structural Beams

1. Inspect sample of Bristol welds accepted by licensee (both shop welds and field weld).

2. Inspect sample of other welds accepted by licensee.

3. Inspect sample of reworked welds.

b. Traceability of Heat Numbers

1. Inspect traceability of heat numbers in a sample of small bore piping in systems inspected and accepted by licensee.

2. Inspect traceability of heat numbers in a sample of large bore piping in systems inspected and accepted by licensee.

3. Inspect traceability of heat numbers in a sample of beams.

c. Welds Inspected After Painting

Inspect a sample of structural and cable tray hanger welds. Determine paint was removed for CG&E inspection and that weld is visually acceptable. NRC to verify acceptability of welds licensee has accepted.

d. Unacceptable Techniques for Radiographs of Prefabricated Piping

A sampling of licensee new radiographs will be read.

e. Cable Separation

Additional inspections will be made to determine if any more cable separation problems exist.

f. Nonverified Socket Weld Fit-Ups

Read sampling of radiographs to confirm discrepancy does exist.

g. Uncontolled Design Document Changes

Inspect sampling of as-built prints and compare with field to assure accuracy and completeness of prints.

h. Pipe Welds

NRC will contract with radiographer to shoot sample of field and shop welds to determine acceptability.

i. Voided RN's

Review new dispositions to determine acceptability.

j. Cable Tray Loading

Review design calculations for thermal and physical loading.

	SPINOFF ALLEGATIONS	INSPECTION RESULTS	ASSISTANCE REQUIRED
P.	1.	KEI-1 WELDING FORMS (see ATTACHED sheet).	NONE - Paul Barrett J. Shapker
P-4	2.	DAILY INSPECTION RECORD which identifies INSPECTION CRITERIA IS STILL required by procedure, but has actually been DISCONTINUED.	NONE - Paul Barrett
P-4	3.	NR 2721 PACKAGE QUESTIONABLE? Preheat 150 TO 70°F	C. Erb
P-2	4.	a) WELD PROCEDURE SUPPLEMENT ALLOWS QUALIFICATION of procedure to UNLIMITED THICKNESS of METAL BEING WELDING, WITHOUT REQUAL-IFICATION of the procedure	C. Erb
P-4		b) SUPPLEMENT was dated 1/19/81, BUT was used ON 1/2/81. (Ref: KEI-1 3235)	C. Erb
P-2	5.	a) FIELD INSPECTION PROCEDURE DOES NOT ADEQUATELY reflect AWS INSPECTION CRITERIA.	~~CARL ERB~~
P-4		b) AWS Code NOT given to QC INSPECTORS UNTIL 2 years ago	~~Carl Erb~~
P-2	6.	Carbon Steel WELDED to stainless STEEL IN SUPPRESSION POOL.	CARL ERB

	SPINOFF ALLEGATIONS	INSPECTION RESULTS	ASSISTANCE REQUIRED
P.	7.	Hangers being installed with double nuts which restricts designed movements.	I. Yin J. Shapker
P-2	8.	Leak chase channel welds appear to be very poor quality. However, may serve no safety function other than seals for testing.	Carl Erb & NRR
P-4	9.	Weld turnover packages being bought off without adequate justification and with nonrelevant records.	NONE - Paul Barrett J. Shapker
P-4	10.	Suppression T-Quencher welds E-308 rod to weld 316 S.S.	Carl Erb
P.	11.	Possible watehammer in condensate polishing system	NONE - Tom Daniels
P-4	12.	Flood control piping downgraded to non-essential. (Dwg. No. S-99, rev. R)	NONE - Tom Daniels
P-2	13.	Welders qualified using chill ring (Backing Plate), but not using it in field welding.	J. Shapker
P-2	14.	Weld tacks used for fitup are not being ground and feathered. Thus possible slag inclusion may result.	J. Shapker

SPINOFF ALLEGATIONS	INSPECTION RESULTS	ASSISTANCE REQUIRED
15.	LARGE number of DDC's IN INSTRUMENT PIPING !! To MANY to CONTROL.	NONE - Paul Barrett
16.	NR's submitted with CONTROL number thru INSPECTION SUPERVISOR, but were return to INSPECTOR with NO disposition. 7 of the 8 hangers identified on NR's have been QC accepted.	TOM DANIELS & I. YIN

P-2

1. What is the allegation?

2. From where or whom did we get the allegation? (Including additional information).

3. When did we get the allegation?

4. How do we know that we are addressing the allegation?

   Ex. A. The specific alleged broken valve?

   B. Do we have the right pipe?

5. Identify the manner in which the allegation was reviewed. List the documents and revisions reviewed, the individuals and dates with whom discussions were held, and direct observations made. For facts determined by conversations with individuals, document the areas discussed and the information obtained.

6. State the acceptance/rejection criteria used to base all conclusions. Identify the code, standard, etc., plus any applicable addenda.

7. Clearly state the conclusion. If the allegation is determined to be non-safety related -- still substantiate if the allegation is true or not.

8. Whether safety related or not, make sure that both the specific and generic (safety related) concerns have been addressed for each allegation.

9. Identify the status (controlled, accepted, or rejected) that the licensee's QA program indicates for the allegation, where possible.

10. Address all previous NRC inspections and investigations that are relevant to the allegations.

11. Obtain and address any information that shows if another government agency (OSHA, etc.) and/or the licensee has dealt with the allegation.

12. Sworn statements will be obtained from those allegers who presented information to Mr. Applegate, Statements obtained from other persons such as QA/QC inspectors will not be sworn statements unless the investigator believes this is appropriate.

13. Since independent tests or radiographs are not intended, please assure that a determination is made that test results and radiographs are not fraudulent and report the basis for this determination.

14. Since it has been stated that management statements may not be accurate because they have a vested interest in the site, verify at least a percentage of management statements by such means as records or direct observation to assure their accuracy.

PRIORITY 1	APPLEGATE
PRIORITY 2	SIGNIFICANT (TECHNICAL ASSISTANCE REQUIRED ON SITE)
PRIORITY 3	MCCARTEN
PRIORITY 4	TECHNICAL ASSISTANCE NOT REQUIRED ON SITE

4.1 Nonconformance Report Voiding

This section addresses the allegation identified in Section 4.1.a.

4.1.1 Allegation

As stated in Section 4.0.a of this report, on November 18, 1980, an NRC inspector was contacted by an individual who alleged that Phillip Gittings, Kaiser Quality Assurance (QA) Manager, was voiding Nonconformance Reports (NRs) based on Gittings' reinspection of the nonconforming items (pipe support hanger welds). Between January 13 and July 4, 1981, 31 current and former Kaiser QC Inspectors and QA Engineers were interviewed by NRC to obtain information regarding the initial allegation. Sixteen of those individuals provided information that resulted in the expansion of the initial allegation into the following investigated areas:

1. The QA Manager was arbitrarily voiding NRs that were not written in error.

2. The QA Manager was diverting NRs by not entering them into the Kaiser nonconformance reporting system.

3. NRs were being voided and their items transferred to Surveillance Reports (SRs).

4. NRs were being improperly dispositioned by the QA Manager and members of the Kaiser Material Review Board (MRB) who frequently dispositioned them as "accept as is" when "repair" or "rework" was appropriate per Kaiser specifications and industry codes and standards.

5. NRs were voided with the justification "to be reinspected after redesign" or "deficiencies would be rewritten on separate NRs." The nonconforming conditions were neither reinspected after redesign nor written on separate NRs.

6. NRs were voided by the QA Manager at the request of the Construction Department to avoid rework and schedule delays.

7. During revisions of an NR, nonconforming items were arbitrarily removed by the QA Manager. Several of the individuals interviewed provided copies of reports they stated they had retained due to distruct of the system.

4.1.2 General Background

4.1.2.1 Nonconformance Reporting System

The Kaiser nonconformance reporting system was established to provide control of nonconforming material. Kaiser Quality Assurance-Construction Methods Instruction (QACMI) G-4, Revision 9, provides the following procedure: The QA Department or Field Engineering may initiate an NR when members identify

nonconforming material, equipment, construction work, or a deviation from specified requirements. The Inspector or QA Engineer initiates the NR and then contacts the Site Document Control (SDC) NR Controller who makes a log entry and assigns a KEI Control Number (CN). The NR is reviewed by the Inspector's supervisor or cognizant QA Engineer and is forwarded to the SDC NR Controller who issues the NR a KEI Control Number (CN).

NRs written on essential systems/components are given an "E" prefix and nonessential systems/components are given an "N" prefix. The QA Manager can approve voiding of NRs "in instances where an NR has been initiated in error, due to interpretation or judgement of borderline conditions, duplications, or where a nonconforming condition has been corrected by the Construction Department after a verbal or written communication from the QA Department..." In these cases, the NR is stamped "Void" with a brief statement indicating justification for the voiding. A copy of the voided NR is required to be retained in the SDC and a copy returned to the initiator.

The KEI Construction Engineer or his designee dispositions NRs as "accept as is", "rework", "repair", or "reject". The "accept as is" and "repair" dispositions require review by the Material Review Board, which consists of the KEI Construction Engineer, CG&E QA Engineer, Kaiser QA Engineer, CG&E sponsoring engineer, and the Sargent & Lundy Design Engineer (for essential material or equipment only). In the case of an ASME Section III Code nonconformance, the Authorized Nuclear Inspector (ANI) must be included on all "accept as is" dispositions. Records of all open and closed NRs are retained by the (SDC) NR Controller.

4.1.2.2 Previous Related NRC Inspection Findings

During an NRC inspection conducted December 2-3, 1980, the RIII inspector observed that of twenty NRs written to document American Welding Society (AWS) welding deficiencies on hanger welds, eight had been voided with the notation "based on re-inspection." It was also observed that NRs had been voided by the issuance of Design Document Controls (DDCs). The inspector informed site personnel and CG&E management during the exit interview on December 16, 1980, that these practices were contrary to site procedures and NRC requirements.

The inspection report containing these items of noncompliance was issued on March 2, 1981 (IE Inspection Report 50-358/80-25). The licensee replied to these items by letter dated March 26, 1981, indicating that a Stop Work Order had been issued prohibiting voiding of NRs, and this order had been subsequently rescinded when improved procedural controls were in place. The improved procedural controls consisted of limiting the authority to void an NR to the Kaiser QA Manager, and the marking of superseded NRs as "superseded" rather than "void".

The licensee's reply also indicated that Kaiser was performing a complete review of voided NRs in response to a licensee audit finding. The review was expected to be completed by April 30, 1981, and full compliance with NRC requirements was to be achieved by May 5, 1981. Between December 15-19, 1980, and on January 5, 1981, Lon Ludwig, of Nuclear Energy Services, Inc., audited the Kaiser nonconformance reporting system for Kaiser.

4.1.2.3 Interviews

4.1.2.3.1 Interview of William Schwiers

On January 16, February 14, and March 22, 1981, William Schwiers, CG&E QA Manager, was interviewed by NRC. Schwiers stated that during an NRC site exit meeting held on December 16, 1980, Eugene Knox, Kaiser Corporate QA Manager, and Phillip Gittings were informed that Kaiser was improperly voiding NRs. Schwiers said he directed Kaiser to audit all previously voided NRs and present the results of the audit to CG&E by February 16, 1981. Schwiers stated he also directed Gittings to cease improperly voiding NRs. He provided a copy of a memo he wrote to Gittings dated January 14, 1981, in which he requested Kaiser to respond to Field Audit Report No. 340 concerning the voiding of NRs. A copy of the memorandum and audit report is included in Appendix B.

4.1.2.4 Interview of Lon Ludwig

On January 14, 1981, Lon Ludwig, Quality Engineering Manager, for Nuclear Energy Services, Inc., was interviewed by NRC. He stated that in December 1980 and January 1981 he audited the Kaiser nonconformance reporting system for CG&E after NRC had identified that NRs were being improperly voided. Ludwig said his audit showed there were approximately 500 voided NRs, and between one-third to one-half of these were superseded and written on other NRs. He said that some NRs identifying numerous nonconforming conditions were had been separated and reissued on individual NRs. One-third of the NRs reviewed were voided as "written in error" without adequate explanation given to justify

this comment. Ludwig stated that he recommended Kaiser audit all voided NRs and provide a better explanation as to why each was voided.

Ludwig also stated that the voided NRs he reviewed covered all areas of plant operation and construction, and dated from 1974 to the present.

4.1.2.5 Interviews of Phillip Gittings

4.1.2.5.1 January 13, 1981, Interview

Phillip Gittings, Kaiser QA Manager, was interviewed by NRC on Janaury 13, 1981. He stated that in October 1980 he voided 7 NRs that were written by QC inspectors who were in training. He said he reinspected the welds identified in the NRs and, in his opinion, the welds met American Welding Society (AWS) Code requirements. He said that during an NRC inspection in December 1980, the inspector took exception to this practice and found the licensee in noncompliance with NRC requirements for improperly voiding NRs.

Gittings said that, following the NRC inspection, the welds identified on the 7 NRs were reinspected by Gladstone Laboratories, Inc. He said Gladstone personnel concluded that 4 of the 7 NRs were properly voided because the noted welds conformed with the AWS Code; however, the other 3 NRs had minor discrepancies which Gladstone concluded did not meet the AWS Code.

Gittings stated that approximately 500 NRs had been voided by Kaiser at the Zimmer project. A number of these NRs were voided and then revised and put

on other NRs, or were voided after it was found they duplicated a previously reported nonconforming condition. He stated that the only NRs he voided for having been "written in error" were those from October and November 1980 that were examined during the NRC inspection on December 2-3, 1980.

Gittings stated that during the past six months Kaiser had problems with some of its QC Inspectors who were over inspecting. Gittings said many of the inspectors were critical of the Kaiser nonconformance reporting system and of the Kaiser weld inspection criteria for pipe support hangers and structural steel. He said there were differences of opinion on various code interpretations, which he felt were common in any weld inspection program.

4.1.2.5.2 July 8, 1981, Interview

Phillip Gittings was re-interviewed by NRC following the NRC investigation of the dispositions of a selected group of 20 NRs. Gittings stated that the voiding of NRs by clerks and by SDC Supervisor Floyd Oltz was improper because neither the clerks nor Oltz were qualified to make engineering judgments concerning deficiencies identified on NRs. Gittings indicated that after a December 1980 NRC inspection, he directed the NR procedure be changed so that only he could void an NR.

Gittings stated that Kaiser procedures allowed any QC Inspector to initiate an NR and required it be entered into the Kaiser nonconformance reporting system. When questioned about his failure to issue NRs with Control Numbers CN-5476, CN-5477, and CN-5479 written by QC Inspector James Ruiz on

February 23, 1981, Gittings said he directed Rex Baker, Inspection Supervisor, to void those NRs. He said his action on those NRs was contrary to the Kaiser procedure that only permitted an NR to be voided if it was "written in error." Gittings said those NRs were not written in error.

Gittings stated that he voided NRs at the request of Construction Department personnel, but added that he made independent evaluations and decisions when doing so, and was not compelled by construction personnel to void NRs. When questioned Gittings stated he did not know why Walter C. Dumford's NR (CN-4309) was not in the Kaiser nonconformance system and denied diverting this NR from the system.

When questioned about specific irregularities found during the NRC investigation, Gittings concurred that the practices of voiding NRs by stating they "would be reinspected after redesign," voiding NRs by transferring the nonconformances to "punch lists", (lists of items to be corrected by construction) and voiding NRs by placing nonconformances on Surveillance Reports were not in accordance with Kaiser procedures.

Gittings stated that Kaiser QC Inspectors were identifying problems at Zimmer. He said CG&E and Kaiser did not have enough sufficiently qualified inspectors. This was evident when Richard Reiter identified a significant material traceability problem when reviewing isometric drawings on small bore pipe systems. Gittings said Reiter had initiated a Surveillance Report correctly identifying the problem and he (Gittings) had not adequately answered the report. He said this problem warranted reporting to NRC; however, Kaiser did not do so. He

said that eventually Kaiser hired two QA Engineers to review the documentation and they found that Reiter's analysis was correct. [During this investigation, the NRC inspectors reviewed the traceability problem and found Reiter's analysis to be correct.]

4.1.2.6 Interview of Kathy Faubion

On February 13, 1981, Kathy Faubion, Kaiser NR Controller, was interviewed by NRC. She stated that Kaiser procedures permit an inspector to call for a Control Number (CN) for an NR. She is required to issue a CN to the inspector, make an entry in the Kaiser Log of Nonconforming Material (NR Log) describing the nonconforming item, and note the initials of the inspector calling for the number. She stated she never "whited out" an entry for a CN in the log.

Faubion indicated that the QA Manager stamps all voided NRs with a red "void" stamp. When she receives a copy of the voided NR, she marks through the CN entry in the log with red ink. She said inspectors frequently call for control numbers and do not subsequently send the NR. In these cases, Faubion said she makes the same "void" entry in the NR Log.

She said that prior to December 1980, Floyd Oltz, Kaiser QA Engineer-Records, also had the authority to void NRs; however, William Schwiers, CG&E QA Manager, directed that this authority be vested solely in the Kaiser QA Manager. She said since that time Oltz has not voided any NRs.

4.1.3 Investigation

Concurrent with the conduct of the interviews, the NRC impounded all NRs that had been voided for any reason to assure that all pertinent NRs would be available for this investigation. The approximatley 500 NRs impounded had been identified during an audit of the NR system by Nuclear Energy Services, Inc. (NES). NES had performed the audit for CG&E following NRC inspection findings described in Section 4.2.2.2 of this report.

Region III personnel reviewed all impounded NRs identified by NES and all NRs provided by individuals interviewed and determined that about 100 of them appeared to fit the alleged categories. Of those 100, 20 NRs were selected for intensive investigation into their disposition. The results of the investigations of the 20 selected NRs are presented as individual investigation efforts in Sections 4.1.4 through 4.1.19. Summary conclusions and findings of the overall investigation in this area are then presented in Section 4.1.20.

4.1.4 Disposition of Nonconformance Report CN-5412

4.1.4.1 Background Information

On December 29, 1980, Walter C. Dumford, Kaiser QC Inspector, initiated Surveillance Report (SR) 2886 to document that a suppression pool liner plate was tensioned before a QC Inspector arrived to verify the initial tensioning. The corrective action to resolve this condition was for an inspector to be present during the seven and thirty day tension checks to verify that the plate was being tensioned properly.

On February 3, 1981, Dumford initiated an NR (assigned CN-5412), which also reported that a suppression pool liner plate was being tensioned in violation of an applied "hold" tag. The NR states "Hold tag was applied while Wall Plate 10D was in process of being tensioned. Once hold tag was applied tensioning was continued until tensioning was completed."

4.1.4.2 Investigation

4.1.4.2.1 Interview of Walter Dumford

On February 11, 1981, Walter C. Dumford, Kaiser QC Inspector, was interviewed by NRC. He stated that on February 3, 1981, he was inspecting suppression pool wall plates and noticed that a bolt on a plate was not perpendicular to the plate. He said construction personnel were preparing to tension the plate when he told them he was going to place a hold tag on it, to which they responded "try and stop us."

Dumford said he left the area to discuss the matter with his supervisor, Dennis Donovan, who told him to initiate an NR for the nonconforming bolt and to place a hold tag to preclude tensioning of the plate. He said he returned to the suppression pool, placed a hold tag on the plate, and construction personnel ceased tensioning the plate. He said, however, as he left the area, he heard the tensioning machine reactivate and observed that the tensioning crew had ignored his hold tag.

Dumford stated he advised Donovan of the occurrence and Donovin told him to write an NR documenting continuation of tensioning after a hold tag had been

applied. Dumford called the NR Controller, was issued CN-5412, and documented the violation of the hold tag. He said that a few days later he was called into the Kaiser QA Manager's office and was told by the QA Manager, Phillip Gittings, that the NR should not have been written since it was "a software (procedural) problem and not a hardware problem." He said Gittings then said, "I'm going to void this NR because we do not need this kind of paperwork floating around because this is the kind of stuff that causes investigations." Dumford stated that Rex Baker and Dennis Donovan, who were also present at the meeting, disagreed with Gittings, conclusion and advised Gittings that they felt it was a valid NR.

Dumford indicated that Dennis Donovan called the NR clerk a few days later and was told CN-5412 had been reassigned to another NR (the original report had not been entered into the NR system). Dumford provided a copy of the original NR CN-5412, which is included in Appendix B.

Dumford said this incident was a typical example of Kaiser QA management not supporting the QA program on site and being influenced by construction considerations. Dumford stated that, in his opinion, the Kaiser QA Manager was influenced by construction and QA was not independent at Zimmer.

On February 11, 1981, Dumford provided a written sworn statement attesting to the preceding information, a copy of which is included in Appendix B.

4.1.4.2.2 Interview of Dennis Donovan

On February 13, 1981, Dennis Donovan, Kaiser QC Inspector, was interviewed by NRC. He stated that on February 3, 1981, Walter C. Dumford contacted him about a Surveillance Report written against tensioning of bolts on a suppression pool plate without QA coverage. Donovan said he called Ken Shinkle, the QA Engineer responsible for the suppression pool area, and advised him of the incident. He said Shinkle told him to write an NR. Donovan stated he wrote the NR and instructed Dumford to place a hold tag on the plate. Donavan said Dumford later returned to the trailer and told him that he had placed a hold tag on the plate, but craft personnel had ignored the tag and continued tensioning the plate. Donovan said he told Dumford to write a second NR against the continuation of work after a hold tag had been applied. Donovan stated he initialed the second report and called the NR clerk who assigned it CN 5412. The NR was forwarded directly to Inspection Supervisor Rex Baker for review.

Donovan said that on February 4, 1981, he, Baker, and Dumford were called into Phillip Gittings' office and Baker gave the original copy of the NR to Gittings. Donovan related that Gittings said, "This report is going to be voided because this is the kind of thing that starts investigations." Donovan said that Gittings commented that inspectors should only write NRs against hardware problems and not against software problems, and ignoring a hold tag was a procedural (software) violation.

Donovan said he and Dumford explained that construction had ignored the hold tag, to which Gittings replied, "If I was in their position I would have done the same thing." Donovan said he responded that a hold tag was the strongest QA control mechanism on site and, if one was ignored, an NR should be written. Donovan said he and Baker told Gittings they disagreed with him and the meeting ended.

Donovan said that a few days later he called the NR controller concerning the disposition of CN-5412 and found that the number had been reissued to another NR. Donovan indicated that in his opinion, this was an example of Kaiser QA management not supporting the inspection program at Zimmer.

On February 13, 1981, Dennis Donovan provided a written sworn statement attesting to the preceding information, a copy of which is included in Appendix B.

4.1.4.2.3 Interview of Kenneth Shinkle

On February 18, 1981, Kenneth Shinkle, Kaiser QA Engineer, was interviewed by NRC. He stated that on February 2, 1981 he received a telephone call from Dennis Donovan regarding a bent bolt on a suppression pool plate. Shinkle stated he told Donovan this should be documented on an NR and a hold tag should be placed on the plate to prevent tensioning. Shinkle stated he later that learned an NR was written and Walter C. Dumford had affixed a hold tag to the plate. Construction personnel subsequently ignored the tag. Shinkle said he also learned that a second NR was written by Dumford

for violation of the hold tag which he initialed and forwarded to Rex Baker, Inspection Supervisor.

Shinkle stated he later that learned Phillip Gittings, after discussions with Dumford, Donovan, and Baker, did not enter the NR into the system. Shinkle said the report had been assigned a CN and the inspectors' supervisor had concurred it was a valid NR. Nevertheless, Gittings told Shinkle it was not going to be processed because "The whole thing has been blown out of proportion."

Shinkle stated in his opinion that Kaiser management does not support the QC program at Zimmer, construction dominates activity at the site, and QA is not independent of construction influence.

On February 18, 1981, Kenneth Shinkle provided a written sworn statement attesting to the preceding information, a copy of which is included in Appendix B.

4.1.4.2.4 Interview of Rex Baker

On March 3, 1981, Rex Baker, Kaiser Inspection Supervisor, was interviewed by NRC. He stated that in early February 1981 he attended a meeting in Gittings' office with Dennis Donovan and WAlter C. Dumford. He stated that during this meeting Dumford said construction had continued to tension a suppression pool plate after he had placed a hold tag on it. Baker stated he agreed Dumford was correct in writing the NR for the hold tag violation. He said Gittings disagreed and stated in his opinion construction was right

to continue tensioning the plate after a hold tag had been affixed to it. Baker stated he did not know the disposition of the NR and that it was in Gittings' possession the last time he saw it.

4.1.4.2.5 Record Reviews

On February 11, 1981, the NR Log was reviewed. The log indicated CN-5412 (E-2996, Revision 1) was written on February 2, 1981, for welds having lack of penetration. This entry does not reflect that CN-5412 had been assigned to another report written by inspector Dumford on February 3, 1981, for violation of a hold tag. The Equipment Name or Process Entry column in the NR Log and the Specification column showed evidence that "white-out" was used to cover previous entries in the log. A copy of the NR Log page and NR E-2996, Revision 1, is included in Appendix B.

4.1.4.3 Findings and Conclusions

Based on record reviews and interviews of personnel, it was established that CN-5412 was not entered into the Kaiser nonconformance reporting system.

4.1.5 Disposition of Nonconformance Report E-5108

4.1.5.1 Background Information

On May 19, 1980, NR E-5108 was issued identifying a 4-in.-long pipe piece installed per DDC M-1108 in the residual heat removal (RHR) system for

which material traceability could not be established. The NR also reports that Weld 80 located near this pipe piece was inside of a wall penetration (M-13), in violation of licensee specifications. The NR was stamped "void" on June 20, 1980, by Floyd Oltz, QA Engineer-Records, who added a note indicating it was voided because "acceptable documentation found" that established material traceability for the pipe piece. A copy of NR E-5108 is included in Appendix B.

4.1.5.2 Investigation

4.1.5.2.1 Interview of Richard Reiter

On March 25, 1981, Richard I. Reiter, former Kaiser Document Reviewer, was interviewed by NRC. He stated he was employed at Zimmer from November 1978 to November 1980. He indicated his job had been to review isometric drawings and insure that related documentation, such as weld data records, met ASME Code requirements and the drawings were correct. He said he found discrepancies between drawings and associated documentation and conditions in the plant. Reiter stated that numbers for pipe sections and weld data records did not match. He said he wrote NRs on the traceability problem and was so concerned about the dispositions of those NRs that on October 28, 1980, he wrote Surveillance Report (SR) 2819 to Floyd Oltz, his immediate supervisor. He stated in SR 2819 that he questioned the disposition of NRs dealing with lack of material traceability and stated with reference to traceability of small-bore piping that "when reviewing isometric drawings he is making assumptions which he felt compromised his integrity." He also asked for a written

directive telling him to make these assumptions, or for Kaiser to reevaluate all small-bore isometrics to insure that there was adequate documentation to allow traceability of the material.

Reiter stated that Oltz responded to the SR by indicating that all the procedures were approved and were adequate to meet regulatory and ASME Code requirements and that Reiter was to continue using the approved procedures and practices in effect. Reiter stated he disagreed with the disposition of the SR and shortly thereafter terminated his employment with Kaiser, because he felt he was being forced to compromise his integrity. A copy of SR 2819 is included in Appendix B. Reiter provided a sworn statement atteating to the information, a copy of which is also included in Appendix B.

4.1.5.2.2 Record Reviews and Field Observations

Region III personnel examined the 4 in. section of pipe between welds 82 and 82a identified on NR E-5108 and on isometric drawing PSK RH 15. No heat or identification number on the pipe piece was found. Weld data sheets (KEI-1 forms) were reviewed for welds RH-82 and RH-82a that joined the pipe piece to the RHR system. Both forms had notations initialed and dated "RLR 6/19/80" identifying the heat number for the pipe piece as Heat No. 232661. (The initials "RLR" were determined to be the initials of Richard L. Reiter). The weld records indicated weld dates of June 15, 1976, (weld RH-82a) and October 14, 1976 (weld RH-82) four years prior to the heat number being noted.

The inspector reviewed releuant weld records, material certificates and drawings, and found no justification for utilizing Heat No. 232661 for the pipe piece.

Region III personnel reviewed the following records related to the disposition of this NR:

NR E-5108, dated May 19, 1980

KEI-1 form No. 4826, dated January 21, 1976

KEI-1 form No. 1852

Construction Piping Inspection Plan for Residual Heat Removal System, Inspection Plan No. RH-15, dated June 16, 1976

4.1.5.3 Findings and Conclusions

Based on record reviews, interviews of personnel, and field observations, it was established that NR E-5108 was improperly voided since documentation was not found to justify voiding the NR.

4.1.6 Disposition of Nonconformance Report CN-4309

4.1.6.1 Background Information

On January 7, 1980, QC Inspector Michael McCoy obtained NR CN-4309 to identify a deficient weld fitup on a 1-3/4-in. cover plate to beam W32X260 located on the reactor pedestal support structure. McCoy stated in the NR

that parts to be fillet welded were not as close as practical (as required), but were separated by more than 3/16 in. A copy of NR CN-4309 is included in Appendix B.

4.1.6.2 Investigation

4.1.6.2.1 Interview of Michael McCoy

On February 11, 1981, Michael McCoy, Kaiser QC Inspector, was interviewed by NRC. He stated that on January 7, 1980, he initiated an NR for welds on the reactor pedestal support structure that did not meet code requirements. McCoy stated his supervisors concurred in his findings, and he received CN-4309 from the NR Controller. He said that after he wrote the NR it was returned to him without disposition. McCoy stated that in addition to voiding this NR, NRs were frequently inadequately dispositioned. He attributed this to the QA Manager's lack of support for either the inspectors or the QC program at Zimmer.

On February 11, 1981, Michael McCoy provided a written statement attesting to the preceding information, a copy of which is included in Appendix B.

4.1.6.2.2 Record Reviews

On February 11, 1981, the NR Log was reviewed. The log indicated CN-4309 was assigned to NR E-2417 which identified deficiencies in electrical conduit bracing in the control room. A copy of this NR is included in Appendix B.

During this review, it was noted that there was evidence of "white-out" in the "Specification" and "Equipment Name or Process" columns of the log. A copy of the NR Log page is alos included in Appendix B.

4.1.6.3 Findings and Conclusions

Based on record reviews and interviews of personnel, it was established that NR CN-4309 was never entered into the Kaiser nonconformance reporting system.

4.1.7 Disposition of Nonconformance Reports CN-4955 through 4959, CN-4930, and CN-4931

4.1.7.1 Background Information

On July 9 and 22, 1980, NRs assigned CNs 4955 through 4959, 4930 and 4931 were written by inspectors Joseph Mills and G. McCann. The NRs identified weld deficiencies on pipe supports in diesel generator (DG) Room A. The 7 NRs had been assigned CNs but no NR number. Copies of the 7 reports are included in Appendix B.

4.1.7.2 Investigation

4.1.7.2.1 Interview of Joseph Mills

On June 2, 1981, Joseph Mills, Kaiser QC Inspector, was interviewed by NRC. He stated that in July and August of 1980 he identified nonconforming welds

while inspecting pipe support hangers in DG Room A. He said he identified these welds on NRs that were assigned CNs 4955 to 4959. He said his supervisor, Rex Baker, concurred the NRs were valid. Mills stated that in August 1980 he was reassigned from pipe support hanger inspection to structural welding inspection, and a week after his reassignment the NRs he wrote were returned to his desk without being processed. Mills stated that other NRs written by Inspector G. McCann were also returned to him.

Mills stated that in March 1981 he learned of an NRC investigation into the NR system and turned in the 7 unprocessed NRs to the NRC Senior Resident Inspector. He said the Senior Resident Inspector asked him to reexamine the welds in DG Room A to see if the nonconforming welds he identified were still uncorrected. Mills stated his reinspection indicated that in each case the condition that he had previously identified had been repaired, and the welds were now acceptable. Mills stated that apparently someone had used the information on the NRs to correct the nonconforming conditions. He said, however, this was not done via the Kaiser NR system since the original NRs and all copies had been returned unprocessed.

On June 2, 1981, Joseph Mills provided a written statement attesting to the preceding information, a copy of which is included in Appendix B.

4.1.7.2.2 Interview of Floyd Oltz

On June 19, 1981, Floyd Oltz, Kaiser QA Engineer-Records, was interviewed by NRC. He stated that he reviewed the NR Log and found that NRs assigned

CNs 4955 to 4959 and 4930 and 4931 had been voided with the comment "Void-NR not issued." Oltz stated that in these instances Kaiser did not retain a copy of the NR in the voided NR file because reports voided as "not issued" are usually returned to the inspector.

4.1.7.2.3 Interview of Lynn Anderson

On June 9, 1981, Lynn Anderson QC Engineer, Nuclear Energy Services, Inc., was interviewed by NRC. He stated that he is contracted to work as a QC Engineer for CG&E. Anderson stated he is currently conducting an audit of the Kaiser nonconformance reporting system. Anderson said that on June 4, 1981, he checked the disposition of NRs assigned CN-4955 to CN-4959. He stated he reviewed the NR log and found that those CNs had been assigned and the reports had been voided on September 30, 1980. Anderson said he checked all of the Kaiser and CG&E NR files and could not locate those NRs. Anderson concluded that, although CNs had been issued, the reports had never been entered into the active or voided NR files.

4.1.7.2.4 Record Reviews and Field Observations

When the NR Log was reviewed on June 10, 1981, it was found that CN-4955 to 4959 had been entered into the NR system; however, the entry had been lined through with the comment "Void-NR not issued" and dated September 30, 1980. A review of the NR Log for entries CN-4930 and CN-4931 indicated that they had also been entered into the NR system; however, the comment "Void-NR not issued" and dated September 30, 1980, was entered in the log book page for each entry. Copies of the pertinent NR Log pages are included in Appendix B.

On June 2, 1981, NRC personnel inspected the areas in DG Room A identified on NR CN-5955 through CN-5959, CN-4930, and CN-4931. In 2 of the 7 cases, it appeared that the welds had been reworked, but this could not be determined for the other 5. However, the nonconforming conditions identified on the NRs were not evident on the welds inspected.

4.1.7.3 Findings and Conclusions

Based on record reviews, interviews of personnel, and field observations, it was established that these NRs were voided but were not retained in Kaiser files; however, copies of the reports had apparently been returned to the inspector.

4.1.8 Disposition of Nonconformance Report E-2466

4.1.8.1 Background Information

During a routine inspection conducted December 27-28, 1979, and December 17-18, 1980 (IE Inspection Report 50-358/79-37), the inspector determined that the QC inspection program for safety-related hangers was inadequate. As a result of the inspection findings, a management meeting was held at the site on January 17, 1980, and a later meeting was held at the RIII office on March 7, 1980. Corrective actions committed to by the licensee included a 100% re-inspection of all installed hangers and restraints by Kaiser QC Inspectors. This commitment is documented in IE Inspection Report 50-358/80-05, Paragraph 6.

On January 3, 1980, Kaiser QC Inspectors inspected large bore pipe hangers in diesel generator (DG) Rooms A, B, and C. They inspected welds on pipe support hangers, concrete embedment bolts, and the configuration and location of pipe support hangers. The inspectors identified nonconforming Kaiser and vendor welds on 5 hangers, and improperly embedded bolts. They identified a total of 124 nonconforming pipe support hangers, and initiated NR E-2466 to document this condition. On June 30, 1980, NR E-2466 was voided with the comment "each hanger listed will be issued on a separate NR." A copy of the first 5 pages of this NR is included in Appendix B.

NRC personnel reviewed the NR Log to ascertain if the hangers identified on NR E-2466 had been issued on separate NRs as stated. This review indicated that of the 124 nonconforming pipe support hangers only 25 had been issued on other NRs. Of these 25, 8 had been reworked, 7 had been voided, and the disposition for the remaining 10 was still open. As of February 12, 1981, the other 99 hangers identified on NR E-2466 had not been reissued.

4.1.8.2 Investigation

4.1.8.2.1 Interview of Rex Baker

On March 3, 1981, Rex Baker, Kaiser Inspection Supervisor, was interviewed by NRC. He stated he was aware that the NR in question was voided and said the reason for the voiding was that all hangers were subject to reinspection because of redesign and new seismic safety criteria. Baker said QA Managers Phillip Gittings and Kenneth Bumgartner directed that previously inspected pipe support hangers that were not redesigned would not to be reinspected.

He said that, since all hangers were not replaced due to the redesign effort, some of the nonconforming hanger welds identified on the subject NR would not be reinspected. Baker stated that the voided NR was not redispositioned or reopened. Baker indicated that, in his opinion, this was not done because of an administrative oversight by the QA Manager.

[Investigator's Note: The statement that pipe support hangers that had not been redesigned were not being reinspected will be reviewed further to determine if it is contrary to a licensee commitment document in IE Inspection Report 50-358/80-05, Paragraph 6. This is an unresolved item pending completion of that review (50-358/81-13-).]

4.1.8.2.2 Record Reviews

On February 12, 1981, NR E-2466 was reviewed by NRC personnel and it was noted that there was a comment on page 2 of the NR stating that an asterisk identifies "what appears to be vendor supplied welds" on pipe support hangers. While reviewing the 31-page NR, it was found that 15 of the 124 pipe hangers identified have an asterisk identifying them as vendor-supplied hangers. These 15 entries on NR E-2466 were crossed out without engineering justification. Examples of the omission of these items from NR E-2466 are included in Appendix B.

4.1.8.3 Findings and Conclusions

Based on record reviews and interviews of personnel, it was established that NR E-2466 was improperly voided because the condition (reissuance on

other NRs) for the voiding was not fully implemented. It was also established that vendor welds were omitted from the NR without engineering justification.

4.1.9 Disposition of Nonconformance Report E-2836

4.1.9.1 Background Information

On June 22, 1980, NR E-2836 was written by Inspection Supervisor Rex Baker after an audit by Nuclear Energy Services, Inc., indicated there was no final weld radiograph for weld WS737 (service water system). There was a comment in the "Description of Nonconformance" section of the NR stating that the only radiograph available was an "information shot of the root layer" of the weld (now buried underground). The NR was dispositioned "accept as is" on October 24, 1980, because the weld data form (KEI-1) reported that the final weld had been radiographed and accepted by Kaiser personnel on April 5, 1976. This form indicated review and approval of the final radiograph by the Authorized Nuclear Inspector (ANI) on April 15, 1976. The "accept as is" disposition of NR E-2836 was initially rejected by the ANI on November 7, 1980; however, he approved the disposition on November 11, 1980, based on an entry on the KEI-1 form showing that a final review of the film was performed by the ANI. The NR E-2836 was voided on November 10, 1980, with a comment "see Revision 1 for new disposition." There is a comment on the original NR which says "Void stamp in error - Rev. 1 cancelled when ANI accepted disposition on 11/11/80." NR E-2836, Revision 1, shows the same nonconforming item with the disposition to "accept as is" and the NR is signed by the appropriate members of the Material Review Board. Both the

original NR and Revision 1 were closed on November 13, 1980. Copies of NR E-2836 and E-2836, Revision 1, are included in Appendix B.

4.1.9.2 Investigation

4.1.9.2.1 Interview of Rex Baker

On June 4, 1981, Rex Baker, Kaiser Inspection Supervisor, was interviewed by NRC. He stated that on October 22, 1980, he initiated NR E-2836 after an audit found that there was no radiograph of completed weld WS737. Baker stated he forwarded the NR to Arch Lanham, Kaiser Construction Department, who dispositioned the NR as "accept as is" based on an entry on the weld data form. The form indicates a final radiograph of this weld was performed on April 5, 1976, and was accepted by both a Kaiser welding engineer and the ANI on April 15, 1976. Baker said the NR was returned to him and he told Lanham the disposition of "accept as is" was contrary to ASME Code requirements because there was no final radiograph of the weld. Baker said he told Lanham that an entry in a KEI-1 form was insufficient evidence that the weld had been radiographed.

Baker stated he is a Qualified Level III Radiographer and that he had previously reviewed the Kaiser radiographic report and the accompanying film dated April 17, 1976. He said he told Lanham the film was an "information shot" of the root layer pass and not a radiograph of the final weld. Baker said Lanham indicated the disposition was correct because the radiograph review block on the KEI-1 form was checked and if QA did not have the film he could care less.

Baker stated he told Lanham that construction would have to excavate the weld and radiograph it, to which Lanham replied, "Bob Marshall would never let us dig it up." Baker stated Lanham dispositioned the NR as "accept as is" yet he knew there was no radiograph in the record for the final weld.

Baker stated that on November 7, 1980, Lowell Burton, the site ANI, rejected the disposition on NR E-2836 but later rescinded the rejection and agreed with the "accept as is" disposition based on the KEI-1 form entry that the final review had been performed by the ANI. Baker said the NR was dispositioned as "accept as is," and he refused to concur in the disposition because it was contrary to ASME Code requirements.

4.1.9.2.2 Interview of Lowell Burton

On June 5, 1981, Lowell Burton, ANI for Hartford Steam Boiler and Insurance Company, was interviewed by NRC. He stated that after reviewing NR E-2836 he erroneously accepted the disposition of the NR on November 11, 1980.

Burton said he had reviewed the record radiographs for weld WS737 and found there was no radiograph of the final weld. He stated he has directed CG&E to reopen the NR to reflect this nonconforming condition. Burton stated he based his previous acceptance on a review of the weld data form and his personal notes showing that on April 15, 1976, he reviewed the final weld radiograph and found it to be acceptable. Burton indicated that during 1976 he reviewed up to 100 radiographs per day and could have mistakenly entered in his notebook or on the KEI-1 form that he had reviewed the final weld radiograph for weld WS737.

4.1.9.2.3 Record Review

Region III personnel reviewed NR E-2836 and associated documentation, including the Kaiser Report of Radiographic Examination and accompanying radiograph. There was no final radiograph for weld WS737. The radiograph referenced as accepted by the ANI on April 15, 1976, is actually a radiograph of a partially completed weld. The radiograph of the incomplete weld dated March 31, 1976, was reviewed by the ANI on April 15, 1976. Apparently, the radiograph of the root pass was mistaken by the ANI to be a radiograph of the final weld.

Between June 2-5, 1981, the following records were reviewed by the RIII inspector:

NRs E-2836 and E-2836, Revision 1.

KEI-1 forms for weld WS737, dated April 10, 1976

Kaiser Engineers Radiographic Examination Report, dated April 15, 1976 (and accompanying radiographic film packet)

4.1.9.3 Findings and Conclusions

Based on record reviews, interviews of personnel, and examination of the radiographic film for weld WS737, it was determined that NR E-2836 was improperly dispositioned as "accept as is" and closed on November 13, 1980. The proper disposition for this NR would have been "rework," which would include radiographic examination of the final weld.

4.1.10 Disposition of Nonconformance Report E-1777

4.1.10.1 Background Information

On April 3, 1979, Inspector Terry Dakin wrote NR E-1777 stating that weld 195A2 (isometeric Drawing RI-195) on a pipe support hanger in the primary containment area had been performed without QA documentation. Dakin performed a post-weld inspection and found the weld acceptable; however, no rod slip (weld rod issue form) was found to ensure that the proper filler metal had been used. The disposition of this NR was to "rework" and cut out the weld. This NR was voided on April 30, 1979, with the comment "rod slip located." A copy of NR E-1777 is included in Appendix B.

4.1.10.2 Investigation

4.1.10.2.1 Interview of Vincent Ferretti

On June 4, 1981, Vincent Ferretti, Level III Radiographer and QA Engineer for Nuclear Energy Services, Inc. was interviewed by NRC. He stated he had conducted an audit of the Kaiser nonconformance reporting system. As part of this audit, he had reviewed NR E-1777 and the associated isometric drawings. Ferretti stated that the drawing shows four hangers and six field welds for each hanger. The isometric drawing and attached weld rod issue slips show, as stated in the NR, that there is no weld rod issue slip for weld 195A2. Ferretti stated the weld rod slips attached to the drawing should identify particular filler metal used for each weld, but he was unable to ascertain

what filler metal was used. Ferretti stated the discrepancy identified in the NR was correct, and he directed the NR be reopened and redispositioned. Ferretti stated that in his opinion this NR was improperly voided.

4.1.10.2.2 Interview of Floyd Oltz

On June 4, 1981, Floyd Oltz, Kaiser QA Engineer-Records, was interviewed by NRC. He stated that he had reviewed NR E-1777, the weld data sheets (KEI-1), and weld rod issue slips (KEI-2). He said that his review indicated that the NR had been improperly voided. Oltz stated that the disposition "rod slip located" was improper, because the rod slip used to justify the voiding of the NR does not specifically identify the weld in which the weld rod was used. Oltz said he found nothing in the records associated with this weld to justify the voiding of the NR.

4.1.10.2.3 Record Reviews

On June 4, 1981, RIII personnel reviewed the following records while resolving this allegation:

NR E-1777

Isometric Drawing No. N4713 RI-195 (Reactor Isolation System)

KEI-2 forms 111515, 139801, 126964, 126963, 126960, 174535, and 174534

4.1.10.3 Findings and Conclusions

Based on record reviews and interviews of personnel, it was established that there was no justification for the voiding of NR E-1777 because there was no rod issue slip (KEI-2) in the weld data package for weld no. 195A2.

4.1.11 Disposition of Nonconformance Report CN-5122

4.1.11.1 Background Information

On October 16, 1980, Kaiser QC Inspector Mark Priebe wrote NR CN-5122 following the initiation of Surveillance Report (SR) 2800 reporting that the flexible outer coating of conduit installed in the containment building was splitting for an unknown reason. This NR was not assigned a NR number, yet it was voided on January 2, 1981, with the comment "see attached Surveillance Report No. 2800." SR 2800 was the report used to issue the NR. A copy of NR CN-5122 is included in Appendix B.

4.1.11.2 Investigation

4.1.11.2.1 Interview of Steven Burke

On June 11, 1981, Steven Burke, Kaiser QC Inspector, was interviewed by NRC. Burke stated that the nonconforming items listed in NR CN-5122 "covering splitting and separating from electrical cables in the containment building" still existed. Burke indicated that he concurred with Priebe's report that

this problem was serious and warranted the issuance of an NR. Burke said Priebe's NR was not written in error, as he identified the same problem at the same locations identified by Priebe.

4.1.11.2.2 Record Reviews

Kaiser QA SR 2800 dated June 11, 1981, indicates that on October 9, 1980, the outer coating of flexible conduit used in the containment area was splitting for unknown reasons. The corrective action statement in the SR states the deficiency could be serious enough to warrant formal reporting to the NRC. Also included in the corrective action section of the SR are comments that NRs CN-5122 and CN-5196 were voided in lieu of this SR. The "corrective action verified" section of the SR is stamped "nonapplicable" and dated October 14, 1980. An October 15, 1981, a memorandum attached to the SR from Robert P. Ehas (CG&E) to the Kaiser QA Manager indicates that in Ehas' opinion this matter did not warrant reporting to the NRC. A copy of SR 2800 and attachments is included in Appendix B.

4.1.11.3 Findings and Conclusions

Based on record reviews, interviews of personnel, and field observations it was established that NR CN-5122 was improperly voided. The SR used to initiate the NRs was apparently used later as justification to void the NRs. These NRs were never introduced into the Kaiser nonconformance reporting system. The Kaiser nonconformance reporting procedure was not followed, and this report was misfiled in the "Inspection Report" file. It appears that NR CN-5196 was dispositioned in the same manner.

4.1.12 Disposition of Nonconformance Report E-2233

4.1.12.1 Background

On November 21, 1979, QC Inspector L. Wood initiated NR E-2233 documenting nonconforming conditions for weld WS62GP in the service water system. The weld lacked evidence of fitup inspection, welder qualification, and material traceability; however, a final visual inspection of the weld was made and the weld was accepted. On December 21, 1979, M. Feltner, QA Engineer, dispositioned the NR and directed it to be "reworked" and cut out. On January 24, 1980, the NR was voided with the comment "KE1 form corrected" which was initialed by Floyd Oltz.

The KEI-1 form, which is included in Appendix B, was initially annotated to reflect that weld procedure, weld qualifications, heat numbers, and fitup would be verified by the QC inspector during inprocess inspection of this weld. The form was annotated with a "NA" superimposed over an mark previously made by a welding engineer.

NR E-2237, dated November 23, 1979, also for the closed cooling water system, reports the same nonconforming condition (i.e., lack of weld traceability and welder qualification) on another weld. The disposition for this report was "rework;" however, it was also voided by Floyd Oltz on December 19, 1979, with a comment "void rod slip found." This disposition was identical to that of NR E-2233. Copies of NR E-2233 and E-2237 are included in Appendix B.

4.1.12.2 Investigation

4.1.12.2.1 Record Reviews

On February 13, 1981, NRC personnel reviewed NR E-2233 and related documentation. This NR was voided after the weld data record (KEI-1) form was "corrected." The correction was actually a deletion of previous stipulated hold points, and there is no documentation included to support the engineering basis for deleting the hold points.

The following records were reviewed while tracking the dispositions of these NRs:

NRs E-2237and E-2233

KEI-1 forms 18391 and associated KEI-2 forms

KEI-1 forms 2554, 2552 and 2560

[Note: During the review of records, Floyd Oltz said he had deleted the hold points from the KEI-1 form; however, no signature or date of deletion was noted on the form.]

4.1.12.3 Findings and Conclusions

Based on record reviews and interviews of personnel it was established that NRs E-2233 and E-2237 were improperly voided because previously stipulated

hold points were deleted by a document reviewer who did not provide engineering justification.

4.1.13 Disposition of Nonconformance Report NRC-0001

4.1.13.1 Background Information

On February 11, 1981, QC Inspector James Ruiz initiated an NR (given identifer NRC-0001 for this investigation report) identifying nonconforming welds on drywell steel in the primary containment. Ruiz described the nonconforming condition as an electrode weave exceeding 3/4 in. The NR was not assigned a CN or NR number. The NR had a comment written in the "Disposition" section stating it was "sent back with no reply." This NR was provided to NRC by Inspector Ruiz. A copy of NRC-0001 is included in Appendix B.

4.1.13.2 Investigation

4.1.13.2.1 Interview of James Ruiz

On February 25, 1981, James Ruiz, Kaiser QC Inspector, was interviewed by NRC. He stated that on February 11, 1981, he performed an inspection of a beam located in the Primary containment building and noted a nonconforming condition on a weld. Ruiz stated he wrote an NR on this condition and submitted it to his supervisor, Dennis Donovan, who concurred and forwarded it to Rex Baker, Inspection Supervisor, who also concurred.

Ruiz stated that the next day Baker informed him Phillip Gittings, the QA Manager had returned the report saying that inspectors were not to write a report against a procedural violation. The NR was then returned to him, without assignment of a CN. Ruiz stated he took exception to Gittings' decision prohibiting inspectors from writing reports against procedural violations. He said the welding procedures delineated the welding specifications, parameters, dimensions, and other inspection criteria for judging whether a weld is acceptable.

Ruiz provided a sworn statement attesting to the preceding information, a copy of which is included in Appendix B.

4.1.13.2.2 Interview of Phillip Norman

On June 3, 1981, Phillip Norman, Kaiser QC Inspector, was interviewed by NRC. He stated that on this date he accompanied the NRC Inspector to the primary containment building during his inspection of drywell steel beam 81. Norman stated he concurred that the electrode weave on a weld on beam 81 exceeded 3/4 in.

4.1.13.2.3 Record Reviews and Field Observations

Region III personnel visually examined the weld inspected by Ruiz on drywell steel beam 81 located in the primary containment building. The weld displayed an electrode weave in excess of 3/4 in.

On June 30, 1981, the NR Log and all Kaiser NRs initiated between February 11 and February 20, 1981, were reviewed. The NR written by Ruiz on February 11, 1981, was not found in the Kaiser files and was apparently not entered into the Kaiser nonconformance reporting system.

4.1.13.3 Findings and Conclusions

Based on record reviews, interviews of perscnnel, and field observations, it was established that NR NRC-0001 was never entered into the Kaiser nonconformance reporting system. The questioned weld on beam 81 in the Primary Containment drywell area was visually inspected by NRC personnel; the deficiency identified by Ruiz and reported in the NR was confirmed. The weld is not necessarily defective; however, it did exceed specifications as stated by Ruiz in the NR. The nonconforming condition identified in the NR had not been corrected.

4.1.14 Disposition of Nonconformance Report E-1661 and E-1662

4.1.14.1 Background Information

On February 8, 1979, Kaiser QC Inspector David Painter initiated NR E-1661 and E-1662 identifying nonconforming welds on pipe support hangers in the drywell pneumatic system. Both of the NR were dispositioned as "rework" on May 2, 1979. On November 11, 1980, the NRs were voided by Floyd Oltz with a comment that the nonconforming hangers would be reinspected after design analysis. Copies of NR E-1661 and E-1662 are included in Appendix B.

4.1.14.2 Investigation

4.1.14.2.1 Interview of David Painter

On January 14 and June 4, 1981, David Painter, Kaiser QC Inspector, was interviewed by NRC. He stated that as a lead inspector he supervises three other inspectors involved in the inspection of pipe support hangers at Zimmer. Painter stated that inspectors wrote a group of NRs identifying nonconforming conditions in pipe support hangers that have been dispositioned as "Void-will be reinspected after design analysis." Painter indicated that when this comment was made, a 100% reinspection was planned for all pipe support hangers. He said that plan was rescinded and hangers are now being inspected according to an M-12 checklist that checks only for configuration and location of the hanger after it is redesigned. Painter indicated the QA Manager said that any hangers previously accepted prior to design changes and not affected by the design changes would not to be reinspected. Painter said this negated the earlier commitment used as justification for voiding the NRs, and now inspectors were finding nonconforming welds on hangers that had previously been inspected and accepted. Painter stated Gittings was told about this, and he repeated that if a pipe support hanger had been previously inspected and accepted he was not initiating a NR for reinspection findings.

4.1.14.2.2 Record Reviews

The following records were reviewed during the resolution of this NR:

NRs E-1661 and E-1662

Kaiser isometric drawing for Line No. RYIB2BA34

Kaiser isometric drawing for Line No. 1IN61AC34 (drywell pneumatic system reactor containment)

4.1.14.3 Findings and Conclusions

Based on record reviews and interviews of personnel, it was determined that NRs E-1661 and E-1662 were improperly voided because the condition (reinspection after design analysis) for the voiding was not fully implemented.

4.1.15 Disposition of Nonconformance Report E-2996

4.1.15.1 Background Information

On February 2, 1981, Rex Baker, Kaiser Inspection Supervisor, initiated NR E-2996, Revision 1, reporting that full penetration welds on T-Quenchers Serial Nos. 001, 003, 007, 0011, and 0012, were found to have a lack of penetration at the backing ring (i.e., split backing ring). However, the rest of the weld was acceptable. The nonconforming T-Quenchers are located in the suppression pool main steam relief system. The NR was dispositioned on February 9, 1981, as "accept as is" by Arch Lanham, KEI Construction Department. Lanham's justification for acceptance was that a split backing ring does not affect the integrity of the weld.

The licensee's architect-engineer, Sargent & Lundy (S&L), took exception to this disposition and directed that the T-Quencher welds be ultrasonically examined. On February 24, 1981, all the T-Quenchers were ultrasonically examined and found acceptable with the exception of No. 007. S&L dispositioned the NR as acceptable, with the exception of No. 007, indicating that additional data was required to resolve No. 007 because it was not ultrasonically tested as directed. The Kaiser Material Review Board (MRB) agreed with S&L's disposition and granted conditional approval of the disposition of the NR in March 1981.

NR E-2996, Revision 1, was dispositioned as closed on March 17, 1981. This NR was closed without any evidence that the required additional examination of T-Quencher No. 007 had been completed. A copy of NR E-2996, Revision 1, is included in Appendix B.

4.1.15.2 Investigation

4.1.15.2.1 Interview of Rex Baker

On June 3, 1981, Rex Baker, Inspection Supervisor, was interviewed by NRC. He stated that he wrote NR E-2996, Revision 1, on February 2, 1981, and that it was improperly closed on March 17, 1981. Baker stated that T-Quencher No. 007 was not ultrasonically examined as directed by S&L. Baker said the NR was improperly closed by a clerk in the Document Control office on March 17, 1981. Baker related from NRC that he learned, E-2996, Revision 1, was closed, after which he initiated NR E-3172 (which references E-2996 and addresses the issue that T-Quencher No. 007 was not adequately tested as directed in NR E-2996).

4.1.15.2.2 Interview of Floyd Oltz

On June 3, 1981, Floyd Oltz, Kaiser QA Engineer-Records, was interviewed by NRC. He stated that NR E-2996, Revision 1, was initiated by Baker on February 2, 1981, for nonconforming welds on T-Quenchers. Oltz stated that S&L directed the T-Quenchers be ultrasonically examined to establish their acceptability. He said that apparently T-Quencher No. 007 could not be ultrasonically examined so S&L dispositioned the report as acceptable, with the exception of T-Quencher No. 007.

Oltz stated he gave the NR to Kathy Faubion, NR Controller, who read the initial disposition of "accept as is" on the NR and did not read the exceptions placed in the rest of the disposition column by the architect-engineer. Oltz said Faubion mistakenly closed the NR because she assumed the condition was "accept as is" when in fact S&L had only granted partial acceptance. Oltz concluded this NR was improperly closed due to a clerical error.

4.1.15.2.3 Interview of Kathy Faubion

On June 4, 1981, Kathy Faubion, Kaiser NR Controller was interviewed by NRC. She stated she closed NR E-2996, Revision 1, on March 17, 1981, because the top of the disposition block on the NR had the comment "accept as is." Faubion said she closed the NR but did not read the additional comments in the "Disposition" column. Faubion stated that in May 1981 Rex Baker told her she had improperly closed this NR. She said Baker then initiated NR E-3172 documenting the nonconforming condition for T-Quencher No. 007.

4.1.15.2.4 Record Review

Region III personnel reviewed documentation and radiographs associated with NR E-2996, Revision 1. The deficiency, (i.e., split backing ring) is permissible under ASME Codes for Class C welds and the condition was not nonconforming. However, an ultrasonic examination was performed to verify the location of the split to be in the backing ring and not in the weld. Records indicated that on February 24, 1981, the questioned T-Quenchers were ultrasonically examined (with the exception of Quencher No. 007) and found to be acceptable. It appeared that further ultrasonic testing (UT) or other nondestructive examination should have been conducted on T-Quencher No. 007; however, NR E-2997, Revision 1, was mistakenly closed on March 17, 1981, without examining T-Quencher No. 007.

During the course of this investigation, the following records were reviewed to track the resolution of this NR:

NRs E-3172, dated May 11, 1981, and

E-2996, Revision 1

Nuclear Energy Services, Inc. Report of Ultrasonic Examination, dated February 14, 1981

Sargent & Lundy Engineers, memo dated March 5, 1981

KEI-1 form for T-Quenchers 011, 003, 007, 009, 011, and 012

4.1.15.3 Findings and Conclusions

Based on record reviews, interviews of personnel, and review of radiographs by RIII personnel, it was established that this NR was improperly closed on March 17, 1981, because the required ultrasonic testing of T-Quencher No. 007 was not performed.

4.1.16 Disposition of Nonconformance Report CN-4389

4.1.16.1 Background Information

On January 3, 1980, D. J. Luttmann, Kaiser QC Inspector, initiated a 33-page NR that was assigned CN-4389. This NR reported various nonconforming conditions in electrical cable, trays, and hangers in the auxillary building. The NR was voided by Kyle Burgess on December 2, 1980, because the "NR was initiated just prior to [the] inspector leaving the job. A lot of the items listed were acceptable in this area. Some items needed reinspection." This NR was recovered from the Site Document Control Vault on June 4, 1980, apparently having been misfiled with "Inspection Reports" identifying nonconforming material found during receipt inspections. Although the NR was "voided," it was stamped "Inspection Report" in the block reserved for assignment of the NR number. A copy of the first 5 pages of NR CN-4389 is included in Appendix B.

4.1.16.2 Investigation

4.1.16.2.1 Interview of Kyle Burgess

On June 18, 1980, Kyle Burgess, Kaiser Inspection Supervisor, was interviewed by NRC. He stated that he voided the NR assigned CN-4389 on December 2, 1980. Burgess stated that inspector D. J. Luttmann was an electrical inspector who had reported various nonconforming conditions in the electrical area. He indicated that he voided this NR because Luttmann had left the site and some of the items had been found to be acceptable; however, some were valid nonconforming conditions. Burgess could give no reason why the voided NR had been placed in the Inspection Report file.

4.1.16.2.2 Record Reviews

The following records were reviewed while tracking the resolution of this NR.

NR CN-4389, dated January 23, 1980.

Kaiser Procedure QACMI G-4, Revision 7, dated April 7, 1980.

4.1.16.3 Findings and Conclusions

Based on record reviews and interviews of personnel, it was established that there was no sufficient reason to justify the voiding of NR CN-4389.

4.1.17 Disposition of Nonconformance Report E-2191

4.1.17.1 Background Information

On November 2, 1979, NR E-2191 was initiated by Richard L. Reiter to report that the consumable insert in a weld in the closed cooling water system was not traceable. Reiter said there was no heat number on the weld rod issue slip (KIE-2) for the consumable insert in weld WR-523 on Drawing PSK WR-9. Reiter commented in the text of the NR that he confirmed this by looking at the original copy of the KEI-2 form. The initial disposition of this report was "accept as is" with the reason given that all consumable inserts are purchased as Class I (safety-related) traceable materials. The NR was closed on November 8, 1979, and was reopened after the Authorized Nuclear Inspector (ANI) rejected this disposition on January 7, 1980.

On February 19, 1980, NR E-2191 was voided with the comment that it was redispositioned on NR E-2191, Revision 1. NR E-2191, Revision 1, was voided on February 22, 1980, by Floyd Oltz, with a comment that the weld rod issue slip had been found. There were no engineering or Material Review Board concurrences on this disposition. Copies of NR E-2191 and E-2191, Revision 1, are included in Appendix B.

4.1.17.2 Investigation

4.1.17.2.1 Interview of Richard L. Reiter

On March 25, 1981, Richard L. Reiter, former Kaiser Document Reviewer, was interviewed by NRC. He stated that on November 2, 1981, he initiated NR E-2191 after he observed that Kaiser weld data form (KEI-1) No. 23037 for weld WR-523 did not have a heat number for the consumable insert that was used. Reiter stated he checked the weld rod issue form, Kaiser warehouse files, and identical copies of the weld rod issue forms, and found no record of the heat number. Reiter stated that if any entries was found on any of the weld rod issue forms, these entries were false and were made after November 2, 1979.

Reiter provided a written statement attesting to the preceding information, a copy of which is included in Appendix B.

4.1.17.2.2 Interview of Floyd Oltz

On February 25, 1981, Floyd Oltz, Kaiser QA Engineer-Records, was interviewed by NRC. He stated that NR E-2191 was written by Reiter when he found no heat number for the consumable insert on weld WR-523. The NR was dispositioned by Louis Boetger with a disposition of "accept as is" because all consumable inserts are purchased as Class 1 nuclear grade material. Oltz stated that the ANI disapproved this disposition on January 7, 1980. This NR was voided on February 19, 1980, and was redispositioned on NR E-2191, Revision 1. Oltz

stated that he voided NR E-2191, Revision 1, on February 22, 1980, with a comment that a weld rod issue slip with a heat number for the consumable insert was found. Oltz stated that Arch Lanham had found the rod slip for the weld with a heat number for the consumable insert.

4.1.17.2.3 Interview of Arch Lanham

On March 25, 1981, Arch Lanham, Kaiser Senior Engineer, was interviewed by NRC. He stated that he dispositions NRs for the Construction Department at Zimmer. Lanham stated that he frequently searches for lost documentation, such as rod slips, when resolving NRs in which a lack of adequate documentation was cited as the nonconforming condition. He stated that, in the case of NR E-2191, the nonconforming condition was lack of a heat number for the consumable insert for weld WR-523. Lanham provided his copy of NR E-2191 with field notes he wrote when dispositioning the NR.

Lanham stated the original disposition of the NR was "accept as is"; however, on December 17, 1979, he noted that Floyd Oltz had the original copy of the NR and he noted on his copy, "could there be more than one rod slip for insert?" Lanham stated there is also a notation that on January 22, 1980, the NR was still not back from the architect-engineer. After reviewing his notes, Lanham stated that it appeared he reviewed the KEI-1 form and original rod slip [KEI-2 form] and found that he had inspected weld WR-523 on October 17, 1977. He stated there was no heat number for the consumable insert on the KEI-1 form; however, he had reviewed weld rod issue slip No. 97957 and found a heat number for the consumable insert.

Lanham indicated that the heat number for the consumable insert was marked in ink on the carbon form (gold copy of form No. 97957) and was circled in red with his initials. Lanham stated he recalls that he made this entry on the gold copy of the form in October 1977 while inspecting the weld. He said there was no heat number on the weld rod issue form, and called the weld rod shack to obtain a proper heat number for the consumable insert. Lanham said he did not make the entry on the form during November 1979 through February 1980 while dispositioning this NR.

4.1.17.2.4 Record Reviews

Kaiser isometric Drawing PSK WR-9 for the closed cooling water system was reviewed for line No. 1WR17AB 2-1/2, weld WR-523. The Kaiser KEI-1 form shows a notation that the heat number for the consumable insert is No. 6059491. Weld rod issue slip (KEI-2 form) No. 97957 (gold copy) shows that heat No. 6059491 is the only entry written in ink on carbon form. Two other copies of KEI-2 form No. 97957 (white copy and blue copy) do not have similar entries for the heat number. Copies of the weld data sheet (KEI-1) and accompanying weld issue forms (KEI-2) are included in Appendix B.

4.1.17.3 Findings and Conclusions

Based on record reviews and interviews of personnel, it was established that NR E-2191, Revision 1, was improperly dispositioned because there was no review by the Kaiser Material Review Board and because information from a weld rod issue form (KEI-2), which is a non-QA document was used to disposition a QA document (NR).

4.1.18 Disposition of Nonconformance Reports CN-5476, CN-5477, CN-5479

4.1.18.1 Background Information

On February 23, 1981, Inspector James Ruiz initiated three NRs, numbered CN-5476, CN-5477, and CN-5479, reporting nonconforming conditions on drywell support steel in the primary containment building. Ruiz stated that weld 63, 58, and 3 were full-penetration groove welds requiring 100% coverage by non-destructive examination by either radiography, magnetic particle, or ultrasonic testing but no tests had been documented. He also found that all three welds lacked documentation for the backing strips, filler metal, welder qualifications, or welding procedure. The NR Log shows that NRs CN-5477 to CN-5479 were voided with the notation "Void-NR not issued" on February 27, 1981. Copies of these NRs were not retained in the Kaiser SDC files. Copies of NRs CN-5476, CN-5477, and CN-5479 are included in Appendix B.

4.1.18.2 Investigation

4.1.18.2.1 Interview of James Ruiz

On February 25, 1981, James Ruiz, Kaiser QC Inspector, was interviewed by NRC. He stated that the Kaiser QA Manager was arbitrarily voiding NRs and he had no assurance that reports he initiated would be entered into the Kaiser nonconformance reporting system or that the conditions he identified would be corrected. Ruiz provided NRs CN-5476, CN-5477, and CN-5479 and stated these had been initiated by him on February 23, 1981. He indicated he did not think they would be processed properly by the nonconformance reporting system.

Ruiz provided a written statement attesting to the preceding information, a copy of which is included in Appendix B.

4.1.18.2.2 Interview of Dennis Donovan

On June 10, 1981, Dennis Donovan, Kaiser QC Inspector, was interviewed by NRC. He stated that he had reviewed NRs CN-5476, CN-5477, and CN-5479 and concurred with them. Donovan stated that Ruiz erred in his identification of one deficiency on these NRs, because a Design Document Change (DDC) had been written by S&L that eliminated the nondestrucive examination (NDE) requirement for welds on these beams. Donovan questioned S&L's waiver of this requirement and said it was contrary to S&L Specification H2174 that requires 100% nondestructive examination of all Class 1 welds. Donovan stated he had reviewed the DDC and found that S&L waived the nondestructive examination for "ease of construction." He said that, in his opinion, this was not an adequate justification for the noted disposition. Donovan advised that the Kaiser construction department is repairing these and other cantilever beams in the primary containment building.

4.1.18.2.3 Interview of Rex Baker

On June 10, 1981, Rex Baker, Kaiser Inspection Supervisor, was interviewed by NRC. He stated that on February 23, 1981, inspector James Ruiz identified nonconforming welds on some cantilever beams located in the primary containment building. Baker stated Ruiz initiated and he concurred in NRs CN-5476, CN-5477, and CN-5479. Baker stated Ruiz documented nonconforming conditions such as

lack of nondestructive examination of full penetration welds, material traceability and welder qualifications.

Baker stated that on February 27, 1981, he voided these NRs with the comment "Void NR not issued." He stated he voided these NRs after a meeting in February 1981 with Phillip Gittings, Kenneth Shinkle, and Robert Marshall during which the nonconforming conditions identified by Ruiz were discussed. Baker said that during the meeting Marshall stated that the welds on these cantilever beams were to be cut out by Kaiser; therefore, these nonconformance reports should be voided. Baker stated that he voided these NRs on Gittings' instructions and gave Gittings the original copies of all four NRs.

4.1.18.2.4 Interview of Kenneth Shinkle

On June 11, 1981, Kenneth Shinkle, Kaiser Mechanical/Civil/Structural QA Engineer, was interviewed by NRC. He stated that on February 23, 1981, QC Inspector James Ruiz initiated NRs CN-5476, CN-5477, and CN-5479.

Shinkle stated he reviewed these NRs and found that Inspector Ruiz had erred in identifying one nonconforming condition. He stated that a DDC had been issued by the licensee's architect-engineer that waived NDE requirements for the nonconforming beams identified by Ruiz.

Shinkle stated that he questioned the justification for this DDC because the text of the DDC said "for ease of construction" NDE is waived. Shinkle said that the welds identified in the NRs are Class 1 welds because they

are welded to the containment liner plate and both S&L specifications and ASME Code requirements require 100% NDE for Class 1 welds.

Shinkle stated Ruiz did not err in identifying the remaining nonconforming conditions, such as lack of material traceability and welder qualifications. Shinkle advised that the cantilever beams in question hold up walkways, pipe support hangers, and heating and ventilation ducts in the primary containment building.

Shinkle stated that he attended a meeting in February 1981 with Rex Baker, Phillip Gittings, and Robert Marshall, regarding Ruiz's NRs. Shinkle stated that Marshall wanted to repair the beams on a case-by-case basis and perform a visual inspection of the welds. Shinkle stated that Gittings agreed with this approach and told him to work with the Construction Department to rework the welds using KEI-1 repair cards without processing the NRs Ruiz had written.

Shinkle stated that to the best of his knowledge the nonconformances written by Ruiz were never entered into the Kaiser nonconformance reporting system. He stated that this was especially significant in light of the fact that in February 1981 there was an NRC investigation into irregularities in the Kaiser nonconformance reporting system.

Shinkle stated that after Gittings directed him to resolve the issues identified, he conducted an inspection of cantilever beams located at the 572-ft elevation of the primary containment building. Shinkle indicated he found that there was no final QC inspection on any of the 27 beams and

4 had no record of fitup inspection. Shinkle stated he identified the same nonconforming conditions, lack of weld filler metal and backing strip traceability, and lack of evidence of welder qualification for these welds. In addition, Shinkle stated he conducted a visual examination of the welds and in many cases the welds did not appear to meet Code requirements.

Shinkle stated he advised Robert Marshall of the above and Marshall stated he did not want to repair the nonconforming conditions because modifications had been made to the beams to add side plates and those plates would have to be removed to conduct inspections of the affected welds. Shinkle advised that the Construction Department is now in the process of removing the questioned beams.

4.1.18.2.5 Interview of Thomas McKenna

On August 10, 1981, Thomas A. McKenna, Sargent & Lundy Structural Project Engineer, was interviewed by NRC. McKenna stated that DDC-712 waived nondestructive examination of full-penetration groove welds on cantilever beams supporting walkways in the primary containment area. The DDC was written in 1975 to waive the NDE examinations for "ease of construction." He said that at that time the beams supported personnel walkways only and had no appendages affixed.

McKenna said, in hindsight, that a better explantion of the engineering basis for the waiver could have been written on the DDC (i.e., the beams supported minimal loads). He said that the S&L waiver of NDE for these welds did not consitute a waiver of other quality requirements, such as visual inspections of the welds, required by the AWS Code.

McKenna stated that since 1975 there has been extensive redesign of the suppresion pool area and the beams now support safety-related pipe supports, air ducts, and electrical cable tray support hangers. He said that in April 1981, an individual on site questioned the quality of these welds. He said that during visual inspections the welds were found to be of poor quality and documentation reviews indicated that the required documentation of quality inspections could not be found. He said these nonconforming conditions are currently being addressed and corrected, and the previous DDC waiving nondestructive examinations of these welds was rescinded on May 18, 1981, by DDC-2635. He said the welds will be repaired and radiographed or magnetic particle tested.

McKenna said he reviewed NRs CN-5476, CN-5477, and CN-5479 and stated DDC-712 addressed Item 1 on those NRs concerning a failure to nondestructively examine these welds. He said, however, the DDC did not waive other nonconforming conditions identified on the NRs, such as traceability of weld filler metal, evidence of fitup inspection, and that the welds did not meet AWS criteria. McKenna stated the voiding of this NR based only on the DDC was improper and he would not have approved its disposition. He said S&L does not receive voided Nonconformance Reports from Zimmer for engineering review and would not have reviewed this NR if it had been voided by Kaiser.

4.1.18.2.6 Record Reviews

On June 6, 1981, Regina Rudd, Kaiser NR Controller, was contacted and asked to retrieve NRs CN-5476, CN-5477, and CN-5479 from the Kaiser Site Document

Control Center. Rudd stated that she conducted a search of the open, closed, and voided nonconformance report files and could not locate the nonconformance reports assigned these numbers. Rudd provided a copy of the NR Log page reflecting that on February 27, 1981, NRs CN-5476, CN-5477, and CN-5479 were voided with a comment "Void-NR not issued." A copy of the NR Log page is included in Appendix B.

4.1.18.3 Findings and Conclusions

Based on record reviewsand interviews of personnel it was established the NRs CN-5476, CN-5477 and CN-5479 were not entered into the Kaiser nonconformance reporting system.

4.1.19 Summary Findings and Conclusions

All of the allegations made by the QC inspectors were found to be correctd. It was found there were widespread irregularities in the system. Kaiser procedures permit voiding of a NR only if the NR was "written in error, duplicated, or the nonconforming conditions has been corrected...by construction." A computerized listing provided in July 1980 indicated that 1,031 NRs were voided, between January 1, 1978, and March 31, 1981, including those that were actually superceded rather than voided. Some were voided by the QA Manager, some by the QA Engineer-Records, and some by a clerk. A chronological breakdown of the number of voided NRs per month is included in Appendix B. The dispositions of a selected group of 20 reports, wither voided or alleged not to be in the reporting system were

reviewed and it was found that in 15 cases the NRs were either voided improperly, improperly dispositioned, closed in error, or the disposition was not fully implemented. In several cases, the justification used for voiding the NR was erroneous (e.g., it was found the QA Manager was voiding NRs which were not written in error). In some cases, the NRs had been reviewed by a Construction Engineer and "rework" was ordered, yet the NR was later "voided." It was found that some of this activity occurred after an NRC inspection on December 2-3, 1980, in which the licensee and the Kaiser QA Manager were told that this activity was contrary to NRC requirements. It was also established that, following the NRC inspection, the Kaiser QA Manager had on three occasions NRs (CN-4309, NRC-0001, CN-5412) not entered NRs into the Kaiser nonconformance reporting system.

This investigation also disclosed that an NR was improperly dispositioned as "accept as is" when "rework" was appropriate. In one case (NR E-2836), the "accept as is" disposition was contrary to ASME Code requirements.

NRs that identified multiple nonconforming conditions were voided improperly with a comment that the NR was being "revised" or that "each deficiency would be issued on a separate NR" or items would be "reinspected." It was determined that nonconforming items were not reissued on separate NRs and were not re-inspected as stated on the NR at the time of voiding. It was also found that during "revisions" some nonconforming items were removed from NRs without justification.

The allegation that the Kaiser QA Manager voided NRs at the request of the Construction Department was correct; however, the QA Manager stated that he had made an independent decision when doing so.

This investigation established that nonconforming conditions identified by Quality Control Inspectors were improperly dispositioned. It was also established that the licensee failed to take effective corrective action following the December 1980 NRC inspection.

This widespread problem of improper handling of NRs is addressed in the Quality Confirmation Program.

4.1.20 Items of Nonconformance

One item of noncompliance was identified related to failure to process nonconforming items in accordance with documented procedures as required by 10 CFR 50, Appendix B, Criterion XV.

I Allegation$S7$U

"Prefabricated piping received in 1977 has defective welds, but construction supervisors told crews not to repair them because the welds were made offsite."

II Findings$U

Pertinent interviews and records revealed that the alleged piping was received in 1979 instead of 1977.

The portion of the allegation, that alleged prefabricated piping received in 1979 has defective welds, was o<not substantiated. Appropriate examination techniques, performed on the piping, did not reveal any unacceptable weld indications.

The portion of the allegation, that alleged construction supervisors told crews not to repair alleged defective welds because the welds were made offsite, was substantiated. Interviews with pertinent personnel and the nonconformance report history support this portion of h<the allegation.

As documented in Region III Investigt<ation Report No. 80-09, ~~Kaiser had released the alleged piping (main steam relief spool pieces) for installation before their acceptability had been established.~~ One item of noncompliance with NRC requirements

was cited ~~in Region III Investigation Report No. 80-09~~ for releasing the spool pieces before determining their acceptability.

No additional noncompliances or safety concerns were identified.

III Investigation$U

A. Background$SInformation$U

1. The following summarizes the initial investigation of this allegation as documented in Region III Investigation Report 80-09.

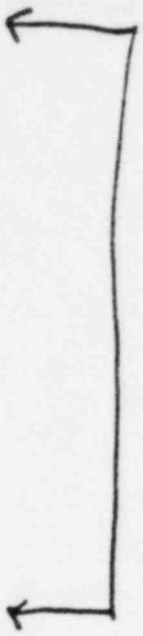
On June 29, 1979, Pullman Power Products of Williamsport, Pennsylvania, also known as M. W. Kellogg Company, ~~shipped~~ trucked five prefabricated pipe spool pieces to the site for installation in the Main Steam Relief System, a safety-related system. The spool pieces were received on July 3, 1979, and nonconformance report #E-1911 was written on July 5, 1979, stating the spools had "rolled off the truck onto the ground and struck other spools." The nonconformance report had the effect of placing the spool pieces in a hod<ld status in the Kaiser warehouse. The welds on the five spool pieces were i<later a<radiographed. The radiographs displayed

Not a direct quote so do not, indent

apparent rejectable weld indications in welds on three of the five a<spool pieces. On September 18-28, 1979, despite the issuance of the nonconformance report, the spool pieces were released to construction and installed. As documented in Region III Investigation Report No. 50-358/80-09 the licensee was found to be in noncompliance with NRC requirements for the release of the spool pieces prior to establishing acceptability. During April and May 1980 the welds on the spool pieces were examined ultrasonically and with magnetic particle and found to be accp<eptable by the licensee's contracted personnel.

On
~~In~~ /a<<April 8, 1980 the RIII inspector reviewed the radiographs ~~on~~ of welds in all five spool pieces (1MS08BB12-6B, 1MS09BA12-1AH, 1MS08BA12-58H, 1MS11B12-7BH, and 1MS10BA12-1CH). The films (radiographs) were marked "For Information Only" because an acceptable radiographic technique could not be established due to e<the pipes' (spool pieces') configurations and sizes (thicknesses).

David Hang, who performed the above radiography, stated that radiography was the s<wrong examination technique.



Region III Inspector, Kavin Ward, stated that radiography was not a credible Nondestructive Examination, NDE, volumetric technique for the alleged spool pieces. The configurations and relatively large thicknesses of the spool pieces in relation to the geometric set-up of the radiograph process, would prevent displays and/or accurate displays of weld indications on the radiographs. Any weld indication depicted on the radiograph could be of undefined distortion.

B. Personnel$SInterviews$U

Interview$Swith$SIndividual$S"A"$U

On April 24, 1981, Individual "A", who was previously interviewed by representatives of GAP was interviewed. Individual "A" stated he he<ad provided information to GAP regarding this allegation. He stated that when he spoke to GAP b<about this allegai<tion he was referring to five prefabricated pipe spool pieces manufactured by Kellogg which fell off a truck during their delivery to the site. He stated Peabody Magnaflux (PM) radiographers examined the pieces and found defective welds on some of them. He a<said construction installed the spool pieces in the plant disregarding PM's finding on the welds.

On April 22, 1981, Individual "A" provided a written statement attesting to the aforementioned information; however, he requested the statement not be attached to this report.

Interview$SwithSDavid$SHang$U

On February 24, 1981, David Hang, former Level II Radiographer, PM, was interviewed. He stated in August 1979 Anthony Pallon, KEI Welding Engineer, s<asked him to radiograph MSR spool pieces which had fallen off the truck upon delivery to the site. Hang said e<the exam was to determine if any of the welds on the pieces had cracked during the fall. Hang stated on three of the five spool pieces he examined he found welds to have unacceptable indications. He said he reported this in his Report of Radiographic Examination to Pallon and told Pallon at that time that radiography was the wrong technique to use to examine welds in this confug<<configuration. Hang said he told Pallon an ultrasonic examination should be performed in this case. Hang also stated that in April 1980 the spool pieces were ultrasonically examined and the welds were found acceptable.

C. Record$SReviews$U

On February 24, 1981, RIII Inspector Kavin Ward reviewed records which indicated the five spool pieces were ultrasonically examined ~~in April and May, 1980~~ by Pullman Power Products O.K. ~~in April and May, 1980,~~ and examined with magnetic particle by Peao<body Magnaflux in April, 1980. The records indicated that welds on all five pieces were acceptable. The magnetic particle records indicated piece No. 1-MS-11B-12-~~7~~BH weld No. V had a linear indication of approximately 1/4 inch long, which was retested and found acceptable after grinding.

Inspector Ward stated that the ultrasonic and magnetic processes were valid examination processes for the alleged pipes (spool pieces).

d. Field$SObservations$U

On February 24, 1981, RIII Inspector Kavin Ward made visual examinations of all of the welds on all five spool pieces and identified no unacceptable indications. The spool pieces were installed in the Main Steam Relief System at the time of the visual examinations.

No additional items of noncompliance or safety concerns were identified.

~~Adjacent$SMaterial$SReviewed$U~~

A7. The RIII inspectors reviewed radiographs of the following field and shop welds ~~for evidence of~~ to identify any unacceptable indications in the welds or adjacent material ~~material adjacent to the welds~~ (including other welds) ~~that may have been reviewed.~~ ~~The NRC found no unacceptable indications in the entire radiographs viewed. This consisted of approximately five radiographs per weld of the 67 welds reviewed.~~

Field$SWelds$U

Line$SNo.$U	Weld$SNo.$S	Diameter$U	Line$SNo.$U	Weld$SNo.$U	Dia.$U
1RH08BB10	RH174C	4"	1RH08BB10	RH176	4"
1RH08BB10	RH177	4"	1RH08BB10	RH178	4"
1RH08BB10	RH179	4"	1RH16C14	RH203	4"
1RH13BB4	RH224	4"	1RH13BB4	RH205	4"
1RH13BB4	RH226	4"	1RH08BB10	RH174A	4"
1RH36B6	RH116	6"	1RH20B6	RH115	6"
1RH08AA10	RH109	10"	1RH06BB10	RH137	10"
1RH07BB10	RH140	10"	1RH07BB10	RH141	10"
1RH07BB10	RH145	10"	1RH36A6	RH123	6"
1RH08BA10	RH105	10"	1RH08CA10	RH104A	10"
1RH08BA10	RH104	10"	1RH07BA10	RH76	10"
1RH02B6	RH15	20"	1RH02B2C0	RH15B	20"
1RH02BC20	RH16	20"	1RH02BC20	RH16A	20"
1RH02BC20	RH16B	20"	1RH02BC20	RH16C	20"

Line$SNo.$U	Weld$SNo.$U	Diameter$U	Line$SNo.$U	Weld$SNo.$U	Dia.$U
1RH02BC20	RH14	20"	1RH02BA20	RH5	16"
1RH02BA20	RH8	20"	1RH02BA20	RH6	20"
1RH02AA20	RH1	20"	1RH02AA20	RH2	20"
1RH02AA20	RH3	20"	1RH02BA20	RH4	20"
1RH02BA20	RH9	20"	1RH02AC20	RH10	20"
1RH02AC20	RH11	20"	1RH0AC20	RH11A	20"
1RH02AC20	RH12	20"	1RH01DA16	RH37	16"
1RH02BA20	RH39	16"	1RH01C18	RH44	18"
1RH01C18	RH43	18"	1RH01C18	RH41	18"
1RH02BC20	RH17	20"	1RH02AB20	RH18	20"
1RH02AB20	RH19	28"	1RH02AB20	RH19A	20"
1RH02BB20	RH20	20"	1RH02BA20	RH40	16"
1RH01C18	RH261	18"	1RH01C18	RH262	18"

Shop$SWelds$U

Line$SNo.$U	Weld$SNo.$U	Diameter$U	Line$SNo.$U	Weld$SNo.$U	Dia.$U
1RH01DB16-25	4	16"	1RH01DB16-24	3	16"
1RH02BA20-6	A	20"	1RH02BA20-3	A	20"
1RH02AC20-10	A	20"	1RH02AB20-17	A	20"
1RH01C18-31	A	18"	1RH01C18-31	A	18"

AT. The RIII inspectors reviewed radiographs of the following field and shop< welds to identify any unacceptable indications in the welds card<<and/or the adjacent material (including other welds).

[Field$SWelds$U]

Line$SNo.$U Weld$SNo.$U Pipe$SDiameter$U

Shop$SWelds$U

The RIII inspector reviewed approximately five radiographs for each of the 67 welds. No unacceptable indications were identified in either the weld or the adjacent material. No adjacent welds were identified in any of the radiographs.

~~Adjacent$SMaterial$SReviewed$U~~

8. The RIII inspectors reviewed radiographs of the following field and shop welds ~~for evidence of~~ to identify any unacceptable indications in the welds or adjacent material ~~material adjacent to the welds~~ (including other welds) ~~that may have been reviewed.~~ The NRC found no ~~unacceptable indications in the entire radiographs viewed. This consisted of approximately five radiographs per weld of the 67 welds reviewed.~~

Field$SWelds$U

Line$SNo.$U	Weld$SNo.$S	Diameter$U	Line$SNo.$U	Weld$SNo.$U	Dia.$U
1RH08BB10	RH174C	4"	1RH08BB10	RH176	4"
1RH08BB10	RH177	4"	1RH08BB10	RH178	4"
1RH08BB10	RH179	4"	1RH16C14	RH203	4"
1RH13BB4	RH224	4"	1RH13BB4	RH205	4"
1RH13BB4	RH226	4"	1RH08BB10	RH174A	4"
1RH36B6	RH116	6"	1RH20B6	RH115	6"
1RH08AA10	RH109	10"	1RH06BB10	RH137	10"
1RH07BB10	RH140	10"	1RH07BB10	RH141	10"
1RH07BB10	RH145	10"	1RH36A6	RH123	6"
1RH08BA10	RH105	10"	1RH08CA10	RH104A	10"
1RH08BA10	RH104	10"	1RH07BA10	RH76	10"
1RH02B6	RH15	20"	1RH02B2C0	RH15B	20"
1RH02BC20	RH16	20"	1RH02BC20	RH16A	20"
1RH02BC20	RH16B	20"	1RH02BC20	RH16C	20"

Line$SNo.$U	Weld$SNo.$U	Diameter$U	Line$SNo.$U	Weld$SNo.$U	Dia.$U
1RH02BC20	RH14	20"	1RH02BA20	RH5	16"
1RH02BA20	RH8	20"	1RH02BA20	RH6	20"
1RH02AA20	RH1	20"	1RH02AA20	RH2	20"
1RH02AA20	RH3	20"	1RH02BA20	RH4	20"
1RH02BA20	RH9	20"	1RH02AC20	RH10	20"
1RH02AC20	RH11	20"	1RH0AC20	RH11A	20"
1RH02AC20	RH12	20"	1RH01DA16	RH37	16"
1RH02BA20	RH39	16"	1RH01C18	RH44	18"
1RH01C18	RH43	18"	1RH01C18	RH41	18"
1RH02BC20	RH17	20"	1RH02AB20	RH18	20"
1RH02AB20	RH19	20"	1RH02AB20	RH19A	20"
1RH02BB20	RH20	20"	1RH02BA20	RH40	16"
1RH01C18	RH261	18"	1RH01C18	RH262	18"

Shop$SWelds$U

Line$SNo.$U	Weld$SNo.$U	Diameter$U	Line$SNo.$U	Weld$SNo.$U	Dia.$U
1RH01DB16-25	4	16"	1RH01DB16-24	3	16"
1RH02BA20-6	A	20"	1RH02BA20-3	A	20"
1RH02AC20-10	A	20"	1RH02AB20-17	A	20"
1RH01C18-31	A	18"	1RH01C18-31	A	18"

A7. The RIII inspectors reviewed radiographs of the following field and shop< welds to identify any unacceptable indications in the welds card<<and/or the adjacent material (including other welds).

[Field$SWelds$U]

Line$SNo.$U Weld$SNo.$U Pipe$SDiameter$U

Shop$SWelds$U

The RIII inspector reviewed approximately five radiographs for each of the 67 welds. No unacceptable indications were identified in either the weld or the adjacent material. No adjacent welds were identified in any of the radiographs.

Attachment D

1039B - 1.39	2012A - 1.35	4009A - 1.30	4421A - 1.28
1044A - 1.28	2012B - 1.25	4010A - 1.45	4424B - 1.53
1052B - 1.51	2017A - 1.37	4011A - 1.41	4433B - 1.39
1053B - 1.26	2018A - 1.36	4012B - 1.41	4435B - 1.46
1055A - 1.26	2019B - 1.31	4022A - 1.40	4438A - 1.31
1055B - 1.28	2024A - 1.37	4044BC - 1.27	4438C - 1.37
1057A - 1.44	2024B - 1.36	4047B - 1.30	4439B - 1.35
1057B - 1.47	2025A - 1.46	4074C - 1.38	4442B - 1.47
1058AB - 1.44	OK 2025B - 1.55	4078K - 1.36	4462B - 1.4[illegible]
1058BC - 1.45	2027A - 1.46	4079K - 1.27	4465B - 1.39 ([illegible])
1059C - 1.33	2029A - 1.27	4080K - 1.44	4564A - 1.46
1073A - 1.25	2029B - 1.48	4086C - 1.27	4569B - 1.4[illegible]
1085B - 1.46	2031B - 1.31	4088C - 1.31	4585C - 1.36
1087B - 1.45	2038A - 1.44	4152BA - 1.26	4613A - 1.37
1088B - 1.35	2062AB - 1.44	4120B - 1.36	4614A - 1.46
1095B - 1.33	2068B - 1.31	4120C - 1.30	4615A - 1.46
OK 1104B - 1.54	2157A - 1.32	4121B - 1.38	4620A - 1.37
1236A - 1.28	2159A - 1.35	4121C - 1.36	4620B - 1.50
17	2160A - 1.40	4122C - 1.29	
	19	4145CB - 1.42	
	3008E - 1.29	4503 - 1.27	
	2 3015E - 1.35	4151B - 1.29	
		4182B - 1.36	
		4183B - 1.28	
		4290A - 1.34	
		4293A - 1.42	
		4299A - 1.39	
		4310A - 1.33	
		4326A - 1.31	
		4328A - 1.36	
		4330A - 1.36	
		4352B - 1.29	53
		4363B - 1.31	
		4394A - 1.43	
		4395A - 1.38	

TRAY SECTIONS RELEASED FOR FIREPROOFING

RK4233	R4307	R4529	R4492
R4234	R4308	R4530	R4493
R4235	R4309	RK4531	
R4236	R4313	R4586	
R4237	R4320	R4593	
R4238	R4322	R4528	
R4239	R4327		
R4240	RK4353		
RK4281	R4355		
R4282			
R4283			
R4285			
R4298			

THESE ROUTING POINTS TO BE AVOIDED
NO CABLE TO BE ROUTED THRU UNDERLINED PTS WITHOUT APPROVAL. (OR THRU FIREPROOFED TRAYS)
PTS. PRECEDED BY OK HAVE BEEN DOCUMENTED TO SHOW THEY CONFORM TO FSAR COMMITTMENT OF 60% OBSOLETE MAX. LOADING WHICH IS D.I OF 1.53

DRAWING RELEASE RECORD

ROUTING POINTS OVER 1.25
ZIMMER N.P.S.
CG&E

SARGENT & LUNDY

14

8 COPIES

13.a. The RIII inspectors observed that weld inspection criteria to verify weld procedure, welder qualification, filler material, joint cleanliness, bevels, and damage had been deleted or designated as not applicable, N/A, on the following KEI-1 forms (weld inspection records).

	System or Component$U	ISO Dwg. No.$U	Beam or Mark #$U	Other Information$U
(1)	Drywell Support Steel	S398B	29	Detail E of S-437
(2)	Drywell Support Steel	S398B	2 stiffners 1/2 x 6- 3/4 x 25-	Line No. MKC 17S493
~~(3)~~	~~Drywell Support Steel~~	~~S398A~~	1/8	
(3)	Drywell Support Steel	S398A	125	Line No. EL-535 191
(4)	Drywell Support Steel	S398B	67	Detail 13 of 493 Detail 2 of 447
(5)	Drywell Support Steel	S398A	C-63 (W8 x 10)	Bottom Plate
(6)	Drywell Support Steel	S398A	W8 x 17	Com Lugs

(7) Service Water System PSK/WS32 55H Line No. 1WS17A18

The records for the Drywell Support Steel indicated that the deleted criteria existed at least from July, 1980 to January, 1981. The record for the Service Water System indicated the criteria was designated as not applicable in November, 1979.

The inspection criteria to verify proper fit-up and tack welds was also designated N/A for the above weld activities on the Service Water System.

b. The licensee could not readily determine if the ASME Code Section III-1971 or if the AWS D1.1-1972 Code inspection criteria governed some of the above activities. Regardless:

(1) The$SASME$SCode$Sstates:$U

(a) NA-4130(a) -- "As used in this Section of the Code, Quality Assurance comprises all those planned and systematic actions necessary to provide adequate confidence that all components, parts, or appurtenances are manufactured and/or installed (as applicable) in accordance with the ~~values~~ rules of this Section."

(b) NA-4420 -- "The manufacturer and/or Installer shall maintain a written description of the procedures used by his organization for control of quality and examinations, showing in detail the implementation of the quality assurance requirements of this Section of the Code."

(c) NA-4510 -- "Inprocess and final examinations and tests shall be established to assure conformance with documented instructions, procedures, and drawings."

(d) NA-4442.1 -- "Welding and brazing materials for all classes of construction shall be controlled in accordance with NB-4122...."

NB-4122 -- "Welding and brazing materials shall be identified and controlled so that they can be traced to each component and/or installation of a piping system, or else a control procedure shall be employed which ensures that the specified materials are used."

(e) NA-4451 -- "...Measures shall be established to assure that processes including welding and heat-treating are controlled in accordance with the rules of this Section of the Code and are accomplished by qualified personnel using qualified procedures."

(f) NB-4230 -- identifies specific requirements for fitting and aligning of weld joints which must be verified.

(2) The$SAWS$SD1.1-1972$SCode$Sstate..$U

(a) Section 3.1.1. -- "All applicable paragraphs of this section shall be observed in the production and inspection of welded assemblies and structures produced by any of the processes acceptable under this Code."

(b) Section 3.2.1 -- "Surfaces and edges to be welded shall be smooth, uniform, and free from fins, tears, cracks, or other defects which would adversely affect the quality or strength of the weld. Surfaces to be welded and surfaces adjacent to a weld shall also be free from loose or thick scale, slag, rust, moisture, grease, or other foreign material that will prevent proper welding ...."

(c) Section 3.3.1 -- "The parts to be joined by fillet welds shall be brought into as close contact as practicable. The gap between parts shall normally not exceed 3/16 inch ....

(d) Section 3.3.7 -- addresses tack weld requirements which must be verified.

(e) Section 6.1.1. -- "The inspector designated by the Engineer shall ascertain that all fabrication by welding is performed in accordance with the requirements of this Code."

(f) Section 6.1.3 -- "He" (the inspector) shall be notified, in advance, of the start of any welding operations."

(g) Section 6.2 -- "The Inspector shall make certain that only materials conforming to the requirements of this Code are used."

(h) Section 6.4.1 -- "The inspector shall permit welding to be performed only by welders, welding operators, and tackers who are qualified in accordance with the requirements of 5.3."

(i) Section 6.5.2 -- "The Inspector shall make certain that only welding procedures that meet the provisions of 5.1 and 5.2 are employed."

(j) Section 6.5.3 -- "The Inspector shall make certain that electrodes are used only in the positions and with the type of welding current and polarity for which they are classified."

(k) Section 6.5.4 -- "The inspector shall, at suitable intervals, observe the technique and performance of each welder, welding operator, and tacker to make certain that the applicable requirements of Section 4 are met."

c. The weld inspection criteria which was deleted or designated as not applicable is contrary to 10 CFR 50 Appendix B, Criterion III and the Wm. H. Zimmer QA Manual, Section 3.3 and 3.13.1 as described in the Appendix A to the report transmittal letter. (358/81-13-26)

RFW - 6/14/81

I. Allegation$SNo.$S3$U

"A radioactive waste drain is clogged with concrete which carelessly was poured into the drain."

II. Findings$U

The portion of the allegation that indicated that a radioactive waste drain was clogged, was substantiated in that interviews with two pertinent personnel indicated that some drains had been clogged with unspecified debris.

The portion of the allegation that indicated that concrete clogged the drain was not substantiated. Flushing records dated in 1979 indicated that 152 out of 169 of the drains, all of which are nonsafety-related, were cleared of all restricting debris. All of the 169 drains were identified by a controlled flushing procedure.

No items of noncompliance or safety concerns were identified.

III. Investigation$U

A. Background$SInformation$U

- The radwaste drains, which are nonsafety-related, will not handle radioactive material until such material is generated following commencement of plant operations.

B. Personnel$SInterviews$U

On February 24, 1981, Individual "A" who was previously interviewed by representatives of GAP was interviewed. Individual "A" stated that while concrete finishing work was underway in the radioactive waste disposal system he suggested to Kaiser Construt<ction personnel that a pipefitter be assigned to the concrete finishing crew to assure concrete did not enter and clog the drains. However, they disagreed with t<his suggestion and instead directed the floor drains to be covered with duct taep<<tape to prevent concrete from entering and clogging the drains. Individual "A" stated that concrete did enter the lines and clogged the radiation waste drains.

On April 22, 1981, Individual "A" provided a written statement attesting to the aforementioned information; however, t<he requested the statement not be attached to this report.

Individual "B" stated that he worked as a pipefitter in 1976-1977 in the drain flushing crew for the radiation waste disposal system. Individual "B" stated that during this period, he observed drains in the system that were clogged with concrete, which he and others unsuccessfully tried to remove.

Insert from page 4 →

C. Record$SReview$Sand$SOnsite$SObservation$U

The Senior Resident Inspector reviewed CG&E Flushing Procedure No. DR, Rev. 0, approved 9/23/77, for the Drain System. The purpose of this procedure was stated as follows: "This docuen<<document details the procedure for cleaning the liquid radwaste l<floor drain and equipment drain piping to the various plant sumps and drain tanks. The floor drain and equipment drain piping shall be flushed until they flow freely and all large particulate matter is removed."

The Radwaste Building Floor Drain Tank, <<<< Appendices to the Flushing Procedure, indicated that 152 out of 169 of the drains related to thn<e Radwaste Building Floor Drain Tank, the Floor Drain Sludge Tank, the Radwaste Floor Drain Sump, the Floor Drain Collector Tank, and the Ce<< Chemical Waste Tank ~~has~~ have been flushed and verified in accordance with the procedure. The Appendices indicated

that the verifications had been made in 1979. The licensee stated that the flushing activities were still continuing.

Make the last paragraph under III. B.

The Senior Resident <<<<

Telephone interviews were conducted by the Senior Resident Inspector on 2/12/81 wih<th the Test Coordinator responsible for the radwaste building drain flushing activities and on 2/13/81 with the Startup Engineer responsible for Drain System flushes. Both individuals inc<dicated that some drains were found to be plugged with unspecified debris. In all of those cases the drains were cleared and flow was verified.

The Senior Resident Inspector made visual inspections of all of the accessible radwaste drain ports identified on Sargent *<& Lundy drawings A-533 Rev. F, A-534 Rev. F, and A-515 Rev. N. These drawings identified the drains in the radwaste building (elevations 496 feet, 527 feet, 513 feet and 511 feet) and in the auxiliary building (elevations 567 feet, 5 inches, and 546 feet). None of the observed drain ports were visibly plugged.

Neither the flushing records, the personnel interviews, nor the Resident Inspector observations confirmed or denir<ed that the drains had been clogged with concrete. These activities did confirm that the drains, which had been flushed, would allow flow on the dates of the verifications.

No items of noncompliance or deviations were identified.

5/1/81

~~Adjacent$SMaterial$SReviewed$U~~

A7. The RIII inspectors reviewed radiographs of the following field and shop welds ~~for evidence of~~ to identify any unacceptable indications in the welds or adjacent material ~~material adjacent to the welds~~ (including other welds) ~~that may have been reviewed. The NRC found no unacceptable indications in the entire radiographs viewed. This consisted of approximately five radiographs per weld of the 67 welds reviewed.~~

Field$SWelds$U

Line$SNo.$U	Weld$SNo.$S	Diameter$U	Line$SNo.$U	Weld$SNo.$U	Dia.$U
1RH08BB10	RH174C	4"	1RH08BB10	RH176	4"
1RH08BB10	RH177	4"	1RH08BB10	RH178	4"
1RH08BB10	RH179	4"	1RH16C14	RH203	4"
1RH13BB4	RH224	4"	1RH13BB4	RH205	4"
1RH13BB4	RH226	4"	1RH08BB10	RH174A	4"
1RH36B6	RH116	6"	1RH20B6	RH115	6"
1RH08AA10	RH109	10"	1RH06BB10	RH137	10"
1RH07BB10	RH140	10"	1RH07BB10	RH141	10"
1RH07BB10	RH145	10"	1RH36A6	RH123	6"
1RH08BA10	RH105	10"	1RH08CA10	RH104A	10"
1RH08BA10	RH104	10"	1RH07BA10	RH76	10"
1RH02B6	RH15	20"	1RH02B2C0	RH15B	20"
1RH02BC20	RH16	20"	1RH02BC20	RH16A	20"
1RH02BC20	RH16B	20"	1RH02BC20	RH16C	20"

Line$SNo.$U	Weld$SNo.$U	Diameter$U	Line$SNo.$U	Weld$SNo.$U	Dia.$U
1RH02BC20	RH14	20"	1RH02BA20	RH5	16"
1RH02BA20	RH8	20"	1RH02BA20	RH6	20"
1RH02AA20	RH1	20"	1RH02AA20	RH2	20"
1RH02AA20	RH3	20"	1RH02BA20	RH4	20"
1RH02BA20	RH9	20"	1RH02AC20	RH10	20"
1RH02AC20	RH11	20"	1RH0AC20	RH11A	20"
1RH02AC20	RH12	20"	1RH01DA16	RH37	16"
1RH02BA20	RH39	16"	1RH01C18	RH44	18"
1RH01C18	RH43	18"	1RH01C18	RH41	18"
1RH02BC20	RH17	20"	1RH02AB20	RH18	20"
1RH02AB20	RH19	28"	1RH02AB20	RH19A	20"
1RH02BB20	RH20	20"	1RH02BA20	RH40	16"
1RH01C18	RH261	18"	1RH01C18	RH262	18"

Shop$SWelds$U

Line$SNo.$U	Weld$SNo.$U	Diameter$U	Line$SNo.$U	Weld$SNo.$U	Dia.$U
1RH01DB16-25	4	16"	1RH01DB16-24	3	16"
1RH02BA20-6	A	20"	1RH02BA20-3	A	20"
1RH02AC20-10	A	20"	1RH02AB20-17	A	20"
1RH01C18-31	A	18"	1RH01C18-31	A	18"

A7. The RIII inspectors reviewed radiographs of the following field and shop< welds to identify any unacceptable indications in the welds card<<and/or the adjacent material (including other welds).

Field$SWelds$U

Line$SNo.$U

Weld$SNo.$U

Pipe$SDiameter$U

Shop$SWelds$U

The RIII inspector reviewed approximately five radiographs for each of the 67 welds. No unacceptable indications were identified in either the weld or the adjacent material. No adjacent welds were identified in any of the radiographs.

5/1/81

A8

The inspectors reviewed radiographs of the following prefabricated pipe (shop) welds for acceptable radiographic (RT) technique, weld quality and reports.

Weld Identification	Weld Seam No.	Pipe Thickness (Inches)	Pipe Outside Diameter (Inches)	Radiograph Area of Interest	RT Date	Results
1FC14CA851(2346)	"A"	0.322	8-5/8	1-2	7/76	No Identified Deficiencies, N.I.D.
"	"	"	"	4-1	"	N.I.D.
"	"	"	"	2-3	"	"
"	"B"	"	"	1-2	"	"
"	"	"	"	4-1	"	"
"	"	"	"	2-3	"	"
"	"C"	"	"	1-2	"	"
"	"	"	"	4-1	"	"
"	"	"	"	3-4	"	"
1FC14CA8118A(2410)	"A"	0.322	8-5/8	1-2	1/76	~~Acceptable~~ N.I.D.
"	"	"	"	2-3	"	No Penetrameter Shim [redacted]
"	"	"	"	3-4	"	[redacted] "
"	"	"	"	4-1	"	"
"	"B"	"	"	1-2	"	"
"	"	"	"	2-3	"	"

"	"	"	"	3-4	"	"
"	"	"	"	4-1	"	"
1HG47A21/2-25	"A"		2-1/2	4-1		No Penetrameter Shim
"	"		"	3-4		"
"	"D"		"	1-2		"
"	"		"	4-1		"
1DG14AA8-57	"G"	0.280	6-5/8	4-1	10/76	No Penetrameter Shim
"	"	"	"	3-4	"	"
"	"E"	"	"	1-4	"	~~Acceptable~~ N.I.D.
"	"	"	"	3-4	"	"
1FW02AB23-85-55	"A"	1.756	23-7/8	1-2	7/75	~~Acceptable~~ N.I.D.
"	"	"	"	2-3	"	"
"	"	"	"	6-1	"	"
"	"B"	"	"	1-2	"	"
"	"	"	"	4-5	"	"
"	"	"	"	6-1	"	"
1FW02C23-83-29	"B"	1.725	24	1-2	12/75	~~Acceptable~~ N.I.D.
"	"	"	"	2-3	"	"
"	"	"	"	6-1	"	"
"	"D"	"	"	1-2	"	"
"	"	"	"	3-4	"	"
"	"	"	"	6-1	"	"
"	"C"	"	"	6-1	"	"
1LP02A127(1622)	"B"	0.375	12-3/4	4-1		~~Acceptable~~ N.I.D.
"	"	"	"	2-3		"

check RT

2/

"	"	"	"	1-2	"
"	"E"	"	"	4-1	"
"	"	"	"	3-4	"
"	"	"	"	1-2	"
1LP02A127(1622)	"F"	0.375	12-3/4	1-2	~~Acceptable~~ N.I.D.
"	"	"	"	3-4	"
"	"	"	"	4-1	"
1DG18A(823(3213)	"B"	0.322	8-1/8	1-2	"
"	"	"	"	3-2	"
"	"	"	"	4-1	"
"	"C"	"	"	4-1	"
"	"	"	"	1-2	"
"	"	"	"	3-4	"
"	"D"	"	"	1-2	"
"	"	"	"	2-3	"
"	"	"	"	4-1	"
1FC01B128	"A"	0.396	10-3/4	1-2	~~Acceptable~~ N.I.D.
"	"	"	"	2-3	"
"	"	"	"	4-1	"
"	"B"	"	"	1-2	"
"	"	"	"	3-4	"
"	"	"	"	4-1	"
"	"C"	"	"	1-2	"
"	"	"	"	2-3	"
"	"	"	"	4-1	"
"	"D"	"	"	1-2	"
"	"	"	"	3-4	"

"	"	"	"	4-1		"
1DG18AA85Q	"A"	0.353	8-5/8	1-2		~~Acceptable~~ N.I.D.
"	"	"	"	3-4		"
"	"	"	"	4-1		"
"	"B"	"	"	1-2		"
"	"	"	"	4-1		"
"	"	"	"	2-3		"
"	"C"	"	"	1-2		"
"	"	"	"	3-4		"
"	"	"	"	4-1		"
1FC01CB105	"M"	0.365	10-3/4	1-2	3/76	~~Acceptable~~ N.I.D.
"	"	"	"	3-4	"	"
"	"	"	"	4-1	"	"
"	"N"	"	"	1-2	"	"
"	"	"	"	4-1	"	"
"	"	"	"	3-4	"	"
"	"P"	"	"	4-1	"	"
"	"	"	"	1-2	"	"
"	"	"	"	3-4	"	"
"	"Q"	"	"	1-2	"	"
"	"	"	"	3-4	"	"
"	"	"	"	4-1	"	"
"	"T"	0.237	4-1/2	3-4	3/76	"
"	"	"	"	4-1	"	"
"	"	"	"	2-3	"	"
"	"U"	"	"	1-2	"	"

"	"	"	"	2-3	"	No Penetra-meter Shim
"	"	"	"	3-4	"	"
"	"S"	"	"	1-2	"	~~Acceptable~~ N.I.O.
"	"	"	"	2-3	"	"
"	"	"	"	3-4	"	"
1FC02AA812(F2305)	"A"	0.322	8-5/8	1-2		~~Acceptable~~ N.I.O.
"	"	"	"	4-1		"
"	"	"	"	2-3		"
"	"B"	"	"	1-2		"
"	"	"	"	2-3		"
"	"	"	"	4-1		"
"	"D"	"	"	2-3		"
"	"	"	"	3-4		"
"	"	"	"	4-1		"
"	"C"	"	"	1-2		"
"	"	"	"	4-1		"
"	"	"	"	2-3		"
1FC02AB817(2310)	"A"	0.322	8-5/8	1-2	1/76	~~Acceptable~~ N.I.O.
"	"	"	"	4-1	"	"
"	"	"	"	2-3	"	"
"	"B"	"	"	2-3	"	"
"	"	"	"	4-1	"	"
"	"	"	"	3-4	"	"
"	"C"	"	"	2-3	"	"
"	"	"	"	4-1	"	"

"	"	"	"	3-4	"	"
"	"F"	"	"	1-2	"	No Penetrameter Shim
"	"	"	"	3-4	"	"
"	"	"	"	4-1	"	"
1FC06B4128(2413)	"B"	0.237	4-1/2	1-2	7/76	No Penetrameter Shim
"	"	"	"	2-3	"	"
"	"	"	"	4-1	"	"
1FC06B4128(2413)	"A"	0.237	4-1/2	1-2	7/76	No Penetrameter Shim
"	"	"	"	2-3	"	"
"	"	"	"	4-1	"	"
"	"C"	"	"	1-2	"	"
"	"	"	"	4-1	"	"
"	"	"	"	2-3	"	"
"	"D"	"	"	1-2	"	"
"	"	"	"	4-1	"	"
"	"	"	"	3-4	"	"
1FC29B684(2380)	"A"	0.280	6-5/8	1-2	3/76	No Penetrameter Shim
"	"	"	"	3-4	"	"
"	"	"	"	4-1	"	"
"	"B"	"	"	1-2	"	~~Acceptable~~ N.I.D.
"	"	"	"	4-1	"	"
"	"	"	"	3-4	"	"

6/

"	"C"	"	"	1-2	"	"
"	"	"	"	4-1	"	"
"	"	"	"	2-3	"	"
"	"G"	"	"	1-2	"	"
"	"	"	"	4-1	"	"
"	"	"	"	3-4	"	"
1HG07A2 1/2 12A(3444) ~~1HG07A2-1/212A(3644)~~	"A"	0.203	2-7/8	1-2	1/77	~~Acceptable~~ N.I.D.
"	"	"	"	2-3	"	"
"	"	"	"	3-4	"	"
"	"	"	"	4-1	"	"
"	"B"	"	"	1-2	"	"
"	"	"	"	4-1	"	"
"	"	"	"	2-3	"	"
"	"C"	"	"	1-2	"	"
"	"	"	"	3-4	"	"
"	"	"	"	4-1	"	"
"	"F"	"	"	1-2	"	"
"	"	"	"	2-3	"	"
"	"	"	"	4-1	"	"
"	"J"	"	"	1-2	"	"
"	"	"	"	2-3	"	"
"	"	"	"	3-4	"	"
"	H"	"	"	1-2	"	"
"	"	"	"	2-3	"	"
"	"	"	"	4-1	"	"

11401A35(3529)	"D"	0.216	3-1/2	4-1	2/77	No Penetra-meter Shim
"	"	"	"	1-2	"	"
"	"	"	"	2-3	"	"
"	"	"	"	3-4	"	"
"	"A"	"	"	1-2	"	~~Acceptable~~ N.I.O.
"	"	"	"	3-4	"	No Penetra-meter Shim
"	"	"	"	4-1	"	"
"	"	"	"	2-3	"	"
"	"B"	"	"	1-2	"	"
"	"	"	"	2-3	"	"
"	"	"	"	3-4	"	"
"	"	"	"	4-1	"	"
1FC39CA621(2314)	"D"	0.280	6-5/8	1-2	1/76	~~Acceptable~~ N.I.D.
"	"	"	"	2-3	"	"
"	"	"	"	3-4	"	"
"	"B"	"	"	1-2	"	"
"	"	"	"	2-3	"	"
"	"	"	"	3-4	"	"
"	"	"	"	4-1	"	"
"	"G"	"	"	1-2	"	"
"	"	"	"	2-3	"	"
"	"	"	"	3-4	"	"
"	"	"	"	4-1	"	"
"	"E"	"	"	1-2	"	"

8/

"	"	"	"	2-3	"	"
"	"	"	"	3-4	"	"
"	"	"	"	4-1	"	"
"	"A"	"	"	1-2	"	"
"	"	"	"	2-3	"	"
"	"	"	"	3-4	"	"
"	"	"	"	4-1	"	"
"	"F"	"	"	1-2	"	No Penetrameter Shim
"	"	"	"	2-3	"	"
"	"	"	"	3-4	"	"
"	"	"	"	4-1	"	~~Acceptable~~ N.I.A
"	"J"	"	"	4-1	"	"
"	"	"	"	2-3	"	"
"	"	"	"	3-4	"	"
"	"	"	"	1-2	"	"
1FW01AA193016(960)	"A"	1.411	20	1-2	2/75	No Penetrameter Shim
"	"	"	"	2-3	"	"
"	"	"	"	3-4	"	"
"	"	"	"	4-5	"	"
"	"	"	"	5-1	"	"
"	"B"	"	"	1-2	"	"
"	"	"	"	2-3	"	"
"	"	"	"	3-4	"	"
"	"	"	"	4-5	"	"
"	"	"	"	5-1	"	"

1FW01AA193015(959)	"A"	1.411	20	1-2	2/75	~~Acceptable~~ N.I.D
"	"	"	"	2-3	"	"
"	"	"	"	3-4	"	"
"	"	"	"	4-5	"	"
"	"	"	"	5-1	"	"
"	"B"	"	"	1-2	"	"
"	"	"	"	2-3	"	"
"	"	"	"	3-4	"	"
1FC02AB8-18(2311)	"A"	0.322	8-5/8	1-2	3/76	No Penetra-meter Shim
"	"	"	"	2-3	"	"
"	"	"	"	3-4	"	"
"	"	"	"	4-1	"	"
"	"B"	"	"	1-2	"	~~Acceptable~~ N.I.D.
"	"	"	"	2-3	"	"
"	"	"	"	3-4	"	"
"	"	"	"	4-1	"	"
1FW01B23835(949)	"A"			6-1	2/75	"
"	"			1-2	"	"
"	"			2-3	"	"
"	"			3-4	"	"
"	"			4-5	"	"
"	"			5-6	"	"
1FW01B23834(948)	"A"	1.725	24	1-2	9/75	"
"	"	"	"	4-5	"	"
"	"	"	"	6-1	"	"

Pipe Thickness a.o.

"	"B"	"	"	6-1	"	"
"	"	"	"	1-2	"	"
"	"	"	"	2-3	"	"
"	"	"	"	3-4	"	"
"	"E"	"	"	1-2	"	"
"	"	"	"	2-3	"	"
"	"	"	"	3-4	"	"
"	"	"	"	4-5	"	"
"	"	"	"	5-6	"	"
"	"	"	"	6-1	"	"
"	"F"	"	"	1-2	"	No Penetrameter Shim
"	"	"	"	2-3	"	"
"	"	"	"	3-4	"	"
"	"	"	"	4-1	"	~~Acceptable~~ N.I.D.
1HP05131028	"A"	0.396	10-3/4	1-2	8/74	"
"	"	"	"	3-4	"	"
"	"	"	"	2-3	"	"
1LP05A1218(1634)	"A"	0.375	12-3/4	1-2	7/75	~~Acceptable~~ N.I.D.
"	"	"	"	2-3	"	"
"	"	"	"	3-4	"	"
"	"	"	"	4-1	"	"
"	"B"	"	"	1-2	"	"
"	"	"	"	2-3	"	"
"	"	"	"	3-4	"	"

"	"	"	"	4-1	"	"
"	"D"	"	"	4-1	"	"
"	"	"	"	3-4	"	"
"	"	"	"	2-3	"	"
"	"	"	"	1-2	"	"
1LP02B102(1616)	"A"	0.593	10-3/4	1-2	8/75	~~Acceptable~~ N.I.D.
"	"	"	"	2-3	"	"
"	"	"	"	3-4	"	"
"	"B"	"	"	1-2	"	"
"	"	"	"	2-3	"	"
"	"	"	"	3-4	"	"
"	"C"	"	"	1-2	"	"
"	"	"	"	2-3	"	"
"	"	"	"	4-1	"	"
1LP02B104(1618)	"A"	0.593	10-3/4	1-2	5/75	~~Acceptable~~ N.I.D.
"	"	"	"	2-3	"	"
"	"	"	"	3-4	"	"
"	"B"	"	"	1-2	"	"
"	"	"	"	2-3	"	"
"	"	"	"	4-1	"	"
10G01AA122(368)	"A"	0.687	12-3/4	1-2	4/76	~~Acceptable~~ N.I.D.
"	"	"	"	2-3	"	"
"	"	"	"	4-1	"	"
"	"B"	"	"	4-1	"	"
"	"	"	"	3-4	"	"

10G01AA122(368)	"B"	0.687	12-3/4	1-2	4/76	~~Acceptable~~ N.I.D.
"	"H"	"	"	1-2	"	"
"	"	"	"	2-3	"	"
"	"	"	"	3-4	"	"
1RD28CA1010(3491)	"B"	0.593	10-3/4	1-2	7/76	No Penetrameter Shim
"	"	"	"	2-3	"	"
"	"	"	"	3-4	"	"
"	"	"	"	4-1	"	"
1CY01AB16504(3129)	"A"	0.375	16	4-1	4/76	~~Acceptable~~ N.I.D.
"	"	"	"	3-4	"	"
"	"	"	"	1-2	"	"
"	"B"	"	"	1-2	"	"
"	"	"	"	2-3	"	"
"	"	"	"	3-4	"	"
"	"	"	"	4-1	"	"
"	"C"	"	"	4-1	"	"
"	"	"	"	2-3	"	"
"	"	"	"	3-4	"	"
"	"	"	"	1-2	"	"
"	"D"	"	"	4-1	"	"
"	"	"	"	3-4	"	"
"	"	"	"	2-3	"	"
10G09AC221(2478)	"C"	0.375	22	1-2	8/76	~~Acceptable~~ N.I.D.
"	"	"	"	2-3	"	"
"	"	"	"	3-4	"	"

"	"	"	"	4-5	"	"
"	"D"	"	"	5-6	"	"
1DG09AC221(2428)	"D"	0.275	22	2-3	8/76	~~Acceptable~~ N.I.O.
"	"	"	"	6-1	"	"
1DG10AC2814	"C"	0.375	28	1-2	2/77	~~Acceptable~~ N.I.O.
"	"	"	"	5-6	"	"
"	"	"	"	6-1	"	"
1DG10AC2813	"C"	0.437	28	1-2	2/77	~~Acceptable~~ N.I.O.
"	"	"	"	6-1	"	"
"	"	"	"	4-5	"	"
1FC-09B828A	"A"	0.322	8-5/8	1-2		~~Acceptable~~ N.I.O.
"	"	"	"	4-1		"
"	"	"	"	3-4		"
"	"C"	"	"	1-2		"
"	"	"	"	2-3		"
"	"	"	"	4-1		"
"	"D"	"	"	1-2		"
"	"	"	"	4-1		"
"	"	"	"	3-4		"
"	"E"	"	"	1-2		"
"	"	"	"	4-1		"
"	"	"	"	2-3		"
"	"F"	"	"	1-2		"
"	"	"	"	2-3		"
"	"	"	"	4-1		"

1FC09CA838	"A"	0.322	8-5/8	1-2	4/76	~~Acceptable~~ N.I.D.
"	"	"	"	3-4	"	"
"	"	"	"	4-1	"	"
"	"C"	"	"	1-2	"	No Penetrameter Shim
"	"C"	"	"	3-4	"	"
"	"	"	"	2-3	"	"
"	"	"	"	4-1	"	"
"	"B"	"	"	1-2		~~Acceptable~~ N.I.D.
"	"	"	"	4-1		"
"	"	"	"	2-3		"
"	"D"	"	"	1-2		"
"	"	"	"	4-1		"
"	"	"	"	3-4		"
"	"F"	"	"	1-2		"
"	"	"	"	4-1		"
"	"	"	"	3-4		"
"	"G"	"	"	1-2		No Penetrameter Shim
"	"	"	"	2-3		"
"	"	"	"	3-4		"
"	"	"	"	4-1		"
"	"E"	"	"	1-2		~~Acceptable~~ N.I.D.
"	"	"	"	4-1		"
"	"	"	"	2-3		"
"	"H"	"	"	1-2		No Penetrameter Shim

"	"	"	"	2-3		"
"	"	"	"	3-4		"
"	"	"	"	4-1		"
"	"J"	"	"	1-2		"
"	"	"	"	2-3		"
"	"	"	"	3-4		"
"	"	"	"	4-1		"
1FC12A8-29	"C"	0.322	8-5/8	1-2	6/76	~~Acceptable~~ N.I.D.
"	"	"	"	2-3	"	"
"	"	"	"	3-4	"	"
"	"D"	"	"	1-2	"	No Penetra-meter Shim
"	"	"	"	2-3	"	"
"	"	"	"	3-4	"	"
"	"	"	"	4-1	"	"
"	"E"	"	"	1-2	"	~~Acceptable~~ N.I.D.
"	"	"	"	4-1	"	"
"	"	"	"	2-3	"	"
"	"K"	"	"	1-2	"	"
"	"	"	"	4-1	"	"
"	"	"	"	3-4	"	"
"	"F"	"	"	1-2	"	"
"	"	"	"	4-1	"	"
"	"	"	"	3-4	"	"
"	"G"	"	"	1-2	"	"
"	"	"	"	4-1	"	"
"	"	"	"	2-3	"	"

"	"H"	"	"	1-2	"	"
"	"	"	"	4-1	"	"
"	"	"	"	3-4	"	"
1HP01A204A(1727)	"A"	0.375	20	6-1	11/75	No Penetrameter Shim
"	"	"	"	5-6	"	"
"	"	"	"	4-5	"	"
"	"	"	"	3-4	"	"
"	"	"	"	2-3	"	"
"	"	"	"	1-2	"	"
1FC14AA866	"B"	0.280	6-5/8	1-2	5/76	~~Acceptable~~ N.I.D.
"	"	"	"	4-1	"	"
"	"	"	"	2-3	"	"
"	"C"	"	"	1-2	"	No Penetrameter Shim
"	"	"	"	4-1	"	"
"	"	"	"	2-3	"	"
"	"	"	"	3-4	"	"
"	"E"	"	"	1-2	"	"
"	"	"	"	2-3	"	"
"	"	"	"	3-4	"	"
"	"	"	"	4-1	"	"
"	"A"	"	"	1-2	"	~~Acceptable~~ N.I.D.
"	"	"	"	4-1	"	"
"	"	"	"	2-3	"	"
"	"F"	"	"	1-2	"	"

"	"	"	"	4-1	"	"
"	"	"	"	2-3	"	"
"	"G"	"	"	1-2	"	"
"	"	"	"	4-1	"	"
"	"	"	"	3-4	"	"
"	"D"	"	"	1-2	"	"
"	"	"	"	4-1	"	"
"	"	"	"	3-4	"	"
1MS08AA10310(3660)	"A"	0.365	10.75	1-2		No Penetrameter Shim
"	"	"	"	2-3		"
"	"	"	"	3-4		"
"	"	"	"	4-1		"
1FW02GB1849(2992)	"A"	1.00	18	4-1	10/75	~~Acceptable~~ N.I.D.
"	"	"	"	3-4	"	"
"	"	"	"	2-3	"	"
"	"	"	"	1-2	"	"
"	"G"	"	"	1-2	"	"
"	"	"	"	2-3	"	"
"	"	"	"	3-4	"	"
"	"	"	"	4-1	"	"
"	"C"	"	"	1-2	"	No Penetrameter Shim
"	"	"	"	2-3	"	"
"	"	"	"	3-4	"	"
"	"	"	"	4-1	"	"

"	"J"	"	"	1-2	"	"
"	"	"	"	2-3	"	"
"	:	:	:	3-4	"	"
"	"	"	"	4-1	"	"
"	"H"	"	"	2-3	"	"
"	"	"	"	1-2	"	"
"	"	"	"	3-4	"	"
"	"D"	1.156	"	1-2	"	"
"	"	"	"	4-1	"	"
"	"	"	"	3-4	"	"
"	"	"	"	2-3	"	"
1MS09AB10320(3665)	"A"	10.75	0.365	1-2		No Penetra-meter Shim
"	"	"	"	2-3		"
"	"	"	"	3-4		"
"	"	"	"	4-1		"
1FW04AB110057(979)	"A"	0.840	11	1-2	1/75	No Penetra-meter Shim
"	"	"	"	2-3	"	~~Acceptable~~ N.I.D.
"	"	"	"	3-4	"	"
"	"	"	"	4-1	"	"
"	"B"	"	"	1-2	"	No Penetra-meter Shim
"	"	"	"	2-3	"	"
"	"	"	"	3-4	"	"
"	"	"	"	4-1	"	"

"	"C"	"	"	1-2	"	~~Acceptable~~ N.I.D.
"	"	"	"	2-3	"	"
"	"	"	"	3-4	"	"
"	"	"	"	4-1	"	"
1HP06B420(1738)	"A"	0.437	4-1/2	1-2	3/76	~~Acceptable~~ N.I.D.
"	"	"	"	2-3	"	"
"	"	"	"	3-4	"	"
"	"	"	"	4-1	"	No Penetrameter Shim
"	"B"	"	"	1-2	"	"
"	"	"	"	2-3	"	"
"	"	"	"	3-4	"	"
"	"	"	"	4-1	"	"
"	"C"	"	"	1-2	"	~~Acceptable~~ N.I.D.
"	"	"	"	2-3	"	"
"	"	"	"	3-4	"	"
"	"	"	"	4-1	"	"
"	"D"	"	"	1-2	"	"
"	"	"	"	2-3	"	"
"	"	"	"	3-4	"	"
"	"	"	"	4-1	"	"
1HP01A203(1725)	"A"	0.375	20	2-3	1/76	No Penetrameter Shim
"	"	"	"	1-2	"	"
"	"	"	"	3-4	"	"
"	"	"	"	4-5	"	"

"	"	"	"	5-6	"	"
"	"	"	"	6-1	"	"
"	"L"	"	"	1-2	"	~~Acceptable~~ N.I.D.
"	"	"	"	2-3	"	"
"	"	"	"	6-1	"	"
"	"D"	"	"	1-2	"	"
"	"	"	"	2-3	"	"
"	"	"	"	6-1	"	"
"	"E"	"	"	6-1	"	"
"	"	"	"	4-5	"	"
"	"	"	"	1-2	"	"
"	"H"	"	"	1-2	"	"
"	"	"	"	5-6	"	"
"	"	"	"	6-1	"	"
"	"J"	"	"	6-1	"	"
"	"	"	"	5-6	"	"
"	"	"	"	3-4	"	"
1MS08AC10307(3637)	"A"	0.365	10-3/4	1-2		~~Acceptable~~ N.I.D.
"	"	"	"	3-4		"
"	"	"	"	4-1		"
"	"B"	"	"	1-2		"
"	"	"	"	4-1		"
"	"	"	"	3-4		"
1HP03A1415(1736)	"F"	0.437	3-1/2	1-2	10/76	~~Acceptable~~ N.I.D.
"	"	"	"	2-3	"	"
"	"	"	"	3-4	"	"

"	"A"	"	"	4-1	"	"
"	"	"	"	2-3	"	"
"	"	"	"	1-2	"	"
"	"B"	"	"	1-2	"	"
"	"	"	"	2-3	"	"
"	"	"	"	3-4	"	"
"	"	"	"	4-1	"	"
"	"C"	"	"	1-2	"	"
"	"	"	"	2-3	"	"
"	"	"	"	4-1	"	"
"	"D"	"	"	1-2	"	"
"	"	"	"	4-1	"	"
"	"	"	"	3-4	"	"
1HP06C421(1739)	"A"	0.237	4-1/2	1-2	2/76	No Penetrameter Shim
"	"	"	"	2-3	"	"
"	"	"	"	3-4	"	~~Acceptable~~ N.I.D.
"	"	"	"	4-1	"	No Penetrameter Shim
"	"B"	"	"	1-2	"	~~Acceptable~~ N.I.D.
"	"	"	"	2-3	"	"
"	"	"	"	3-4	"	"
"	"	"	"	4-1	"	"
1MS01BB248(1020)	"A"	0.875	24.25	1-2	1/75	~~Acceptable~~ N.I.D.
"	"	"	"	5-6	"	"
"	"	"	"	6-1	"	"

"	"B"	"	"	1-2	"	"
"	"	"	"	6-1	"	"
"	"	"	"	5-6	"	"
1MS08AC10307(3637)	"A"	0.365	10-3/4	1-2		~~Acceptable~~
"	"	"	"	3-4		"
"	"	"	"	4-1		"
"	"B"	"	"	1-2		"
"	"	"	"	4-1		"
"	"	"	"	3-4		"
1MS08AB10312(3638)	"A"	0.365	10-3/4	1-2		~~Acceptable~~
"	"	"	"	4-1		"
"	"	"	"	2-3		"
1MS08AD10141	"A"	0.427	10-3/4	1-2		~~Acceptable~~
"	"	"	"	4-1		"
"	"	"	"	2-3		"
"	"B"	"	"	1-2		"
"	"	"	"	3-4		"
"	"	"	"	4-1		"
"	"C"	"	"	1-2		"
"	"	"	"	2-3		"
"	"	"	"	4-1		"
1MS20B3169(2999)	"D"	0.437	3-1/2	1-2	5/76	No Penetrameter Shim
"	"	"	"	2-3	"	"
"	"	"	"	3-4	"	"
"	"	"	"	~~4-5~~	"	"

"	"	"	"	5-1	"	"
"	"E"	"	"	1-2	"	"
"	"	"	"	2-3	"	"
"	"	"	"	3-4	"	"
"	"	"	"	4-5	"	"
"	"	"	"	5-1	"	"
"	"G"	"	"	1-2	"	"
"	"	"	"	3-4	"	"
"	"	"	"	4-5	"	"
"	"	"	"	5-1	"	"
"	"	"	"	2-3	"	"
"	"C"	"	"	1-2	"	"
"	"	"	"	2-3	"	"
"	"	"	"	3-4	"	"
"	"	"	"	4-5	"	"
"	"	"	"	5-1	"	"
"	"A"	"	"	1-2	"	"
"	"	"	"	2-3	"	"
"	"	"	"	3-4	"	"
"	"	"	"	4-5	"	"
"	"	"	"	5-1	"	"
1MS20B3169(2999)	"F"	0.437	3-1/2	1-2	5/76	No Penetrameter Shim
"	"	"	"	2-3	"	"
"	"	"	"	3-4	"	"
"	"	"	"	4-5	"	"

"	"	"	"	5-1	"	"
"	"B"	"	"	1-2	"	"
"	"	"	"	2-3	"	"
"	"	"	"	3-4	"	"
"	"	"	"	4-5	"	"
"	"	"	"	5-1	"	"
1MS09AB10140	"A"	0.427	10-3/4	1-2		~~Acceptable~~ N.I.D.
"	"	"	"	4-1		"
"	"	"	"	2-3		"
"	"B"	"	"	3-4		Insufficient Shim
"	"	"	"	5-6		"
"	"	"	"	4-5		"
"	"	"	"	2-3		"
"	"	"	"	1-2		~~Acceptable~~ N.I.D.
"	"C"	"	"	1-2		"
"	"	"	"	4-1		"
"	"	"	"	3-4		"
"	"D"	"	"	1-2		"
"	"	"	"	4-1		"
"	"	"	"	3-4		"
1MS10AA10145	"E"	0.396	10-3/4	1-2		~~Acceptable~~ "
"	"	"	"	4-1		"
"	"	"	"	3-4		"
"	"D"	"	"	1-2		"
"	"	"	"	4-1		"

RF DLT

"	"	"	"	3-4	"
"	"E"	"	"	1-2	"
"	"	"	"	2-3	"
"	"	"	"	4-1	"
"	"A"	"	"	1-2	"
"	"	"	"	2-3	"
"	"	"	"	4-1	"
"	"B"	"	"	1-2	"
"	"	"	"	2-3	"
"	"	"	"	4-1	"
"	"C"	"	"	1-2	"
"	"	"	"	4-1	"
"	"	"	"	3-4	"
1MS11A10335(3647)	"A"	0.365	10-3/4	1-2	No Penetra-meter Shim
"	"	"	"	2-3	"
"	"	"	"	3-4	"
"	"	"	"	4-1	"
1MS08AB10316(3642)	"A"	0.365	10-3/4	1-2	~~Acceptable~~ N.I.D.
"	"	"	"	4-1	"
"	"	"	"	3-4	"
1MS08AC10112(1576)	"A"	0.365	10-3/4	1-2	~~Acceptable~~ "
"	"	"	"	4-1	"
"	"	"	"	2-3	"
"	"B"	"	"	1-2	"
"	"	"	"	4-1	"
"	"	"	"	2-3	"

1MS01BA2411(1013)	"A"	0.894	24-1/4	1-2	2/75	~~Acceptable~~ N.I.D.
"	"	"	"	2-3	"	"
"	"	"	"	6-1	"	"
"	"D"	"	"	1-2	"	"
"	"	"	"	3-4	"	"
"	"	"	"	6-1	"	"
"	"E"	"	"	1-2	"	"
"	"	"	"	2-3	"	"
"	"	"	"	6-1	"	"
1MS01BA2410	"A"	0.894	24-1/4	1-2		~~Acceptable~~
"	"	"	"	6-1		"
"	"	"	"	2-3		"
1MS11A10134	"A"	0.365	10-3/4	1-2		"
"	"	"	"	4-1		"
"	"	"	"	2-3		"
"	"B"	"	"	4-1		"
"	"	"	"	3-4		"
"	"	"	"	1-2		"
1MS11A10338(3650)	"A"	0.375	10-3/4	1-2		"
"	"	"	"	2-3		"
"	"	"	"	4-1		"
1MS09AA10321(3666)	"A"	0.365	10-3/4	1-2		"
"	"	"	"	4-1		"
"	"	"	"	2-3		"
"	X	"	[redacted]"	2-3		"
"	"	"	"	1-2		"
"	"	"	"	4-1		"

?Seam?

1MS08AD10298(3628)	"A"	0.365	10-3/4	1-2	~~Acceptable~~ N.I.D.
"	"	"	"	4-1	"
"	"	"	"	2-3	"
1MS10AB10127(1595)	"A"	0.365	10-3/4	4-1	" ~~Acceptable~~
"	"	"	"	3-4	"
"	"	"	"	1-2	"
"	"C"	"	"	4-1	"
"	"	"	"	3-4	"
"	"	"	"	1-2	"
"	"B"	"	"	1-2	"
"	"	"	"	2-3	"
"	"	"	"	4-1	"
"	"D"	"	"	1-2	"
"	"	"	"	4-1	"
"	"	"	"	3-4	"
1MS07AC10149A	"A"	0.427	10-3/4	1-2	" ~~Acceptable~~
"	"	"	"	2-3	"
"	"	"	"	4-1	"
"	"B"	"	"	1-2	"
"	"	"	"	4-1	"
"	"	"	"	2-3	"
"	"C"	"	"	1-2	"
"	"	"	"	2-3	"
"	"	"	"	4-1	"

1MS07AB10158A	"A"	0.427	10-3/4	1-2		~~Acceptable~~	N.I.D.
"	"	"	"	2-3		"	
"	"	"	"	4-1		"	
"	"B"	"	"	1-2		"	
"	"	"	"	2-3		"	
"	"	"	"	4-1		"	
1MS01BA2416(1028)	"A"	0.894	24-1/2	1-2	1/75	" ~~Acceptable~~	
"	"	"	"	2-3	"	"	
"	"	"	"	3-4	"	"	
"	"	"	"	4-5	"	"	
"	"	"	"	5-6	"	"	
"	"	"	"	6-1	"	"	
"	"B"	"	"	1-2	"	"	
"	"	"	"	2-3	"	"	
"	"	"	"	3-4	"	"	
"	"	"	"	4-5	"	"	
"	"	"	"	5-6	"	"	
"	"	"	"	6-1	"	"	

Radiographs for 206 welds were reviewed per ASME Section III 1971, Winter 1972 Addenda and M. W. Kellogg Co. Procedures ES-414, ES-415, and ES-416. No unacceptable RT technique deficiencies were identified in 517 of the radiographs and no unacceptable indications were identified in the respective welds, ~~with~~ 183 of the radiographs were apparently made without any of the required shims under the penetrameters. Four of the radiographs were apparently made with insufficient shims under the penetrameter.

The essential hole of the penetrameter is used to determine if the radiograph has been sufficiently exposed to show weld indications that are in nonconformance with the ASME Section III code. Sufficient shimming of the penetrameter is necessary to assure that the total thickness under the penetrameter is the same as the total weld thickness, thus establishing a valid reference for identifying weld indications. Exposure of an insufficiently shimmed penetrameter would give a false assurance that the weld had received sufficient exposure to reveal any unacceptable ~~weld~~ indications in the portion of the weld that is thicker than the base metal.

ASME Section EEE-1971 with Winter 1972 Addenda, Appendix IX, Paragraph IX-3334.4 states, "The shim thickness shall be selected so that the total thickness being radiographed under the penetrameter is the same as the total weld thickness ..."

M. W. Kellogg Co. (the manufacturer of the pipe and performing agency of the above RT) Radiographic Procedure No. ES-414 dated 9/26/72, Paragraph 4.1.8, states "Wherever required, shims shall be used to produce a total thickness under the penetrameter equal to the nominal thickness of the base metal

plus the height of the crown or reinforcement. Shims shall be of a radiographically similar material to the weld metal."

The insufficient shimming of penetrameter in regards to the radiographs of the above welds is contrary to 10 CFR 50, Appendix B, Criterion XI and the Wm. H. Zimmer QA Manual, Section 11.2 as described in the Appendix A to the report transmittal letter. (358/81-13-13)

The above citation does not imply that the respective welds are unacceptable. The citation implies that the radiographs were not of sufficient quality for interpretation to determine if the welds were acceptable or not.

The RIII inspectors also verified that the following welds matched the respective radiographs by comparing the radiograph to the welds:

Pipe$SLine$SNo.$U	Weld$SNo.$U
1FC36CA621	B
1MS20B3169	A
1FC02AB818	B
1MS20B3169	D
1FC39CA621	C
1FC02AB818	A

5/12/21

A10 The RIII inspector made field observations, reviewed and discussed site control measures, and reviewed and discussed the design basis and verifications regarding cable tray loading. Tray loading was considered in three aspects: ~~(1)~~ cable ampacity or thermal loading; ~~(2)~~ physical weight loading; and ~~(3)~~ the commitments in the Zimmer FSAR Section 8.3.3.1.

1. The following cable tray routine points (nodes) were selected for the reviews and discussions:

   a. 1057A - yellow division/power tray - selected because of the high design index, D.I. #1.44 (see paragraph 3 of this report section for explanation of Design Index).

   b. 2025A - blue division/power tray - selected because of the high D.I. #1.46.

   c. 2023A - blue division/power tray - selected for verification of D.I. # accuracy (D.I. 1.18).

   d. 2038A - blue division/power tray - selected because of the high D.I. #1.44.

   e. 2039A - blue division/power tray selected during field observations because of the appearance of being highly filled.

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f. 1073A - yellow division/power tray - selected for verification of the number of cables installed.

g. 2086B - blue division/control tray - selected during field observations because of the appearance of being highly filled.

h. 1104B - yellow division/control tray - selected because of the high D. I. #1.54.

2. The RIII inspector and a licensee representative counted the cables in the following tray nodes and compared the counts to the number of cables listed in the S & L Cable Pan Loading Report, dated 2/2/81:

Node	Field Count	Report Count
a. 1057A	27	27
b. 2025A	24	23
c. 2039A	39	39
d. 1073A	32	33

The Cable Pan Loading Report is a computerized periodical which states the design status of the cable tray loads. The Report identifies the individual cable numbers which have been specified to be routed through the segmented tray points (nodes).

The RIII inspector reviewed the H. J. Kaiser Cable Monitoring Report dated 2/5/81 and some cable pull (installation cards) to verify that the cables specified for tray nodes 1057A, 2025A, 2023A and 1073A in the Loading Report had actually been installed. For tray node 2025A, cable No. LL145 was found to be two individual conductors and for tray node 1073A, the records indicated that cable No. VP210 had not been installed yet, which accounted for the discrepancies between the above Field and Report counts. No other discrepancies were identified in either the design or installation reports and records for trays nodes 1057A, 2025A, 2023A, 2039A, and 1073A. Thus the design and installation records appeared to match the number of cables actually installed in the plant.

3. The RIII inspector inquired as to how the computerized Design Index program correlated to the Zimmer FSAR Section 8.3.3.1 concerning cable ampacity and Section 3.10.1.2.3.c concerning physical weight limitations.

→ a. F.S.A.R. Section 8.3.3.1 states the following:

8.3.3.1.1 In$STrays$U

All power cables to be used in ZPS-1 are assigned in accordance with Table 8.3-18. The tables for power cable loading are based on IPCEA Publication No. P-46-426.

8.3.3.1.2 NotSInSTrays$U

The thermal ampacity of power and control cables with no part of their length in solid-bottom tray are in accordance with IPCEA P-46-426, with appropriate rating factors applied for ambient, shields, and direct-current service.

8.3.3.1.3 Fill$U

The summation of the cross-sectional areas of the cables shall not exceed 50% of the tray usable cross-sectional area or two layers of cables, whichever is larger, but not to exceed 60% of the cross-sectional area in any case.

Conduit is sized in accordance with Sargent & Lundy Standard EDSB-10, Electrical Drafting Reference for Determining Conduit and Pipe Sizes, which limits conduit fill to the percentages established by the National Electric Code.

F.S.A.R. Section 3.10.1.2.3.c states "Cable tray loading of 40 psf (pounds per square foot) is used throughout."

On 3/17/81 and 3/19/81 the S & L Assistant Manager of Electrical Engineers described the correlation between the FSAR and the Design Index program as follows:

The power cable ampacity loading is based not on IPCEA P-46-426 1962, but on IEEE Paper 70TP557-PWR (by J. Stolpe) printed in 1970, IPCEA Publication P-54-440 1975 which based on Stolpe's Paper, and S & L Standard ESA-104a revision 11/1/72.

The Stolpe method bases ampacity on the Depth-of-Fill of cables in tray rather than on the percentage fill. S & L uses a 2-inch depth-of-fill as the basis of selecting a cable for a particular ampere load.

(1) The 2-inch depth-of-fill design results in a major conservation because of:

(a) Load diversity - many cables carry current only intermittently (e.g. valve operators, sump pumps, etc.)

(b) Cable size granularity - only a few cable types and sizes are purchased, resulting in selection of oversize cables for most services. This means many cables would be capable of carrying larger currents (rated) than what are actually carried.

(c) Design ampere margin - the design ampere loads used to select cables before the final equipment design data is known are necessarily conservative (high).

(2) Because of the above conservatisms, the S & L design practices are as follows:

(a) Cables are routed into trays without limiting fill.

(b) The resulting fill is monitored as the design proceeds.

(c) When the fill reaches a target level the actual heat load is calculated and if the heat load exceeds the allowable amount, sufficient cables are removed from the affected trays.

To accomplish steps (2)(b) and (2)(c), S & L uses the Design Index program. Design Index is a measure of tray fill. Mathematically:

$$\text{Design Index} = \frac{\text{The sum of the (cable diameters)}^2}{\text{useable area of the tray}}$$

where useable area, U.A. = tray width X design depth-of-fill
(design depth-of-fill is based on square cables)
= 50% of tray cross-sectional area.

For 24 in. x 4 in. power trays;$U

the total area = 96 square inches and

useable area = 24" x 2" = 48 sq. inches

$$D.I. = \frac{E(d^2)\$U}{A} \quad \text{U.\$.}$$

E means summation

d means cable diameter

This equation is consistent with the Stolpe method. "Percent Fill" is not consistent with the Stolpe method because the depth of the tray is used rather than the depth of the cables in the tray. Also percent fill is based on the actual cable cross sectional area rather than the square cable that is assumed in the Stolpe method.

~~For Tray 2025A: 4" x 24" = 96 sq. in. total area, thus a useable area = 2 x 24" = 48 sq. in.~~

~~Cable No. Cable Type Actual Area~~

Mathematically: Percent Fill $= \frac{\text{Sum of cable cross-sectional areas} \times 100}{\text{total cross-sectional tray area}}$

where the sum of cable cross-sectional areas = $E(\text{pi} \times r^2)$

with r = radius of the cable

pi = 3.1416

thus Percent Fill $= \frac{E(\text{pi} r^2) \times 100}{\text{total area}}$

@ See Attachment ϕ for D.I. and percent fill calculated for tray 2025A.

The relation between design index and percent fill is therefore:

$$\frac{\text{Percent Fill}}{\text{Design Index}} = \frac{\frac{E(\text{pi} \times r^2) \times 100}{\text{total area}}}{\frac{E(d^2)}{\text{useable area}}}$$

Since total area, T.A. = 2 X useable area, U.A.

and d = 2 x r

$$\frac{P.F.}{D.I.} = \frac{\dfrac{E\left[pi \times \left(\frac{d}{2}\right)^2\right]}{2(u.a.)} \times 100}{\dfrac{E(d^2)}{u.a.}} \quad * \quad = \frac{\dfrac{\frac{pi}{4} E(d^2)}{2} \times 100}{E(d^2)}$$

$$= \frac{pi}{8} \times 100 = \underline{39.3\%} \text{ per D.I.}$$

Thus for a 4 inch deep tray:

39.3% Actual Fill = 1.0 Design Index = 2 inch design depth-of-fill (square cables)

50% Actual Fill = 1.27 Design Index = 2.54 inch design depth-of-fill (square cables)

60% Actual Fill = 1.52 Design Index = 3.04 inch design depth-of-fill (square cables)

And for a 6 inch deep tray:

39.3% Actual Fill = 1.0 Design Index = 3 inch design depth-of-fill (square cables)

Based on the above relationships between design index and depth of square cables and the fact that S & L has used a 2-inch depth-of-fill as the basis of selecting cables for particular ampere loads, the cables in tray nodes with a D.I. over 1.0 would have to be re-evaluated considering the increased depths. This item is unresolved pending the completion of the re-evaluations (358/81-13-15).

The above design bases for cable ampacity was a deviation from the FSAR which was not identified on any control document. This deviation is contrary to 10 CFR 50 Appendix B, Criterion III and the Wm. H. Zimmer QA Manual Section 3.6 as described in the Appendix A to the report transmittal letter. (358/81-13-16)

On 3/17/81, the S & L Assistant Manager of Electrical Engineers stated that appropriate modifications to the FSAR would be submitted to NRR. Also specific consideration would be given to the differing types of cable insulations, addressed in the publications (standards), when compared to the cable insulations used in Zimmer.

4. The RIII inspector reviewed S & L Instruction No. PI-ZI-10.1 Rev. 0 dated 2/6/78, paragraph 4.5 which states, "The Senior Electrical Project Engineer shall assign an electrical engineer to run thermal loading calculations for all power tray routing points with a design index exceeding 1.25. He shall compare these loadings, in watts per feet, with the watts per feet limits established for the design indexes involved."

The RIII inspector requested the thermal calculations for tray nodes 2025A, 1057A, 2038A, and 2027A which had D.I.'s in excess of 1.25. S & L provided calculations for nodes 2025A, 1057A, and 2027A. These calculations which were performed in 1978 and 1979, had not been reviewed or approved. S & L described these as interim calculations, which would have to be redone after all of the final electrical loads in the plant were established and defined. Thermal calculations had not been performed for tray node 2038A.

S & L provided a controlled list (Attachment D) dated 2/24/81 of 37 routing points (nodes) with design indexes over 1.25 for the Zimmer plant. Thirty-four of these tray points exceed for 50% tray fill requirement specified in the F.S.A.R., Section 8.3.3.1. Tray nodes 1104B and 2025B also exceed 60% fill. The S & L Assistant Manager stated that thermal calculations (both allowable and actual) will be performed in the near future for all power trays with a D.I. over 1.25, including those on Attachment D. These calculations will be provided to the NRC, Region III. This item is unresolved. (358/81-13-17)

5. Neither S & L Instruction No. PI-ZI-10.1 Rev. 0 nor any other document established controls to verify the thermal loading power cable (penetration) sleeves and the physical (dead weight) loading of trays (power, control, and instrument).

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a. The Cable Pan Loading Report included the design indexes of sleeves. Sleeve #SL111 had a reported D.I. of 1.29 and sleeve #SL105 had a reported D.I. of 1.26. A controlled list of powers sleeves with a D.I. over 1.25 was not maintained.

b. S & L stated that design index of 1.25 would be used as the determining factor as to when calculations would be performed for physical (dead weight) loading.

The lack of design control measures to verify the adequacy of the thermal loading of power sleeves and the physical loading of trays is contrary to 10 CFR 50 Appendix B Criterion III and the Wm. H. Zimmer QA Manual, Section 3.11.2 as described in the Appendix A to the report transmittal letter. (358/81-13-18)

S & L revised Instruction PI-ZI-10.1 Rev. 1, Section 4.5, 4.6, and 4.7 on 3/18/81 to include requirements to verify and control the thermal loading of power sleeves and the physical loading of all trays (power, control, and instrument) which have a design index over 1.25.

S & L stated that calculations for the physical loads of all power, control, and instrument trays, and for thermal loads of all power sleeves, with a design index over 1.25, will be performed in the near future. These calculations will be provided to the NRC, Region III.

The RIII inspector requested the justification for using the design index program for the determining factor for physical loads since the design index program had absolutely no technical relation to physical weight. The RIII inspector also requested justification for using the design index of 1.25 as the determining limit for performing design calculations. S & L stated that both of the justifications would be provided to the NRC, Region III. This item is unresolved. (358/81-13-19)

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The RIII inspector observed a note on the bottom of the thermal calculation sheet dated 12/27/79 for cable tray #1057A. The note indicated that two cables "#VC016 and VC073 are overloaded". The noted overloaded cables were not identified on any control document which would have required appropriate evaluation and disposition. The S & L personnel stated that a control program ~~does~~ did not exist for such design deviations. This is contrary to 10 CFR 50, App. B, Criterion III and the Wm. H. Zimmer QA Manual Section 3.6 as described in the Appendix A to the report transmittal letter. (358/81-13-20)

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The RIII inspector performed the following physical weight tabulation of yellow division control tray #1104B:

Cable #$U	Cable Type$U	Cable Weight *(lbs./ft)$U

AP079	12126	.622
AP080	"	"
AP081	"	"
AP166	"	"
AP167	04106	.316
AP168	"	"
AP170	12126	.622
AP171	04106	.316
AP172	"	"
AP432	12126	.622
AP504	04106	.316
AP505	"	"
AP508	"	"
AP540	"	"
AP541	"	"
AP542	"	"
AP762	"	"
CM011	10126	.583
DG022	12126	.622
DG028	"	"
DG084	"	"
DG185	07126	.342
IN032	12126	.622
IN035	"	"
IN038	"	"

LC011	10126	.583
LC015	12126	.622
LC019	"	"
LC022	"	"
LC025	"	"
LC029	"	"
LC033	"	"
LC036	"	"
LC040	"	"
LC044	"	"
LC047	"	"
LC051	"	"
LC055	"	"
LC057	07126	.342
LC060	"	"
LC062	"	"
LC064	"	"
LL112	02126	.146
NB200	04126	.245
NB202	"	"
NB210	"	"
NB228	"	"
NB229	"	"
NB230	"	"
NB231	"	"
NB232	"	"

NB233	"	"
NB234	"	"
NB235	"	"
NB236	"	"
NB237	"	"
NB238	"	"
NB239	"	"
NB254	"	"
NB258	"	"
NB261	"	"
NB265	"	"
NB269	"	"
NB271	"	"
NB272	"	"
NB273	"	"
NB275	"	"
NB276	"	"
NB277	"	"
NB279	"	"
NB285	"	"
NB286	"	"
NB287	"	"
NB288	"	"
NB289	"	"
NB290	"	"
NB291	"	"

NB292	"	"
NB297	"	"
NB299	"	"
NB301	"	"
NB302	"	"
NB303	"	"
NB304	"	"
NB305	"	"
NB306	"	"
NB307	"	"
NB308	"	"
NB309	"	"
NB310	"	"
NB316	"	"
NB317	"	"
NB318	"	"
NB319	"	"
NB334	"	"
PC013	07126	.342
RE055	02126	.146
RF128	"	"
VA018	10126	.583
VA019	02126	.146
VA020	"	"
VA024	"	"
VC023	07126	.342

VC024	"	"
VC025	"	"
VC062	10126	.583
VC119	"	"
VC120	"	"
VC121	"	"
VC122	07126	.342
VC123	"	"
VC127	02126	.146
VC230	04126	.245
VC265	07126	.342
VD014	12126	.622
VG020	"	"
VG028	10126	.583
VG032	"	"
VG081	"	"
VG082	12126	.622
VG084	10126	.583
VG085	"	"
VG152	04126	.245
VG170	"	"
VG171	"	"
VH030	12126	.622
VH040	04126	.245
VP022	12126	.622
VP030	"	"

VP050	"	"
VP057	02126	.146
VP132	12126	.622
VP136	"	"
VP144	"	"
VP148	"	"
VQ014	10126	.583
VQ022	02126	.146
VQ030	12126	.622
VQ031	"	"
VQ082	07126	.342
VQ083	"	"
VQ084	"	"
VR030	12126	.622
VR058	07126	.342
VX019	12126	.622
VX051	07126	.342
VX052	"	"
VX072	04126	.245
VX128	02126	.146
VX156	"	"
VX130	"	"
VY014	07126	.342
VY015	"	"
VY019	12126	.622
VY027	"	"

VY039	04126	.245
VY043	"	"
VY056	07126	.342
VY057	"	"
WR011	12126	.622
WR013	"	"
WR016	"	"
WR019	"	"
WR022	"	"
WR025	"	"
WR028	"	"
WR048	02126	.146
WR070	04106	.316
WR071	"	"
WR077	02126	.146
WR082	"	"
WR087	"	"
WR127	07126	.342
WR129	10126	.583
WS140	04106	.316
WS141	12126	.622
WS142	07126	.342
WS143	02126	.146
WS144	07126	.342
WS145	02126	.146

WS210	12126	.622
WS212	"	"
WA213	"	"
WS215	"	"
WS216	04126	.245
WS217	"	"
WS218	"	"
WS222	"	"
WS313	03091	.326
WS316	07126	.342

Total 73.06 lb./ft

Since tray 1104B is 2 ft. x 6 inch,

then the total weight of the cables at tray 1104B

is $\frac{73.06}{2} = 36.53$ lb./ft^2

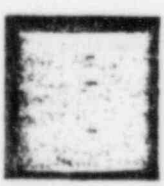
Therefore tray 1104B (D.I. 1.54) is in compliance with the F.S.A.R., Section 3.10.1.2.3 which allows up to 40 lb./ft^2.

*The RIII inspector verified the cable weights for type 03091, 04106, and 12126 with the following manufacturer's data:

03091 - Okonite Proposal Data for S & L specification 2160B dated 12/21/73

04106 - Okonite Bid Quotation dated 10/23/73

12126 - Okonite Proposal Data for S & L specification H-2161 dated 5/22/74



For Tray 2025A: 4" x 24" = 96 sq. in. total area, thus a useable area = 2 x 24" = 48 sq. in.

Cable No.	*Cable Type	Actual Area ($pixr^2$)		Design Index Area (d^2)		Sq. In.^{2}
AP181	03409	Pi $(1.2)^2$ =	4.52	E diameter^2 =	$(2.4)^2$	= 5.76
AP185	03409	Pi $(1.2)^2$ =	4.52	+	$(2.4)^2$	= 5.76
AP292	03500	Pi $(1.3)^2$ =	5.30	+	$(2.6)^2$	= 6.76
AP316	03501	Pi $(1.3)^2$ =	5.30		$(2.6)^2$	= 6.76
AP456	03501	Pi $(1.3)^2$ =	5.30		$(2.6)^2$	= 6.76
LL145	01001	Pi $(0.3)^2$ =	.28 + .28		$(0.6)^2$	$+(0.6)^2$=0.36 + 0.36
OG010	03061	Pi $(0.5)^2$ =	.78		$(1.0)^2$	= 1.0
OG011	03091	Pi $(0.35)^2$=	0.38		$(0.7)^2$	= 0.49
OG012	03091	Pi $(0.35)^2$=	0.38		$(0.7)^2$	= 0.49
OG018	03091	Pi $(0.35)^2$=	0.38		$(0.7)^2$	= 0.49
RD221	03009	Pi $(0.9)^2$ =	2.54		$(1.8)^2$	= 3.24
RH120	03205	Pi $(1.1)^2$ =	3.80		$(2.2)^2$	= 4.84
RH192	03205	Pi $(1.1)^2$ =	3.80		$(2.2)^2$	= 4.84
VC013	03501	Pi $(1.3)^2$ =	5.30		$(2.6)^2$	= 6.76
VC014	03001	Pi $(0.75)^2$=	1.76		$(1.5)^2$	= 2.25
VC015	03041	Pi $(0.55)^2$=	0.95		$(1.1)^2$	= 1.21
VC017	03301	Pi $(0.85)^2$=	2.26		$(1.7)^2$	= 2.89
VG014	03301	Pi $(0.85)^2$=	2.26		$(1.7)^2$	= 2.89
VT010	03001	Pi $(0.75)^2$=	1.76		$(1.5)^2$	= 2.25
VT015	03301	Pi $(0.85)^2$=	2.26		$(1.7)^2$	= 2.89
WA037	03091	Pi $(0.35)^2$=	0.38		$(0.7)^2$	= 0.49
WA128	03091	Pi $(0.35)^2$=	0.38		$(0.7)^2$	= 0.49
WS130	03091	Pi $(0.35)^2$=	0.38		$(0.7)^2$	= 0.49
		E of areas =			34 in.	70.52 sq.in.

For Tray 2025A

D.I. = $\frac{70.52 \text{ sq. in.}}{48 \text{ sq. in.}}$ = 1.469

And the actual % fill = $\frac{55.25}{96}$ = 57.55%

*Cable types taken from S & L Drawing #E1005 (Cable Tab Sheet)

change WA 037 &
WA 128

to: WS 037 &
WS 128

Σ of areas = 55.25 sq. in.

Attachment ~~Enclosure~~ ϕ

5/1/81

16. The RIII inspectors reviewed reader sheets for radiographs, made between October, 1979 and March, 1980, of the following field welds to determine if CG&E or H. J. Kaiser Co. personnel had accepted welds previously rejected by Peabody Magnaflux, PM:

Weld$SNo.$U	Reader$SSheet Identification$SNo.$U
1. RH-113	RH-31
2. R1-7	R1-11
3. RH-53	RH-20
4. RH-55	RH-20
5. K-73	RH-20
6. RH-40	RH-26
7. K-494	MS-37
8. FW-454	MS-30A
9. HG47A2-1/2	NR-E-2252
10. K-926	WR-26
11. K-455	MS-26A
12. MS22AA2	MS-311
13. K-84	RH-38
14. P.L.2M20795	LC-19
15. LP-9	LP-3
16. K-507	MS-44
17. K-508	MS-45
18. K-448	MS-27A

19. HP-19B	HP-5
20. FC-93	FC-29
21. K-414	MS-24A
22. K-523	MS-27A
23. RH-54	RH-20
24. RH-56	RH-20
25. RH-46	RH-20
26. RE-75A	RE-1
27. K-288	WX-8
28. RH-86	RH-64
29. @A3	DO-2
30. @C3	DG-25
31. HGK-250	HG-16
32. RD-K4	RD-1
33. 1MS22AC2	MS-315
34. DG03AA-3/4	DG-88
35. P.L.2M20803	LC-13
36. K-483	MS-43
37. K-499	MS-39
38. 1RRB1AA-3/4	RR-122
39. K-288	RT-2
40. FC-5	FC-14
41. K-33	FW-4
42. FWK-31	FW-2
43. LP-13	LP-11
44. CYK-221	CY-49

45. WR41AA3	WR-44
46. FW58A	FW-2
47. K-877	WR-2
48. HP-55	HP-4
49. K-475	MS-34

Reader sheets are the documents that accompany radiographs and identify such items as the radiograph interpreters, dates, acceptance, rejection, etc. None of the above reader sheets indicated that Kaiser personnel had accepted radiographs that had previously been rejected by Peabody Magnaflux. CG&E did not have personnel with direct QC and/or NDE responsibilities.

3/1/81

1. The RIII inspectors made visual examinations of structural steel beams in the blue switchgear and cable spreading rooms.

a. The area observed in the blue switchgear room (elevation 546 ft.) was 8 feet 3 inches west of workline G, 16 feet 6 inches east of workline H and between columns 22 and 54 of S&L drawing No. S-546 Rev. AB.

The following discrepancies were identified:

(1) The W8 x 17 beam (8 feet 3 inches in length) positioned east to west and located 1 foot 9 inches south of column 24 and 10 inches below elevation 546, was not specified on any pertinent design drawing. The beam appeared to be permanently installed. Traceability a<of the beam heat number was not maintained. After extensive and unsuccessful retrieval efforts by QA personnel, construction personnel were requested to identify any document that would control the unspecified beam. The construction personnel provided Design Document Change, DDC, No. S-2050, dated May 29, 1980. The DDC only had the signatures of two site construction engineers, who were identifying some of the additional W8 x 17 beams in the area covered by S&L drawing S-546. The DDC had no S&L architectural engineering, AE, signatures of approval as of March 27, 1981. The DDC did not identify any specific beams.

The licensee identified S&L drawing E-189, s<Sheet 3, Rev. H, Note No. 17, which allows W8 x 17 beams to be installed and then be submitted on a DDC for S&L approval.

W8x17

The beam was not identified on any QC inspection record.

(2) The W8 x 17 beam (6 feet 3 inches in length) positioned north to south and located 13 feet 8 inches west or workline G and one inch below elevation 546, was not specified on any pertinent design drawing; not documented on any QC record; and had unacceptable welds.

(3) The W8 x 17 beam (5 feet 5 inches in length) positioned east to west and located 8 feet 10 inches south of cl<olumn 24 and one inch below elevation 546, was not specified on any pertinent design drawing; not documented on any QC record; and had unacceptable welds.

(4) The W8 x 17 beam (2 feet 8 inches in length) positioned north to south, located 9 feet 6 inches west of worlin<< workline G, and attached to the beam addressed in paragraph 1.a.(1)(c) and extending north, was not specified on any pertinent design drawing and not documented on any QC record.

(5) Two W8 x 17 ~~e<bems~~ beams (8 feet 3 inches in length) positioned east to west, one located 5 feet 3 3/8 inches and the other located 9 feet 7 7/8 inches south of column 24, are only tack welded in place; display no identification or heat numbers; and are not documented on a KEI-1 form (weld record) or any other QC control document. The beams were identified on DDC-2087 which was incorporated into S&L drawing S-546 Rev. AB. DDCs and S&L drawings by themselves do not assure QC verification. ——??

(6) The location of additional unacceptable e<welds are identified on Attachment A to this report and noted by (6).

The welds identified in aboe<ve paragraphs (2), (3), and (6) do not comply with AWS D1.1-1972 for one or more of the following reasons: slag not removed, weld profiles having excessive convexity or concavity, blowholes, porosity and/or undercut.

(7) Re-entrant corners of several W8 x 17 beams had notches instead of the 1/2 inch minimum radius required by AISC seventh edition (1969) page 4.113. The locations of these unacceptable beam corners are identified on Attachment A to this report and noted by (7).

b. The inspectors identified the following discrepancies in the cable spreading rooms:

(1) W12X14 beam No. F2500/8-66B4 had a weld that contains gross porosity. This beam was directly above cable tray hanger No. 4HV8FEC231, which was attached. The beam was located approximately eleven feet south of the north wall at the stairwell.

(2) The ta<raceability of the heat numbers was not maintained for two W8 x 17 beams, located south of and parallel to beam No. F2500/8-66B4.

The first one of the beams was located immediately adjacent to beam F2500/8-66B4. The second beam was the fourth beam south of beam F2500/8-66B4.

The first beam was installed flush to the ceiling of the cable spe<reading room. S&L drawing No. S-546 Rev. AB specifies the beam to be one inch below the ceiling.

(3) A weld on the five inch channel beam which supports HVAC hanger No. 2071 had excessive irregular weld profile, excessive undercut, porosity, and craters that are not filled. The channel beam is located wto<<two feet north and one foot

west of the cable tray hanger No. 13H2FEC008. The W-Y and B Inspection Report dated February 19, 1980 indicated that the weld was ascc<<acceptable.

(4) Two W8 x 17 beams, loa<cated in the northeast corner (north of WL-16 and east of WL-K), were only tack-welded into place.

(a) The beasm<<beams were specified on DDC No. E-3834 dated October 20, 1978. DDC E-3834 was posted on, but had not been incorporated into S&L drawing No. S-546x Rev. AB dated 10/22/80. DDC No. E-3834 effects eight drawings. A cancellation stamp on the DDC indicated that the applicable portions of DDC No. 3834 had been incorporated into some of the respective drawings. The cancellation stamp did not include drawing No. S-546 as of October 22, 1980 (Revision AB).

The beams were not identified on any QC inspector<< inspection record which would indicate their status.

(b) Heat No. 72161 (purchase order No. 31134) was marked on the southern beam. The traceability of the heat number of the northern beam was not maintained.

The beams were not identified on any QA inspection record which would have inid<<indicated their stats<us.

Note: Some of the welds inspected by the RIII inspectors were painted. Therefore, the inspections were for relatively large deficiencies only.

The unacceptable welds identified above are contrary to 10 CFR 50 Appendix B, Criterion IX and the Wm. H. Zimmer QA Manual, Sec. 9.2 as described in the Appendix A to the report transmittal letter. (353/81-13-01)

For the beams addressed in paragraphs 1.a.(1) and 1.b.(4) above, no measures existed for DDCs which would identify to QA, installations and work that was done by contruction before receiving S&L approval. Thus no measures existed to assure that all of the required QA inspections (e.g. welder qualification, proper filler metal, traceability of materials, etc.) related to DDCs would be accomplished.

This condition was previously identified in IE Report Item No. 80-15-04. The corrective actions, taken in regard to Item No. 80-15-04, did not include the DDCs written prior to the implementation of the corrective actions, and the DDCs that are and have been implemented prior to receiving the S&L approvals.

The beams with unacceptable re-entrant corners and the beams that were installed and not identified as a requirement on any design document are contrary to 10 CFR 50 Appendix B, Criterion XV and the Wm. H. Zimmer QA Manual, Section 15.2.2 as described in the Appendix A to the report transmittal letter. (358/81-13-03)

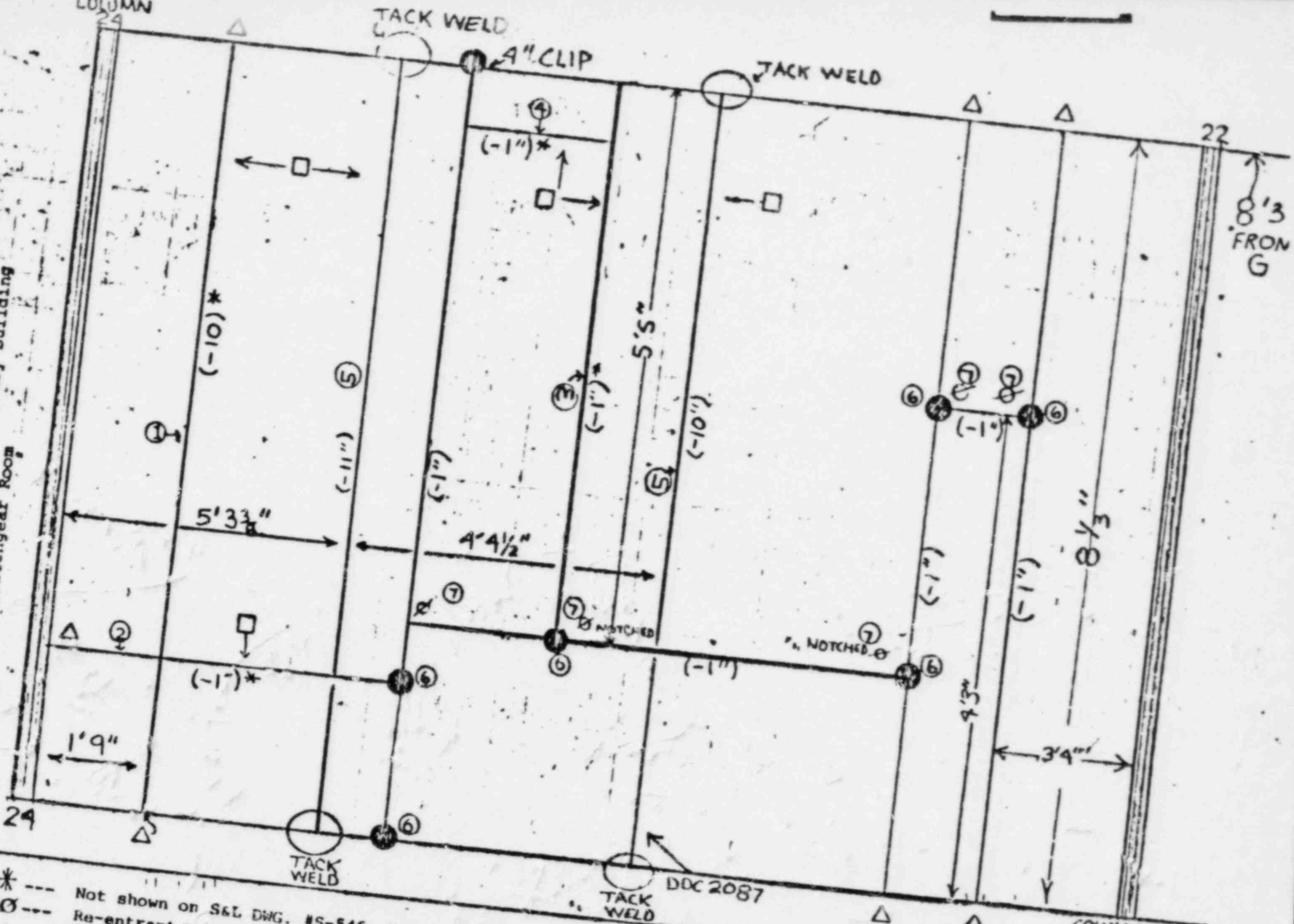
These inadequate corrective actions are contrary to 10 CFR 50 Appendix B, Criterion XVI and the Wm. H. Zimmer QA Manual, s<Section 16.5 as described in the Appendix A to the report transmittal letter. (358/81-13-02)

The beams with unacceptable re-entrant corners and the beams that were installed and not identified as a requirement on any design document are contrary to 10 CFR 50, Appendix B, Criterion XV and the Wm. H. Zimmer QA Manual, Section 15.2.2 as described in the Appendix A to the report transmittal letter. (358/81-13-03)

The beams for which the traceability of the heat numbers was not maintained is contrary to 10 CFR 50 Appendix B, Crt<iterion VIII and the Wm. H. Zimmer QA Manual, Section 8.2 as described in the Appendix A to the report transmittal letter. (358/81-13-04)

ATTACHMENT A

W8 X 17's - Elevation 546 Auxiliary Building Switchgear Room



* --- Not shown on S&L DWG. #S-546, Rev. AB or DDC's listed.

Ø --- Re-entrant corners not coped.

△ --- Welds or connections covered with fire proofing unable to evaluate.

□ --- No identification on W8X17's or records to support.

● --- Defectiv...

RFL
4/1/81

2. The RIII inspector reviewed the Bristol Steel and Iron Works QA Manual, Appendix B, Section 1.0 titled, "Erection Quality Control". Paragraph 1.1 states that "The Erection Quality Control . . . is the responsibility of the Project Superintendent, who reports to the Project Manager."

Both the Project Superintendent and the Project Manager had cost and scheduling responsibilities. 10 CFR 50, Appendix B, Criterion 1 requires sufficient independence from cost and schedule.

Bristol

The RIII inspector reviewed the Quality Control Steel Erection Report, Q-7, (inspection report) dated July 14, 1975 for the inspection of the beams installed on elevation 546 g<feet f<between column rows 15-22 and F-L. The report was a boilerplate which did not identify any of the following specifics: weld procedure numbers, welding materials (types), welder identifications, bolting procedure numbers, or beam heat numbers. The report only indicated acceptance (by signature) of general categories including those listed above and others. 10 CFR 50, Appendix B, Criterion VII requires documentary evidence . . . to identify the specific requirements . . . met and Criterion XVII requires the records to include data such as: qualification of personnel, procedures and equipment.

Bristol

The RIII inspector identified unacceptable structural beam welds, as described in section 1 of the Details ~~section~~ of this report. 10 CFR 50, Appendix B, Criterion X requires nonconforming materials to be controlled.

The insufficient QA indp<ependence; the inadequate records; and the uncontrolled and unacceptable welds taken cumulatively comprise a QA program that is contrary to 10 CFR 50, Appendix B, Criterion II and the Wm. H. Zimmer QA Manual, Section 2 as described in the Appendix A to the report transmittal letter. (358/81-13-05)

3. The RIII inspectors made visual examinations of the installed materials and reviewed pertinent documentation to determine if structural beams, piping, and weld rod were traceable to mill certifications.

a. Structural$SBeams$U

(1) The traceability of the W8 x 17 beams, installed by the Bristol Steel Company in the blue switchgear, was properly maintained by recording the respective matet<rial heat numbers on the applicable drawing and/or the beams themselves.

(2) The traceability of some W8 x 17 beams, installed by H. J. Kaiser Company, was not maintained. No records were documented to identify heat numbers. Some beams were marked with heat numbers. The beams, identified by the symbol ☐ on Attachment A to this report, did not have any traceability maintained. Ths<ese beams wee<re located in the auxiliary building blue switchgear room at elevation 546 feet.

Furthermore, several thousand feet of W8 x 17 beams were purchased on the following order numbers from vendors which were not approved:

P.O. No. 10275 - PBI Steel Exchange - 2400 feet

P.O. No. 12868 - U.S. Steel Supply - 1500 feet

P.O. No. 16321 - Frank Adams Co. - 1012 feet

P.O. No. 10009 - Frank Adams Co. - 1024 feet

P.O. No. 9761 - Frank Adams Co. - 1472 feet

P.O. No. 9628 - Frank Adams Co. - 450 feet

P.O. No. 9872 - U.S. Steel Supply - 300 feet

These beams were not controlled to prevent their use in safety related systems. Mill certifications were available for these beams. On April 10, 1981 the licensee stated that these beams had been made available for installation in safety related systems based on the mill certifications and without regard to the vendor not being approved. The licensee also stated that the credibility of the mill certifications would be established. Failure to assure that the beams were purchased from a vendor that had been approved is contrary to 10 CFR 50, Appendix B, Criterion II and the Wm. H. Zimmer QA Manual, Section 2 as described in the Appendix A to the report transmittal letter. (358/81-13-06)

b. Piping$U

The traceability of some of the piping components comprising the lines in the diesel generator cooling water, starting air, and fuel oil systems was not maintained. The discrepancies were as follows:

(1) Some heat numbers recorded on the isometric drawings did not match the heat numbers on the installed components. These piping components are documented on Attachment C to this report.

(2) Some heat numbers recorded on the isometric drawings had been marked or whited out and then an incorrect heat number recorded. For example, ISK M-242-2-DG-53 was apparently changed to indicate heat number HA-001 for the 3/4 inch and 1/2 inch installed piping. Based on the records for accepted heat numbers, number HA-001 represented 1 1/4 inch piping.

(3) Three heat numbers (HA-0170, TW 24402, and 502891) found on the installed piping, do not appear on the records of accepted heat numbers.

In many instances, heat numbers could not be found on the installed component. Therefore, a comparison could not be made to the number recordd<ed on the drawings.

c. Weld$SRod$U

3. Failure to maintain heat number identification for the above<< beams, piping, and weld rod is contrary to 10 CFR 50, Appendix B, Criterion VIII and the Wm. H. Zimmer QA Manual, Section 8 as described in the Appendix A to the report transmittal letter. (358/81-13-07)

ATTACHMENT C

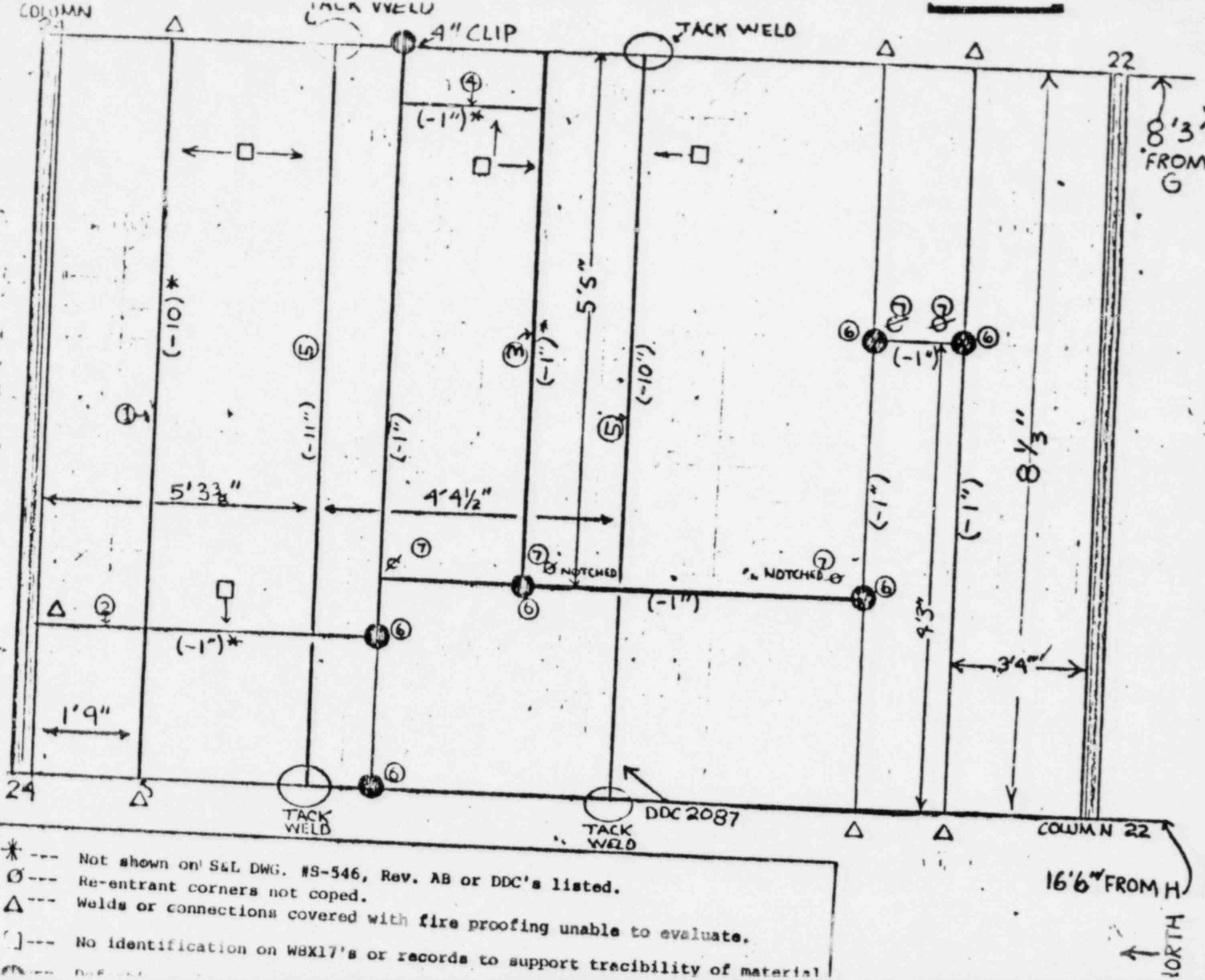
Discrepancies$SBetween$SInstalled$SPiping$Sand$STraceability$SRecords$U

Isometric Drawing Number	Line No.	Item In Question	Heat Number or Identification No. Part ~~Part~~ According to Drawing	Actually Installed
ISKM-428-6-DG-19	1DG28AB1	90 ells	M276	M267
		Tee	M315	M274
		Pipe	HE 6247	8464
ISKM-428-6-DG-103	1DG28AB1	Flange	RVA	CB8
ISKM-428-6-DG-16	1DG27AB1	Pipe	HE6247	16E4
				16D2
ISKM-428-8-DG-68	1DG01AB1	Pipe	HE6247	3416
ISKM-767-4-DG-113	1DGF2AA 1/2	90 ells	M395	M252
	1DGF2BA 1/2			
ISKM-428-6-DG-24	1DG27AE1			
	1DG28AE1	Pipe	HD7123	TW2440Z
ISKM-428-6-DG-105	1DG28AE1	Flange	RD2Y	CB8
ISKM-242-2-DG-53	1DG-C5AA 3/4	Pipe	HA001	JE9922
		90 ell	M262	M87
	1DGFAA 1/2	Pipe	HA001	HA0170
	1DGC5BA 3/4	Pipe	HA001	JE9922
		90 ell	M262	M87

Isometric Drawing Number	Line No.	Item In Question	Heat Number or Part Identification No. ~~Part~~ According to Drawing	Actually Installed
	1DG6BA 1/2	Pipe	HA001	HA0171
ISKM-428-6-DG-26	1DG25AC2	Pipe	516405	502891
				415007
		90 ell	M287	M273
ISKM-428-6-DG-27	1DG25AC2	Pipe	516405	502891
				415007

ATTACHMENT A

W8 X 17's - Elevation 546 Auxiliary Building Switchgear Room



* --- Not shown on S&L DWG. #S-546, Rev. AB or DDC's listed.

Ø --- Re-entrant corners not coped.

△ --- Welds or connections covered with fire proofing unable to evaluate.

[ ] --- No identification on W8X17's or records to support tracibility of material

5/1/81

4. The RIII inspectors reviewed the H. J. Kaiser Company Procedure No. W<QACMI G-14, Revision 3 for initiating and documenting QA Surveillance ~~Reports, SR~~ Reports, SR. Page 1, paragraph 2 sa<tates that surveillance reports will be used to identify ~~in<<an~~ in-process nonconformance, which can be corrected without processing a Nonconformance Report (NR). The QA Surveillance Report form provides a checkpoint to identify in-process deficiencies.

The following QA Surveillance Reports have been initiated to ~~identify~~ identify deficiencies or nonconforming items:

No. 2899 dated December 19<8, 1980 - bolt torque verifications missed

No. 2903 dated January 14, 1981 - weld verifications missed

No. F-2909 dated January 16, 1981 - bl<olts missing or loose

No. 2914 dated January 15, 1981 - NDE hold points by-passed

No. F-2941 dated January 28, 1981 - broken flex; bolts fail to torque, etc.

No. F-3070 dated March 24, 1981 - bolt installation not verified

No. F-3071 dated March 24, 1981 - elongated holes in baseplate

No. F-3072 dated MARCH @$, !(*! <<<

No. F-3072 dated March 24, 1981 - eo<longated holes in baseplate

No. F-3073 dated March 24, 1981 - bolts do not meet torque requirements

No. F-3074 dated March 24, 1981 - bolts t<stripped

No. F-3075 dated March 24, 1981 - bolt holes elongated

No. F-3076 " " " " - hanger needs shimming and spalling repair

No. F-3082 dated Mr<arch 25, 1981 - cable is too short

No. F-3083 dated March 26, 1981 - unacceptable welds

No. F-3099 dated March 27, 1981 - bolt deficiencies

No. F-7000 dated March 30, 1981 - weld deficiencies; missing braces; etc.

No. F-7006 dated April 1, 1981 - weld deficiencies ~~missing braces; etc.~~

No. F-7019 dated M<April 6, 1981 - weld deficiencies ~~missing braces; etc.~~

Per QACMI G-14, Revision 3, page 2, paragraph 5, a surveillance report, which identifies an in-proe<cess nonconformance, will be transferred to an NR when the ~~noncomplying~~ nonconforming condition has not been acceptably corrected within 30 days.

Measures were not established to assure that la<<all in-process deficiency ~~and~~ disposis<tions are reviewed and approved by appropriate design and QA engineers. This is contrary to 10 CFR 50, Appendix B, Criterion XV and the Wm. H. Zimmer QA Manual, Section 15.9 as described in the Appendix A to the report transmittal letter. (358/81-13-08)

5. The RIII n<inspectors made visual inspections of both vendor and field welds on the following cable tray hangers in the cable spreading room, blue switchgear room, and elevation 473 feet auxiliary building.

a. Cable$SSpreading$SRoom$SHangers$U

(1) No. 14H11FEC145 - no unacceptable weld discontinuities

(2) No. 14H11FEC147 - no unacceptable weld discontinuities

(3) No. 4H2FEC193 - no unacceptable weld discontinuities; foot connection covered with fireprr<oofing

(4) No. 15H1FEC160 - covered with fireproofing <<<

(4) No. 15H1FEC160 - no unacceptable weld discontinuities; foot connection covered with fireprr<oofing

(5) No. 70HFEC165 (cross brace member No. 23HV5FEC294) - welds had irregular profile, porosity, and undercut

(6) No. 15H2FEC175 (second horizontal member from the top) - weld has undercut.

(7) No. 14H11FEC146 (cross member) - an apparent vendor weld has undercut and slag

(8) No. 16H1FEC156 (weld marked rejected) - weld has spatter and undercut

All of these welds were painted, therefore, the ~~welds were~~ RIII inspector inspected for rou<<relatively large discontinuities only.

The RIII inspectors reviewed approximately 180 Construction Inspection Plans (CIP), inspection records, for the hangers in the cable spreading room (elevation 536 feet in the north section of the auxiliary building).. The records indicated that all of the field welds were inspected and accepted in December, 1980 and January, 1981.

The unacceptable welds identified on hangers 70HFEC165, 15H2FEC175, 14H11FEC146, and 16H1FEC156 were not controlled on any QA document. This is contrary to 10 CFR 50, Appendix B, Criterion XV and the Wm. H. Zimmer QA Manual, Section 15 as described in the Appendix A to the report transmittal letter. (358/81-13-09)

No records were available to indicate that in-process inspections were made to verify proper filler metal, weld procedure, welder's qualification, surface conditions, etc., as required by the AWS D1-1-1972 code, section 6.

Discussions with the pertinent QC management and inspection personnel revealed that the welds had been n<inspected after being painted. The licensee stated that the visual examinations of the tray hanger welds were bs<ased on H. J. Kaiser Company Procedure No. SPPM 4.6, Revision 8, dated August 29, 1980,

paragraph 5.1.3 which states, "Surface condition - joint surfaces to be examined shall be cleaned and free from slag, rust, arc burns, paint, dirt, or other contaminants that would interfere with the examination." The licensee stated that paint (galvanox) that was applied to the hanger welds did not interfere with the visual examination and in some cases actually highlighted discontinuities. AWS D1.1-1972 code, section 3.10.1 states, ". . . Welded joints t<shall not be painted until after the work has been completed and accepted. . ."

The apparent lack of in-process inspections and inadequate visual inspections of the above hanger welds is contrary to 10 CFR 50 Appendix B, Criterion X and the Wm. H. Zimmer QA Manual, Section 10.1.2 as described in the Appendix A to the report transmittal letter. (358/81-13-10)

The RIII inspector requested the design acceptance criteria which was used by QC to evaluate the undercut on hanger No. 15H2FEC175. The licensee provided S&L Specification H-2713 Supplement 7, Standard EB-117 and J. H. Kaiser Procedure No. SPPM 4.6, Revision 8, Paragraph 5.2.9 which allows up to 1/16 inch undercut on the cable tray hanger welds. The 1/16 inch criteria does not comply with AWS D1.1 1972 Section 3.6.4 which states, "For buildings and tubular structures, undercut shall be no more than 0.01 inch deep when it's direction is transverse to primary tensile stress in the part that is undercut, nor more than 1/32 inch for all other situations.

Further review of Procedure No. SPPM 4.6 paragraph 5.2 revealed other noted exceptions to the AWS D1.1-1972 code. These exceptions included fillet weld size and weld x<convexity. On March 5, 1981, S&L provided a documented investigation program of fillet weld size for P-W Industires cable pan hangers, purchase order No. 7070-25102. This program was performed by Gladstone Laboratory of Cincinnati to substantiate the design adequacy of the undersized fillet welds at the flare bevel joints of the cable pan hangers. The study was based on a sample of 95 welds cut from P-W cable tray hangers. The 95 welds were sectioned and etched to determine actual weld size and relative weld quality. Only one weld was identified as rejectable, due to a lack of fusion. Though this study may justify that the weld size was adequate, where the weld pee<netration was not measurable by normal visual techniques, no justification was rp<<provided to sut<< substantiate the exceptions to the AWS D1.1-1972 code requirements concerning weld convec<xity and undercut.

These deviations from the AWS code are contrary to 10 CFR 50, Appendix B, Criterion III, the Wm. H. Zimmer FSAR, Table 3.8.2, and the Wm. H. Zimmer QA Manual, Section 3.3 as described in the Appendix A to the report transmittal letter. (358/81-13-11)

b. Blue$SSwitchgear$SRoom$SHangers$S(Elevation$S525$SFeet$Sand$U
E-96
Drawing$SNo.$SE(096)$U

(1) No. 1H029 - no unacceptable e<weld discontinuities

(2) No. 5H25 - foot connection covered with fireprr<oofing; no visible unacceptable weld discontinuities

(3) No. 5H30 (2) - no unacceptable weld discontinuities

(4) No. 1H077 - no unacceptable weld discontinuities

(5) No. 1H079 - no unacceptable weld discontinuities

(6) No. 1H133 - no unacceptable weld discontinuities

(7) 2 Nos. 5H19 - no unacceptable weld discontinuities

(8) No. 109HV4 (east and west side s) - had unacceptable weld discontinuities which were cn<ontrolled on construction inspection plans (records)

(9) No. 1H28-2 - no unacceptable weld discontinuities

(10) No. 1H28-1-no unacceptable weld discontinuities

(11) No. 1H29 - no unacceptable weld discontinuities

(12) No. 5H30 (2) - no unacceptable weld discontinuities

(13) No. 1H077 - no unacceptable weld discontinuities

(14) No. 1H133 - no unacceptable weld discontinuities

(15) No. 5H19 (4) - no unacceptable weld discontinuities

(16) No. 5H3(12) - no unacceptable weld discontinuities

(17) No. 5H2(12) - no unacceptable weld discontinuities

(18) No. 5H25 - no unacceptable weld discontinuities; foot connection covered with fireproofing

c. Elevation$S473$SFeet$SAuxiliary$SBuilding$SHangers$U

(1) No. 5H009 (drawing E-91) - no unacceptable weld discontinuities

(2) No. 4H3 (drawing E-14) - no unacceptable weld s<discontinuities

(3) No. 2H1 (drawing E-14) - no unacceptable weld discontinuities

(4) No. 5H010 (drawing E-91) - no unacceptable weld discontinuities

(5) No. 5H012 (drawing E-91) - no unacceptable weld discontinuities

(6) No. 6H1 (2) (drawing E-14) - no unacceptable weld discontinuities

(7) No. 6H1 (1) (drawing E-14) - no unacceptable weld discontinuities

Four to six welds were inspected on each of the above hangers.

Several of the tray hanger foot connections (where the hangers are attached to the structural beams) were covered with fireproofing and could not be inspected. Therefore, the RIII inspector requested QC inspection documentation to assure that the welds, covered by fireproofing, were acceptable. The licensee provided a copy of Surveillance Report No. 2893 dated January 8, 1981 which stated that 94 of 179 cable tray hangers, in the cable spreading room, have one or both foot connections covered with fireproofing. The SR requested clarification as to what QC should do since the foot connections had not been inspected. As of March 27, 1981, the SR had no disposition.

This item is unresolved pending the resolution of the hangers identified in SR No. 2893 and any other hanger connections throughout the plant that were covered before being inspected. (358/81-13-12)

5/12/.

8. The RIII inspectors observed six installed conditions which did not comply with one or more of the following F.S.A.R. criteria concerning cable separation:

a. (1) IEEE Std. 383-1974 defines Class IE: "The safety classification of the electric equipment and systems that are essential to emergency reactor shutdown, containment isolation, reactor core cooling and containment, and reactor heat removal or otherwise are essential in preventing significant release of radioactive material to the environment."

(2) The Zimmer FSAR, Section 8.3.1.12.2 states: "Class IE cable is assigned to a division according to Table 8.3-19." ~~The~~ The divisions are comprised of the systems addressed in the class IE definition.

1

32

"A Class IE cable is routed only in its division tray conduit, etc."

"Each non-Class IE cable which has any part of its length in a division tray, conduit, etc., or which connects to a Class IE power system is a division-associated cable and is not routed in tray, conduit, etc. of another division."

The terms division-associated, associated, non-Class IE, balance-of-plant, nonessential, and non-ESF (non-engineered safety features) are all used interchangeably.

(3) The FSAR Section 8.3.1.13 states:

.2 "...Balance-of-plant cables not associated with reactor protection or engineered safety features systems, when assigned to a tray section with a Class IE segregation code, are routed only in trays with that segregation code."

.3"...Cables will have either green, yellow, or blue identification for ESF cable; orange for reactor protection system cable; white for balance-of-plant cables; and white with another color for associated cables."

(4) The FSAR Table 8.3-16 states "A nonessential cable may be run in nonessential or ESF tray, but shall not occupy more than

one tray system."

(5) The FSAR Section 8.3.1.11.2.1.d. states "In the cable spreading room, cable tray risers (chutes) are used to route the cables into the bottom of control panels located in the control room above. Here a 1-foot horizontal, 3-foot vertical separation is maintained."

(6) The FSAR Section 8.3.1.12.1.3 which addresses Instrument Cables states "Low-level signal cables are run in trays and/or conduits separate from all power and control cables."

b. The six installed conditions were as follows:

(1) On the east side of the cable spreading room, at approximately WL 26, yellow/white (associated) cable #RE053 extends out of a two inch conduit (which also contains blue/white cable #RE058), passes approximately four inches vertically above the blue Class IE cables contained in tray #2072C, and enters blue/white sleeve No. 79.

Contrary to the above F.S.A.R. criteria: Cables #RE053 and RE058 were routed in the same raceway and cable #RE053 was not installed a minimum of 3 feet above tray 2072C.

(2) On the south side of the cable spreading room, green instrument tray #3029K, which was 6 inches wide and approximately 50 feet long, was installed inside of white control tray #4638B. The installation was in accordance with S & L drawings E-223 Revision G and E-224 Revision F. Green cable #WS714, green/white cable #TI725 and other cables were installed in the green tray. Blue/white and yellow/white cables were installed in the remaining white tray. Contrary to the FSAR criteria: The green and green/white cables were in essence installed in the white tray; the green, green/white, blue/white and yellow/white cables were not separated by a minimum of 1-foot horizontally; and the green tray which contained instrument cables was not separate from the white tray which contains control cables.

(3) Near the stairwell at the center of the cable spreading room two blue cables #RI103 and CM111 were routed from blue tray #2077A into green tray riser #3025A, which extended up to the control room. Green cables #HP073 and HP096 were among the cables installed in riser 3025A. Contrary to the FSAR criteria: The blue cables were routed in the green division riser and were not horizontally separated from the green cables by at least 1-foot. The licensee documented blue cables RI103 and CM111 on Nonconformance Report #7549 dated 3/18/81 as a result of the NRC finding. No QC inspection

requirements existed to verify separation criteria for cables extending up and out of raceway to the control room.

(4) In the cable spreading room:

(a) White tray #4080K contained many different division-associated cables including blue/white cable #TI192, yellow/white cable #RR781, and green/white cable #TI816.

(b) White tray riser #RK4627 contained yellow/white cables #TI942 and #TI943, and blue/white cables #TI808 and TI760.

(c) White tray riser #4139 contained many blue/white and yellow/white cables.

The routing of blue/white, yellow/white, and/or green/white cables together in white trays appeared to be a widespread design practice. This design is contrary to the FSAR Section 8.3.1.13.2 as stated above.

(5) In the instrument-relay room yellow/white conduit #RR199 extended from white tray #4157A to yellow tray #1040B. The conduit and trays contained yellow/white cable #RR199 and white cable #DC258 (also mislabelled DC257). Per the cable installation (pull) card, cable #DC258 was designed to be

routed through tray #4157A, but not tray 1040B. Since cable #DC258 was a nonsafety related cable there were no QC inspection requirements to verify the routing. ~~Contrary to the FSAR, the misrouted cable was not classified a division associated cable. Fire Cable~~

(6) With the exception of the green tray riser identified in paragraph b(3) above, the RIII inspector did not observe any other risers (chutes) installed in the cable spreading room. The licensee stated that only 8 chutes had been designed ~~for~~ and installed in the spreading room and that alternate methods for achieving cable separation were being considered. S & L drawing #E-98-FB Rev. D Note 4 required that the portions of cables in the cable spreading room which were not enclosed or protected by steel chutes, be coated with a 1/8 inch (after dry) application of fireproofing material. During a phone conversation on 5/7/81 the licensee stated that the design identified on drawing #E-98-FB was being reconsidered for alterations.

c. (1) The conditions identified in paragraphs b(1), b(2), b(4), and b(6) above apparently resulted from designs which deviate from the FSAR. These deviations are contrary to 10 CFR 50, Appendix B, Criterion III and the Wm. H. Zimmer QA Manual, Section 3.1 and 3.6 as described in the Appendix A to the report transmittal letter. (358/81-13-21)

The licensee stated that the following actions would be taken with regards to the conditions identified in paragraphs b(1), b(2), b(4), and b(6): Either the field installations would be changed to comply with the FSAR or appropriate changes to the FSAR with engineering justifications ~~to the FSAR~~, would be submitted to NRR.

(2) The conditions identified in paragraphs b(3) ~~and b(5)~~ above apparently resulted from construction activities for which ~~requ~~ required verifications had not been established ~~there were no~~ QC inspection ~~requirements~~. The lack of QC inspection ~~verifications requirements~~ procedures for the condition in paragraph b(3) is contrary to 10 CFR 50 Appendix B, Criterion X, and the Wm. H. Zimmer QA Manual, Section 12.1.2 as described in the Appendix A to the report transmittal letter (358/81-13-22)

(3) The misrouted cable identified in paragraph b(5) apparently resulted from construction activities for which the FSAR does not require QC inspection verification. The misrouted cable does influence cable separation and Tray loading and therefore will have to be appropriately dispositioned. This item is unresolved pending the disposition of cable # DC258. (358/81-13-23)

11. The RIII inspector requested for review all of the CG&E audits of S&L. The following audits were provided and reviewed to determine if CG&E was assessing the effectiveness of the S&L nonconformance program and to determine the general nature of the audits.

Audit Dates	Audit Number When Noted
(1) 2/15-16/72	
(2) 8/8-9/74	
(3) 8/7-8/75	
(4) 7/28-19/76	
(5) 11/14-15/77	77/24
(6) 9/6-7/78	78/07
(7) 10/16-17/78	78/09
(8) 11/27-30/78	78/10
(9) 1/30-31/79	79/01
(10) 12/18-19/79	79/07
(11) 3/5-6/80	80/01
(12) 10/21-22/80	80/04

The RIII inspector observed only two items (deficiencies) in all of the above audits, covering a nine year period, which addressed the S&L nonconformance program. These deficiencies, which addressed distribution and logging of nonconformance reports, were closed in Audit 77/24.

Audit 77/24 indicated that S&L Project Procedure #PI-8.1, Revision 0, had been prepared to describe responsibilities and instructions, and to require a log and a file of nonconformance reports.

The RIII inspector did not observe any other portions in any of the audits which would have represented comprehensive and planned ~~and periodic~~ audits of the nonconformance program. Comprehensive and planned ~~and periodic~~ audits are required to verify compliance with the QA program and determine the effectiveness of the nonconformance program. The audits of the nonconformance program should address such things as implementation, design reviews, identification of acceptance or rejection, disposition control, and notification of affected organizations.

The audits generally appeared to be reactive in nature, in that specific problems, which had been previously identified, were audited. The audits did not appear to be progressive and programmatic, which may have identified new and generic problems.

Failure by CG&E to perform a comprehensive audit of the S&L nonconformance program during the past nine years is contrary to 10 CFR 50 Appendix B Criterion XVIII and the Wm. H. Zimmer QA Manual, Section 18.1 as described in the Appendix A to the report transmittal letter.

(358/81-13-23)

5/14/81

12. During the review of the CG&E audits of S&L, the RIII inspector noted that the audits were identifying a recurring problem. The problem was design calculations and verifications were not performed. The specific problem in each audit is as follows:

	Audit$U Date$Sor$SNo.$U	Problems$U
a.	8/8-9/74	(1) ITE Imperial drawings of essential equipment had not been signed and bore no evidence of a design review.
		(2) Inadequacies in documenting design reviews.
		(3) Structural design calculation were not in accordance with new procedures.
		(4) No direct evidence was available of the S&L review of vendor design calculations.
b.	78/07	(1) S&L had not maintained a record of support [illegible] calculations.
		(2) DDC #2973 was approved without review by EMD even though a major support location change was clearly identified on the DDC.

3

(This item was identified in the details of the audit report, but was not cited and had no apparent followup on subsequent audits.

c. 78/09

(1) Very little data was available to justify the embedment criteria of 4.5 times the normal diameter of concrete expansion anchors.

(2) Calculations could not be located which would verify that a structured review was performed to show that no reinforcement was needed for a 24 x 68 radial beam which was cut at both flanges.

d. 78/10

(1) Calculations were not available for all walls to substantiate the statement that block walls were "judged to be OK".

(2) Calculations were not available to back up design signatures which indicated design ~~verification~~ verification for 5 design changes approving core bores.

(3) No approval signatures were found on any calculations for Structural Steel Modifications (including Beam #86) due to Pool Hydrodynamic loads. The modification had been released for construction.

(4) Audit finding was closed based on calculations which were in progress but not yet complete. The calculations were for beams (embedded plates) in the primary containment to verify that the plates can support ~~the~~ additional loads.

e. 80/04

(1) a. The calculation required to evaluate the clamp deflection on a pipe support was not performed.

b. Also, the weld calculation was not performed on the most critical weld.

(2) Calculations performed by NPS were incomplete in that the deflection due to torsional rotation of the beam was not included.

(3) Calculations performed by NPS were not in reasonable order, which made them difficult to follow.

5

None of the audits, which identified the above calculation concerns, addressed the apparent generic and programmatic cause of design calculations and verifications not being performed. The corrective actions that were taken did not assure that the cause was determined to preclude repetition. Failure to determine the cause and to take corrective action to preclude repetition is contrary to 10 CFR 50, Appendix B, Criterion XVI and the Wm. H. Zimmer QA Manual, Section 16.5 as described in the Appendix A to the report transmittal letter. (358/81-13-24)

b

6/5/81

16. The RIII inspector reviewed the QC installation records for the diesel generator cooling water, starting air, and fuel oil piping. The records indicated that a large number of in-process QC inspections had not been performed for proper pipe fit-up, proper weld procedure, proper weld filler metal (traceability), welder qualification, etc. These inspection criteria, which are specified on the installation record (KEI-1 form), were required by the ASME Code, Section III-1971 Edition, Winter 1972 Addenda. Some of the inspections, which had not been performed, were documented on Q.A. Surveillance Reports, SR. SRs #2367, #2370, #2380 and #2412, identified 39 welds, in the diesel generator subsystems, for which required in-process inspections had not been performed. The corrective actions taken to resolve these deficiencies consisted of final visual inspections of the welds; ~~using~~ records clerks transferring the information on KEI-2 forms ~~to KEI-1~~ forms (weld inspection records) (weld rod issue slips) as justification for weld rod traceability, ~~and~~ welding dates, welder qualification verification; and making radiographs to verify proper pipe fit-up. # The final visual inspections, the KEI-2 forms, and the radiographs did not adequately correct the unverified in-process inspection requirements for the following reasons:

a. The final visual inspections were only weld surface verifications and therefore have no direct relation to any in-process inspections.

b. The KEI-2 form was not an in-process QC inspection record, in that QC inspectors did not signify on the KEI-2 forms any of the infor-

1

mation indicated on the KEI-2 forms. In essence, the KEI-2 form was a construction document used by the welders to obtain weld rod from the storage personnel. The QC significance of the KEI-2 form was that the QC inspectors were allowed to transfer the weld rod heat number, entered by the storage personnel, to the KEI-1 form (QC weld record) at the time and place of the weld activity only. Therefore, any information transferred from the KEI-2 form to any QC document after the time of ~~and~~ or away from the weld activity would not be credible QC verifications.

In addition, the RIII inspector noted a considerable number of discrepancies between the QC weld records, KEI-1 forms, and the weld rod issue forms, KEI-2 forms. The records indicated discrepancies between the weld rod heat numbers used, identification of the welders performing the welds, and dates the weld were made. The Document Records personnel were resolving these discrepancies by conspicuously altering the KEI-1 forms to match the KEI-2 forms. In effect the QC records, which supposedly provide independent verification, were being changed to conform with Construction Department records. The alterations appeared to be arbitrary in that some of the welds within a certain line were changed, but the other welds of identical circumstances were not changed.

The following are examples of the altered records:

(1) Welder$Sand$SRod$SHeat$SNumber$S(used$Sfor$Straceability)$S Changes$U

(a) Dwg. M-479-3-DG-121 for line 1DGD9AB-1/2 contains weld records for welds A-4 thru A-21 which, according to QA inspector #81, were made by welder KOE using weld rod heat #D65118 during March 1978. Additional weld rod issue forms (#126508, 126509, 126510, 126511, 126884, 126885 and 126890) exist which indicate welder LFC, using weld rod heat #77402, may have worked on welds A-4 thru A-21. Because of these rod issue forms, on January 1981, the Documents Records personnel changed the QA records to include welder LFC and rod heat number 77402 on welds A-4 thru A-13, A-18, A-20 and A-21. No explanation was given why the records for welds A-14 thru A-17 and A-19 were not changed.

The inspector verified that the only welder identification symbol, KOE, appears near the welds in question.

(b) Dwg. M-479-3-DG-119 for line 1DGD7AB-1/2 contains weld records for welds A-4 thru A-21 which, according to QA inspector #81, were made by welder LJP during March 1978. Weld rod issue forms (KEI-2) #123346 and 119063, enclosed with the drawing, showed welder LJP may have worked on

welds A-4 thru A-6, A-8 thru A-11 and A-15 thru A-17. Weld rod issue form #119066 indicates welder KQE may have worked on welds A-4 thru A-21. As a result of these ~~four~~ KEI-2 forms the Document Records personnel changed the QA records on 1/29/81 for welds A-6, A-7, A-13, A-14 and A-18 thru A-21 by crossing out the welder symbol LJP and the date 3/29/78 and replacing them with the welder symbol KOE and date 3/22/78 respectively. No explanation was given why the records for welds A-4, A-5, A-8 thru A-12 and A-15 thru A-17 were not changed. The inspector verified that the only welder identification symbol LJP appeared near all the welds.

(c) KEI-1 form for weld number 79DG on line 1DG37AA2-1/2 showed the heat # of the consumable insert used was 6059491. On 1/26/81 the number was crossed out and changed to 6058921 to agree with KEI-2 form #123099. The weld number written on the gold copy of the KEI-2 form #123099 was too faint to read. The inspector checked with the Welding Department, but the original (white copy) of KEI-2 number 123099 could not be located.

(2) Weld$SDates$SChanged$U

(a) The KEI-1 form, for weld A-7 on line 1DGD5AB-1/2, indicated the final weld inspection was performed by QA inspector #81 on 4/5/78. The date was crossed out and changed to 4/6/78 on 1/27/81 because of a weld rod issue form (#118920) which indicates welder LJP may have worked on A-7 on 4/6/78.

(b) The KEI-1 form, for weld A-20 on line 1DGD2AB-1/2, indicated final weld inspection was performed by QA inspector #81 on 4/10/78. The date was crossed out and changed to 4/11/78 on 1/27/81 because of a weld rod issue form (#123834) which indicates welder LJP may have worked on A-20 on 4/11/78.

c. The licensee had a partial listing of over 400 socket welds (including systems other than the diesel generator) for which proper pipe fit-up for cleanliness, mismatch, and socket engagement had not been performed.

The ASME Code Section III-1971 Edition, Article NB-3661.5(b) states "....A gap of approximately 1/16 inch shall be provided between the end of the pipe and the bottom of the socket before welding."

H. J. Kaiser Procedure #SPPM 4.6 Rev. 8, paragraph 6.2.1 states "All welds shall be inspected at the following stages: ....At fit-up for cleanliness, mismatch, and minimum socket engagement. Socket welds shall have an approximate end gap of 1/16" prior to welding for all sizes."

Based on the SIS Report dated 11/14/79 from the Authorized Nuclear Inspector, ANI, from The Hartford Steam Boiler Inspection and Insurance Company, and the H. J. Kaiser response letter dated 12/4/79 an agreement was made that 20 of the unverified socket welds would be selected at random to be radiographed to verify proper fit-up. One of the 39 welds identified on SRs #2367, 2370, 2380, and 2412 was chosen to be radiographed. No design justification was provided to allow verification based on only 20 radiographs.

The SIS Report dated 2/11/81 from the ANI indicated that additional welds were made, after 12/4/79, without verification of fitup. The ANI indicated that all of the welds, for which the fit-up was not verified after 12/4/79, should be radiographed. The lack of justification for the 20 radiographs and recurrence of in-process fit-ups not being verified, reflect inadequate corrective actions.

~~16.~~

d.

~~X~~ No apparent actions were taken to assure that the proper weld procedure was used on any of unverified in-process weld activities.

Failure to take corrective actions when weld procedures were not verified and failure to take adequate corrective actions when proper pipe fit-up, weld filler metal (traceability), and welder qualification were not verified, is contrary to 10 CFR 50, Appendix B, Criterion XVI and the Wm. H. Zimmer QA Manual, Section 16.1 as described in the Appendix A to the report transmittal letter.

(358/81-13-25)