HENRY J. KAISER COMPANY
P.O. BOX 201, MOSCOW, OHIO 45153

October 15, 1981

Jim Foster
Pat Gynn
Nuclear Regulatory Commission
Region III

Subject: 1) Weld WR K-523
2) KE-1 23037
3) KE-2 97957

Dear Sirs:

The following is a response to your oral request of October 9, 1981, regarding falsification of heat numbers for Weld WR K-523 on the KE-1 and KE-2 forms.

Kaiser has investigated the above alleged falsification of documents and has found no justification for this allegation. Kaiser has met all ASME code requirements and has documented evidence of heat number traceability for the above referenced weld and further states that there are no false entries made on any of the above referenced documents.

Kaiser is unable to investigate the rod slip provided Mr. McCarten (as referenced in Mr. Reiters statement to the NRC). Please provide a copy of this rod slip in order for Henry J. Kaiser to respond to this second allegation.

Sincerely,

Henry J. Kaiser Company

Mark Albertin

Mark Albertin
Project Manager

CC: J. Foster

MA/TRB/dfw

Foster

July 14, 1981

MEMORANDUM FOR: J. G. Keppler
A. B. Davis
J. F. Streeter
R. F. Warnick
J. P. Schapker
F. A. Maura
R. Janke
M. Singh
P. A. Barrett
J. B. McCarten

FROM: J. E. Foster, Investigator

SUBJECT: STATUS OF ZIPPER INVESTIGATION REPORT, ASSIGNMENT OF TASKS AND RECOMMENDATIONS

An overall report format, allegation format, and numbering scheme have been developed for the report. Applegate/G.A.P. allegations Nos. 1, 3, 5, 7, 8, 11, 13, 14, 15, 17 and 18 have been edited and reorganized into the allegation format. Allegation 1 is attached as a clean draft example.

Attached is an outline of the report as proposed, including proposals for subsections of the report. Those items marked with a dot either have not been prepared, or are in the earliest stages of production. When these items are drafted, additional editorial, organizing and typing will be required. Tables and exhibits will also need numbering when the final report is organized.

In an effort to expedite production of the report, the following assignments of responsibility for the remaining subsections is proposed:

TRANSMITTAL LETTER TO LICENSEE	Streeter, Keppler
APPENDIX "A"	Barrett
REPORT COVER PAGE AND SUMMARY	Foster
REASON FOR INVESTIGATION	Foster
SUMMARY OF FACTS	Warnick, Streeter, Keppler
PERSONNEL CONTACTED	Janke

RIII
Foster/qg 8209300146

SCOPE	Foster
BACKGROUND	McCarten, Foster
QC ALLEGATIONS	Schapker (No. 2) Maura (No. 3) McCarten (No. 4)
OPEN ITEMS/OPEN ISSUES	Barrett
EXIT INTERVIEWS	Warnick
MANAGEMENT MEETING	Warnick, Streeter
LICENSEE COMMITMENTS/CORRECTIVE ACTION	Warnick, Barrett
ATTACHMENT HANDLING	Singh
TABLE OF CONTENTS	Singh

I also recommend the following:

1. That M. Singh return to RIII on July 30th or 31st, 1981, and remain through the weekend of the 25th (if agreeable).

2. That final drafts of the report be generated during a retreat to Nordic Hills during the week of July 27, 1981.

J. E. Foster
Investigator

Attachments:
1. Draft Allegation Example
2. Report Outline

5.3.1 Allegation

"A radioactive waste drain is clogged with concrete which carelessly was poured into the drain."

5.3.2 Background Information

Normal practice is to flush drains 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, 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 are synonymous terms for floor drains, which normally drain small amounts of radioactive water that can leak from such items as valve packings.

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, although 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 to be covered with duct 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 preceding information; however, he requested 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 rad system. Individual B stated that during this period, he observed floor drains in the system that were clogged with contrete, 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.

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:

a. Radwaste Building--elevation 527 ft.

(1) Drain Y-20

(2) Drain Y-17

b. Auxiliary Building--elevation 567 ft.

(1) Drain L-26

(2) Drain G-26 (elevation 562 ft.-5 1/4 in.)

(3) Drain G-22

(4) Drain G-20

(5) Drain G/H-20 (elevation 562 ft.-6 3/4 in.)

(6) Drain H-22 (elevation 562 ft.-7 5/8 in.)

(7) Drain H/J-24

(8) Drin G/H-22

Neither the flushing records, the personnel interview, nor the Resident Inspector observations confirmed or denied 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.

5.3.4 Findings

NRC interviews with site personnel indicated that some drains had been clogged with unspecified debris.

Flushing records generated in 1979 indicated that 152 out of a total of 169 of the potential radioactive waste drains, all of which are nonsafety-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 plant operation (50-358/81-13-).

5.3.5 Items of Noncompliance

No items of noncompliance or deviations were identified.

REPORT FORMAT

- TRANSMITTAL LETTER TO LICENSEE
- APPENDIX "A"
- REPORT COVER PAGE & SUMMARY
- TABLE OF CONTENTS
- REASON FOR INVESTIGATION
- SUMMARY OF FACTS
- DETAILS

- 1. PERSONNEL CONTACTED
- 2. SCOPE
- 3. BACKGROUND
- 4. QC ALLEGATIONS
- 5. APPLEGATE ALLEGATIONS

- ALLEGATIONS RECEIVED THROUGH SITE INTERVIEWS
- INDEPENDENT NRC INSPECTION FINDINGS
- OPEN ITEMS/OPEN ISSUES
- EXIT INTERVIEWS
- MANAGEMENT MEETING
- LICENSEE COMMITMENTS/CORRECTIVE ACTION PROGRAM

ATTACHMENTS
EXHIBITS

ALLEGATION FORMAT

1. ALLEGATION
   CLARIFYING INFORMATION
2. BACKGROUND(WHERE NECESSARY)
3. INVESTIGATION
4. FINDINGS
5. ITEMS OF NONCOMPLIANCE (WHERE FOUND)

INSPECTION FORMAT

1. REASON FOR INSPECTION
2. INSPECTOR, DATES OF INSPECTION
3. BACKGROUND (WHERE NECESSARY)
4. FINDINGS
5. ITEMS OF NONCOMPLIANCE (WHERE FOUND)

OPEN ISSUES FORMAT

1. ORIGIN OF ISSUE/ITEM
2. ACTIONS TO DATE
3. PLANNED ACTIONS
4. COMPLETION ESTIMATE

Att. 2

CINTI ENQUIRER
1-7-81

southwest ohio

Civil Service Board Seeking NRC Probe Of Zimmer Allegations

A special counsel office for a federal civil service board in Washington has asked the Nuclear Regulatory Commission to investigate charges of safety defects and criminal violations at the Zimmer Nuclear Power Plant in Moscow, Ohio.

Joseph Fouschard, spokesman for the NRC in Washington, said Tuesday that his agency has been asked by the Special Counsel Office of the Merit Systems Protection Board to investigate the charges.

That board oversees federal employee "whistle-blowing" statutes. NRC Chairman John Ahearne has 60 days to file a written response to the special counsel office's request.

The charges were brought by private investigator Thomas W. Applegate, who was hired by Cincinnati Gas & Electric in 1979 to examine time-card cheating. After working one month at Zimmer, Applegate found some evidence of time-card cheating and also lodged more serious charges with the NRC about the safety of construction in the nuclear power facility.

After the NRC investigated and dismissed as groundless some of Applegate's charges this year, Applegate then took the charges to the the special counsel's office.

The Government Accountability Project (GAP), a privately funded think-tank in the nation's capital, prepared Applegate's request for an investigation. GAP also serves as his legal representative.

Fouschard said Tuesday the special counsel's office forwarded its demand for an investigation to the NRC within the last week.

Fouschard said the report filed by GAP contained "some new allegations" about procedures at the nuclear power plant, which is owned by CG&E.

Those claims will be investigated by the NRC office in Chicago, he said.

The GAP report claimed Applegate documented "a scheme of labor-management collusion to permit and coverup illegal, dangerously negligent behavior among plant personnel" as well as instances of theft and black-marketing smuggling.

CINTI. ENQUIRER
1-6-81

Readers' Views

CG&E's Critic Deserves To Have Bias Weighed

TO THE EDITOR: Warren Wheat reported (Dec. 23) the charge by private investigator Thomas W. Applegate that the Nuclear Regulatory Commission (NRC) ignored his allegations of problems at the Zimmer Nuclear Power Plant.

In his article, Mr. Wheat disclosed that the request for investigation filed with something called the Special Counsel Office of the Merit Systems Protection Board was prepared for Mr. Applegate by a project of the Institute for Policy Studies (IPS). This letter is intended to speak to the character of the IPS and, in that way, provide some clue as to the accuracy of the charge of allegations, or whether they may be somewhat overblown.

To say the IPS is left-wing understates its position on most matters by half. While much has been writeen by and about IPS, a recent column by John Train in the Nov. 24 edition of *Forbes* magazine is worth consulting. The article appears under the headline "Washington's Institute for Policy Studies Is a Veritable Font of Worldwide Anti-American, Anti-Business Propaganda." In the article, it is stated that "IPS publishes books and papers, and stages numerous conferences . . . on such subjects as 'The Myth of the Soviet Threat' or 'Repression of Workers.' " Train refers to IPS as a "sinister source," which is "almost always against the official U.S. positions on defense, against a U.S. covert intelligence capability, against business." There is much more.

As this case develops — and if reactions follow the current norm — the tendency among press and public will probably be to pillory the NRC and Cincinnati Gas and Electric Co. In this case, however, it might be wise for us to remember the nature and bias of their real adversary, IPS, and temper our judgments accordingly.

FRED C. ROBERTSHAW
9712 Humphrey Rd.

Panel Ignored Zimmer Evidence, Investigator Says

BY WARREN WHEAT
Gannett News Service

WASHINGTON—A private investigator has charged the Nuclear Regulatory Commission (NRC) with ignoring alleged evidence of serious safety defects, drunkenness and criminal violations he found at the Zimmer Nuclear Power Plant.

The allegations about the Moscow, Ohio, plant are contained in a request for an investigation filed with the Special Counsel Office of the Merit Systems Protection Board under provisions of federal employee "whistle-blowing" disclosure statutes.

Federal law requires the special counsel to turn the complaint over to the NRC promptly. NRC Chairman John Ahearne then would have 60 days to file a written response.

In the complaint, Thomas W. Applegate, hired by Cincinnati Gas & Electric Co. (CG&E) as an undercover investigator last December to obtain evidence of time-cheating by employees, charges NRC investigator Gerald A. Phillip with violations of law, mismanagement, abuse of authority, gross waste and perpetuating a substantial and specific danger to public health and safety.

THE REQUEST for the investigation was prepared for Applegate by the Government Accountability Project (GAP) of the Institute for Policy Studies, a privately funded, non-profit organization based in the nation's capital.

Working undercover as a cost-accounting engineer at the William H. Zimmer Nuclear Power Facility, Applegate obtained evidence of time cheating by some employees, according to GAP.

But in four weeks he also "documented a scheme of labor-management collusion to permit and cover-up illegal, dangerously negligent behavior among plant personnel, as well as dangerously faulty welds in key piping, indicative of a breakdown in quality-assurance practices."

GAP said Applegate uncovered "well-documented" instances of theft and black-market smuggling operations at the plant, auctions of "hot weapons," the illegal manufacture of belt buckles with nuclear-grade steel, "and coercion and retaliation against the quality-control radiographers designated to uncover safety defects.

"BILL MURRAY, his (Applegate's) contact in CG&E management, was pleased about the evidence of time cheating, but ignored the discoveries of safety defects and collusion by KEI (construction contractor Kaiser Engineering International)," GAP said.

The 24-page GAP document was signed by Staff Assistant Rachel Bellis, Associate Director Thomas Devine and Director Louis Clark.

When Applegate informed CG&E of the safety concerns, the utility said his contract was terminated. The employees who had been the targets of his time-cheating investigation also were fired.

"Curiously, these same employees were vocal critics of lax safety practices at the plant and had provided Mr. Applegate with the early leads for his probe into quality control," GAP said.

CG&E also informed the dismissed employees of Applegate's role in their termination and he said he has since received threats of physical violence ranging from sodomy to murder.

CG&E Agrees To Pay For Warning Devices

BATAVIA—The Cincinnati Gas & Electric Co. (CG&E) has told Clermont County officials it will purchase all necessary warning devices and radiation-monitoring equipment before its $1 billion nuclear plant opens in Moscow.

County officials have met with CG&E representatives to discuss the need for communications equipment, a prompt notification system and off-site radiation monitoring systems, Sheriff John R. Van Camp said.

"It looks to me like they (CG&E) will pay for all of it," Van Camp said.

"They indicated they will purchase a complete communication package," as long as it is used in connection with the William H. Zimmer Nuclear Power Station, Van Camp said.

County officials have made it clear they cannot afford to pay for the equipment. "This county has very tight purse strings right now, and that is expected to continue next year," Van Camp said.

Zimmer is nearly completed at its Ohio River site, but CG&E is waiting for the Nuclear Regulatory Commission (NRC) to issue an operating license. Additional hearings must be conducted by the NRC before the license can be issued.

CG&E has told the county it will purchase smaller pieces of equipment, such as one of the county's outdated radio base stations that was destroyed recently by lightning. A new one will cost $5,000, Van Camp said.

Other equipment to be purchased includes tonal alert devices for individual homes, additional radio and other communication equipment, more telephone lines and microwave radio systems, he said.

The utility has not actually determined what the package will cost. Other details, such as maintenance and insurance costs, still must be worked out, the sheriff said.

Staffers at Education Attack RIF Methods

A newly-formed group within e Education Department is call- g for a meeting with Secretary rrel Bell and an investigation the Office of Personnel Man- ement of the reduction in force nned for the office of elemen- ry and secondary education ESE).

The planned reduction would minate about half of some 500 sitions in OESE.

A spokesman for the Employee uity Committee said the group nsists of employees and super- sors concerned about possible fair and discriminatory action d confused about the RIF proce- res being used.

D'Alan Huff, a manager in the SE, explained that employees not want a legal confrontation th the agency, but that they will to court if necessary to defend ir rights.

The primary concern is the de- rtment's limitation of the com- titive area for the RIF to OESE ly with no allowance for ency-wide competition.

The department has said the re- riction is necessary because it es not have adequate informa- n to carry out a larger RIF at is time. A general department- de reduction is planned for next ring.

Huff said that means employees th several years experience will ffer while those with little or ne will keep their jobs. "It looks e gross unfairness," he said.

He said many positions within ESE have the same job titles nd require the same qualifica- ons as those in other depart- ent offices. Huff is certain that a rge number of OESE workers ould successfully compete for other department jobs.

The committee has sent letters to Bell's office and to OPM and has filed a freedom of information request asking for data on posi- tions filled since April, current vacancies and equal employment opportunity records.

Huff noted that OESE employed a large percentage of women and other minorities and heavy cuts in that office could comprise "unlawful discrimination" against them.

In its letter to OPM, the group charged the RIF procedure would "not provide for any meaningful competition among employees."

The group further contends that such procedures are inadequate since they were designed to cor- rect classification problems rath- er than to carry out a reduction in force.

Spokesmen for Bell and for OPM said they had received the letters, but that no response had been made yet.

Bell is expected to respond soon, but it is not known whether he will meet with group members.

An OPM spokesman said more information is needed before that office can decide whether an investigation is warranted.

The employee group contends the department violated federal personnel guidelines.

Huff said his group has also met with representatives of the head- quarters local and the parent organization, the American Federation of Government Em- ployees, to discuss cooperative measures to protect employee rights.

"He described that meeting as a good first step."

— MARLOW.

package fashioned by the Republi- can leadership would be offered as an amendment to appease the President's concerns. "I believe the President will sign the bill if the amendment we offer is adopt- ed," he said.

In a related move, Sen. Ted Stevens, R-Alaska, will offer an amendment to lift the current federal executive pay cap. Time ran out on Stevens November 18 before he could propose the meas- ure, which would boost top gov- ernment officials' pay by more than 15 percent. It would also re- lieve what he called a severe problem of pay compression for top federal employees, in which the seven highest salary levels in government are now all limited to $50,112 per year.

NRC Chief Admits Inspection Laxity

The head of the Nuclear Regula- tory Commission says an internal study reveals "inadequacies" and a "generic problem" in the agen- cy's safety-related inspections program.

The study was ordered in December after a private detec- tive raised allegations of safety defects at a nuclear power plant under construction near Cincin- nati.

The detective, Thomas Apple- gate Jr., also charged that the NRC's Office of Inspection and Enforcement failed to properly investigate his allegations con- cerning the Zimmer Nuclear Power Station, now near comple- tion.

In a letter to Chairman Morris K. Udall of the House Interior and Insular Affairs Committee, NRC Chairman Nunzio J. Palladino cited "inadequacies in the initial OIE investigation of Zimmer and in its investigatory program generally."

He also wrote: "Shortcomings in the earlier OIE investigation of Zimmer reveal a generic problem. Steps are being taken to remedy that problem."

Palladino said that these prob- lems "to date" have not endan- gered public health or safety at the site.

The follow-up study was made by the agency's Office of Inspec- tor and Audit. It said the OIE investigation of Applegate's alle- gations was improperly documented and incorrectly determined the status and history of several welds Applegate had questioned.

The investigation also "was nei- ther vigorous nor sufficiently broad in scope" and drew conclu- sions that were "not consistent with the facts," the new study said.

"The overall investigatory ef- fort in this instance was unsatis- factory," OIA Director James J. Cummings told Palladino. "In our opinion responsibility for this situation must be shared not only by the individuals who were specifically assigned to the case but also by regional officials who failed to properly supervise the case."

The OIE staff, in written com- ments, said it had acted according to guidelines and discounted some findings of the new study as insig- nificant or irrelevant.

Thomas Devine of the Washington-based Government Accountability Project, which sought the new study on Apple- gate's behalf, said it "confirms what critics have been charging for more than a decade: NRC investigations are little more than paperwork reviews."

"The ultimate significance is that the 1980 whitewash at Zimmer was not an aberration," he said. "It represents business as usual at the NRC."

The OIA report was released at GAP's request under the Freedom of Information Act.

The self-described "whistle- blower support group" took Applegate's allegations last year to the Merit Systems Protection Board's Office of Special Counsel, which ordered the nuclear agency to review its inspection of Zimmer, being built for Cincinnati Gas & Electric Co.

Soon after that, at the merit board's request, the Justice De- partment ruled that the special counsel cannot compel an agency to investigate charges raised by private citizens who are not gov- ernment workers or job appli- cants.

37

Stigma Of Zimmer Fire More Damaging Than Amount

IN12

CINCINNATI (AP) — The implied guilt in paying a $200,000 fine for sloppy quality assurance in the construction of the William H. Zimmer Nuclear Power Station at Moscow may be more damaging to Cincinnati Gas & Electric Co. than the amount of the fine, says CG&E President William Dickhoner.

"The mere fact that you're fined carries a certain stigma and the stigma has a greater penalty than the dollar value of the fine," Dickhoner said Wednesday in announcing that the utility had paid the fine proposed Nov. 24 by the Nuclear Regulatory Commission.

He said CG&E and its partners in the nuclear plant — Dayton Power & Light Co. and Columbus and Southern Ohio Electric Co. — admitted no intentional wrongdoing, but "have elected to pay the fine rather than pursue our differences and contest this issue with the NRC."

"That course could entail lengthy proceedings which would be enormously more costly than the penalty," Dickhoner said. "We believe it is important to be free to devote our full energies and attention toward the positive goal of completing Zimmer Station in a quality manner. Moreover, we feel that the time has come to devote our full efforts toward ... placing it in operation as an asset to the community."

Dickhoner acknowledged some sloppy record keeping, but blamed the company it hired to build the plant.

"We do agree that deficiencies existed in implementing our quality assurance program and in exercising sufficient surveillance over our construction contractor, the Henry J. Kaiser Co., but we believe that we have fully corrected these deficiencies," he said.

Some wording in the NRC notice of violation, particularly the use of the word "false" concerning documentation of construction work, rankled Dickhoner.

"As far as we're concerned, the definition of false means that there was intent to mislead or defraud, and that's where we take serious exception to the way the NRC has categorized the inaccuracies," he said.

"We admit that there were errors in the records. But certainly there was no intent to mislead the NRC into thinking something was safe when it really wasn't. False implies a certain criminal activity, which certainly was not the case at Zimmer. And we have gone 'round and 'round with the commission on that."

The $1.2 billion Zimmer plant, about 30 miles upriver from Cincinnati, has been under construction for a decade and is 97 percent complete. Dickhoner said he expects it to be finished in July and that commercial operation will be under way early in 1983.

"Overall, we believe that the construction quality programs we have undertaken at Zimmer Station will provide additional assurance of the plant's safety," he said. "We have increased our quality assurance organization to more than 200 personnel. We are conducting a comprehensive program to confirm that the quality of work already completed meets the high standards required of a nuclear power plant."

JOURNAL TRIBUNE
MARYSVILLE, O.
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FEB-25-82

Illinois Press Association
(Press Services Inc.)
1035 Outer Park Drive
Springfield, IL 62704
217/793-0070

ROCKFORD
Register Star
79,706 D

FEB 25 1982

Promotions 211

● **William Forney** has been named U.S. Nuclear Regulatory Commission's senior resident inspector at the **Byron Nuclear Power Station** now under construction near Byron.

Forney, who joined the NRC in 1980, had been senior resident inspector at the LaCrosse Nuclear Power Station near LaCrosse, Wis.

Forney previously was employed for 13 years at the Mare Island Naval Shipyard in Vallejo, Calif., where he was a senior shift refueling engineer, then reactor plant test manager, and finally senior ship superintendent. From 1959 to 1967 he was in the Navy's nuclear power program.

HENRY J. KAISER, CO.
WM. H. ZIMMER POWER STATION

NONCONFORMANCE REPORT

NO. E-2237 PAGE 1 OF 1

G/INSTALLATION NO.	2. DWG/INSTALLATION NAME:	3. PO/CONTRACT NO.	4. SUPPLIER/CONTRACTOR NAME:
M447	WR Closed Cooling Water	7070	BJK

SPECTION PLAN NO.:	6. INSPECTOR:	7. DATE:	8. SPECIFICATION NO.	ASME
	J. Barrison	11/23/79	B-2256	YES ☒ NO ☐

SCRIPTION OF NONCONFORMANCE	10. DISPOSITION	11. DISPOSITION INSTRUCTIONS/JUSTIFICATION
STEM: WR CLOSED COOLING WATER		
CATION: REactor Bldg.		
QUIREMENT: SPPM 8.0 All essential ems have qualified welders and aceable materials.	REWORK	CUT OUT WELD WR-GP-218 REWELD USING NEW WELD NUMBER WR-K-904. NOTE: QC TO VERIFY AND DOCUMENT THE NEW WELD (ALL GP MAT'L IS FURNISHED BY KELLOGG) Monte Feltner 12-18-79
DITION: The following welds have rod slips, no traceability on ders I.D. qualification, filler terial, HT No's.		
WR-26 218 GP		

VIEW BOARD (REQUIRED ON ALL ACCEPT-REPAIR DISPOSITIONS) 12-10-79

KEI CONSTRUCTION ENGR. / DATE

SL DATE CG&E SPONSOR ENGR DATE CG&E Q.A.&S. DATE KEI QAE DATE

PAIR/REWORK COMPLETE AND ACCEPTABLE

INSPECTOR/ENGINEER DATE

USE

LOST DOCUMENTATION

15. CORRECTIVE ACTION

QC TO DOCUMENT ALL MAT'L BEING INSTALLED IN ESSENTIAL SYSTEMS.

R FIELD (7), CG&E (4), S&L (1), A.I. (1), QA FILES (ORIG.)

QI 4017

KUKCO FORM NO. QA-14
REV. 9/73

(See reverse side for instructions & responsibilities)

Cleanliness Class

System or Component: Reactor Bldg Closed Cool Wtr — ISO DWG No. PSK1WR 26 — Line No. 1WR01AA12 — MK# 159A — To MK# NA

Base SA: P1 — To SA: P1 — Nom. Pipe Size: NA — Nom. Wall Thks: NA — Fillet Size: NA — Project Spec: H-2256

Code Class: S&LC — Welding Procedure No: 3.1.8 — Special Instructions: PART. PENN. Weld 3/8

Filler Material Requirement
Electrode
Type: E7018 — Bare/Covered — Size: 3/32 — HT#/Lot# — Size: 1/8 — HT#/Lot# — Size: 5/32 — HT#/Lot#

Consumable Insert: NA — HT No. — Backing Ring: NA — HT#

Purge Req. I.D. Purge: NA — CFH — Torch Purge: NA — CFH — Ref. [redacted]/Weld No. 218WRGP

Heat Treat Requirements: *300° F Min required for welds NA

Preheat Temp Req. 60° °F Min — Interpass Temp Req. 60° °F Min — Post Weld Req. NA — Procedure

Fit Up / Installation / NDE Requirements

Instructions:	Req.	QA Stamp	Date	AI Hold Pts	Record/Remarks
(1) Verify, proper weld procedure, welders qualif., proper filler mat'l., proper C.I./B.R.	X				
(2) Verify proper bevels, details, fit, cleanliness, damage. Verify Mark No.'s	X				Record MK No. to MK No.
(3) Verify proper fit up, temp. tack welds	X				
(4) NDE Examine weld edge preparation surface	MT PT RT Other				
(5) NDE ROOT PASS (visually examine I.D. surface were accessable)	MT PT RT Other				Verify Preheat Temp.
(6) NDE INTERPASS	MT PT Other				Verify Interpass Temp.
(7) NDE FINAL PASS ~~[illegible]~~	MT PT UT (Other)				Visual Per STM 4.6.II /
(8) NDE RT post PWHT	RT				
(9) POST WELD HEAT TREAT Verify Record Time / Temp					Attach Time/Temp Recordings
(10) NDE FINAL NDE					

Instructions:	Req.	QA Stamp	Date	AI Hold Pts	Record/Remarks
(11) NDE: FINAL RT/UT					
(12) Verify welders I.D. on weld joint (record welder's symbol)					
(13) Tack Symbol	(14) Root Layers Symbol			(15) Intermediate Layers Symbol	
(16) Symbol	(17) Symbol			(18) Final Symbol	
(19) Verify Ferrite Content (where applicable)					Record Range
(20) 1st Repair Ref. WRD No.					
(21) 2nd Repair Ref. WRD No.					
(22) 3rd Repair Ref. WRD No.					Note: If 3rd repair is not acceptable, refer to Review Board Action. Attach Copy NR

APPROVALS: Wayne J Blzd 2-25-77 — M Kuanchuk 2-25-77

A 18391 Dw

ZIMMER NUCLEAR POWER STATION — WELD DATA SHEET

(See reverse side for instructions & responsibilities)

WR-2C
Cleanliness Class

Reactor Bldg Closed Cool Wtr — Dwg. No. PSK1WR2C — Line No. 1WR01AA12 — 159A — NA

P1 — P1 — NA — NA — NA — Project Spec. H-2256

S&LC — Welding Procedure No. 3.1.8 — Special Instructions: PART. PENN. WELD 3/8

E7018 — Size 3/32 — Size 1/8 — Size 5/32

NA — Backing Ring NA

NA CFH — Torch Purge NA CFH — Ref. /Weld No. 218WRGP

*300° F Min required for welds NA

60° Min — 60° Min — Post Weld Req NA Procedure

Installation / Inspection	Req	QA Stamp	Date	At Hold Pt.	Record/Remarks	Instructions	Req	QA Stamp	Date	At Hold Pt.	Record/Remarks
[illegible]	~~NA~~ X	NA	4CY			FINAL WELD	NA	NA			
[illegible]	~~NA~~	NA	4CU		Record MK No. to MK No.	Verify welder I.D. on weld joint (record welder's symbol)	NA	NA			
[illegible]	~~NA~~	NA	4CY			Tack — Symbol —	Root Layers — Symbol —			Intermediate Layers — Symbol —	
[illegible]	MT PT RT Other	NA				Symbol —	Symbol —			Final — Symbol K21	
ROOT PASS [illegible]	MT PT RT Other	NA			Verify Preheat Temp	Verify Ferrite Content (where applicable)	NA	NA			Record Range
[illegible]	MT PT Other	NA			Verify Interpass Temp						
	X	KEI QA 111	2-13-80		6						
		NA									

NA NA

ABL 2-25-77 MMHamchuk 2-5-77

KAISER ENGINEERS, INC
WM. H. ZIMMER POWER STATION

NONCONFORMANCE REPORT

NO. E2233 PAGE 1 OF 1

DWG/INSTALLATION NO.	2. DWG/INSTALLATION NAME:	3. PO/CONTRACT NO.	4. SUPPLIER/CONTRACTOR NAME:
SK IWS 32	SERVICE WATER	7070	HSK

INSPECTION PLAN NO.:	6. INSPECTOR:	7. DATE:	8. SPECIFICATION NO.	ASME
CIP-45	L. Wood	11-21-79	N-2256	YES ☒ NO ☐

DESCRIPTION OF NONCONFORMANCE	10. DISPOSITION	11. DISPOSITION INSTRUCTIONS/JUSTIFICATION
SYS: WS SERVICE WATER LOC: REACTOR BLDG. ELEV. 573' REQ'D. WELDS ARE TO BE INSPECTED PER REQUIREMENTS OF KE 1 FORM. WELD WS 626P WAS WELDED TO COMPLETION WITHOUT EVIDENCE OF FITUP INSPECTION, WELDER QUALIFICATION, MATERIAL TRACEABILITY, AND A FINAL VISUAL. ARE ALL ACCEPTABLE.	REWORK	CUT OUT WELD WS-626P REWELD USING NEW WELD WS-K-378(GP). NOTE: QC TO VERIFY AND DOCUMENT NEW WELD. (TRACEABLE MAT'L FURNISHED BY KELLOGG) M. Felton 12-21-79

VOID

KE-1 FORM CORRECTED 12-24-79

REVIEW BOARD (REQUIRED ON ALL ACCEPT/REPAIR DISPOSITIONS)

S&L	DATE	CG&E SPONSOR ENGR	DATE	CG&E Q.A.&S.	DATE	KEI CONSTRUCTION ENGR/	DATE
N/A		N/A		N/A		[signature] 12-24-79	

REPAIR/REWORK COMPLETE AND ACCEPTABLE

INSPECTOR/ENGINEER DATE

CAUSE

CRAFT DID NOT NOTIFY QC AT FIT-UP

15. CORRECTIVE ACTION

CRAFT INSTRUCTED NOT TO BY-PASS QC HOLD PTS.

DISTR: FIELD (7), CG&E (4), S&L (1), A.I. (2), QA FILES (ORIG.)

KEI FORM NO. QA-

2554

Wm. H. ZIMMER NUCLEAR POWER STATION – WELD DATA SHEET

(See reverse side for instructions & responsibilities)

Clean

Component: SERVICE WATER SYS — ISO DWG No. BK1WS32 — Line No. 1WS17A18 — MK# 55 ... — To MK# ——

P1 — To P1 — Nom. Pipe Size NA — Nom. Wall Thks. < 1½ — /Fillet Size 3/8" — Project Spec. H-2256

S&L C — Welding Procedure No. 3.1.8 — Special Instructions ______

Filler Material Requirement:

Type E7018 — Bare/Covered (circled) — Size 3/32 — HT#/Lot# 421-JN311 — Size 1/8 — HT#/Lot# ______ — Size 5/32 — HT#/Lot# ______

Consumable Insert NA — HT No. ______ — Backing Ring NA — HT# ______

Purge Req.: I.D. Purge NA — CFH ______ — Torch Purge NA — CFH ______

CIP WS 45

Heat Treat Requirements:

Preheat Temp Req. 60 MIN °F — Interpass Temp.Req. 60 MIN °F — Post Weld Req. NA — Procedure ______

Fit Up / Installation / NDE Requirements:

Instructions:	Req.	QA Stamp	Date	AI Hold Pts.	Record/Remarks
1) Verify, proper weld procedure, welder's qualif., proper filler mat'l., ~~prep + G.I.C.R.~~	N/A				
2) Verify proper bevels, details fit, cleanliness, damage. ~~Verify Mark No.'s~~	N/A				Record MK No. ______ to MK No. ______ N/A
3) Verify proper fit-up, Insp. tack welds.	N/A				
4) NDE: Examine weld edge preparation surface	MT PT RT Other				
5) NDE: ROOT PASS (visually examine I.D. surface were accessable)	MT PT RT Other				Verify Preheat Temp
6) NDE: INTERPASS	MT PT Other				Verify Interpass Temp.
7) NDE: FINAL PASS	MT PT Other (circled)	KEI QA 123	11/29/79		VISUAL PER SPPM 4.6
8) NDE RT prior PWHT	RT				
9) POST WELD HEAT TREAT Verify Record Time/Temp.					Attach Time/Temp. Recordings
10) NDE FINAL					

Instructions:	Req.	QA Stamp	Date	AI Hold Pts.	Record/Remarks
11) NDE: FINAL RT/UT	N/A				
12) Verify welders I.D. on weld joint. (record welder's symbol)	/	/	/	/	
13) Tack Symbol LBL	14) Root Layers Symbol LBL			15) Intermediate Layers Symbol LBL	
16) Symbol LB1	17) Symbol LB2			18) Final Symbol LB2	
19) Verify Ferrite Content. (where applicable)					Record Range
20) 1st Repair Ref. WRD No. ______					
21) 2nd Repair Ref. WRD No. ______					
22) 3rd Repair Ref. WRD No. ______					Note: If 3rd repair is not acceptable, refer to Review Board Action. Attach Copy NR.

APPROVALS: Wayne A Blazek 11-26-75 — Welding Engr. — [signature] 11/26/75 — WELD/NDE QA ENGR.

HENRY J. KAISER CO.
WM. H. ZIMMER POWER STATION

NONCONFORMANCE REPORT

NO E-2836 PAGE 1 OF 1

1. DWG/INSTALLATION NO.	2. DWG/INSTALLATION NAME:	3. PO/CONTRACT NO.	4. SUPPLIER/CONTRACTOR NAME.	
PSK WS-61	SERVICE WATER	7070	HJK	
5. INSPECTION PLAN NO.:	6. INSPECTOR:	7. DATE:	8. SPECIFICATION NO.	ASME
PSK WS-61	BAKER	10-22-80	H2256 FORM H10	YES ☒ NO ☐

9. DESCRIPTION OF NONCONFORMANCE	10. DISPOSITION	11. DISPOSITION INSTRUCTIONS/JUSTIFICATION
LOCATION: YARD SYSTEM: SERVICE WATER REQUIREMENT: H-2256, FORM H10, ALL PRESSURE-RETAINING WELDS IN CLASS III PIPING, 4" AND GREATER SHALL BE RADIOGRAPHED. Condition: During a NES audit weld WS-737 was found not to have a radiograph taken of the final weld. Only film available is a information shot of the root layer. Subject weld is buried underground.	Accept As Is	The KEI for weld W.S. 737 shows that fin. weld was radiographed an accepted by Kaiser NDE Level III on 4-8-76. KEI also shows that film was reveived an accepted by site A.N.I. on 4-15-76. A copy of Radiograph - Report shows acceptance by Peabody - Magnaflux also on file with KEI. 10/24/80 [signature] REPLY REQUESTED BY 11-5-80

12. REVIEW BOARD (REQUIRED ON ALL ACCEPT/REPAIR DISPOSITIONS)

S&L NSO... [illegible] 11/6/80 — A.N.I. Rejected 11/7/80 HSB JB — [signature] KEI CONSTRUCTION ENGR. DATE

S&L DATE CG&E SPONSOR ENGR DATE CG&E QA &S DATE KEI QAE DATE

13. REPAIR/REWORK COMPLETE AND ACCEPTABLE

SEE REV. 1 FOR NEW DISPOSITION 11-18-80

CLOSED DATE 11-13-80

INSPECTOR/ENGINEER DATE

14. CAUSE

LOST X-RAY FILM [signature] 11/13/80

15. CORRECTIVE ACTION

QC TO MAINTAIN ALL WELD RECORDS FOR ESS. SYS.

VOID STAMP IN ERROR - REV. 1 CANCELLED WHEN ANI ACCEPTED DISPOSITION. 11-18-80 [signature]

9.

[illegible] (7/80)

CH. 6129

10-27-80

NONCONFORMANCE REPORT

NO E-2036 Rev 1 PAGE 1 OF 1

1. INSTALLATION NO.	2. DESIGNATION	3. PO/CONTRACT NO.	4. SUPPLIER/CONTRACTOR NAME
SK 105-61	SERVICE WATER	7070	HJS
INSPECTION PLAN NO.	6. INSPECTOR	7. DATE	8. SPECIFICATION NO. / ASME
SK 105-61	BAKER	Rev 1 11-4-80 / 10-22-80	4-41	YES X NO

DESCRIPTION OF NONCONFORMANCE

LOCATION: YARD

SYSTEM: SERVICE WATER

REQUIREMENT: ~~ASME CODE ... PRESSURE-RETAINING ... IN CLASS II PIPING ... SHALL BE RADIOGRAPHED.~~ Retain Records Rev 1

Condition: During a review of weld W.S. 737, ... film could not be ... Rev 1 Only film available ... information that of the root layer. Subject ... is buried underground.

10. DISPOSITION

Accept As Is

11. DISPOSITION JUSTIFICATION (NA 4900) Rev 1 11-4-80

The KEI for weld W.S. 737 shows that the weld was radiographed and accepted by Kaiser NDE Level III on 4-5-76. KEI also shows that film was received and accepted by site A.N.I. on 4-15-76. A copy of Radiograph Report shows acceptance by Peabody Magnaflux also on file with KEI.

10/24/80 [signature]

REPLY REQUESTED BY 11-5-80

(REVIEW BOARD REQUIRED ON ALL ACCEPT/REPAIR DISPOSITIONS)

[signature] 10-2? KEI CONSTRUCTION ENGR DATE

[signature] 11-4-80 SAI DATE | [signature] 11/5/80 CSAI SPONSOR ENGR DATE | J.F. Weinerberg 11/6/80 GSRR Q.A.&S. DATE | [signature] 11/7 KEI QAE

REPAIR/REWORK COMPLETE AND ACCEPTABLE

INSPECTOR/ENGINEER DATE

CAUSE

THIS COPY ISSUED FOR
INFORMATION ONLY
NOT TO BE USED FOR
PHYSICAL CONSTRUCTION

NR
CLOSED

15. CORRECTIVE ACTION

GC TO MAINTAIN ALL WELD RECORDS FOR ESS. SYS.

... 11-13-80

9

HENRY J. KAISER, CO.
WM. H. ZIMMER POWER STATION

NONCONFORMANCE REPORT

NO. E-2836 Rev. 1 PAGE 1 OF 1

1. DWG/INSTALLATION NO.	2. DWG/INSTALLATION NAME:	3. PO/CONTRACT NO.	4. SUPPLIER/CONTRACTOR NAME:
PSK WS-61	Service Water	7070	HJK
5. INSPECTION PLAN NO.: PSK WS-61	6. INSPECTOR: R. Baker	7. DATE: 11-10-80	8. SPECIFICATION NO. H-2256 Form 410 — ASME YES [x] NO [ ]

9. DESCRIPTION OF NONCONFORMANCE	10. DISPOSITION	11. DISPOSITION INSTRUCTIONS/JUSTIFICATION
LOCATION: Yard SYSTEM: Service Water REQUIREMENT: H-2256, Form 410, all pressure - retaining welds in Class III Piping, 4" and greater shall be radiographed. CONDITION: During a NES Audit Weld WS-737 was found not to have a radiograph taken of the final weld. Only film available is a information shot of the root layer. Subject weld is buried underground.		

VOID

WRITTEN IN ERROR. NR RESOLVED ON ORIGINAL ISSUE. 11-11-80 [illegible]

12. REVIEW BOARD (REQUIRED ON ALL ACCEPT/REPAIR DISPOSITIONS)

KEI CONSTRUCTION ENGR. DATE

S&L DATE — CG&E SPONSOR ENGR DATE — CG&E Q.A.&S. DATE — KEI QAE

13. REPAIR/REWORK COMPLETE AND ACCEPTABLE

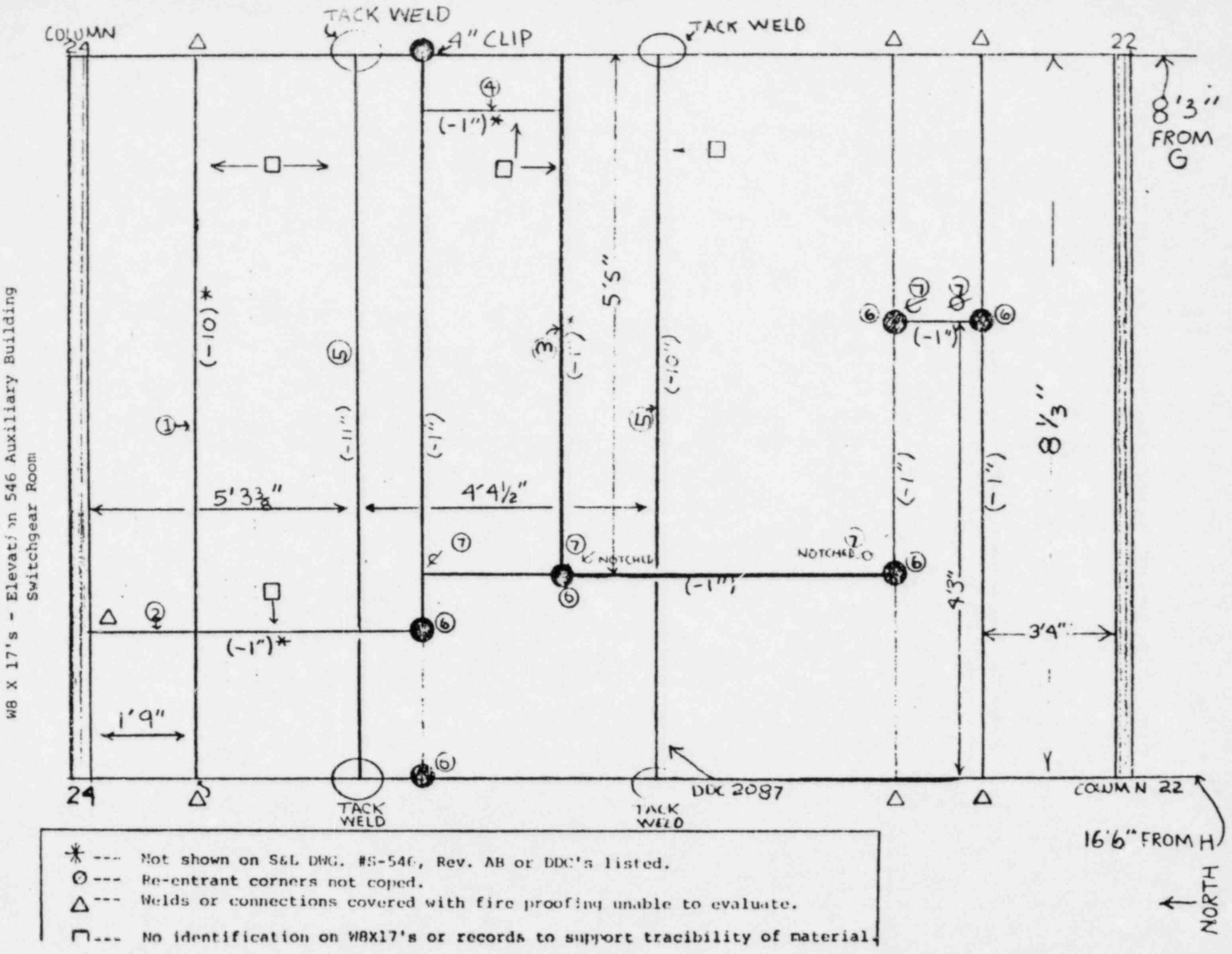
INSPECTOR/ENGINEER DATE

14. CAUSE	15. CORRECTIVE ACTION

KAISER FIELD (7), CG&E (4), S&L (1), A.I. (1), QA FILES (ORIG.)

5268

HJK-CT FORM


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"
(-1")
(-10")
8 1/3"
5'3 3/8"
4'4 1/2"
(-1")
(-1")
(-1")
(-1")*
4'3"
3'4"
1'9"
NOTCHED
NOTCHED
(-1")
DUC 2087
TACK WELD
TACK WELD
COLUMN 22
16'6" FROM H
NORTH
* --- Not shown on S&L DWG. #S-546, Rev. AB or DDC's listed.
O --- 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.

4. ALLEGATION VOIDING ON NR'S

to END

3 FINDINGS

BACKGROUND

GENERAL

4.1.1.1 BACKGROUND INFORMATION

2 INTERVIEW OF CG&E QUALITY ASSURANCE MANAGER
INTERVIEW OF NES CONSULTANT
INTERVIEW OF KAISER QUALITY ASSURANCE MANAGER
INTERVIEW OF KATHY FAYBION

4.1.1.1 INVESTIGATION OF DISPOSITION OF NONCONFORMANCE REPORT CONTROL NO. 5412

4.1.1.1.1 BACKGROUND INFORMATION

4.1.1.1.2.1

INVESTIGATION

PERSONNEL INTERVIEWS
INTERVIEW OF WALTER C. DUMFORD
INTERVIEW OF DENNIS DONOVAN

4.1.1.1.2. INTERVIEW OF KENNETH SHINKLE
INTERVIEW OF REX BAKER
RECORD REVIEWS
FIELD OBSERVATIONS

2 INVESTIGATION OF DISPOSITION OF NON-CONFORMANCE REPORT E-5108
BACKGROUND INFORMATION
INTERVIEW OF NRC INSPECTOR
RECORD REVIEWS
FIELD OBSERVATIONS

3 INVESTIGATION OF DISPOSITION OF NON-CONFORMANCE REPORT CONTROL NO. 4309
BACKGROUND INFORMATION
INTERVIEW OF MICHAEL McCOY
RECORD REVIEWS
FIELD OBSERVATIONS
~~ACCEPTANCE CRITERIA~~

4 INVESTIGATION
BACKGROUND INFORMATION
INTERVIEW OF JOSEPH MILLS

INTERVIEW OF FLOYD OLTZ
INTERVIEW OF LYNN ANDERSON
RECORD REVIEWS
FIELD OBSERVATIONS

5 INVESTIGATION OF DISPOSITION OF NON-CONFORMANCE REPORT E-2466
BACKGROUND INFORMATION
PERSONNEL INTERVIEWS
INTERVIEW OF REX BAKER
RECORD REVIEWS
FIELD OBSERVATION

6 INVESTIGATION OF DISPOSITION OF NON-CONFORMANCE REPORT E-2836
BACKGROUND INFORMATION
INTERVIEW OF REX BAKER
INTERVIEW OF LOWELL BURTON
INTERVIEW OF JEROME SCHAFKER
RECORD REVIEWS
FIELD OBSERVATION

7 INVESTIGATION OF DISPOSITION OF NON-CONFORMANCE REPORT E-1777
BACKGROUND INFORMATION
INTERVIEW OF VINCENT FERETTI
INTERVIEW OF FLOYD OLTZ
INTERVIEW OF JEROME SCHAFKER
RECORD REVIEWS
FIELD OBSERVATIONS

*8 INVESTIGATION OF DISPOSITION OF NON-CONFORMANCE REPORT CONTROL NO.
BACKGROUND INFORMATION
INTERVIEW OF STEVEN BURKE
RECORD REVIEWS
FIELD OBSERVATIONS

9 INVESTIGATION OF DISPOSITION OF NON-CONFORMANCE REPORT E-2233
BACKGROUND INVESTIGATION
INTERVIEW OF JERRY SCHAPKER
RECORD REVIEWS
FIELD OBSERVATIONS

10 INVESTIGATION INTO DISPOSITION OF INSPECTOR RUIZ NONCONFORMANCE REPORT DATED FEBRUARY 11, 1981
BACKGROUND INFORMATION
INTERVIEW OF JAMES RUIZ
INTERVIEW OF JERRY SCHAPKER
INTERVIEW OF PHILLIP NORMAN
RECORD REVIEWS
FIELD OBSERVATIONS
RECORD REVIEWS

* 11 INVESTIGATION
BACKGROUND INFORMATION
INTERVIEW OF DAVID PAINTER
FIELD OBSERVATIONS

* 12 INVESTIGATION INTO DISPOSITION OF NONCONFORMANCE REPORT
BACKGROUND INFORMATION
INTERVIEW OF REX BAKER
INTERVIEW OF FLOYD OLTZ
INTERVIEW OF CATHY FAUBION
INTERVIEWS OF JERRY SCHAPKER
RECORD REVIEWS
FIELD OBSERVATIONS

13 INVESTIGATION INTO DISPOSITION OF NON-CONFORMANCE REPORT CN-4357
BACKGROUND INFORMATION
PERSONNEL INTERVIEWS
INTERVIEW OF KYLE BURGESS

INTERVIEW OF JEROME SCHAPKER
RECORD REVIEWS

*14 INVESTIGATION INTO DISPOSITION OF NON-CONFORMANCE REPORT E-2191
BACKGROUND INFORMATION
INTERVIEW OF RICHARD L. REITER
INTERVIEW OF ARCH LANHAM
RECORD REVIEWS
FIELD OBSERVATIONS

*15 INVESTIGATION INTO DISPOSITION OF NON-CONFORMANCE REPORTS
BACKGROUND INVESTIGATION INFORMATION
PERSONAL INTERVIEWS
INTERVIEW OF DENNIS DONOVAN
INTERVIEW OF REX BAKER
INTERVIEW OF KENNETH SHINKLE
RECORD REVIEWS
FIELD OBSERVATIONS

FINDINGS

ITEMS OF NONCOMPLIANCE

QA

THE CINCINNATI GAS & ELECTRIC COMPANY

WM. H. ZIMMER NUCLEAR POWER STATION

DDC No. E-3324 Page 1 of 1

DWG/SPEC. NO.:	REV.	ITEMIZATION NO. & SYSTEM:	DDC PREPARED BY:	DATE:
E187	R		E.J. Maynard	7-25-78
DWG/SPEC. NAME:	**DWG/SPEC. ISSUED BY:**	**DWG/SPEC. REGISTER NO:**	**DDC REGISTER NO.:**	
DRYWELL SEC.	S&L	94015	99373	

REASON FOR CHANGE

ANACONDA METAL HOSE NOW HAS AVAILABLE FLEXIBLE NUCLEAR LIQUIDTIGHT WIRING CONDUIT DESIGNATED AS TYPE "NWC" & "NPW" WHICH IS SUITABLE FOR SERVICE WITHIN THE CONTAINMENT AREA OF NUCLEAR GENERATING STATIONS

DESCRIPTION OF CHANGE

REVISE NOTE 4 ON E187 (OR ADD ADDITIONAL NOTE) INDICATING THAT ANACONDA TYPE NWC (SIZES 3/4" THROUGH 2") AND TYPE NPW (SIZES 2 1/2" THROUGH 4") FLEXIBLE LIQUID TIGHT ELECTRICAL WIRING CONDUIT WITH STANDARD FITTINGS IS ACCEPTABLE AS AN EQUAL TO ANACONDA BRONZE CORRUGATED HOSE, TYPE 50, WITH MALE FITTINGS

DDC CANCELLED
BY E-187 Rev S-
DATE 12-19-78

Essential ☒
Non-Essential ☐

KE Cognizant Engineer Review — S&L Preparer — Date

E J Maynard 7/25/78

Chief Piping Engineer — Construction Engineer — Electric Const. Engineer

APPROVAL OF CHANGE:

Stephen V. Tatich 7/31/78 — S&L ENGINEERING — DATE

R.T. Reimann 8-1-78 — CG&E ENGINEERING — DATE

R P Ehes 8-2-78 — CG&E QUALITY ASSURANCE — DATE

Paragraph 4.1.18

CN-5476, 77, 79

1. Reinspect with NRC inspectors

KEI QC inspector Dennis Donavan said the welds on C/N 5476, 5477, and 5479 have been cut out and replaced (not just repaired)

Donavan is supply to Daniels/Barrett KEI-1 and NDE records for the replacement welds

TD 8/25/81

FIELD (... CLEE (4), S&L (1), A.I. (1), CA FILES (ORIG.) C/N 5477 5

HIKCO FORM NO. C-34

DRAFT1 10/8/81

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, August 10, [redacted] 24-28, and October 5-9, 1981

Investigation Team Members:

P. A. Barrett — Date
Reactor Inspector

J. B. McCarten — 10/13/81
Investigator

R. M. Burton — Date
Investigator

E. C. Gilbert — Date
Investigator

P. E. Baci — Date
Investigator

A 23037

KAISER ENGINEERS, INC.

Wm. H. ZIMMER NUCLEAR POWER STATION – WELD DATA SHEET

(See reverse side for instructions & responsibilities)

new pipe ~~358-12~~ 356

Field Weld No. [illegible]

Cleanliness Class

System/Component: Chilled Cooling Water — ISO DWG No. PSK-1WR-9 — Line No. 1WR17KB2½ — MK# ~~[illegible]~~ — 1WR17AB2½-357 — ~~357~~ H2256

Base Mat'l SA P1 — To SA P1 — Nom. Pipe Size 2½" — Nom. Wall Thks. .203" — Fillet Size NA

Code Class C — Welding Procedure No. 3.1.7 — Special Instructions

[redacted] 31

Filler Material Requirement:

Electrode Type E70S-2 — Bare/Covered - Size 3/32 — HT#/Lot# 065118 — Size 1/8 — HT#/Lot# — Size — HT#/Lot#

Consumable Insert X — HT No. 6059491 — Backing Ring NA — HT#

Purge Req.: I.D. Purge X — CFH 6 Vol. Chgs. — Torch Purge X — CFH 15-25

Ref. Cip/Weld No.: [illegible]

Heat Treat Requirements: *300° F Min required for welds N/A

90° ELL HT# LL35B · from original spool -357 RLR 11-17-80

~~Kellogg Spool 1WR 13AB-356~~

2½" Pipe HT# 240483

Preheat Temp Req. 60° °F Min — Interpass Temp Req. 60° °F Min — Post Weld Req. NA — Procedure

Fit Up / Installation / NDE Requirements:

Instructions	Req.	QA Stamp	Date	AI Hold Pts	Record/Remarks	Instructions	Req.	QA Stamp	Date	AI Hold Pts	Record/Remarks
1) Verify, proper weld procedure, welders qualif., proper filler mat'l., proper C.I./B.R.	X	KEI QA 38	10/17/77			(11) NDE: FINAL RT/UT	NA	NA			
2) Verify proper bevels, details for, cleanliness, damage. Verify Mark No.'s	X	KEI QA 38	10/17/77		Record MK No. new pipe ~~358-12~~ RLR 11-17-80 to MK No. ~~elbow~~ 357	(12) Verify welders I.D. on weld joint. (record welder's symbol)					
3) Verify proper fit-up, Insp. tack welds.	X	KEI QA 38	10/17/77			(13) Tack Symbol KGJ	(14) Root Layers Symbol KGJ			(15) Intermediate Layers Symbol KGJ	
4) NDE: Examine weld edge preparation surface	MT PT HT Other	NA				(16) Symbol	(17) Symbol			(18) Final Symbol KGJ	
5) NDE: ROOT PASS (visually examine I.D. surface were accessable)	MT PT RT Other	NA			Verify Preheat Temp > 60	(19) Verify Ferrite Content (where applicable)	NA	NA			Record Range
6) NDE: INTERPASS	MT PT Other	NA			Verify Interpass Temp. > 60						
7) NDE: FINAL PASS Prior to PWHT —	~~MT~~ ~~PT~~ ~~UT~~ (Other)	KEI QA 38	10/17/77		Visual Per SPPM 4.6 R-2	(20) 1st Repair Ref. WRD No.					
8) NDE RT prior PWHT	RT	NA				(21) 2nd Repair Ref. WRD No.					
9) POST WELD HEAT TREAT • Verify Record Time/Temp.	[illegible] NA	NA			Attach Time/Temp. Recordings	(22) 3rd Repair Ref. WRD No.					Note: If 3rd repair is not acceptable, refer to Review Board Action. Attach Copy NR
10) NDE FINAL MT/PT	NA	NA				APPROVALS: [signature] 10/17/77 Field Welding Engr.	[signature] 10/5/77 Welding QA Engr.				

LOG OF NONCONFORMING MATERIAL REPORTS

	KEI Control Number	NR # Essen.	NR # Non-Ess.	P/O Spec.	Equip. Name or Process	Date NR Initiated	KEI Constr. Engr.	Disp.	Approval Status: Spon. Engr. / QA&S	Approval Status: S&L	Approval Status: KEI QAE	NR Closed
K B	5473	3074		H2073 [illegible]	[illegible]	3-4-81	4-8-81	ACCEPT AS IS	[illegible] / 4-11-81			
K B	5474	3120		H2173 [illegible]	[illegible]	3-4-81	4-27-81	REWORK REPAIR ACCEPT	[illegible] / 4-27-81			
D P	5475	3061		[illegible] H2256	NO ROD SLIP	2-24-81	5-28-81	REWORK	TO CG&E / 5-28-81			
[illegible]	5476			H2174	Cont Connection Bm #63 551' Drywell							
DD	5477	VOID	—	H2174	Cont Connection Bm #58 551' Drywell	NR	NOT	ISSUED	—	—	[illegible]	2-27-81
DD	5478	VOID	—	H2174	Cont Connection Bm #62 551'	NR	NOT	ISSUED	—	—	[illegible]	2-27-81
DD	5479	VOID	—	H2174	Cont Connection Bm #3 551' Drywell	NR	NOT	ISSUED	—	—	[illegible]	2-27-81
DD	5480	3048		H2174	Cont End Bm #40 590' Drywell	2-20-81	3-5-81	ACCEPT AS IS REWORK	3-17-81 / 3-20-81	3-10-81	3-23-81	
	5481	6231		H2256	[illegible]	2-25-81	2-26-81	ACCEPT AS IS	3-19-81 / 3-20-81	3-6-81	3-23-81	3-23-81
FR BR	5482	5120 R2		H-2256	WELD NOT DOC. WELD MISS DOC.	2-24-81	2-27-81	ACCEPT AS IS	3-19-81 / 3-20-81	3-11-81	3-23-81	3-23-81
	5483	515[illegible]		H-2256	WELD BM NO [illegible]	1-23-81	2-25-81	ACCEPT AS IS	3-3-81 / 3-3-81	3-2-81	3-3-81	3-3-81
[illegible]	5484	3[illegible]3		H-2123	[illegible]	2-26-81 / 3-13-81	6-1-81	ACCEPT AS IS	TO CG&E / 6-2-81			
D P	5485	3062		DDC SLS [illegible]	[illegible]	2-25-81	5-11-81	REWORK	N/A / 5-29-81	N/A	6-3-81	

A = 52.37
= 9640.39

KAISER ENGINEERS, Inc.
STORES ISSUE (Weld 2 Form)

No. W 97957

Date: 10 17 7

SYSTEM WR WELD NO.

DRAWING NO. SK WR WELD PROCEDURE 31.7

Stock No.	Description	Qty.	Unit	Unit Price	Amount			Account No. Charge	CR.
150-270		1							
	HEAT #								
	QTY. RETURNED	0							
	NET	1							
	HEAT #								
	QTY. RETURNED								
	NET								

WELDER SIGNATURE: SYMBOL: K G J TOTAL 113

AUTHORIZED BY: FILLED BY: RECEIVED BY:

1393

31

A 23037
UNIT 3640.39

KAISER ENGINEERS, Inc.
STORES ISSUE (Weld 2 Form)

P-32
No. W 97957 3/20/81 JGM
Date: 10-17-77

SYSTEM WR WELD NO. WR K523 3/20/81

DRAWING NO. PSK WR-9 WELD PROCEDURE 3.1.7

Stock No.	Description	Qty.	Unit	Unit Price	Amount		Account No. Charge	CR.
150-270	2 1/2" sch 40 C.S.	1					2673654039	
	HEAT # CONS. INSERT							
	QTY. RETURNED	0						
	NET	1						
	HEAT #							
	QTY. RETURNED							
	NET							

WELDER SIGNATURE [signature] SYMBOL: KGJ TOTAL .183

AUTHORIZED BY: B. Hulz FILLED BY: RECEIVED BY: ABW

193

31

34

KAISER ENGINEERS, Inc.
STORES ISSUE (Weld 2 Form)

No. W 97957

Date: 10 17 7

STEM WR

DRAWING NO. FSK WR 9 WELD NO. WR 523

WELD PROCEDURE 3.1.7

Stock No.	Description	Qty.	Unit	Unit Price	Amount			Account No. Charge	CR.
	2 1/2 Sch 40 C.S.	1							
	HEAT #								
	QTY. RETURNED								
	105 9491 NET								
	HEAT #								
	QTY. RETURNED								
	NET								

SIGNATURE: [illegible] SYMBOL K C J TOTAL

AUTHORIZED BY: [illegible] FILLED BY:

RECEIVED BY: [illegible]

31

1. ... POWER STATION	NO. E-2996 ...	PAGE 1 OF ...

1. INSTALLATION NO.	2. DWG/INSTALLATION NAME	3. PO/CONTRACT NO.	4. SUPPLIER/CONTRACTOR NAME
MS-26A	MS-26A	7020	H.JK
5. INSPECTION PLAN NO.	6. INSPECTOR:	7. DATE:	8. SPECIFICATION NO. / ASME
	BAKER	2-2-81	2256 / YES X NO ☐

9. DESCRIPTION OF NONCONFORMANCE

System: Suppression Pool

System: Main Steam

Requirement: ASME, NE-5321, ...s that are shown by ... to have any zone of incomplete penetration are acceptable.

Contrary to above: Full Penetration welds on T-Quenchers S/N S/N003, S/N007, S/N009, 011, and S/N012 were found to have Lack of penetration at the backing ring (1). H.P. is split backing ring (2) Rest of welds is acceptable.

10. DISPOSITION

Accept As is

S&L Action: Welds on quenchers 001, 003, 009, 011, and 012 are acceptable based on the UT wall thickness data provided on P.O. Additional data on #007 is required and the non-conformance on it remains. CGE is to submit a revised ... include additional data.

11. DISPOSITION INSTRUCTIONS/JUSTIFICATION

Condition as stated as lack of fusion is at point of contact with backing ring splice, integrity of weld is not effected

2/9/81 [signature]

Subject T Quenchers have been U.T.'d by NES per S&L request. See attached copies of U.T.

2/24/81 [signature]

CLOSED

REPLY REQUESTED BY "RUSH" DATE 3-17-81

prel. [signature]

J. Alcimo 2/9/81

KEI CONSTRUCTION ENGR. DATE

12. REVIEW BOARD (REQUIRED ON ALL ACCEPT/REPAIR DISPOSITIONS)

(conditional - see above) partial approval as noted — conditional approval

[signature] 3-4-81	[signature] 3/12/81	R.F. Wood 3/13/81	David Foe 3/16/81
DATE	CG&E SPONSOR ENGR DATE	CG&E Q.A.&S. DATE	KEI QAE DATE

13. REPAIR/REWORK COMPLETE AND ACCEPTABLE

INSPECTOR/ENGINEER DATE

14. CAUSE

Not using proper welding procedure pertaining to use of backing ring

15. CORRECTIVE ACTION

people instructed to be more knowledgeable on proper welding procedures [signature]

[signature] 3/17/81

28

C/N 5712

To P.S. Gittings
cc C.A. Burgess

10-15-80

Re: HSK QA S/R 2800 of 10-9-80 Splitting of Jacket on Anaconda Supplied Liquatite Flex Conduit.

The GCD Electrical Engineer has been aware of this problem for some time and has been working with the vendor to determine the cause of the splitting of the liquid tite jacket material on their flex conduit.

The engineers do not feel this is a reportable case under 50.55e because the problem does not fit the criteria for reportability.

Conduit is used to protect cable from physical damage this includes flex conduit. The jacket is used on Anaconda Flex to make it liquid tite. that is to prohibit the entrence of moisture. If this moisture barrier is broken, as in the case of split jacket, there could be no damage to the cables because our cables have water proof insulation and jacketing proven in LOCA tests. What we do not want to happen is for the broken jacket material to fall off the flex and clog sump pumps, which has not been happening.

23

I agree, that if flex replacement is made it will be a big problem, but I feel it is not a reportable item.

A.P. Chao

Q. A. SURVEILLANCE REPORT

No. 2800

To: C.A. Burgess

Organization:

cc: Wayne Bible

Reference: QACM-014

___ In-process Deficiency ___ Clarification ___ Calibration/Test Record

___ Audit/Follow-up ___ Subcontractor Surveillance ✓ Surveillance Information

GENERAL OBSERVATIONS/DESCRIPTION:

SYSTEM Conduit

(LIQUATITE)

The N.W.C. type of flexible conduit used in the containment area has been splitting. It is not certain to what is causing the flex to split. The splitting seems to be caused from rotting or some reason other than mechanical or carelessness.

Some examples are conduits LD035, LD010, LD027 and LD030. These examples are photo-displayed on the following page. NOTE: Flex conduit LD030 has been removed and is available for examination.

Report Prepared By: Mark R. Priebe WPB 10/14/80 QCP Date 10-9-80

If Deficiency is Nonconforming in Nature, List:

1. Reference Drawing, Spec. or Std.

2. Specific Location

CORRECTIVE ACTION STATEMENT Check with Phil, this could be a reportable item under 50.55 E. ?? Material Breakdown NR 4, 5 5122 & 5196 VOIDED IN LIEU OF THIS SR N/A

CG&E SHOULD CONSIDER REPORING UNDER 50.55 E (SEE ATTACHED SHT. FROM B. EHAS)

10/15/80

Corrective Action Verified By: N/A Date 10/14/80

FIGURE 1

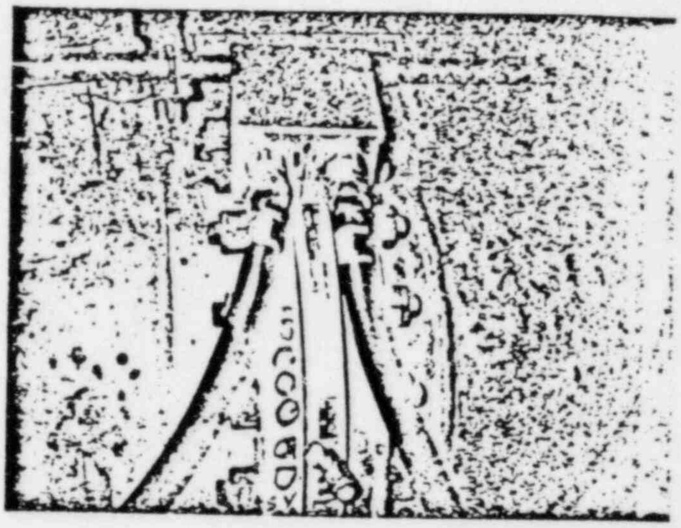
23

KAISER ENGINEERS, INC.
WM. H. ZIMMER POWER STATION

NONCONFORMANCE REPORT
No. ________ Page 8 of 4

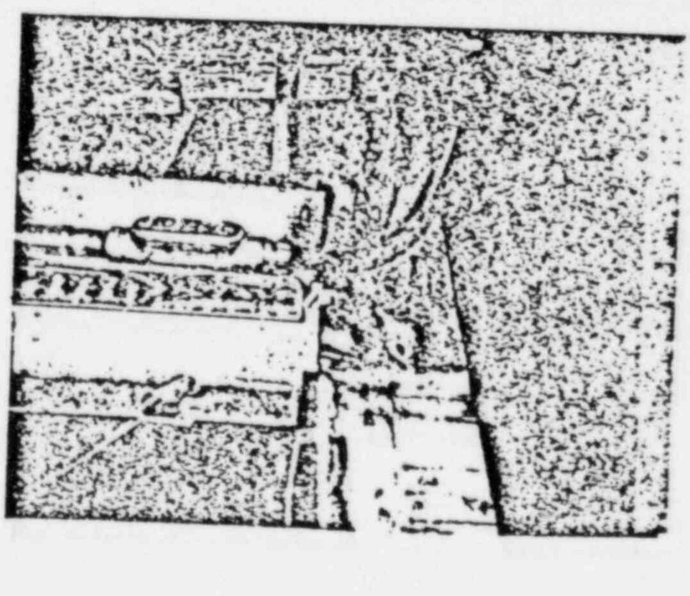
9. Description of Nonconformance

PCO-59
525' 1"



LD-746
525' 3/4"

LD-724
525' 3/4"



23

QA# 5122

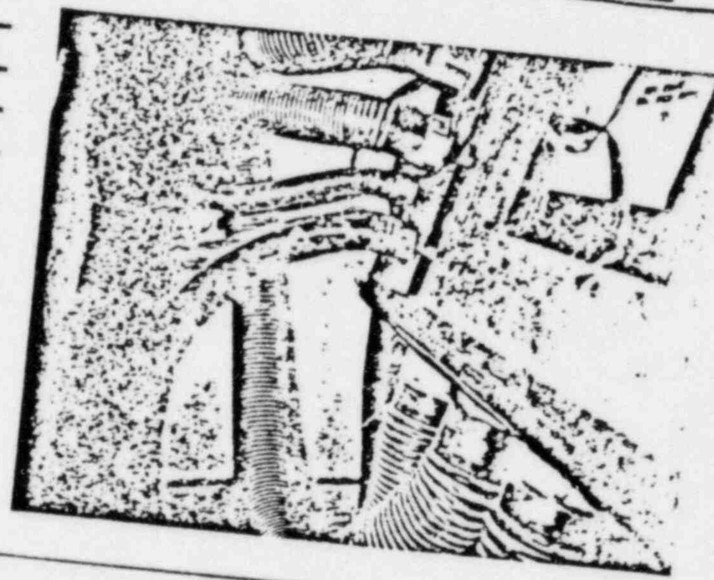
WM. H. ZIMMER POWER STATION

9. Description of Nonconformance

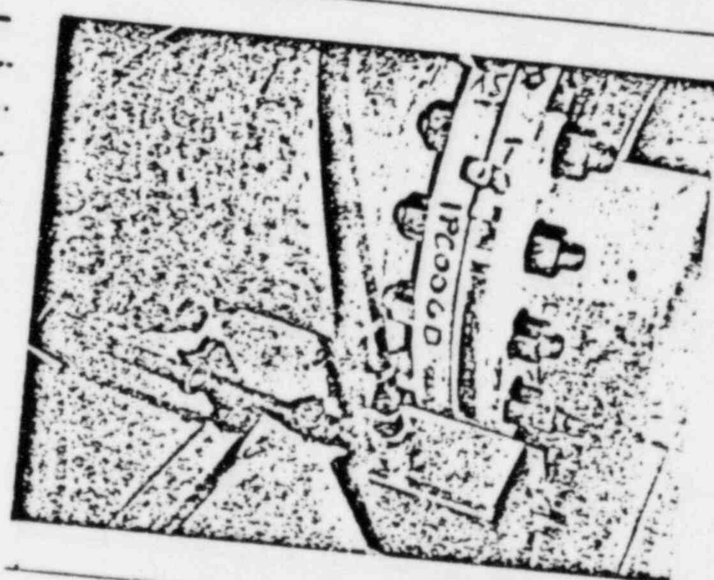
NONCONFORMANCE REPORT

No. ________ Page 3 of 4

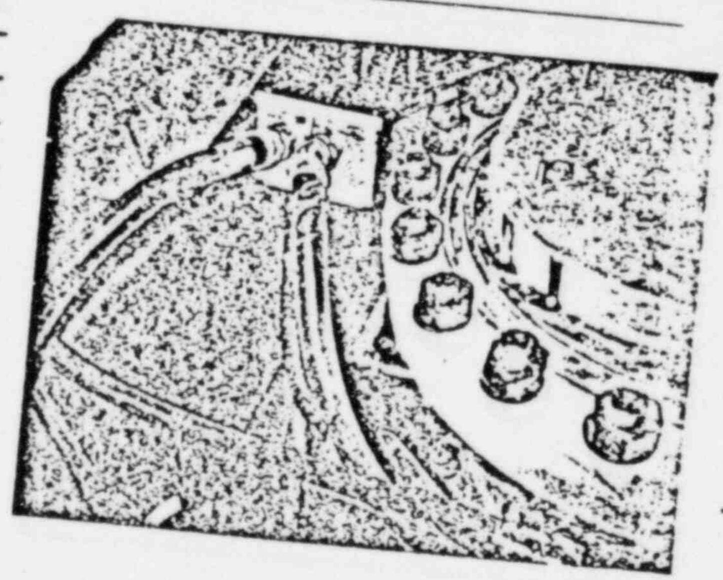
LD-912
PENETRATION "E-5-1"



PCO-62
525'-1"



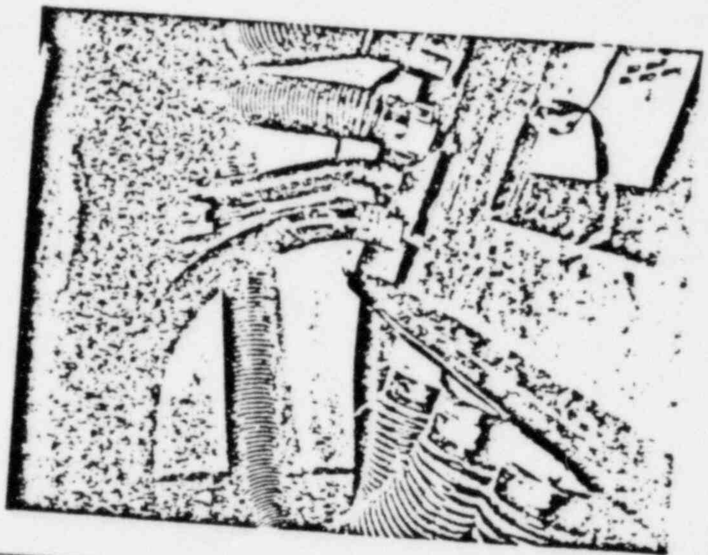
PCO-62
525'-1"



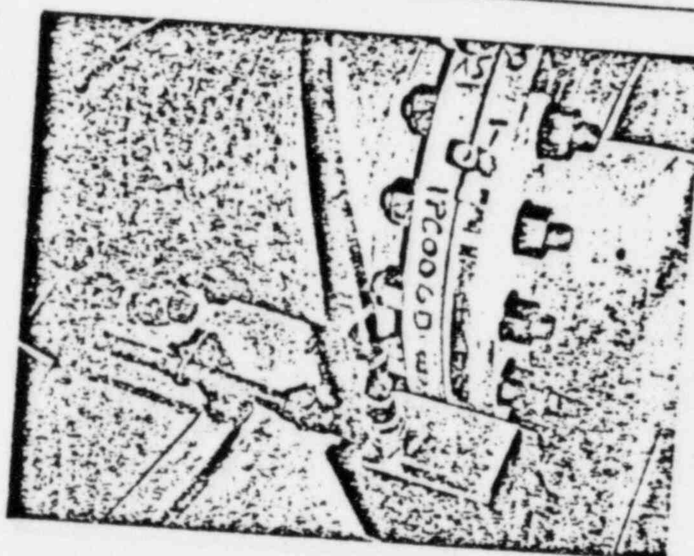
23

CNF 5122-

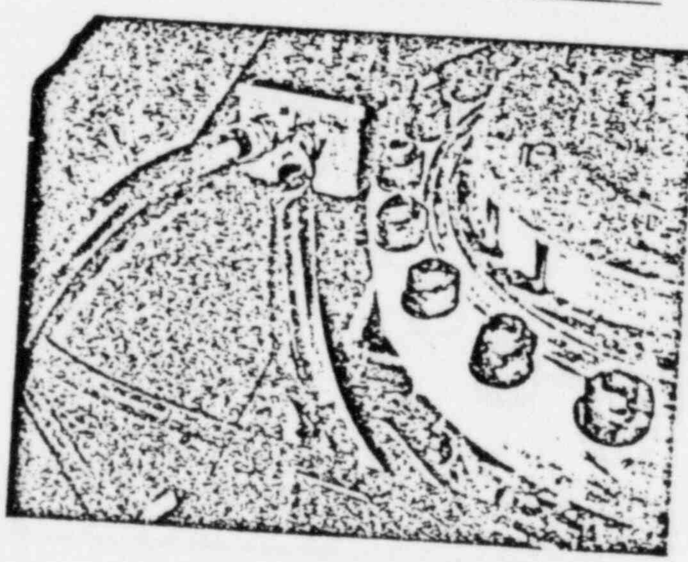
)-912
ETRATION #E-5-1"



-62
- 1'



62
-1"



23

CNF 5122
CN 5122

HENRY J. KAISER, CO.
WM. H. ZIMMER POWER STATION

NONCONFORMANCE REPORT

NO. E-2936 Rev. 1 PAGE 1 OF 1

1. DWG/INSTALLATION NO.	2. DWG/INSTALLATION NAME:	3. PO/CONTRACT NO.	4. SUPPLIER/CONTRACTOR NAME:
PSK WS-61	Service Water	7070	HJK
5. INSPECTION PLAN NO.:	**6. INSPECTOR:**	**7. DATE:**	**8. SPECIFICATION NO.** / **ASME**
PSK WS-61	R. Baker	11-10-80	H-2256 Form 410 — YES ☒ NO ☐

9. DESCRIPTION OF NONCONFORMANCE	10. DISPOSITION	11. DISPOSITION INSTRUCTIONS/JUSTIFICATION
LOCATION: Yard SYSTEM: Service Water REQUIREMENT: H-2256, Form 410, all pressure - retaining welds in Class III Piping, 4" and greater shall be radiographed. CONDITION: During a NES Audit Weld WS-737 was found not to have a radiograph taken of the final weld. Only film available is a information shot of the root layer. Subject weld is buried underground.		

12 REVIEW BOARD (REQUIRED ON ALL ACCEPT/REPAIR DISPOSITIONS)

KEI CONSTRUCTION ENGR. DATE

S&L DATE | CG&E SPONSOR ENGR DATE | CG&E Q.A.&S. DATE | KEI QAE

13. REPAIR/REWORK COMPLETE AND ACCEPTABLE

INSPECTOR/ENGINEER DATE

14. CAUSE	15. CORRECTIVE ACTION
	20

KAISER FILE (7), CG&E (4), S&L (1), A.I. (2), QA FILES (ORIG.)

5208

NPC

HENRY J. KAISER, CO.
WM. H. ZIMMER POWER STATION

NONCONFORMANCE REPORT

NO. E-NCR-[illegible] PAGE 1 OF 4

1. DWG/INSTALLATION NO.	2. DWG/INSTALLATION NAME:	3. PO/CONTRACT NO.	4. SUPPLIER/CONTRACTOR NAME:
E-145	ELECT - INSTALLATION	7070	FEC

5. INSPECTION PLAN NO.:	6. INSPECTOR:	7. DATE:	8 SPECIFICATION NO.	ASME
—	CAB 11/11/80 MARK PRIEBE	10-16-80	QACMI G-4	YES ☐ NO ☑

9. DESCRIPTION OF NONCONFORMANCE	10. DISPOSITION	11. DISPOSITION INSTRUCTIONS/JUSTIFICATION
LOCATION: CONTAINMENT SYSTEM: CONDUITS (FLEX) - LD, VP, AR, AS, RI REQUIREMENTS: QACMI G-4 REF: SR 2800 DEFICIENCY: THE N.W.C. LIQUITITE TYPE OF FLEXIBLE CONDUIT, USED IN THE CONTAINMENT AREA, HAS BEEN SPLITING. IT IS NOT CERTAIN TO WHAT IS CAUSING THE FLEX TO SPLIT. THE SPLITING SEEMS TO BE CAUSED FROM AGING OR SOME OTHER REASON THAN MECHANICAL OR CONSTRUCTION CARELESSNESS. SOME EXAMPLES ARE PICTURED ON THE FOLLOWING PAGES.		See attached SR 2800 dtd 12/8/81

12. REVIEW BOARD (REQUIRED ON ALL ACCEPT/REPAIR DISPOSITIONS)

S&L DATE | CG&E SPONSOR ENGR DATE | CG&E Q.A.&S. DATE | KEI CONSTRUCTION ENGR. DATE | KEI QAE DAT

13. REPAIR/REWORK COMPLETE AND ACCEPTABLE

INSPECTOR/ENGINEER DATE

14. CAUSE

15. CORRECTIVE ACTION

22 & 23

KAISER FIELD (7), CG&E (4), S&L (1), A.I. (1), QA FILES (ORIG.)

CN# 5122

HJKCO FORM NO. QA-
Rev. 7

HENRY J. KAISER, CO.

WM. H. ZIMMER POWER STATION

NONCONFORMANCE REPORT

NO. E-2466 PAGE 1 OF 3

1. DWG/INSTALLATION NO.	2. DWG/INSTALLATION NAME:	3. PO/CONTRACT NO.	4. SUPPLIER/CONTRACTOR NAME
VARIOUS	DG, L/B HANGERS	9070	HJK/CG&E
5. INSPECTION PLAN NO.:	6. INSPECTOR:	7. DATE:	8. SPECIFICATION NO. / ESSENTIAL
VARIOUS	BELCHER/RAMSEY/RUIZ/WARD	1/3/80	VARIOUS / YES ☑ NO ☐

9. DESCRIPTION OF NONCONFORMANCE

SYSTEM: DIESEL GENERATOR (DG)

LOCATION: DIESEL GENERATOR BUILDING "A, B, C"

REF: QACMI-M-12, QACMI-M-15, SQPM-4.6, DOC-SCS-328

CONDITION: THE FOLLOWING PROCESS PIPE HANGERS WERE INSPECTED FOR WELD ACCEPTABILITY AND HILTI BOLT ACCEPTABILITY. DURING THE TIME OF INSPECTION THE PROCEDURES CHANGED REQUIRING, ON A SURVEILLANCE BASIS,

10. DISPOSITION

11. DISPOSITION INSTRUCTIONS/JUSTIFICATION

VOID

EACH HANGER LISTED WILL BE ISSUED A SEPARATE NR 2-3-80

12. REVIEW BOARD (REQUIRED ON ALL ACCEPT/REPAIR DISPOSITIONS)

CONSTRUCTION ENGR. DATE

S&L DATE | CG&E SPONSOR ENGR DATE | CG&E Q.A.&S. DATE | KEI QAE DATE

13. REPAIR/REWORK COMPLETE AND ACCEPTABLE

INSPECTOR/ENGINEER DATE

14. CAUSE

15. CORRECTIVE ACTION

19

(4). S&L (1), A.I. (1), QA FILES (ORIG.) CN 4313

HJKCO FORM NO.

Description of Discrepancy	Disposition	Disposition Instructions & Details
INSPECTION FOR CONFIGURATION AND LOCATION, ANY DEFICIENCIES THAT WERE FOUND ON THESE HANGERS IS SO NOTED. ITEMS IN THIS N/R WHICH ARE IDENTIFIED WITH AN "X" APPEAR TO BE VENDOR SUPPLIED WELDS.		

9. Description of Nonconformance	10. Disposition	11. Disposition Remarks
1DG096HR Rev.B 1-8-80		
Weld: Rust, Slag, Porosity, Under-cut Greater Than 1/32 In. Lack of Fusion, Cold Lap & Arc Strike in Heat Affected Zone. "U"-Bolt Nuts Not Welded.		
1DG095HR Rev.A 1-8-80		
Weld: Slag, Blow Hole, Cold Lap, Porosity & Rust. "U"-Bolt Nuts are Not Welded.		
1DG097HR Rev.A 1-8-80		
All Welds: Slag, Porosity, Lack of Fusion, Cold Lap, Rust & Lack of Fusion, Greater Than 1/32 Inch. "U"-Bolt Nuts are Not Welded.		
1DG031HR Rev.B 1-8-80		
All Welds: Cold Lap, Arc Strikes & Under-cut Greater Than 1/32 Inch.		
* 1DG011SR Rev.A 1-8-80 ~~Item-3 To Item-4's Heavy Paint Coveld Under-cut Suspected of Exceeding 1/32 Inch.~~		
* 1DG048HR Rev.A 1-8-80 ~~Welds: Evidence of Cold Lap & Under-cut Under Dry Paint.~~		

19

* Under Welds

Description of Nonconformance	Disposition	Closure Instructions
DG019HR REV.A 1-8-80 ALL WELDS - COVERED WITH SLAG		
DG091HR REV.A 1-8-80 ~~WELD - HEAVY PAINT, EVIDENT OF PIN HOLE & POSSIBLE POROSITY.~~ "U"-BOLT NUTS ARE NOT TACKED.		
DG032HR REV.A 1-8-80 ITEM #1 TO EMBEDMENT PLATES: SLAG & RUST PREVENTS ADEQUATE INSPECTION. UNDER-CUT GREATER THAN 1/32 INCH. ITEM #2 TO ITEM #1: COLD LAP & WELD SPATTER. UNDER-CUT GREATER THAN 1/32 INCH		
DG037HR REV.C 1-8-80 ITEM #7 (SOUTH SHEAR LUG): INCOMPLETELY WELDED. ITEM #7 (NORTH SHEAR LUG): UNDER-SIZED FILLET, APPROX. 1/8" INSTEAD OF REQUIRED 3/16" FILLET. ITEM #3 TO ITEM #4: UNDER SIZED FILLET LESS THAN 1/8 IN. & LACK OF FUSION.		
DG130HR REV.B 1-9-80 ANGLE TO PLATE: UNDER-CUT GREATER THAN 1/32 INCH. INCOMPLETE WELD & FILLET IS UNDER-SIZE - 1/8" INSTEAD OF REQUIRED " FILLET. HEAVY RUST. VENDOR WELDS		

[illegible]

NAD

WM. H. ZIMMER POWER STATION | NONCONFORMANCE REPORT No. 5 Page 5 of 31

9. Description of Nonconformance	10. Disposition	11. Disposition Instructions & Results
IDG 131 HR REV. B 1-9-80 ANGLE TO PLATE: HEAVY RUST & SLAG. INCOMPLETE WELD & UNDER-SIZE FILET- 1/8 IN. INSTEAD OF REQUIRED 1/4 INCH.		
IDG 043 HR REV. A 1-9-80 ALL WELDS: UNDERSIZE FILLETS 1/8" INSTEAD OF 3/16 INCH. ITEM #3 TO PLATE: HEAVY UNDER-CUT DETECTABLE UNDER PAINT. HEAVY PAINT PREVENTS PROPER INSPECTION		
IDG 042 HR REV. A 1-9-80 ITEM #3 TO #4: WELD HAS UNDER-CUT GREATER THAN 1/32 INCH. ~~ITEM #3 TO #2 & ITEM #6 TO #1: WELDS ARE COVERED WITH HEAVY PAINT & SLAG MINIMIZE SUSPECTED OF CONCEALING DEFECTS.~~		
~~IDG 041 HR REV. A 1-9-80 ALL WELDS: THERE IS EVIDENCE OF UNDER-CUT, COLD LAP & POROSITY & MAY BE UNDER HEAVY PAINT.~~		
IDG 088 HR REV. A 1-9-80 ~~HEAVY PAINT SUSPECTED OF COVERING UNDER-CUT & COLD LAP.~~ U-BOLT NUTS ARE NOT WELDED.		

19

[illegible] POWER STATION

NONCONFORMANCE REPORT

NO. E-2836 PAGE 1 OF 1

1. INSTALLATION NO.	2. DWG/INSTALLATION NAME	3. PO/CONTRACT NO.	4. SUPPLIER/CONTRACTOR NAME
35K WS-61	SERVICE WATER	7070	H&K
5. INSPECTION PLAN NO.	6. INSPECTOR	7. DATE	8. SPECIFICATION NO. / ASME
35K WS-61	BAKER	10-23-80	H2256, Form 110 / YES X NO

9. DESCRIPTION OF NONCONFORMANCE	10. DISPOSITION	11. DISPOSITION INSTRUCTIONS/JUSTIFICATION
LOCATION: YARD	Accept As Is	The KEI for weld W.S. 737 shows that the weld was radiographed and accepted by Bailey NDE Level III [illegible]. KEI also shows the film was reviewed and accepted by site ANI on 4-15-76. A copy of Radiograph Report shows acceptance by Peabody Magnaflux also complies with KEI.
SYSTEM: SERVICE WATER		10/24/80
EQUIPMENT: H2256, FORM 110, ALL PRESSURE-RETAINING WELDS IN CLASS III PIPING, [illegible] GREATER SHALL BE RADIOGRAPHED.		
Condition: During a KES audit weld WS-737 was found not to have a radiograph taken of the final weld. Only film available is information shot of the root layer. Subject weld is buried underground.		

REPLY REQUESTED BY 11-5-80

REVIEW BOARD (REQUIRED ON ALL ACCEPT/REPAIR DISPOSITIONS) [illegible] A.N.I. Rejected 11/7/80 [illegible] KEI CONSTRUCTION ENGR DATE

SSL DATE | CG&E SPONSOR ENGR DATE | [illegible] | CG&E [illegible] DATE | KEI CG&E [illegible]

REPAIR REWORK COMPLETE AND ACCEPTABLE

SEE RCVN [illegible] FOR NEW DISPOSITION 11-18-80

CLOSED

DATE 11-19-80

INSPECTOR/ENGINEER | DATE

CAUSE: LOST X-RAY FILM [signature] 11/17/80

15. CORRECTIVE ACTION: QC TO MAINTAIN ALL WELD RECORDS FOR ESS. SYS.

20

VOID STAMP IN ERROR - RCVN CANCELLED [illegible] AND ACCEPTED DISPOSITION. 11-11-80 [signature] 9.

[illegible]

Alt. K120

COPY

10-27-80

NONCONFORMANCE REPORT

NO E-2036 Rev 1 PAGE 1 OF 1

WOLF CREEK GENERATING STATION

INSTALLATION NO. SK WS-61	ORIGINATING COMPONENT: SERVICE WATER	PO/CONTRACT NO. 7070	SUPPLIER/CONTRACTOR NAME: KSE
INSPECTION PLAN NO. SK WS-61	INSPECTOR: WAKER	DATE Rev 1 11-4-80 / 10-27-80	SPECIFICATION: ASME YES X NO

DESCRIPTION OF NONCONFORMANCE:

LOCATION: YARD

SYSTEM: SERVICE WATER

REQUIREMENTS: ~~ASME CODE ... pressure ... class III ... radiography ... be retained~~ Retain Records (Rev 1)

CONDITION: DURING A RECORD ... weld W.S. 737 ... film could not ... located ... (Rev 1) Only film available ... information that of ... ... subject ... in buried when ... ed.

DISPOSITION: Accept as is

DISPOSITION JUSTIFICATION: (Rev 1 11-4-80)

The KEI for weld W.S. 737 shows that the weld was radiographed and accepted by Kaiser NDE level III on 4-5-76. KEI also shows that film was reviewed and accepted by site A.N.I. on 4-15-76. A copy of radiograph report shows acceptance by Peabody - Magnaflux also on file with KEI.

10/24/80 [signature]

REPLY REQUESTED BY 11-5-80

(MRB BOARD REQUIRED ON ALL ACCEPT/REPAIR DISPOSITIONS)

[signature] 11/4/80 DATE — [signature] 10/31/80 CIVIL SPONSOR ENGR DATE — J. F. Winnerberg 11/6/80 ... Q.A.S. DATE — [signature] KEI CLASS ... ENGR DATE — [signature] 11/7 KEI QAE

REPAIR/WORK COMPLETE AND ACCEPTABLE

INSPECTOR/ENGINEER DATE

CORRECTIVE ACTION

QC TO MAINTAIN ALL WELD RECORDS FOR ESS. SYS.

THIS COPY ISSUED FOR INFORMATION ONLY NOT TO BE USED FOR PHYSICAL CONSTRUCTION

NR CLOSED

... 11-13-80

20

9.

57

LOG OF NONCONFORMING MATERIAL REPORTS

KEI Control Number	NR # Essen.	NR # Non-Ess.	P/O Spec.	Equip. Name or Process	Date NR Initiated	KEI Constr. Engr.	Disp.	Spon. Engr. / QA&S	S&L	KEI QAE	NR Closed	
4953	2738 ~~5153~~	...	H2256	w/Kay schedule pipe cut. DD-62	7-22-80	2-14-81	Rework	N/A / 2-17-81	N/A	2-19-81	5-20-81	D G
SEE CAR #8 4954	VOID		H-2114	Structural steel-bypassed QA hold points							7-23-8[illegible]	
4955	6 VOID		H2256	Seismic viol. between U-bolts, welding deficiencies	NR	NOT	ISSUED				9-30-80	D G
~~4956~~	VOID		H 2256	Num. welding deficiencies on pipe hangers	NR	NOT	ISSUED				9-30-80	D G
~~4957~~	VOID		H-2256	Num. welding deficiencies on pipe hangers	NR	NOT	ISSUED				9-30-80	D G
~~4958~~	VOID		H-2256	Num. welding deficiencies on pipe hangers	NR	NOT	ISSUED				9-30-80	D G
~~4959~~	VOID		H-2256	Num welding deficiencies on pipe hangers	NR	NOT	ISSUED				9-30-80	D G
4960	2606 R2		H2256	PSK WS-33, NO DOC. FOR STANCHION ON LINE WS12AA16.	7-22-80	7-24-80	Rework	NA / N.	NA	7-24-80	9-9-80	WS
4961	5154		H2256	PSK RH-13, ARC STRIKE ON VALVE BODY. PSK RH-15, GROUND AREA ON VALVE BODY.	7-18-80	9-18-80	Rework	N/A / 9-19-80	N/A	9-22-80	11-18-80	R H
4962	5059 R1		SPPM 4.6	ISK'S RH54, 369 & 65 VIOLATION OF BASE METAL REQ.	7-21-80	8-5-80	Rework	N/A / 8-6-80	N/A	8-7-80	10-21-80	R H
4963	2735	VOID	See R-1 [illegible] H 2256	PSK RI-171, REPAIR NOT COMPLETED ON WELD B8.	7-22-80						8-21-80	R I
4964	2737		H2121	BENT PLATE USED ON ANGLE FOR BEAM #11.	7-24-80	8-26-80	Rework	N/A / 8-28-80	N/A	8-28-80		S T
[illegible]	[illegible]			SR 2016 EXPIRED 30 DAY LIMIT	[illegible]		Accept	1-8-81	[illegible]	[illegible]	[illegible]	=

HENRY J. KAISER, CO.
WM. H. ZIMMER POWER STATION

NONCONFORMANCE REPORT

NO. _____ PAGE 1 OF 1

1. DWG/INSTALLATION NO.	2. DWG/INSTALLATION NAME:	3. PO/CONTRACT NO.	4. SUPPLIER/CONTRACTOR NAME:
1426-33H-SHT 10	PIPE SUPPORT	7070	HJK

5. INSPECTION PLAN NO.:	6. INSPECTOR:	7. DATE:	8. SPECIFICATION NO.	ASME
	S. McCANN S&B	7-9-80	H2256	YES ☐ NO ☒

9. DESCRIPTION OF NONCONFORMANCE	10. DISPOSITION	11. DISPOSITION INSTRUCTIONS/JUSTIFICATION
LOCATION: "A" DG ROOM EL 532'8" S.E.		
SYSTEM: DG SEIS: CLASS "E"		
REQUIREMENT: QACMI M-12 R.7		
DEFICIENCY: 1DG096HR HANGER HAS EXCESSIVE GAP (3/16") BETWEEN "U" BOLT & PIPE		
ALSO 1/4"x2"x2" ANGLE TO EMBEDMENT WELD HAS EXCESSIVE UNDERCUT, WELD IS UNDERSIZE WITH SLAG & COLD LAP		

12. REVIEW BOARD (REQUIRED ON ALL ACCEPT/REPAIR DISPOSITIONS)

KEI CONSTRUCTION ENGR. DATE

S&L DATE CG&E SPONSOR ENGR DATE CG&E Q.A.&S. DATE KEI QAE D

13. REPAIR/REWORK COMPLETE AND ACCEPTABLE

INSPECTOR/ENGINEER DATE

14. CAUSE	15. CORRECTIVE ACTION
	15

KAISER FIELD (7), CG&E (4), S&L (1), A.I. (1), QA FILES (ORIG.)

4931

HJKCO FORM NC. G
Rev.

HENRY J. KAISER, CO.
WM. H. ZIMMER POWER STATION

NONCONFORMANCE REPORT
NO. _____ PAGE 1 OF 1

1. DWG/INSTALLATION NO.	2. DWG/INSTALLATION NAME:	3. PO/CONTRACT NO.	4. SUPPLIER/CONTRACTOR NAME:
1428-35H-SHT "9	PIPE SUPPORT	7070	HJK

5. INSPECTION PLAN NO.:	6. INSPECTOR:	7. DATE:	8. SPECIFICATION NO.	ASME
	G. McCann PIB	9-9-80	H5256	YES ☐ NO ☒

9. DESCRIPTION OF NONCONFORMANCE	10. DISPOSITION	11. DISPOSITION INSTRUCTIONS/JUSTIFICATION
LOCATION: "A" DG ROOM EL 532'-8" S.E		
SYSTEM: DG SETS CLASS "B"		
REQUIREMENT: QACN II M-12 C.7		
DEFICIENCY: 1DG095HR HANGER 1/4"X2"X2" ANGLE TO EMBEDMENT WELD HAS EXCESSIVE SLAG, RUST, COLD LAP AND UNDERSIZED FILLET		

12. REVIEW BOARD (REQUIRED ON ALL ACCEPT/REPAIR DISPOSITIONS)

KEI CONSTRUCTION ENGR DATE

S&L DATE | CG&E SPONSOR ENGR DATE | CG&E Q.A.&S. DATE | KEI QAE D

13. REPAIR/REWORK COMPLETE AND ACCEPTABLE

INSPECTOR/ENGINEER DATE

14. CAUSE	15. CORRECTIVE ACTION
	15

KAISER FIELD (7), CG&E (4), S&L (1), A.I. (1), QA FILES (ORIG.)

4930

HJKCO FORM NO. C
Rev.

HENRY J. KAISER, CO.
WM. H. ZIMMER POWER STATION

NONCONFORMANCE REPORT

NO. _____ PAGE 1 OF 1

1. DWG/INSTALLATION NO.	2. DWG/INSTALLATION NAME:	3. PO/CONTRACT NO.	4. SUPPLIER/CONTRACTOR NAME:
(M-428-32H Rev B)	1DG083HR	7070	HJ KAISER

5. INSPECTION PLAN NO.:	6. INSPECTOR:	7. DATE	8. SPECIFICATION NO.	ASME
QACMI-12 R.7	J Mills R&D	7/22/80	H256	YES ☐ NO ☑

9. DESCRIPTION OF NONCONFORMANCE	10. DISPOSITION	11. DISPOSITION INSTRUCTIONS/JUSTIFICATION
LOCATION: DG ROOM "A" 0" off 12A 44'8" E-of H Elev 533'6"		
System: DG (Seismic B)		
Requirement: QACMI-12 R.7		
Deficiency: Weld craters not filled to nominal fillet size. Angle corners not tied into remaining weld.		

12. REVIEW BOARD (REQUIRED ON ALL ACCEPT/REPAIR DISPOSITIONS)

KEI CONSTRUCTION ENGR. DATE

S&L DATE | CG&E SPONSOR ENGR DATE | CG&E Q.A.&S. DATE | KEI QAE D

13. REPAIR/REWORK COMPLETE AND ACCEPTABLE

INSPECTOR/ENGINEER DATE

14. CAUSE	15. CORRECTIVE ACTION
	15

KAISER FIELD (7), CG&E (4), S&L (1), A.I. (1), QA FILES (ORIG.)

C/N 1959

HJKCO FORM NO. G
Rev.

4'

HENRY J. KAISER, CO.
WM. H. ZIMMER POWER STATION

NONCONFORMANCE REPORT

NO. PAGE 1 OF 1

1. DWG/INSTALLATION NO.	2. DWG/INSTALLATION NAME:	3. PO/CONTRACT NO.	4. SUPPLIER/CONTRACTOR NAME:
M-428-32H Rev A	1DG08ZHR	7070	H.J. Kaiser

5. INSPECTION PLAN NO.:	6. INSPECTOR:	7. DATE:	8. SPECIFICATION NO.	ASME
QACMI-M-12 R.7	J Mills	7/22/80	H2256	YES ☐ NO ☑

9. DESCRIPTION OF NONCONFORMANCE	10. DISPOSITION	11. DISPOSITION INSTRUCTIONS/JUSTIFICATION
Location; DG Room "A" 0" off 12A 38'10" S-of H ELEV 533'6"		
System; DG Seismic Class B		
Requirement; QACMI-12 R.7		
Deficiency; Undersized fillet, excessive Slag, Incomplete Weld-Out		

12. REVIEW BOARD (REQUIRED ON ALL ACCEPT/REPAIR DISPOSITIONS)

KEI CONSTRUCTION ENGR. DATE

S&L DATE CG&E SPONSOR ENGR DATE CG&E Q.A.&S. DATE KEI QAE DA

13. REPAIR/REWORK COMPLETE AND ACCEPTABLE

INSPECTOR/ENGINEER DATE

14. CAUSE	15. CORRECTIVE ACTION
	15

KAISER FIELD (7), CG&E (4), S&L (1), A.I. (1), QA FILES (ORIG.)

C/N 4958

HJKCO FORM NC. Q.
Rev. 1

HENRY J. KAISER, CO.
WM. H. ZIMMER POWER STATION

NONCONFORMANCE REPORT
NO. _____ PAGE 1 OF 1

1. DWG/INSTALLATION NO.	2. DWG/INSTALLATION NAME:	3. PO/CONTRACT NO.	4. SUPPLIER/CONTRACTOR NAME:
M-428-34H Rev A	1DG104HR	7070	H. J. KAISER

5. INSPECTION PLAN NO.:	6. INSPECTOR:	7. DATE:	8. SPECIFICATION NO.	ASME
QACMI-M-12-R7	D Mills RED	7/22/80	H256	YES ☐ NO ☑

9. DESCRIPTION OF NONCONFORMANCE	10. DISPOSITION	11. DISPOSITION INSTRUCTIONS/JUSTIFICATION
Location; DG Room "A" 10'4" N- of 12A/46'2E of H ELEV 532'6"		
System; DG Room Seismic Class B		
Requirement; QACMI-M12R7		
Deficiency; Undersized fillet, 3/16, Angle Corners not tied into remaining WELD		

12. REVIEW BOARD (REQUIRED ON ALL ACCEPT/REPAIR DISPOSITIONS)

KEI CONSTRUCTION ENGR. DATE

S&L DATE | CG&E SPONSOR ENGR DATE | CG&E Q.A.&S. DATE | KEI QAE D

13. REPAIR/REWORK COMPLETE AND ACCEPTABLE

INSPECTOR/ENGINEER DATE

14. CAUSE	15. CORRECTIVE ACTION
	15

KAISER FIELD (7), CG&E (4), S&L (1), A.I. (1), QA FILES (ORIG.)

C/N 4957

HJKCO FORM NO. G
Rev.

HENRY J. KAISER, CO.
WM. H. ZIMMER POWER STATION

NONCONFORMANCE REPORT
NO. _____ PAGE 1 OF 1

1. DWG/INSTALLATION NO.	2. DWG/INSTALLATION NAME:	3. PO/CONTRACT NO.	4. SUPPLIER/CONTRACTOR NAME:
M-428-33H Rev A	1DG094HR	7070	A. J. Kaiser

5. INSPECTION PLAN NO.:	6. INSPECTOR:	7. DATE:	8. SPECIFICATION NO.	ASME
QACMI-M-12 R-7	J Mills	7/22/80	H2356	YES ☐ NO ☑

9. DESCRIPTION OF NONCONFORMANCE	10. DISPOSITION	11. DISPOSITION INSTRUCTIONS/JUSTIFICATION
Location; DG Room "A" 42'10" E-of H / 0" off 12A Elev 532'8"		
System; DG Seismic Class B		
Requirement; QACMI-M-12 R-7		
Deficiency; Undersized fillet, Cold Lap, Undercut, Overlap.		

12. REVIEW BOARD (REQUIRED ON ALL ACCEPT/REPAIR DISPOSITIONS)

KEI CONSTRUCTION ENGR. DATE

S&L DATE | CG&E SPONSOR ENGR DATE | CG&E Q.A.&S. DATE | KEI QAE D

13. REPAIR/REWORK COMPLETE AND ACCEPTABLE

INSPECTOR/ENGINEER DATE

14. CAUSE	15. CORRECTIVE ACTION
	15

KAISER FIELD (7), CG&E (4), S&L (1), A.I. (1), QA FILES (ORIG.)

C/N 4956

HJKCO FORM NO. 6
Rev.

HENRY J. KAISER, CO.
WM. H. ZIMMER POWER STATION

NONCONFORMANCE REPORT
NO. _____ PAGE 1 OF 1

1. DWG/INSTALLATION NO	2. DWG/INSTALLATION NAME:	3. PO/CONTRACT NO.	4. SUPPLIER/CONTRACTOR NAME:
M-428-32H Rev A	1DG081HR	7070	H.J. KAISER

5. INSPECTION PLAN NO.:	6. INSPECTOR:	7. DATE:	8. SPECIFICATION NO.	ASME
QACMJ-M-12 R.7	J Mills	7/22/80	H225C	YES ☐ NO ☑

9. DESCRIPTION OF NONCONFORMANCE	10. DISPOSITION	11. DISPOSITION INSTRUCTIONS/JUSTIFICATION
Location: DG Room "A" 0" off 12A / 32'10" E- of H Elev 533'6 System: DG Seismic Class B Requirements: QACMJ-M-12 R.7 Deficiency: No clearance between U-bolt & pipe. (Hole) U-bolt restrains movement of pipe. Holes for U-bolt mount has been elongated from 5/16" to 1/2" Incomplete Welding, Cold Lap, Slag Entrapment, Excessive Slag.		

12. REVIEW BOARD (REQUIRED ON ALL ACCEPT/REPAIR DISPOSITIONS)

KEI CONSTRUCTION ENGR. DATE

S&L DATE | CG&E SPONSOR ENGR DATE | CG&E Q.A.&S. DATE | KEI QAE D

13. REPAIR/REWORK COMPLETE AND ACCEPTABLE

INSPECTOR/ENGINEER DATE

14. CAUSE	15. CORRECTIVE ACTION

15

KAISER FIELD (7), CG&E (4), S&L (1), A.I. (1), QA FILES (ORIG.)

C/N 4955

HJKCO FORM NC G
Rev. 5

13

LOG OF NONCONFORMING MATERIAL REPORTS

KEI Control Number	NR # Essen.	NR # Non-Ess.	P/O Spec.	Equip. Name or Process	Date NR Initiated	KEI Constr. Engr.	Disp.	Approval Status: Spon. Engr. / QA&S	Approval Status: S&L	Approval Status: KEI QAE	NR Closed	
TRANS. TO NRE 5045												
344	2401	VOID	Q M-15	VARIOUS HANGERS HAVE HILTI BOLT VIOLATIONS.	1-4-80						1-11-80	R I
SEE RI C/N 4742												
	2402	VOID	Q M-15	VARIOUS HANGERS HAVE HILTI BOLT VIOLATIONS.	1-4-80						4-11-80	M S
301	2403	VOID	Q M-15	HGR. 1FW061HV HAS HILTI BOLT VIOLATION.	1-4-80						5-12-80	F W
SEE RI C/N 4743												
302	2404	VOID	Q M-15	VARIOUS HANGERS HAVE HILTI BOLT VIOLATIONS.	1-4-80						4-11-80	F E
SEE RI C/N 4729												
303	2405	VOID	Q M-15	VARIOUS HANGERS HAVE HILTI BOLT VIOLATIONS.	1-4-80						4-10-80	H G
304	2406		Q M-15	VARIOUS HANGERS HAVE HILTI BOLT VIOLATIONS.	1-4-80	4-22-80	Accept As Is	7-21-80 / 7-21-80	5-27-80	7-23-80	7-23-80	R T
305	2407	VOID	Q M-15	VARIOUS HANGERS HAVE HILTI BOLT VIOLATIONS.	1-4-80						5-12-80	G
SEE RI C/N 4741												
306	2408	VOID	Q M-15	VARIOUS HANGERS HAVE HILTI BOLT VIOLATIONS.	1-4-80						4-14-80	W K
TRANS. TO NRE 5046												
307	2409	VOID	Q M-15	VARIOUS HANGERS HAVE HILTI BOLT VIOLATIONS.							1-11-80	R H
308		821	H2173	PANEL 1PL87J HAS HOLES IN BOTTOM	1-7-80	1-21-80	Rework	N/A / N/A	N/A	1-23-80	2/01/80	R A
309	2417		H 2173	Work not in accordance to design specification	1-9-80	3-10-80	Rework	N/A / N/A	N/A	3-18-80	6-27-80	
310	2410		SA-530 SPPM 46	Base Metal/Arc Repair / Strike	1-7-80	1-28-80	Rework	N/A / N/A	N/A	1-28-80	10-21-80	
				Seismic								

LOG OF NONCONFORMING MATERIAL REPORTS

KEI Control Number	NR # Essen.	NR # Non-Ess.	P/O Spec.	Equip. Name or Process	Date NR Initiated	KEI Constr. Engr.	Disp.	Approval Status: Spon. Engr. / QA&S	Approval Status: S&L	Approval Status: KEI QAE	NR Closed
TRANS. TO NRE 5045											
344	2401	VOID	Q M-15	VARIOUS HANGERS HAVE HILTI BOLT VIOLATIONS.	1-4-80						1-11-80
SEE RI C/N 4742											
0	2402	VOID	Q M-15	VARIOUS HANGERS HAVE HILTI BOLT VIOLATIONS.	1-4-80						4-11-80
401	2403	VOID	Q M-15	HGR. 1FW061HV HAS HILTI BOLT VIOLATION.	1-4-80						5-12-80
SEE RI C/N 4743											
402	2404	VOID	Q M-15	VARIOUS HANGERS HAVE HILTI BOLT VIOLATIONS.	1-4-80						4-11-80
SEE RI C/N 4729											
403	2405	VOID	Q M-15	VARIOUS HANGERS HAVE HILTI BOLT VIOLATIONS.	1-4-80						4-10-80
1304	2406		Q M-15	VARIOUS HANGERS HAVE HILTI BOLT VIOLATIONS.	1-4-80	4-22-80	Accept As Is	1-21-80 / 1-21-80	5-27-80	7-23-80	7-23-80
1305	2407	VOID	Q M-15	VARIOUS HANGERS HAVE HILTI BOLT VIOLATIONS.	1-4-80						5-12-80
SEE RI C/N 4741											
1306	2408	VOID	Q M-15	VARIOUS HANGERS HAVE HILTI BOLT VIOLATIONS.	1-4-80						4-14-80
TRANS. TO NRE 5046											
407	2409	VOID	Q M-15	VARIOUS HANGERS HAVE HILTI BOLT VIOLATIONS.							1-11-80
1308		821	H2173	PANEL 1PL87J HAS HOLES IN BOTTOM	1-7-80	1-21-80	Rework	N/A / N/A	N/A	1-23-80	2/01/80
4309	2417		H2173	Weld not to accordance to design specification	1-9-80	3-10-80	Rework	N/A / N/A	N/A	3-18-80	6-27-80
1310	2410		SA-530 SPPM 46	Base Metal/Arc Repair Strike	1-7-80	1-28-80	Rework	N/A / N/A	N/A	1-28-80	10-21-80
				Seismic							

Q. A. SURVEILLANCE REPORT No. 2E1

To: Floyd Oltz Organization: QA

cc: Reference: QACM-014

___ In-process Deficiency X Clarification ___ Calibration/Test Record

___ Audit/Follow-up ___ Subcontractor Surveillance ___ Surveillance Information

GENERAL OBSERVATIONS/DESCRIPTION:

SYSTEM small bore ISOS.
all systems

In preparing NPP-1 forms for small bore isometrics I must make assumptions which I feel compromise my integrity. See page two for further explanation of this.

I am requesting a written directive telling me to make these assumptions, or to re-evaluate all small bore isometrics' material traceability documentation.

Report Prepared By: RICHARD L REITER Date 10-23-80

If Deficiency is Nonconforming in Nature, List:

1. Reference Drawing, Spec. or Std. _____

2. Specific Location _____

CORRECTIVE ACTION STATEMENT

PROCEDURES AS WRITTEN AND APPROVED ARE ADEQUATE TO MEET REGULATORY AND CODE REQUIREMENTS FOR THE WM. H. ZIMMER PLANT. REVIEW OF DOCUMENTATION IS TO BE CONTINUED USING THE APPROVED PROCEDURES AND PRACTICES NOW IN EFFECT.

[signature] 10/28/80

Corrective Action Verified By: _____ Date _____

FIGURE 1

9

It is required that all materials in an essential system be traceable thru the use of a unique Heat no. This requires that all pieces in a welded assembly be uniquely identified and assigned a unique Heat no.

The system by which material traceability for ISKs is achieved can not insure the retention of this information.

example ① Take an ISK with five 90° ells and six pup pieces. All welds are documented. There are two good Heat nos. recorded for each of these items. Since no unique correlation exists between the items pictured on an ISK and the Heat no(s) recorded for those items, no unique traceability is recorded.

example ② Take an ISK with two pup pieces and one 90° ell. All welds are documented. One Heat no. is recorded for each of the items. Even in this simple situation, one must assume that this Heat no. is recorded for both of the pups; it does not state that anywhere.

The requirements do not distinguish between large bore and small bore piping. Situations which are written up on Nonconformance Reports on PSKs are given acceptable reviews on ISKs. Should all ISKs be re-reviewed with the unique traceability requirements in mind?

9

HENRY J. KAISER, CO.
WM. H. ZIMMER POWER STATION

NONCONFORMANCE REPORT

NO. E5108 PAGE 1 OF 1

[DW]G/INSTALLATION NO.	2. DWG/INSTALLATION NAME:	3. PO/CONTRACT NO.	4. SUPPLIER/CONTRACTOR NAME:	
[?]-51 Sht.1	Residual Heat Removal	7070	EJK	
[INS]PECTION PLAN NO.:	6. INSPECTOR:	7. DATE:	8. SPECIFICATION NO.	ASME
[P]SK RH-15	R.L. Reiter/F.J. Oltz	5/19/80	E-2256	YES ☒ NO ☐

[DE]SCRIPTION OF NONCONFORMANCE | 10. DISPOSITION | 11. DISPOSITION INSTRUCTIONS/JUSTIFICATION

[SYS]TEM: Residual Heat Removal (RH)

[LO]CATION: Reactor Bld'g 555'

[REQ]UIREMENT: All materials on [es]sential systems be traceable.

[DI]SCREPANCY: There is a 4" long pup [in]stalled per DDC M-1108 between [we]lds 82 & 82A. No material traceability is available for this piece.

[A]lso, weld 80 is located 1'-0" inside [o]f penetration M-13, in violation of [S]ection 910.1 of H-2256. → pre service inspection

VOID

Accept As Is

REVIEW BOARD (REQUIRED ON ALL ACCEPT/REPAIR DISPOSITIONS)

KEI CONSTRUCTION ENGR. DATE

S&L DATE | CG&E SPONSOR ENGR DATE | CG&E Q.A.&S. DATE | KEI QAE DATE

REPAIR/REWORK COMPLETE AND ACCEPTABLE

INSPECTOR/ENGINEER DATE

[14]. CAUSE | 15. CORRECTIVE ACTION

8

KEI Control Number	NR # Essen.	NR # Non-Ess.	P/O Spec.	Equip. Name or Process	Date NR Initiated	KEI Constr. Engr.	Disp.	Approval Status: Spon. Engr. / QA&S	Approval Status: S&L	Approval Status: KEI QAE	Closed
5408			H2174	PLATE DEF.	NR REWRITTEN C/N 5417						
5409	2997		H-2174	DEF IN CON REC.	2-2-81						
5410	3004		H-2174	SUPP. POOL WALL 10D Anchor bolt	2-3-81						
5411			40217 A36	Beams WF wrong material	2-3-81						
5412	2996 C-1		7070	WELDS HAVE LACK OF PENT.	2-2-81	2-9-81	ACCEPT AS IS	TO CG&E FOR SIGN 2-[illegible]-81			
5413	3006		[illegible] H-2174	DW STRUCT ST. HT. NOT TRANS. CORRECT.	2-4-81	2-12-81	REPAIR	TO CG&E 2-15-81			
5414	3007		H-2174	HT. NOT TRANS [illegible]	2-3-81						
5415	3008		H-2174	BM71 Ch. Channel NO HT. NO.	2-3-81						
5416	1319 R-1		H-2256	PIPE HGRS NOT INST. PER DWG.	7-11-80	2-10-81	REWORK	N/A 2-10-81	N/A	2-10-81	
5417	3002		H-2174	COVER PL. WELDED NOT SPEC. ON HAT LOCATION	2-3-81	2-12-81	ACCEPT AS IS	2-12-81 2-12-81	2-12-81	2-12-81	2-12-81
5418	5176		H-2256	MAT. IN ASME SYS. NOT HT. NO. TRAC.	1-28-81	[illegible]					
5419	3011		SPPM8ORG	OLD WELDS RAND NO INSPEC.	2-2-81 2-5-81	TO CG&E 2-5-81					
5420	3012		ECPL[illegible]	HT. NO 74212 NO TRACE.	2-2-81 [illegible]	2-12-81	REPAIR	TO CG&E 5 2-13-81			

THE CINCINNATI GAS & ELECTRIC COMPANY
AUDIT FINDING REPORT

QA AUDITOR SIGNATURE/ATL INITIALS	INDIVIDUAL/ORGANIZATION CONTACTED	AFR NUMBER	AUDIT DATE
	HJK Quality Assurance	340-1	1/15/81

REFERENCE

10CFR50, Appendix B, XVI
Henry J. Kaiser QAP-16
QACMI - G-4, Revision 8

FINDING

Essential Nonconformance Reports are being closed by voiding when they should be receiving dispositions of accept-as-is, rework or the nonconforming condition still exists.

RECOMMENDED CORRECTIVE ACTION

1) Henry J. Kaiser Inc. to review all void Essential Nonconformance Reports. Re-open and properly close those which were improperly voided. Where necessary, expand description of the reason for voiding.

2) Revise QACMI G-4 and if necessary, QAP-16 to fully discuss the voiding of Nonconformance Reports. Upon completion of HJK review, CG&E QA will re-audit void NR file and issue supplement to this audit report and additional AFR's as necessary.

SCHEDULED RESPONSE DATE	RESPONSIBLE FOR CORRECTIVE ACTION
2/16/81*	P. S. Gittings

(1) CORRECTIVE ACTION TAKEN AND RESULTS ACHIEVED (2) CORRECTIVE ACTION TAKEN TO AVOID FURTHER NONCOMPLIANCE (3) DATE WHEN FULL COMPLIANCE WILL BE ACHIEVED

*Progress Report including projected date for completion of rev iew.

SUBMITTED BY	DATE	MANAGEMENT APPROVAL	DATE

AFR VERIFICATION

RESPONSE ACCEPTABLE	YES / NO	AUDITOR	DATE	MANAGEMENT APPROVAL	DATE

2

UNION LIGHT HEAT AND POWER
CORRESPONDENCE

F.A.

TO: P. S. GITTINGS

DATE: JANUARY 14, 1981

FROM: W. W. SCHWIERS

QUALITY ASSURANCE AUDIT/SURVEILLANCE
REPORT NO. 340, DATED 12/15-19/80, 1/5/81

Attached is a copy of a QA Report for your information and action.

A written statement or explanation in reply, including for each example of any stated deficiency: (1) the corrective action taken and the results achieved; (2) corrective action to be taken to avoid further noncompliance; and (3) date when full compliance will be achieved. The response to the Audit Finding Reports (AFR's) should be indicated on the AFR in the space provided and if necessary, continued on a sheet attached to the AFR.

Your reply is requested by February 16, 1981.

W. W. SCHWIERS

LCL:ec
cc: Henry J. Kaiser Co.
Attn: E. V. Knox

2

THE CINCINNATI GAS & ELECTRIC COMPANY
WM. H. ZIMMER NUCLEAR POWER STATION

FIELD AUDIT REPORT NO. 340

Vendor Audited Henry J. Kaiser Co. Audit Date 12/15-19/80, 1/5/81

P.O. No. N/A Auditor L. C. LUDWIG

Subcontractor N/A

Functions Audited

HJK file of voided Nonconformance Reports

Individuals Contacted

F. Oltz

Description of Audit

See Attached

Deficiencies, Observations, Suggestions

See Attached

Corrective Action

See Audit Finding Report attached

Date to be Completed

2/16/81

Distribution

E. V. Knox

2

Form QAS-103

Description of Audit

This audit was conducted as a review of void NR's which were assembled into a single file by HJK and which were listed in a letter of 12/12/80 from P. S. Gittings of HJK to W. W. Schwiers of CG&E.

Approximately 160 of these void reports were reviewed for the purpose of determining the reason for voiding. Approximately 85 reports starting with the earliest and 75 working back from the latest (not from E-5000 or E-6000 series) were reviewed. There are approximately 500 voided NR's.

Summary of Findings

(1) Approximately one third on the void reports were cases where the description of the nonconforming condition was re-written as another NR, or was a duplication of an existing NR. These are instances where only the NR number is being voided; the condition described will be followed through to disposition elsewhere. There is no apparent problem with void reports of this type.

(2) The next largest category is those reports which were voided because the condition described was brought into conformance by a change in requirements. Examples are NR's E-2461 (1/23/80), E-2502 (2/13/80), E-2508 (2/12/80), E-2378 (12/26/79), E-2431 (1/8/80), all of which were voided after DDC-M4806 was written on 2/18/80. Also E-2480 which details a drawing error, is voided on the basis of a note which acknowledges an error, but is voided without a description of the corrective action taken with regard to that error. E-2474, 2476 and 2477 are voided when drawings (PSK's) are corrected.

These represent a NONCOMPLIANCE with QAP-16 of the HJK Quality Assurance Manual, Paragraph 2.5 and Figure 16-1. That paragraph specifies that "Establishment of cause and corrective action procedures will constitute an integral part on the nonconforming (sic) control system".

Additionally, these should not have been voided since they were valid descriptions of actual nonconformances which were brought into conformance by some action (a disposition).

(3) A third large category is that of "inspection error" or "written in error". It is unclear from the few words of explanation accompanying the stamping just what the error was, how it was resolved and what will be done to prevent repetition.

These represent an indeterminate condition and more information must be provided to substantiate the voiding. Examples are E-5128 and E-5110. The recently revised QACMI G-4, (Rev. 8) requires a "brief" description. A complete description is necessary, regardless of length.

(4) E-2399, E-2428, E-2429 and others are voided with the note to the effect that they will be re-inspected after redesign. Since they represent component supports not in conformance with the current design and are installed and capable of being used in operation, there is a NONCOMPLIANCE with Criterion XV of 10CFR50, Appendix "B" which requires nonconforming items be controlled

2

to prevent use.

(5) There are numerous other reports which:

were voided for reasons other than those allowed by QACMI G-4, (E-2323 - E-2448).

Exit Meeting:

An Exit meeting to discuss these findings was held on 1/6/80. Present at the meeting were:

P. S. Gittings - Kaiser Site QA Manager
R. P. Ehas - CG&E Senior Quality Engineer
L. C. Ludwig - NES, Lead Auditor
E. V. Knox - HJK Corporate QA Manager

Corrective Action

Henry J. Kaiser personnel will review the entire file of Void Reports and:

(1) Identify those which have been superceded.

(2) Re-open and properly disposition any which were improperly voided.

(3) Expand upon the reason for voiding in those cases where the reason is vague or incomplete.

(4) Revise QACMI-G4 and, if necessary, Q4P-16 to fully describe controls for voiding Nonconformance Reports.

(5) Report to CG&E QA Manager by February 16, 1981 on the progress of the corrective action and giving a proposed date for completion.

Upon completion of the Henry J. Kaiser Corrective Action, CG&E will re-audit the Void Nonconformance Reports and issue a supplement to this report and additional Audit Finding Reports as necessary.

L. C. LUDWIG - LEAD AUDITOR (NES)

2

Carter Quarnstrom

CHRONOLOGICAL INDEX OF KEI NR

VOIDED BY MONTH AND YEAR

	1978	1979	1980	1981
January	17	46	49	8
February	14	27	46	5
March	12	27	41	4
April	11	30	19	
May	26	19	27	
June	19	19	13	
July	16	38	22	
August	27	52	9	
September	47	29	19	
October	46	18	20	
November	31	73	25	
December	21	62	7	

4.1 Nonconformance Report Voiding

4.1.1 Allegation

On November 18, 1980, ~~J. Harrison, Resident Inspector~~ an NRC 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 co- usion 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 series 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.

needs word engr

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.

Revised 4.3.4

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 fu 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 of the 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-2336 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.

Unresolved item ?

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.

Unresolved Item?

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

for which a CN was obtained

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.

Unresolved Item ?

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.

Unresolved Item

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 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 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).

4. July 24 ~~Final~~ Direct Field Inspection

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. Unresolved Item

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. Unresolved Item

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.

How can we say in section 5.1 that the MSR T Quenchers is OK if 007 was not ultrasonically tested?

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.

Unresolved Item 2.

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.

Unresolved Item, 2.

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~~ erred 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 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 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 correct; 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)

Any INCs?

This widespread problem of improper voiding of NRs is addressed in the Quality Implementation Program-57. The matter will be reviewed prior to final resolution.

5.1.2 Background Information

The Zimmer facility uses a General Electric boiling water reactor (BWR) Mark II containment system design, which includes a pressure suppression pool in the lower levels of the containment building. Based on actual Mark I operating experiences related to safety relief valve actuations and large-scale testing of the more recently designed Mark III containment design system, new suppression pool hydrodynamic loads associated with postulated loss-of-coolant accidents (LOCA) were identified that had not been explicitly considered in the original design of the Mark II containment system. These newly identified loads result from the dynamic effects of drywell air and steam being rapidly forced into the suppression pool during a postulated LOCA or safety relief valve actuation. When this possible problem was first identified, General Electric and NRC and its consultants performed an in-depth review of the General Electric Mark II containment system design. Utilities owning facilities that would use the Mark II containment system also formed an owners' group to share calculations, evaluations, and acceptable modifications to the Mark II containments.

The NRC effort in reviewing the new dynamic loads was divided into two programs: a short-term evaluation program for the lead plants (Zimmer, La Salle, Shoreham), and a long-term program for final detailed evaluation of the adequacy of modifications. The description of the NRC evaluation is available in NUREG-0487, "Mark II Containment Lead Plant Program Load Evaluation and Acceptance Criteria," published in November 1978.* This document indicates that the lead plants, those first to use the Mark II containment system, would be reviewed by NRC to determine the acceptability of modifications made in their design to accommodate the identified loads. NUREG-0474, "A Technical Up-Date on Pressure Suppression Type Containments in Use in U.S. Light Water Reactor Nuclear Power Plants," issued in July 1978,* details the ongoing NRC monitoring of the modification and analysis program. NUREG-0371, "Task Action Plans for Generic Activities (Category A)," issued in November 1978,* identifies review of the Mark II pressure suppression containment as Generic Task A-8. NUREG-0510, "Identification of Unresolved Safety Issues Relating to Nuclear Power Plants, Report to Congress," issued in January 1979,* identifies two generic tasks as being related to the analysis of suppression pool dynamic loads and safety relief valve loads/temperature limits for BWR containments.

In the lead plant program load evaluation, NRC approved the design basis used for modifications to the suppression pool system, including a device known as a "T quencher" as part of the safety relief system, and additional equipment, such as base and wall plates, to support these new installations.

NRC does not have regulatory jurisdiction over the construction costs of a nuclear power plant.

*These documents are available for inspection at NRC public document rooms or for purchase from the NRC/GPO sales program, Washington, DC 20555.

5.1.3 Investigation

5.1.3.1 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 Kaiser had installed a large portion of the main steam relief (MSR) piping, knowing that sections of it would later have to be removed. He recalled that 2 years after its installation Kaiser removed large sections of the piping at and below the 525-ft level of the reactor containment building but left the pipe sections above that level in place.

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.

5.1.3.2 Interview of Individuals B and C

On April 14 and 16, 1981, Individuals B and C, identified as having provided information regarding this allegation to representatives of GAP, were interviewed by NRC. They both stated that they had no information concerning this allegation.

5.1.3.3 Interview of H. C. Brinkman

During the period of February 9-13 and 23-27, 1981, discussions with H. C. Brinkman, CG&E Principal Mechanical Engineer, indicated that experimentation had revealed the need to redesign the relief system based on newly identified discharge loads. Therefore, several utilities, including CG&E, decided on a modification to replace the already installed "rams head" safety relief valve (SRV) discharge devices with "quenchers."

In 1975, CG&E decided to start designing the quencher modification, knowing that part of the piping to be installed would later have to be removed due to the identification of new discharge loads. The basis for the decision was that approximately 90 to 97% of the original quencher modification would likely be acceptable and therefore only 3 to 10% would be subject to rework. CG&E concluded that it would be less costly to proceed with installation activities rather than delay the construction schedule until the quencher modification design was complete. To date, the modification ~~installation~~ ~~design~~ O.K. is not complete.

5.1.3.4 Record Review and Onsite Observations

The MSR modification has required (in part) the replacement of 10-in. Schedule 40 pipe with other 10-in. Schedule 40 pipe of different geometric configuration, 10-in. extra-strong pipe, and 12-in. extra-strong pipe (thicker walled pipe).

During this investigation, the licensee provided cost figures for the modification to date, which exceeded the alleged amount. NRC made no attempt to corroborate the licensee's claim that it was cheaper to proceed with an installation known to require rework before installation actually took place.

The RIII inspector reviewed all revisions to the KEI isometric drawing PSK-1MS, Sheets 21 and 21A, that were pertinent to the quencher modification of the main steam relief piping. The revisions identified the following changes:

Rev. No.	Implemented Change	Date
Rev. 0	Redrawn--original configuration replaced	9/8/76
Rev. 1	Hangers added	3/31/77
Rev. 2	Eight lugs added	1/10/78
Rev. 3	Hanger changed	5/5/78
Rev. 4	New spool pieces added, welds MS212 and MS195 voided per S&L	4/3/79
Rev. 5	Piping tee section added	6/18/79
Rev. 6	Weld MS160 and a 4-in. dimension added	10/1/79
Rev. 7	Field-marked (redline) updates added	1/9/80
Rev. 8	Welds K-461 and K-463 changed; weld K-592 changed to K-593 per NR-2499; hanger detail section D-D added	8/27/80
Rev. 9	Weld K-592 changed to K-461; weld K-593 changed to K-594	9/4/80

The RIII inspector reviewed the QC documentation for the following main steam relief piping field welds: 160, 160A, 267A, 267B, 267C, 267D, 268B, 268C, 459, 460, and 461. The records showed that the welds had been accomplished in accordance with the appropriate code (ASME Section III 1971, with Summer 1973 Addenda).

The RIII inspector interpreted the radiographs for the following main steam relief piping field welds: 160A, 459, 460, 461, 462, and 594. There were approximately five to seven radiographs for each of these welds. Varying numbers of radiographs were necessary to cover the entire 360 degrees of each pipe weld. The radiography was performed in accordance with the appropriate code (ASME Section III 1971, with Summer 1973 Addenda). The RIII inspector identified no unacceptable weld indications on the radiographs.

5.1.4 Findings and Conclusions

The quencher modification to the main steam relief system was being made with the knowledge of NRC. CG&E personnel stated they made an economic decision to install piping for the main steam relief system quencher modification with the knowledge that approximately 3 to 10% would have to be removed due to continuing identification of changes in design loads. Because NRC does not have regulatory jurisdiction over construction costs, no attempt was made to determine the estimated labor cost for the portion of pipe that was installed and removed. The safety importance of this allegation is limited to whether the main steam relief piping is installed properly.

RIII has concluded that the modification is being properly installed and tested, except for the improper voiding of one NR as discussed in Section 4.1 of this report.

5.1.5 Items of Noncompliance

No items of noncompliance were identified.

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.

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 the 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 will be followed up in a subsequent inspection (50-358/81-13-).

Individual F repeatedly stated that it had been three years since he had been at Zimmer and that he could not remember further specifics.

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 had 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 0 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 5.2-1):

Table 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	
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

*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

P-r2 end of Table 5.2-1

the hydraulic system drain lines (1RR39AC and 1RR40AC), which are functional parts of the hydraulic system.

Table 5.2-1. Hydraulic Actuator Data (continued)

Components	Sargent & Lundy Piping and Instrumentation Drawings	Kaiser Engineers Isometric Drawings
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
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	
**The disposition to FDDR No. KN-1-299 was applied to both drain lines #1RR39AC and #1RR40AC.		
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
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 a 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 drawing M-464-4RR-257 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 5.2-2):

Table 5.2-2 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
1RR40AC*	100	150	200
1RR40AD	2200	3000	3000
1RR40AA	2200	3000	3000
1RR40AB	2200	3000	3000

*These were the drain lines affected by FDDR No. KN-1-299.

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:

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-).

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 5.2-3):

Table 5.2-3 Hydrostatic Test Results

Line No.	Test Pressure (psig) 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
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
1RR40AC	200	215	210	150	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 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 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 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.

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 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 ~~for~~ the plant operation (~~50~~ 358/81-13-).

5.3.5 Items of Noncompliance

No items of noncompliance were identified.

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.

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 coated, 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~~ may 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

Independent Measurements

During September, 1981 the NRC selected six welds, in areas in which uncontrolled weld rod had been laying around, to verify their quality. At the NRC's request, the licensee radiographed the welds and then removed [boat] samples of the welds. The NRC inspector reviewed the radiographs. The radiographs were of acceptable quality. No unacceptable indications were depicted in the radiographs. The NRC sent the boat samples of the welds to Franklin Research Center for analysis. On 3/24/81, Franklin Research Center sent the results of the analysis to the NRC.

?? The results of the analysis (chemical, hardness, and metallographic indicated that the welds were of the quality specified by the design. Thus, the correct type and quantity of weld rods were apparently used

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 RIII by telephone on August 13, 1981, that the licensee's review of all timecards for the dates in question showed the appropriate weld rod clerks were working on the days in question. He indicated the NRC did not review all of the timecards. This is considered to be an unresolved item and will be reviewed during a subsequent inspection (358/81-13-).

In addition, RIII inspectors on numerous occasions during previous inspections have observed weld rods lying uncontrolled in the construction area.

The concerns regarding the physical control of weld rod identified during the investigation of this allegation are addressed in the licensee's Quality Confirmation Program.

5.5.4 Findings and Conclusions

Based on the findings of ~~this investigation~~ previous NRC inspections, 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.

5.5.5 Items of Noncompliance

No new items of noncompliance were identified.

5.6 Argon Gas Exposure

5.6.1 Allegation

"Argon gas valves for flushing oxygen from pipes routinely are left open by the day crew, causing the night crew to be overcome by gas, a problem about which CG&E Safety Director Cummings expressed disinterest."

In an affidavit provided to GAP by a pipefitter (Individual A) formerly employed at Zimmer, it was alleged that workers on the day shift routinely crimped and wired argon gas hoses shut rather than closing the gas valves at the source upon leaving work. The pipefitter stated that this practice resulted in argon gas leaking from the hoses and caused the workers on the night shift to suffer from dizziness. The pipefitter further stated he advised former Kaiser Safety Director Larry Cummings of his concerns and that Cummings indicated he was not interested, because argon gas would not hurt anyone.

On February 26, 1981 during a meeting between NRC Region III personnel, a GAP representative, and Thomas Applegate, Applegate alleged that he received information from James Bedinghaus indicating that, in late fall or early winter 1980, his son, John Bedinghaus, had been overcome by argon gas while conducting fire watch rounds in the area of the containment vessel.

5.6.2 Background Information

Argon gas is a "shielding gas" used to purge or displace the oxygen inside pipes in certain welding procedures, to prevent the metal from oxidizing during welding. Argon gas is colorless and odorless. It is also heavier than oxygen and therefore settles in low areas, displacing oxygen. This occurs in the same manner that water displaces air as it is poured into and fills a glass. MAPP (which actually refers to a trade name) refers to combustible gas used in welding, typically for heating and cutting various metals. It does not displace oxygen as argon gas does. It is colorless but it has an odor which can be described as "noticeably foul." MAPP gas is generally not toxic, although significant concentrations may be ignited and become explosive.

NRC does not regulate the use of the subject gases. On February 6, 1981, the NRC Region III office telephoned the Cincinnati, Ohio, office of the U.S. Department of Labor, Occupational Safety and Health Administration (OSHA). During a conversation with OSHA representative John Phillips, it was determined that the allegation involved a matter over which OSHA has primary jurisdiction. An understanding was also reached that any action necessary to resolve this matter would be taken by OSHA. A letter confirming this understanding, a copy of which is included as Exhibit 40, was forwarded by Region III to the Cincinnati OSHA office on February 19, 1981.

By letter dated May 15, 1981, the Cincinnati OSHA office advised the NRC Region III office that an investigation of conditions in the containment suppression pool area had been conducted by OSHA on February 4-5, 1981. The letter stated OSHA addressed a previous complaint alleging leaks of argon gas at Zimmer and concluded that an air contamination or oxygen deficiency situation did not exist. A copy of this letter is included as Exhibit 41.

5.6.3 Investigation

5.6.3.1 Interview with James Bedinghaus

On March 12, 1981, James Bedinghaus was interviewed by telephone. He stated that he was a second shift security supervisor employed by W&W Security at the Zimmer Nuclear Power Station from February to November 1980. He stated that while on duty, sometime in October 1980, an incident occurred during his shift in which Security Officer Gayle Spencer became ill due to inhalation of gas. Spencer was assisted back to the guard house to recover from his illness and was later sent home. Bedinghaus learned from Spencer that Spencer was making his rounds in the area of the reactor vessel when he apparently became ill from inhalation of gas. Another worker in the area (whose identity Bedinghaus does not know) advised Spencer there was an argon gas leak where he was located and that he should leave the area immediately. Bedinghaus immediately reported this information to Kaiser Safety Inspector Dan Parlier, who went to check the area where the incident had occurred. Shortly afterwards (approximately 1/2 hour), Parlier contacted Bedinghaus and advised him there was a MAPP gas leak, rather than an argon gas leak, in the area where Spencer had been. Bedinghaus indicated he was not aware of any argon gas incident involving his son John.

On March 25, 1981, Bedinghaus provided a written statement attesting to the preceding information, a copy of which is included as Exhibit 42.

5.6.3.2 Interview with John Bedinghaus

On March 12, 1981, John Bedinghaus was interviewd by telephone. He stated that he was a security officer employed by W&W Security at the Zimmer Nuclear Power Station from October 1980 to January 1981. He advised that while employed at Zimmer he was never involved in any incident ~~when~~ in which he became ill from or was overcome by argon or any other type of gas.

On March 25, 1981, Bedinghaus provided a written statement attesting to the preceding information, a copy of which is included as Exhibit 43.

5.6.3.3 Interview with Daniel Parlier

On March 12, 1981, Daniel Parlier, Kaiser Assistant Safety Representative, was interviewed by NRC. He stated that to his knowledge there has never been an incident where anyone was overcome by argon gas. He also stated he did not believe such an incident occurred because being overcome by argon gas would likely cause suffocation, an incident of which he would certainly be aware.

Parlier acknowledged that he had discovered instances when craft workers had crimped argon and MAPP gas hoses and had wired them closed rather than shutting the gas off at the source. He indicated he considered this practice a serious safety concern and whenever the practice was observed he immediately brought it to the attention of the appropriate craft supervisor.

Parlier checked the Kaiser Safety Department's "Unusual Incident Reports" for October 1980 to determine if a report of the incident involving Security Officer Spencer had been prepared. He located a report describing the incident in question and included the following information:

> "On October 27, 1980, at 6:30 p.m. a Mapp gas leak located in the reactor suppression pool area at elevation levels 503' and 518' was investigated by Daniel Parlier. Parlier reported that Security Officer Gayle Spencer was in the reactor suppression pool at the time of a mild Mapp gas leak. A reading taken with a M.A.S. [intended as an abbreviation for the manufacturer "Mine Safety Appliances"] Explosimeter registered 0% on the upper and lower areas of the suppression pool. Spencer complained of a headache and feeling tired. He was advised by "First Aid" to see a physician if his condition worsened or Security Supervisor James Bedinghaus was to send him to a doctor if he became worse while still at work. Parlier took action to correct the Mapp gas leak by turning off the gas manifolds in the reactor building and disconnecting the gas hoses from the manifolds."

A copy of this "Unusual Incident Report" is included as Exhibit 44.

In addition to the "Unusual Incident Report" prepared by Parlier, he sent a note dated October 27, 1980, to his supervisor, Mike Hoyman. In the note

(which was apparently a "cover note" for the incident report), Parlier advised Hoyman of the incident and concluded that the incident was a result of the craft workers "not disconnecting their gas hoses from the manifolds." (Disconnecting the hoses from the manifold would have necessitated that the gas be shut off at the manifold.) A copy of the "cover note" is included as Exhibit 45.

During a subsequent telephone conversation on April 24, 1981, Parlier was questioned regarding how he perceived former Kaiser Safety Supervisor Cummings' attitude toward gas leak incidents at Zimmer. He stated it was his opinion that Cummings was very conscientious regarding this problem and it appeared to him Cummings considered gas leaks to be a serious safety concern. Parlier also remarked he did not believe Cummings ever expressed disinterest in gas leak problems or said they were unimportant.

5.6.3.4 Interview with Larry Cummings

On April 27, 1981, Larry Cummings was interviewd by telephone. He stated that he held the position of Kaiser Safety Supervisor at the Zimmer Nuclear Power Station for approximately two years until he left the site in May 1980. He verified that he was aware of instances in which workers at Zimmer crimped and wired argon gas hoses closed rather than shutting the argon gas valves off at the source. Cummings remarked that these instances occurred "less than frequently, but more often than they would like." He was unable to specify approximately how many cases of argon hose crimping the Safety Department had detected while he was at Zimmer.

Cummings denied expressing disinterest in the argon hose crimping problem and advised it was a topic of concern at many Safety Department meetings. He stated that the crimping of argon hoses was a bad work practice; however, it was one that was hard to pin down because it was extremely difficult to catch the individuals responsible.

Cummings said he felt Kaiser had an adequate safety system for preventing serious argon gas problems and incidents at the site. He explained that it was Kaiser's practice and policy to place mine safety lamps wherever workers were located in low-lying areas, particularly the suppression pool area. These lamps serve as warning devices in that they remain lit unless a gas buildup reaches the lamps' air inlet and puts out the flame. Whenever a safety lamp goes out, it is an indication of gas in the area and a signal for the workers to immediately evacuate the area. Cummings stated he knew of no instances when any workers were ever overcome by argon gas.

5.6.4 Findings and Conclusions

No evidence was obtained to show that the argon gas valves were routinely left open, that persons on the night crew had been overcome by argon gas, or that Safety Director Cummings expressed disinterest in the argon gas problem.

Notwithstanding the above, it was determined that there had been instances when craft workers had crimped argon gas hoses and wired them closed rather than shutting the gas off at the source.

This matter is under the jurisdication of the U.S. Department of Labor, Occupational Safety and Health Administration (OSHA). An OSHA inspection did not confirm a situation of air contamination or oxygen deficiency at the time of their inspection.

5.6.5 Items of Noncompliance

No items of noncompliance were identified.

5.7 Damaged Prefabricated Piping

5.7.1 Allegation

"Prefabricated piping received in 1977 has defective welds, but construction supervisors told crews not to repair them because the welds were made offsite."

During an interview with Applegate and GAP representatives, this allegation was clarified to be piping received July 3, 1979, the subject of one of Applegate's prior allegations.

5.7.2 Background Information

The following summarizes the initial investigation of this allegation as documented in IE Investigation Report No. 50-358/80-09.

On June 29, 1979, Pullman Power Products of Williamsport, Pennsylvania, also known as the M. W. Kellogg Company, shipped five prefabricated pipe spool pieces by truck to the Zimmer site for installation in the main steam relief (MSR) 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." The nonconformance report had the effect of placing the spool pieces in a "hold" status in the Kaiser warehouse. The welds on the five spool pieces were later radiographed. The radiographs displayed apparent rejectable weld indications in welds on three of the five spool pieces. On September 18 through 28, 1979, despite the issuance of the nonconformance report, the spool pieces were released to construction and installed. As documented in IE 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 by magnetic particle testing and found to be acceptable.

On April 8, 1980, the RIII inspector reviewed the radiographs on 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 because of the configurations and thicknesses of the spool pieces.

RIII personnel determined that radiography was not the correct nondestructive examination (NDE) technique for the spool pieces. The geometrical configurations and relatively large thicknesses of the spool pieces would prevent

accurate displays of weld indications on the radiographs. A weld indication shown on the radiograph could be caused by distortion. The ultrasonic and magnetic particle tests ultimately performed on the installed spool pieces were correct techniques.

5.7.3 Investigation

5.7.3.1 Interview with Individual A

On April 24, 1981, Individual A, who was previously interviewed by representatives of GAP, was interviewed by NRC. Individual A stated he had provided information to GAP regarding this allegation, and he was referring to five prefabricated pipe spool pieces manufactured by Kellogg that fell off a truck during their delivery to the site. He stated that Peabody Magnaflux (PM) radiographers examined the pieces and found defective welds on some of them. He said construction personnel installed the spool pieces in the plant, disregarding PM's finding on the welds.

On April 22, 1981, Individual A provided a written sworn statement attesting to the preceding information; however, he requested the statement not be attached to this report.

5.7.3.2 Interview with David Hang

On February 24, 1981, David Hang, former PM Level II Radiographer, was interviewed. He stated that in August 1979 Anthony Pallon, KEI Welding Engineer, asked him to radiograph MSR spool pieces that had fallen off the truck on delivery to the Zimmer site. Hang said the examination was to determine if any of the welds on the pieces had cracked from the impact of the fall. Hang indicated that three of the five spool pieces he examined had what appeared to be unacceptable radiographic indications. He said he reported this in the Report of Radiographic Examination submitted to Pallon and also told Pallon that radiography was the wrong technique to use to examine welds of this configuration. Hang said he advised Pallon that an ultrasonic examination should be performed in this case. Hang also stated the spool pieces were ultrasonically examined in April 1980 and the welds were found to be acceptable.

On February 24 and April 23, 1981, Hang provided written sworn statements attesting to the preceding information, copies of which are included as Exhibit 46.

5.7.3.3 Record Reviews

On February 24, 1981, RIII Inspector Kavin Ward reviewed records that indicated the five spool pieces were ultrasonically examined by Pullman Power Products (Kellogg) in April and May 1980 and examined by magnetic particle testing by Peabody Magnaflux in April 1980. The records showed that welds on all five pieces were acceptable. The magnetic particle records indicated that piece 1-MS-11B-12-7BH, weld No. V, had a linear indication approximately 1/4-in. long, which was ground, retested, and found acceptable.

The RIII inspector determined that the ultrasonic and magnetic particle tests were valid examinations for the spool piece welds.

5.7.3.4 Field Observations

On February 24, 1981, RIII Inspector Kavin Ward made visual examinations of all of the welds on the five spool pieces and identified no unacceptable indications. The spool pieces had been installed in the main steam relief system prior to the time of the visual examinations.

5.7.4 Findings and Conclusions

The subject of this allegation was investigated by NRC in early 1980. At that time radiographs displayed apparent rejectable weld indications in welds on three of five spool pieces. One item of noncompliance was cited in IE Investigation Report No. 50-358/80-09 for releasing and installing the spool pieces before determining their acceptability. Subsequently, the licensee and RIII independently determined that ultrasonic testing, rather than radiography, was the correct nondestructive testing technique for examining welds of that geometry and thickness. The welds were examined by ultrasonic and magnetic particle testing and determined to be acceptable.

5.7.5 Items of Noncompliance

No new items of noncompliance were identified.

5.8 Prefabricated Pipe Welds

5.8.1 Allegation

"At least three sources contacted by [Thomas] Applegate confirmed that an estimated 20% of the plant prefabricated welds are defective."

During an interview with Thomas Applegate and a GAP representative (Thomas Devine), Applegate stated that this information came from either Individual A, Individual B, Allen Sellars, Steve Sellars, or David Hang (no specific source was named). Also, Steve Binning, David Binning and James Tyner were named as having additional information. The name Steve Sellars is in error, as no such individual was employed at Zimmer. It appears that this was a reference to Steve Binning.

5.8.2 Background Information

Radiography is similar to a medical X-ray procedure, with the exception that a small but intensely radioactive material (source) is utilized to produce the radiation. The radiographic film that is produced is like an X-ray and can be a permanent record. Nuclear welding codes often specify radiographic testing (RT) as a required examination. In many cases, the weld root pass (bottom portion of the weld, or first welding pass) is radiographed for information, and to determine if the root is acceptable. The completed weld is radiographed for formal code acceptance. Nuclear welding codes contain detailed standards

for radiography, including extent of exposure and clarity of the resulting radiographic film.

A radiograph is interpreted (read) by an interpreter. Radiographic interperters are assigned levels of authority and responsibility based on examination and length of experience, with a Level III radiographer being the highest level.

When a radiograph is read, a "reader sheet" is filled out. The reader sheet identifies the weld, date of radiography, radiographic technique, interpreter, areas of the weld included, and the conclusions of the interpreter. The reader sheet is normally filed with the radiographs it represents.

Many types of defects or discontinuities can be detected through radiography, including incomplete fusion, cracks, pososity, slag, oxidation, undercut, and other defects. The welding Code applied indicates the requirements for weld acceptability, and defects may be acceptable as provided in the relevant Code. Many interpretations are highly subjective, and it is possible for interpreters to disagree on the acceptability or rejectability of an observed defect. In some cases, additional radiography may be performed to provide additional information. As long as the pipe is not inaccessible, subsequent radiography is normally not difficult or too time-consuming.

In practice, the most common occurrence is that a section of a weld, rather than the whole weld, ~~will~~ may include rejectable defects. The section of the weld containing the defects is then removed through grinding, re-welded, and re-radiographed. If the repair radiograph is acceptable, the entire weld can be accepted.

Pipe, spool pieces, and piping formations are purchased from various vendors. These items contain welds, and vendors are required to perform nondestructive examination of these welds according to applicable codes and standards. ASME Section III standards require 100% nondestructive examination for safety-related (class A) pipe welds. When radiography is required, radiographs are provided to the utility purchasing the item for review and permanent filing.

5.8.3 Investigation

5.8.3.1 Interview with Individual A

On April 24, 1981, Individual A, who was previously interviewed by representatives of GAP, was interviewed by NRC. Individual A stated he was a pipefitter assigned to assist employees of Peabody Magnaflux (PM), the firm responsible for radiographic examination of pipe welds onsite. He said that in his opinion 20% of the prefabricated pipe welds manufactured by Kellogg were defective. He indicated that he based his opinion on a statement made by PM personnel that they had observed defective welds on prefabricated pipe spool pieces manufactured by Kellogg on four occasions when they examined Kaiser welds in the residual heat removal (RHR) system. He conjectured that the defective welds were not found by Kellogg because he understood it was Kellogg's practice to radiograph 10% versus 100% of their welds. He said PM radiographers Allen Sellars and David Binning reported this to CG&E personnel, who allegedly told them not to examine the welds because they were vendor supplied.

Individual A stated an incident involving prefabricated piping occurred in August 1979 when PM was asked to radiograph welds on sections of main steam relief (MSR) spool pieces (addressed in Allegation 5.7) that had fallen off a truck on delivery to the site. He said that, while examining the spool pieces, PM personnel found 5 of 20 welds examined to be defective. He said CG&E overruled PM's findings on this examination, but PM retained copies of their reports and could provide investigators with further information regarding this matter.

Individual A also stated he had a discussion with Robert Marshall, Kaiser Construction Superintendent, during which he told Marshall that 20% of the prefabricated welds in the plant were bad. He said Marshall agreed with the statement.

On April 22, 1981, Individual A provided a written sworn statement attesting to the preceding information; however, he requested the statement not be attached to this report.

5.8.3.2 Interview with Individual B

On April 14, 1981, Individual B, who was previously interviewed by representatives of GAP, was interviewed by NRC. Individual B stated that, during a telephone conversation he had with GAP representatives, he responded in the affirmative when asked if 20% of the prefabricated pipe welds in the plant were defective. He said he had heard from Individual A that 20% of the prefabricated pipe welds were defective.

Individual B said he had no specific information regarding this allegation because he was not involved in the fabrication of large bore pipes of the type manufactured by Kellogg, and was not in a position to provide information about defective welds on these pipes. He said that to quote him as generally confirming that 20% of the prefabricated welds in the plant are defective was a misquote. He said he merely confirmed a rumor that the pipe welds in question were defective.

On April 14, 1981, Individual B provided a written sworn statement attesting to the preceding information; however, he requested the statement not be attached to this report.

5.8.3.3 Interview with James Tyner

On April 16, 1981, James Tyner, former Kaiser Pipefitter Superintendent, was interviewed by NRC. He stated he was contacted by a GAP representative who asked him if he was aware that 20% of the prefabricated pipe welds were defective and that Robert Marshall had concurred with this statement. He said he responded to the GAP representative that he could not support that statement and said the prefabricated welds would have to be radiographed and the results evaluated before he could make such a determination. Tyner said the pipe welds in the plant are good, and attributed this to Kaiser's Welder Qualification Program which identified unqualified welders and prohibited them from working on safety-related welds.

Tyner recalled that on one occasion PM radiographers examined a Kaiser field weld and found a defect (porosity) in the adjacent Kellogg weld. He said this piping was part of the class D portion of the closed cooling water system and was not safety-related piping. He indicated that the radiographers may have applied safety-related standards to a nonsafety-related pipe and therefore found rejectable defects in the welds. Tyner stated this was not indicative of 20% of the prefabricated pipe welds being defective.

5.8.3.4 Interview with Robert Marshall

On April 16, 1981, Robert Marshall, Kaiser Construction Superintendent, was interviewed by NRC. He stated that he never commented to Individual A that 20% of the prefabricated welds in the plant were defective. He did recall a conversation in which he commented to Individual A that the workers Individual A was supervising were having a high weld rejection rate on pipe support hangers on which they were working. He said he never mentioned that a percentage of the prefabricated piping was defective and he was not aware of any defects in these pipes. Marshall stated that Anthony Pallon, Kaiser Welding Engineer, had not reported any problems with the acceptability of Kellogg welds and a nonconformance report was never written on this subject.

Marshall recalled that in August 1979 PM radiographed some Kellogg prefabricated spool pieces that had fallen off a truck. He said PM reported some of the welds were defective. The radiographs were subsequently reexamined by Kaiser's Level III Radiographer, Rex Baker, and NRC Inspector Kavin Ward. He said Baker and Ward determined that the geometry of the welds was such that it distorted the view of the weld and rendered the radiographic examination invalid due to the use of an improper technique.

5.8.3.5 Interview with David Hang

On February 24 and April 23, 1981, David Hang, former PM Level II Radiographer, was interviewed by NRC. He stated PM was responsible for conducting radiographic examinations of field welds for Kaiser at Zimmer and did not routinely radiograph welds on prefabricated pipe spool pieces manufactured by Kellogg. He stated 20% of the prefabricated Kellogg welds onsite were not defective. He said on occasion, when Kaiser welders cut into a Kellogg weld or if a Kaiser weld overlapped a Kellogg weld, PM would examine and find defects in the Kellogg weld. In each instance, these defects were reported to Kaiser on the radiographic examination report and forwarded to Anthony Pallon for corrective action.

Hang stated that in August 1979 Pallon asked him to radiograph a group of MSR spool pieces that had fallen off of a truck on delivery to the site. The examination was to determine if any of the welds had cracked from the impact of the fall. Hang indicated he disagreed with Pallon on this and told him radiography was the wrong examination technique. He said the spool pieces were Schedule 844 pipe (3-1/2-in. wall thickness) with welds 1-1/2-in. wide, which would require ultrasonic examination to determine if any welds were defective. When examining these spool pieces, they would be radiographing at an angle through laminations in the steel, which would prevent them from seeing some defects and would exaggerate others. Hang said he examined the spool pieces

for "information only" purposes and reported his findings to Pallon. Hang said he found five of the twenty welds were unacceptable based on the radiographs; however, the spool pieces were later ultrasonically examined and found acceptable. He indicated that ultrasonic examination was the proper technique to examine the spool pieces and is the valid examination.

On April 24, 1981, David Hang provided a written sworn statement attesting to the preceding information, a copy of which included as Exhibit 47.

5.8.3.6 Interview with Steven Binning

On April 15, 1981, Steven Binning, PM Level II Radiographer, was interviewed by NRC. He stated that, while assigned to the Zimmer site, he was responsible for performing radiographic examinations of pipe welds fabricated by Kaiser welders onsite. He said he did not routinely radiograph prefabricated spool pieces manufactured by Kellogg since these were previously examined by Kellogg prior to delivery. He said he had no basis to judge if 20% of the welds on prefabricated spool pieces were defective.

He did recall one occasion when David Hang examined Kellogg spool pieces that had fallen off a truck. Hang initially found defective welds but he later determined that the radiographic technique distorted the view of the weld and the technique used was therefore unacceptable.

On April 15, 1981, Steven Binning provided a written sworn statement attesting to the preceding information, a copy of which is included as Exhibit 48.

5.8.3.7 Interview with David Binning

On January 19 and April 15, 1981, David Binning, PM Level I Radiographer, was interviewed by NRC. He stated PM did not routinely examine welds on prefabricated spool pieces manufactured by Kellogg. He recalled that, on one occasion, David Hang examined some Kellogg spool pieces that had fallen off a truck on delivery to the site. He stated that Hang, while apparently taking "information shots" of the welds, found defective welds in his initial examination.

After a further examination of the film, Hang had determined the geometric configuration of the radiograph was wrong and the examination was invalid. Binning said that, to the best of his knowledge, he never heard PM employees mention that 20% of the prefabricated pipe welds in the plant were defective.

5.8.3.8 Interview with Allen Sellars

On April 15, 1981, Allen Sellars, PM Level II Radiographer, was interviewed by NRC. He stated PM was primarily responsible for the nondestructive examination of welds fabricated by Kaiser personnel onsite. He said that he occasionally examined pipe field welds that junctured with prefabricated pipe manufactured by Kellogg and had observed defects in the adjoining Kellogg welds. He said he noted this on the Report of Radiographic Examination which would then be submitted to Anthony Pallon, who would review the film and assure rejectable defects were corrected. Sellars indicated he was aware that, when one examines one weld and another juncturing weld, frequently the geometry of the juncturing weld causes defects to appear on the film, which

are actually distortions of the weld. He stated that when he identified defects in Kellogg welds he would be asked to reexamine them after the defects had been corrected by Kaiser. Sellars stated he was not being overridden by Kaiser for his identification of defects in either Kaiser field welds or Kellogg welds. He said the defects he identified in overlapping Kellogg welds were so few that it would be incorrect to say 20% of the prefabricated welds in the plant were defective. Sellars said Kellogg examined all of the prefabricated spool pieces prior to their delivery to the site and that it was Kellogg's responsibility, not that of PM, to examine these welds.

Sellars recalled an incident in August 1979 when Anthony Pallon asked David Hang to radiograph some Kellogg spool pieces that had fallen off the truck on delivery to the site. Sellars said Hang attempted to radiograph the spool pieces in question, but the film quality was poor and the technique was wrong, which caused exaggerated flaws in the radiographs of the spool pieces. When Sellars and Hang initially told Pallon about this, Pallon requested they continue the examination anyway. Sellars stated the spool pieces were later ultrasonically examined and found to be acceptable. He indicated that ultrasonic examination was the proper technique to use when examining welds in this configuration. Sellars said the ultrasonic examination did not detect any defects in the spool pieces.

On April 15, 1981, Allen Sellars provided a written sworn statement attesting to the preceding information, a copy of which is included as Exhibit 49.

5.8.3.9 Interview with Wayne Draffon

On February 19, 1981, Wayne Draffon, PM Level III Radiographer, was interviewed by NRC. He stated that he was employed at Zimmer from January to August 1980 and during this period supervised PM radiographers onsite. Draffon stated that on occasion Kaiser requested PM to examine Kellogg prefabricated pipe welds. He recalled discussing with the radiographers one incident that occurred prior to his arrival onsite when PM was asked to radiograph some Kellogg spool pieces that had fallen off a truck. The radiographers informed him that, when Kaiser personnel requested the examination, they knew radiography was the wrong technique to use. He said they told him the geometric configuration of the welds was such that radiography would distort the view of the weld. Draffon indicated that he later reviewed these films during an NRC investigation and concluded the geometry was such that radiography distorted the view of the welds. He stated the spool pieces in question were later ultrasonically examined and found to be acceptable.

Draffon indicated the PM radiographers had told him that, while examining Kaiser field welds, they occasionally noticed a defect in a Kellogg weld that overlapped a Kaiser weld. He said the defects would be noted on the examination report and forwarded to Kaiser. Draffon cautioned that when welds overlap or come to a juncture one had to be careful the geometry of the situation did not distort the view of a weld. Draffon said he knew of no reason why any PM employee would state that 20% of the prefabricated welds onsite were defective.

5.8.3.10 Record Reviews

Region III inspectors reviewed radiographs of the following field and shop welds in spool pieces in the residual heat removal (RHR) system (the system identified by Individual A as containing defective welds) to determine if there were any unacceptable indications in the welds or adjacent material and to determine if the radiographs of the field welds overlapped any shop welds. (see Table 5.8-1).

Table 5.8-1 Welds in the RHR System

Line No.	Weld No.	Diameter (in.)	Line No.	Weld No.	Diameter (in.)
Field Welds					
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	1RH02B2CO	RH15B	20
1RH02BC20	RH16	20	1RH02BC20	RH16A	20
1RH02BC20	RH16B	20	1RH02BC20	RH16C	20
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 Welds					
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

The RIII inspector reviewed approximately five radiographs for each of the 62 welds. No unacceptable indications were identified in either the welds or the adjacent material. No shop welds were included (overlapped) in the radiographs of the above field welds.
In addition to the welds in Table 5.8-1, the inspectors reviewed radiographs of 206 prefabricated pipe (shop) welds (700 radiographs) for acceptable radiographic testing (RT) technique, weld quality, and documentation (see Appendix B).

Radiographs of the welds were reviewed per ASME Section III, 1971 Edition, with ~~Winter 1972~~ Summer 1973 Addenda, and M. W. Kellogg Co. Procedures ES-414, ES-415, and ES-416. No unacceptable radiographic technique deficiencies were identified in 517 of the radiographs and no unacceptable indications were identified in the respective welds. However, ~~183~~ of the radiographs were made without required shims under the penetrameters. An additional four radiographs were made with insufficient shims under the penetrameter.

ASME Section III, 1971 Edition, with ~~Winter 1972~~ Summer 1973 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. (pipe manufacturer and agency performing the radiography) 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. Shims shall be of a radiographically similar material to the weld metal."

The insufficient shimming of the penetrameter in radiographs of the noted welds is contrary to 10 CFR 50, Appendix B, Criterion XI, and the Wm. H. Zimmer QA Manual, Section 11.2 (50-358/81-13-13).

All of the radiographs in which the penetrameters were insufficiently shimmed were previously accepted by the fabricator (M. W. Kellogg), the Authorized Nuclear Inspector (Hartford Steam Boiler Insurance Company) at the fabricator's shop, the site radiographer (Nuclear Energy Services), and the licensee at the site. (Special identification of the 206 welds for which radiographs were examined is included as Exhibit 50.)

A penetrameter is a device used to determine the image quality of a radiograph, usually a thin strip of metal of a thickness specified as some percentage of thickness of the material being radiographed. Placed on the part being radiographed, it is normally required that it be of material radiographically similar to that of the item being inspected. Various sized holes, multiples of the penetrameter thickness, are on the strip. The ability of the radiograph to show some definite sized hole establishes its quality. The essential hole of the penetrameter is used to determine if the radiograph has been sufficiently exposed to show weld indications that are in noncomformance 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. An insufficiently shimmed penetrameter will give false assurance that the weld had received sufficient exposure to reveal any unacceptable indications in the portion of the weld that is thicker than the metal under the penetrameter.

The licensee disagreed with the NRC interpretation of Paragraph IX-3334.4 of the ASME Code, Section III-1971, regarding the use of shims under the penetrameter. This matter was discussed in a meeting on April 30, 1981, between representatives of RIII, RIV, the State of Ohio, the National Board of Boiler and Pressure Vessel Inspectors, and the licensee and his consultants. The meeting is documented in IE Inspection Report No. 50-358/81-16. The representatives from the State of Ohio and the National Board concurred with the NRC's position.

A program that may demonstrate the adequacy of the radiographs in question is being implemented by CG&E and is included in the Quality Confirmation Program. This program is described in Section 11.x of NRC report.

5.8.3.11 Verification

Region III inspectors also verified that the following welds matched the respective radiographs by comparing a sketch (onionskin) made by the RIII inspectors, of the welds depicted in the respective radiographs for the following welds:

Pipeline No.	Weld No.
1FC36CA621	B
1MS20B3169	A
1FC02AB818	B
1MS20B3169	D
1FC39CA621	C
1FC02AB818	A

5.8.4 Findings and Conclusions

Interviews with the individuals identified by the alleger did not provide specific information of any defective weld. Therefore, the RIII inspector examined more than 700 radiographs to determine the acceptablility of the welds. No unacceptable welds were identified; however, 187 radiographs could not be interpreted because of an unacceptable radiographic technique. To provide further assurance that both prefabricated and field welds are satisfactory, the quality of the welds and the radiographic technique have been addressed in the Quality Confirmation Program.

5.8.5 Items of Noncompliance

One item of noncompliance was identified (failure to assure that radiography test requirements for shimming the penetrameter had been satisfied).

5.9 Design Control

5.9.1 Allegation

"Engineering "designs" routinely are drawn after the fact to conform with piping that already had been installed."

5.9.2 Background Information

Problems associated with the design and installation of large-bore piping and pipe suspension systems were identified by the RIII inspection program beginning in May 1978. Similar problems were identified for small-bore piping and pipe suspension systems beginning in February 1980. Seventeen inspections have covered these large-bore and small-bore pipe and piping suspension systems.

Problems related to installations not being in accordance with design drawings were identified for large-bore piping and pipe suspension systems in an August 1978 RIII inspection and for small-bore piping and pipe suspension systems in a February 1980 inspection. The resolution of these problems is being followed in the RIII inspection program.

5.9.3 Investigation

5.9.3.1 Interview with Individual A

On April 24, 1981, Individual A. who was previously interviewed by representatives of GAP, was interviewed by NRC. Individual A stated Kaiser construction personnel used "construction aids" rather than final design drawings when fabricating and installing pipe support hangers on site. He stated that if a pipe support hanger or pipe piece was moved, the construction aid was changed in the field without an engineer's concurrence. He said there was no assurance that the pipe was in the proper location or was installed as designed. He characterized this as designing pipe hanger and support systems "after the fact" because the construction aids were used as the final drawing after installation.

Individual A said the systems were not installed to follow drawings approved by an engineer, but rather the pipe support system was installed by construction and the engineer took the construction aid and made it into the final drawing for the system. He said this occurred because Sargent & Lundy (S&L), the architect-engineer, did not have enough engineers assigned to the site to draw and approve design changes on the pipe support system or to provide accurate and updated design drawings for the craft personnel to use when installing the systems.

On April 22, 1981, Individual A provided a written sworn statement attesting to the preceding information; however, he requested the statement not be attached to this report.

5.9.3.2 Interview with James Tyner

On April 16, 1981, James Tyner, former Kaiser Pipefitter Superintendent, was interviewed by NRC. He stated his concern about Kaiser's practice of installing pipe supports from "construction aids" or "field sketches" rather than from approved design drawings. He said construction was far ahead of schedule and the designers were behind in this area. He stated that pipe supports as drawn on the construction aid occasionally did not fit in the location they were designed for and were moved arbitrarily and noted in red on the construction aid. This change was then transposed to the final drawing without an engineer's evaluation of the change. Tyner indicated that this resulted from poor initial design on the construction aid itself.

Tyner also said that, in his opinion, the licensee did not have qualified engineers or engineering support staff on site to properly draw the construction aids to match actual conditions in the plant.

5.9.3.3 Interview with Individual B

On April 14, 1981, Individual B, who was previously interviewed by representatives of GAP, was interviewed by NRC. Individual B stated that he was provided with a field construction drawing or construction plan when installing systems in the plant. The system would be installed and the engineering staff would be shown where construction personnel had made changes or alterations in the installation of the system. He characterized this as construction designing the systems while they were being installed, rather than designing the system by engineers. Individual B indicated that in 1977 Kaiser Quality Control Inspectors contracted from Butler Services, Inc., saw this practice and directed that it be stopped because it was contrary to Quality Control Procedures.

On April 14, 1981, Individual B provided a written sworn statement attesting to the preceding information; however, he requested the statement not be attached to this report.

5.9.3.4 Review of Previous NRC Inspections

NRC has previously identified problems with the installation of pipe hangers and the related quality assurance inspection program. These problems were documented and notices of violation were issued in Region III Inspection Reports No. 78-10, 78-18, 78-22, 78-27, 78-32, 79-03, 79-10, 79-11, 79-22, 79-37, 80-05, 80-13, 80-16, 80-22, 80-25, 81-04, and 81-17.

1. RIII inspection of large bore piping and pipe suspension system design and installation was initiated in May, 1978. By the latter part of 1978, RIII was aware that most of the existing installations were not in accordance with the design, due to implementation of an inadequate installation and QA/QC program. The situation was further compounded

by the updating of GE design criteria that invalidated the previous engineering design and calculations. Since then, the licensee has determined that all installations are considered preliminary and that final calculations will be performed prior to system test and acceptance. Because of this, RIII has not inspected large bore piping suspension system hardware since 1979. The findings relative to support installations not in accordance with design and inadequate design review remain open. issues which will be reviewed by the NRC.

2. RIII inspection of small bore process and instrumentation piping and pipe suspension system design and installation was initiated in February, 1980. Problems relative to field design changes being made without S&L approval are documented in Inspection Report 80-05. At present, the design of small bore systems is contracted to Nuclear Power Services, Inc. (NPS). RIII review of the NPS program and its implementation will be a part of future routine site inspections.

3. RIII inspections of small bore CRD piping and pipe suspension systems design and installation were performed in December, 1980. The inspection identified inadequacies in design and the QA/QC programs and as a result CG&E issued a Stop Work Order. RIII followup inspection in June, 1981 (Report No. 81-17) resolved most of the findings, however, the present RCI design control provisions relative to procedures; verification and approval remain open.

The corrective measures to resolve these problems have been and continue to be closely monitored by Region III.

5.9.4 Findings and Conclusions

There have been cases of both large- and small-bore piping and pipe suspension systems being installed without proper design control. Field installations have been made that were not in accordance with approved design documents. This problem was initially identified for large-bore piping systems during a May 1978 RIII inspection. It was initially identified for small-bore piping systems during an RIII inspection in February 1980, which was conducted as a result of an allegation concerning small-bore piping problems at another RIII facility.

These problems have resulted in items of noncompliance, management meetings with the licensee and licensee stop work orders, one of which was confirmed in an Immediate Action Letter. Resolution of these problems is not complete and is being followed in the RIII inspection program.

5.9.5 Items of Noncompliance

No new items of noncompliance were identified.

5.10 Cable Tray Hangers and Loading

5.10.1 Allegation

"Shock-absorbing electrical tray hangers previously found unsatisfactory are still unsafe due to faulty welds, and electrical cable trays remain dangerously full."

5.10.2 Background Information

During an interview on February 26, 1981, Thomas Applegate and a GAP representative, Thomas Devine, indicated that Edwin Hofstadter was the source of this allegation.

Hofstadter was employed by Husky Products, the Zimmer cable tray vendor, between February 8, 1973 and August 4, 1978. He wrote a letter of complaint that he sent to various parties on August 18, 1978. RIII personnel contacted him by telephone on September 9, 1978, and he was interviewed by RIII personnel on September 29, 1978. His allegations, relating to materials and welding on cable trays supplied to the Zimmer and Clinton sites, were investigated in detail by RIII, and the findings related to Zimmer are documented in IE Investigation Report 50-358/78-21. The RIII investigation resulted in one item of noncompliance (a deficiency), but cable tray materials and welding were considered acceptable.

During the 1978 RIII investigation, Hofstadter sent a series of letters to the NRC (dated September 30, October 9, 19, 20, 31, December 15, 1978, and February 11, 1979) stating his concerns and expressing dissatisfaction with NRC investigation findings. On February 2, 1979, a public press conference was held in Cincinnati wherein RIII personnel met with Hofstadter, a lawyer representing Ralph Nader, and representatives of Citizens Against A Radioactive Environment (CARE), an intervenor group, to discuss the NRC investigation.

At RIII's request, a vendor inspection of Husky Products was performed by Region IV personnel during February 12-15, 1979 (Report No. 99900356/79-01). The inspection did not identify significant deficiencies (QA Manual lacked description of duties or policy statement, weld procedure 107 lacked welding parameters for metal under 1/4-in.).

On March 9, 1979, CARE sent a letter to various media representatives, taking issue with the RIII finding of cable tray acceptability. Subsequently, the Mississippi Valley Power Project (MVPP), another intervenor group, introduced the acceptability of cable trays and cable tray loading as contentions in the Zimmer licensing hearings. These contentions were accepted for litigation, and extensive testimony by NRC, Husky Products, CG&E, Hofstadter, and MVPP personnel is documented in the hearing transcripts.

A review of the Atomic Safety Licensing Board hearing transcripts indicated that they did not reveal any significant information not included in the RIII investigation report. The conclusion of cable tray acceptability has not been altered.

Hofstadter made no allegations concerning cable tray hangers, and these were not supplied by Husky Products.

A report (50.55e) was submitted to NRC by the licensee concerning cable tray hanger welding deficiencies on July 17, 1978. A followup report was sent to the NRC on October 30, 1978. Review of the licensee's corrective actions was performed during an inspection conducted during March 21-23, 1979. During that inspection, corrective action appeared to be acceptable, but had not been completed.

5.10.3 Investigation

5.10.3.1 Interview of Edwin Hofstadter

Edwin Hofstadter was contacted by telephone on July 31, 1981. He stated his concerns dealt with cable tray (fittings) welding, and he had no knowledge of cable tray hangers. He expressed concern regarding cable tray loading at Zimmer.

5.10.3.2 Observations and Reviews Concerning Cable Tray Hanger Welds

The following findings address the present review of the allegation as expressed by GAP in their letter of December 10, 1980, to the Merit Systems Protection Board concerning cable tray hangers and cable tray loading.

RIII inspectors made visual inspections of both vendor and field welds on ~~the following Superstrut~~ cable tray hangers in the cable spreading room ~~and~~ and ~~blue switchgear room, and at an elevation of 473-ft in the auxiliary building~~. OK

~~The following data was noted for~~ the cable spreading room:
The RIII inspectors observed ~~the following hangers~~ welds in the following tray hangers in

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 fireproofing

4. No. 15H1FEC160--no unacceptable weld discontinuities; foot connection covered with fireproofing

W (1) 5. No. 70HFEC165 (cross brace member No. 23HV5FEC294)--welds had irregular profile, porosity, and undercut

W (2) 6. No. 15H2FEC175 (second horizontal member from the top)--weld had undercut

W (3) 7. No. 14H11FEC146 (cross member)--an apparent vendor weld had undercut and slag

W (4) 8. No. 16H1FEC156 (weld marked rejected)--weld had spatter and undercut

All of these welds were painted; therefore, the RIII inspector examined for relatively large discontinuities only.

The unacceptable welds identified on hangers 70HFEC165, 15H2FEC175, 14H11FEC146, and 16H1FEC156 were not controlled in any QA document. This is contrary to 10 CFR 50, Appendix B, Criterion XV, and the Wm. H. Zimmer QA Manual, Section 15 (358/81-13-09).

The RIII inspectors reviewed approximately 180 construction inspection plans (CIPs) and inspection records for the hangers in the cable spreading room (elevation 536 ft in the north section of the auxiliary building). The licensee stated that inspections documented on the CIPs also included vendor welds, even though the records only reflected field welds. The vendor welds were inspected because of repairs necessary to close the 10 CFR 50.55(e) report telephoned to NRC on July 17, 1978. The 10 CFR 50.55(e) report indicated that vendor welds on Superstrut cable tray hangers, which were used only in the cable spreading room (PW Industries hangers are utilized elsewhere and appear acceptable), did not meet the visual inspection requirements of AWS D1.1-1972. The CIP records and the 10 CFR 50.55(e) report indicate that all of the final field and vendor welds were reinspected after repairs were made to vendor welds on more than half of the 141 hangers. These were accepted by the licensee in December 1980 and January 1981.

No inspection records were available to indicate that in-process inspections of either the field or vendor welds were made to verify proper filler metal, weld procedure, welder's qualifications, surface conditions, etc., as required by the AWS D1.1-1972 Code, Section 6. Certificates had been supplied by the vendor stating that the material met the purchase specification requirements. The RIII inspector requested the licensee to obtain the in-process and field weld inspection records for the hanger welds made by the vendor (Superstrut). A letter dated May 1, 1981, from Midland-Ross Corporation to CG&E was provided to the RIII inspector on June 1, 1981. The letter indicated that Superstrut had been acquired by the Midland-Ross Corporation in January 1978, and that no records could be located with respect to in-process inspection of hangers supplied to Zimmer.

Discussions with pertinent QC management and inspection personnel revealed that the welds documented on the above CIPs had been inspected after having been painted. The licensee stated that field visual examinations of tray hanger welds were based 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) applied to the hanger welds did not interfere with visual examination and, in some cases, actually highlighted discontinuities.

AWS D1.1-1972 Code, Section 3.10.1, states, "...Welded joints shall not be painted until after the work has been completed and accepted...."

The apparent lack of in-process and adequate final inspections of the above field and vendor hanger welds is contrary to 10 CFR 50, Appendix B, Criterion X, and the Wm. H. Zimmer QA Manual, Section 10.1.2 (358/81-13-10).

The RIII inspector requested the design acceptance criteria that was used by QC to evaluate the undercut on hanger 15H2FEC175. The licensee provided

S&L Specification H-2713, Supplement 7, Standard EB-117, and H. J. Kaiser Procedure No. SPPM 4.6, Revision 8, paragraph 5.2.9, which allows up to 1/16-in. undercut on the cable tray hanger welds. The 1/16-in. criterion 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 its 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 convexity. On March 5, 1981, S&L provided a documented investigation program of fillet weld size for P-W Industries 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. Although this study may justify that the weld size was adequate where the weld penetration was not measurable by normal visual techniques, no justification was provided to substantiate the exceptions to the AWS D1.1-1972 Code requirements concerning weld convexity 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 (358/81-13-11).

The Region III inspectors observed the ~~following~~ welds on the following tray hangers in ~~The following data was noted for~~ the blue switchgear room ~~hangers~~ (elevation 525 ft and drawing E-96):

1. No. 1H029--no unacceptable weld discontinuities

2. No. 5H25--foot connection covered with fireproofing; 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 sides)--had unacceptable weld discontinuities that were controlled 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--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.

The RIII inspectors observed the welds on the following tray hangers in the ~~The following data was noted for~~ elevation 473 ft auxiliary building: ~~hangers:~~

1. No. 5H009 (drawing E-91)--no unacceptable weld discontinuities

2. No. 4H3 (drawing E-14)--no unacceptable weld 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 preceding 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 (SR) No. 2893 dated January 8, 1981, which stated that 94 of 179 (Superstrut) 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 resolution of SR No. 2893 and action to resolve other hanger connections throughout the plant that were covered before they were inspected (358/81-13-12).

The concerns identified above are addressed in the licensee's Quality Confirmation Program.

5.10.3.3 Observations, Reviews, and Interviews Concerning Cable Tray Loading

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: cable ampacity or thermal loading; physical weight loading; and the commitments in the Zimmer FSAR, Section 8.3.3.1.

1. The following cable tray routing points (nodes) were selected for the reviews and discussions:

   a. 1057A--yellow division/power tray--selected because of the high design index (DI) of 1.44 (see 5.10.3.3 paragraph 3 for explanation of design index).

   b. 2025A--blue division/power tray--selected because of the high DI of 1.46.

   c. 2023A--blue division/power tray--selected for verification of DI accuracy (DI of 1.18).

   d. 2038A--blue division/power tray--selected because of the high DI of 1.44.

   e. 2039A--blue division/power tray--selected during field observations because of the appearance of being highly filled.

   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 DI of 1.54.

   i. 2027A--blue division/power tray--selected because of high DI of 1.46.

2. The RIII inspector and a licensee representative counted the cables in the following tray nodes and compared the counts with the number of cables listed in the S&L Cable Pan Loading Report, dated February 2, 1981:

	Node	Field Count	Report Count	
a.	1057A	27	27	
b.	2025A	24	23	(see explanation below)
c.	2039A	39	39	
d.	1073A	32	33	(see explanation below)

The Cable Pan Loading Report is a computerized periodical that gives the design status of cable tray loads. The report identifies individual cable numbers that have been specified to be routed through the segmented tray points (nodes).

The RIII inspector reviewed the H. J. Kaiser Cable Monitoring Report dated February 5, 1981, and some cable pull (installation cards) to verify that the cables specified for tray nodes 1057A, 2025A, 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 yet been installed, which accounted for the discrepancies between the preceding field and report counts. No other discrepancies were identified in either the design or installation reports and records for tray nodes 1057A, 2025A, 2039A, and 1073A. Thus, the design and installation records appeared to match the numbers of cables actually installed in the plant.

The RIII inspector also compared the number of cables specified in the S&L Cable Pan Loading Report for tray nodes 2023A against the H. J. Kaiser Cable Monitoring Report. The cables on the two reports matched.

3. The RIII inspector inquired how the computerized design index program correlated to Zimmer FSAR Section 8.3.3.1 (dealing with ampacity) and Section 3.10.1.2.3.c (dealing with physical weight limitations).

a. FSAR ~~Section 8.3.3.1~~ states the following:

> 8.3.3.1.1 In Trays
>
> 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 [Insulated Power Cable Engineers Association] Publication No. P-46-426.
>
> 8.3.3.1.2 Not In Trays
>
> 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
>
> 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.

FSAR Section 3.10.1.2.3.c states, "Cable tray loading of 40 psf (pounds per square foot) is used throughout."

b. On March 17 and March 19, 1981, the S&L Assistant Manager of Electrical Engineering 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 P-54-440 (1975), which was based on Stolpe's Paper, and S&L Standard ESA-104a (revised November 1, 1972).

The Stolpe method bases ampacity on the depth-of-fill design of cables in the tray rather than on the percentage fill. S&L uses a 2-in. depth-of-fill as the basis for selecting a cable for a particular ampere load.

(1) The 2-in. depth-of-fill design results in a major conservatism because of the following:

(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 oversized cables for most services. This means many cables would be capable of carrying larger currents (rated) than those 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. The design index is a measure of tray fill and is expressed mathematically as follows:

$$\text{Design Index} = \frac{\text{The sum of the (cable diameters)}^2}{\text{Useable area of the tray}}$$

where useable area (UA) equals tray width times design depth-of-fill (design depth-of-fill is based on square cables) and 50% of the tray cross-sectional area.

For 24 in. x 4 in. power trays, the total area equals 96 sq in. and useable area equals 24 in. x 2 in. equals 48 sq in.

$$DI = \frac{E(d^2)}{UA}$$

where

E = summation
d = 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. Percent fill is also based on the actual cable cross-sectional area rather than the square cable that is assumed in the Stolpe method. Expressed mathematically,

$$\text{Percent Fill} = \frac{\text{Sum of cable cross-sectional areas x 100}}{\text{Total cross-sectional tray area}}$$

where the sum of cable cross-sectional areas equals $E(pi \times r^2)$ with r = radius of the cable and pi = 3.1416.

Thus,

$$\text{Percent Fill} = \frac{E\ (pi \times r^2) \times 100}{\text{Total area}}$$

The relation between design index and percent fill is therefore

$$\frac{\text{Percent Fill}}{\text{Design Index}} = \frac{\dfrac{E(pi \times r^2) \times 100}{\text{Total area}}}{\dfrac{E(d^2)}{\text{Useable area}}}$$

since the total area (TA) equals 2 times the useable area (UA) and d = 2 x r.

$$\frac{PF}{DI} = \frac{\frac{E[pi \times \frac{d^2}{4}] \times 100}{2(UA)}}{\frac{E(d^2)}{UA}} = \frac{\frac{Pi}{4} E (d^2) \times 100}{E(d^2)}$$

$$= \frac{pi}{8} \times 100 = \underline{39.3\%} \text{ per DI}$$

Thus, for a 4-in.-deep tray:

39.3% Actual Fill = 1.0 Design Index = 2-in. design depth-of-fill (square cables)

50% Actual Fill = 1.27 Design Index = 2.54-in. design depth-of-fill (square cables)

60% Actual Fill = 1.52 Design Index = 3.04-in. design depth-of-fill (square cables)

and for a 6-in.-deep tray:

39.3% Actual Fill = 1.0 Design Index = 3-in. design depth-of fill (square cables)

Based on the preceding relationships between design index and depth of square cables, and the fact that S&L has used a 2-in. depth-of-fill as the basis of selecting cables for particular ampere loads, the cables in tray nodes with a DI over 1.0 would have to be re-evaluated considering the increased depths. This item is unresolved pending completion of the re-evaluations (358/81-13-15).

The above design basis for cable ampacity was a deviation from the FSAR design ~~(FSAR) that~~ was not identified on any control document. This is contrary to 10 CFR 50, Appendix B, Criterion III, and the Wm. H. Zimmer QA Manual, Section 3.6 (358/81-13-16).

On March 17, 1981, the S&L Assistant Manager of Electrical Engineering stated that appropriate modifications to the FSAR would be submitted. Also, specific consideration would be given to the differing types of cable insulations, addressed in the previously discussed publications (standards), when compared with the cable insulations used in Zimmer.

4. The RIII inspector reviewed S&L Instruction No. PI-ZI-10.1, Revision 0, dated February 6, 1978, 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 that had DIs in excess of 1.25. S&L provided calculations for nodes 2025A, 1057A, and 2027A. These calculations were performed in 1978 and 1979 and 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 dated February 24, 1981 of 37 routing points (nodes) with design indexes over 1.25. Thirty-four of these tray points exceed the 50% tray fill requirement specified in the FSAR, 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 DI over 1.25. These calculations will be provided to NRC Region III. This item is unresolved (358/81-13-17).

5. Neither S&L Instruction No. PI-ZI-10.1, Revision 0, nor any other document established controls to verify the thermal loading power of cable (penetration) sleeves and the physical (dead weight) loading of trays (power, control, and instrument).

   a. The Cable Pan Loading Report included the design indexes of sleeves. Sleeve #SL111 had a reported DI of 1.29 and sleeve #SL105 had a reported DI of 1.26. A controlled list of power sleeves with a DI over 1.25 was not maintained.

   b. S&L stated that a design index of 1.25 would be used as the factor to determine 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 (358/81-13-18).

S&L revised Instruction PI-ZI-10.1, Revision 1, Sections 4.5, 4.6, and 4.7, on March 18, 1981 to include requirements to verify and control the thermal loading of power sleeves and the physical loading of all trays (power, control, and instrument) that 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 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 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 NRC Region III. This item is unresolved pending evaluation of the justification for using a design index program (358/81-13-19).

6. The RIII inspector observed a note on the bottom of the thermal calculation sheet dated December 27, 1979 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 that would have required appropriate evaluation and disposition. S&L personnel stated that a control program did not exist for such design deviations,> This is contrary to 10 CFR 50, Appendix B, Criterion III, and the Wm. H. Zimmer QA Manual, Section 3.6 (358/81-13-20).
when identified by the S&L engineers.

7. The RIII inspector determined the physical weight of yellow division control tray 1104B.

   The total weight of the cables for tray 1104B was determined to be

$$\frac{73.06}{2} = \underline{36.53} \text{ lb/ft}^2$$

   Therefore, tray 1104B (DI 1.54) is in compliance with FSAR Section 3.10.1.2.3, which allows up to 40 lb/ft^2.

Problems identified during investigaiton of this allegation are addressed in the licensee's Quality Confirmation Program.

5.10.4 Findings and Conclusions

This allegation raises concerns of potential safety importance that cannot be assessed without further inspections and evaluations by the licensee and NRC.

Cable tray hanger weld deficiencies in the cable spreading room had been reported to the NRC in July 1978 in accordance with 10 CFR 50.55(e). The licensee's corrective action of this matter was completed in January 1981. Although this matter was being carried as an open inspection item by NRC, the licensee's final corrective action was not reviewed prior to this investigation effort. This investigation effort disclosed that the hanger welds throughout the plant had not been inspected before the welds were painted or coated with fireproofing.

The acceptability of electrical tray hanger welds is unresolved pending (1) additional inspections of hanger welds, which will be made after paint and fireproofing have been removed, and (2) establishment of the quality of those welds for which in-process inspections were not performed and for which inspection criteria deviated from AWS Code requirements.

The acceptability of electrical cable trays fill and loading is unresolved pending the completion and review of tray-loading calculations for several

tray-routing points; re-evaluations of cable selections; establishment of the actual design basis and verification measures for cable tray loading; establishment of design measures to verify the thermal loading of power sleeves and the physical loading of trays; and establishment of measures to control design deviations.

It should be noted that the time to determine compliance with ampacity requirements is at the completion of the electrical design. According to the licensee and A/E this was to be accomplished.

These concerns are addressed in the licensee's Quality Confirmation Program.

5.10.5 Items of Noncompliance

Six items of noncompliance were identified. (Failure to identify and control unacceptable welds on four cable tray hangers; failure to execute the programs for inprocess and final (before painting) inspections of cable tray hanger welds; failure to assure that appropriate weld inspection criteria (1/32 inch undercut) was specified in design documents; failure to control deviations from the design basis for cable ampacity; failure to establish measures to assure verification of the design adequacy of the thermal loading of power sleeves and the physical loading of trays; and failure to establish measures to assure that design deviations, identified by S&L engineers were controlled).

These items have generic applicability to plants designed by S&L and are being forwarded to NRC Region IV, Vendor Inspection Branch for generic followup.

5.11 Clogged Intake

5.11.1 Allegation

"Sand and mud choke the feedwater pumps and intake flues carrying makeup water to the cooling tower, because of a flaw in the plant's design. Pumps used to rectify the flaw quickly burn out."

During an interview with Thomas Applegate and a GAP representative (Thomas Devine), it was clarified that this allegation pertained to the river intake. The river intake provides service water, not feedwater.

5.11.2 Background Information

10 CFR 50.55(e) requires licensees to report to NRC major defects found during construction or operation of power reactors. These reports are public documents, maintained in NRC files and Public Document Rooms.

The licensee reported silting conditions in CG&E letters QA-1148 dated June 20, 1979, and QA-1168 dated July 23, 1979, and service water pump impeller wear conditions in letters QA-1196 dated September 6, 1979, QA-1239 dated December 31, 1979, and QA-1371 dated December 17, 1980, that were sent to NRC Region III pursuant to the requirements of 10 CFR 50.55(e). Copies of these letters are included as Exhibit 51.

The silting and pump impeller wear conditions, along with the measures to correct these conditions, are described in Appendix J of the Wm. H. Zimmer FSAR, Revision 69, dated December 1980 (see as Exhibit 52 of this report).

5.11.3 Investigation

A review was made of the 10 CFR 50.55(e) reports and related documents. Additional investigation was not performed by RIII because the matter was known and resolution was in progress.

The corrective measures to be taken, as described in licensee submittals, have been reviewed and accepted in Subsection 9.2.1 of NUREG-0528, "Safety Evaluation Report (SER) Related to the Operation of Wm. H. Zimmer Nuclear Power Station, Unit 1," Supplement 1, issued in June 1981 by the Office of Nuclear Reactor Regulation, U.S. Nuclear Regulatory Commission.

The implementation of these corrective measures is unresolved pending completion of the corrective measures described in the Wm. H. Zimmer FSAR, Appendix J, Revision 69, dated December 1980 (50-358/81-13-31).

5.11.4 Findings and Conclusions

The licensee reported the silting condition concerning the service water intake structure to NRC Region III by telephone on June 18, 1979 and by letters QA-1148 on June 20, 1979 and QA-1168 dated July 23, 1979 pursuant to the requirements of 10 CFR 50.55(e). The plant design and operating procedures had to be modified to control the silting condition.

Accelerated service water pump impeller wear was reported by the licensee by telephone on August 10, 1979, and by letters QA-1196 dated September 6, 1979, QA-1239 dated December 31, 1979, and QA-1371 dated December 17, 1980, pursuant to the requirements of 10 CFR 50.55(e).

The silting and pump impeller wear concerns are open items pending completion of corrective measures described in the Wm. H. Zimmer Final Safety Analysis Report (FSAR), Appendix J, Revision 69, dated December 1980 (including a sedimentation monitoring program and plant modifications) and review by RIII inspectors. The implementation of these corrective measures will be reviewed during a subsequent inspection.

5.11.5 Items of Noncompliance

No items of noncompliance were identified.

5.12 Overpressurization Incident

5.12.1 Allegation

"A design flaw in the heat exchanger control panel permitted an operator mistakenly to force 1200 pounds of pressure through pipes only meant to handle 300 pounds, ripping the pipe and soaking electricians with a hard spray of water that would have been radioactive had the plant been in operation."

5.12.2 Background Information

10 CFR 50.55(e) requires licensees to report to NRC major defects found during construction or operation of power reactors. These reports are public documents, maintained in NRC files and Public Document Rooms.

The licensee reported the overpressurization incident in CG&E letter QA-1106 dated March 2, 1979 (see Exhibit 53) pursuant to the requirements of 10 CFR 50.55(e). The report indicated that on January 19, 1979, during a construction test to demonstrate the flow rate through the high-pressure core spray (HPCS) system orifice, the steam jet air ejector was overpressurized and failed. The report alludes to two operator errors as the cause of the overpressurization. The errors involved two administratively controlled valves, which were incorrectly documented as closed. "Administratively" means that the valve positions (e.g., open, closed, etc.) are verified and documented in accordance with site procedures.

Although water in the HPCS system is not presently radioactive, it can be contaminated during normal operation.

The 10 CFR 50.55(e) report also stated that the design, utilizing two administratively controlled valves, was permitted by the ASME Section III Code, and concluded that the overpressurization incident was not due to a design deficiency, although a check valve would have compensated for the two operator errors.

5.12.3 Investigation

5.12.3.1 Interview with Individual A

On April 22, 1981, Individual A, who was previously interviewed by representatives of GAP, was interviewed by NRC. Individual A stated he recalled an incident when the heat exchanger control panel was pressurized with 1200 pounds of pressurized water when it was only meant to handle 300 pounds. He said he learned that high-pressure water entered the low-pressure system and ruptured pipes in the low-pressure system. He said two electricians in the area were doused with water when the pipes ruptured. He related that other plant employees said this incident occurred because an operator apparently failed to turn off a valve allowing high-pressure water to enter the low-pressure system.

On April 22, 1981, Individual A provided a written sworn statement attesting to the preceding information; however, he requested the statement not be attached to this report.

5.12.3.2 Interview with Individual B

On April 14, 1981, Individual B, who was previously interviewed by representatives of GAP, was interviewed by NRC. Individual B stated he recalled an incident when the "alpha air injector condenser" on the ground floor of the turbine building was injected with high-pressure water instead of low-pressure water and the pipes in the condenser ruptured. He said other workers in the

plant told him this occurred because an operator failed to close the high-pressure valve and the high-pressure water entered the low-pressure system that ruptured the lines.

On April 24, 1981, Individual B provided a written sworn statement attesting to the preceding information; however, he requested the statement not be attached to this report.

5.12.3.3 Record Review

Region III inspectors have previously reviewed the overpressurization concern as documented in the following excerpts of IE Inspection Reports No. 79-06, Section 8; No. 79-23, page 4; No. 79-29, pages 4 and 5; and No. 80-06, page 2.

Report No. 79-06, Section 8

"The inspector reviewed the event of January 19, 1979, during which high pressure core spray (HPCS) water entered the condensate (CD) and low pressure core spray (LPCS) systems because valves 1E22-F003 and F031 had been left open causing a rupture of the steam jet air ejector condenser 1A. The review consisted of interviews with testing and operating personnel and a review of the licensee's final report on his investigation of the event. The review showed that:

"a. Procedure OP.HP.01-4, Revision 0 was used to lineup, fill and vent the HPCS system.

"b. At the completion of the fill and vent operation the operator never completed Step 5.1.5 which required him to close valves 1E22-F003 and F-31. With these two valves open the CD and HPCS systems became crosstied thru the cycled condensate (CY) system. The operator claims he informed the Shift Supervisor that he had left the two valves open while the latter does not recall being told. This failure to follow procedures is contrary to 10 CFR Part 50, Appendix B, Criterion V and is considered to be an example of an item of noncompliance (358/79-06-06B) of the infraction level.

"c. For some unknown reason, valve 1E21-F025 which had been safety tagged closed under Switching Order No. 781317, dated November 16, 1978, was in the open position. This completed the cross connection of the LPCS and HPCS systems. Violation of Switching Order No. 781317 is contrary to 10 CFR 50, Appendix B, Criterion V and is considered an example of an item of noncompliance (358-79-06-06C) of the infraction level. The switching order was cleared on January 24, 1979. The corrective action which the licensee is currently taking regarding a previous noncompliance with the safety tagging procedure (358-79-01-01) is also applicable to this event, therefore the inspector stated no response to this item of noncompliance is required.

"d. Paragraph 13.0 of Safety Tagging Procedure EC.SAD.02, Revision 00 allows for the operation of equipment for test purposes without the removal of the safety tags. It is possible that valve 1E21-F025 was operated for test purposes thru tags and subsequently left open by

error. The inspectors have objected to Paragraph 13.0 of the Safety Tagging Procedure.

"On March 21, 1979, the licensee issued operating memo 79-2, Revision 9, which specifically requires that "Do Not Operate" tags must be removed before energizing electrical equipment or opening valves. An exception is made in the case of electrical testing conducted by EOTD in which case only the EOTD master tag will be left in place.

"e. On December 12, 1977, a General Electric system engineer recommended that a check valve be installed on line 1HP18A3 downstream of valve 1E22-F013) because a similar overpressurization of a small section of low pressure piping had occurred. The recommendation was rejected because the licensee thought that two valves (1E22-F003 and F031) plus administrative controls were sufficient to prevent recurrence. The licensee stated the check valve will be installed. All other ECCS systems have check valves in the line from the CY system.

"The inspector stated his concern regarding repeatable occurrences where a lack of communication or understanding between parties have resulted in damage to equipment. It is our intention to closely monitor the licensee's performance during the preoperational test program to determine the adequacy of plant staffing and training as fuel load date approaches."

Report No. 79-06, page 2

"(Closed) Noncompliance (358/79-01-01). Failure to follow safety tagging (switching order) procedure. The inspector found that the licensee is conducting safety tagging refresher training for all operations personnel and systems engineers as stated in their letter, Borgmann to Heishman, dated February 28, 1979."

Report No. 79-23, page 4

"(Open) 10 CFR 50.55(e) Report: Overpressurization of the steam jet air ejector heat exchanger (tube side). The inspector established that a check valve has been installed as stated in the licensee's report dated March 1, 1979 (QA-1106). This item remains open pending further review by NRC Operations Branch."

Report No. 79-29, pages 4 and 5

"(Closed) Overpressurization of the steam jet air ejector heat exchanger (tube side). NR number 7247R1, dated February 21, 1979, stated that over pressure to 1200 psi of the LPCS piping system occurred in addition to others. The A-E (Sargent and Lundy) analyzed the piping system and valves with dispositions as follows:

"1. Carbon steel piping 3/4" up to 12" acceptable since stress was well below yield point.

"2. The one stainless steel 3/4" pipe is likewise o.k.

"3. Six hundred pound valves are acceptable with the pressure experienced only being a repeat hydro test.

"4. Three hundred pound and 150 pound valves the manufacturer should be consulted.

"5. The relief valve causing the problem should be retested and reset.

"Further information available (Construction Engineering Report dated April 14, 1979) stated that the valve manufacturers recommended a seat leakage test be conducted on the valves and that this test was performed without any leaks being detected and it further stated that the relief valve had been removed, tested and reset of set points done. The NR was signed as completed on October 25, 1979. The inspector indicated that he had no further questions regarding this item."

Report No. 80-06, page 2

"(Closed) Noncompliance (50-358/79-06b). Failure to follow OP.HP.01-4 valve lineup. (Not closing valves IE22-F003 and IE22-F031.) The inspector reviewed the licensee's action to prevent further non-adherence to procedures and found them acceptable."

The licensee's General Engineering Department's report of April 24, 1979 (excluding attachments and tables) that documents the final disposition of NR-7247R1, is included in Appendix B. ? ? is this report ?

5.12.4 Findings and Conclusions

The overpressure event referred to in the allegation was reported to the NRC in March 1979, in accordance with 10 CFR 50.55(e). The event was caused by operator errors, that incorrectly permitted two valves to remain open, rather than inadequate system design.

The actions taken by the licensee to assure the quality of the affected piping and components and to prevent recurrence had been reviewed by the NRC prior to the allegation and found satisfactory.

5.12.5 Items of Noncompliance

No new items of noncompliance were identified.

5.13 Lax Fuel Security

5.13.1 Allegation

"There have been periods when there were no security surveillance cameras during nuclear fuel deliveries to the site, and perimeter security consisted for an extended period of only a four foot chickenwire fence."

On February 26, 1981, during a meeting between NRC officials, Thomas Devine (GAP representative) and Thomas Applegate at the Region III NRC office, they advised that, among others, former Yoh Security Officers Jeffrey Hyde and Ronald Wright were aware of periods of time when the nuclear fuel was left unattended. It was alleged these situations presented a threat to the public health and safety and left the fuel susceptible to terrorism, theft, and/or diversion.

In addition, it was alleged that the walls of the fuel storage area were "blow-out" walls, designed to give way during tornadoes.

5.13.2 Background Information

On June 26, 1978, NRC Special Nuclear Material License No. SNM-1823 was issued to CG&E authorizing receipt, possession, inspection, and storage (at the Wm. H. Zimmer Nuclear Power Station) of 2,000 kilograms of uranium-235 (U-235) reactor fuel at an enrichment not to exceed 2%. The U-235 CG&E received was in the form of new (unirradiated) reactor fuel assemblies. These assemblies are stored on the 627-ft level (seventh floor) of the reactor building in the spent fuel pool area.

Nuclear fuel enriched above natural levels but less than 10% in the U-235 isotope is defined under 10 CFR 73.2(y) as "special nuclear material of low strategic significance." The physical protection requirements for possession of special nuclear material of low strategic significance at a fixed site are set forth in 10 CFR 73.67(f), which states the following:

> "Each licensee who possesses or uses special nuclear material of low strategic significance at fixed sites, except those who are licensed to operate a nuclear power reactor pursuant to Part 50, shall:
>
> "(1) Store or use the material only within a controlled access area,
>
> "(2) Monitor with an intrusion alarm or other device or procedures the controlled access areas to detect unauthorized penetrations or activities,
>
> "(3) Assure that a watchman or offsite response force will respond to all unauthorized penetrations or activities, and
>
> "(4) Establish and maintain response procedures for dealing with threats of thefts or thefts of such material."

The licensee is obligated to abide by the preceding requirements and any special conditions set forth or committed to in Special Nuclear Material License No. SNM-1823. A licensee (prior to being granted an operating license) is not required to comply with other more stringent physical security requirements of 10 CFR 73 and related Appendix B.

During NRC safeguards inspections conducted on September 25, 1979 (Report No. 70-2838/79-01) and January 22-23, 1981 (Report No. 70-2838/81-01), it was determined that the licensee was complying with the requirements of 10 CFR 73.67(f) and License No. SNM-1823 with regards to protection and storage of the nuclear fuel.

NRC License No. SNM-1823 requires that administrative controls be used to control access to the new fuel storage area. To implement the provisions of the license and 10 CFR 73.67(f), the licensee wrote and included in the Station Administrative Directives, Procedure No. SE.SAD.03 Rev. 1, which is entitled "Interim Access Control, New Fuel Storage Area." The primary purpose of this directive (as well as subsequent related procedural issuances and revisions) is to provide the administrative requirements for access control to the 627-ft elevation of the reactor building during receipt, inspection, and storage of new fuel, in accordance with their NRC license. Procedure No. SE.SAD.03 Rev. 1, requires that a minimum of one watchman be stationed at the location where normal entry and/or exit to the 627-ft elevation is controlled. The watchman's purpose in being stationed at this location is to control access and maintain surveillance of the 627-ft elevation during receipt, inspection, and storage of new fuel. "Watchman" as used in this context is defined by 10 CFR 73.2(d) as "an individual, not necessarily uniformed or armed with a firearm, who provides protection for a plant and the special nuclear material therein in the course of performing other duties."

In August 1979, when CG&E was preparing to receive the first shipment of nuclear fuel, CG&E contracted with Yoh Security, Inc., to provide ten security officers (watchmen) for the sole purpose of providing security for the receipt and subsequent storage of the nuclear fuel. Yoh Security personnel were required to adhere to the policy and/or procedures prepared by CG&E Security Supervisor, Frederick Lautenslager. CG&E did not exercise direct supervision over Yoh Security personnel, but provided the procedural requirements through the Yoh Lead Security Officer.

CG&E is not required by NRC regulations to have armed security officers for protection of new unirradiated nuclear fuel; however, the licensee chose to arm Yoh Security personnel with .38 caliber Smith & Wesson revolvers. There was no NRC requirement for such watchmen to be trained and/or to qualify with their assigned firearms. Subsequent to NRC expressing concern that the armed officers did not have specific firearms training and qualification, CG&E (effective as of March 1980) took action to assure that all security officers assigned to armed security responsibilities were trained and had qualified with their assigned firearms in accordance with procedures CG&E established. Prior to March 1980, armed security officers were selected based on previous firearms training experience that they had acquired from former military and/or police service.

Deliveries of nuclear fuel to Zimmer took place during the period August 15 through September 7, 1979. The shipping casks (containing two fuel assemblies each) in which the nuclear fuel was delivered measured approximately 15 ft in length by 21 in. in width and 11 in. in height. The fuel assemblies themselves were contained within a metal shipping container that was, in turn, enclosed within a wooden shipping container. A wooden and metal

shipping container together composed what is referred to as a single shipping cask. A wooden shipping container by itself weighed approximately 760 lb, a metal shipping container approximately 620 lb, and each fuel assembly approximately 685 lb. This made the approximate total weight of a single shipping cask (with two fuel assemblies enclosed) 2,750 lb. Subsequent to receipt of a shipping cask at the site, the metal shipping container was uncrated from the wooden shipping container at the ground level. The metal container (with fuel assemblies enclosed) was then lifted by crane to the 627-ft level of the reactor building (refueling floor) and temporarily stored in the metal containers. After the fuel assemblies were removed from the metal containers, they were inspected for possible damage, channelled, and then lowered into fuel racks located inside the spent fuel pool for storage. As a further assurance that the fuel has not been damaged while in storage, it will be examined by the licensee prior to loading it into the reactor.

Unirradiated fuel, although radioactive, does not pose a significant health and safety problem regarding radiation emissions. It is only subsequent to being loaded into the reactor and becoming irradiated during plant operation that the uranium becomes contaminated with the intensely radioactive products of the fission reaction, causing it to be highly radioactive.

The nuclear fuel, in its current form, contains a low percentage of U-235 enrichment, has little or no potential for use in any type of nuclear weapon, and thus has been defined as "special nuclear material of low strategic significance."

Additional security-related background information is also contained in Section 5.14.2.

5.13.3 Investigation

5.13.3.1 Interview with Jeffrey Hyde

On March 26, 1981, Jeffrey Hyde was interviewed by NRC. Hyde was also interviewed by telephone on June 9, 1981. He stated he was employed as a security officer with Yoh Security and stationed at the Wm. H. Zimmer Nuclear Power Station from August 1979 to October 1980. While stationed at Zimmer and assigned the duty of protecting the nuclear fuel, Hyde advised he became aware of approximately four occasions when the fuel was left unattended. He related that these instances occurred while the fuel was at ground level (prior to the time it was moved to the 627-ft level) with each instance lasting approximately 4 to 5 minutes, except for one that lasted approximately 10 minutes. Hyde explained that, subsequent to receipt, the nuclear fuel was moved by maintenance workers with the help of a crane from the ground level to the 627-ft level where it is currently stored. During this operation, there were usually two or three Yoh Security Officers stationed on the 627-ft level as the fuel was raised by crane and brought to rest on that floor. On various occasions, there were no security officers at the ground level watching the fuel as it was being moved and raised to the 627-ft level because officers were not required to watch the fuel during times it was under the control and/or observation of maintenance workers. Hyde stated the problem arose when the maintenance workers ended

their work shifts and left the area before he arrived at the ground level to keep watch over fuel that had not yet been moved to the 627-ft level. This resulted in the fuel being left unattended during those periods. (It should be noted that the licensee's procedures did not require continuous surveillance of the new fuel until it was in storage in the new fuel storage area).

Hyde was asked what, if any, personal knowledge he had of the fuel being left unattended while it was stored on the 627-ft level. He stated that he did not recall any instances when the fuel (while on the 627-ft level) was left unattended, except during those instances when the area radiation monitor (ARM) alarm was sounded. Hyde explained that, during occasions when the ARM alarm was sounded, security procedures required all persons to be present on the 627-ft level to be evacuated to a lower elevation level (floor). He indicated that, once everyone was evacuated to a lower elevation (e.g., the 593-ft level), access to the 627-ft level could still be controlled without a loss of security integrity (individuals going to the 627-ft level would have to pass through the 593-ft level).

On March 26, 1981, Hyde provided a written statement attesting to the preceding information, a copy of which is included as Exhibit 54.

5.13.3.2 Interview with Ronald Wright

On March 10, 1981, Ronald Wright was interviewed by NRC. Wright was also interviewed by telephone on March 12, 1981. He stated that he was employed as a security officer with Yoh Security and stationed at the Wm. H. Zimmer Nuclear Power Station from October 1979 to October 1980. Wright was asked what, if any, personal knowledge he had of the nuclear fuel being left unattended. He responded that the only times he recalled leaving the fuel unattended was once when he evacuated the 627-ft level during an earthquake and once during a tornado warning. He indicated that, although he left the 627-ft level on those occasions, he was still able to control access to the 627-ft level from a lower elevation of the reactor building (e.g., the 593-ft level) without loosing security integrity.

Wright also noted that when instances arose during which no other security officers were available and he had to leave the 627-ft level for some reason, he would call the control room and someone would relieve him at his post until he returned.

He stated to the best of his knowledge there was always someone present on the 627-ft level watching the fuel pool area where the fuel was stored, except during the described instances.

On March 10, 1981, Wright provided a written statement attesting to the preceding information, a copy of which is included as Exhibit 55.

5.13.3.3 Interview with Frederick Lautenslager

On February 24-25 and March 13, 1981, Frederick Lautenslager was interviewed by NRC. He stated that he is employed as the CG&E Security Supervisor and

has been assigned to the Wm. H. Zimmer Nuclear Power Station since August 1978. Lautenslager verified that no security surveillance cameras were used during nuclear fuel deliveries in August-September 1979 and remarked that there is no requirement for surveillance cameras to be used during deliveries. He noted that surveillance cameras were subsequently installed in December 1980 (part of required security for an operational plant).

With regard to the protection of the nuclear fuel during delivery, Lautenslager remarked that, although there was no requirement for security for the nuclear fuel while it was being unloaded from the delivery trucks and uncrated, CG&E provided armed security protection and surveillance over the fuel (beginning at the time it arrived on CG&E property). They also maintained this security profile during unloading, uncrating, inspection and subsequent storage of the fuel on the 627-ft level.

Lautenslager stated that, to the best of his knowledge, the nuclear fuel has not lacked armed security protection at any time since it was received at Zimmer. He also stated that once the fuel was placed in the spent fuel pool for storage, as well as during fuel inspection, access to the storage area has been under security control of the officers assigned to station security.

The only time the access control security officer is permitted to leave the 627-ft elevation is during evacuations covered by written security procedures. Lautenslager advised that, to his knowledge, there has been only one incident in which the officer left the 627-ft elevation. This incident, which occurred during an earthquake, involved the security officer moving to the 593-ft elevation where he was still able to control access to the 627-ft level and prevent any loss of security integrity.

On March 27, 1981, Lautenslager provided a typewritten statement attesting to the preceding information, a copy of which is included as Exhibit 56.

Frederick Lautenslager was interviewed by telephone on June 3, 1981, concerning the allegation that "perimeter security consisted for an extended period of time of only a four foot chickenwire fence." He stated that he recalled a fence fitting that general description being used around the plant site some time ago and described the fence as an "owner controlled fence," which marked the boundary line of CG&E's property. Lautenslager indicated that the fence would have been on areas outside the jurisdiction of the station security system, the primary concern of which was protection of the nuclear fuel.

5.13.3.4 Interview with James Caplinger

On March 12, 1981, James Caplinger was interviewed by NRC. He stated that he was employed as a lead security officer with Yoh Security and stationed at the Wm. H. Zimmer Nuclear Power Station from August 1979 to October 1980.

With regard to protection of the nuclear fuel, Caplinger advised that, to his knowledge, the fuel was never left unattended except during required evacuations. He explained that during an evacuation of the seventh floor fuel storage area the security officers repositioned themselves on the sixth

floor and were still able to control access to the seventh floor without a loss of security integrity.

On March 12, 1981, [Caplinger] provided a written statement attesting to the preceding information, a copy of which is included as Exhibit 57.

5.13.3.5 Interview with William Ross

On March 11, 1981, William Ross was interviewed by NRC. He stated he was employed as a lead security officer with Yoh Security and stationed at the Wm. H. Zimmer Nuclear Power Station from March 1979 to February 1980.

Ross stated he personally felt that a minimal job had been done to protect the nuclear fuel. He also stated that he did not recall any times during which he left the fuel unattended.

On March 11, 1981, Ross provided a written statement attesting to the preceding information, a copy of which is included as Exhibit 58.

5.13.3.6 Interview with John Bedinghaus

On March 12, 1981, NRC staff interviewed John Bedinghaus by telephone. On March 25, 1981, he was interviewed in Williamsburg, Ohio. He stated that he was employed as a security officer with W&W Security and assigned to nuclear fuel protection duties at the Wm. H. Zimmer Nuclear Power Station from October 1980 to January 1981. Bedinghaus was questioned about the adequacy of nuclear fuel security during the time he had been stationed at Zimmer. He stated that the fuel storage area on the seventh floor was well protected and the security officers assigned to fuel protection were conscientious in performing their duties. Bedinghaus also indicated that, to his knowledge, the fuel was never left unattended and no unauthorized persons were allowed entry into the fuel storage area.

On March 25, 1981, John Bedinghaus provided a written statement attesting to the preceding information, a copy of which is included as Exhibit 59.

5.13.3.7 Interview with David Simpson

On March 11, 1981, David Simpson was interviewed by NRC. He stated he was employed as a security officer with Yoh Security and stationed at the Wm. H. Zimmer Nuclear Power Station from September 1979 to October 1980. Simpson was questioned about the adequacy of nuclear fuel security during the time he had been stationed at Zimmer. He advised it was his opinion that CG&E's procedures for protection of the nuclear fuel were good and the protection of the fuel itself was more than adequate. Simpson stated that he had no complaints or concerns regarding the adequacy of the protection of the nuclear fuel at Zimmer.

On March 11, 1981, Simpson provided a written statement attesting to the preceding information, a copy of which is included as Exhibit 60.

5.13.3.8 Interview with James Bice

On April 20, 1981, NRC staff interviewed James Bice by telephone. He stated he was employed as a security officer with Yoh Security and stationed at the Wm. H. Zimmer Nuclear Power Station from September 1979 to July 1980. Bice was questioned about the adequacy of nuclear fuel security during the time he had been stationed at Zimmer. He stated that, to his knowledge, there were no instances when the fuel was left unattended except during evacuations (covered by written procedures) following area radiation monitor (ARM) alarms. On those occasions when the seventh floor was evacuated following an ARM alarm, the security officers would move to the sixth floor, secure the elevator, and continue to control access to the seventh floor from the sixth floor. Bice indicated there was no loss of security integrity during these instances.

5.13.3.9 Review of Unattended Fuel

Fuel was apparently left unattended for short periods of time (up to 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-Loading," 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,

1. The blow-out design feature is to protect safety structures from collapse;

2. The spent fuel storage facility, which will store the spent fuel under water once it becomes radioactive, is designed to preclude significant loss of watertight integrity of the pool and to prevent missiles from contacting fuel within the pool;

5.13.4 Findings and Conclusions

Security surveillance cameras were not installed during nuclear fuel deliveries to the site and NRC regulations did not require them to be in service at that time. Interviews with former security guards confirmed the nuclear fuel while inside it's metal shipping container was left unattended for periods of time up to 10 minutes on occasion. This practice was acceptable. Since the fuel has been onsite, there has been no known attempt to steal or damage the fuel. The fuel has been inspected and will be visually examined again before it is loaded into the reactor.

The allegation that the perimeter security consisted of only a 4-ft chicken-wire fence was confirmed by one individual; however, NRC regulations do not prescribe site security requirements prior to issuance of the operating license.

The FSAR states "all siding and roof decking of any superstructure is designed and detailed to blow off when the design tornado approaches the station." This is an acceptable design.

5.13.5 Items of Noncompliance

No items of noncompliance were identified.

5.14 Alcohol and Drug Abuse

5.14.1 Allegation

"A lax attitude toward employee behavior was evidenced by complete disregard of drinking and drug use on the site, and routine hiring of temporary laborers prone to violence."

On February 24, 1981, during a meeting with NRC officials, Thomas Devine (GAP representative) and Thomas Applegate at the Region III NRC office, they advised that, among others, former security officers Ronald Wright, Jeffrey Hyde, and David Simpson had knowledge of "people who were drunk on the job;" "people who were frequently intoxicated;" and "construction workers walking around smoking dope, drinking moonshine liquor, getting drunk...."

5.14.2 Background Information

A brief history and description of plant security is provided in the following paragraphs. Portions of this information are based on statements received during interviews with Frederick Lautenslager, CG&E Security Supervisor, and Norborne C. Ward, President of W&W Protection Agency, Inc., the current security service contractor at Zimmer.

"Construction security" may be defined as the protection of property used in and for construction activities at Zimmer, and the protection of those areas in which construction is taking place. NRC does not impose security requirements on licensees during plant construction. Construction security does not extend to the 627-ft level (seventh floor) of the reactor building (spent fuel pool area) where the nuclear fuel is stored, and does not extend to those areas specifically released by the construction project manager and signed for by the CG&E Electric Production Department (EPD). The protection of the above areas not related to construction and the protection of the nuclear fuel is defined as "station security." "Construction security" and "station security" are two separate security operations.

From the start of plant construction until September 1976, the H. J. Kaiser Company maintained its own security force that was responsible for construction security matters at Zimmer. In September 1976, W&W took over from Kaiser and became the sole security contractor, using

the same security procedures that had applied to Kaiser's security force. The primary responsibility for construction security is vested in the construction project manager, although in essence W&W has been informally delegated the authority to conduct security activities on his behalf.

In August 1979, while preparing to receive the first shipment of nuclear fuel, CG&E contracted with Yoh Security to provide ten security officers (armed watchmen) for the sole purpose of providing security for the receipt and subsequent storage of the nuclear fuel. Yoh Security personnel were required to adhere to policies and procedures prepared by CG&E Security Supervisor Frederick Lautenslager; however, CG&E did not exercise direct supervision over the Yoh Security Officers. The CG&E Security Supervisor coordinated the requirements of CG&E security procedures through the Yoh lead security officer, who had responsibility for implementing those directives. Specifically, the jurisdiction of the CG&E Security Supervisor and Yoh Security Officers extended only to areas that were included under the definition of "station security." Therefore, from a security standpoint, the primary concern of the CG&E Security Supervisor and Yoh Security was protecting the spent fuel pool area where the nuclear fuel was stored and controlling access to that area on the 627-ft level (seventh floor) of the reactor building.

At the request of Yoh Security officials in October 1980, CG&E terminated Yoh's contract to provide officers for station security. W&W, upon Yoh's leaving, assigned some officers exclusively for station security. The W&W officers assigned to station security conducted security activities in accordance with the same procedures and under the same supervisory structure as those that had applied to Yoh. (Additional security-related background information is also contained in Section 5.13.2.)

The allegation was reviewed to determine if it had any significance regarding matters under NRC jurisdiction; specifically, the review attempted to determine if the adequacy of construction of safety-related systems was compromised by individuals who performed work in safety-related areas during times when their ability to perform their job was impaired due to use of intoxicants. To help make this determination, two basic questions were asked of persons interviewed, who stated they observed workers who in their opinion were intoxicated. In essence, the following questions were asked:

1. Did you ever observe anyone who in your opinion was intoxicated to the point where their ability to perform their job was impaired?

2. If so, where did you observe these individuals?

5.14.3 Investigation

5.14.3.1 Interview with Ronald Wright

On March 10, 1981, Ronald Wright was interviewed by NRC. He stated that he was employed as a security officer with Yoh Security and was stationed at Zimmer from October 1979 to October 1980. While stationed there, he observed what he believed to be evidence of alcohol and drug use by workers at the Zimmer site. At least once a week while on patrol at the site, Wright would

find quantities of beer cans on the auxiliary building roof and in a lunch/break area that was then located in the diesel generator room. He related that on many occasions (he could not recall a specific number) he discovered what appeared to be marijuana cigarette butts in one or two small rooms accessible from the rooftop of the radwaste building. Wright stated that on one occasion he discovered four or five capsules of material (colored black and yellow or black and orange) that appeared to be some type of drug. These capsules were discovered between the two locker rooms on the second floor of the service building. Wright was unable to recall what disposition he made of these suspected narcotic materials and was unaware whether any analysis was ever performed to identify the materials.

Wright related that he was personally aware of two separate instances in which construction workers, who in his opinion were intoxicated to the point that they were unable to perform their duties, reported for duty at the seventh floor entrance to the spent fuel storage pool. The two workers involved in these incidents were refused access to the spent fuel pool area on those occasions.

He also stated that, in his opinion, a former Yoh Lead Security Officer was very intoxicated on at least two occasions when he reported for work and (based on the smell of his breath and his conduct) was somewhat intoxicated on other occasions.

On March 10, 1981, Wright provided a written statement attesting to this information, a copy of which is included as Exhibit 55.

5.14.3.2 Interview with Jeffrey Hyde

On March 26, 1981, Jeffrey Hyde was interviewed by NRC. He stated that he was employed as a security officer with Yoh Security and was stationed at Zimmer from August 1979 to October 1980. While stationed at the plant, he observed what he believed to be evidence of alcohol use indicated by the empty beer cans and liquor bottles in various areas of the plant. Hyde was able to recall only one instance when he observed a construction worker who, in his opinion, appeared to be intoxicated to the point that his ability to perform his job was impaired. He observed this worker at the seventh floor entrance to the spent fuel pool area. Hyde indicated that when the workers condition was noted, he was prohibited entry to the fuel storage area, removed from the floor, and suspended from work assignments on that floor.

Hyde also stated that he observed on several occasions (more than five but less than ten) a former Yoh lead security officer who, in his opinion, was intoxicated to the point that his ability to perform his job was impaired.

On March 26, 1981, Hyde provided a written statement attesting to the above information, a copy of which is included as Exhibit 54.

5.14.3.3 Interview with David Simpson

On March 11, 1981, David Simpson was interviewed by NRC. He stated he was employed as a security officer with Yoh Security and was stationed at

Zimmer from September 1979 to October 1980. While stationed there, he observed what he believed to be indications of alcohol use by the workers at Zimmer. Simpson advised that on many occasions, particularly on the main floor of the turbine building, he discovered quantities of empty beer cans and liquor bottles. He remarked that, although he never observed any workers who, in his opinion, were intoxicated to the point their ability to perform their job was impaired, he believed it was reasonable to assume some workers' ability to perform was at times impaired, based on the number of empty beer cans and liquor bottles found.

Simpson stated he had no personal knowledge regarding the extent of drug use, although on one occasion while outside the reactor building, he detected the odor of what appeared to be burning marijuana.

Simpson indicated he had no knowledge of any former Yoh Lead Security Officer being intoxicated while on duty and, in his opinion, the former lead officer never appeared to be intoxicated while on duty.

On March 11, 1981, Simpson provided a written statement attesting to the preceding information, a copy of which is included as Exhibit 60.

5.14.3.4 Interview with William Ross

On March 11, 1981, William Ross was interviewed by NRC. He stated he was employed as a lead security officer with Yoh Security and was stationed at the Wm. H. Zimmer Nuclear Power Station from March 1979 to February 1980. While stationed there, Ross observed what he believed to be indications of alcohol and drug use by workers at Zimmer. Ross advised that, on a few occasions, he had seen construction workers drinking beer during their lunch hours, although he had never noticed whether this drinking had any apparent affect on the workers' ability to perform their jobs. Ross indicated Yoh security officers were instructed not to confront workers who were observed drinking in nonstation security areas but rather to obtain information such as the payroll number or name on their hard hats that could be used to identify the individuals. If identifying information was secured, it was referred to the construction project manager or W&W, because they had jurisdiction over construction activities.

Ross recalled one occasion when he observed a worker who, in his opinion, was intoxicated, although he could not determine whether the worker was intoxicated to the point that his ability to perform his job was impaired. Ross observed this worker at the seventh floor entrance to the spent fuel pool storage area shortly after the worker was refused access to the fuel storage area by a fellow Yoh security officer. (Based on Ross' description of this incident, it appears he may be referring to the same incident that former security officers Hyde and Wright described.)

Ross also advised that on one occasion he found what appeared to be marijuana cigarette butts on a rooftop area located between the reactor and turbine buildings. Ross related he was not able to determine whether workers were using drugs to the extent that it impaired their ability to perform their jobs and had not formed an opinion in that regard.

On March 11, 1981, Ross provided a written statement attesting to this information, a copy of which is included as Exhibit 58.

5.14.3.5 Interview with James Bedinghaus

On March 25, 1981, James Bedinghaus was interviewed by NRC. He stated that he was employed as a second shift security supervisor with W&W Protection Agency, Inc., and was stationed at Zimmer from February 1980 to November 1980. While employed there, Bedinghaus noticed what he believed to be evidence of alcohol use by workers at Zimmer, as indicated by workers he encountered who smelled of alcohol and had the appearance of being intoxicated. Bedinghaus specifically recalled approximately three occasions on which he observed workers who, in his opinion, were intoxicated to the point that their ability to perform their job was impaired. These workers were observed attempting to enter the site through the main gate. Bedinghaus indicated that, while he was assigned to the gate, workers who in his opinion were intoxicated were refused entrance to the site.

Bedinghaus also stated he was aware of an incident when a second shift security officer encountered a group of men with beer who were in two automobiles leaving the site via the main gate. During that encounter, the security officer observed that the men in one automobile had open beer inside their vehicle and the other automobile contained a case of beer inside the trunk. The occupants of both vehicles indicated they were coming from an onsite CG&E fire school; however, none of them had identification cards or visitor passes. Bedinghaus expressed the opinion that the first shift security officers had not checked the identification or issued passes to these individuals at the time they entered the plant.

Bedinghaus also expressed his belief that security was lax in the areas controlled by W&W, and W&W security officers were present onsite more for display purposes rather than for providing property protection.

With regard to alleged drug use, Bedinghaus stated he had no personal knowledge of drug use at Zimmer, although he had observed individuals who, in his opinion, appeared to be intoxicated or "stoned" on something other than alcohol.

On March 25, 1981, James Bedinghaus provided a written statement attesting to this information, a copy of which is included as Exhibit 61.

5.14.3.6 Interview with James Caplinger

On March 12, 1981, James Caplinger was interviewed by NRC. He stated that he was employed as a lead security officer with Yoh Security and was stationed at Zimmer from August 1979 to October 1980. While stationed there, Caplinger observed what he believed to be evidence of alcohol and drug use by workers at Zimmer. This evidence was in the form of empty beer cans and what appeared to be marijuana cigarette butts detected by Caplinger onsite. Although he detected evidence of alcohol and drug use, Caplinger stated he never personally observed anyone drinking intoxicants or smoking marijuana. He indicated that, if he had, he would have reported the individual to their superior and that person probably would have been fired.

[Caplinger] also remarked that, based on his 20 years experience in the U.S. Army as a senior noncommissioned officer and observation of alcohol and drug abuse among that population, he would not characterize the use of alcohol and drugs at Zimmer as widespread.

On March 12, 1981, [Caplinger] provided a written sworn statement attesting to the preceding information, a copy of which is included as Exhibit 57.

5.14.3.7 Interview with James Bice

On April 20, 1981, James Bice was interviewed by telephone. He stated that he was employed as a security officer with Yoh Security and was stationed at Zimmer from September 1979 to July 1980. While employed there, Bice detected several instances of alcohol use by construction workers at Zimmer. He related that on approximately four to six occasions he personally observed workers consuming alcoholic beverages while onsite. These instances of alcohol consumption usually occurred during lunch hours in locations that included the electrical shop and a break area located in the turbine building. Beer and whiskey were among the alcoholic beverages consumed onsite. Bice recalled two specific instances involving the presence of alcohol: one during which he observed a worker pouring "Jack Daniels" whiskey into a Coke soda can and the other during which he found a bottle of what he believed to be "moonshine" liquor (based on its smell) in the turbine building.

In addition to instances where the consumption and presence of alcoholic beverages were observed, Bice also recalled removing quantities of beer cans (approximately 300 while stationed at Zimmer) from inside a few small rooms that were accessible from the second level of the reactor building. Based on his experience at Zimmer, Bice speculated that approximately 25% of the workers there consumed alcoholic beverages, usually during their lunch hours.

Despite his observations regarding the extent of alcohol use, Bice said that on only one occasion did he observe a worker who, in his opinion, was intoxicated to the point that his ability to perform his job was impaired. This worker was observed at the seventh floor entrance to the spent fuel pool storage area. Based on Bice's description of the incident, it appears he may be referring to the same incident that former security officers Hyde, Wright, and Ross described.

Regarding alleged drug use, Bice stated he did observe what he believed to be evidence of drug use at Zimmer. Bice related that, during the course of his routine security rounds each day, he would find approximately three to four apparent marijuana cigarette butts. He indicated that to his knowledge there were no analyses made of the cigarette butts he detected, although based on their appearance (the presence of seeds common to the marijuana plant) he was convinced the butts were from marijuana cigarettes.

Bice stated he prepared approximately 10 to 11 field incident reports regarding suspected alcohol and marijuana use while he was stationed at Zimmer and these reports were forwarded to CG&E Security Supervisor

Fred Lautenslager. He remarked that Lautenslager advised him on one occasion there was nothing Yoh Security and the CG&E Security Supervisor could do about these instances (since they apparently occurred in areas under W&W Security's jurisdiction) and not to worry about such incidents.

Bice verified that all the instances of alcohol and drug use he observed occurred in areas under W&W Security's jurisdiction, except for the incident on the seventh floor involving an apparently intoxicated worker.

Bice also advised that on one occasion he observed two CG&E employees in the reactor control room who were smoking what appeared to be marijuana. He said, however, he did not confront the workers regarding their suspected conduct, and he does not recall preparing a field incident report about the event.

5.14.3.8 Interview with Dennis Shinkle

On March 26, 1981, Dennis Shinkle was interviewed by NRC. He stated that he has been employed as a security officer with the W&W Protection Agency, Inc., from approximately 1976 to the present. During that time, he was off work for about six to seven months from January to July 1980. While stationed at Zimmer, he has primarily been assigned to main gate security. Shinkle indicated that he has detected evidence of alcohol use by the workers there. Shinkle specifically recalled one incident that took place during the Fall of 1979. The incident involved four or five construction workers who had apparently brought alcoholic beverages onsite during their lunch hour. He related that a construction supervisor first observed the workers with the alcoholic beverages and requested that Shinkle accompany him to corroborate this observation. When Shinkle did so, the supervisor took immediate action and the workers were fired.

Shinkle was asked whether he had ever observed any workers who in his opinion were intoxicated to the point that their ability to perform their job was impaired. He replied that on several occasions (he was unable to estimate how many) he had observed workers attempting to enter the site by the main gate who, in his opinion, appeared to be intoxicated. Shinkle denied entry to the site to any workers he observed at the main gate who appeared to be intoxicated.

Shinkle indicated that it was difficult to prevent workers from bringing alcoholic beverages onsite, particularly when there were large numbers of workers entering the site at approximately the same time. Although security officers would often conduct a cursory search of lunch containers and coolers for alcohol, they could not (lawfully or practically) search the person of each worker who entered the site. The same problem applied to searching the motor vehicles permitted onsite. Security officers could conduct a cursory search of the vehicle trunks and a visual search of the inside of the vehicle; however, they could not individually search each occupant.

With regard to alleged drug use, Shinkle stated that he never observed, and was not personally aware of, any drug use by workers at Zimmer.

5.14.3.9 Interview with Norborne Ward

On March 27, 1981, Norborne C. Ward was interviewed by NRC. He stated that he is President of the W&W Protection Agency, Inc., and has held that position since W&W became the construction security contractor at Zimmer in September 1976. From September 1976 to October 1980, he was stationed on a full-time basis at Zimmer and thereafter visited the site to oversee security operations usually twice a week.

Ward indicated that he is well informed about security-related matters and incidents at Zimmer. He explained that W&W inherited Kaiser's security procedures and basically has continued to conduct security activities in accordance with those guidelines. Ward related that, during the time W&W has been security contractor there, he has become aware of instances of alcohol use by construction workers at Zimmer.

Ward indicated that alcohol use onsite became a real concern and certain measures were initiated to reduce the problem. In July 1980, W&W began the practice of searching the coolers and lunch containers brought onsite by the construction workers. This action was somewhat effective in preventing some workers from bringing alcoholic beverages onsite. Also, a contributing factor to the problem was the sale of liquor by certain individuals in the parking lot outside the site. Ward stated that a "crackdown" on parking lot liquor sales was initiated in 1977 when state law enforcement officials were contacted. These officials subsequently came out to the site and, to his knowledge, made at least one arrest for liquor sale violations.

Ward was asked whether he had ever observed workers who, in his opinion, were intoxicated to the point their ability to perform their job was impaired. He replied that instances of workers being intoxicated to that extent were relatively rare and he estimated that, since W&W became a security contractor in 1976, approximately 25 intoxicated workers were observed and denied access to, or were ejected from, the site. The most common occurrence of this was when intoxicated workers came to the site on payday to pick up their checks. Ward remarked that the worker involved would take the day off and, after they had been drinking and were already intoxicated, would come to the site at 10:00 or 11:00 a.m. just to pick up their paychecks. On those occasions, when a worker entering the site was determined to be intoxicated, Ward would deny the worker's entry to the site.

Ward indicated it is difficult to enforce rules regarding use of alcohol on site. He explained W&W security officers have been instructed to identify (if possible), rather than confront, workers who are observed consuming alcoholic beverages on site. This is usually done by trying to obtain identifying information, such as a payroll number or a name from the individual's hard hat. If identifying information is obtained, the matter is then referred to the individual's supervisor for action.

Ward expressed the opinion the biggest problem affecting security in general is that Kaiser and CG&E allow too many motor vehicles on site. He indicated the large number of vehicles permitted onsite increases the potential for contraband being brought on and/or taken offsite without detection. Ward

also stated that, since he has been at Zimmer, there has been little trouble with regard to violent acts. He could recall only one incident when two construction workers were involved in a fight.

Ward mentioned that, during the time Thomas Applegate was onsite, there were six or seven security officers on duty during each shift.

5.14.3.10 Interview with Frederick Lautenslager

On February 24-25 and March 13, 1981, Frederick Lautenslager was interviewed by NRC. He stated that he is employed as the CG&E Security Supervisor and has been assigned to the Zimmer since August 1978.

Lautenslager was questioned regarding his knowledge of alleged alcohol use by workers at Zimmer. He stated he has no personal knowledge of anyone drinking alcoholic beverages onsite and he has never observed anyone drinking alcohol onsite.

Lautenslager was also questioned regarding his knowledge of alleged drug use (particularly marijuana) by workers onsite. He indicated he has no personal knowledge of any drug use and is aware of no incidence of marijuana use by anyone at Zimmer. Lautenslager related that on one occasion a Yoh Security Officer discovered and turned over to him some cigarette butts which appeared to be hand-rolled. He stated since many of the craft personnel roll their own cigarettes and since there was nothing to indicate that the butts found by the security officer were in fact marijuana, no further action was taken other than to notify W&W security personnel that the hand-rolled cigarette butts were found.

Lautenslager also stated that he has never received a report of any individuals drinking alcoholic beverages or smoking marijuana onsite.

On March 27, 1981, Lautenslager provided a typewritten statement attesting to the preceding information, a copy of which is included as Exhibit 56.

5.14.3.11 Field Observations

While at Zimmer, the NRC resident inspector has observed evidence of alcohol use by workers. During approximately 50% of the time he has spent touring the plant while conducting inspection activities, he has observed empty beer cans in various safety-related areas of the plant. On a less frequent basis, he has also observed empty "hard liquor" bottles (e.g., whiskey bottles). The areas where empty cans and bottles were observed included the cable spreading room, the two residual heat removal rooms, the related residual heat removal heat exchanger rooms, and the reactor building. Within these areas, the locations he observed empty alcoholic beverage containers were generally hidden and isolated.

The quantity of empty beer cans in these areas varied greatly from time to time. On some occasions (generally in the winter months), as many as 10 to 12 empty beer cans could be found in any of the noted locations of the plant (although some of the cans may have been there a month or more since the

last time the area was cleaned). On other occasions (generally in the summer months), only a few cans would be present in those same locations.

The resident inspector has never personally observed anyone consuming alcoholic beverages. He recalled observing instances in the diesel generator room and reactor building when workers were drinking beverages from non-alcoholic beverage containers (e.g., thermos bottles) and, upon seeing him approach, made an apparent effort to conceal the containers from which they were drinking. These instances led him to suspect that workers concealed intoxicants in and consumed intoxicants from non-alcoholic beverage containers. Observations of beer can accumulations in different areas of the plant have been documented in various NRC inspection reports and that on at least two occasions the beer can litter situation has been brought to the attention of the Construction Project Manager, Scott Swain.

The resident inspector has never observed anyone who, in his opinion, was intoxicated to the point where their ability to perform their job was impaired. In the inspectors opinion, the drinking of alcohol at Zimmer is not as bad as he has seen at other construction sites.

The resident inspector has observed approximately ten marijuana cigarette butts during his plant tours and he recently found two marijuana cigarettes. The resident discussed this matter with the Kaiser Construction Project Manager.

5.14.4 Findings and Conclusions

The NRC investigation identified evidence that there had been some drinking and drug use onsite. No attempt was made to examine the attitude of management toward drinking, drug use, or violence; however, based on interviews with site personnel coupled with NRC site observations both prior to and during the investigation, a widespread problem was not evident.

An adequately functioning quality assurance program would assure detection and correction of any adverse effects from construction personnel whose abilities have been impaired while under the influence of alcohol or drugs. Since we have questions regarding the quality assurance program based on other findings of this investigation, the licensee Quality Confirmation Program will assure construction defects have been identified.

5.14.5 Items of Noncompliance

No items of noncompliance were identified.

5.15 Employee Dismissals

5.15.1 Allegation

"Employees fired for time [card] cheating had been cheating with the express approval of management, and only time cheaters fired were vocal and knowledgeable critics of plant QA and safety."

5.15.2 Background Information

Thomas Applegate's investigation into timecard cheating at Zimmer found that five individuals (three construction workers and two guards) were involved in "timecard cheating" (i.e., absent from work onsite but recorded as being at work). All those individuals involved were terminated by their respective employers.

5.15.3 Investigation

5.15.3.1 Interview of Construction Worker

The NRC interviewed one of the construction workers who had been terminated for timecard irregularities. The other terminated construction workers could not be located. No attempt was made to interview the two guards also terminated because they were not directly involved in assuring adequacy of plant construction. The construction workers were those who would have had knowledge of "plant QA and safety" (construction problems).

5.15.3.2 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 Kaiser terminated his employment in January 1980, after Thomas Applegate uncovered irregularities in his timecard. He said he was not fired for his criticism of plant safety and it was not until after he was terminated that he provided any information to GAP. Individual A said that although he had serious concerns about construction work at the plant, he was not fired by Kaiser for criticizing plant QA and safety.

On April 24, 1981, Individual A provided a written statement attesting to the preceding information; however, he requested the statement not be attached to this report.

5.15.3.3 Interview of Individual B

On April 14, 1981, Individual B, who was previously interviewed by representatives of GAP, was interviewed by NRC. Individual B stated that he would not characterize himself as a "vocal critic" of plant safety. He stated he had concerns about the QC program at Zimmer which he related to the RIII Investigator. However, he said he was fired for irregularities in his timecard and not for his concerns about the QC program.

On April 22, 1981, Individul B provided a written sworn statement attesting to the preceding information; however, he requested the statement not be attached to this report.

5.15.3.4 Interview of William Murray

On April 14, 1981, William Murray, CG&E Senior Engineer, was interviewed by NRC. He stated that from December 10, 1980 to January 4, 1981 Confidential Service (CS) was hired by CG&E to investigate alleged timecard irregular-

ities at Zimmer. He stated CS entered into contract with CG&E after Applegate told them he had uncovered evidence of employee timecard cheating. Murray stated the investigation was contracted for a 30-day period. During that period, Applegate identified two guards and three construction personnel who were involved in timecard cheating. Murray indicated that all five of the individuals Applegate identified had been terminated. He denied that the only individuals terminated were those who were vocal and knowledgeable critics of plant safety, and stated emphatically that the individuals fired were fired solely for irregularities in their timecards.

Murray also stated that Major W. Cox, Director of CS, felt that the investigation was compromised when Murray left Applegate's reports unattended in his desk. Murray said that at that point the contract was ending and he and Cox concurred timecard cheating was not widespread. Both agreed that, because of the questions about the security of the operation, the contract should be terminated. However, Murray said Applegate stated that he was concerned about the QA problems he had identified and wanted to continue investigating. Murray said the concerns Applegate raised had already been identified by the CG&E QA group and he saw no reason to continue the investigation. He said Applegate was adamant in his insistence to continue the investigation, so he referred him to William Schweirs, Quality Assurance Manager. Schweirs agreed there was no need to investigate these matters further and advised Applegate of his conclusion. Murray said the contract was terminated with Cox's approval, but over Applegate's objections.

Murray provided a letter from CS regarding the contract termination, dated January 4, 1980, and is included in Exhibit 62.

In a subsequent telephone conversation, Murray stated that Individual B was not one of five identified by Applegate nor was he fired at CG&E's direction for timecard cheating, but that he may have been terminated by Kaiser for another timecard matter.

5.15.3.5 Interview of Major W. Cox

On April 30, 1981, Major W. Cox, Director of CS, was interviewed by NRC. Cox stated he employed Thomas Applegate as a private investigator for CS. He indicated that in November 1979, when Applegate was investigating another matter, Applegate came across evidence of employee timecard cheating at Zimmer. Cox stated he was reluctant to pursue the matter, but on several occasions Applegate approached both him and CG&E about this matter. Cox said Applegate continued to pursue the matter and CG&E formally requested CS to investigate the matter. Cox stated the investigation was contracted to last 30 days during which Applegate would work undercover onsite with the primary task of investigating employee timecard cheating. Cox said the CS investigation began on December 10, 1979 and ended on January 6, 1980, and identified several employees who were involved in timecard cheating. Cox said the operation ran its course and was terminated at the end of the original 30-day contract period.

Cox stated that during the last weeks of the investigation, Applegate said he found evidence of irregularities in pipe welds and in the plant QA program. Cox told William Murray about this and Murray said CG&E was already aware of

the problems Applegate had identified and did not need to pursue them further. Cox recalled that Applegate had learned there was a disagreement between Peabody Magnaflux (PM) employees and CG&E over the interpretation of X-rays taken of some pipes on site.

Cox said there was no attempt by CG&E to cover up any of Applegate's disclosures. Cox said it appeared to him that CG&E was already aware of the problems Applegate identified and Applegate was not providing them with any new information. Cox stated that after the 30-day contract period, both he and CG&E decided to terminate the contract. Cox stated Applegate disagreed with this decision and wanted the investigation to continue so he could pursue irregularities he had identified in the QA program. Cox said CG&E denied Applegate's request.

Cox said that in his opinion Applegate held a grudge against CG&E for ending the investigation over his objections. He indicated that since January 1980 he has had no further contact with Applegate regarding the Zimmer investigation, and Applegate has taken custody of all of the tape recordings and copies of reports he made during the investigation.

5.15.3.6 Record Reviews

The Confidential Service memorandum dated January 4, 1980 authored by Major W. Cox, Director of CS, was reviewed by the investigator. The first paragraph of the letter addresses Cox's concerns about the security of CS confidential reports. The letter indicates Cox objected to security breaches during the investigation and asked CG&E to terminate the investigation. However, Cox did state in the letter that, based on information he had, he did not concur with CG&E's conclusion that Applegates allegations regarding questionable construction were without merit.

5.15.4 Findings and Conclusions

The two former employees interviewed by GAP were contacted by NRC. They denied they had been fired for any criticism of plant QA and safety, but rather had been fired for timecard cheating. There was no indication from the interviews that management approved of timecard cheating.

5.15.5 Items of Noncompliance

No items of noncompliance were identified.

5.16 Radiographer Suppression

5.16.1 Allegation

"CG&E had warned PM management to silence the radiographers at Zimmer, who were criticizing CG&E's consistent approval of welds rejected by PM."

On February 26, 1981, Thomas Applegate provided further information regarding the allegation. He stated he learned that on the weekend of January 9-10, 1981, Individuals D and E had probably broken into the

Peabody Magnaflux (PM) trailer onsite. He alleged that during this burglary those individuals removed records of an instance where CG&E had overridden PM's rejection of welds.

5.16.2 Background Information

CG&E did not have personnel with direct nondestructive examination responsibilities, and as such, would not have been involved with "overriding" of PM radiograph interpretations. Additional background on radiography is included in Section 5.8.2.

On July 3, 1979, five prefabricated pipe spool pieces manufactured by Kellogg were received at the Zimmer site (see Section 5.7). Kaiser personnel wrote Nonconformance Report E1911 stating that the "spools were rolled off of truck onto ground and striking other spools." On July 6, 1979, Kaiser directed that the welds on the spool pieces be radiographed.

On July 21, 1979, David Hang of PM radiographed the spool pieces and identified rejectable defects in welds on three of the five spool pieces. PM forwarded the findings to Anthony Pallon, KEI Welding Engineer. The reports and film identifying the examined welds were then reviewed by Pallon and filed in the Kaiser Document Control Center, three radiographs of welds with apparently rejectable defects were filed with a nonconforming report. On April 8, 1980, these films were reviewed by NRC Inspector Kavin Ward who determined that the welds had the wrong geometry for radiography and the films were not acceptable.

On April 25-28, 1980, PM personnel performed magnetic particle and ultrasonic inspections of the questioned spool pieces and concluded on the basis of these examinations that the welds on the spool pieces were acceptable. On April 28, 1980, Kellogg performed ultrasonic examinations of the same spool pieces and also found them to be acceptable.

The above information including details of processing of nonconformance report E-1911 is included in IE Investigation Report No. 50-358/80-09.

5.16.3 Investigation

5.16.3.1 Interview of Individual A

On April 22, 1981, Individual A, who was previously interviewed by representatives of GAP, was interviewed by NRC. Individual A stated PM radiographers Allen Sellars and David Binning had told him, on two occasions, that they found defective welds in Kellogg prefabricated spool pieces. He said they had discovered the defects when examining Kaiser field welds that joined the spool pieces in the residual heat removal system. He said they also found similar defects in five of twenty welds on the main steam relief (MSR) spool pieces that had fallen off a truck on delivery to the site.

Individual A stated that PM personnel told him CG&E overrode their rejection of welds on the MSR system and had retained a copy of the examination report and radiographic film in their files. He said CG&E overrode PM when they examined prefabricated spool pieces, but they were not overridden in their weld determinations for Kaiser welds.

Individual A also stated that in January 1979 CG&E hired undercover private investigator Thomas Applegate who had questioned PM employees about this examination. He said Applegate and Allan Sellars had met at the Riverview Inn to discuss the matter. A few days after this meeting, Sellars met Individual A onsite and told him his supervisors had advised him not to discuss the matter with anyone. He said Sellars later informed him there had been a burglary of the PM trailer, and the film and examination reports for the MSR spool pieces which PM had retained were missing.

On April 24, 1981, Individual A provided a written statement attesting to the preceding information; however, he requested the statement not be attached to this report.

5.16.3.2 Interview of Thomas Applegate

On February 26, 1981, Thomas Applegate was interviewed by NRC. He stated he had a telephone conversation with Ernest Aldredge, President of PM, in which Aldredge said weld records were missing from the PM trailer onsite. Applegate said he subsequently learned that there was a break-in of the PM trailer on the weekend of January 9-10, 1980, and that records were taken from the trailer. He indicated Security Officers Ronald Wright, James Bedinghaus, and David Simpson had told him Individuals D and E were probably involved in the break-in and had stolen records from the trailer.

Applegate said PM is now unable to "defend itself" against CG&E in a dispute about the acceptability of welds PM examined on the MSR system since its records were stolen. He stated that although these welds had been examined by PM and found defective they were later accepted by CG&E. Applegate said that since the burglary PM has instructed its employees not to say anything about this matter for fear of industry-wide reprisals against PM.

5.16.3.3 Interviews of Security Officers

Between February 1 and March 15, 1981, the individuals listed below were interviewed by NRC. They could not provide any information concerning the break-in of the PM trailer in January of 1980. All of these individuals are former Security Officers at the Zimmer site and all stated the break-in had not been reported to the Security Department. They stated that they were unaware of the identity of any individuals who might have committed the break-in.

David Simpson, Felicity, Ohio, Police Department
Ronald Wright, Felicity, Ohio, Police Department
James Bedinghaus, former Security Officer, Zimmer Nuclear Power Station
John Bedinghaus, former Security Officer, Zimmer Nuclear Power Station
Jeffrey Hyde, former Security Officer, Zimmer Nuclear Power Station
James Caplinger, former Security Officer, Zimmer Nuclear Power Station
William Ross, Investigator, Clairmont County, Ohio Welfare Department

5.16.3.4 Interview of Ernest Aldredge

On April 10, 1980, Ernest Aldredge, PM President, was interviewed by NRC. Aldredge stated that to the best of his knowledge PM radiographers at the Zimmer site were not consistently overridden in their weld determinations. He stated that Charles Wood, PM's Cincinnati Office Manager, had never reported this problem to him.

Aldredge also stated that from January through June 1980 there was an NRC investigation at Zimmer as a result of complaints made by Thomas Applegate, a private investigator, who had been hired by CG&E. He indicated Charles Wood informed him that PM employees had apparently told Applegate that there were defective welds at the plant. Aldredge stated Applegate subsequently contacted both the NRC and the local press about PM personnel telling him about defective welds, charging that PM had been overridden in their decisions to reject welds.

Aldredge said that, as the result of the NRC investigation and newspaper articles about it, he contacted the Public Relations Officer of his parent company, Magnaflux Quality Services. They advised him that due to the sensitive nature of nondestructive examination of nuclear power plants it would be bad publicity for PM to make any public statement, since the statement could be misconstrued by the press. Aldredge stated he was therefore advised to not make any statement to TV reporters or any other members of the media. He indicated he also advised Charles Wood it would be in the best interest of PM not to make any statements at that time.

Aldredge said PM's contract at Zimmer was not renewed due to production problems that had been attributed to frequent breakdowns of the film processing machine onsite. He said information such as this could impact the company's professional reputation, so he felt it was best not to make a statement about why PM's contract was not renewed.

Aldredge stated that there had been no attempt to silence the radiographers at Zimmer regarding public statements about the investigation. Aldredge provided a sworn statement on August 17, 1981, a copy of which is included as Exhibit 63.

5.16.3.5 Interview of William Schwiers

On April 23, 1981, William Schwiers, CG&E Quality Assurance Manager, was interviewed by NRC. He stated he would forward a letter to the investigator outlining the reasons PM's contract was terminated at Zimmer. Subsequently, Schweirs provided an unofficial memorandum outlining his reasons for terminating PM's contract in April 1980. A retyped copy of the provided memo is included as Exhibit 64. Schweirs stated the contract was not terminated because of PM's criticism of "CG&E's consistent approval of welds rejected by them."

5.16.3.6 Interview of Charles Wood

On April 15, 1981, Charles Wood, PM Cincinnati Office Manager, was interviewed by NRC. He stated that since 1972, PM has been employed as the firm

responsible for nondestructive examination at Zimmer. He said PM has conducted both ultrasonic, liquid penetrant, and radiographic examinations of large-bore and small-bore pipe welds onsite. Wood said PM's responsibility was to examine welds and present their preliminary findings to Kaiser. Kaiser personnel would examine radiographs and make the determination if a weld was accepted or rejected. He stated Anthony Pallon, KEI Welding Engineer, was responsible for reviewing PM's work and was not "consistently overriding" PM on their decisions to accept or reject a weld. He said Pallon supported PM's work onsite and, when a defective weld was identified, assured that the weld was repaired.

Wood stated that CG&E hired Thomas Applegate in January 1980, and apparently Applegate talked to a number of PM employees about their work onsite. Wood said Applegate called him in January 1980 and identified himself as "Thomas Jackson," a CG&E Cost Accounting Engineer. Wood indicated that at that time there was a question about PM being retained onsite due to problems in meeting production goals.

Wood advised there was discussion among PM employees about the contract renewal, and he learned PM employees had told Applegate that PM had identified defective welds in the plant. Wood said it was PM's responsibility to identify defective welds and report their findings to Kaiser. Kaiser would assign a status of either repair, hold, or rework to the defective weld. Wood indicated that when his employees told Applegate that there were "bad welds," they were referring to defective welds they had identified and reported to Kaiser. Wood stated his employees had answered Applegate's questions in good faith, assuming he knew the meaning of the term "bad welds" (that were identified as needing repairs by the Kaiser Quality Control system).

Wood stated that on one occasion Applegate called him and asked him if there were "bad welds in the plant" and he responded in the affirmative. He said he assumed Applegate knew what a defective weld was and that Applegate was questioning (as an auditor) PM's ability to identify weld defects. Wood said Applegate later went to the newspapers and quoted Wood and other PM employees as saying "there are defective welds" in the plant. Wood said that rejectable welds are identified by nondestructive examination and are repaired under the quality control system.

Wood said that later there was a series of very controversial newspaper articles about Zimmer construction. He consulted with PM's attorney, Charles Russ, who advised him that media representatives could misconstrue anything he said and cautioned him to instruct his employees not to discuss the matter with the media. Wood said there was no attempt to "cover up" any of PM's activities onsite, and their records accurately report their findings. Wood indicated that after the discussion with their attorney he advised PM employees to not make any further statements regarding the matter.

Wood said PM employees were receiving phone calls from media representatives and a number of PM employees were disturbed about the calls. He felt it was PM's responsibility as their employer to advise them not to discuss Applegate's charges with media personnel.

Wood said Applegate charged PM was "overridden" in their weld evaluations, and that its contract was not renewed by CG&E because PM had continued to reject welds. Wood stated the contract was not renewed because of problems in meeting production goals onsite and not for any disagreements over PM's weld examinations.

Wood recalled that Allan Sellars told him in January 1980 that there had been a break-in of the PM trailer. Sellars reported to Wood that no equipment was missing, but he was unsure if Sellars had told him that any records were taken. Wood said PM retains the blue copy of all its examination reports for billing purposes; however, the X-ray film of a weld and other copies of examination reports are the property of CG&E and Kaiser and are retained by them.

On April 15, 1981, Wood provided a written statement attesting to the preceding information, a copy of which is included as Exhibit 65.

5.16.3.7 Interview of Allan Sellars

On February 19 and April 15, 1981, Allan Sellars, PM Level II Radiographer, was interviewed by NRC. He stated that he was employed at Zimmer from April 1976 to April 1980, and performed radiographic examinations of Kaiser field welds and occasionally examined welds on spool pieces manufactured by Kellogg. He indicated that when he identified defective Kaiser or Kellogg welds he identified them on the examination report and forwarded the report to Anthony Pallon, KEI Welding Engineer. Sellars stated he was not overridden by Pallon when he identified defects in either Kaiser or Kellogg welds.

Sellars did recall an incident in the Summer of 1979 when PM was asked to examine welds on some Kellogg MSR system spool pieces that apparently fell off the truck on delivery to the site. He said he and David Hang radiographed welds on the spool pieces in question, but the film quality was poor. He indicated the geometrical configuration of the welds was such that it would exaggerate flaws in the welds and project them on the film at varying angles, distorting the view of the weld. Sellars said that he had told Pallon radiography was the wrong technique to use in this case, but Pallon said to conduct the examination anyway. Sellars said Hang observed some unacceptable indications (defects) on the resultant radiographic film and noted this on the examination reports. Later, during an NRC investigation, these spool pieces were ultrasonically examined and the welds were found to be acceptable.

Sellars also stated that after the investigation there was considerable publicity regarding PM's work onsite, and he was told by PM management not to comment to members of the press because anything he said could be taken out of context. Sellars said this was not an attempt to intimidate or silence him about PM's work onsite. In his opinion PM's contract was not renewed due to production problems, which he attributed to breakdowns in the film processing machine. Sellars said another factor in CG&E's decision was audits that were critical of PM's work onsite. He indicated the contract was not terminated for problems in their identification of defective welds. Sellars also stated the PM trailer had been broken into; however, he was not aware of anything taken during the break-in.

On April 15, 1981, Allan Sellars provided a written statement attesting to the preceding information, a copy of which is included as Exhibit 49.

5.16.3.8 Interview of David Hang

On March 27, 1981, David Hang, former PM Level II Radiographer, was interviewed by NRC. He stated he was employed at Zimmer from September 19, 1976, to August 1979. Hang said he was responsible for conducting radiographic examinations of large bore pipe welds.

Hang indicated that he was not overridden on his weld determinations by Anthony Pallon, KEI Welding Engineer. To the contrary, Hang said welds PM accepted were frequently found unacceptable by Pallon and Pallon would request PM to reexamine the welds. When Pallon found a defect in a weld that PM had not detected, he would order the weld repaired. Hang said Pallon, as a Level III radiographer, had the final say in acceptance or rejection of a weld.

Hang recalled that in August 1979 Pallon asked him to examine some pipe spool pieces on the MSR system that had fallen off of a truck on delivery to the site. Hang said he took one radiographic "shot," evaluated the film, and concluded that radiography was the wrong technique to use when examining the spool pieces.

Hang said he told Pallon that the geometric configuration of the spool pieces was such that it distorted the view of the weld and might exaggerate flaws that would appear as defects on the film. Hang indicated Pallon requested he examine the remainder of the welds by radiography and these examinations revealed apparent rejectable defects on three spool pieces.

Hang said he reported the results of his examinations to Pallon and retained the PM copy of the reports and film in a special folder in the PM trailer onsite. He added that ultrasonic examination would be the proper nondestructive testing technique to use to examine pipe welds in this geometric configuration, and he later learned the spool pieces had been ultrasonically examined and found acceptable.

Hang said he left Zimmer in August 1979 and, on his return in March 1980, he was informed by Allan Sellars that there had been a break-in of the PM trailer and the file on the MSR pieces was missing. Hang stated that in April 1981 he reviewed the radiographic examination reports for the MSR spool pieces that were recovered from the Kaiser Document Control Center. Hang verified that the reports and films were the originals from August 1979. He indicated these examination reports were for the three welds he found unacceptable, and apparently were filed by Kaiser with a nonconformance report.

On April 23, 1981, David Hang provided a written statement attesting to the preceding information, a copy of which is included as Exhibit 47.

5.16.3.9 Interview of Wayne Draffon

On February 19, 1981, Wayne Draffon, PM Level III Radiographer, was interviewed by NRC. He stated that he was employed by PM at Zimmer from January 19 to April 1980. Draffon said it was PM's responsibility to radiograph Kaiser field welds onsite. He said PM performed a radiograph of a weld and did a preliminary review to ascertain if the weld was rejectable. He indicated PM did not have authority for final acceptance of a weld but that the KEI welding engineer who reviewed the radiographic film was responsible for final acceptance. Draffon stated PM was not frequently overridden in its weld determinations and that welds accepted by PM were frequently found unacceptable by Kaiser.

Draffon said he learned that radiographers occasionally observed defects in Kellogg welds when they overlapped Kaiser welds. These cases were reported and forwarded to Kaiser to determine if the Kellogg weld should be repaired. Draffon stated that when welds junctured, the geometry of the juncturing welds is frequently not the same and therefore radiographic views of the weld may be distorted. He indicated that inexperienced Level I or II Radiographers would often examine juncturing welds and report rejectable defects, not recognizing that the view was distorted. Draffon said a more experienced radiographer can discern this and find the weld acceptable. Draffon stated that when he arrived on site a problem similar to this had apparently occurred where PM radiographers examined MSR spool pieces that had fallen off the truck and found the welds unacceptable. In fact, the view of the weld was distorted due to configuration problems. Draffon said the spool pieces were later ultrasonically examined and found to be acceptable. Draffon commented that this appeared to be an isolated instance, and CG&E or Kaiser did not often override PM in their weld determinations.

Draffon stated he had heard that the PM trailer was broken into, but this occurred prior to his arrival onsite. He learned that Thomas Applegate, a private investigator, had called the trailer and told employees it had been broken into. He said, however, employees searched the trailer and found no records or equipment missing.

Draffon also stated that PM's contract was terminated in April 1980 at the customer's request. He said this occurred because the volume of work was slowing, and PM had experienced production problems, which he attributed to frequent breakdowns in the film processing machine onsite.

5.16.3.10 Interview of Steven Binning

On April 15, 1981, Steven Binning, PM Level II Radiographer, was interviewed by NRC. He stated he was employed at Zimmer from April 1978 until April 1980. Binning said he received his Level II certification in October 1979 and routinely radiographed large bore pipe welds fabricated by Kaiser onsite. Binning said PM radiographed welds, developed the film, did a preliminary examination to determine if the welds were acceptable or rejectable, and then forwarded their report to Anthony Pallon, KEI welding engineer, who made the final determination on the acceptability of the welds. He indicated Pallon did not consistently override PM in their weld determination and would sometimes reject welds that PM had initially found acceptable.

He frequently directed them to re-shoot welds that Kaiser had repaired after PM had identified rejectable defects in the welds.

Binning recalled one occasion where PM examined some prefabricated spool pieces for the MSR system that were manufactured by Kellogg and had apparently fallen off a truck on delivery to the site. He said David Hang examined the spool pieces and determined there were rejectable indications in some welds. Binning said the radiographs were later evaluated by Kaiser, it was found the weld geometry precluded correct interpretation, and the welds on the spool pieces were not defective. Binning said Hang retained copies of his report of this particular examination.

Binning also stated that in January 1980 he received a telephone call from an unidentified individual who told him the PM trailer had been broken into. He said he immediately checked the back door and found the lock had been pried off and apparently the trailer had been entered. Binning said he inventoried the equipment in the trailer, checked the files, and found the only items missing were the examination reports and films for the MSR spool pieces that had been examined by Hang earlier. He indicated he told Allan Sellars and Wayne Draffon about the burglary but did not discuss it with anyone else.

Binning said PM management never told him to be silent about activities that occurred at the site. He said PM's contract was not renewed because of production problems, which he attributed to their film processor frequently breaking down. He also stated that NRC had audited PM's radiation safety operations and technical work and these audits were critical of some aspects of the PM operation. Binning said PM was not asked to leave the site for their identification of defective welds, and PM employees were not harassed or intimidated by Kaiser or CG&E.

On April 15, 1981, Steven Binning provided a written statement attesting to the preceding information, a copy of which is included as Exhibit 48.

5.16.3.11 Interview of David Binning

On January 19 and April 15, 1981, David Binning, PM Radiographer's Assistant, was interviewed by NRC. He indicated that, as a Radiographer's Assistant, he was not responsible for reading or interpreting film or making any weld determinations. He said he worked with both David Hang and Allan Sellars and did not recall them commenting that Anthony Pallon overrode them. He stated that PM usually radiographed Kaiser field welds; however, on one occasion they radiographed Kellogg prefabricated pieces. He said he recalled Hang took some "information only" shots of some prefabricated pieces and identified rejectable indications in some welds. He indicated Hang reported this to Pallon, but he was not aware of the final disposition of the report.

Binning also said that in January 1980 there was a break-in of the PM trailer and records were taken; however, he did not recall what records were missing. He said at about the same time the burglary occurred, Thomas Applegate conducted an investigation and later notified NRC and the local press concerning

PM's work. He said he was told by Sellars not to say anything about the investigation because he (Sellars) was getting harassed by the press and Applegate about it. Binning said he was never told by PM management to "cover up" anything about their activities at the site. Binning volunteered that PM had production problems onsite, which he attributed to the film processor breaking down and holding up production.

5.16.3.12 Interview of Robert Marshall

On April 16, 1981, Robert Marshall, KEI Construction Superintendent, was interviewed by NRC. Marshall stated PM was not overridden by Pallon on weld determinations at Zimmer. He said Pallon did not report to him that he overrode PM on their weld findings. Marshall also stated that the PM radiographers with whom he spoke after Applegate made his disclosures to the press did not support the claim that Pallon was overriding them in their weld determinations.

He recalled one incident when PM was asked to examine some MSR spool pieces that had fallen off a truck on delivery to the site. He said that in April 1980 he reviewed the radiographs taken of these spool pieces and he, Rex Baker, KEI Welding Engineer, and NRC Inspector Kavin Ward examined the films. All concurred that the welds were of the wrong geometry for radiographic examination. Marshall said that on some of the films the geometric configuration had distorted the radiographic view of the welds. He added that this examination was an exception to common practice because PM normally radiographed Kaiser field welds but not welds on Kellogg prefabricated pieces. Marshall advised that the MSR spool pieces were later ultrasonically examined and found to be acceptable.

5.16.3.13 Interview of Anthony Pallon

On August 13, 1981, Anthony Pallon, Sr., was interviewed by NRC. Pallon stated he was employed at Zimmer as a Kaiser 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 override PM in their weld determinations 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 about 20% of the prefabricated pipe welds in the plant being defective, since PM did not radiograph them, he did not review the radiographs, and he would not make an unqualified statement about their acceptability.

Pallon said in April 1980 that PM's contract at Zimmer was not renewed and Nuclear Energy Services (NES), Inc., took control of the radiography work at Zimmer. He attributed this to poor management of the PM operation at Zimmer, coupled with equipment problems that 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.

5.16.3.14 Record Reviews

The RIII inspectors reviewed reader sheets for radiographs of field welds made between October 1979 and March 1980 to determine if CG&E or Kaiser personnel had accepted welds previously rejected by PM. The results of that review are given in Table 5.16-1.

Table 5.16-1 Radiographic Reader Sheet Data

Weld No.	Reader Sheet Ident. No.	Weld No.	Reader Sheet Ident. No.
1. RH-113	RH-31	26. RE-75A	RE-1
2. R1-7	R1-11	27. K-288	WX-8
3. RH-53	RH-20	28. RH-86	RH-64
4. RH-55	RH-20	29. @A3	DO-2
5. K-73	RH-20	30. @C3	DG-25
6. RH-40	RH-26	31. HGK-250	HG-16
7. K-494	MS-37	32. RD-K4	RD-1
8. FW-454	MS-30A	33. 1MS22AC2	MS-315
9. HG47A2-1/2	NR-E-2252	34. DG03AA-3/4	DG-88
10. K-926	WR-26	35. P.L.2M20803	LC-13
11. K-455	MS-26A	36. K-483	MS-43
12. MS22AA2	MS-311	37. K-499	MS-39
13. K-84	RH-38	38. 1RRB1AA-3/4	RR-122
14. P.L.2M20795	LC-19	39. K-288	RT-2
15. LP-9	LP-3	40. FC-5	FC-14
16. K-507	MS-44	41. K-33	FW-4
17. K-508	MS-45	42. FWK-31	FW-2
18. K-448	MS-27A	43. LP-13	LP-11
19. HP-19B	HP-5	44. CYK-221	CY-49
20. FC-93	FC-29	45. WR41AA3	WR-44
21. K-414	MS-24A	46. FW58A	FW-2
22. K-523	MS-27A	47. K-877	WR-2
23. RH-54	RH-20	48. HP-55	HP-4
24. RH-56	RH-20	49. K-475	MS-34
25. RH-46	RH-20		

None of the reader sheets for the welds in Table 5.16-1 indicated that Kaiser personnel had accepted radiographs that had previously been rejected by PM.

5.16.4 Findings and Conclusions

Seven current and former PM employees who were interviewed denied any attempts by PM management to silence them for their weld determinations. In addition, the radiographers, CG&E, and PM management personnel denied

that PM was consistently overridden in its weld determinations. A review of PM radiographic examination reports did not reveal a pattern of PM being overridden by Kaiser in their weld determinations.

The PM trailer had been broken into on the weekend of January 9-10, 1981. It was not established that this was done by Individuals D and E. Seven security officers who Applegate indicated had information regarding the break-in were interviewed and said they had no knowledge of any break-in of the trailer or of any information regarding the involvement of Individuals D and E in such a break-in. After the break-in, PM's copies of examination reports of Kellogg prefabricated main steam relief spool pieces were determined to be missing. Three of the eight reports on the spool pieces were found in the Kaiser Document Control Center filed with a nonconformance report, but five of the reports are still missing. The reports and films were reviewed by the PM employee who did the initial examination of the welds and who verified the reports and films are the originals. He said the reports filed with the nonconformance report are for the welds thought to be defective, and the missing five reports are of the radiographs of the acceptable welds.

5.16.5 Items of Noncompliance

No items of noncompliance were identified.

5.17 Industry Blacklisting

5.17.1 Allegation

"Union pipefitters and PM employees have been intimidated by fear of utility and industry-wide reprisals should they complain about the QA practices."

5.17.2 Background Information

No additional information was provided.

5.17.3 Investigation

5.17.3.1 Interview of Individuals A and B

On April 22 and 24, 1981, Individuals A and B, both union pipefitters, were interviewed by NRC. They stated they had not been intimidated or subjected to reprisals for their criticism of QA practices at Zimmer. Individuals A and B both stated that they were fired in January 1980 as a result of the findings of Thomas Applegate's investigation into their involvement in timecard cheating. They have since been re-employed by CG&E subcontractors at Zimmer and other CG&E sites.

5.17.3.2 Interview of William Schwiers

On January 16, 1981, William Schwiers, QA Manager (CG&E), was interviewed by NRC. He was asked to provide the names and current place of employment for Kaiser QC inspectors who had left the site since January 1, 1979. A

list was subsequently provided, indicating that a total of twenty-three QC inspectors had left the site since that date. Fifteen were known to be employed at other nuclear power plants under construction, two were employed as QC inspectors in defense-related industries, and there was no known place of employment for the remaining six inspectors. Schwiers said there has been no attempt by CG&E to engage in any form of industry-wide reprisals against employees who left Zimmer.

5.17.3.3 Interview of Ernest Aldredge

On April 10, 1980, Ernest Aldredge, President of Peabody Magnaflux (PM), was interviewed by NRC. He stated that neither PM nor its employees had been subjected to any reprisals by CG&E or other utilities for their work at Zimmer.

Aldredge indicated that he was contacted by private investigator Thomas Applegate who asked him about the termination of the PM contract at Zimmer. He stated he told Applegate the situation at Zimmer could affect PM's performance record in the industry. Aldredge said the contract was terminated because of production problems that he attributed to a lack of adequate staffing on PM's part, and frequent breakdowns of their onsite film processing machine.

Aldredge also said he was advised by Charles Wood, the PM Cincinnati Office Manager, that NRC had audited PM's records onsite and had found deficiencies. Aldredge said he talked to Applegate about PM being removed from other contractor's bid lists because of the work at Zimmer, but he was referring to their poor performance record at Zimmer affecting other contracts. He indicated that he was not referring to any systematic attempt by CG&E to engage in any intimidation or reprisals against PM for its work onsite. Aldredge stated that during the conversation with Applegate he was concerned that the professional and business reputation of PM not be tarnished. He indicated he felt that Applegate misunderstood what he said and falsely accused CG&E of engaging in "industry-wide" intimidation of PM.

5.17.3.4 Interviews of PM Employees

Between January 19 and April 15, 1981, seven current and former PM employees were interviewed by NRC. They denied that they had been placed in fear of utility or industry-wide reprisals should they complain about QA practices at Zimmer. The results of these interviews are reported in Sections 5.7.3, 5.8.3, and 5.16.3.

5.17.4 Findings and Conclusions

Two fired union pipfitters and seven current and former employees of Peabody Magnaflux, which included the individuals interviewed by GAP, were contacted by NRC and they denied having been intimidated or subjected to industry-wide reprisals for their critcism of Zimmer QA practices.

5.17.5 Items of Noncompliance

No items of noncompliance were identified.

5.18 Inspector's Journal

5.18.1 Allegation

"A KEI employee has kept a detailed journal of safety hazards and incidents at Zimmer."

On January 29, 1980, Thomas Applegate was interviewed by NRC. He stated that an individual named Yohan Reiter had told him he maintained a detailed journal of safety defects while employed as a radiation waste chemistry technician at Zimmer.

5.18.2 Background Information

It is common practice for inspectors performing certain types of inspections to utilize notebooks to record their observations. Such notes can later be used to generate surveillance reports, nonconformance reports, or other documents as required.

5.18.3 Investigation

5.18.3.1 Personnel Record Review

The NRC Senior Resident Inspector reviewed CG&E personnel records and found an individual named Yohan Reiter. Inquiry indicated that Reiter was employed by Westinghouse, Inc., in Brazil. Personnel records confirmed that Reiter had been employed at Zimmer at the time Thomas Applegate was onsite.

5.18.3.2 Interview with Yohan Reiter

On February 5, 1981, Yohan Reiter of Westinghouse, Inc., was interviewed by telephone. He stated he was formerly employed as a radiation chemistry technician at Zimmer. He said he recalled meeting Thomas Applegate in the radiation waste disposal area during a routine inspection. Reiter also recalled commenting to Applegate that his field notebook was his "paper brain" in which he recorded the results of his field inspections. He said the notebook listed deficiencies identified during system walkdowns of the radioactive waste disposal system. Reiter indicated that he used the notebook to record deficiencies such as malfunctioning gauges or acid eating through floor tiles, which were then recorded on an equipment service list and corrected by the plant maintenance staff. He said that to his knowledge all of the deficiencies he identified were properly corrected by the licensee. He added that during meetings with his supervisor, Dean Erickson, and other members of the Radiation Protection Department staff, the adequacy of the resulting corrective action was discussed.

Reiter indicated that he was not keeping any detailed journal of safety defects at the plant and, if he had any concerns regarding the safe operation of the plant, he would have contacted the NRC himself.

5.18.4 Findings and Conclusions

The individual who was alleged to have kept a "journal of safety hazards and incidents at Zimmer" stated that the "journal" was a field inspection notebook. He stated he used this notebook to record deficiencies he identified during system walkdowns of the radiation waste disposal system. He said that to his knowledge all of the deficiencies he identified were properly corrected by the licensee.

5.18.5 Items of Noncompliance

No items of noncompliance were identified.

5.19 Pipefitter Joke

5.19.1 Allegation

"A common 'joke' among pipefitters at Zimmer is that they will be hundreds of miles away when the plant goes on line, due to their predictions of a disastrous accident."

5.19.2 Background Information

No additional information was provided as to the source or significance of the "joke" or statement.

5.19.2.1 Media Interview

During interviews conducted by Bettina Gregory of ABC News (broadcast on May 19, 1981), Edwin Hofstadter made a similar comment. Hofstadter was neither a pipefitter nor site employee, as detailed in Section 5.10.2.

5.19.3 Investigation

5.19.3.1 Interviews

Sixteen pipefitters interviewed by RIII inspectors could not provide any information concerning any specific equipment design or installation deficiencies.

During one interview, a QC inspector indicated that this joke had been heard in the plant.

5.19.4 Findings and Conclusions

It was determined that the alleged statement had been made. The NRC is addressing the allegations and safety concerns identified during this investigation.

The only other way that the NRC can deal with an allegation such as this is to determine if the quality of the plant is adequate. The NRC inspection program, the licensee's Quality Confirmation Program, and the preoperational testing program will enable this determination to be made.

5.19.5 Items of Noncompliance

No items of noncompliance were identified.

6.0 Allegations Received Through Site Interviews

During interviews conducted at the Zimmer site, the investigators and inspectors received additional allegations. A number of these allegations coincided with or added detail to those in Section 4 and are included in that Section of this report.

6.1 Inspector Harassment

6.1.1 Allegation

QC inspectors have been harassed by construction personnel who have repeatedly doused them with water. QC inspectors have been transferred following complaints from construction personnel.

6.1.2 Background Information

Some friction between QC inspectors and construction personnel is expected due to the very nature of the system. That friction can be increased when construction personnel take the view that QC inspectors are "over inspecting" or overly critical. It is management's responsibility to take action to assure that friction does not develop unhealthy attitudes that adversely affect construction quality.

6.1.3 Investigation

6.1.3.1 Interview of Phillip Gittings

On January 13, 15, and July 8, Phillip Gittings, Kaiser QA Manager, was interviewd by NRC. He stated that Rex Baker told him of one incident in September 1980 when a QC inspector was doused with water while performing an inspection. Gittings stated Baker told him that the person who had doused the inspector had been identified and fired by construction management.

Gittings stated that Swain and other construction personnel had given him "bad reports" on the inspection activities of Individual I, a QC inspector, and his lack of completed inspections. He then directed Baker to transfer Individual I from pipe support hanger inspection to structural welding inspection activities. Gittings also indicated that in January 1980 he directed Baker to reassign QC Inspectors Ruiz, Wimbish, and Hendley because of problems with their inspection activities.

6.1.3.2 Interview of Dennis Donovan

On March 10 and 11, Dennis Donovan, Kaiser Lead Civil (structural) QC Inspector, was interviewed by NRC. He stated that he was aware that water had been dumped on QC Inspectors Janice Mulkey and Anthony Pallon, Jr., by craft personnel during the course of their inspections.

Donovan stated that on February 16, 1981, James Ruiz was involuntarily reassigned from inspections in the drywell area to the fabrication shop. Donovan explained that he had been Ruiz's lead supervisor and was directed by Rex Baker to make the reassignment. He stated that Baker offered no explanation for the reassignment except that the Kaiser QA Manager had requested he reassign Ruiz.

Donovan stated it was obvious to him that Baker disapproved of the reassignment. He indicated the reassignment resulted from a personality conflict between Ruiz and Jerry Adams, Ironworker Superintendent, who felt that Ruiz was too strict and "nit-picking" during his inspections. Donovan stated that Adams had complained to him about Ruiz's inspections and had discussed this matter with Baker. Baker indicated that Ruiz was a good inspector, was not overly critical, and was justified in citing the various deficiencies he discovered in Adams' area. Donovan speculated that Adams had complained about Ruiz to General Superintendent James Sandlin who then talked to Gittings, who decided to remove Ruiz from the inspection area. Donovan added that concurrently he had heard unsubstantiated rumors that QC Inspectors Hendley, Wimbish, and McCoy were also going to be reassigned because of criticism of their inspection findings by Kaiser construction personnel.

On March 11, 1981, Donovan provided a sworn statement attesting to the preceding information, which is included as Exhibit 66.

6.1.3.3 Interview of Janice Mulkey

On March 11 and 12, 1981, Janice H. Mulkey, Kaiser QC Inspector, was interviewed by NRC. She stated that on three or four occasions between August 1979 to August 1980 water had been thrown on her from above by craft personnel while she performed inspections. Mulkey said she never saw the responsible individuals but on each occasion she reported the incident to her supervisors (K. Shinkle, J. Setlock, or S. Heath). She recalled that on one occasion Heath threatened to remove all the QC inspectors from the site if water continued to be thrown. Mulkey said Robert Marshall was then apprised of the incidents. Marshall then told the craft superintendents to assure that the water-throwing incidents stopped or he would terminate eight craft personnel who were suspected of being responsible.

Mulkey said the water-throwing incidents adversely affected her performance and caused her difficulties in concentrating on her inspection activities because she had to be constantly vigilant for water being thrown on her. Mulkey also stated that, when water was thrown from three stories above her, it struck her with such force that on one occasion it knocked the breath out of her and on another caused her to bruise her knee. She indicated that other QC inspectors had also been doused with water.

On March 12, 1981, Janice Mulkey provided a written statement attesting to the preceding information, a copy of which is included as Exhibit 67.

6.1.3.4 Interview with Anthony Pallon, Jr.

On February 10, 1981, Anthony Pallon, Jr., Kaiser QC Inspector, was interviewed by NRC. He stated that since January 1981 he has performed visual

weld inspections in the suppression pool area to ensure these welds met AWS Code requirements. Pallon said the previous inspector in this area had been lax, and he began rejecting about 50% of the welds he inspected. Soon afterwards, he was being called to inspection points by craft personnel who would douse him with water from above when he arrived. Pallon said this occurred about two or three times a week and he had been squirted with a fire extinguisher while performing an inspection the night prior to this interview.

Pallon said he was also told that Douglas Haff, Kaiser Pipefitter Superintendent, had told QC Inspector Joseph Mills that he would have Pallon fired. Pallon said Haff on one occasion harrassed him when he returned from lunch by directing security personnel to search him and Joseph Mills for alcohol.

On February 10, 1981, Pallon provided a sworn statement attesting to the preceding information, which is included as Exhibit 68.

6.1.3.5 Interview of Joseph Mills

On February 10, 1981, Joseph Mills, Kaiser QC Inspector, was interviewed by NRC. He stated that, while performing inspections in the suppression pool area, both he and Anthony Pallon had been called to inspection points and doused with water. Mills felt it was significant that Pallon was doused in excess of six times in one month. Craft personnel were apparently doing this because of Pallon's weld rejections. Mills indicated that Douglas Haff, the superintendent in this area, told him he would get Pallon fired because he was "nit-picking" on his inspections. Mills said he ignored this comment because it was impossible for Haff to fire a QC inspector.

Mills indicated that later Haff attempted to harass him and Pallon by having them searched by security guards for alcohol when they returned from lunch one day. He stated these actions did not affect his inspection activity, although he did feel that the QA program at Zimmer was understaffed, procedures were poorly written, and the existing program lacked support from Kaiser management.

6.1.3.6 Interview of Michael McCoy

On February 11, 1981, Michael McCoy, Kaiser QC Inspector, was interviewed by NRC. He stated that on one occasion during the spring of 1980 he and QC Inspector Charles Belcher were called to an inspection point by craft personnel. McCoy said when they arrived at the inspection point an attempt was made to douse them with water thrown at them from above.

On February 11, 1981, McCoy provided a sworn statement attesting to the preceding information, which is included as Exhibit 69.

6.1.3.7 Interview of John Sullivan

On February 19, 1981, John Sullivan, Nuclear Energy Services Inc., was interviewed by NRC. He stated that he personally has never been doused with water but that he was aware Kaiser QC Inspectors Anthony Pallon and Rick Sizemore had been doused with water while performing inspections in

the suppresion pool area. Sullivan stated that when Sizemore was doused he was performing an inspection using a 220-volt magnetic particle testing machine, and, if water had struck the machine, Sizemore might have been electrocuted. He indicated that Construction Superintendents Edward Stanley and Douglas Haff were standing in the area when this incident occurred.

Sullivan also related another incident when he and Pallon were searched by security personnel when they were returning from lunch one day. He stated that, in his opinion, Haff and Stanley were attempting to harass Pallon because of Pallon's inspection activities in their area.

On February 19, 1981, Sullivan provided a sworn statement attesting to the preceding information, which is included as Exhibit 70.

6.1.3.8 Interview of Billy Tyree

On February 18 and 20, 1981, Billy Tyree, former Kaiser QC Inspector, was interviewed by NRC. He stated that he was employed at Zimmer from September 24 to November 20, 1979, by Butler Services, Inc. Tyree stated that he was aware that buckets of water were thrown on QC inspectors by Kaiser construction workers. Tyree indicated that he never observed such incidents, but he recalled that on four or six occasions QC Inspector Janice Mulkey was doused with water, and had reported these incidents to her immediate supervisor.

Tyree also stated that two or three other QC inspectors were also doused with water, and he conjectured this was done to limit the thoroughness of inspections by QC personnel. He was unaware of any inquiry or investigation to identify the individuals involved in the dousing incidents, but learned that a construction worker named "Frenchie" was considered to be generally responsible for some of the water-throwing incidents.

On February 20, 1981, Tyree provided a sworn statement attesting to the preceding information, which is included as Exhibit 71.

6.1.3.9 Interview of Richard Price

On February 18 and March 7, 1981, Richard Price, former QC Inspector, was interviewed by NRC. He stated he was employed by Butler Services, Inc., from September 1975 to November 28, 1980, and by Kaiser from December 1 to 14, 1980. Price stated he was aware that, on at least twelve occasions, construction workers poured buckets of water on QC inspectors who were conducting inspections in the containment building. He stated his opinion that the water was thrown on the inspectors because they were conscientious and refused to accept inferior or nonconforming work by craft personnel.

Price stated he heard rumors that two Kaiser construction workers nicknamed "Frenchie" and "John Boy" were the individuals responsible for throwing water.

He indicated that Kaiser management was apprised of these incidents and construction personnel were unofficially told that they would be terminated if there were any further incidents of water being thrown on QC inspectors.

On March 2, 1981, Price provided a sworn statement attesting to the preceding information, which is included as Exhibit 72.

6.1.3.10 Interview of Winston Jackson

On February 18 and 20, 1981, Winston Jackson, former QC Inspector, was interviewed by NRC. He stated he was employed at Zimmer by Butler Services, Inc., from July 1979 to November 1980. Jackson stated he was aware of several incidents when buckets of water were dumped on QC inspectors by craft personnel while they were performing inspections in the containment building. He indicated that in his opinion these incidents represented harassment of QC inspectors by construction personnel, and he added that these incidents were reported to Kaiser management. He stated he was not aware of any action Kaiser took concerning this matter.

On February 20, 1981, Jackson provided a sworn statement attesting to the preceding information, which is included as Exhibit 73.

6.1.3.11 Interview of James Ramsey

On February 18 and 20, 1981, James Ramsey, former Kaiser QC Inspector, was interviewed by NRC. He stated he formerly worked at Zimmer for Butler Services, Inc., and also for Kaiser Engineering between July 1979 and December 14, 1980. Ramsey stated that QC Inspectors Janice Mulkey and Michael DePuccio were doused with water by construction personnel while performing inspections in the containment building. He indicated that, in his opinion, these incidents amounted to harassment of the inspectors by construction personnel. Ramsey said these incidents were reported to Kaiser management and an investigation was conducted into the matter, but he was unaware of any outcome of the inquiry.

On February 20, 1981, Ramsey provided a sworn statement attesting to the preceding information, which is included as Exhibit 74.

6.1.3.12 Interview of Individual I

On February 18 and 20, 1981, Individual I, former Kaiser QC Inspector, was interviewed by NRC. He indicated that he was aware of incidents of QC inspectors being harassed by construction personnel. Individual I stated that two inspectors in particular were subject to harassment in the form of buckets of water dumped on them while they were performing their inspections. He said the above incidents were reported to Kaiser management but nothing was ever done about the problem. Individual I indicated that he had heard that General Foreman Walter Hamm was aware of the identity of the individuals involved in the incidents but was protecting those individuals.

6.1.3.13 Interview of Dennis Taylor

On February 19, 1981, Dennis Taylor, Kaiser QC Inspector, was interviewed by NRC. He stated that in October or November 1980, while performing a magnetic particle inspection of a weld in the reactor containment building, he was hit with a stream of water from a fire extinguisher. Taylor also

indicated that QC Inspector Anthony Pallon was frequently doused with water while performing inspections in the suppression pool area. In Taylor's opinion, Pallon was being harassed by craft personnel in this area because he was rejecting welds made by the craft personnel.

6.1.3.14 Interview of Jesse Ruiz

On February 18 and 20, 1981, Jesse Ruiz, former Kaiser QC inspector, was interviewed by NRC. He indicated that construction workers were pouring buckets of water on QC inspectors who were performing inspections. He said that these incidents were brought to the attention of Robert Marshall, Kaiser Construction Superintendent, who stated that anyone throwing water on a QC inspector would be fired. However, no formal investigation or report was made of these incidents.

6.1.3.15 Interview of Walter Hamm, Sr.

On March 26, 1981, Walter Hamm, Sr., Kaiser General Foreman, was interviewed by NRC. He stated he was aware that water had been thrown on several QC inspectors, including Janice Mulkey. Hamm indicated that the culpable individuals were never identified and no disciplinary action was ever initiated. He stated that according to rumors individuals nicknamed "Fat Frenchie," "Skinny Frenchie," and one pipefitter nicknamed "John Boy" were involved in the incidents. Hamm identified these individuals but he was unable to substantiate their involvement. He personally warned all of these individuals that he would terminate them if he found they were throwing water on QC inspectors.

Hamm was critical of the QC inspection activities at Zimmer and stated that QC inspectors often rejected work that, in his opinion, was acceptable. He also mentioned that he frequently had difficulty in finding inspectors when he needed them to respond to an inspection point in a timely manner. Hamm stated that the QC inspectors delayed construction and increased construction expenses because of their critical inspections. He indicated that he had frequently criticized the inspectors personally and had admonished them for their inavailability to perform inspections.

On March 26, 1981, Hamm provided a sworn statement attesting to the preceding information, which is included as Exhibit 75.

6.1.3.16 Interview of Rex Baker

On January 13 and March 3, 1981, Rex Baker, Kaiser Inspection Supervisor, was interviewed by NRC. Baker stated that in January or February 1981, Phillip Gittings suggested that QC Inspectors Ruiz, Hendley, and Wimbish be reassigned because they were "nit-picking" during their inspections and writing too many nonconformance reports. Baker disagreed with this suggestion and expressed his opinion that the inspectors were performing inspections in accordance with Kaiser procedures and were writing valid nonconformance reports. He stated that he did move Inspectors Ruiz and Hendley from weld inspections in the reactor building to inspections in the fabrication shop.

Baker also stated that, when he first arrived on the site, he learned from the previous Inspection Supervisor that the lead welding inspector, Kenneth Shinkle, had also been reassigned.

Baker also understood that QC inspector Janice Mulkey was doused with water while performing an inspection, but he was not exactly sure how or when the incident occurred.

6.1.3.17 Interview of Kenneth Shinkle

On February 18, 1980, Kenneth Shinkle, Kaiser QC Engineer, was interviewed by NRC. He stated that from November 1977 to February 1980 he was lead pipe support hanger inspector at Zimmer. Shinkle stated that in February 1980 Kaiser was involved in a 100% reinspection of all pipe support hanger welds. He said his inspectors were rejecting up to 95% of the hangers inspected and initiating nonconformance reports for deficient hanger welds.

Shinkle stated that he was called into a meeting with both CG&E and Kaiser management, who criticized his group's high rate of rejection, their inspection techniques, and the continuing identification of deficiencies on welds that were found acceptable during previous inspections. He said those Kaiser officials present initially denied they had committed Kaiser to a 100% reinspection, but later in the meeting they admitted this was the commitment for reinspection of pipe support hangers. Shinkle stated that at the end of the meeting a Kaiser official asked him, "Do you understand who you work for now?" He took this comment as an attempt to intimidate him and to pressure his inspectors to accept pipe support hangers undergoing inspection at the time.

Shinkle stated that the next day he submitted nonconformance reports for deficient welds on pipe support hangers, and Kaiser management removed him from his job later that afternoon. He learned that William Schwiers, CG&E QA Manager, had objected to Kaiser about Shinkle's reassignment but was told Robert Marshall had said "it would be a cold day in hell before he'll [Shinkle] touch another pipe hanger." Shinkle stated that he has never been reassigned to pipe support hanger inspection activities.

On September 1, 1980, Shinkle was promoted to Quality Assurance Engineer for civil/structural activities, the job description for which states that he is responsible for pipe support hanger inspections. However, Phillip Gittings told him that this was a typing error in the description and he would have nothing to do with pipe support hanger inspection activities.

On February 18, 1981, Shinkle provided a sworn statement attesting to the preceding information, which is included as Exhibit 76.

6.1.3.18 Interview of Mack White

On March 11 and 25, 1981, Mack White, QC Inspector, was interviewed by NRC. He stated that on March 11, 1981, at about 10:30 a.m., he was conducting an inspection in the drywell area of the primary containment building at Level 524. White indicated that at this time an unknown individual dumped

a few gallons of water on him from above. He looked up but was unable to identify the individual as he ran away.

White stated he reported the incident to the NRC, QC management personnel, and to Construction Superintendent Adams. He said that Adams commenced an inquiry to attempt to determine who was responsible, but was unsuccessful. White stated he had no idea who threw the water and he was unable to speculate on what prompted the incident.

On March 25, 1981, White provided a sworn statement attesting to the preceding information, which is included as Exhibit 77.

6.1.3.19 Interview of James Ruiz

On February 25, 1981, James Ruiz, Kaiser QA Inspector, was interviewed by NRC. He stated that on February 22, 1981 he was reassigned from inspections in the primary containment building to inspections in the fabrication shop. Ruiz stated that Rex Baker had commented to him at the time of his transfer that "you were doing too good a job and so they transferred you." Ruiz stated that prior to his reassignment he had disagreed with Ironworker Superintendent Jerry Adams, who accused him of "nit-picking" inspections.

Ruiz stated he was told by Dennis Donovan that Adams had gone to James Sandlin, Kaiser General Superintendent, and asked Sandlin to have the QA Manager remove him from the containment area. Ruiz stated that his reassignment was an example of Gittings' lack of support for QC inspectors and proved that the QA Department was not independent of construction influence at Zimmer.

On February 25, 1981, Ruiz provided a sworn statement attesting to the preceding information, which is included as Exhibit 78.

6.1.3.20 Interview of James Sandlin

On March 13, 1981, James T. Sandlin, Kaiser General Superintendent (structural), was interviewed by NRC. He indicated that QC Inspector James Ruiz had been unable to establish or maintain a good working relationship with construction personnel or his fellow inspectors. Sandlin stated that Ruiz conducted inspections without listening to any advice and did not solicit the cooperation of construction personnel or other QC inspectors.

Sandlin stated that Ruiz had been unnecessarily critical in his inspections and had been accused of "nit-picking." He indicated that this had caused conflict between Ruiz and Gerald Adams, Structural Superintendent, and he brought this matter to the attention of the QA Manager asking him to resolve the situation. Sandlin denied that he asked Gittings to reassign Ruiz from the primary containment area.

On March 25, 1981, Sandlin provided a sworn statement that attested to the preceding information, which is included as Exhibit 79.

6.1.3.21 Interview of Gerald Adams

On March 13 and 25, 1981, Gerald Adams, Kaiser Structural Superintendent, was interviewed by NRC. He stated that he received numerous complaints from

construction personnel regarding the inspections of QC Inspector James Ruiz. He said that in his opinion Ruiz was too critical and "nit-picking" on his inspections, thereby delaying construction activities. Adams indicated that Ruiz did not cooperate with craft personnel and, in his opinion, was inspecting according to ASME Code requirements when he should be following the less stringent AWS Code requirements.

Adams stated that he had accused Ruiz of holding up construction and being overcritical in his inspections. He also threatened to have him terminated if he persisted in his unjustified delays of construction. However, Adams denied threatening to have Ruiz terminated unless he accepted welds that did not meet AWS criteria. Adams stated he had complained to Donovan, Baker, Sandlin, and Gittings about Ruiz's inspections and specifically suggested to Baker that it would be better for both him and Ruiz if Ruiz was reassigned to another area. However, Adams denied any responsibility for initiating Ruiz's reassignment.

On March 25, 1981, Adams provided a sworn statement attesting to the preceding information, which is included as Exhibit 80.

6.1.3.22 Interview of L. Q. Hendley

On March 9, 1981, L. Q. Hendley, Kaiser QC Inspector, was interviewed by NRC. He stated that in February 1980 he was reassigned from pipe support hanger inspection duties to the fabrication shop. Hendley stated that his supervisor, David Painter, told him he was "doing his job too well and that is the reason for your reassignment." Hendley stated that, after his reassignment, nonconformance reports he had written were dispositioned as "Accept-As-Is" by the QC Manager.

6.1.3.23 Interview of David Hang

On February 24, 1981, David Hang, Kaiser QC Inspector, was interviewed by NRC. He stated that prior to his employment by Kaiser he worked for Peabody Magnaflux, the firm which had been responsible for nondestructive examination of welds at Zimmer. He said that in March 1980, while inspecting welds in the containment building, he was doused with a bucket of water from above. Hang indicated this was not an unusual occurrence and that this had happened to other QC inspectors before and after this event.

Hang also stated that during the summer of 1978 he was re-inspecting a weld he had previously rejected when a pipefitter threatened him with bodily harm if he did not pass the weld. Hang said he did not report the incident to anyone, but was intimidated by this threat and did not enter that particular area for some time.

On February 24, 1981, Hang provided a sworn statement attesting to the preceding information, which is included as Exhibit 81.

6.1.4 Findings and Conclusions

Quality control inspectors were harassed by construction personnel who dumped water on them from above. In one case, inspectors, when entering

the site, were searched by security personnel who allegedly were instructed to perform the search by Construction Department supervisors.

There was no indication that any of these activities were condoned by Kaiser or CG&E management. There were indications that action was taken by Kaiser to identify and disipline those harassing QC inspectors.

The Kaiser Quality Assurance Manager reassigned Quality Control inspectors on four occasions after the Kaiser Construction Department criticized them.

In a related finding, NRC inspectors found that some of the nonconformance reports generated by these inspectors prior to their reassignment were improperly voided or were not entered into the Kaiser nonconformance reporting system following their reassignments (see Section 4.1). QC inspection supervisors interviewed stated that the Kaiser Quality Assurance Manager reassigned inspectors because construction management complained about their inspection activities.

6.1.5 Items of Noncompliance

No items of noncompliance were identified.

6.2 Weld Inspection Criteria Deleted

An allegation concerning the deletion of required weld inspection criteria was received by the NRC during the investigation from a site employee. The employee showed the Region III inspector copies of KEI-1 forms (weld inspection records) that supported the allegation.

6.2.1 Review of Weld Inspection Records

The Region III inspectors observed that weld inspection criteria utilized 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):

Table 6.2-1 Weld Inspection Records

System or Component	Isometric Drawing #	Beam or Mark #	Other Information
(1) Drywell Support Steel	S398B	29	Detail E of S-437
(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 or 493 Detail 2 of 447

Table 6.2-1 (continued)

System or Component	Isometric Drawing #	Beam or Mark #	Other Information
(5) Drywell Support Steel	S398A	C-63 (W8 x 10)	Bottom Plate
(6) Drywell Support Steel	S398A	W8 x 17	Cam Lugs
(7) Service Water System	PSK1WS32	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 weld in the service water system indicated the criteria was designated as not applicable in November 1979.

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

6.2.2 Code Requirements

The welding activities were governed by ASME Code Section III-1971 Edition or by the AWS D1.1-1972 Code. The applicable requirements of both codes are as follows:

ASME Code, Section III 1971 Requirements

1. NA-4130--"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 of weld joints which must be verified.

AWS D1.1-1972 Code Requirements

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 of 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 which 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 5.2."

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."

The weld inspection criteria were deleted or designated as not applicable on weld inspection forms used routinely to inspect welds. This appears to be contrary to 10 CFR 50 Appendix B, Criterion III, and the Wm. H. Zimmer QA Manual, Sections 3.3 and 3.13.1 (358/81-13-26).

This matter is addressed in the licensee's Quality Confirmation Program.

6.2.3 Findings and Conclusions

Weld inspection criteria were deleted from weld inspection forms used to document inspections of welds between July 1980 and January 1981 and were designated as not applicable for one weld made in November 1979. This concern is addressed in the licensee's Quality Confirmation Program.

6.2.4 Items of Noncompliance

One item of noncompliance was identified (failure to delineate required weld inspection criteria).

6.3 QA Surveillance Reports

An allegation concerning Surveillance Report procedure violations was received by the NRC from a site employee during this investigation. 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 QACMI G-14, Revision 3, for initiating and documenting QA Surveillance Reports (SR). 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)." 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, 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 disposition of SR ~~X~~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 ~~X~~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 ~~X~~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 P-2899, P-2903, and P-2914 would have been documented on nonconformance reports (NRs), H. J. Kaiser Company Instruction QACMI G-4 would have required dispositions to have been made by the Material Review Board. The Material Review Board is comprised of the KEI Construction Engineer, CG&E QA and Standards Engineer, KEI QA Engineer, CG&E Sponsor Engineer, and the S&L Design Engineer.

The nonconforming items accepted in SRs P-2899, P-2903, and P-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 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

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 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 addressed in the licensee's Quality Conformation Program.

6.3.3 Items of Noncompliance

Two items of noncompliance were identified (inadequate procedures to assure nonconformances are subjected to design control measures commensurate with those applied to the original design, and failure to follow procedure to

transfer in-process nonconformances identified on Surveillance Reports to Nonconformance Reports in 30 days).

7.0 Independent NRC Inspection Findings

During the course of the investigation, RIII inspectors performed independent inspections of various plant areas during allegation reviews. In those areas where deficient conditions were observed, further inspection undertaken to determine the extent of the deficient conditions.

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 [redacted] served 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 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 identification 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 15.2.2 (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, (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 (50-358/81-13-06).

This concern is addressed in the licensee's 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).

This concern is 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-procress

inspections related to Design Document Changes would be performed; 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).

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. During checks for cable separation on 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 brief tour of the cable spreading room while inspecting others matters, 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. 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 (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 (358/81-13-22).

The adequacy of cable separation is addressed in the licensee's Quality Confirmation Program.

7.2.3 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 (358/81-13-23).

7.2.4 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).

With regard to the installed conditions identified in paragraph 7.2.2 items 1, 2, and 4, and 7.2.3 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.

7.2.5 Findings and Conclusions

Four locations were identified in which the cable separation requirements had not been maintained as specified in the FSAR. The adequacy of cable separation is addressed in the licensee's Quality Confirmation Program.

7.2.6 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).

7.3 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 S&L

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

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

The audits did not address in depth the effectiveness of the nonconformance program. The RIII inspector observed only two items in all of the 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).

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.

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 (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 directed toward identification of new and generic problems. The audits appeared to identify adverse findings for which there were no corrective action taken or followup 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

The CG&E audits of S&L ~~were identifying~~ identified a recurring problem concerning the performance of design calculations, reviews, and verifications by S&L. The specific problems identified in each audit are described in Table 7.3-1.

Table 7.3-1 CG&E Audit Findings

Audit Date or No.	Problems
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.
	(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.
	(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."

Table 7.3-1 (continued)

Audit Date or No.	Problems
	(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.
	(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 which identified the above problems, or corrective actions instituted addressed 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 (358/81-13-24).

This concern is addressed in the licensee's Quality Confirmation Program.

7.3.4 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.

7.3.5 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, 5.10.3.3, 5.11.3, 4.1.8.2.1, 7.1.3, 7.2.3, 7.2.4, 7.3.2.

9. Open Items

When this investigation was initiated, the NRC interviewed numerous quality control inspectors, construction craftsmen, and management personnel who provided information that deserved review by the NRC. The information provided was prioritized with the highest priority given to the initial four allegations received from a former Zimmer contractor QC Inspector (Section 4), the 19 allegations received from GAP/Applegate (Section 5), and the most significant 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, 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.

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 11, the inspectors and investigators met with licensee representatives periodically during the investigation and on March 26, 1981. Attendees at the March 26 meeting 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~~ Cables ~~install~~ designed and installed in violation of the cable separation criteria.

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. Gwynn, 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

11. 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.

12. NRC Actions and Licensee Commitments

12.1 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 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~~ Four 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.

12.3 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. This program will independently verify on a sampling basis the licensee's Quality Confirmation Program.

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

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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 — Date
Reactor Inspector

J. B. McCarten — Date
Investigator

R. M. Burton — Date
Investigator

E. C. Gilbert — Date
Investigator

P. E. Baci — Date
Investigator

K. D. Ward
Reactor Inspector

Date

C. Erb
Reactor Inspector

Date

J. F. Schapker
Reactor Inspector

Date

F. A. Maura
Reactor Inspector

Date

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

A. B. Davis
Deputy Director

Date

James G. Keppler
Director

Date

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.

CONTENTS

Exhibits

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 (a non-government agency), on behalf of Thomas Applegate, requested 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 GAP letter.

This investigation was initiated into 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 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.

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, 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.

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 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.

DETAILS

1. Personnel Contacted

Cincinnatic Gas & Electric

*W. Schwiers, QA Manager
*J. R. Schott, Plant Manager
*W. D. Waymire, Manager, General Engineer
*B. K. Culver, Manager, Generation Construction
*S. C. Swain, Site Construction Manager
*H. C. Brinkman, Principal ME - Nuclear
*R. P. Ehas, QE
*E. A. Borgmann, Senior V.P.
D. Kramer
W. Murray, Senior Engineer
B. Gott, Field Structural Engineer
L. Wood, QA & S Engineer
F. Lautenslager, Security Supervisor

REVISED

Kaiser Engineers, Inc. (KEI)

J. P. Coyle, V. P. Power Division
*R. Marshall, Construction Superintendent
*C. H. Stanfield, Construction Manager
*E. V. Knox, Corporate QA Manager
*P. S. Gittings, Site QA Manager
F. J. Oltz, Supervisor Document Control
S. Godsey, Lead Code Forms
T. Schmidgall, Field Verifier
T. Edwards, Field Verifier
W. Puckett, Welding Engineer
P. Norman, Piping Lead QC Inspector
C. Cherry, QA Inspector
D. Fox, Lead Mech. Piping Quality Engineer
A. Lanham, Senior Engineer
K. Shinkle, QC Engineer
K. Burgess, Inspection Supervisor
C. Burgess
B. Winters
T. Foster
B. Lake
J. Deerwester, QC Inspector
D. Painter, QC Inspector
C. Oldenski
C. Camaron
W. Hamm, Sr., General Foreman Pipefitter
D. Haff, Pipefitter Superintendent
J. Mills, QC Inspector
R. Baker, Inspection Supervisor
J. Tyner, Kaiser, Pipefitter Superintendent

*Present at exit interview on March 26, 1981.

L. Cummings
D. Parlier
G. Adams, Structural Superintendent or Ironworker Superintendent
K. Faubion, NR Controller
R. L. Reiter (NW)**, Document Reviewer
J. H. Mulkey, QC Inspector
J. T. Sandlin, General Superintendent (Structural)
A. Pallon, Jr., QC Inspector
M. McCoy, QC Inspector
S. Heath (NW), Inspection Supervisor
W. Racer (NW), Lead Elect. Quality Engineer
M. Kopp, QC Inspector & QC Engineer & Lead Insp. Elect.
D. Donovan, Lead Civil/Structural QA Inspector
W. C. Dumford, QC Inspector (Trainee)
J. Ruiz, QC Inspector
D. Taylor, QC Inspector
L. Q. Hendley, QC Inspector
S. Burke, QC Inspector
D. J. Luttman, QC Inspector
D. O'Keefe, QC Inspector
P. Brown, QCI Trainee
S. Barger, QCI Inspector
J. Movatt, QC Inspector
B. Hargrove, QC Inspector
T. Dakin, QC Inspector
J. Tanner, QC Inspector
J. Heimpold, QC Inspector
W. Kitchen, QC Inspector
W. M. Sharp, QC Inspector
P. S. Wimbish, QC Inspector
E. J. Kwalick, QC Inspector
T. Smith, QC Inspector
W. Smith, QC Inspector
L. Ritchie, QC Inspector
S. Tult (NW), QA Engineer
G. Jodrey (NW), QC Inspector
E. Schroeder (NW), QC Inspector
R. Turner (NW), QC Manager
M. Ward (NW), QC Inspector
M.E. WHITE, QC INSPECTOR

REVISED

Butler Services, Inc.

J. L. Ramsey (NW), QC Inspector
W. R. Jackson (NW), QC Inspector
R. B. Price (NW), QC Inspector
B. E. Tyree (NW), QC Inspector
J. R. Booth (NW), QC Inspector
~~M. E. White, QC Inspector~~

**NW indicates no longer working for that company.

Nuclear Energy Services, Inc.

R. Baker, QC Inspector Supervisor
J. B. Sullivan, QC Inspector
V. Ferretti, QC Engineer
L. Ludwig, QA Manager
L. Anderson, QC Engineer

Peabody Magnaflux, Inc.

E. Aldredge, President
C. Wood (NW), PM Office Manager
A. Sellars (NW), PM Radiographer
S. Binning (NW), PM Radiographer
D. Hang (NW), PM Radiographer
D. Binning, PM Radiographer

REVISED

Yob Security

J. Caplinger (NW), Sec. Guard Supervisor
J. Bice (NW), Security Officer
W. Ross (NW), Lead Security Officer
D. Simpson (NW), Security Officer
J. Hyde (NW), Security Officer
R. Wright (NW), Security Officer

W&W Protection Agency, Inc.

D. Shinkle, Security Officer
J. Bedinghaus (NW), Security [redacted] OFFICER
N. C. Ward, President

Sargent & Lundy

R. Pruski, Engineer
T. McKenna, Engineer
D. Fox

U.S. Testing

J. Ruiz (NW), QC Inspector
C. Sheridan

General Electric Company

T. F. Van Natta, Site Control & Instrument Engineer
T. E. Bloom

Westinghouse, Inc.

Y. Reiter, Radiation Chem. Tech.

Confidential Service

M. W. Cox, Director
T. Applegate (NW), Private Investigator

Hartford Steam Boiler and Insurance Company

L. Burton, Authorized Nuclear Inspector

REVISED

Individuals

J. Woliver, Attorney At Law
A. Dennison, Attorney At Law
L. Seiler, Attorney At Law
Dr. J. Fankhauser, Professor, University of
E. Hofstadter, Former Huskey employee
Individuals A through I

2. Scope

This investigation focuses on allegations and concerns provided by Thomas Applegate, the Government Accountability Project of the Institute for Policy Studies, and former and present QC Inspectors. The report also documents those items independently observed by Region III personnel in the course of the investigation. The report is not intended to be all-inclusive since there are additional allegations that will be documented in subsequent reports on this investigation.

3. Background

In late 1979, while involved in an investigation for a client which was 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 his employer and Cincinnati Gas and Electric Company (owner of Zimmer), 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 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.

... START

In [redacted] 1980 Applegate contacted the NRC Office of Inspector and Auditor. Subsequently, on February 28, 1980, he 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 NRC jurisdiction. 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.

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. 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 problems and issues already investigated. (Some are the same affidavits as those presented at the Atomic Safety and Licensing Board Hearings.)

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.

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. QC Allegations

On November 18, 1980, an NRC inspector was contacted by an individual who identified himself as a former Quality Control (QC) Inspector at Zimmer. The individual alleged that there were irregularities in the welding QC program at Zimmer. On December 9, 1980, the individual was contacted by telephone by the NRC to obtain details of his allegations. During the conversation, he made the following allegations:

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 expansion of the initial allegation into the following areas:

1. The QA Manager was arbitrarily voiding NRs that were not written in error.

2. The QA Manager was diverting [redacted] REPORTS 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 because of their distrust of the system.]

4.1.2 ~~General Background~~ BACKGROUND INFORMATION

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 [redacted] REPORT and then contacts the Site Document Control (SDC) NR Controller who makes a entry in the NR Log and assigns a KEI Control Number (CN). The [redacted] REPORT is then reviewed by the Inspector's supervisor or cognizant QA Engineer and forwarded to the SDC NR Controller who issues [redacted] an NR Number prefixed with either and "E" or "N". NRs written on essential systems/components are given the "E" prefix and nonessential systems/components are given the "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 20 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 that 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, [redacted] Nuclear Energy Services, Inc., audited the Kaiser nonconformance reporting system for CG&E.

[redacted] Interviews

to EXHIBIT

[redacted] 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 as Exhibit 2.

[redacted] 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 [redacted] 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 that comment. Ludwig stated that he recommended Kaiser audit all 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.

[redacted] Interviews of Phillip Gittings

[redacted] January 13, 1981, Interview

On January 13, 1981, Phillip Gittings, Kaiser QA Manager, was interviewed by NRC. 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. at the request of Kaiser. He said Gladstone concluded that 4 of the 7 NRs were properly voided because the noted welds conformed with the AWS Code but that the other 3 NRs [redacted] minor discrepancies which 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.

[redacted] July 8, 1981, Interview

On July 8, 1981, Phillip Gittings was re-interviewed by NRC following the NRC investigation of the dispositions of a selected group of [redacted] 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 [redacted] and required it be entered into the Kaiser nonconformance reporting system. When questioned about his failure to issue [redacted] 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 [redacted]. He said his action on those [redacted] was contrary to the Kaiser procedure that only permitted an NR to be voided if it was "written in error." Gittings said those [redacted] 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 [redacted] (CN-4309) was not in the Kaiser nonconformance system and denied diverting that [redacted] 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," by transferring the nonconformances to "punch lists" (lists of items to be corrected by construction), and 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.]

to EXHIBIT

[redacted] 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 [redacted]. 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 [redacted] call for control numbers and [redacted] not subsequently send [redacted]. In these cases, Faubion said she makes the same "void" entry in the [redacted] Log.

She said that prior to December 1980, Floyd Oltz, Kaiser QA Engineer-Records, 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 [redacted] 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. [redacted] approximatley 500 NRs impounded had been identified during the audit of the NR system by Nuclear Energy Services, Inc. (NES). [redacted] findings described in Section [redacted] of this report.

Region III personnel reviewed all impounded NRs identified by NES and all [redacted] provided by individuals interviewed and determined that about 100 of them appeared to fit the alleged categories. Of those 100, [redacted] NRs were selected for intensive investigation into their disposition. The results of the investigations of the selected [redacted] are presented as individual investigation efforts, [redacted] EXHIBIT [redacted].

CONTINUED ON INSERT

to EXHIBIT

[redacted] (14) Disposition of [redacted] Report CN-5412

[redacted] 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 that 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 [redacted] (assigned CN-5412) which reported that a suppression pool [redacted] was being tensioned in violation

of an applied "hold" tag. The REPORT 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."

Investigation

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 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. 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 REPORT 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 REPORT 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 REPORT

Dumford indicated that Dennis Donovan called the NR clerk a few days later and was told CN-5412 had been reassigned to another REPORT (the original report had not been entered into the NR system). Dumford provided a copy of the original REPORT CN-5412, which is included as Exhibit 2.

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 as Exhibit 3.

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

DOCUMENTING A HEAT NUMBER FOR A WASHER ON A BOLT FOR A SUPPRESSION

HE RECALLED I AM OUTSTANDING SURVEILLANCE REPORT DOCUMENTING THAT THE BOLT WAS NO PERPINDICULA

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 [redacted] was forwarded directly to Inspection Supervisor Rex Baker for review. REPORT

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 REPORT [redacted]. 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 as Exhibit [redacted].

[redacted] 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 REPORT tag. Shinkle said he also learned that a second [redacted] was written by Dumford for violation of the hold tag which he initialed and forwarded to Rex Baker, Inspection Supervisor. HAD

Shinkle stated he later that learned Phillip Gittings, after discussions with Dumford, Donovan, and Baker, did not enter the [redacted] 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 [redacted], a copy of which is included as Exhibit [redacted].

[redacted] 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 [redacted] 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 [redacted] and that it was in Gittings' possession the last time he saw it.

[redacted] 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 [redacted] column in the NR Log and the Specification column showed evidence that "white-out" was used to cover previous entries in the log. [redacted]

[redacted] 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.

(6) [redacted] Disposition of Nonconformance Report E-5108

[redacted] 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 was found" that established material traceability for the pipe piece. [redacted]

[redacted] Investigation

[redacted] 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 that 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 was 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. [redacted]. On MARCH 25, 1981, Reiter provided a written sworn statement [redacted], a copy of which is also included as Exhibit [redacted].

[redacted] 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 relevant 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

[redacted] 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.

(11)

[redacted] Disposition of [redacted] Report CN-4309

[redacted] Background Information

On January 7, 1980, QC Inspector Michael McCoy obtained [redacted] 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 [redacted] that parts to be fillet welded were not as close as practical (as required), but were separated by more than 3/16 in. [redacted]

[redacted] Investigation

[redacted] 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 [redacted] 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 number CN-4309 from the NR Controller. He said that after he wrote the [redacted] it was returned to him without disposition. McCoy stated that in addition to voiding this [redacted], 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 sworn statement [redacted], a copy of which is included as Exhibit [redacted].

[redacted] 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. [redacted]

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. [redacted]

[redacted] Findings and Conclusions

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

[redacted] Disposition of [redacted] Reports CN-4955 through 4959, CN-4930, and CN-4931

[redacted] Background Information

On July 9 and 22, 1980, [redacted] assigned CNs 4955 through 4959, 4930 and 4931 were written by inspectors Joseph Mills and G. McCann. The [redacted] identified weld deficiencies on pipe supports in Diesel Generator (DG) Room A. The 7 [redacted] had been assigned CNs but no NR number. [redacted]

[redacted] Investigation

[redacted] 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 [redacted] that were assigned CNs 4955 to 4959. He said his supervisor, Rex Baker, concurred the [redacted] 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 [redacted] 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 [redacted] 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 [redacted] to correct the nonconforming conditions. He said, however, this was not done via the Kaiser NR system since the original [redacted] and all copies had been returned unprocessed.

On June 2, 1981, Joseph Mills provided a written statement [redacted] a copy of which is included as Exhibit [redacted].

[redacted] 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 [redacted] 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 [redacted] 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 [redacted] 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 [redacted] 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 CN-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. [redacted].

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 [redacted] were voided but were not retained in Kaiser files; however, copies of the reports had apparently been returned to the inspector.

(2) ~~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% reinspection 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." [redacted].

[redacted] Investigation

[redacted] 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 documented in IE Inspection Report 50-358/80-05, Paragraph 6. This is an unresolved item pending completion of that review (358/81-13-).]

[redacted] Record Reviews

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 those 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.

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. [redacted].

[redacted] 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

AND SOME OF THE [illegible] WERE STILL IN A NONCONFORMING CONDITION, INCLUDING VENDOR WELDS.

other NRs) for the voiding was not fully implemented. It was also established that vendor welds were omitted from the NR without engineering justification.

(7) [redacted] Disposition of Nonconformance Report E-2836

[redacted] 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 the KEI-1 form entry 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. [redacted].

[redacted] Investigation

[redacted] 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.

[redacted] 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.

[redacted] 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.

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)

[redacted] Findings and Conclusions

Based on record reviews, interviews of personnel, and examination of the radiographic film for Weld WS737, it was established 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.

(3) Disposition of Nonconformance Report E-1777

Background Information

On April 3, 1979, Inspector Terry Dakin wrote NR E-1777 stating that weld 195A2 (isometeric Drawing RI-195) on a SOCKET WELD [redacted] 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 (also referred to weld rod slip, and KEI-2 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." [redacted].

Investigation

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 4 hangers and 6 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.

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, AND COULD NOT EXPLAIN HIS VOIDING OF THIS NR.

Record Reviews

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

NR E-1777
Isometric Drawing No. N4713 RI-195 (Reactor Isolation System).
KEI-2 forms 111515, 139801, 126964, 126963, 126960, 174535, and 174534

[redacted] 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.

(9) [redacted] Disposition of [redacted] Report CN-5122

[redacted] Background Information

On October 16, 1980, Kaiser QC Inspector Mark Priebe wrote [redacted] 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 [redacted] 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 [redacted] the [redacted]. [redacted].

[redacted] Investigation

[redacted] 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 [redacted] 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 [redacted] was not written in error, as he identified the same problem at the same locations identified by Priebe.

[redacted] 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 [redacted] 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. [redacted].

[redacted] Findings and Conclusions

Based on record reviews, interviews of personnel, and field observations, it was established that [redacted] CN-5122 was improperly voided. The SR used to initiate the [redacted] was apparently used later as justification to void the [redacted]. These [redacted] 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. Apparently [redacted] CN-5196 was dispositioned in the same manner.

[redacted] Disposition of Nonconformance Report E-2233

[redacted] 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 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, 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. [redacted].

[redacted] Investigation

[redacted] Record Reviews

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.]

[redacted] 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

TO EXHIBIT

hold points were deleted by a document reviewer who did not provide engineering justification.

(10) [redacted] Disposition of [redacted] Report NRC-0001

[redacted] Background Information

On February 11, 1981, QC Inspector James Ruiz initiated an [redacted] (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 [redacted] was not assigned a CN or NR number. The [redacted] had a comment written in the "Disposition" section stating it was "sent back with no reply." This [redacted] was provided to NRC by Inspector Ruiz. [redacted]

[redacted] Investigation

[redacted] 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 [redacted] 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 [redacted] 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 as Exhibit [redacted].

[redacted] 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.

[redacted] 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.

TO EXHIBIT

RIII personnel reviewed the NR Log and all Kaiser NRs initiated between February 11 and February 20, 1981. The [redacted] 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.

[redacted] Findings and Conclusions

REPORT

Based on record reviews, interviews of personnel, and field observations, it was established that [redacted] 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 [redacted] was confirmed. The weld is not necessarily defective; however, it did exceed specifications as stated by Ruiz. [redacted]

(1) [redacted] Disposition of Nonconformance Report E-1661 and E-1662

[redacted] Background Information

On February 8, 1979, Kaiser QC Inspector David Painter initiated NRs E-1661 and E-1662 identifying nonconforming welds on pipe support hangers in the drywell pneumatic system. Both of the NRs 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. [redacted]

[redacted] Investigation

[redacted] 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.

[redacted]

TO EXHIBIT

~~4.1.14.2.2~~ Record Reviews

RIII personnel reviewed the following records related to the disposition 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 established that NRs E-1661 and E-1662 were improperly voided because the [redacted] (reinspection after design analysis) for the voiding was not fully implemented. JUSTIFICATION

(8)

~~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. [redacted]

~~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).

~~4.1.15.2.3~~ 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.

Region III personnel reviewed the following records related to the disposition 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 [redacted] Report CN-4389

~~4.1.16.1~~ Background Information

On January 3, 1980, D. J. Luttmann, Kaiser QC Inspector, initiated a 33-page [redacted] that was assigned CN-4389. This [redacted] reported various nonconforming conditions in electrical cable, trays, and hangers in the Auxillary Building. The [redacted] 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 [redacted] 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 [redacted] 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 as Exhibit 8.~~

~~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 [redacted] 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 [redacted] 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 [redacted] had been placed in the Inspection Report file.

~~4.1.16.2.2~~ Record Reviews

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

[redacted] CN-4389, dated January 23, 1980.
Kaiser Procedure QACMI G-4, Revision 7, dated April 7, 1980.

TO EXHIBIT

~~4.1.16.2~~ Findings and Conclusions

~~Based on record review and interview of personnel it was established that there was insufficient reason to justify the voiding of~~ CN-4389 REPORT

(4) ~~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 as Exhibit~~ .

~~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 as Exhibit .

~~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

TO EXHIBIT

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 he 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 (NRC E) and accompanying weld rod issue forms (KEI-2) are included as Exhibit 38.~~

~~4.1.17.3~~ Findings and Conclusions VOIDED

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 nonQA document, was used to disposition a QA document (NR).~~

(13) Disposition of [redacted] Reports CN-5476, CN-5477, CN-5479

Background Information

On February 23, 1981, Inspector James Ruiz initiated three [redacted], numbered CN-5476, CN-5477, and CN-5479, reporting nonconforming conditions on drywell support steel in the Primary Containment Building. Ruiz stated that Welds 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 3 welds lacked documentation for the backing strips, filler metal, welder qualifications, or welding procedure. The NR Log shows that [redacted] CN-5477 to CN-5479 were voided with the notation "Void-NR not issued" on February 27, 1981. Copies of these [redacted] were not retained in the Kaiser SDC files. [redacted]

Investigation

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 [redacted] 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 sworn statement [redacted] a copy of which is included as Exhibit [redacted].

Interview of Dennis Donovan

On June 10, 1981, Dennis Donovan, Kaiser QC Inspector, was interviewed by NRC. He stated that he had reviewed [redacted] CN-5476, CN-5477, and CN-5479 and concurred with them. Donovan stated that Ruiz erred in his identification of one deficiency on these [redacted], 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.

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 [redacted] 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 [redacted] with the comment "Void NR not issued." He stated he voided these [redacted] 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 [redacted] on Gittings' instructions and gave Gittings the original copies of all 4 [redacted]

~~4.1.10.2.4~~ 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 [redacted] CN-5476, CN-5477, and CN-5479.

Shinkle stated he reviewed these [redacted] 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 [redacted] 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 [redacted]. 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 [redacted]s Ruiz had written.

Shinkle stated that to the best of his knowledge the [redacted] 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 suppression 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 [redacted] CN-5476, CN-5477, and CN-5479 and stated DDC-712 addressed Item 1 on those [redacted] concerning a failure to nondestructively examine these welds. He said, however, the DDC did not waive other nonconforming conditions identified on the [redacted], 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 [redacted] 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 [redacted] if it had been voided by Kaiser.

to EXHIBIT

~~4.1.16.2.6~~ Record Reviews

On June 6, 1981, Regina Rudd, Kaiser NR Controller, was contacted and asked to retrieve [redacted] 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, [redacted] 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 as EXHIBIT 89.~~

~~4.1.16.3~~ Findings and Conclusions

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

[redacted] Summary Findings and Conclusions

All of the allegations made by the QC inspectors were found to be correct. It was found there were widespread irregularities in the system. Kaiser procedures permit voiding of an 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 and March 31, 1981, including those that were actually superseded 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 as Exhibit [redacted].~~ The dispositions of a selected group of [redacted] reports, either voided or alleged not to be in the reporting system, were reviewed and it was found that [redacted] 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, [redacted] which ~~the licensee and the Kaiser [redacted]~~. It was also established that, following the NRC inspection, the Kaiser QA Manager had on three occasions not entered [redacted] (CN-4309, NRC-0001, CN-5412) into the Kaiser nonconformance reporting system.

This investigation also disclosed that an NR was improperly dispositioned as "accept as is" when "rework" was appropriate [redacted], ~~"accept as is" dispositions [redacted]~~ ASME Code requirements.

~~A~~ NR [redacted] that identified multiple nonconforming conditions [redacted] was 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 1988 NRC inspection.

This widespread problem of improper handling of NRs is addressed in the licensee's Quality Confirmation Program.

4.1.5 Items of Noncompliance

One item of noncompliance was identified (failure to process nonconforming items in accordance with documented procedures).

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 M-12, "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.
> 5/8" Ø and larger - 3/16" larger than nominal bolt Ø.
>
> [Ø is symbol used for bolt hole diameter]
>
> "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 all bolt holes were being inspected and that the procedure was being revised to require inspection of all bolt holes. The licensee's past inspection program for examining bolt holes was consistent with the sample size used in IE Bulletin 79-02, "Pipe Support Base Plate Designs Using Concrete Expansion Anchor Bolts."

4.2.2.2 FSAR Requirements

The Zimmer FSAR, Table 3.8.2, commits to ANSI N45.2.5-1972 (Draft), "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 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 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.

This is an unresloved item and will be reviewed during a subsequent inspection (50-358/81-13-).

4.2.4 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 consistent with IE Bulletin 79.02, "Pipe Support Base Plant Designs Using Concrete Expansion Anchor Bolts." The licensee is currently inspecting all bolt holes.

4.2.5 Items of Noncompliance

No items of noncompliance were identified.

4.3 ASME Code Data Package Discrepancies

4.3.1 Allegation

It was alleged that during system turnover, Quality Assurance Engineers, (QAEs) Wood and David Fox were reviewing documentation in ASME Code Data

(CG&E) (S+L)

packages and identifying numerous discrepancies in these packages, which were being recorded on exception lists instead of nonconformance reports. The alleger questioned whether it was acceptable to document discrepancies on exception lists. He also said the QAEs were being criticized for identifying too many discrepancies during their reviews.

4.3.2 Background Information

The licensee is required by the ASME Code to maintain certain records which are evidence that the Quality Assurance Department has inspected materials, components, and processes (welding and nondestructive examination) to ensure systems are constructed in accordance with accepted industry standards. The documentation packages are filed and retained in the Kaiser Site Document Control (SDC) Center and are turned over to the licensee when a system is completely installed and ready for preoperational testing. Prior to system turnover, these packages are reviewed for accuracy and completeness by QAEs who verify that the packages are complete.

4.3.3 Investigation

4.3.3.1 Interview of David Fox

On January 14, 1981, David Fox, Sargent & Lundy (S&L), was interviewed by NRC. He stated that from January to December 1980 he was employed by S&L and subcontracted to CG&E to review ASME Code Data packages. Fox stated he identified discrepancies in these packages and recorded them on exception lists which were forwarded to Floyd Oltz, SDC. Oltz would attempt to rectify the problem. If this was not possible, he would initiate a nonconformance report for the deficiency. Fox stated that some common deficiencies he identified during his reviews were a lack of mill certifications for steel used in the various systems, missing valve data reports, and that QC inspectors had not properly filled out the inspection reports in the packages. Fox stated he heard rumors that Phillip Gittings, QA Manager, said he was being too "nit-picking" during his reviews of the Code Data packages. Fox stated that at one time he made up a list of the common problems he found during the reviews and forwarded them to Floyd Oltz and Phillip Gittings and suggested they give QC Inspectors additional training in the area of inspection documentation. Fox stated he later discussed the matter with Gene Knox, Kaiser Corporate Quality Assurance Manager, who advised him that the requested classes would be given.

4.3.3.2 Interview of Phillip Gittings

On February 16, 1981, Phillip Gittings, Kaiser QA Manager, was interviewed by NRC. He said two KEI QAEs are involved in the Kaiser review of ASME Code Data packages. Gittings identified these individuals as Individual H and Individual E.

4.3.3.3. Interview of Individual H

On February 20, 1981, Individual H, Kaiser QC Engineer, was interviewed by NRC. He stated he had been employed at Zimmer since December 29, 1980. Individual H stated he is responsible for reviewing ASME Code Data packages

for the diesel generator, diesel oil, and main steam rooms. He said while reviewing the packages he ensures that the documentation in the package is complete, accurate, and that the inspection data on the isometric drawings and accompanying weld data forms have been properly filled out by Kaiser QC Inspectors. Individual H stated during these reviews he noted that heat numbers certifying pipes as nuclear grade steel on weld data records do not match the heat numbers listed on the isometric drawings. Also, heat numbers listed on the isometric drawings, when checked with certified material test reports, are not for the material that, according to the drawing, was supposedly installed.

Individual H stated that some heat numbers on the isometric drawings had been changed, crossed out, or "whited out" without justification for the changes. Also, there was no evidence that these changes were verified by QC personnel in the field, and he had no assurance that changed numbers on the records actually represent what is installed in the plant. Individual H stated he has found similar unexplained changes in the records when reviewing weld data and weld rod issue forms and other documentation in the packages.

On February 20, 1981, Individual H provided a written sworn statement ~~attesting to the preceding information~~ a copy of which is included as Exhibit [redacted].

4.3.3.4 Interview of Individual E

On February 20, 1981, Individual E, Kaiser QC Engineer, was interviewed by NRC. He stated he has been employed at Zimmer since December 22, 1980. Individual E stated he reviews ASME Code Data packages for the main steam, diesel generator, residual heat removal and low pressure core spray system. He stated he ensures that the data on isometric drawings, weld rod issue forms, and other inprocess QC inspection documentation is properly recorded in the packages. He has noted during his reviews that heat numbers on the isometric drawings certifying pipes as nuclear grade steel do not match the heat numbers for the same pipe listed on the weld data record. Individual E stated the weld records are what the QC inspectors verified as being installed during their field inspections, yet the isometric drawing reflects other heat numbers for the same pipe. Individual E said he attempted to resolve these contradictions and found when he reviewed certified material test reports that the heat numbers for the pipe on the drawings were not for the same type of material that was installed in the system. Individual E attributed this to Kaiser's failure to follow proper procedures for the documentation of both in-process and final inspections. This has resulted in a loss of material traceability from many areas of the plant.

Individual E said he has reported specific problems on exception lists that were forwarded to Floyd Oltz, Document Control Supervisor. Individual E stated Floyd Oltz improperly changes heat numbers on records without field verification or any engineering justification in order to disposition what he has reported on the exception lists. Individual E cited an example where he reported that, contrary to the ASME Code, Kaiser QC Inspectors had not verified the 1/16 in. fitup gap on small-bore stainless steel instrument lines during most of their in-process inspections. This gap ensures that the weld does not crack when the pipe and weld cool. Individual E stated that there

are over 1,000 socket welds where this gap was unverified, yet Kaiser resolved this problem by testing a sample of 20 welds when ASME Code requires a 100% verification of socket weld fitup.

Individual E stated he has no faith in the accuracy of records at Zimmer and would not approve any of the systems he has reviewed to date because the documentation does not meet industry codes and standards.

On February 20, 1981, Individual E provided a written sworn statement attesting to the preceding information, a copy of which is included as Exhibit [redacted].

4.3.3.5 Interview of Leonard Wood

On August 3, 1981, Leonard Wood, CG&E QA and Standards Engineer, was interviewed by NRC. He stated that from 1973 to 1981 he reviewed ASME Code Data packages for vendor components supplied to Zimmer. Wood said he occasionally noted that documentation was missing, material certifications were to the wrong specification, or required documentation had not been included in the packages. He said he contacted the vendors involved and was furnished the necessary documentation. Wood said he was not criticized for identifying these problems, and in most cases he resolved them on his own.

4.3.3.6 Record Reviews

A Region III inspector reviewed ASME Code Data packages for the diesel generator, cooling water, starting air, and fuel oil piping systems. These records indicated that a number of in-process QC inspections were not performed for proper pipe fitup, proper weld procedure, proper weld filler metal (traceability), and welder qualifications. These inspection criteria are required by 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). Also, Kaiser procedures outlined that these inspection criteria are to be entered on the weld data form (KEI-1 form). The inspector found the following:

1. Required inspections were not performed. This condition was documented in QA Surveillance Reports (SRs) 2367, 2370, 2380, and 2412, which identified 39 welds in the diesel generator subsystems in which the required in-process inspections were not performed.

   In addition, the licensee had a partial listing of over 400 socket welds (including welds other than the diesel generator system) where inspections for proper pipe fitup (cleanliness, mismatch, and socket engagement) was not performed. 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 Number SPPM 4.6 Rev. 8, paragraph 6.2.1 states: "All welds shall be inspected at the following stages: ...At fitup for cleanliness, mismatch, and minimum socket engagement. Socket welds shall have an approximate end-gap of 1/16 inch prior to welding for all sizes."

An SIS Report dated November 14, 1979, authored by the Authorized Nuclear Inspector (ANI) (Hartford Steam Boiler Inspection and Insurance Company) and the H. J. Kaiser response letter dated December 4, 1979, which responded to the audit, said an agreement was made that 20 of the unverified socket welds would be selected at random to be radiographed to verify proper fitup. One of the 39 welds identified on Surveillance Report Nos. 2367, 2370, 2380, and 2412 was chosen to be radiographed. No engineering justification was given to allow acceptance of all of the socket welds based on the sample of the 20 that were radiographed.

A second SIS Report from the ANI dated February 11, 1981 reported that additional welds were made after December 4, 1979 without verification of fitup. The ANI indicated that all the welds, for which the fitup was not verified after December 4, 1979, should be radiographed.

The Region III inspector found no engineering justification for acceptance of the 400 questioned socket welds based on a radiographic examination of only 20 of the socket welds. The licensee had not implemented in-process inspections to verify proper socket weld fitups during subsequent inspections. This reflects the licensee took inadequate corrective action.

2. Data packages for the diesel generator system indicated that there was final visual inspection of all applicable welds.

3. A review of KEI-1 forms (weld data records) indicated that personnel had transferred information written on KEI-2 forms (weld rod issue slips) to KEI-1 forms in order to justify weld rod traceability, date of welding, and welder qualifications. The KEI-2 form is a construction document used by the welders to obtain weld rods from the weld rod issue point. There is no QC significance for the KEI-2 form, yet QC inspectors and document reviewers were allowed to transfer weld rod heat numbers entered on the KEI-2 form by the storage personnel to the KEI-1 form (QC weld record). This can only be done at the time and place of the weld activity. Therefore, any information transferred from the KEI-2 form to any QC document after the time of or away from the weld activity would not be creditable QC verification.

   In addition, Region III inspectors noted a considerable number of discrepancies between the weld data records (KEI-1 forms) and the weld rod issue forms (KEI-2 forms). The records showed discrepancies between the heat numbers for the weld rod used, identification of the welder performing the particular weld, and dates the welds were made. It was found that document reviewers were resolving these discrepancies by altering 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. Alterations appeared to be arbitrary in that some of the documentation for welds within a certain line changed, but no changes were made for other welds of identical circumstances. The following are examples of the altered records:

a. Welder and Rod Heat Number (used for traceability) Changes

(1) Drawing M-479-3-DG-121 for line 1DGD9AB-1/2 contains weld records for Welds A-4 through A-21 which, according to QA Inspector No. 81, were made by welder KOE using weld rod Heat No. 065118 during March 1978. Additional weld rod issue forms (126508, 126509, 126510, 126511, 126884, 126885, and 126890) exist indicating that welder LFC, using weld rod Heat No. 77402, may have worked on Welds A-4 through A-21. Because of these weld rod issue forms, the Document Records personnel changed the QA records to include welder LFC and rod Heat No. 77402 on Welds A-4 through A-13, A-18, A-20, and A-21. No explanation was given why the records for Welds A-14 through A-17 and A-19 were not changed.

The RIII inspector verified that only the welder identification symbol, KOE, appears near the welds in question.

(2) Drawing M-479-3-DG-119 for line 1DG7AB-1/2 contains weld records for Welds A-4 through A-21 that, according to QA Inspector No. 81, were made by welder LJP during March 1978. Weld rod issue forms (KEI-2) 123346 and 119061, enclosed with the drawing, showed that welder LJP may have worked on Welds A-4 through A-6, A-8 through A-11, and A-15 through A-17. Weld rod issue form 119066 indicates that welder KOE may have worked on Welds A-4 through A-21. As a result of these KEI-2 forms, the Document Records personnel changed the QA records on January 29, 1981, for Welds A-6, A-7, A-13, A-14, and A18 through A-21 by crossing out the welder symbol LJP and the date March 29, 1978, and replacing them with the welder symbol KOE and date March 22, 1978, respectively. No explanation was given why the records for welds A-4, A-5, A-8 through A-12, and A-15 through A-17 were not changed.

The inspector verified that only welder identification symbol LJP appeared near all the welds.

(3) KEI-1 form for weld number 79DG on line 1DG37AA2-1/2 showed the heat number of the consumable insert used was 6059491. On January 26, 1981, 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 form 123099 could not be located.

The licensee was previously cited in IE Inspection Report 50-358/79-15 for transferring information from KEI QC inspector's notebooks to KEI-1 forms.

No apparent actions were taken to assure that the proper weld procedure was used on any of the unverified in-process weld activities.

b. Weld Date Changes

(1) The KEI-1 form, for Weld A-7 on line 1DG5AB-1/2, indicated the final weld inspection was performed by QA Inspector No. 81 on April 5, 1978. The date was crossed out and changed to April 6, 1978 on January 27, 1981 because weld rod issue form 118920 indicates welder LJP may have worked on A-7 on April 6, 1978.

(2) The KEI-1 form for Weld A-20 on line 1DGD2AB-1/2 indicated that final weld inspection was performed by QA Inspector No. 81 on April 10, 1978. The date was crossed out and changed to April 11, 1978 on January 27, 1981 because weld rod issue form 123834 indicates welder LPJ may have worked on A-20 on April 11, 1978.

Failure to take adequate corrective action when inspections for proper pipe fitup were identified as not having been performed; and failure to take adequate corrective action when information concerning weld filler metal traceability, welder identification, and welding dates was found to be missing from the weld data records or was questioned are contrary to 10 CFR 50, Appendix B, Criterion XVI, and the Wm. H. Zimmer QA Manual, Section 16.1 (50-358/81-13-).

These concerns are addressed in the licensee's Quality Confirmation Program.

4.3.3.7 Observations

The only data package (diesel generator system ASME Code Data package) that had passed all inspections and had received final acceptance approval by Kaiser Quality Assurance was reviewed by the inspector and many discrepancies were found. As a result, the inspector performed detailed field observations of the piping systems (i.e., cooling water, starting air, and fuel oil) for Diesel Generators A and C. Numerous discrepancies were identified during these observations as follows:

1. Piping--The traceability of some of the piping components was not maintained. Summaries of the discrepancies are as follows:

   a. Some heat numbers recorded on the isometric drawings did not match the heat numbers on the installed components. These piping components are listed in Table 4.3-1 to this report.

Table 4.3-1 Discrepancies Between Installed Piping and Tracability Records

Isometric Drawing No.	Line No.	Item in Question	Heat or Part Identification No. According to Dwg.	Heat or Part Identification No. Actually Installed
ISK M-428-6-DG-19	IDG28AB1	90° ells	M276	M267
		tee	M315	M274
		pipe	HE6247	8464

Table 4.3-1 (continued)

Isometric Drawing No.	Line No.	Item in Question	Heat or Part Identification No. According to Dwg.	Heat or Part Identification No. Actually Installed
ISK M-428-6-DG-103	1DG28AB1	flange	RVA	CB8
ISK 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	1DGF2AA1/2	90° ells	M395	M252
ISK M-428-6 DG-24	1DG28AE1	pipe	HD7123	TW24402
ISK M-428-6-DG-105	1DG28AE1	flange	RD2Y	CB8
ISK M-242-2-DG-53	1DGC5AA3/4	pipe	HA001	JE9922
		90° ell	M262	M87
	1DGF6AA1/2	pipe	HA001	HA0170
	1DGC5BA3/4	pipe	HA001	JE9922
		90° ell	M262	M87
	1DGF6BA1/2	pipe	HA001	HA0171
ISK M-428-6-DG-26	1DG25AC2	pipe	516405	502891 415007
		90° ell	M287	M273
ISK M-428-6-DG-27	1DG25AC2	pipe	516405	502891 415007

b. 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 in. and 1/2 in. installed piping. Based on the records for accepted heat numbers, number HA-001 represented 1 1/4 in. piping.

c. Three heat numbers (HA-0170, TW 24402, and 502891) found on the installed piping do not appear on the records of acceptable heat numbers.

d. 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.

Failure to maintain heat number identification for the above piping, and weld rod indicates a serious lack of control and is contrary to 10 CFR 50 Appendix A, Criterion VIII and the Wm. H. Zimmer QA Manual, Section 8. (50-358/81-13-07).

This concern is addressed in the licensee's Quality Confirmation Program.

4.3.4 Findings and Conclusions

As a result of the investigation of this allegation, significant quality assurance deficiencies over and above those alleged have been identified. It was determined that discrepancies in the documentation in ASME Code Date packages were being recorded on exception lists; however, this was permitted by licensee procedure and is acceptable to NRC. There was no evidence that criticism of Quality Assurance Engineers for identifying discrepancies adversely impacted their work.

Major discrepancies were identified in Quality Assurance records and the apparent improper modification of those records. This matter has been referred to the NRC Office of Inspector and Auditor for possible criminal consideration. Potential problems were identified related to adequacy of facility construction, such as material traceability and use of proper materials, proper socket weld fitup, proper weld procedure, and welder qualifications. These matters are being addressed in the licensee's Confirmation Program to determine the adequacy of plant construction.

4.3.5 Items of Noncompliance

Two items of noncompliance were identified (failure to maintain heat number traceability for piping and weld rod; and failure to take adequate corrective action for identified deficiencies involving (i) not verifying proper pipe fitup, and (ii) missing or questionable weld data record information regarding weld filler metal traceability, welder identification, and dates welds were made.)

4.4 Threatened Firing

4.4.1 Allegation

Robert Marshall, Kaiser Construction Superintendent, directed Phillip Gittings, Kaiser QA Manager, to fire Individual I (QC inspector) for using a magnifying glass to inspect a weld.

4.4.2 Background Information

CG&E retained Kaiser Engineers, Inc. (KEI), to construct the Zimmer plant. Kaiser maintains a Quality Assurance (QA) Department headed by the QA Manager and consisting of Quality Assurance Engineers (QAE) and Quality Control (QC) Inspectors. QC Inspectors perform field inspections of all safety-related components. Some QC Inspectors are employed by Kaiser and some by outside inspection firms that are retained to increase inspection manpower for a limited time in particular areas. During 1979 and 1980, Kaiser retained a number of contract inspectors (supplied by Butler Services, Inc.) to increase inspection manpower. In November 1980, all of the contract QC

inspector positions were terminated and some contractor employees were offered positions in the Kaiser QC organization.

4.4.3 Investigation

4.4.3.1 Interview of Rex Baker

On January 13 and March 3, 1981, Rex Baker, Kaiser Inspection Supervisor, was interviewed by NRC. He stated that in August or September 1980, the Kaiser QA Manager (Phillip Gittings) directed him to fire Individual I after Gittings had been told by Robert Marshall, Kaiser Construction Superintendent, that Individual I had used a magnifying glass to inspect a weld. Baker said he told Gittings that according to the American Welding Society (AWS) Code, Individual I could use a magnifying glass during his inspections and therefore there were no grounds to fire him. Later that day, Gittings told Baker to retain Individual I but to transfer him from pipe support hanger inspections to structural steel welding inspections. Baker said that Individual I was not threatened with firing for his failure to accept welds, but was reassigned due to his poor productivity and lack of completed inspections.

On January 13, 1981 Baker provided a sworn statement attesting to the preceding information, a copy of which is included as Exhibit .

4.4.3.2 Interview of Phillip Gittings

On January 13 and 15 and July 8, 1981, Phillip Gittings, Kaiser QA Manager, was interviewed by NRC. He stated that Scott Swain, CG&E Site Construction Manager, had told him he had seen Individual I inspecting a pipe support hanger with a magnifying glass. Gittings said he told Rex Baker that if Individual I had been using a magnifying glass he wanted him off the site immediately. Gittings indicated that Individual I later came to his office and told him he had not been using a magnifying glass to inspect welds, but had been using a mirror. Based on that information, Gittings said he rescinded the termination order.

Gittings stated that Swain and other construction personnel had given him "bad reports" on inspection activities of Individual I and his lack of completed inspections. He then directed Baker to transfer him from pipe support hanger inspection to structural welding inspection activities.

4.4.3.3 Interview of Robert Marshall

On January 15, 1981, Robert Marshall, Kaiser Construction Superintendent, was interviewed by NRC. He stated that in the summer of 1980 QC inspectors performed visual AWS weld inspections, rejected 95% of the welds on pipe support hangers, and initiated more than fifty nonconformance reports documenting nonconforming hanger welds. He said that he and Scott Swain, CG&E Site Construction Manager, were touring the plant discussing this problem when they observed Individual I inspecting a weld with a mirror, flashlight, and pick.

Marshall indicated that later that day Swain told Gittings that an inspector was using a magnifying glass to look at a weld. Gittings responded that he would fire the inspector. Marshall stated emphatically that he did not direct Gittings to fire Individual I, and later they both concurred that firing the inspector was too drastic an action to take.

4.4.3.4 Interview of Scott Swain

On January 15, 1981, Scott Swain, CG&E Site Construction Manager, was interviewed. He stated that in November 1980, he and Robert Marshall were touring the diesel generator rooms and observed Individual I inspecting a pipe support hanger weld with a flashlight, pick, and another tool. Swain said Marshall identified this tool to him as a magnifying glass. During a meeting concerning the high rejection rates on visual inspections of pipe support hanger welds, Swain mentioned this to those present. Gittings responded that he would fire the inspector involved if he found the inspector was using a magnifying glass to visually inspect a weld. Swain stated he later learned the tool was a mirror, and that Gittings was not going to fire the inspector involved.

4.4.3.5 Interview of Individual I

On February 20, 1981, Individual I, former Butler Services, Inc., QC Inspector, was interviewed by NRC. He stated he was employed at Zimmer from October 8, 1979 to December 1980. He stated that he was performing a pipe support hanger weld inspection in the diesel generator room in November 1980 when he noticed that Robert Marshall and Scott Swain were observing his inspections. At one point, they looked at the tools he had with him. Shortly afterwards, Individual I was called into Rex Baker's office and Baker said Phillip Gittings had been told by Marshall and Swain that he was using a magnifying glass to inspect a weld.

Individual I said Baker also related that Gittings had been asked by Marshall to terminate the inspector. He indicated he later met with Gittings and was again told that Marshall had seen him using a magnifying glass to inspect a weld and wanted him off the site. Individual I stated he later met with Baker and explained he did not have a magnifying glass with him when observed and that the tool Marshall had seen was a mirror. He also added that, even if he had been using a magnifying glass, both the AWS Code D1.1, Section 6.5.5, and Kaiser Procedure SPPM 4.6 ,(Revision 8 recognized and approved the use of a magnifying glass for weld inspection.

Individual I stated that he demanded Baker and Gittings document the reason for his proposed termination and he advised Baker he would consult with his attorney and fight the termination.

Individual I provided a sworn statement attesting to the preceding informa-tion, a copy of which is included as Exhibit [redacted].

4.4.3.7 Interview of Jesse Ruiz

On February 18 and 20, 1981, Jesse Ruiz, former Kaiser QC Inspector, was interviewed by NRC. He stated that QC Inspectors at Zimmer were being

harrassed and intimidated by Kaiser construction personnel. Ruiz said that his brother, James Ruiz, had been threatened with the loss of his job for allegedly using a magnifying glass to inspect a weld when he was actually using a mirror, a common weld inspection tool.

On February 20, 1981, Ruiz provided a sworn statement ~~attesting to the pre-coding information~~, a copy of which is included as Exhibit ●.

4.4.4 Findings and Conclusions

A QC Inspector was threatened with dismissal by the QA Manager after the Construction Superintendent advised him (incorrectly) that the QC Inspector used a magnifying glass to visually inspect weld surfaces. The QC Inspector protested the planned dismissal and was not dismissed; however, he was re-assigned to another area of inspection. FURTHER, TWO ADDITIONAL QC INSPECTORS WERE THREATENED WITH TERMINATIONS BY KAISER PERSONNEL FOR BEING TOO CRITICAL. NEITHER WAS DISMISSED ALTHOUGH ONE WAS ~~REINSTATED~~ REASSIGNED.

4.4.5 Items of Noncompliance

No items of noncompliance were identified.

5. Applegate/GAP Allegations

On January 5, 1981, the Government Accountability Project (GAP) requested an investigation into the conduct of an earlier RIII investigation of concerns provided by Thomas Applegate. In addition to this request, they provided a list of nineteen allegations, some of which appeared to contain information known to NRC, and some of which were new information. A commitment was made to review the nineteen allegations even if they appeared to pertain to known situations.

To clarify the allegations provided, a meeting was held between Applegate, Thomas Devine (GAP representative), and RIII personnel on February 26, 1981. The meeting was recorded, and a transcript was produced.

Some of the allegations provided concern issues that do not fall under the jurisdiction of the NRC, and have been brought to the attention of the appropriate agencies for action as they consider appropriate. Other allegations were provided during this meeting and in correspondence from GAP, some of which are not addressed in this report but will be reviewed and documented in subsequent reports. A review of outstanding allegations indicates that their investigation would not change the conclusions reached in this report.

In a letter dated July 22, 1981, GAP responded to an RIII request to identify specific systems or equipment their sources believed to be deficient. Their response included many plant systems and was not acceptably specific.

5.1 Unsuitable Piping Installation

5.1.1 Allegation

"KEI knowingly installed and ripped out unsuitable main steam relief piping, at an estimated labor cost of $320,000."

5.1.2 Background Information

The Zimmer facility uses a General Electric boiling water reactor (BWR) Mark II containment system design, which includes a pressure suppression pool in the lower levels of the containment building. Based on actual Mark I operating experiences related to safety relief valve actuations and large-scale testing of the more recently designed Mark III containment design system, new suppression pool hydrodynamic loads associated with postulated loss-of-coolant accidents (LOCA) were identified that had not been explicitly considered in the original design of the Mark II containment system. These newly identified loads result from the dynamic effects of drywell air and steam being rapidly forced into the suppression pool during a postulated LOCA or safety relief valve actuation. When this possible problem was first identified, General Electric and NRC and its consultants performed an in-depth review of the General Electric Mark II containment system design. Utilities owning facilities that would use the Mark II containment system also formed an owners' group to share calculations, evaluations, and acceptable modifications to the Mark II containments.

The NRC effort in reviewing the new dynamic loads was divided into two programs: a short-term evaluation program for the lead plants (Zimmer, La Salle, Shoreham), and a long-term program for final detailed evaluation of the adequacy of modifications. The description of the NRC evaluation is available in NUREG-0487, "Mark II Containment Lead Plant Program Load Evaluation and Acceptance Criteria," published in November 1978.* This document indicates that the lead plants, those first to use the Mark II containment system, would be reviewed by NRC to determine the acceptability of modifications made in their design to accommodate the identified loads. NUREG-0474, "A Technical Up-Date on Pressure Suppression Type Containments in Use in U.S. Light Water Reactor Nuclear Power Plants," issued in July 1978,* details the ongoing NRC monitoring of the modification and analysis program. NUREG-0371, "Task Action Plans for Generic Activities (Category A)," issued in November 1978,* identifies review of the Mark II pressure suppression containment as Generic Task A-8. NUREG-0510, "Identification of Unresolved Safety Issues Relating to Nuclear Power Plants, Report to Congress," issued in January 1979,* identifies two generic tasks as being related to the analysis of suppression pool dynamic loads and safety relief valve loads/temperature limits for BWR containments.

In the lead plant program load evaluation, NRC approved the design basis used for modifications to the suppression pool system, including a device known as a "T quencher" as part of the safety relief system, and additional equipment, such as base and wall plates, to support these new installations.

NRC does not have regulatory jurisdiction over the construction costs of a nuclear power plant.

*These documents are available for inspection at NRC public document rooms or for purchase from the NRC/GPO sales program, Washington, DC 20555.

5.1.3 Investigation

5.1.3.1 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 Kaiser had installed a large portion of the main steam relief (MSR) piping, knowing that sections of it would later have to be removed. He recalled that 2 years after its installation Kaiser removed large sections of the piping at and below the 525-ft level of the reactor containment building but left the pipe sections above that level in place.

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.

5.1.3.2 Interview of Individuals B and C

BY GAP PERSONNEL

On April 14 and 16, 1981, Individuals B and C, identified as having provided information regarding this allegation to representatives of GAP, were interviewed by NRC. They both stated that they had no information concerning this allegation.

5.1.3.3 Interview of H. C. Brinkman

During the period of February 9-13 and 23-27, 1981, discussions with H. C. Brinkman, CG&E Principal Mechanical Engineer, indicated that experimentation had revealed the need to redesign the relief system based on newly identified discharge loads. Therefore, several utilities, including CG&E, decided on a modification to replace the already installed "rams head" safety relief valve (SRV) discharge devices with "quenchers."

In 1975, CG&E decided to start designing the quencher modification, knowing that part of the piping to be installed would later have to be removed due to the identification of new discharge loads. The basis for the decision was that approximately 90 to 97% of the original quencher modification would likely be acceptable and therefore only 3 to 10% would be subject to rework. CG&E concluded that it would be less costly to proceed with installation activities rather than delay the construction schedule until the quencher modification design was complete. To date, the modification installation is not complete.

5.1.3.4 Record Review and Onsite Observations

The MSR modification has required (in part) the replacement of 10-in. Schedule 40 pipe with other 10-in. Schedule 40 pipe of different geometric configuration, 10-in. extra-strong pipe, and 12-in. extra-strong pipe (thicker walled pipe).

During this investigation, the licensee provided cost figures for the modification to date, which exceeded the alleged amount. NRC made no attempt to corroborate the licensee's claim that it was cheaper to proceed with an installation known to require rework before installation actually took place.

AN
RIII inspector reviewed all revisions to the KEI isometric drawing PSK-1MS, Sheets 21 and 21A, that were pertinent to the quencher modification of the main steam relief piping. The revisions identified the following changes:

Rev. No.	Implemented Change	Date
Rev. 0	Redrawn--original configuration replaced	9/8/76
Rev. 1	Hangers added	3/31/77
Rev. 2	Eight lugs added	1/10/78
Rev. 3	Hanger changed	5/5/78
Rev. 4	New spool pieces added, welds MS212 and MS195 voided per S&L	4/3/79
Rev. 5	Piping tee section added	6/18/79
Rev. 6	Weld MS160 and a 4-in. dimension added	10/1/79
Rev. 7	Field-marked (redline) updates added	1/9/80
Rev. 8	Welds K-461 and K-463 changed; weld K-592 changed to K-593 per NR-2499; hanger detail section D-D added	8/27/80
Rev. 9	Weld K-592 changed to K-461; weld K-593 changed to K-594	9/4/80

AN
RIII inspector reviewed the QC documentation for the following main steam relief piping field welds: 160, 160A, 267A, 267B, 267C, 267D, 268B, 268C, 459, 460, and 461. The records showed that the welds had been accomplished in accordance with the appropriate code (ASME Section III 1971, with Summer 1973 Addenda).

AN
RIII inspector interpreted the radiographs for the following main steam relief piping field welds: 160A, 459, 460, 461, 462, and 594. There were approximately five to seven radiographs for each of these welds. Varying numbers of radiographs were necessary to cover the entire 360 degrees of each pipe weld. The radiography was performed in accordance with the appropriate code (ASME Section III 1971, with Summer 1973 Addenda). The RIII inspector identified no unacceptable weld indications on the radiographs.

5.1.4 Findings and Conclusions

The quencher modification to the main steam relief system was being made with the knowledge of NRC. CG&E personnel stated they made an economic decision to install piping for the main steam relief system quencher modification with the knowledge that approximately 3 to 10% would have to be removed due to continuing identification of changes in design loads. Because NRC does not have regulatory jurisdiction over construction costs, no attempt was made to determine the estimated labor cost for the portion of pipe that was installed and removed. The safety importance of this allegation is limited to whether the main steam relief piping is installed properly.

RIII has concluded that the modification is being properly installed and tested, except for the improper voiding of one NR as discussed in Section 4.1 of this report.

5.1.5 Items of Noncompliance

No items of noncompliance were identified.

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.

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 will be followed up in a subsequent inspection (50-358/81-13-).

Individual F repeatedly stated that it had been three years since he had been at Zimmer and that he could not remember further specifics.

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 had 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 0 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 5.2-1):

Table 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	
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

*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.

Table 5.2-1. Hydraulic Actuator Data (continued)

Components	Sargent & Lundy Piping and Instrumentation Drawings	Kaiser Engineers Isometric Drawings
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
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	
**The disposition to FDDR No. KN-1-299 was applied to both drain lines #1RR39AC and #1RR40AC.		
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
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 drawing M-464-4RR-257 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 5.2-2):

Table 5.2-2 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
1RR40AC*	100	150	200
1RR40AD	2200	3000	3000
1RR40AA	2200	3000	3000
1RR40AB	2200	3000	3000

*These were the drain lines affected by FDDR No. KN-1-299.

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:

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-).

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 5.2-3):

Table 5.2-3 Hydrostatic Test Results

Line No.	Test Pressure (psig) 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
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
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 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 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 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 ~~according 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.

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 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 for plant operation (50-358/81-13-).

5.3.5 Items of Noncompliance

No items of noncompliance were identified.

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.

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).

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 RIII by telephone on August 13, 1981, that the licensee's review of all timecards for the dates in question showed the appropriate weld rod clerks were working on the days in question. He indicated the NRC did not review all of the timecards. This is considered to be an unresolved item and will be reviewed during a subsequent inspection (358/81-13-).

In addition, RIII inspectors on numerous occasions have observed weld rods lying uncontrolled in the construction area.

The concerns regarding the physical control of weld RODS identified during the investigation of this allegation are addressed in the licensee's Quality Confirmation Program.

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.

5.5.5 Items of Noncompliance

No new items of noncompliance were identified.

5.6 Argon Gas Exposure

5.6.1 Allegation

"Argon gas valves for flushing oxygen from pipes routinely are left open by the day crew, causing the night crew to be overcome by gas, a problem about which CG&E Safety Director Cummings expressed disinterest."

In an affidavit provided to GAP by a pipefitter (Individual A) formerly employed at Zimmer, it was alleged that workers on the day shift routinely crimped and wired argon gas hoses shut rather than closing the gas valves at the source upon leaving work. The pipefitter stated that this practice resulted in argon gas leaking from the hoses and caused the workers on the night shift to suffer from dizziness. The pipefitter further stated he advised former Kaiser Safety Director Larry Cummings of his concerns and that Cummings indicated he was not interested, because argon gas would not hurt anyone.

On February 26, 1981 during a meeting between NRC Region III personnel, a GAP representative, and Thomas Applegate, Applegate alleged that he received information from James Bedinghaus indicating that, in late fall or early winter 1980, his son, John Bedinghaus, had been overcome by argon gas while conducting fire watch rounds in the area of the containment vessel.

5.6.2 Background Information

Argon gas is a "shielding gas" used to purge or displace the oxygen inside pipes in certain welding procedures, to prevent the metal from oxidizing during welding. Argon gas is colorless and odorless. It is also heavier than oxygen and therefore settles in low areas, displacing oxygen. This occurs in the same manner that water displaces air as it is poured into and fills a glass. MAPP (which actually refers to a trade name) refers to combustible gas used in welding, typically for heating and cutting various metals. It does not displace oxygen as argon gas does. It is colorless but it has an odor which can be described as "noticeably foul." MAPP gas is generally not toxic, although significant concentrations may be ignited and become explosive.

NRC does not regulate the use of the subject gases. On February 6, 1981, the NRC Region III office telephoned the Cincinnati, Ohio, office of the U.S. Department of Labor, Occupational Safety and Health Administration (OSHA). During a conversation with OSHA representative John Phillips, it was determined that the allegation involved a matter over which OSHA has primary jurisdiction. An understanding was also reached that any action necessary to resolve this matter would be taken by OSHA. A letter confirming this understanding, a copy of which is included as Exhibit 40, was forwarded by Region III to the Cincinnati OSHA office on February 19, 1981.

By letter dated May 15, 1981, the Cincinnati OSHA office advised the NRC Region III office that an investigation of conditions in the containment suppression pool area had been conducted by OSHA on February 4-5, 1981. The letter stated OSHA addressed a previous complaint alleging leaks of argon gas at Zimmer and concluded that an air contamination or oxygen deficiency situation did not exist. A copy of this letter is included as Exhibit 41.

5.6.3 Investigation

5.6.3.1 Interview with James Bedinghaus

On March 12, 1981, James Bedinghaus was interviewed by telephone. He stated that he was a second shift security supervisor employed by W&W Security at the Zimmer Nuclear Power Station from February to November 1980. He stated that while on duty, sometime in October 1980, an incident occurred during his shift in which Security Officer Gayle Spencer became ill due to inhalation of gas. Spencer was assisted back to the guard house to recover from his illness and was later sent home. Bedinghaus learned from Spencer that Spencer was making his rounds in the area of the reactor vessel when he apparently became ill from inhalation of gas. Another worker in the area (whose identity Bedinghaus does not know) advised Spencer there was an argon gas leak where he was located and that he should leave the area immediately. Bedinghaus immediately reported this information to Kaiser Safety Inspector Dan Parlier, who went to check the area where the incident had occurred. Shortly afterwards (approximately 1/2 hour), Parlier contacted Bedinghaus and advised him there was a MAPP gas leak, rather than an argon gas leak, in the area where Spencer had been. Bedinghaus indicated he was not aware of any argon gas incident involving his son John.

On March 25, 1981, Bedinghaus provided a written statement ~~attesting to the preceding information,~~ a copy of which is included as Exhibit [redacted].

5.6.3.2 Interview with John Bedinghaus

On March 12, 1981, John Bedinghaus was interviewd by telephone. He stated that he was a security officer employed by W&W Security at the Zimmer Nuclear Power Station from October 1980 to January 1981. He advised that while employed at Zimmer he was never involved in any incident when he became ill from or was overcome by argon or any other type of gas.

On March 25, 1981, Bedinghaus provided a written statement ~~attesting to the preceding information~~, a copy of which is included as Exhibit [redacted].

5.6.3.3 Interview with Daniel Parlier

On March 12, 1981, Daniel Parlier, Kaiser Assistant Safety Representative, was interviewed by NRC. He stated that to his knowledge there has never been an incident where anyone was overcome by argon gas. He also stated he did not believe such an incident occurred because being overcome by argon gas would likely cause suffocation, an incident of which he would certainly be aware.

Parlier acknowledged that he had discovered instances when craft workers had crimped argon and MAPP gas hoses and had wired them closed rather than shutting the gas off at the source. He indicated he considered this practice a serious safety concern and whenever the practice was observed he immediately brought it to the attention of the appropriate craft supervisor.

Parlier checked the Kaiser Safety Department's "Unusual Incident Reports" for October 1980 to determine if a report of the incident involving Security Officer Spencer had been prepared. He located a report describing the incident in question and included the following information:

> "On October 27, 1980, at 6:30 p.m. a Mapp gas leak located in the reactor suppression pool area at elevation levels 503' and 518' was investigated by Daniel Parlier. Parlier reported that Security Officer Gayle Spencer was in the reactor suppression pool at the time of a mild Mapp gas leak. A reading taken with a M.A.S. [intended as an abbreviation for the manufacturer "Mine Safety Appliances"] Explosimeter registered 0% on the upper and lower areas of the suppression pool. Spencer complained of a headache and feeling tired. He was advised by "First Aid" to see a physician if his condition worsened or Security Supervisor James Bedinghaus was to send him to a doctor if he became worse while still at work. Parlier took action to correct the Mapp gas leak by turning off the gas manifolds in the reactor building and disconnecting the gas hoses from the manifolds."

A copy of this "Unusual Incident Report" is included as Exhibit [redacted].

In addition to the "Unusual Incident Report" prepared by Parlier, he sent a note dated October 27, 1980, to his supervisor, Mike Hoyman. In the note

(which was apparently a "cover note" for the incident report), Parlier advised Hoyman of the incident and concluded that the incident was a result of the craft workers "not disconnecting their gas hoses from the manifolds." (Disconnecting the hoses from the manifold would have necessitated that the gas be shut off at the manifold.) A copy of the "cover note" is included as Exhibit 45.

During a subsequent telephone conversation on April 24, 1981, Parlier was questioned regarding how he perceived former Kaiser Safety Supervisor Cummings' attitude toward gas leak incidents at Zimmer. He stated it was his opinion that Cummings was very conscientious regarding this problem and it appeared to him Cummings considered gas leaks to be a serious safety concern. Parlier also remarked he did not believe Cummings ever expressed disinterest in gas leak problems or said they were unimportant.

5.6.3.4 Interview with Larry Cummings

On April 27, 1981, Larry Cummings was interviewd by telephone. He stated that he held the position of Kaiser Safety Supervisor at the Zimmer Nuclear Power Station for approximately two years until he left the site in May 1980. He verified that he was aware of instances in which workers at Zimmer crimped and wired argon gas hoses closed rather than shutting the argon gas valves off at the source. Cummings remarked that these instances occurred "less than frequently, but more often than they would like." He was unable to specify approximately how many cases of argon hose crimping the Safety Department had detected while he was at Zimmer.

Cummings denied expressing disinterest in the argon hose crimping problem and advised it was a topic of concern at many Safety Department meetings. He stated that the crimping of argon hoses was a bad work practice; however, it was one that was hard to pin down because it was extremely difficult to catch the individuals responsible.

Cummings said he felt Kaiser had an adequate safety system for preventing serious argon gas problems and incidents at the site. He explained that it was Kaiser's practice and policy to place mine safety lamps wherever workers were located in low-lying areas, particularly the suppression pool area. These lamps serve as warning devices in that they remain lit unless a gas buildup reaches the lamps' air inlet and puts out the flame. Whenever a safety lamp goes out, it is an indication of gas in the area and a signal for the workers to immediately evacuate the area. Cummings stated he knew of no instances when any workers were ever overcome by argon gas.

5.6.4 Findings and Conclusions

No evidence was obtained to show that the argon gas valves were routinely left open, that persons on the night crew had been overcome by argon gas, or that Safety Director Cummings expressed disinterest in the argon gas problem.

Notwithstanding the above, it was determined that there had been instances when craft workers had crimped argon gas hoses and wired them closed rather than shutting the gas off at the source.

This matter is under the jurisdication of the U.S. Department of Labor, Occupational Safety and Health Administration (OSHA). An OSHA inspection did not confirm a situation of air contamination or oxygen deficiency at the time of their inspection.

5.6.5 Items of Noncompliance

No items of noncompliance were identified.

5.7 Damaged Prefabricated Piping

5.7.1 Allegation

"Prefabricated piping received in 1977 has defective welds, but construction supervisors told crews not to repair them because the welds were made offsite."

During an interview with Applegate and GAP representatives, this allegation was clarified to be piping received July 3, 1979, the subject of one of Applegate's prior allegations.

5.7.2 Background Information

The following summarizes the initial investigation of this allegation as documented in IE Investigation Report No. 50-358/80-09.

On June 29, 1979, Pullman Power Products of Williamsport, Pennsylvania, also known as the M. W. Kellogg Company, shipped five prefabricated pipe spool pieces by truck to the Zimmer site for installation in the main steam relief (MSR) 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." The nonconformance report had the effect of placing the spool pieces in a "hold" status in the Kaiser warehouse. The welds on the five spool pieces were later radiographed. The radiographs displayed apparent rejectable weld indications in welds on three of the five spool pieces. On September 18 through 28, 1979, despite the issuance of the nonconformance report, the spool pieces were released to construction and installed. As documented in IE 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 by magnetic particle testing and found to be acceptable.

On April 8, 1980, the RIII inspector reviewed the radiographs on 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 because of the configurations and thicknesses of the spool pieces.

RIII personnel determined that radiography was not the correct nondestructive examination (NDE) technique for the spool pieces. The geometrical configurations and relatively large thicknesses of the spool pieces would prevent

accurate displays of weld indications on the radiographs. A weld indication shown on the radiograph could be caused by distortion. The ultrasonic and magnetic particle tests ultimately performed on the installed spool pieces were correct techniques.

5.7.3 Investigation

5.7.3.1 Interview with Individual A

On April 24, 1981, Individual A, who was previously interviewed by representatives of GAP, was interviewed by NRC. Individual A stated he had provided information to GAP regarding this allegation, and he was referring to five prefabricated pipe spool pieces manufactured by Kellog that fell off a truck during their delivery to the site. He stated that Peabody Magnaflux (PM) radiographers examined the pieces and found defective welds on some of them. He said construction personnel installed the spool pieces in the plant, disregarding PM's finding on the welds.

On April 22, 1981, Individual A provided a written sworn statement ~~attesting to the preceding information~~; however, he requested the statement not be attached to this report.

5.7.3.2 Interview with David Hang

On February 24, 1981, David Hang, former PM Level II Radiographer, was interviewed. He stated that in August 1979 Anthony Pallon, KEI Welding Engineer, asked him to radiograph MSR spool pieces that had fallen off the truck on delivery to the Zimmer site. Hang said the examination was to determine if any of the welds on the pieces had cracked from the impact of the fall. Hang indicated that three of the five spool pieces he examined had what appeared to be unacceptable radiographic indications. He said he reported this in the Report of Radiographic Examination submitted to Pallon and also told Pallon that radiography was the wrong technique to use to examine welds of this configuration. Hang said he advised Pallon that an ultrasonic examination should be performed in this case. Hang also stated the spool pieces were ultrasonically examined in April 1980 and the welds were found to be acceptable.

On February 24 and April 23, 1981, Hang provided written sworn statements ~~attesting to the preceding information~~, copies of which are included as Exhibit 46.

5.7.3.3 Record Reviews

On February 24, 1980, RIII Inspector Kavin Ward reviewed records that indicated the five spool pieces were ultrasonically examined by Pullman Power Products (Kellogg) in April and May 1980 and examined by magnetic particle testing by Peabody Magnaflux in April 1980. The records showed that welds on all five pieces were acceptable. The magnetic particle records indicated that piece 1-MS-11B-12-7BH, weld No. V, had a linear indication approximately 1/4-in. long, which was ground, retested, and found acceptable.

The RIII inspector determined that the ultrasonic and magnetic particle tests were valid examinations for the spool piece welds.

5.7.3.4 Field Observations

On February 24, 1981, RIII Inspector Kavin Ward made visual examinations of all of the welds on the five spool pieces and identified no unacceptable indications. The spool pieces had been installed in the main steam relief system prior to the time of the visual examinations.

5.7.4 Findings and Conclusions

The subject of this allegation was investigated by NRC in early 1980. At that time radiographs displayed apparent rejectable weld indications in welds on three of five spool pieces. One item of noncompliance was cited in IE Investigation Report No. 50-358/80-09 for releasing and installing the spool pieces before determining their acceptability. Subsequently, the licensee and RIII independently determined that ultrasonic testing, rather than radiography, was the correct nondestructive testing technique for examining welds of that geometry and thickness. The welds were examined by ultrasonic and magnetic particle testing and determined to be acceptable.

5.7.5 Items of Noncompliance

No new items of noncompliance were identified.

5.8 Prefabricated Pipe Welds

5.8.1 Allegation

"At least three sources contacted by [Thomas] Applegate confirmed that an estimated 20% of the plant prefabricated welds are defective."

During an interview with Thomas Applegate and a GAP representative (Thomas Devine), Applegate stated that this information came from either Individual A, Individual B, Allen Sellars, Steve Sellars, or David Hang (no specific source was named). Also, Steve Binning, David Binning and James Tyner were named as having additional information. The name Steve Sellars is in error, as no such individual was employed at Zimmer. It appears that this was a reference to Steve Binning.

5.8.2 Background Information

Radiography is similar to a medical X-ray procedure, with the exception that a small but intensely radioactive material (source) is utilized to produce the radiation. The radiographic film that is produced is like an X-ray and can be a permanent record. Nuclear welding codes often specify radiographic testing (RT) as a required examination. In many cases, the weld root pass (bottom portion of the weld, or first welding pass) is radiographed for information, and to determine if the root is acceptable. The completed weld is radiographed for formal code acceptance. Nuclear welding codes contain detailed standards

for radiography, including extent of exposure and clarity of the resulting radiographic film.

A radiograph is interpreted (read) by an interpreter. Radiographic interperters are assigned levels of authority and responsibility based on examination and length of experience, with a Level III radiographer being the highest level.

When a radiograph is read, a "reader sheet" is filled out. The reader sheet identifies the weld, date of radiography, radiographic technique, interpreter, areas of the weld included, and the conclusions of the interpreter. The reader sheet is normally filed with the radiographs it represents.

Many types of defects or discontinuities can be detected through radiography, including incomplete fusion, cracks, pososity, slag, oxidation, undercut, and other defects. The welding Code applied indicates the requirements for weld acceptability, and defects may be acceptable as provided in the relevant Code. Many interpretations are highly subjective, and it is possible for interpreters to disagree on the acceptability or rejectability of an observed defect. In some cases, additional radiography may be performed to provide additional information. As long as the pipe is not inaccessible, subsequent radiography is normally not difficult or too time-consuming.

In practice, the most common occurrence is that a section of a weld, rather than the whole weld, will include rejectable defects. The section of the weld containing the defects is then removed through grinding, re-welded, and re-radiographed. If the repair radiograph is acceptable, the entire weld can be accepted.

Pipe, spool pieces, and piping formations are purchased from various vendors. These items contain welds, and vendors are required to perform nondestructive examination of these welds according to applicable codes and standards. ASME Section III standards require 100% nondestructive examination for safety-related welds. When radiography is required, radiographs are provided to the utility purchasing the item for review and permanent filing.

5.8.3 Investigation

5.8.3.1 Interview with Individual A

On April 24, 1981, Individual A, who was previously interviewed by representatives of GAP, was interviewed by NRC. Individual A stated he was a pipefitter assigned to assist employees of Peabody Magnaflux (PM), the firm responsible for radiographic examination of pipe welds onsite. He said that in his opinion 20% of the prefabricated pipe welds manufactured by Kellogg were defective. He indicated that he based his opinion on a statement made by PM personnel that they had observed defective welds on prefabricated pipe spool pieces manufactured by Kellogg on four occasions when they examined Kaiser welds in the residual heat removal (RHR) system. He conjectured that the defective welds were not found by Kellogg because he understood it was Kellogg's practice to radiograph 10% versus 100% of their welds. He said PM radiographers Allen Sellars and David Binning reported this to CG&E personnel, who allegedly told them not to examine the welds because they were vendor supplied.

Individual A stated an incident involving prefabricated piping occurred in August 1979 when PM was asked to radiograph welds on sections of main steam relief (MSR) spool pieces (addressed in Allegation 5.7) that had fallen off a truck on delivery to the site. He said that, while examining the spool pieces, PM personnel found 5 of 20 welds examined to be defective. He said CG&E overruled PM's findings on this examination, but PM retained copies of their reports and could provide investigators with further information regarding this matter.

Individual A also stated he had a discussion with Robert Marshall, Kaiser Construction Superintendent, during which he told Marshall that 20% of the prefabricated welds in the plant were bad. He said Marshall agreed with the statement.

On April 22, 1981, Individual A provided a written sworn statement ~~attesting to the preceding information~~; however, he requested the statement not be attached to this report.

5.8.3.2 Interview with Individual B

On April 14, 1981, Individual B, who was previously interviewed by representatives of GAP, was interviewed by NRC. Individual B stated that, during a telephone conversation he had with GAP representatives, he responded in the affirmative when asked if 20% of the prefabricated pipe welds in the plant were defective. He said he had heard from Individual A that 20% of the prefabricated pipe welds were defective.

Individual B said he had no specific information regarding this allegation because he was not involved in the fabrication of large bore pipes of the type manufactured by Kellogg, and was not in a position to provide information about defective welds on these pipes. He said that to quote him as generally confirming that 20% of the prefabricated welds in the plant are defective was a misquote. He said he merely confirmed a rumor that the pipe welds in question were defective.

On April 14, 1981, Individual B provided a written sworn statement ~~attesting to the preceding information~~ however, he requested the statement not be attached to this report.

5.8.3.3 Interview with [James Tyner]

On April 16, 1981, [James Tyner], [former Kaiser Pipefitter Superintendent], was interviewed by NRC. He stated he was contacted by a GAP representative who asked him if he was aware that 20% of the prefabricated pipe welds were defective and that Robert Marshall had concurred with this statement. He said he responded to the GAP representative that he could not support that statement and said the prefabricated welds would have to be radiographed and the results evaluated before he could make such a determination. [Tyner] said the pipe welds in the plant are good, and attributed this to Kaiser's Welder Qualification Program which identified unqualified welders and prohibited them from working on safety-related welds.

[Tyner] recalled that on one occasion PM radiographers examined a Kaiser field weld and found a defect (porosity) in the adjacent Kellogg weld. He said this piping was part of the class D portion of the closed cooling water system and was not safety-related piping. He indicated that the radiographers may have applied safety-related standards to a nonsafety-related pipe and therefore found rejectable defects in the welds. Tyner stated this was not indicative of 20% of the prefabricated pipe welds being defective.

5.8.3.4 Interview with Robert Marshall

On April 16, 1981, Robert Marshall, Kaiser Construction Superintendent, was interviewed by NRC. He stated that he never commented to Individual A that 20% of the prefabricated welds in the plant were defective. He did recall a conversation in which he commented to Individual A that the workers Individual A was supervising were having a high weld rejection rate on pipe support hangers on which they were working. He said he never mentioned that a percentage of the prefabricated piping was defective and he was not aware of any defects in these pipes. Marshall stated that Anthony Pallon, Kaiser Welding Engineer, had not reported any problems with the acceptability of Kellogg welds and a nonconformance report was never written on this subject.

Marshall recalled that in August 1979 PM radiographed some Kellogg prefabricated spool pieces that had fallen off a truck. He said PM reported some of the welds were defective. The radiographs were subsequently reexamined by Kaiser's Level III Radiographer, Rex Baker, and NRC Inspector Kavin Ward. He said Baker and Ward determined that the geometry of the welds was such that it distorted the view of the weld and rendered the radiographic examination invalid due to the use of an improper technique.

5.8.3.5 Interview with David Hang

On February 24 and April 23, 1981, David Hang, former PM Level II Radiographer, was interviewed by NRC. He stated PM was responsible for conducting radiographic examinations of field welds for Kaiser at Zimmer and did not routinely radiograph welds on prefabricated pipe spool pieces manufactured by Kellogg. He stated 20% of the prefabricated Kellogg welds onsite were not defective. He said on occasion, when Kaiser welders cut into a Kellogg weld or if a Kaiser weld overlapped a Kellogg weld, PM would examine and find defects in the Kellogg weld. In each instance, these defects were reported to Kaiser on the radiographic examination report and forwarded to Anthony Pallon for corrective action.

Hang stated that in August 1979 Pallon asked him to radiograph a group of MSR spool pieces that had fallen off of a truck on delivery to the site. The examination was to determine if any of the welds had cracked from the impact of the fall. Hang indicated he disagreed with Pallon on this and told him radiography was the wrong examination technique. He said the spool pieces were Schedule 844 pipe (3-1/2-in. wall thickness) with welds 1-1/2-in. wide, which would require ultrasonic examination to determine if any welds were defective. When examining these spool pieces, they would be radiographing at an angle through laminations in the steel, which would prevent them from seeing some defects and would exaggerate others. Hang said he examined the spool pieces

for "information only" purposes and reported his findings to Pallon. Hang said he found five of the twenty welds were unacceptable based on the radiographs; however, the spool pieces were later ultrasonically examined and found acceptable. He indicated that ultrasonic examination was the proper technique to examine the spool pieces and is the valid examination.

On April 24, 1981, David Hang provided a written sworn statement ~~attesting to the preceding information~~, a copy of which included as Exhibit [redacted].

5.8.3.6 Interview with Steven Binning

On April 15, 1981, Steven Binning, PM Level II Radiographer, was interviewed by NRC. He stated that, while assigned to the Zimmer site, he was responsible for performing radiographic examinations of pipe welds fabricated by Kaiser welders onsite. He said he did not routinely radiograph prefabricated spool pieces manufactured by Kellogg since these were previously examined by Kellogg prior to delivery. He said he had no basis to judge if 20% of the welds on prefabricated spool pieces were defective.

He did recall one occasion when David Hang examined Kellogg spool pieces that had fallen off a truck. Hang initially found defective welds but he later determined that the radiographic technique distorted the view of the weld and the technique used was therefore unacceptable.

On April 15, 1981, Steven Binning provided a written sworn statement ~~attesting to the preceding information~~, a copy of which is included as Exhibit [redacted].

5.8.3.7 Interview with David Binning

On January 19 and April 15, 1981, David Binning, PM Level I Radiographer, was interviewed by NRC. He stated PM did not routinely examine welds on prefabricated spool pieces manufactured by Kellogg. He recalled that, on one occasion, David Hang examined some Kellogg spool pieces that had fallen off a truck on delivery to the site. He stated that Hang, while apparently taking "information shots" of the welds, found defective welds in his initial examination.

After a further examination of the film, Hang had determined the geometric configuration of the radiograph was wrong and the examination was invalid. Binning said that, to the best of his knowledge, he never heard PM employees mention that 20% of the prefabricated pipe welds in the plant were defective.

5.8.3.8 Interview with Allen Sellars

On April 15, 1981, Allen Sellars, PM Level II Radiographer, was interviewed by NRC. He stated PM was primarily responsible for the nondestructive examination of welds fabricated by Kaiser personnel onsite. He said that he occasionally examined pipe field welds that junctured with prefabricated pipe manufactured by Kellogg and had observed defects in the adjoining Kellogg welds. He said he noted this on the Report of Radiographic Examination which would then be submitted to Anthony Pallon, who would review the film and assure rejectable defects were corrected. Sellars indicated he was aware that, when one examines one weld and another juncturing weld, frequently the geometry of the juncturing weld causes defects to appear on the film, which

are actually distortions of the weld. He stated that when he identified defects in Kellogg welds he would be asked to reexamine them after the defects had been corrected by Kaiser. Sellars stated he was not being overridden by Kaiser for his identification of defects in either Kaiser field welds or Kellogg welds. He said the defects he identified in overlapping Kellogg welds were so few that it would be incorrect to say 20% of the prefabricated welds in the plant were defective. Sellars said Kellogg examined all of the prefabricated spool pieces prior to their delivery to the site and that it was Kellogg's responsibility, not that of PM, to examine these welds.

Sellars recalled an incident in August 1979 when Anthony Pallon asked David Hang to radiograph some Kellogg spool pieces that had fallen off the truck on delivery to the site. Sellars said Hang attempted to radiograph the spool pieces in question, but the film quality was poor and the technique was wrong, which caused exaggerated flaws in the radiographs of the spool pieces. When Sellars and Hang initially told Pallon about this, Pallon requested they continue the examination anyway. Sellars stated the spool pieces were later ultrasonically examined and found to be acceptable. He indicated that ultrasonic examination was the proper technique to use when examining welds in this configuration. Sellars said the ultrasonic examination did not detect any defects in the spool pieces.

On April 15, 1981, Allen Sellars provided a written sworn statement ~~attesting to the preceding information~~, a copy of which is included as Exhibit [redacted].

5.8.3.9 Interview with Wayne Draffon

On February 19, 1981, Wayne Draffon, PM Level III Radiographer, was interviewed by NRC. He stated that he was employed at Zimmer from January to August 1980 and during this period supervised PM radiographers onsite. Draffon stated that on occasion Kaiser requested PM to examine Kellogg prefabricated pipe welds. He recalled discussing with the radiographers one incident that occurred prior to his arrival onsite when PM was asked to radiograph some Kellogg spool pieces that had fallen off a truck. The radiographers informed him that, when Kaiser personnel requested the examination, they knew radiography was the wrong technique to use. He said they told him the geometric configuration of the welds was such that radiography would distort the view of the weld. Draffon indicated that he later reviewed these films during an NRC investigation and concluded the geometry was such that radiography distorted the view of the welds. He stated the spool pieces in question were later ultrasonically examined and found to be acceptable.

Draffon indicated the PM radiographers had told him that, while examining Kaiser field welds, they occasionally noticed a defect in a Kellogg weld that overlapped a Kaiser weld. He said the defects would be noted on the examination report and forwarded to Kaiser. Draffon cautioned that when welds overlap or come to a juncture one had to be careful the geometry of the situation did not distort the view of a weld. Draffon said he knew of no reason why any PM employee would state that 20% of the prefabricated welds onsite were defective.

5.8.3.10 Record Reviews

Region III inspectors reviewed radiographs of the following field and shop welds in spool pieces in the residual heat removal (RHR) system (the system identified by Individual A as containing defective welds) to determine if there were any unacceptable indications in the welds or adjacent material (see Table 5.8-1).

Table 5.8-1 Welds in the RHR System

Line No.	Weld No.	Diameter (in.)	Line No.	Weld No.	Diameter (in.)
Field Welds					
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	1RH02B2CO	RH15B	20
1RH02BC20	RH16	20	1RH02BC20	RH16A	20
1RH02BC20	RH16B	20	1RH02BC20	RH16C	20
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 Welds					
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

The RIII inspector reviewed approximately five radiographs for each of the 62 welds. No unacceptable indications were identified in either the welds or the adjacent material.

In addition to the welds in Table 5.8-1, the inspectors reviewed radiographs of 206 prefabricated pipe (shop) welds (700 radiographs) for acceptable radiographic testing (RT) technique, weld quality, and documentation (see Appendix B).

Radiographs of the welds were reviewed per ASME Section III, 1971 Edition, with Winter 1972 Addenda, and M. W. Kellogg Co. Procedures ES-414, ES-415, and ES-416. No unacceptable radiographic technique deficiencies were identified in 517 of the radiographs and no unacceptable indications were identified in the respective welds. However, 183 of the radiographs were made without required shims under the penetrameters. An additional four radiographs were made with insufficient shims under the penetrameter.

ASME Section III, 1971 Edition, 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. (pipe manufacturer and agency performing the radiography) 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. Shims shall be of a radiographically similar material to the weld metal."

The insufficient shimming of the penetrameter in radiographs of the noted welds is contrary to 10 CFR 50, Appendix B, Criterion XI, and the Wm. H. Zimmer QA Manual, Section 11.2 (50-358/81-13-13).

All of the radiographs in which the penetrameters were insufficiently shimmed were previously accepted by the fabricator (M. W. Kellogg), the Authorized Nuclear Inspector (Hartford Steam Boiler Insurance Company) at the fabricator's shop, the site radiographer (Nuclear Energy Services), and the licensee at the site. (Special identification of the 206 welds for which radiographs were examined is included as Exhibit 50.)

A penetrameter is a device used to determine the image quality of a radiograph, usually a thin strip of metal of a thickness specified as some percentage of thickness of the material being radiographed. Placed on the part being radiographed, it is normally required that it be of material radiographically similar to that of the item being inspected. Various sized holes, multiples of the penetrameter thickness, are on the strip. The ability of the radiograph to show some definate sized hole establishes its quality. The essential hole of the penetrameter is used to determine if the radiograph has been sufficiently exposed to show weld indications that are in noncomformance 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. An insufficiently shimmed penetrameter will give false assurance that the weld had received sufficient exposure to reveal any unacceptable indications in the portion of the weld that is thicker than the metal under the penetrameter.

The licensee disagreed with the NRC interpretation of Paragraph IX-3334.4 of the ASME Code, Section III-1971, regarding the use of shims under the penetrameter. This matter was discussed in a meeting on April 30, 1981, between representatives of RIII, RIV, the State of Ohio, the National Board of Boiler and Pressure Vessel Inspectors, and the licensee and his consultants. The meeting is documented in IE Inspection Report No. 50-358/81-16. The representatives from the State of Ohio and the National Board concurred with the NRC's position.

A program that may demonstrate the adequacy of the radiographs in question is being implemented by CG&E and is included in the Quality Confirmation Program. This program is described in Section 11.

5.8.3.11 Verification

Region III inspectors also verified that the following welds matched the respective radiographs by comparing a sketch (onionskin) made by the RIII inspectors, of the welds depicted in the respective radiographs for the following welds:

Pipeline No.	Weld No.
1FC36CA621	B
1MS20B3169	A
1FC02AB818	B
1MS20B3169	D
1FC39CA621	C
1FC02AB818	A

5.8.4 Findings and Conclusions

Interviews with the individuals identified by the alleger did not provide specific information of any defective weld. Therefore, the RIII inspector examined more than 700 radiographs to determine the acceptablility of the welds. No unacceptable welds were identified; however, 187 radiographs could not be interpreted because of an unacceptable radiographic technique. To provide further assurance that both prefabricated and field welds are satisfactory, the quality of the welds and the radiographic technique have been addressed in the Quality Confirmation Program.

5.8.5 Items of Noncompliance

One item of noncompliance was identified (failure to assure that radiography test requirements for shimming the penetrameter had been satisfied).

5.9 Design Control

5.9.1 Allegation

"Engineering "designs" routinely are drawn after the fact to conform with piping that already had been installed."

5.9.2 Background Information

Problems associated with the design and installation of large-bore piping and pipe suspension systems were identified by the RIII inspection program beginning in May 1978. Similar problems were identified for small-bore piping and pipe suspension systems beginning in February 1980. Seventeen inspections have covered these large-bore and small-bore pipe and piping suspension systems.

Problems related to installations not being in accordance with design drawings were identified for large-bore piping and pipe suspension systems in an August 1978 RIII inspection and for small-bore piping and pipe suspension systems in a February 1980 inspection. The resolution of these problems is being followed in the RIII inspection program.

5.9.3 Investigation

5.9.3.1 Interview with Individual A

On April 24, 1981, Individual A, who was previously interviewed by representatives of GAP, was interviewed by NRC. Individual A stated Kaiser construction personnel used "construction aids" rather than final design drawings when fabricating and installing pipe support hangers on site. He stated that if a pipe support hanger or pipe piece was moved, the construction aid was changed in the field without an engineer's concurrence. He said there was no assurance that the pipe was in the proper location or was installed as designed. He characterized this as designing pipe hanger and support systems "after the fact" because the construction aids were used as the final drawing after installation.

Individual A said the systems were not installed to follow drawings approved by an engineer, but rather the pipe support system was installed by construction and the engineer took the construction aid and made it into the final drawing for the system. He said this occurred because Sargent & Lundy (S&L), the architect-engineer, did not have enough engineers assigned to the site to draw and approve design changes on the pipe support system or to provide accurate and updated design drawings for the craft personnel to use when installing the systems.

On April 22, 1981, Individual A provided a written sworn statement ~~attesting to the preceding information;~~ however, he requested the statement not be attached to this report.

5.9.3.2 Interview with James Tyner

On April 16, 1981, James Tyner, former Kaiser Pipefitter Superintendent, was interviewed by NRC. He stated his concern about Kaiser's practice of installing pipe supports from "construction aids" or "field sketches" rather than from approved design drawings. He said construction was far ahead of schedule and the designers were behind in this area. He stated that pipe supports as drawn on the construction aid occasionally did not fit in the location they were designed for and were moved arbitrarily and noted in red on the construction aid. This change was then transposed to the final drawing without an engineer's evaluation of the change. Tyner indicated that this resulted from poor initial design on the construction aid itself.

Tyner also said that, in his opinion, the licensee did not have qualified engineers or engineering support staff on site to properly draw the construction aids to match actual conditions in the plant.

5.9.3.3 Interview with Individual B

On April 14, 1981, Individual B, who was previously interviewed by representatives of GAP, was interviewed by NRC. Individual B stated that he was provided with a field construction drawing or construction plan when installing systems in the plant. The system would be installed and the engineering staff would be shown where construction personnel had made changes or alterations in the installation of the system. He characterized this as construction designing the systems while they were being installed, rather than designing the system by engineers. Individual B indicated that in 1977 Kaiser Quality Control Inspectors contracted from Butler Services, Inc., saw this practice and directed that it be stopped because it was contrary to Quality Control Procedures.

On April 14, 1981, Individual B provided a written sworn statement ~~attesting to the preceding information;~~ however, he requested the statement not be attached to this report.

5.9.3.4 Review of Previous NRC Inspections

NRC has previously identified problems with the installation of pipe hangers and the related quality assurance inspection program. These problems were documented and notices of violation were issued in Region III Inspection Reports No. 78-10, 78-18, 78-22, 78-27, 78-32, 79-03, 79-10, 79-11, 79-22, 79-37, 80-05, 80-13, 80-16, 80-22, 80-25, 81-04, and 81-17.

1. RIII inspection of large bore piping and pipe suspension system design and installation was initiated in May, 1978. By the latter part of 1978, RIII was aware that most of the existing installations were not in accordance with the design, due to implementation of an inadequate installation and QA/QC program. The situation was further compounded

by the updating of GE design criteria that invalidated the previous engineering design and calculations. Since then, the licensee has determined that all installations are considered preliminary and that final calculations will be performed prior to system test and acceptance. Because of this, RIII has not inspected large bore piping suspension system hardware since 1979. The findings relative to support installations not in accordance with design and inadequate design review remain open.

2. RIII inspection of small bore process and instrumentation piping and pipe suspension system design and installation was initiated in February, 1980. Problems relative to field design changes being made without S&L approval are documented in Inspection Report 80-05. At present, the design of small bore systems is contracted to Nuclear Power Services, Inc. (NPS). RIII review of the NPS program and its implementation will be a part of future routine site inspections.

3. RIII inspections of small bore CRD piping and pipe suspension systems design and installation were performed in December, 1980. The inspection identified inadequacies in design and the QA/QC programs and as a result CG&E issued a Stop Work Order. RIII followup inspection in June, 1981 (Report No. 81-17) resolved most of the findings, however, the present RCI design control provisions relative to procedures; verification and approval remains open.

The corrective measures to resolve these problems have been and continue to be closely monitored by Region III.

5.9.4 Findings and Conclusions

There have been cases of both large- and small-bore piping and pipe suspension systems being installed without proper design control. Field installations have been made that were not in accordance with approved design documents. This problem was initially identified for large-bore piping systems during a May 1978 RIII inspection. It was initially identified for small-bore piping systems during an RIII inspection in February 1980, which was conducted as a result of an allegation concerning small-bore piping problems at another RIII facility.

These problems have resulted in items of noncompliance, management meetings with the licensee and licensee stop work orders, one of which was confirmed in an Immediate Action Letter. Resolution of these problems is not complete and is being followed in the RIII inspection program.

5.9.5 Items of Noncompliance

No new items of noncompliance were identified.

5.10 Cable Tray Hangers and Loading

5.10.1 Allegation

"Shock-absorbing electrical tray hangers previously found unsatisfactory are still unsafe due to faulty welds, and electrical cable trays remain dangerously full."

5.10.2 Background Information

During an interview on February 26, 1981, Thomas Applegate and a GAP representative, Thomas Devine, indicated that Edwin Hofstadter was the source of this allegation.

Hofstadter was employed by Husky Products, the Zimmer cable tray vendor, between February 8, 1973 and August 4, 1978. He wrote a letter of complaint that he sent to various parties on August 18, 1978. RIII personnel contacted him by telephone on September 9, 1978, and he was interviewed by RIII personnel on September 29, 1978. His allegations, relating to materials and welding on cable trays supplied to the Zimmer and Clinton sites, were investigated in detail by RIII, and the findings related to Zimmer are documented in IE Investigation Report 50-358/78-21. The RIII investigation resulted in one item of noncompliance (a deficiency), but cable tray materials and welding were considered acceptable.

During the 1978 RIII investigation, Hofstadter sent a series of letters to the NRC (dated September 30, October 9, 19, 20, 31, December 15, 1978, and February 11, 1979) stating his concerns and expressing dissatisfaction with NRC investigation findings. On February 2, 1979, a public press conference was held in Cincinnati wherein RIII personnel met with Hofstadter, a lawyer representing Ralph Nader, and representatives of Citizens Against A Radioactive Environment (CARE), an intervenor group, to discuss the NRC investigation.

At RIII's request, a vendor inspection of Husky Products was performed by Region IV personnel during February 12-15, 1979 (Report No. 99900356/79-01). The inspection did not identify significant deficiencies (QA Manual lacked description of duties or policy statement, weld procedure 107 lacked welding parameters for metal under 1/4-in.).

On March 9, 1979, CARE sent a letter to various media representatives, taking issue with the RIII finding of cable tray acceptability. Subsequently, the Mississippi Valley Power Project (MVPP), another intervenor group, introduced the acceptability of cable trays and cable tray loading as contentions in the Zimmer licensing hearings. These contentions were accepted for litigation, and extensive testimony by NRC, Husky Products, CG&E, Hofstadter, and MVPP personnel is documented in the hearing transcripts.

A review of the Atomic Safety Licensing Board hearing transcripts indicated that they did not reveal any significant information not included in the RIII investigation report. The conclusion of cable tray acceptability has not been altered.

Hofstadter made no allegations concerning cable tray hangers, and these were not supplied by Husky Products.

A report (50.55e) was submitted to NRC by the licensee concerning cable tray hanger welding deficiencies on July 17, 1978. A followup report was sent to the NRC on October 30, 1978. Review of the licensee's corrective actions was performed during an inspection conducted during March 21-23, 1979. During that inspection, corrective action appeared to be acceptable, but had not been completed.

5.10.3 Investigation

5.10.3.1 Interview of Edwin Hofstadter

Edwin Hofstadter was contacted by telephone on July 31, 1981. He stated his concerns dealt with cable tray (fittings) welding, and he had no knowledge of cable tray hangers. He expressed concern regarding cable tray loading at Zimmer.

5.10.3.2 Observations and Reviews Concerning Cable Tray Hanger Welds

The following findings address the present review of the allegation as expressed by GAP in their letter of December 10, 1980, to the Merit Systems Protection Board concerning cable tray hangers and cable tray loading.

RIII inspectors made visual inspections of both vendor and field welds on the following Superstrut cable tray hangers in the cable spreading room and blue switchgear room, and at an elevation of 473-ft in the auxiliary building.

The following data was noted for the cable spreading room:

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 fireproofing

4. No. 15H1FEC160--no unacceptable weld discontinuities; foot connection covered with fireproofing

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 had undercut

7. No. 14H11FEC146 (cross member)--an apparent vendor weld had undercut and slag

8. No. 16H1FEC156 (weld marked rejected)--weld had spatter and undercut

All of these welds were painted; therefore, the RIII inspector examined for relatively large discontinuities only.

The unacceptable welds identified on hangers 70HFEC165, 15H2FEC175, 14H11FEC146, and 16H1FEC156 were not controlled in any QA document. This is contrary to 10 CFR 50, Appendix B, Criterion XV, and the Wm. H. Zimmer QA Manual, Section 15 (358/81-13-09).

The RIII inspectors reviewed approximately 180 construction inspection plans (CIPs) and inspection records for the hangers in the cable spreading room (elevation 536 ft in the north section of the auxiliary building). The licensee stated that inspections documented on the CIPs also included vendor welds, even though the records only reflected field welds. The vendor welds were inspected because of repairs necessary to close the 10 CFR 50.55(e) report telephoned to NRC on July 17, 1978. The 10 CFR 50.55(e) report indicated that vendor welds on Superstrut cable tray hangers, which were used only in the cable spreading room (PW Industries hangers are utilized elsewhere and appear acceptable), did not meet the visual inspection requirements of AWS D1.1-1972. The CIP records and the 10 CFR 50.55(e) report indicate that all of the final field and vendor welds were reinspected after repairs were made to welds on more than half of the 141 hangers. These were accepted by the licensee in December 1980 and January 1981.

No inspection records were available to indicate that in-process inspections of either the field or vendor welds were made to verify proper filler metal, weld procedure, welder's qualifications, surface conditions, etc., as required by the AWS D1.1-1972 Code, Section 6. Certificates had been supplied by the vendor stating that the material met the purchase specification requirements. The RIII inspector requested the licensee to obtain the in-process and field weld inspection records for the hanger welds made by the vendor (Superstrut). A letter dated May 1, 1981, from Midland-Ross Corporation to CG&E was provided to the RIII inspector on June 1, 1981. The letter indicated that Superstrut had been acquired by the Midland-Ross Corporation in January 1978, and that no records could be located with respect to in-process inspection of hangers supplied to Zimmer.

Discussions with pertinent QC management and inspection personnel revealed that the welds documented on the above CIPs had been inspected after having been painted. The licensee stated that field visual examinations of tray hanger welds were based 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) applied to the hanger welds did not interfere with visual examination and, in some cases, actually highlighted discontinuities.

AWS D1.1-1972 Code, Section 3.10.1, states, "...Welded joints shall not be painted until after the work has been completed and accepted...."

The apparent lack of in-process and adequate final inspections of the above field and vendor hanger welds is contrary to 10 CFR 50, Appendix B, Criterion X, and the Wm. H. Zimmer QA Manual, Section 10.1.2 (358/81-13-10).

The RIII inspector requested the design acceptance criteria that was used by QC to evaluate the undercut on hanger 15H2FEC175. The licensee provided

S&L Specification H-2713, Supplement 7, Standard EB-117, and H. J. Kaiser Procedure No. SPPM 4.6, Revision 8, paragraph 5.2.9, which allows up to 1/16-in. undercut on the cable tray hanger welds. The 1/16-in. criterion 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 its 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 convexity. On March 5, 1981, S&L provided a documented investigation program of fillet weld size for P-W Industries 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. Although this study may justify that the weld size was adequate where the weld penetration was not measurable by normal visual techniques, no justification was provided to substantiate the exceptions to the AWS D1.1-1972 Code requirements concerning weld convexity 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 (358/81-13-11).

The following data was noted for the blue switchgear room hangers (elevation 525 ft and drawing E-96):

1. No. 1H029--no unacceptable weld discontinuities

2. No. 5H25--foot connection covered with fireproofing; 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 sides)--had unacceptable weld discontinuities that were controlled 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--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.

The following data was noted for elevation 473 ft auxiliary building hangers:

1. No. 5H009 (drawing E-91)--no unacceptable weld discontinuities

2. No. 4H3 (drawing E-14)--no unacceptable weld 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 preceding 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 (SR) No. 2893 dated January 8, 1981, which stated that 94 of 179 (Superstrut) 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 resolution of SR No. 2893 and action to resolve other hanger connections throughout the plant that were covered before they were inspected (358/81-13-12).

The concerns identified above are addressed in the licensee's Quality Confirmation Program.

5.10.3.3 Observations, Reviews, and Interviews Concerning Cable Tray Loading

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: cable ampacity or thermal loading; physical weight loading; and the commitments in the Zimmer FSAR, Section 8.3.3.1.

1. The following cable tray routing points (nodes) were selected for the reviews and discussions:

   a. 1057A--yellow division/power tray--selected because of the high design index (DI) of 1.44 (see 5.10.3.3 paragraph 3 for explanation of design index).

   b. 2025A--blue division/power tray--selected because of the high DI of 1.46.

   c. 2023A--blue division/power tray--selected for verification of DI accuracy (DI of 1.18).

   d. 2038A--blue division/power tray--selected because of the high DI of 1.44.

   e. 2039A--blue division/power tray--selected during field observations because of the appearance of being highly filled.

   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 DI of 1.54.

   i. 2027A--blue division/power tray--selected because of high DI of 1.46.

2. The RIII inspector and a licensee representative counted the cables in the following tray nodes and compared the counts with the number of cables listed in the S&L Cable Pan Loading Report, dated February 2, 1981:

	Node	Field Count	Report Count	
a.	1057A	27	27	
b.	2025A	24	23	(see explanation below)
c.	2039A	39	39	
d.	1073A	32	33	(see explanation below)

The Cable Pan Loading Report is a computerized periodical that gives the design status of cable tray loads. The report identifies individual cable numbers that have been specified to be routed through the segmented tray points (nodes).

The RIII inspector reviewed the H. J. Kaiser Cable Monitoring Report dated February 5, 1981, and some cable pull (installation cards) to verify that the cables specified for tray nodes 1057A, 2025A, 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 yet been installed, which accounted for the discrepancies between the preceding field and report counts. No other discrepancies were identified in either the design or installation reports and records for tray nodes 1057A, 2025A, 2039A, and 1073A. Thus, the design and installation records appeared to match the numbers of cables actually installed in the plant.

The RIII inspector also compared the number of cables specified in the S&L Cable Pan Loading Report for tray nodes 2023A against the H. J. Kaiser Cable Monitoring Report. The cables on the two reports matched.

3. The RIII inspector inquired how the computerized design index program correlated to Zimmer FSAR Section 8.3.3.1 (dealing with ampacity) and Section 3.10.1.2.3.c (dealing with physical weight limitations).

   a. FSAR Section 8.3.3.1 states the following:

      8.3.3.1.1 In Trays

      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 [Insulated Power Cable Engineers Association] Publication No. P-46-426.

      8.3.3.1.2 Not In Trays

      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

      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.

FSAR Section 3.10.1.2.3.c states, "Cable tray loading of 40 psf (pounds per square foot) is used throughout."

b. On March 17 and March 19, 1981, the S&L Assistant Manager of Electrical Engineering 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 P-54-440 (1975), which was based on Stolpe's Paper, and S&L Standard ESA-104a (revised November 1, 1972).

The Stolpe method bases ampacity on the depth-of-fill design of cables in the tray rather than on the percentage fill. S&L uses a 2-in. depth-of-fill as the basis for selecting a cable for a particular ampere load.

(1) The 2-in. depth-of-fill design results in a major conservatism because of the following:

(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 oversized cables for most services. This means many cables would be capable of carrying larger currents (rated) than those 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. The design index is a measure of tray fill and is expressed mathematically as follows:

$$\text{Design Index} = \frac{\text{The sum of the (cable diameters)}^2}{\text{Useable area of the tray}}$$

where useable area (UA) equals tray width times design depth-of-fill (design depth-of-fill is based on square cables) and 50% of the tray cross-sectional area.

For 24 in. x 4 in. power trays, the total area equals 96 sq in. and useable area equals 24 in. x 2 in. equals 48 sq in.

$$DI = \frac{E(d^2)}{UA}$$

where

E = summation
d = 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. Percent fill is also based on the actual cable cross-sectional area rather than the square cable that is assumed in the Stolpe method. Expressed mathematically,

$$\text{Percent Fill} = \frac{\text{Sum of cable cross-sectional areas x 100}}{\text{Total cross-sectional tray area}}$$

where the sum of cable cross-sectional areas equals $E(\text{pi} \times r^2)$ with r = radius of the cable and pi = 3.1416.

Thus,

$$\text{Percent Fill} = \frac{E\ (\text{pi} \times r^2) \times 100}{\text{Total area}}$$

The relation between design index and percent fill is therefore

$$\frac{\text{Percent Fill}}{\text{Design Index}} = \frac{\dfrac{E(\text{pi} \times r^2) \times 100}{\text{Total area}}}{\dfrac{E(d^2)}{\text{Useable area}}}$$

since the total area (TA) equals 2 times the useable area (UA) and d = 2 x r.

$$\frac{PF}{DI} = \frac{E\left[pi \times \frac{d^2}{4}\right] \times 100}{\frac{2(UA)}{E(d^2)}} = \frac{\frac{Pi}{4} E\,(d^2) \times 100}{\frac{2}{E(d^2)}}$$

$$= \frac{pi}{8} \times 100 = \underline{39.3\%} \text{ per DI}$$

Thus, for a 4-in.-deep tray:

39.3% Actual Fill = 1.0 Design Index = 2-in. design depth-of-fill (square cables)

50% Actual Fill = 1.27 Design Index = 2.54-in. design depth-of-fill (square cables)

60% Actual Fill = 1.52 Design Index = 3.04-in. design depth-of-fill (square cables)

and for a 6-in.-deep tray:

39.3% Actual Fill = 1.0 Design Index = 3-in. design depth-of fill (square cables)

Based on the preceding relationships between design index and depth of square cables, and the fact that S&L has used a 2-in. depth-of-fill as the basis of selecting cables for particular ampere loads, the cables in tray nodes with a DI over 1.0 would have to be re-evaluated considering the increased depths. This item is unresolved pending completion of the re-evaluations (358/81-13-15).

The above design basis for cable ampacity was a deviation from the design (FSAR) that was not identified on any control document. This is contrary to 10 CFR 50, Appendix B, Criterion III, and the Wm. H. Zimmer QA Manual, Section 3.6 (358/81-13-16).

On March 17, 1981, the S&L Assistant Manager of Electrical Engineering stated that appropriate modifications to the FSAR would be submitted. Also, specific consideration would be given to the differing types of cable insulations, addressed in the previously discussed publications (standards), when compared with the cable insulations used in Zimmer.

4. The RIII inspector reviewed S&L Instruction No. PI-ZI-10.1, Revision 0, dated February 6, 1978, 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 that had DIs in excess of 1.25. S&L provided calculations for nodes 2025A, 1057A, and 2027A. These calculations were performed in 1978 and 1979 and 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 dated February 24, 1981 of 37 routing points (nodes) with design indexes over 1.25. Thirty-four of these tray points exceed the 50% tray fill requirement specified in the FSAR, 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 DI over 1.25. These calculations will be provided to NRC Region III. This item is unresolved (358/81-13-17).

5. Neither S&L Instruction No. PI-ZI-10.1, Revision 0, nor any other document established controls to verify the thermal loading power of cable (penetration) sleeves and the physical (dead weight) loading of trays (power, control, and instrument).

   a. The Cable Pan Loading Report included the design indexes of sleeves. Sleeve #SL111 had a reported DI of 1.29 and sleeve #SL105 had a reported DI of 1.26. A controlled list of power sleeves with a DI over 1.25 was not maintained.

   b. S&L stated that a design index of 1.25 would be used as the factor to determine 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 (358/81-13-18).

   S&L revised Instruction PI-ZI-10.1, Revision 1, Sections 4.5, 4.6, and 4.7, on March 18, 1981 to include requirements to verify and control the thermal loading of power sleeves and the physical loading of all trays (power, control, and instrument) that 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 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 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 NRC Region III. This item is unresolved pending evaluation of the justification for using a design index program (358/81-13-19).

6. The RIII inspector observed a note on the bottom of the thermal calculation sheet dated December 27, 1979 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 that would have required appropriate evaluation and disposition. S&L personnel stated that a control program did not exist for such design deviations. This is contrary to 10 CFR 50, Appendix B, Criterion III, and the Wm. H. Zimmer QA Manual, Section 3.6 (358/81-13-20).

7. The RIII inspector determined the physical weight of yellow division control tray 1104B.

   The total weight of the cables for tray 1104B was determined to be

$$\frac{73.06}{2} = \underline{36.53} \text{ lb/ft}^2$$

   Therefore, tray 1104B (DI 1.54) is in compliance with FSAR Section 3.10.1.2.3. which allows up to 40 lb/ft^2.

Problems identified during investigaiton of this allegation are addressed in the licensee's Quality Confirmation Program.

5.10.4 Findings and Conclusions

This allegation raises concerns of potential safety importance that cannot be assessed without further inspections and evaluations by the licensee and NRC.

Cable tray hanger weld deficiencies in the cable spreading room had been reported to the NRC in July 1978 in accordance with 10 CFR 50.55(e). The licensee's corrective action of this matter was completed in January 1981. Although this matter was being carried as an open inspection item by NRC, the licensee's final corrective action was not reviewed prior to this investigation effort. This investigation effort disclosed that the hanger welds throughout the plant had not been inspected before the welds were painted or coated with fireproofing.

The acceptability of electrical tray hanger welds is unresolved pending (1) additional inspections of hanger welds, which will be made after paint and fireproofing have been removed, and (2) establishment of the quality of those welds for which in-process inspections were not performed and for which inspection criteria deviated from AWS Code requirements.

The acceptability of electrical cable trays fill and loading is unresolved pending the completion and review of tray-loading calculations for several

tray-routing points; re-evaluations of cable selections; establishment of the actual design basis and verification measures for cable tray loading; establishment of design measures to verify the thermal loading of power sleeves and the physical loading of trays; and establishment of measures to control design deviations.

It should be noted that the time to determine compliance with ampacity requirements is at the completion of the electrical design. According to the licensee and A/E this was to be accomplished.

These concerns are addressed in the licensee's Quality Confirmation Program.

5.10.5 Items of Noncompliance

Six items of noncompliance were identified. (Failure to identify and control unacceptable welds on four cable tray hangers; failure to execute the programs for inprocess and final (before painting) inspections of cable tray hanger welds; failure to assure that appropriate weld inspection criteria (1/32 inch undercut) was specified in design documents; failure to control deviations from the design basis for cable ampacity; failure to establish measures to assure verification of the design adequacy of the thermal loading of power sleeves and the physical loading of trays; and failure to establish measures to assure that design deviations, identified by S&L engineer, were controlled).

These items have generic applicability to plants designed by S&L and are being forwarded to NRC Region IV, Vendor Inspection Branch for generic followup.

5.11 Clogged Intake

5.11.1 Allegation

"Sand and mud choke the feedwater pumps and intake flues carrying makeup water to the cooling tower, because of a flaw in the plant's design. Pumps used to rectify the flaw quickly burn out."

During an interview with Thomas Applegate and a GAP representative (Thomas Devine), it was clarified that this allegation pertained to the river intake. The river intake provides service water, not feedwater.

5.11.2 Background Information

10 CFR 50.55(e) requires licensees to report to NRC major defects found during construction or operation of power reactors. These reports are public documents, maintained in NRC files and Public Document Rooms.

The licensee reported silting conditions in CG&E letters QA-1148 dated June 20, 1979, and QA-1168 dated July 23, 1979, and service water pump impeller wear conditions in letters QA-1196 dated September 6, 1979, QA-1239 dated December 31, 1979, and QA-1371 dated December 17, 1980, that were sent to NRC Region III pursuant to the requirements of 10 CFR 50.55(e). Copies of these letters are included as Exhibit 51.

The silting and pump impeller wear conditions, along with the measures to correct these conditions, are described in Appendix J of the Wm. H. Zimmer FSAR, Revision 69, dated December 1980 (see Exhibit [redacted]).

5.11.3 Investigation

A review was made of the 10 CFR 50.55(e) reports and related documents. Additional investigation was not performed by RIII because the matter was known and resolution was in progress.

The corrective measures to be taken, as described in licensee submittals, have been reviewed and accepted in Subsection 9.2.1 of NUREG-0528, "Safety Evaluation Report (SER) Related to the Operation of Wm. H. Zimmer Nuclear Power Station, Unit 1," Supplement 1, issued in June 1981 by the Office of Nuclear Reactor Regulation, U.S. Nuclear Regulatory Commission.

The implementation of these corrective measures is unresolved pending completion of the corrective measures described in the Wm. H. Zimmer FSAR, Appendix J, Revision 69, dated December 1980 (50-358/81-13-31).

5.11.4 Findings and Conclusions

The licensee reported the silting condition concerning the service water intake structure to NRC Region III by telephone on June 18, 1979 and by letters QA-1148 on June 20, 1979 and QA-1168 dated July 23, 1979 pursuant to the requirements of 10 CFR 50.55(e). The plant design and operating procedures had to be modified to control the silting condition.

Accelerated service water pump impeller wear was reported by the licensee by telephone on August 10, 1979, and by letters QA-1196 dated September 6, 1979, QA-1239 dated December 31, 1979, and QA-1371 dated December 17, 1980, pursuant to the requirements of 10 CFR 50.55(e).

The silting and pump impeller wear concerns are open items pending completion of corrective measures described in the Wm. H. Zimmer Final Safety Analysis Report (FSAR), Appendix J, Revision 69, dated December 1980 (including a sedimentation monitoring program and plant modifications) and review by RIII inspectors. The implementation of these corrective measures will be reviewed during a subsequent inspection.

5.11.5 Items of Noncompliance

No items of noncompliance were identified.

5.12 Overpressurization Incident

5.12.1 Allegation

"A design flaw in the heat exchanger control panel permitted an operator mistakenly to force 1200 pounds of pressure through pipes only meant to handle 300 pounds, ripping the pipe and soaking electricians with a hard spray of water that would have been radioactive had the plant been in operation."

5.12.2 Background Information

10 CFR 50.55(e) requires licensees to report to NRC major defects found during construction or operation of power reactors. These reports are public documents, maintained in NRC files and Public Document Rooms.

The licensee reported the overpressurization incident in CG&E letter QA-1106 dated March 2, 1979 (see Exhibit 53) pursuant to the requirements of 10 CFR 50.55(e). The report indicated that on January 19, 1979, during a construction test to demonstrate the flow rate through the high-pressure core spray (HPCS) system orifice, the steam jet air ejector was overpressurized and failed. The report alludes to two operator errors as the cause of the overpressurization. The errors involved two administratively controlled valves, which were incorrectly documented as closed. "Administratively" means that the valve positions (e.g., open, closed, etc.) are verified and documented in accordance with site procedures.

Although water in the HPCS system is not presently radioactive, it can be contaminated during normal operation.

The 10 CFR 50.55(e) report also stated that the design, utilizing two administratively controlled valves, was permitted by the ASME Section III Code, and concluded that the overpressurization incident was not due to a design deficiency, although a check valve would have compensated for the two operator errors.

5.12.3 Investigation

5.12.3.1 Interview with Individual A

On April 22, 1981, Individual A, who was previously interviewed by representatives of GAP, was interviewed by NRC. Individual A stated he recalled an incident when the heat exchanger control panel was pressurized with 1200 pounds of pressurized water when it was only meant to handle 300 pounds. He said he learned that high-pressure water entered the low-pressure system and ruptured pipes in the low-pressure system. He said two electricians in the area were doused with water when the pipes ruptured. He related that other plant employees said this incident occurred because an operator apparently failed to turn off a valve allowing high-pressure water to enter the low-pressure system.

On April 22, 1981, Individual A provided a written sworn statement ~~attesting to the preceding information;~~ however, he requested the statement not be attached to this report.

5.12.3.2 Interview with Individual B

On April 14, 1981, Individual B, who was previously interviewed by representatives of GAP, was interviewed by NRC. Individual B stated he recalled an incident when the "alpha air injector condenser" on the ground floor of the turbine building was injected with high-pressure water instead of low-pressure water and the pipes in the condenser ruptured. He said other workers in the

plant told him this occurred because an operator failed to close the high-pressure valve and the high-pressure water entered the low-pressure system that ruptured the lines.

On April 24, 1981, Individual B provided a written sworn statement ~~attesting to the preceding information;~~ however, he requested the statement not be attached to this report.

5.12.3.3 Record Review

Region III inspectors have previously reviewed the overpressurization concern as documented in the following excerpts of IE Inspection Reports No. 79-06, Section 8; No. 79-23, page 4; No. 79-29, pages 4 and 5; and No. 80-06, page 2.

Report No. 79-06, Section 8

"The inspector reviewed the event of January 19, 1979, during which high pressure core spray (HPCS) water entered the condensate (CD) and low pressure core spray (LPCS) systems because valves 1E22-F003 and F031 had been left open causing a rupture of the steam jet air ejector condenser 1A. The review consisted of interviews with testing and operating personnel and a review of the licensee's final report on his investigation of the event. The review showed that:

"a. Procedure OP.HP.01-4, Revision 0 was used to lineup, fill and vent the HPCS system.

"b. At the completion of the fill and vent operation the operator never completed Step 5.1.5 which required him to close valves 1E22-F003 and F-31. With these two valves open the CD and HPCS systems became crosstied thru the cycled condensate (CY) system. The operator claims he informed the Shift Supervisor that he had left the two valves open while the latter does not recall being told. This failure to follow procedures is contrary to 10 CFR Part 50, Appendix B, Criterion V and is considered to be an example of an item of noncompliance (358/79-06-06B) of the infraction level.

"c. For some unknown reason, valve 1E21-F025 which had been safety tagged closed under Switching Order No. 781317, dated November 16, 1978, was in the open position. This completed the cross connection of the LPCS and HPCS systems. Violation of Switching Order No. 781317 is contrary to 10 CFR 50, Appendix B, Criterion V and is considered an example of an item of noncompliance (358-79-06-06C) of the infraction level. The switching order was cleared on January 24, 1979. The corrective action which the licensee is currently taking regarding a previous noncompliance with the safety tagging procedure (358-79-01-01) is also applicable to this event, therefore the inspector stated no response to this item of noncompliance is required.

"d. Paragraph 13.0 of Safety Tagging Procedure EC.SAD.02, Revision 00 allows for the operation of equipment for test purposes without the removal of the safety tags. It is possible that valve 1E21-F025 was operated for test purposes thru tags and subsequently left open by

error. The inspectors have objected to Paragraph 13.0 of the Safety Tagging Procedure.

"On March 21, 1979, the licensee issued operating memo 79-2, Revision 9, which specifically requires that "Do Not Operate" tags must be removed before energizing electrical equipment or opening valves. An exception is made in the case of electrical testing conducted by EOTD in which case only the EOTD master tag will be left in place.

"e. On December 12, 1977, a General Electric system engineer recommended that a check valve be installed on line 1HP18A3 downstream of valve 1E22-F013) because a similar overpressurization of a small section of low pressure piping had occurred. The recommendation was rejected because the licensee thought that two valves (1E22-F003 and F031) plus administrative controls were sufficient to prevent recurrence. The licensee stated the check valve will be installed. All other ECCS systems have check valves in the line from the CY system.

"The inspector stated his concern regarding repeatable occurrences where a lack of communication or understanding between parties have resulted in damage to equipment. It is our intention to closely monitor the licensee's performance during the preoperational test program to determine the adequacy of plant staffing and training as fuel load date approaches."

Report No. 79-06, page 2

"(Closed) Noncompliance (358/79-01-01). Failure to follow safety tagging (switching order) procedure. The inspector found that the licensee is conducting safety tagging refresher training for all operations personnel and systems engineers as stated in their letter, Borgmann to Heishman, dated February 28, 1979."

Report No. 79-23, page 4

"(Open) 10 CFR 50.55(e) Report: Overpressurization of the steam jet air ejector heat exchanger (tube side). The inspector established that a check valve has been installed as stated in the licensee's report dated March 1, 1979 (QA-1106). This item remains open pending further review by NRC Operations Branch."

Report No. 79-29, pages 4 and 5

"(Closed) Overpressurization of the steam jet air ejector heat exchanger (tube side). NR number 7247R1, dated February 21, 1979, stated that over pressure to 1200 psi of the LPCS piping system occurred in addition to others. The A-E (Sargent and Lundy) analyzed the piping system and valves with dispositions as follows:

"1. Carbon steel piping 3/4" up to 12" acceptable since stress was well below yield point.

"2. The one stainless steel 3/4" pipe is likewise o.k.

"3. Six hundred pound valves are acceptable with the pressure experienced only being a repeat hydro test.

"4. Three hundred pound and 150 pound valves the manufacturer should be consulted.

"5. The relief valve causing the problem should be retested and reset.

"Further information available (Construction Engineering Report dated April 14, 1979) stated that the valve manufacturers recommended a seat leakage test be conducted on the valves and that this test was performed without any leaks being detected and it further stated that the relief valve had been removed, tested and reset of set points done. The NR was signed as completed on October 25, 1979. The inspector indicated that he had no further questions regarding this item."

Report No. 80-06, page 2

"(Closed) Noncompliance (50-358/79-06b). Failure to follow OP.HP.01-4 valve lineup. (Not closing valves IE22-F003 and IE22-F031.) The inspector reviewed the licensee's action to prevent further non-adherence to procedures and found them acceptable."

The licensee's General Engineering Department's report of April 24, 1979 (excluding attachments and tables) that documents the final disposition of NR-7247R1, is included in Appendix B.

5.12.4 Findings and Conclusions

The overpressure event referred to in the allegation was reported to the NRC in March 1979, in accordance with 10 CFR 50.55(e). The event was caused by operator errors, that incorrectly permitted two valves to remain open, rather than inadequate system design.

The actions taken by the licensee to assure the quality of the affected piping and components and to prevent recurrence had been reviewed by the NRC prior to the allegation and found satisfactory.

5.12.5 Items of Noncompliance

No new items of noncompliance were identified.

5.13 Lax Fuel Security

5.13.1 Allegation

"There have been periods when there were no security surveillance cameras during nuclear fuel deliveries to the site, and perimeter security consisted for an extended period of only a four foot chickenwire fence."

On February 26, 1981, during a meeting between NRC officials, Thomas Devine (GAP representative) and Thomas Applegate at the Region III NRC office, they advised that, among others, former Yoh Security Officers Jeffrey Hyde and Ronald Wright were aware of periods of time when the nuclear fuel was left unattended. It was alleged these situations presented a threat to the public health and safety and left the fuel susceptible to terrorism, theft, and/or diversion.

In addition, it was alleged that the walls of the fuel storage area were "blow-out" walls, designed to give way during tornadoes.

5.13.2 Background Information

On June 26, 1978, NRC Special Nuclear Material License No. SNM-1823 was issued to CG&E authorizing receipt, possession, inspection, and storage (at the Wm. H. Zimmer Nuclear Power Station) of 2,000 kilograms of uranium-235 (U-235) reactor fuel at an enrichment not to exceed 2%. The U-235 CG&E received was in the form of new (unirradiated) reactor fuel assemblies. These assemblies are stored on the 627-ft level (seventh floor) of the reactor building in the spent fuel pool area.

Nuclear fuel enriched above natural levels but less than 10% in the U-235 isotope is defined under 10 CFR 73.2(y) as "special nuclear material of low strategic significance." The physical protection requirements for possession of special nuclear material of low strategic significance at a fixed site are set forth in 10 CFR 73.67(f), which states the following:

> "Each licensee who possesses or uses special nuclear material of low strategic significance at fixed sites, except those who are licensed to operate a nuclear power reactor pursuant to Part 50, shall:
>
> "(1) Store or use the material only within a controlled access area,
>
> "(2) Monitor with an intrusion alarm or other device or procedures the controlled access areas to detect unauthorized penetrations or activities,
>
> "(3) Assure that a watchman or offsite response force will respond to all unauthorized penetrations or activities, and
>
> "(4) Establish and maintain response procedures for dealing with threats of thefts or thefts of such material."

The licensee is obligated to abide by the preceding requirements and any special conditions set forth or committed to in Special Nuclear Material License No. SNM-1823. A licensee (prior to being granted an operating license) is not required to comply with other more stringent physical security requirements of 10 CFR 73 and related Appendix B.

During NRC safeguards inspections conducted on September 25, 1979 (Report No. 70-2838/79-01) and January 22-23, 1981 (Report No. 70-2838/81-01), it was determined that the licensee was complying with the requirements of 10 CFR 73.67(f) and License No. SNM-1823 with regards to protection and storage of the nuclear fuel.

NRC License No. SNM-1823 requires that administrative controls be used to control access to the new fuel storage area. To implement the provisions of the license and 10 CFR 73.67(f), the licensee wrote and included in the Station Administrative Directives, Procedure No. SE.SAD.03 Rev. 1, which is entitled "Interim Access Control, New Fuel Storage Area." The primary purpose of this directive (as well as subsequent related procedural issuances and revisions) is to provide the administrative requirements for access control to the 627-ft elevation of the reactor building during receipt, inspection, and storage of new fuel, in accordance with their NRC license. Procedure No. SE.SAD.03 Rev. 1, requires that a minimum of one watchman be stationed at the location where normal entry and/or exit to the 627-ft elevation is controlled. The watchman's purpose in being stationed at this location is to control access and maintain surveillance of the 627-ft elevation during receipt, inspection, and storage of new fuel. "Watchman" as used in this context is defined by 10 CFR 73.2(d) as "an individual, not necessarily uniformed or armed with a firearm, who provides protection for a plant and the special nuclear material therein in the course of performing other duties."

In August 1979, when CG&E was preparing to receive the first shipment of nuclear fuel, CG&E contracted with Yoh Security, Inc., to provide ten security officers (watchmen) for the sole purpose of providing security for the receipt and subsequent storage of the nuclear fuel. Yoh Security personnel were required to adhere to the policy and/or procedures prepared by CG&E Security Supervisor, Frederick Lautenslager. CG&E did not exercise direct supervision over Yoh Security personnel, but provided the procedural requirements through the Yoh Lead Security Officer.

CG&E is not required by NRC regulations to have armed security officers for protection of new unirradiated nuclear fuel; however, the licensee chose to arm Yoh Security personnel with .38 caliber Smith & Wesson revolvers. There was no NRC requirement for such watchmen to be trained and/or to qualify with their assigned firearms. Subsequent to NRC expressing concern that the armed officers did not have specific firearms training and qualification, CG&E (effective as of March 1980) took action to assure that all security officers assigned to armed security responsibilities were trained and had qualified with their assigned firearms in accordance with procedures CG&E established. Prior to March 1980, armed security officers were selected based on previous firearms training experience that they had acquired from former military and/or police service.

Deliveries of nuclear fuel to Zimmer took place during the period August 15 through September 7, 1979. The shipping casks (containing two fuel assemblies each) in which the nuclear fuel was delivered measured approximately 15 ft in length by 21 in. in width and 11 in. in height. The fuel assemblies themselves were contained within a metal shipping container that was, in turn, enclosed within a wooden shipping container. A wooden and metal

shipping container together composed what is referred to as a single shipping cask. A wooden shipping container by itself weighed approximately 760 lb, a metal shipping container approximately 620 lb, and each fuel assembly approximately 685 lb. This made the approximate total weight of a single shipping cask (with two fuel assemblies enclosed) 2,750 lb. Subsequent to receipt of a shipping cask at the site, the metal shipping container was uncrated from the wooden shipping container at the ground level. The metal container (with fuel assemblies enclosed) was then lifted by crane to the 627-ft level of the reactor building (refueling floor) and temporarily stored in the metal containers. After the fuel assemblies were removed from the metal containers, they were inspected for possible damage, channelled, and then lowered into fuel racks located inside the spent fuel pool for storage. As a further assurance that the fuel has not been damaged while in storage, it will be examined by the licensee prior to loading it into the reactor.

Unirradiated fuel, although radioactive, does not pose a significant health and safety problem regarding radiation emissions. It is only subsequent to being loaded into the reactor and becoming irradiated during plant operation that the uranium becomes contaminated with the intensely radioactive products of the fission reaction, causing it to be highly radioactive.

The nuclear fuel, in its current form, contains a low percentage of U-235 enrichment, has little or no potential for use in any type of nuclear weapon, and thus has been defined as "special nuclear material of low strategic significance."

Additional security-related background information is also contained in Section 5.14.2.

5.13.3 Investigation

5.13.3.1 Interview with Jeffrey Hyde

On March 26, 1981, Jeffrey Hyde was interviewed by NRC. Hyde was also interviewed by telephone on June 9, 1981. He stated he was employed as a security officer with Yoh Security and stationed at the Wm. H. Zimmer Nuclear Power Station from August 1979 to October 1980. While stationed at Zimmer and assigned the duty of protecting the nuclear fuel, Hyde advised he became aware of approximately four occasions when the fuel was left unattended. He related that these instances occurred while the fuel was at ground level (prior to the time it was moved to the 627-ft level) with each instance lasting approximately 4 to 5 minutes, except for one that lasted approximately 10 minutes. Hyde explained that, subsequent to receipt, the nuclear fuel was moved by maintenance workers with the help of a crane from the ground level to the 627-ft level where it is currently stored. During this operation, there were usually two or three Yoh Security Officers stationed on the 627-ft level as the fuel was raised by crane and brought to rest on that floor. On various occasions, there were no security officers at the ground level watching the fuel as it was being moved and raised to the 627-ft level because officers were not required to watch the fuel during times it was under the control and/or observation of maintenance workers. Hyde stated the problem arose when the maintenance workers ended

their work shifts and left the area before he arrived at the ground level to keep watch over fuel that had not yet been moved to the 627-ft level. This resulted in the fuel being left unattended during those periods. (It should be noted that the licensee's procedures did not require continuous surveillance of the new fuel until it was in storage in the new fuel storage area).

Hyde was asked what, if any, personal knowledge he had of the fuel being left unattended while it was stored on the 627-ft level. He stated that he did not recall any instances when the fuel (while on the 627-ft level) was left unattended, except during those instances when the area radiation monitor (ARM) alarm was sounded. Hyde explained that, during occasions when the ARM alarm was sounded, security procedures required all persons present on the 627-ft level to be evacuated to a lower elevation level (floor). He indicated that, once everyone was evacuated to a lower elevation (e.g., the 593-ft level), access to the 627-ft level could still be controlled without a loss of security integrity (individuals going to the 627-ft level would have to pass through the 593-ft level).

On March 26, 1981, Hyde provided a written statement ~~attesting to the preceding information~~, a copy of which is included as Exhibit .

5.13.3.2 Interview with Ronald Wright

On March 10, 1981, Ronald Wright was interviewed by NRC. Wright was also interviewed by telephone on March 12, 1981. He stated that he was employed as a security officer with Yoh Security and stationed at the Wm. H. Zimmer Nuclear Power Station from October 1979 to October 1980. Wright was asked what, if any, personal knowledge he had of the nuclear fuel being left unattended. He responded that the only times he recalled leaving the fuel unattended was once when he evacuated the 627-ft level during an earthquake and once during a tornado warning. He indicated that, although he left the 627-ft level on those occasions, he was still able to control access to the 627-ft level from a lower elevation of the reactor building (e.g., the 593-ft level) without losing security integrity.

Wright also noted that when instances arose during which no other security officers were available and he had to leave the 627-ft level for some reason, he would call the control room and someone would relieve him at his post until he returned.

He stated to the best of his knowledge there was always someone present on the 627-ft level watching the fuel pool area where the fuel was stored, except during the described instances.

On March 10, 1981, Wright provided a written statement ~~attesting to the preceding information~~, a copy of which is included as Exhibit .

5.13.3.3 Interview with Frederick Lautenslager

On February 24-25 and March 13, 1981, Frederick Lautenslager was interviewed by NRC. He stated that he is employed as the CG&E Security Supervisor and

has been assigned to the Wm. H. Zimmer Nuclear Power Station since August 1978. Lautenslager verified that no security surveillance cameras were used during nuclear fuel deliveries in August-September 1979 and remarked that there is no requirement for surveillance cameras to be used during deliveries. He noted that surveillance cameras were subsequently installed in December 1980 (part of required security for an operational plant).

With regard to the protection of the nuclear fuel during delivery, Lautenslager remarked that, although there was no requirement for security for the nuclear fuel while it was being unloaded from the delivery trucks and uncrated, CG&E provided armed security protection and surveillance over the fuel (beginning at the time it arrived on CG&E property). They also maintained this security profile during unloading, uncrating, inspection and subsequent storage of the fuel on the 627-ft level.

Lautenslager stated that, to the best of his knowledge, the nuclear fuel has not lacked armed security protection at any time since it was received at Zimmer. He also stated that once the fuel was placed in the spent fuel pool for storage, as well as during fuel inspection, access to the storage area has been under security control of the officers assigned to station security.

The only time the access control security officer is permitted to leave the 627-ft elevation is during evacuations covered by written security procedures. Lautenslager advised that, to his knowledge, there has been only one incident in which the officer left the 627-ft elevation. This incident, which occurred during an earthquake, involved the security officer moving to the 593-ft elevation where he was still able to control access to the 627-ft level and prevent any loss of security integrity.

On March 27, 1981, Lautenslager provided a typwritten statement ~~attaching to the preceding information~~ a copy of which is included as Exhibit [redacted].

Frederick Lautenslager was interviewed by telephone on June 3, 1981, concerning the allegation that "perimeter security consisted for an extended period of time of only a four foot chickenwire fence." He stated that he recalled a fence fitting that general description being used around the plant site some time ago and described the fence as an "owner controlled fence," which marked the boundary line of CG&E's property. Lautenslager indicated that the fence would have been on areas outside the jurisdiction of the station security system, the primary concern of which was protection of the nuclear fuel.

5.13.3.4 Interview with James Caplinger

On March 12, 1981 James Caplinger was interviewed by NRC. He stated that he was employed as a lead security officer with Yoh Security and stationed at the Wm. H. Zimmer Nuclear Power Station from August 1979 to October 1980.

With regard to protection of the nuclear fuel, Caplinger advised that, to his knowledge, the fuel was never left unattended except during required evacuations. He explained that during an evacuation of the seventh floor fuel storage area the security officers repositioned themselves on the sixth

floor and were still able to control access to the seventh floor without a loss of security integrity.

On March 12, 1981, [Caplinger] provided a written statement ~~attesting to the preceding information~~, a copy of which is included as Exhibit [redacted].

5.13.3.5 Interview with William Ross

On March 11, 1981, William Ross was interviewed by NRC. He stated he was employed as a lead security officer with Yoh Security and stationed at the Wm. H. Zimmer Nuclear Power Station from March 1979 to February 1980.

Ross stated he personally felt that a minimal job had been done to protect the nuclear fuel. He also stated that he did not recall any times during which he left the fuel unattended.

On March 11, 1981, Ross provided a written statement ~~attesting to the preceding information~~, a copy of which is included as Exhibit [redacted].

5.13.3.6 Interview with John Bedinghaus

On March 12, 1981, NRC staff interviewed John Bedinghaus by telephone. On March 25, 1981, he was interviewed in Williamsburg, Ohio. He stated that he was employed as a security officer with W&W Security and assigned to nuclear fuel protection duties at the Wm. H. Zimmer Nuclear Power Station from October 1980 to January 1981. Bedinghaus was questioned about the adequacy of nuclear fuel security during the time he had been stationed at Zimmer. He stated that the fuel storage area on the seventh floor was well protected and the security officers assigned to fuel protection were conscientious in performing their duties. Bedinghaus also indicated that, to his knowledge, the fuel was never left unattended and no unauthorized persons were allowed entry into the fuel storage area.

On March 25, 1981, John Bedinghaus provided a written statement ~~attesting to the preceding information~~, a copy of which is included as Exhibit [redacted].

5.13.3.7 Interview with David Simpson

On March 11, 1981, David Simpson was interviewed by NRC. He stated he was employed as a security officer with Yoh Security and stationed at the Wm. H. Zimmer Nuclear Power Station from September 1979 to October 1980. Simpson was questioned about the adequacy of nuclear fuel security during the time he had been stationed at Zimmer. He advised it was his opinion that CG&E's procedures for protection of the nuclear fuel were good and the protection of the fuel itself was more than adequate. Simpson stated that he had no complaints or concerns regarding the adequacy of the protection of the nuclear fuel at Zimmer.

On March 11, 1981, Simpson provided a written statement ~~attesting to the preceding information~~, a copy of which is included as Exhibit [redacted].

5.13.3.8 Interview with James Bice

On April 20, 1981, NRC staff interviewed James Bice by telephone. He stated he was employed as a security officer with Yoh Security and stationed at the Wm. H. Zimmer Nuclear Power Station from September 1979 to July 1980. Bice was questioned about the adequacy of nuclear fuel security during the time he had been stationed at Zimmer. He stated that, to his knowledge, there were no instances when the fuel was left unattended except during evacuations (covered by written procedures) following area radiation monitor (ARM) alarms. On those occasions when the seventh floor was evacuated following an ARM alarm, the security officers would move to the sixth floor, secure the elevator, and continue to control access to the seventh floor from the sixth floor. Bice indicated there was no loss of security integrity during these instances.

5.13.3.9 Review of Unattended Fuel

Based on the information obtained, the
A Fuel was apparently left unattended for short periods of time (up to 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. while at ground level ~~In view of the~~ protection, was afforded the fuel by the shipping container. ~~and the fact that~~ There ~~was~~ is no evidence, to indicate ~~that~~ the shipping containers had been ~~opened,~~ tampered with or opened. ~~this matter is not viewed as significant.~~

<INSERT>

5.13.3.10 Review of Storage Area Wall Design

The Zimmer FSAR, Section 3.3.2, "Tornado-Loading," 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,

1. The blow-out design feature is to protect safety structures from collapse;

2. The spent fuel storage facility, which will store the spent fuel under water once it becomes radioactive, is designed to preclude significant loss of watertight integrity of the pool and to prevent missiles from contacting fuel within the pool;

5.13.4 Findings and Conclusions

Security surveillance cameras were not installed during nuclear fuel deliveries to the site and NRC regulations did not require them to be in service at that time. Interviews with former security guards confirmed the nuclear fuel while inside it's metal shipping container was left unattended for periods of time up to 10 minutes on occasion. This practice was acceptable. Since the fuel has been onsite, there has been no known attempt to steal or damage the fuel. The fuel has been inspected and will be visually examined again before it is loaded into the reactor.

The allegation that the perimeter security consisted of only a 4-ft chicken-wire fence was confirmed by one individual; however, NRC regulations do not prescribe site security requirements prior to issuance of the operating license.

The FSAR states "all siding and roof decking of any superstructure is designed and detailed to blow off when the design tornado approaches the station." This is an acceptable design.

5.13.5 Items of Noncompliance

No items of noncompliance were identified.

5.14 Alcohol and Drug Abuse

5.14.1 Allegation

"A lax attitude toward employee behavior was evidenced by complete disregard of drinking and drug use on the site, and routine hiring of temporary laborers prone to violence."

On February 24, 1981, during a meeting with NRC officials, Thomas Devine (GAP representative) and Thomas Applegate at the Region III NRC office, they advised that, among others, former security officers Ronald Wright, Jeffrey Hyde, and David Simpson had knowledge of "people who were drunk on the job;" "people who were frequently intoxicated;" and "construction workers walking around smoking dope, drinking moonshine liquor, getting drunk...."

5.14.2 Background Information

A brief history and description of plant security is provided in the following paragraphs. Portions of this information are based on statements received during interviews with Frederick Lautenslager, CG&E Security Supervisor, and Norborne C. Ward, President of W&W Protection Agency, Inc., the current security service contractor at Zimmer.

"Construction security" may be defined as the protection of property used in and for construction activities at Zimmer, and the protection of those areas in which construction is taking place. NRC does not impose security requirements on licensees during plant construction. Construction security does not extend to the 627-ft level (seventh floor) of the reactor building (spent fuel pool area) where the nuclear fuel is stored, and does not extend to those areas specifically released by the construction project manager and signed for by the CG&E Electric Production Department (EPD). The protection of the above areas not related to construction and the protection of the nuclear fuel is defined as "station security." "Construction security" and "station security" are two separate security operations.

From the start of plant construction until September 1976, the H. J. Kaiser Company maintained its own security force that was responsible for construction security matters at Zimmer. In September 1976, W&W took over from Kaiser and became the sole security contractor, using

the same security procedures that had applied to Kaiser's security force. The primary responsibility for construction security is vested in the construction project manager, although in essence W&W has been informally delegated the authority to conduct security activities on his behalf.

In August 1979, while preparing to receive the first shipment of nuclear fuel, CG&E contracted with Yoh Security to provide ten security officers (armed watchmen) for the sole purpose of providing security for the receipt and subsequent storage of the nuclear fuel. Yoh Security personnel were required to adhere to policies and procedures prepared by CG&E Security Supervisor Frederick Lautenslager; however, CG&E did not exercise direct supervision over the Yoh Security Officers. The CG&E Security Supervisor coordinated the requirements of CG&E security procedures through the Yoh lead security officer, who had responsibility for implementing those directives. Specifically, the jurisdiction of the CG&E Security Supervisor and Yoh Security Officers extended only to areas that were included under the definition of "station security." Therefore, from a security standpoint, the primary concern of the CG&E Security Supervisor and Yoh Security was protecting the spent fuel pool area where the nuclear fuel was stored and controlling access to that area on the 627-ft level (seventh floor) of the reactor building.

At the request of Yoh Security officials in October 1980, CG&E terminated Yoh's contract to provide officers for station security. W&W, upon Yoh's leaving, assigned some officers exclusively for station security. The W&W officers assigned to station security conducted security activities in accordance with the same procedures and under the same supervisory structure as those that had applied to Yoh. (Additional security-related background information is also contained in Section 5.13.2.)

The allegation was reviewed to determine if it had any significance regarding matters under NRC jurisdiction; specifically, the review attempted to determine if the adequacy of construction of safety-related systems was compromised by individuals who performed work in safety-related areas during times when their ability to perform their job was impaired due to use of intoxicants. To help make this determination, two basic questions were asked of persons interviewed, who stated they observed workers who in their opinion were intoxicated. In essence, the following questions were asked:

1. Did you ever observe anyone who in your opinion was intoxicated to the point where their ability to perform their job was impaired?

2. If so, where did you observe these individuals?

5.14.3 Investigation

5.14.3.1 Interview with Ronald Wright

On March 10, 1981, Ronald Wright was interviewed by NRC. He stated that he was employed as a security officer with Yoh Security and was stationed at Zimmer from October 1979 to October 1980. While stationed there, he observed what he believed to be evidence of alcohol and drug use by workers at the Zimmer site. At least once a week while on patrol at the site, Wright would

find quantities of beer cans on the auxiliary building roof and in a lunch/break area that was then located in the diesel generator room. He related that on many occasions (he could not recall a specific number) he discovered what appeared to be marijuana cigarette butts in one or two small rooms accessible from the rooftop of the radwaste building. Wright stated that on one occasion he discovered four or five capsules of material (colored black and yellow or black and orange) that appeared to be some type of drug. These capsules were discovered between the two locker rooms on the second floor of the service building. Wright was unable to recall what disposition he made of these suspected narcotic materials and was unaware whether any analysis was ever performed to identify the materials.

Wright related that he was personally aware of two separate instances in which construction workers, who in his opinion were intoxicated to the point that they were unable to perform their duties, reported for duty at the seventh floor entrance to the spent fuel storage pool. The two workers involved in these incidents were refused access to the spent fuel pool area on those occasions.

He also stated that, in his opinion, a former Yoh Lead Security Officer was very intoxicated on at least two occasions when he reported for work and (based on the smell of his breath and his conduct) was somewhat intoxicated on other occasions.

On March 10, 1981, Wright provided a written statement ~~attesting to this information~~, a copy of which is included as Exhibit [redacted].

5.14.3.2 Interview with Jeffrey Hyde

On March 26, 1981, Jeffrey Hyde was interviewed by NRC. He stated that he was employed as a security officer with Yoh Security and was stationed at Zimmer from August 1979 to October 1980. While stationed at the plant, he observed what he believed to be evidence of alcohol use indicated by the empty beer cans and liquor bottles in various areas of the plant. Hyde was able to recall only one instance when he observed a construction worker who, in his opinion, appeared to be intoxicated to the point that his ability to perform his job was impaired. He observed this worker at the seventh floor entrance to the spent fuel pool area. Hyde indicated that when the workers condition was noted, he was prohibited entry to the fuel storage area, removed from the floor, and suspended from work assignments on that floor.

Hyde also stated that he observed on several occasions (more than five but less than ten) a former Yoh lead security officer who, in his opinion, was intoxicated to the point that his ability to perform his job was impaired.

On March 26, 1981, Hyde provided a written statement ~~attesting to the above information~~, a copy of which is included as Exhibit [redacted].

5.14.3.3 Interview with David Simpson

On March 11, 1981, David Simpson was interviewed by NRC. He stated he was employed as a security officer with Yoh Security and was stationed at

Zimmer from September 1979 to October 1980. While stationed there, he observed what he believed to be indications of alcohol use by the workers at Zimmer. Simpson advised that on many occasions, particularly on the main floor of the turbine building, he discovered quantities of empty beer cans and liquor bottles. He remarked that, although he never observed any workers who, in his opinion, were intoxicated to the point their ability to perform their job was impaired, he believed it was reasonable to assume some workers' ability to perform was at times impaired, based on the number of empty beer cans and liquor bottles found.

Simpson stated he had no personal knowledge regarding the extent of drug use, although on one occasion while outside the reactor building, he detected the odor of what appeared to be burning marijuana.

Simpson indicated he had no knowledge of any former Yoh Lead Security Officer being intoxicated while on duty and, in his opinion, the former lead officer never appeared to be intoxicated while on duty.

On March 11, 1981, Simpson provided a written statement ~~attesting to the preceding information~~, a copy of which is included as Exhibit [redacted].

5.14.3.4 Interview with William Ross

On March 11, 1981, William Ross was interviewed by NRC. He stated he was employed as a lead security officer with Yoh Security and was stationed at the Wm. H. Zimmer Nuclear Power Station from March 1979 to February 1980. While stationed there, Ross observed what he believed to be indications of alcohol and drug use by workers at Zimmer. Ross advised that, on a few occasions, he had seen construction workers drinking beer during their lunch hours, although he had never noticed whether this drinking had any apparent affect on the workers' ability to perform their jobs. Ross indicated Yoh security officers were instructed not to confront workers who were observed drinking in nonstation security areas but rather to obtain information such as the payroll number or name on their hard hats that could be used to identify the individuals. If identifying information was secured, it was referred to the construction project manager or W&W, because they had jurisdiction over construction activities.

Ross recalled one occasion when he observed a worker who, in his opinion, was intoxicated, although he could not determine whether the worker was intoxicated to the point that his ability to perform his job was impaired. Ross observed this worker at the seventh floor entrance to the spent fuel pool storage area shortly after the worker was refused access to the fuel storage area by a fellow Yoh security officer. (Based on Ross' description of this incident, it appears he may be referring to the same incident that former security officers Hyde and Wright described.)

Ross also advised that on one occasion he found what appeared to be marijuana cigarette butts on a rooftop area located between the reactor and turbine buildings. Ross related he was not able to determine whether workers were using drugs to the extent that it impaired their ability to perform their jobs and had not formed an opinion in that regard.

On March 11, 1981, Ross provided a written statement attesting to this information, a copy of which is included as Exhibit 58.

5.14.3.5 Interview with James Bedinghaus

On March 25, 1981, James Bedinghaus was interviewed by NRC. He stated that he was employed as a second shift security supervisor with W&W Protection Agency, Inc., and was stationed at Zimmer from February 1980 to November 1980. While employed there, Bedinghaus noticed what he believed to be evidence of alcohol use by workers at Zimmer, as indicated by workers he encountered who smelled of alcohol and had the appearance of being intoxicated. Bedinghaus specifically recalled approximately three occasions on which he observed workers who, in his opinion, were intoxicated to the point that their ability to perform their job was impaired. These workers were observed attempting to enter the site through the main gate. Bedinghaus indicated that, while he was assigned to the gate, workers who in his opinion were intoxicated were refused entrance to the site.

Bedinghaus also stated he was aware of an incident when a second shift security officer encountered a group of men with beer who were in two automobiles leaving the site via the main gate. During that encounter, the security officer observed that the men in one automobile had open beer inside their vehicle and the other automobile contained a case of beer inside the trunk. The occupants of both vehicles indicated they were coming from an onsite CG&E fire school; however, none of them had identification cards or visitor passes. Bedinghaus expressed the opinion that the first shift security officers had not checked the identification or issued passes to these individuals at the time they entered the plant.

Bedinghaus also expressed his belief that security was lax in the areas controlled by W&W, and W&W security officers were present onsite more for display purposes rather than for providing property protection.

With regard to alleged drug use, Bedinghaus stated he had no personal knowledge of drug use at Zimmer, although he had observed individuals who, in his opinion, appeared to be intoxicated or "stoned" on something other than alcohol.

On March 25, 1981, James Bedinghaus provided a written statement ~~attesting to this information~~, a copy of which is included as Exhibit ●.

5.14.3.6 Interview with James Caplinger

On March 12, 1981, James Caplinger was interviewed by NRC. He stated that he was employed as a lead security officer with Yoh Security and was stationed at Zimmer from August 1979 to October 1980. While stationed there, Caplinger observed what he believed to be evidence of alcohol and drug use by workers at Zimmer. This evidence was in the form of empty beer cans and what appeared to be marijuana cigarette butts detected by Caplinger onsite. Although he detected evidence of alcohol and drug use, Caplinger stated he never personally observed anyone drinking intoxicants or smoking marijuana. He indicated that, if he had, he would have reported the individual to their superior and that person probably would have been fired.

[Caplinger] also remarked that, based on his 20 years experience in the U.S. Army as a senior noncommissioned officer and observation of alcohol and drug abuse among that population, he would not characterize the use of alcohol and drugs at Zimmer as widespread.

On March 12, 1981, [Caplinger] provided a written sworn statement ~~attesting to the preceding information~~, a copy of which is included as Exhibit [redacted].

5.14.3.7 Interview with James Bice

On April 20, 1981, James Bice was interviewed by telephone. He stated that he was employed as a security officer with Yoh Security and was stationed at Zimmer from September 1979 to July 1980. While employed there, Bice detected several instances of alcohol use by construction workers at Zimmer. He related that on approximately four to six occasions he personally observed workers consuming alcoholic beverages while onsite. These instances of alcohol consumption usually occurred during lunch hours in locations that included the electrical shop and a break area located in the turbine building. Beer and whiskey were among the alcoholic beverages consumed onsite. Bice recalled two specific instances involving the presence of alcohol: one during which he observed a worker pouring "Jack Daniels" whiskey into a Coke soda can and the other during which he found a bottle of what he believed to be "moonshine" liquor (based on its smell) in the turbine building.

In addition to instances where the consumption and presence of alcoholic beverages were observed, Bice also recalled removing quantities of beer cans (approximately 300 while stationed at Zimmer) from inside a few small rooms that were accessible from the second level of the reactor building. Based on his experience at Zimmer, Bice speculated that approximately 25% of the workers there consumed alcoholic beverages, usually during their lunch hours.

Despite his observations regarding the extent of alcohol use, Bice said that on only one occasion did he observe a worker who, in his opinion, was intoxicated to the point that his ability to perform his job was impaired. This worker was observed at the seventh floor entrance to the spent fuel pool storage area. Based on Bice's description of the incident, it appears he may be referring to the same incident that former security officers Hyde, Wright, and Ross described.

Regarding alleged drug use, Bice stated he did observe what he believed to be evidence of drug use at Zimmer. Bice related that, during the course of his routine security rounds each day, he would find approximately three to four apparent marijuana cigarette butts. He indicated that to his knowledge there were no analyses made of the cigarette butts he detected, although based on their appearance (the presence of seeds common to the marijuana plant) he was convinced the butts were from marijuana cigarettes.

Bice stated he prepared approximately 10 to 11 field incident reports regarding suspected alcohol and marijuana use while he was stationed at Zimmer and these reports were forwarded to CG&E Security Supervisor

Fred Lautenslager. He remarked that Lautenslager advised him on one occasion there was nothing Yoh Security and the CG&E Security Supervisor could do about these instances (since they apparently occurred in areas under W&W Security's jurisdiction) and not to worry about such incidents.

Bice verified that all the instances of alcohol and drug use he observed occurred in areas under W&W Security's jurisdiction, except for the incident on the seventh floor involving an apparently intoxicated worker.

Bice also advised that on one occasion he observed two CG&E employees in the reactor control room who were smoking what appeared to be marijuana. He said, however, he did not confront the workers regarding their suspected conduct, and he does not recall preparing a field incident report about the event.

5.14.3.8 Interview with Dennis Shinkle

On March 26, 1981, Dennis Shinkle was interviewed by NRC. He stated that he has been employed as a security officer with the W&W Protection Agency, Inc., from approximately 1976 to the present. During that time, he was off work for about six to seven months from January to July 1980. While stationed at Zimmer, he has primarily been assigned to main gate security. Shinkle indicated that he has detected evidence of alcohol use by the workers there. Shinkle specifically recalled one incident that took place during the Fall of 1979. The incident involved four or five construction workers who had apparently brought alcoholic beverages onsite during their lunch hour. He related that a construction supervisor first observed the workers with the alcoholic beverages and requested that Shinkle accompany him to corroborate this observation. When Shinkle did so, the supervisor took immediate action and the workers were fired.

Shinkle was asked whether he had ever observed any workers who in his opinion were intoxicated to the point that their ability to perform their job was impaired. He replied that on several occasions (he was unable to estimate how many) he had observed workers attempting to enter the site by the main gate who, in his opinion, appeared to be intoxicated. Shinkle denied entry to the site to any workers he observed at the main gate who appeared to be intoxicated.

Shinkle indicated that it was difficult to prevent workers from bringing alcoholic beverages onsite, particularly when there were large numbers of workers entering the site at approximately the same time. Although security officers would often conduct a cursory search of lunch containers and coolers for alcohol, they could not (lawfully or practically) search the person of each worker who entered the site. The same problem applied to searching the motor vehicles permitted onsite. Security officers could conduct a cursory search of the vehicle trunks and a visual search of the inside of the vehicle; however, they could not individually search each occupant.

With regard to alleged drug use, Shinkle stated that he never observed, and was not personally aware of, any drug use by workers at Zimmer.

5.14.3.9 Interview with Norborne Ward

On March 27, 1981, Norborne C. Ward was interviewed by NRC. He stated that he is President of the W&W Protection Agency, Inc., and has held that position since W&W became the construction security contractor at Zimmer in September 1976. From September 1976 to October 1980, he was stationed on a full-time basis at Zimmer and thereafter visited the site to oversee security operations usually twice a week.

Ward indicated that he is well informed about security-related matters and incidents at Zimmer. He explained that W&W inherited Kaiser's security procedures and basically has continued to conduct security activities in accordance with those guidelines. Ward related that, during the time W&W has been security contractor there, he has become aware of instances of alcohol use by construction workers at Zimmer.

Ward indicated that alcohol use onsite became a real concern and certain measures were initiated to reduce the problem. In July 1980, W&W began the practice of searching the coolers and lunch containers brought onsite by the construction workers. This action was somewhat effective in preventing some workers from bringing alcoholic beverages onsite. Also, a contributing factor to the problem was the sale of liquor by certain individuals in the parking lot outside the site. Ward stated that a "crackdown" on parking lot liquor sales was initiated in 1977 when state law enforcement officials were contacted. These officials subsequently came out to the site and, to his knowledge, made at least one arrest for liquor sale violations.

Ward was asked whether he had ever observed workers who, in his opinion, were intoxicated to the point their ability to perform their job was impaired. He replied that instances of workers being intoxicated to that extent were relatively rare and he estimated that, since W&W became a security contractor in 1976, approximately 25 intoxicated workers were observed and denied access to, or were ejected from, the site. The most common occurrence of this was when intoxicated workers came to the site on payday to pick up their checks. Ward remarked that the worker involved would take the day off and, after they had been drinking and were already intoxicated, would come to the site at 10:00 or 11:00 a.m. just to pick up their paychecks. On those occasions, when a worker entering the site was determined to be intoxicated, Ward would deny the worker's entry to the site.

Ward indicated it is difficult to enforce rules regarding use of alcohol on site. He explained W&W security officers have been instructed to identify (if possible), rather than confront, workers who are observed consuming alcoholic beverages on site. This is usually done by trying to obtain identifying information, such as a payroll number or a name from the individual's hard hat. If identifying information is obtained, the matter is then referred to the individual's supervisor for action.

Ward expressed the opinion the biggest problem affecting security in general is that Kaiser and CG&E allow too many motor vehicles on site. He indicated the large number of vehicles permitted onsite increases the potential for contraband being brought on and/or taken offsite without detection. Ward

also stated that, since he has been at Zimmer, there has been little trouble with regard to violent acts. He could recall only one incident when two construction workers were involved in a fight.

Ward mentioned that, during the time Thomas Applegate was onsite, there were six or seven security officers on duty during each shift.

5.14.3.10 Interview with Frederick Lautenslager

On February 24-25 and March 13, 1981, Frederick Lautenslager was interviewed by NRC. He stated that he is employed as the CG&E Security Supervisor and has been assigned to the Zimmer since August 1978.

Lautenslager was questioned regarding his knowledge of alleged alcohol use by workers at Zimmer. He stated he has no personal knowledge of anyone drinking alcoholic beverages onsite and he has never observed anyone drinking alcohol onsite.

Lautenslager was also questioned regarding his knowledge of alleged drug use (particularly marijuana) by workers onsite. He indicated he has no personal knowledge of any drug use and is aware of no incidence of marijuana use by anyone at Zimmer. Lautenslager related that on one occasion a Yoh Security Officer discovered and turned over to him some cigarette butts which appeared to be hand-rolled. He stated since many of the craft personnel roll their own cigarettes and since there was nothing to indicate that the butts found by the security officer were in fact marijuana, no further action was taken other than to notify W&W security personnel that the hand-rolled cigarette butts were found.

Lautenslager also stated that he has never received a report of any individuals drinking alcoholic beverages or smoking marijuana onsite.

On March 27, 1981, Lautenslager provided a typewritten statement ~~objecting to the preceding information~~, a copy of which is included as Exhibit [redacted].

5.14.3.11 Field Observations

While at Zimmer, the NRC resident inspector has observed evidence of alcohol use by workers. During approximately 50% of the time he has spent touring the plant while conducting inspection activities, he has observed empty beer cans in various safety-related areas of the plant. On a less frequent basis, he has also observed empty "hard liquor" bottles (e.g., whiskey bottles). The areas where empty cans and bottles were observed included the cable spreading room, the two residual heat removal rooms, the related residual heat removal heat exchanger rooms, and the reactor building. Within these areas, the locations he observed empty alcoholic beverage containers were generally hidden and isolated.

The quantity of empty beer cans in these areas varied greatly from time to time. On some occasions (generally in the winter months), as many as 10 to 12 empty beer cans could be found in any of the noted locations of the plant (although some of the cans may have been there a month or more since the

last time the area was cleaned). On other occasions (generally in the summer months), only a few cans would be present in those same locations.

The resident inspector has never personally observed anyone consuming alcoholic beverages. He recalled observing instances in the diesel generator room and reactor building when workers were drinking beverages from non-alcoholic beverage containers (e.g., thermos bottles) and, upon seeing him approach, made an apparent effort to conceal the containers from which they were drinking. These instances led him to suspect that workers concealed intoxicants in and consumed intoxicants from non-alcoholic beverage containers. Observations of beer can accumulations in different areas of the plant have been documented in various NRC inspection reports and that on at least two occasions the beer can litter situation has been brought to the attention of the Construction Project Manager, Scott Swain.

The resident inspector has never observed anyone who, in his opinion, was intoxicated to the point where their ability to perform their job was impaired. In the inspectors opinion, the drinking of alcohol at Zimmer is not as bad as he has seen at other construction sites.

The resident inspector has observed WHAT APPEARED TO BE approximately ten marijuana cigarette butts during his plant tours and he recently found two marijuana cigarettes. The resident discussed this matter with the Kaiser Construction Project Manager. WHAT APPEARED TO BE.

5.14.4 Findings and Conclusions

The NRC investigation identified evidence that there had been some drinking and drug use onsite. No attempt was made to examine the attitude of management toward drinking, drug use, or violence; however, based on interviews with site personnel coupled with NRC site observations both prior to and during the investigation, a widespread problem was not evident.

An adequately functioning quality assurance program would assure detection and correction of any adverse effects from construction personnel whose abilities have been impaired while under the influence of alcohol or drugs. AS THERE ARE [redacted] questions regarding the quality assurance program based on other findings of this investigation, the licensee Quality Confirmation Program will assure construction defects have been identified.

5.14.5 Items of Noncompliance

No items of noncompliance were identified.

5.15 Employee Dismissals

5.15.1 Allegation

"Employees fired for time [card] cheating had been cheating with the express approval of management, and only time cheaters fired were vocal and knowledgeable critics of plant QA and safety."

5.15.2 Background Information

Thomas Applegate's investigation into timecard cheating at Zimmer found that five individuals (three construction workers and two guards) were involved in "timecard cheating" (i.e., absent from work onsite but recorded as being at work). All those individuals involved were terminated by their respective employers.

5.15.3 Investigation

5.15.3.1 Interview of Construction Worker

The NRC interviewed one of the construction workers who had been terminated for timecard irregularities. The other terminated construction workers could not be located. No attempt was made to interview the two guards also terminated because they were not directly involved in assuring adequacy of plant construction. The construction workers were those who would have had knowledge of "plant QA and safety" (construction problems).

5.15.3.2 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 Kaiser terminated his employment in January 1980, after Thomas Applegate uncovered irregularities in his timecard. He said he was not fired for his criticism of plant safety and it was not until after he was terminated that he provided any information to GAP. Individual A said that although he had serious concerns about construction work at the plant, he was not fired by Kaiser for criticizing plant QA and safety.

On April 24, 1981, Individual A provided a written statement ~~attesting to the preceding information~~; however, he requested the statement not be attached to this report.

5.15.3.3 Interview of Individual B

On April 14, 1981, Individual B, who was previously interviewed by representatives of GAP, was interviewed by NRC. Individual B stated that he would not characterize himself as a "vocal critic" of plant safety. He stated he had concerns about the QC program at Zimmer which he related to the RIII Investigator. However, he said he was fired for irregularities in his timecard and not for his concerns about the QC program.

On April 22, 1981, Individul B provided a written sworn statement ~~attesting to the preceding information~~; however, he requested the statement not be attached to this report.

5.15.3.4 Interview of William Murray

On April 14, 1981, William Murray, CG&E Senior Engineer, was interviewed by NRC. He stated that from December 10, 1980 to January 4, 1981 Confidential Service (CS) was hired by CG&E to investigate alleged timecard irregular-

ities at Zimmer. He stated CS entered into contract with CG&E after Applegate told them he had uncovered evidence of employee timecard cheating. Murray stated the investigation was contracted for a 30-day period. During that period, Applegate identified two guards and three construction personnel who were involved in timecard cheating. Murray indicated that all five of the individuals Applegate identified had been terminated. He denied that the only individuals terminated were those who were vocal and knowledgeable critics of plant safety, and stated emphatically that the individuals fired were fired solely for irregularities in their timecards.

Murray also stated that Major W. Cox, Director of CS, felt that the investigation was compromised when Murray left Applegate's reports unattended in his desk. Murray said that at that point the contract was ending and he and Cox concurred timecard cheating was not widespread. Both agreed that, because of the questions about the security of the operation, the contract should be terminated. However, Murray said Applegate stated that he was concerned about the QA problems he had identified and wanted to continue investigating. Murray said the concerns Applegate raised had already been identified by the CG&E QA group and he saw no reason to continue the investigation. He said Applegate was adamant in his insistence to continue the investigation, so he referred him to William Schweirs, Quality Assurance Manager. Schweirs agreed there was no need to investigate these matters further and advised Applegate of his conclusion. Murray said the contract was terminated with Cox's approval, but over Applegate's objections.

Murray provided a letter from CS regarding the contract termination, dated January 4, 1980, and is included in Exhibit [redacted].

In a subsequent telephone conversation, Murray stated that Individual B was not one of five identified by Applegate nor was he fired at CG&E's direction for timecard cheating, but that he may have been terminated by Kaiser for another timecard matter.

5.15.3.5 Interview of Major W. Cox

On April 30, 1981, Major W. Cox, Director of CS, was interviewed by NRC. Cox stated he employed Thomas Applegate as a private investigator for CS. He indicated that in November 1979, when Applegate was investigating another matter, Applegate came across evidence of employee timecard cheating at Zimmer. Cox stated he was reluctant to pursue the matter, but on several occasions Applegate approached both him and CG&E about this matter. Cox said Applegate continued to pursue the matter and CG&E formally requested CS to investigate the matter. Cox stated the investigation was contracted to last 30 days during which Applegate would work undercover onsite with the primary task of investigating employee timecard cheating. Cox said the CS investigation began on December 10, 1979 and ended on January 6, 1980, and identified several employees who were involved in timecard cheating. Cox said the operation ran its course and was terminated at the end of the original 30-day contract period.

Cox stated that during the last weeks of the investigation, Applegate said he found evidence of irregularities in pipe welds and in the plant QA program. Cox told William Murray about this and Murray said CG&E was already aware of

the problems Applegate had identified and did not need to pursue them further. Cox recalled that Applegate had learned there was a disagreement between Peabody Magnaflux (PM) employees and CG&E over the interpretation of X-rays taken of some pipes on site.

Cox said there was no attempt by CG&E to cover up any of Applegate's disclosures. Cox said it appeared to him that CG&E was already aware of the problems Applegate identified and Applegate was not providing them with any new information. Cox stated that after the 30-day contract period, both he and CG&E decided to terminate the contract. Cox stated Applegate disagreed with this decision and wanted the investigation to continue so he could pursue irregularities he had identified in the QA program. Cox said CG&E denied Applegate's request.

Cox said that in his opinion Applegate held a grudge against CG&E for ending the investigation over his objections. He indicated that since January 1980 he has had no further contact with Applegate regarding the Zimmer investigation, and Applegate has taken custody of all of the tape recordings and copies of reports he made during the investigation.

5.15.3.6 Record Reviews

The Confidential Service memorandum dated January 4, 1980 authored by Major W. Cox, Director of CS, was reviewed by the investigator. The first paragraph of the letter addresses Cox's concerns about the security of CS confidential reports. The letter indicates Cox objected to security breaches during the investigation and asked GC&E to terminate the investigation. However, Cox did state in the letter that, based on information he had, he did not concur with CG&E's conclusion that Applegates allegations regarding questionable construction were without merit.

5.15.4 Findings and Conclusions

The two former employees interviewed by GAP were contacted by NRC. They denied they had been fired for any criticism of plant QA and safety, but rather had been fired for timecard cheating. There was no indication from the interviews that management approved of timecard cheating.

5.15.5 Items of Noncompliance

No items of noncompliance were identified.

5.16 Radiographer Suppression

5.16.1 Allegation

"CG&E had warned PM management to silence the radiographers at Zimmer, who were criticizing CG&E's consistent approval of welds rejected by PM."

On February 26, 1981, Thomas Applegate provided further information regarding the allegation. He stated he learned that on the weekend of January 9-10, 1981, Individuals D and E had probably broken into the

Peabody Magnaflux (PM) trailer onsite. He alleged that during this burglary those individuals removed records of an instance where CG&E had overridden PM's rejection of welds.

5.16.2 Background Information

CG&E did not have personnel with direct nondestructive examination responsibilities, and as such, would not have been involved with "overriding" of PM radiograph interpretations. Additional background on radiography is included in Section 5.8.2.

On July 3, 1979, five prefabricated pipe spool pieces manufactured by Kellogg were received at the Zimmer site (see Section 5.7). Kaiser personnel wrote Nonconformance Report E1911 stating that the "spools were rolled off of truck onto ground and striking other spools." On July 6, 1979, Kaiser directed that the welds on the spool pieces be radiographed.

On July 21, 1979, David Hang of PM radiographed the spool pieces and identified rejectable INDICATIONS in welds on three of the five spool pieces. PM forwarded the findings to Anthony Pallon, KEI Welding Engineer. The reports and film identifying the examined welds were then reviewed by Pallon and filed in the Kaiser Document Control Center, three radiographs of welds with apparently rejectable INDICATIONS were filed with a nonconforming report. On April 8, 1980, these films were reviewed by NRC Inspector Kavin Ward who determined that the welds had the wrong geometry for radiography and the films were not acceptable.

On April 25-28, 1980, PM personnel performed magnetic particle and ultrasonic inspections of the questioned spool pieces and concluded on the basis of these examinations that the welds on the spool pieces were acceptable. On April 28, 1980, Kellogg performed ultrasonic examinations of the same spool pieces and also found them to be acceptable.

The above information including details of processing of nonconformance report E-1911 is included in IE Investigation Report No. 50-358/80-09.

5.16.3 Investigation

5.16.3.1 Interview of Individual A

On April 22, 1981, Individual A, who was previously interviewed by representatives of GAP, was interviewed by NRC. Individual A stated PM radiographers Allen Sellars and David Binning had told him, on two occasions, that they found defective welds in Kellogg prefabricated spool pieces. He said they had discovered the defects when examining Kaiser field welds that joined the spool pieces in the residual heat removal system. He said they also found similar defects in five of twenty welds on the main steam relief (MSR) spool pieces that had fallen off a truck on delivery to the site.

Individual A stated that PM personnel told him CG&E overrode their rejection of welds on the MSR system and had retained a copy of the examination report and radiographic film in their files. He said CG&E overrode PM when they examined prefabricated spool pieces, but they were not overridden in their weld determinations for Kaiser welds.

Individual A also stated that in January 1979 CG&E hired undercover private investigator Thomas Applegate who had questioned PM employees about this examination. He said Applegate and Allan Sellars had met at the Riverview Inn to discuss the matter. A few days after this meeting, Sellars met Individual A onsite and told him his supervisors had advised him not to discuss the matter with anyone. He said Sellars later informed him there had been a burglary of the PM trailer, and the film and examination reports for the MSR spool pieces which PM had retained were missing.

On April 24, 1981, Individual A provided a written statement ~~attesting to the preceding information;~~ however, he requested the statement not be attached to this report.

5.16.3.2 Interview of Thomas Applegate

On February 26, 1981, Thomas Applegate was interviewed by NRC. He stated he had a telephone conversation with Ernest Aldredge, President of PM, in which Aldredge said weld records were missing from the PM trailer onsite. Applegate said he subsequently learned that there was a break-in of the PM trailer on the weekend of January 9-10, 1980, and that records were taken from the trailer. He indicated Security Officers Ronald Wright, James Bedinghaus, and David Simpson had told him Individuals D and E were probably involved in the break-in and had stolen records from the trailer.

Applegate said PM is now unable to "defend itself" against CG&E in a dispute about the acceptability of welds PM examined on the MSR system since its records were stolen. He stated that although these welds had been examined by PM and found defective they were later accepted by CG&E. Applegate said that since the burglary PM has instructed its employees not to say anything about this matter for fear of industry-wide reprisals against PM.

5.16.3.3 Interviews of Security Officers

Between February 1 and March 15, 1981, the individuals listed below were interviewed by NRC. They could not provide any information concerning the break-in of the PM trailer in January of 1980. All of these individuals are former Security Officers at the Zimmer site and all stated the break-in had not been reported to the Security Department. They stated that they were unaware of the identity of any individuals who might have committed the break-in.

David Simpson, Felicity, Ohio, Police Department
Ronald Wright, Felicity, Ohio, Police Department
James Bedinghaus, former Security Officer, Zimmer Nuclear Power Station
John Bedinghaus, former Security Officer, Zimmer Nuclear Power Station
Jeffrey Hyde, former Security Officer, Zimmer Nuclear Power Station
James Caplinger, former Security Officer, Zimmer Nuclear Power Station
William Ross, Investigator, Clairmont County, Ohio Welfare Department

5.16.3.4 Interview of Ernest Aldredge

On April 10, 1980, Ernest Aldredge, PM President, was interviewed by NRC. Aldredge stated that to the best of his knowledge PM radiographers at the Zimmer site were not consistently overridden in their weld determinations. He stated that Charles Wood, PM's Cincinnati Office Manager, had never reported this problem to him.

Aldredge also stated that from January through June 1980 there was an NRC investigation at Zimmer as a result of complaints made by Thomas Applegate, a private investigator, who had been hired by CG&E. He indicated Charles Wood informed him that PM employees had apparently told Applegate that there were defective welds at the plant. Aldredge stated Applegate subsequently contacted both the NRC and the local press about PM personnel telling him about defective welds, charging that PM had been overridden in their decisions to reject welds.

Aldredge said that, as the result of the NRC investigation and newspaper articles about it, he contacted the Public Relations Officer of his parent company, Magnaflux Quality Services. They advised him that due to the sensitive nature of nondestructive examination of nuclear power plants it would be bad publicity for PM to make any public statement, since the statement could be misconstrued by the press. Aldredge stated he was therefore advised to not make any statement to TV reporters or any other members of the media. He indicated he also advised Charles Wood it would be in the best interest of PM not to make any statements at that time.

Aldredge said PM's contract at Zimmer was not renewed due to production problems that had been attributed to frequent breakdowns of the film processing machine onsite. He said information such as this could impact the company's professional reputation, so he felt it was best not to make a statement about why PM's contract was not renewed.

Aldredge stated that there had been no attempt to silence the radiographers at Zimmer regarding public statements about the investigation. Aldredge provided a sworn statement on August 17, 1981, a copy of which is included as Exhibit [redacted].

5.16.3.5 Interview of William Schwiers

On April 23, 1981, William Schwiers, CG&E Quality Assurance Manager, was interviewed by NRC. He stated he would forward a letter to the investigator outlining the reasons PM's contract was terminated at Zimmer. Subsequently, Schweirs provided an unofficial memorandum outlining his reasons for terminating PM's contract in April 1980. A retyped copy of the provided memo is included as Exhibit 64. Schweirs stated the contract was not terminated because of PM's criticism of "CG&E's consistent approval of welds rejected by them."

5.16.3.6 Interview of Charles Wood

On April 15, 1981, Charles Wood, PM Cincinnati Office Manager, was interviewed by NRC. He stated that since 1972, PM has been employed as the firm

responsible for nondestructive examination at Zimmer. He said PM has conducted both ultrasonic, liquid penetrant, and radiographic examinations of large-bore and small-bore pipe welds onsite. Wood said PM's responsibility was to examine welds and present their preliminary findings to Kaiser. Kaiser personnel would examine radiographs and make the determination if a weld was accepted or rejected. He stated Anthony Pallon, KEI Welding Engineer, was responsible for reviewing PM's work and was not "consistently overriding" PM on their decisions to accept or reject a weld. He said Pallon supported PM's work onsite and, when a defective weld was identified, assured that the weld was repaired.

Wood stated that CG&E hired Thomas Applegate in January 1980, and apparently Applegate talked to a number of PM employees about their work onsite. Wood said Applegate called him in January 1980 and identified himself as "Thomas Jackson," a CG&E Cost Accounting Engineer. Wood indicated that at that time there was a question about PM being retained onsite due to problems in meeting production goals.

Wood advised there was discussion among PM employees about the contract renewal, and he learned PM employees had told Applegate that PM had identified defective welds in the plant. Wood said it was PM's responsibility to identify defective welds and report their findings to Kaiser. Kaiser would assign a status of either repair, hold, or rework to the defective weld. Wood indicated that when his employees told Applegate that there were "bad welds," they were referring to defective welds they had identified and reported to Kaiser. Wood stated his employees had answered Applegate's questions in good faith, assuming he knew the meaning of the term "bad welds" (that were identified as needing repairs by the Kaiser Quality Control system).

Wood stated that on one occasion Applegate called him and asked him if there were "bad welds in the plant" and he responded in the affirmative. He said he assumed Applegate knew what a defective weld was and that Applegate was questioning (as an auditor) PM's ability to identify weld defects. Wood said Applegate later went to the newspapers and quoted Wood and other PM employees as saying "there are defective welds" in the plant. Wood said that rejectable welds are identified by nondestructive examination and are repaired under the quality control system.

Wood said that later there was a series of very controversial newspaper articles about Zimmer construction. He consulted with PM's attorney, Charles Russ, who advised him that media representatives could misconstrue anything he said and cautioned him to instruct his employees not to discuss the matter with the media. Wood said there was no attempt to "cover up" any of PM's activities onsite, and their records accurately report their findings. Wood indicated that after the discussion with their attorney he advised PM employees to not make any further statements regarding the matter.

Wood said PM employees were receiving phone calls from media representatives and a number of PM employees were disturbed about the calls. He felt it was PM's responsibility as their employer to advise them not to discuss Applegate's charges with media personnel.

Wood said Applegate charged PM was "overridden" in their weld evaluations, and that its contract was not renewed by CG&E because PM had continued to reject welds. Wood stated the contract was not renewed because of problems in meeting production goals onsite and not for any disagreements over PM's weld examinations.

Wood recalled that Allan Sellars told him in January 1980 that there had been a break-in of the PM trailer. Sellars reported to Wood that no equipment was missing, but he was unsure if Sellars had told him that any records were taken. Wood said PM retains the blue copy of all its examination reports for billing purposes; however, the X-ray film of a weld and other copies of examination reports are the property of CG&E and Kaiser and are retained by them.

On April 15, 1981, Wood provided a written statement ~~attesting to the preceding information~~, a copy of which is included as Exhibit [redacted].

5.16.3.7 Interview of Allan Sellars

On February 19 and April 15, 1981, Allan Sellars, PM Level II Radiographer, was interviewed by NRC. He stated that he was employed at Zimmer from April 1976 to April 1980, and performed radiographic examinations of Kaiser field welds and occasionally examined welds on spool pieces manufactured by Kellogg. He indicated that when he identified defective Kaiser or Kellogg welds he identified them on the examination report and forwarded the report to Anthony Pallon, KEI Welding Engineer. Sellars stated he was not overridden by Pallon when he identified defects in either Kaiser or Kellogg welds.

Sellars did recall an incident in the Summer of 1979 when PM was asked to examine welds on some Kellogg MSR system spool pieces that apparently fell off the truck on delivery to the site. He said he and David Hang radiographed welds on the spool pieces in question, but the film quality was poor. He indicated the geometrical configuration of the welds was such that it would exaggerate flaws in the welds and project them on the film at varying angles, distorting the view of the weld. Sellars said that he had told Pallon radiography was the wrong technique to use in this case, but Pallon said to conduct the examination anyway. Sellars said Hang observed some unacceptable indications (defects) on the resultant radiographic film and noted this on the examination reports. Later, during an NRC investigation, these spool pieces were ultrasonically examined and the welds were found to be acceptable.

Sellars also stated that after the investigation there was considerable publicity regarding PM's work onsite, and he was told by PM management not to comment to members of the press because anything he said could be taken out of context. Sellars said this was not an attempt to intimidate or silence him about PM's work onsite. In his opinion PM's contract was not renewed due to production problems, which he attributed to breakdowns in the film processing machine. Sellars said another factor in CG&E's decision was audits that were critical of PM's work onsite. He indicated the contract was not terminated for problems in their identification of defective welds. Sellars also stated the PM trailer had been broken into; however, he was not aware of anything taken during the break-in.

On April 15, 1981, Allan Sellars provided a written statement [redacted], a copy of which is included as Exhibit 49.

5.16.3.8 Interview of David Hang

On March 27, 1981, David Hang, former PM Level II Radiographer, was interviewed by NRC. He stated he was employed at Zimmer from September 19, 1976, to August 1979. Hang said he was responsible for conducting radiographic examinations of large bore pipe welds.

Hang indicated that he was not overridden on his weld determinations by Anthony Pallon, KEI Welding Engineer. To the contrary, Hang said welds PM accepted were frequently found unacceptable by Pallon and Pallon would request PM to reexamine the welds. When Pallon found a defect in a weld that PM had not detected, he would order the weld repaired. Hang said Pallon, as a Level III radiographer, had the final say in acceptance or rejection of a weld.

Hang recalled that in August 1979 Pallon asked him to examine some pipe spool pieces on the MSR system that had fallen off of a truck on delivery to the site. Hang said he took one radiographic "shot," evaluated the film, and concluded that radiography was the wrong technique to use when examining the spool pieces.

Hang said he told Pallon that the geometric configuration of the spool pieces was such that it distorted the view of the weld and might exaggerate flaws that would appear as defects on the film. Hang indicated Pallon requested he examine the remainder of the welds by radiography and these examinations revealed apparent rejectable defects on three spool pieces.

Hang said he reported the results of his examinations to Pallon and retained the PM copy of the reports and film in a special folder in the PM trailer onsite. He added that ultrasonic examination would be the proper nondestructive testing technique to use to examine pipe welds in this geometric configuration, and he later learned the spool pieces had been ultrasonically examined and found acceptable.

Hang said he left Zimmer in August 1979 and, on his return in March 1980, he was informed by Allan Sellars that there had been a break-in of the PM trailer and the file on the MSR pieces was missing. Hang stated that in April 1981 he reviewed the radiographic examination reports for the MSR spool pieces that were recovered from the Kaiser Document Control Center. Hang verified that the reports and films were the originals from August 1979. He indicated these examination reports were for the three welds he found unacceptable, and apparently were filed by Kaiser with a nonconformance report.

On April 23, 1981, David Hang provided a written statement [redacted], a copy of which is included as Exhibit [redacted].

5.16.3.9 Interview of Wayne Draffon

On February 19, 1981, Wayne Draffon, PM Level III Radiographer, was interviewed by NRC. He stated that he was employed by PM at Zimmer from January 19 to April 1980. Draffon said it was PM's responsibility to radiograph Kaiser field welds onsite. He said PM performed a radiograph of a weld and did a preliminary review to ascertain if the weld was rejectable. He indicated PM did not have authority for final acceptance of a weld but that the KEI welding engineer who reviewed the radiographic film was responsible for final acceptance. Draffon stated PM was not frequently overridden in its weld determinations and that welds accepted by PM were frequently found unacceptable by Kaiser.

Draffon said he learned that radiographers occasionally observed defects in Kellogg welds when they overlapped Kaiser welds. These cases were reported and forwarded to Kaiser to determine if the Kellogg weld should be repaired. Draffon stated that when welds junctured, the geometry of the juncturing welds is frequently not the same and therefore radiographic views of the weld may be distorted. He indicated that inexperienced Level I or II Radiographers would often examine juncturing welds and report rejectable defects, not recognizing that the view was distorted. Draffon said a more experienced radiographer can discern this and find the weld acceptable. Draffon stated that when he arrived on site a problem similar to this had apparently occurred where PM radiographers examined MSR spool pieces that had fallen off the truck and found the welds unacceptable. In fact, the view of the weld was distorted due to configuration problems. Draffon said the spool pieces were later ultrasonically examined and found to be acceptable. Draffon commented that this appeared to be an isolated instance, and CG&E or Kaiser did not often override PM in their weld determinations.

Draffon stated he had heard that the PM trailer was broken into, but this occurred prior to his arrival onsite. He learned that Thomas Applegate, a private investigator, had called the trailer and told employees it had been broken into. He said, however, employees searched the trailer and found no records or equipment missing.

Draffon also stated that PM's contract was terminated in April 1980 at the customer's request. He said this occurred because the volume of work was slowing, and PM had experienced production problems, which he attributed to frequent breakdowns in the film processing machine onsite.

5.16.3.10 Interview of Steven Binning

On April 15, 1981, Steven Binning, PM Level II Radiographer, was interviewed by NRC. He stated he was employed at Zimmer from April 1978 until April 1980. Binning said he received his Level II certification in October 1979 and routinely radiographed large bore pipe welds fabricated by Kaiser onsite. Binning said PM radiographed welds, developed the film, did a preliminary examination to determine if the welds were acceptable or rejectable, and then forwarded their report to Anthony Pallon, KEI welding engineer, who made the final determination on the acceptability of the welds. He indicated Pallon did not consistently override PM in their weld determination and would sometimes reject welds that PM had initially found acceptable.

He frequently directed them to re-shoot welds that Kaiser had repaired after PM had identified rejectable defects in the welds.

Binning recalled one occasion where PM examined some prefabricated spool pieces for the MSR system that were manufactured by Kellogg and had apparently fallen off a truck on delivery to the site. He said David Hang examined the spool pieces and determined there were rejectable indications in some welds. Binning said the radiographs were later evaluated by Kaiser, it was found the weld geometry precluded correct interpretation, and the welds on the spool pieces were not defective. Binning said Hang retained copies of his report of this particular examination.

Binning also stated that in January 1980 he received a telephone call from an unidentified individual who told him the PM trailer had been broken into. He said he immediately checked the back door and found the lock had been pried off and apparently the trailer had been entered. Binning said he inventoried the equipment in the trailer, checked the files, and found the only items missing were the examination reports and films for the MSR spool pieces that had been examined by Hang earlier. He indicated he told Allan Sellars and Wayne Draffon about the burglary but did not discuss it with anyone else.

Binning said PM management never told him to be silent about activities that occurred at the site. He said PM's contract was not renewed because of production problems, which he attributed to their film processor frequently breaking down. He also stated that NRC had audited PM's radiation safety operations and technical work and these audits were critical of some aspects of the PM operation. Binning said PM was not asked to leave the site for their identification of defective welds, and PM employees were not harassed or intimidated by Kaiser or CG&E.

On April 15, 1981, Steven Binning provided a written statement ~~attesting to the preceding information~~, a copy of which is included as Exhibit [redacted].

5.16.3.11 Interview of David Binning

On January 19 and April 15, 1981, David Binning, PM Radiographer's Assistant, was interviewed by NRC. He indicated that, as a Radiographer's Assistant, he was not responsible for reading or interpreting film or making any weld determinations. He said he worked with both David Hang and Allan Sellars and did not recall them commenting that Anthony Pallon overrode them. He stated that PM usually radiographed Kaiser field welds; however, on one occasion they radiographed Kellogg prefabricated pieces. He said he recalled Hang took some "information only" shots of some prefabricated pieces and identified rejectable indications in some welds. He indicated Hang reported this to Pallon, but he was not aware of the final disposition of the report.

Binning also said that in January 1980 there was a break-in of the PM trailer and records were taken; however, he did not recall what records were missing. He said at about the same time the burglary occurred, Thomas Applegate conducted an investigation and later notified NRC and the local press concerning

PM's work. He said he was told by Sellars not to say anything about the investigation because he (Sellars) was getting harassed by the press and Applegate about it. Binning said he was never told by PM management to "cover up" anything about their activities at the site. Binning volunteered that PM had production problems onsite, which he attributed to the film processor breaking down and holding up production.

5.16.3.12 Interview of Robert Marshall

On April 16, 1981, Robert Marshall, KEI Construction Superintendent, was interviewed by NRC. Marshall stated PM was not overridden by Pallon on weld determinations at Zimmer. He said Pallon did not report to him that he overrode PM on their weld findings. Marshall also stated that the PM radiographers with whom he spoke after Applegate made his disclosures to the press did not support the claim that Pallon was overriding them in their weld determinations.

He recalled one incident when PM was asked to examine some MSR spool pieces that had fallen off a truck on delivery to the site. He said that in April 1980 he reviewed the radiographs taken of these spool pieces and he, Rex Baker, KEI Welding Engineer, and NRC Inspector Kavin Ward examined the films. All concurred that the welds were of the wrong geometry for radiographic examination. Marshall said that on some of the films the geometric configuration had distorted the radiographic view of the welds. He added that this examination was an exception to common practice because PM normally radiographed Kaiser field welds but not welds on Kellogg prefabricated pieces. Marshall advised that the MSR spool pieces were later ultrasonically examined and found to be acceptable.

5.16.3.13 Interview of Anthony Pallon

On August 13, 1981, Anthony Pallon, Sr., was interviewed by NRC. Pallon stated he was employed at Zimmer as a Kaiser 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 override PM in their weld determinations 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 about 20% of the prefabricated pipe welds in the plant being defective, since PM did not radiograph them, he did not review the radiographs, and he would not make an unqualified statement about their acceptability.

Pallon said in April 1980 that PM's contract at Zimmer was not renewed and Nuclear Energy Services (NES), Inc., took control of the radiography work at Zimmer. He attributed this to poor management of the PM operation at Zimmer, coupled with equipment problems that 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.

5.16.3.14 Record Reviews

The RIII inspectors reviewed reader sheets for radiographs of field welds made between October 1979 and March 1980 to determine if CG&E or Kaiser personnel had accepted welds previously rejected by PM. The results of that review are given in Table 5.16-1.

Table 5.16-1 Radiographic Reader Sheet Data

Weld No.	Reader Sheet Ident. No.	Weld No.	Reader Sheet Ident. No.
1. RH-113	RH-31	26. RE-75A	RE-1
2. R1-7	R1-11	27. K-288	WX-8
3. RH-53	RH-20	28. RH-86	RH-64
4. RH-55	RH-20	29. @A3	DO-2
5. K-73	RH-20	30. @C3	DG-25
6. RH-40	RH-26	31. HGK-250	HG-16
7. K-494	MS-37	32. RD-K4	RD-1
8. FW-454	MS-30A	33. 1MS22AC2	MS-315
9. HG47A2-1/2	NR-E-2252	34. DG03AA-3/4	DG-88
10. K-926	WR-26	35. P.L.2M20803	LC-13
11. K-455	MS-26A	36. K-483	MS-43
12. MS22AA2	MS-311	37. K-499	MS-39
13. K-84	RH-38	•38. 1RRB1AA-3/4	RR-122
14. P.L.2M20795	LC-19	39. K-288	RT-2
15. LP-9	LP-3	40. FC-5	FC-14
16. K-507	MS-44	41. K-33	FW-4
17. K-508	MS-45	42. FWK-31	FW-2
18. K-448	MS-27A	43. LP-13	LP-11
19. HP-19B	HP-5	44. CYK-221	CY-49
20. FC-93	FC-29	45. WR41AA3	WR-44
21. K-414	MS-24A	46. FW58A	FW-2
22. K-523	MS-27A	47. K-877	WR-2
23. RH-54	RH-20	48. HP-55	HP-4
24. RH-56	RH-20	49. K-475	MS-34
25. RH-46	RH-20		

None of the reader sheets for the welds in Table 5.16-1 indicated that Kaiser personnel had accepted radiographs that had previously been rejected by PM.

5.16.4 Findings and Conclusions

Seven current and former PM employees who were interviewed denied any attempts by PM management to silence them for their weld determinations. In addition, the radiographers, CG&E, and PM management personnel denied

that PM was consistently overridden in its weld determinations. A review of PM radiographic examination reports did not reveal a pattern of PM being overridden by Kaiser in their weld determinations.

The PM trailer had been broken into on the weekend of January 9-10, 1981. It was not established that this was done by Individuals D and E. Seven security officers who Applegate indicated had information regarding the break-in were interviewed and said they had no knowledge of any break-in of the trailer or of any information regarding the involvement of Individuals D and E in such a break-in. After the break-in, PM's copies of examination reports of Kellogg prefabricated main steam relief spool pieces were determined to be missing. Three of the eight reports on the spool pieces were found in the Kaiser Document Control Center filed with a nonconformance report, but five of the reports are still missing. The reports and films were reviewed by the PM employee who did the initial examination of the welds and who verified the reports and films are the originals. He said the reports filed with the nonconformance report are for the welds thought to be defective, and the missing five reports are of the radiographs of the acceptable welds.

5.16.5 Items of Noncompliance

No items of noncompliance were identified.

5.17 Industry Blacklisting

5.17.1 Allegation

"Union pipefitters and PM employees have been intimidated by fear of utility and industry-wide reprisals should they complain about the QA practices."

5.17.2 Background Information

No additional information was provided.

5.17.3 Investigation

5.17.3.1 Interview of Individuals A and B

On April 22 and 24, 1981, Individuals A and B, both union pipefitters, were interviewed by NRC. They stated they had not been intimidated or subjected to reprisals for their criticism of QA practices at Zimmer. Individuals A and B both stated that they were fired in January 1980 as a result of the findings of Thomas Applegate's investigation into their involvement in timecard cheating. They have since been re-employed by CG&E subcontractors at Zimmer and other CG&E sites.

5.17.3.2 Interview of William Schwiers

On January 16, 1981, William Schwiers, QA Manager (CG&E), was interviewed by NRC. He was asked to provide the names and current place of employment for Kaiser QC inspectors who had left the site since January 1, 1979. A

list was subsequently provided, indicating that a total of twenty-three QC inspectors had left the site since that date. Fifteen were known to be employed at other nuclear power plants under construction, two were employed as QC inspectors in defense-related industries, and there was no known place of employment for the remaining six inspectors. Schwiers said there has been no attempt by CG&E to engage in any form of industry-wide reprisals against employees who left Zimmer.

5.17.3.3 Interview of Ernest Aldredge

On April 10, 1980, Ernest Aldredge, President of Peabody Magnaflux (PM), was interviewed by NRC. He stated that neither PM nor its employees had been subjected to any reprisals by CG&E or other utilities for their work at Zimmer.

Aldredge indicated that he was contacted by private investigator Thomas Applegate who asked him about the termination of the PM contract at Zimmer. He stated he told Applegate the situation at Zimmer could affect PM's performance record in the industry. Aldredge said the contract was terminated because of production problems that he attributed to a lack of adequate staffing on PM's part, and frequent breakdowns of their onsite film processing machine.

Aldredge also said he was advised by Charles Wood, the PM Cincinnati Office Manager, that NRC had audited PM's records onsite and had found deficiencies. Aldredge said he talked to Applegate about PM being removed from other contractor's bid lists because of the work at Zimmer, but he was referring to their poor performance record at Zimmer affecting other contracts. He indicated that he was not referring to any systematic attempt by CG&E to engage in any intimidation or reprisals against PM for its work onsite. Aldredge stated that during the conversation with Applegate he was concerned that the professional and business reputation of PM not be tarnished. He indicated he felt that Applegate misunderstood what he said and falsely accused CG&E of engaging in "industry-wide" intimidation of PM.

5.17.3.4 Interviews of PM Employees

Between January 19 and April 15, 1981, seven current and former PM employees were interviewed by NRC. They denied that they had been placed in fear of utility or industry-wide reprisals should they complain about QA practices at Zimmer. The results of these interviews are reported in Sections 5.7.3, 5.8.3, and 5.16.3.

5.17.4 Findings and Conclusions

Two fired union pipfitters and seven current and former employees of Peabody Magnaflux, which included the individuals interviewed by GAP, were contacted by NRC and they denied having been intimidated or subjected to industry-wide reprisals for their critcism of Zimmer QA practices.

5.17.5 Items of Noncompliance

No items of noncompliance were identified.

5.18 Inspector's Journal

5.18.1 Allegation

"A KEI employee has kept a detailed journal of safety hazards and incidents at Zimmer."

On January 29, 1980, Thomas Applegate was interviewed by NRC. He stated that an individual named Yohan Reiter had told him he maintained a detailed journal of safety defects while employed as a radiation waste chemistry technician at Zimmer.

5.18.2 Background Information

It is common practice for inspectors performing certain types of inspections to utilize notebooks to record their observations. Such notes can later be used to generate surveillance reports, nonconformance reports, or other documents as required.

5.18.3 Investigation

5.18.3.1 Personnel Record Review

The NRC Senior Resident Inspector reviewed CG&E personnel records and found an individual named Yohan Reiter. Inquiry indicated that Reiter was employed by Westinghouse, Inc., in Brazil. Personnel records confirmed that Reiter had been employed at Zimmer at the time Thomas Applegate was onsite.

5.18.3.2 Interview with Yohan Reiter

On February 5, 1981, Yohan Reiter of Westinghouse, Inc., was interviewed by telephone. He stated he was formerly employed as a radiation chemistry technician at Zimmer. He said he recalled meeting Thomas Applegate in the radiation waste disposal area during a routine inspection. Reiter also recalled commenting to Applegate that his field notebook was his "paper brain" in which he recorded the results of his field inspections. He said the notebook listed deficiencies identified during system walkdowns of the radioactive waste disposal system. Reiter indicated that he used the notebook to record deficiencies such as malfunctioning gauges or acid eating through floor tiles, which were then recorded on an equipment service list and corrected by the plant maintenance staff. He said that to his knowledge all of the deficiencies he identified were properly corrected by the licensee. He added that during meetings with his supervisor, Dean Erickson, and other members of the Radiation Protection Department staff, the adequacy of the resulting corrective action was discussed.

Reiter indicated that he was not keeping any detailed journal of safety defects at the plant and, if he had any concerns regarding the safe operation of the plant, he would have contacted the NRC himself.

5.18.4 Findings and Conclusions

The individual who was alleged to have kept a "journal of safety hazards and incidents at Zimmer" stated that the "journal" was a field inspection notebook. He stated he used this notebook to record deficiencies he identified during system walkdowns of the radiation waste disposal system. He said that to his knowledge all of the deficiencies he identified were properly corrected by the licensee.

5.18.5 Items of Noncompliance

No items of noncompliance were identified.

5.19 Pipefitter Joke

5.19.1 Allegation

"A common 'joke' among pipefitters at Zimmer is that they will be hundreds of miles away when the plant goes on line, due to their predictions of a disastrous accident."

5.19.2 Background Information

No additional information was provided as to the source or significance of the "joke" or statement.

5.19.2.1 Media Interview

During interviews conducted by Bettina Gregory of ABC News (broadcast on May 19, 1981), Edwin Hofstadter made a similar comment. Hofstadter was neither a pipefitter nor site employee, as detailed in Section 5.10.2.

5.19.3 Investigation

5.19.3.1 Interviews

Sixteen pipefitters interviewed by RIII inspectors could not provide any information concerning any specific equipment design or installation deficiencies.

During one interview, a QC inspector indicated that this joke had been heard in the plant.

5.19.4 Findings and Conclusions

It was determined that the alleged statement had been made. The NRC is addressing the allegations and safety concerns identified during this investigation.

The only other way that the NRC can deal with an allegation such as this is to determine if the quality of the plant is adequate. The NRC inspection program, the licensee's Quality Confirmation Program, and the preoperational testing program will enable this determination to be made.

5.19.5 Items of Noncompliance

No items of noncompliance were identified.

6.0 Allegations Received Through Site Interviews

During interviews conducted at the Zimmer site, the investigators and inspectors received additional allegations. A number of these allegations coincided with or added detail to those in Section 4 and are included in that Section of this report.

6.1 Inspector Harassment

6.1.1 Allegation

QC inspectors have been harassed by construction personnel who have repeatedly doused them with water. QC inspectors have been transferred following complaints from construction personnel THAT THE QC INSPECTORS HAVE BEEN TOO CRITICAL

6.1.2 Background Information

Some friction between QC inspectors and construction personnel is expected due to the very nature of the system. That friction can be increased when construction personnel take the view that QC inspectors are "over inspecting" or overly critical. It is management's responsibility to take action to assure that friction does not develop unhealthy attitudes that adversely affect construction quality.

6.1.3 Investigation

6.1.3.1 Interview of Phillip Gittings

On January 13, 15, and July 8, Phillip Gittings, Kaiser QA Manager, was interviewd by NRC. He stated that Rex Baker told him of one incident in September 1980 when a QC inspector was doused with water while performing an inspection. Gittings stated Baker told him that the person who had doused the inspector had been identified and fired by construction management.

Gittings stated that Swain and other construction personnel had given him "bad reports" on the inspection activities of Individual I, a QC inspector, and his lack of completed inspections. He then directed Baker to transfer Individual I from pipe support hanger inspection to structural welding inspection activities. Gittings also indicated that in January 1980 he directed Baker to reassign QC Inspectors Ruiz, Wimbish, and Hendley because of problems with their inspection activities.

6.1.3.2 Interview of Dennis Donovan

On March 10 and 11, Dennis Donovan, Kaiser Lead Civil (structural) QC Inspector, was interviewed by NRC. He stated that he was aware that water had been dumped on QC Inspectors Janice Mulkey and Anthony Pallon, Jr., by craft personnel during the course of their inspections.

Donovan stated that on February 16, 1981, James Ruiz was involuntarily reassigned from inspections in the drywell area to the fabrication shop. Donovan explained that he had been Ruiz's lead supervisor and was directed by Rex Baker to make the reassignment. He stated that Baker offered no explanation for the reassignment except that the Kaiser QA Manager had requested he reassign Ruiz.

Donovan stated it was obvious to him that Baker disapproved of the reassignment. He indicated the reassignment resulted from a personality conflict between Ruiz and Jerry Adams, Ironworker Superintendent, who felt that Ruiz was too strict and "nit-picking" during his inspections. Donovan stated that Adams had complained to him about Ruiz's inspections and had discussed this matter with Baker. Baker indicated that Ruiz was a good inspector, was not overly critical, and was justified in citing the various deficiencies he discovered in Adams' area. Donovan speculated that Adams had complained about Ruiz to General Superintendent James Sandlin who then talked to Gittings, who decided to remove Ruiz from the inspection area. Donovan added that concurrently he had heard unsubstantiated rumors that QC Inspectors Hendley, Wimbish, and McCoy were also going to be reassigned because of criticism of their inspection findings by Kaiser construction personnel.

On March 11, 1981, Donovan provided a sworn statement ~~attesting to the preceding information~~, which is included as Exhibit [redacted].

6.1.3.3 Interview of Janice Mulkey

On March 11 and 12, 1981, Janice H. Mulkey, Kaiser QC Inspector, was interviewed by NRC. She stated that on three or four occasions between August 1979 to August 1980 water had been thrown on her from above by craft personnel while she performed inspections. Mulkey said she never saw the responsible individuals but on each occasion she reported the incident to her supervisors (K. Shinkle, J. Setlock, or S. Heath). She recalled that on one occasion Heath threatened to remove all the QC inspectors from the site if water continued to be thrown. Mulkey said Robert Marshall was then apprised of the incidents. Marshall then told the craft superintendents to assure that the water-throwing incidents stopped or he would terminate eight craft personnel who were suspected of being responsible.

Mulkey said the water-throwing incidents adversely affected her performance and caused her difficulties in concentrating on her inspection activities because she had to be constantly vigilant for water being thrown on her. Mulkey also stated that, when water was thrown from three stories above her, it struck her with such force that on one occasion it knocked the breath out of her and on another caused her to bruise her knee. She indicated that other QC inspectors had also been doused with water.

On March 12, 1981, Janice Mulkey provided a written statement ~~attesting to the preceding information~~, a copy of which is included as Exhibit [redacted].

6.1.3.4 Interview with Anthony Pallon, Jr.

On February 10, 1981, Anthony Pallon, Jr., Kaiser QC Inspector, was interviewed by NRC. He stated that since January 1981 he has performed visual

weld inspections in the suppression pool area to ensure these welds met AWS Code requirements. Pallon said the previous inspector in this area had been lax, and he began rejecting about 50% of the welds he inspected. Soon afterwards, he was being called to inspection points by craft personnel who would douse him with water from above when he arrived. Pallon said this occurred about two or three times a week and he had been squirted with a fire extinguisher while performing an inspection the night prior to this interview.

Pallon said he was also told that Douglas Haff, Kaiser Pipefitter Superintendent, had told QC Inspector Joseph Mills that he would have Pallon fired. Pallon said Haff on one occasion harrassed him when he returned from lunch by directing security personnel to search him and Joseph Mills for alcohol.

On February 10, 1981, Pallon provided a sworn statement ~~attesting to the preceding information~~, which is included as Exhibit ●.

6.1.3.5 Interview of Joseph Mills

On February 10, 1981, Joseph Mills, Kaiser QC Inspector, was interviewed by NRC. He stated that, while performing inspections in the suppression pool area, both he and Anthony Pallon had been called to inspection points and doused with water. Mills felt it was significant that Pallon was doused in excess of six times in one month. Craft personnel were apparently doing this because of Pallon's weld rejections. Mills indicated that Douglas Haff, the superintendent in this area, told him he would get Pallon fired because he was "nit-picking" on his inspections. Mills said he ignored this comment because it was impossible for Haff to fire a QC inspector.

Mills indicated that later Haff attempted to harass him and Pallon by having them searched by security guards for alcohol when they returned from lunch one day. He stated these actions did not affect his inspection activity, although he did feel that the QA program at Zimmer was understaffed, procedures were poorly written, and the existing program lacked support from Kaiser management.

6.1.3.6 Interview of Michael McCoy

On February 11, 1981, Michael McCoy, Kaiser QC Inspector, was interviewed by NRC. He stated that on one occasion during the spring of 1980 he and QC Inspector Charles Belcher were called to an inspection point by craft personnel. McCoy said when they arrived at the inspection point an attempt was made to douse them with water thrown at them from above.

On February 11, 1981, McCoy provided a sworn statement ~~attesting to the preceding information~~, which is included as Exhibit ●.

6.1.3.7 Interview of John Sullivan

On February 19, 1981, John Sullivan, Nuclear Energy Services Inc., was interviewed by NRC. He stated that he personally has never been doused with water but that he was aware Kaiser QC Inspectors Anthony Pallon and Rick Sizemore had been doused with water while performing inspections in

the suppresion pool area. Sullivan stated that when Sizemore was doused he was performing an inspection using a 220-volt magnetic particle testing machine, and, if water had struck the machine, Sizemore might have been electrocuted. He indicated that Construction Superintendents Edward Stanley and Douglas Haff were standing in the area when this incident occurred.

Sullivan also related another incident when he and Pallon were searched by security personnel when they were returning from lunch one day. He stated that, in his opinion, Haff and Stanley were attempting to harass Pallon because of Pallon's inspection activities in their area.

On February 19, 1981, Sullivan provided a sworn statement ~~attesting to the preceding information~~, which is included as Exhibit [redacted].

6.1.3.8 Interview of Billy Tyree

On February 18 and 20, 1981, Billy Tyree, former Kaiser QC Inspector, was interviewed by NRC. He stated that he was employed at Zimmer from September 24 to November 20, 1979, by Butler Services, Inc. Tyree stated that he was aware that buckets of water were thrown on QC inspectors by Kaiser construction workers. Tyree indicated that he never observed such incidents, but he recalled that on four or six occasions QC Inspector Janice Mulkey was doused with water, and had reported these incidents to her immediate supervisor.

Tyree also stated that two or three other QC inspectors were also doused with water, and he conjectured this was done to limit the thoroughness of inspections by QC personnel. He was unaware of any inquiry or investigation to identify the individuals involved in the dousing incidents, but learned that a construction worker named "Frenchie" was considered to be generally responsible for some of the water-throwing incidents.

On February 20, 1981, Tyree provided a sworn statement ~~attesting to the preceding information~~, which is included as Exhibit [redacted].

6.1.3.9 Interview of Richard Price

On February 18 and March 7, 1981, Richard Price, former QC Inspector, was interviewed by NRC. He stated he was employed by Butler Services, Inc., from September 1975 to November 28, 1980, and by Kaiser from December 1 to 14, 1980. Price stated he was aware that, on at least twelve occasions, construction workers poured buckets of water on QC inspectors who were conducting inspections in the containment building. He stated his opinion that the water was thrown on the inspectors because they were conscientious and refused to accept inferior or nonconforming work by craft personnel.

Price stated he heard rumors that two Kaiser construction workers nicknamed "Frenchie" and "John Boy" were the individuals responsible for throwing water.

He indicated that Kaiser management was apprised of these incidents and construction personnel were unofficially told that they would be terminated if there were any further incidents of water being thrown on QC inspectors.

On March 2, 1981, Price provided a sworn statement ~~attesting to the preceding information~~, which is included as Exhibit [redacted].

6.1.3.10 Interview of Winston Jackson

On February 18 and 20, 1981, Winston Jackson, former QC Inspector, was interviewed by NRC. He stated he was employed at Zimmer by Butler Services, Inc., from July 1979 to November 1980. Jackson stated he was aware of several incidents when buckets of water were dumped on QC inspectors by craft personnel while they were performing inspections in the containment building. He indicated that in his opinion these incidents represented harassment of QC inspectors by construction personnel, and he added that these incidents were reported to Kaiser management. He stated he was not aware of any action Kaiser took concerning this matter.

On February 20, 1981, Jackson provided a sworn statement ~~attesting to the preceding information~~, which is included as Exhibit [redacted].

6.1.3.11 Interview of James Ramsey

On February 18 and 20, 1981, James Ramsey, former Kaiser QC Inspector, was interviewed by NRC. He stated he formerly worked at Zimmer for Butler Services, Inc., and also for Kaiser Engineering between July 1979 and December 14, 1980. Ramsey stated that QC Inspectors Janice Mulkey and Michael DePuccio were doused with water by construction personnel while performing inspections in the containment building. He indicated that, in his opinion, these incidents amounted to harassment of the inspectors by construction personnel. Ramsey said these incidents were reported to Kaiser management and an investigation was conducted into the matter, but he was unaware of any outcome of the inquiry.

On February 20, 1981, Ramsey provided a sworn statement ~~attesting to the preceding information~~, which is included as Exhibit [redacted].

6.1.3.12 Interview of Individual I

On February 18 and 20, 1981, Individual I, former Kaiser QC Inspector, was interviewed by NRC. He indicated that he was aware of incidents of QC inspectors being harassed by construction personnel. Individual I stated that two inspectors in particular were subject to harassment in the form of buckets of water dumped on them while they were performing their inspections. He said the above incidents were reported to Kaiser management but nothing was ever done about the problem. Individual I indicated that he had heard that General Foreman Walter Hamm was aware of the identity of the individuals involved in the incidents but was protecting those individuals.

A SWORN STATEMENT BY INDIVIDUAL I IS ATTACHED AS EXHIBIT [redacted]

6.1.3.13 Interview of Dennis Taylor

On February 19, 1981, Dennis Taylor, Kaiser QC Inspector, was interviewed by NRC. He stated that in October or November 1980, while performing a magnetic particle inspection of a weld in the reactor containment building, he was hit with a stream of water from a fire extinguisher. Taylor also

indicated that QC Inspector Anthony Pallon was frequently doused with water while performing inspections in the suppression pool area. In Taylor's opinion, Pallon was being harassed by craft personnel in this area because he was rejecting welds made by the craft personnel.

6.1.3.14 Interview of Jesse Ruiz

On February 18 and 20, 1981, Jesse Ruiz, former Kaiser QC inspector, was interviewed by NRC. He indicated that construction workers were pouring buckets of water on QC inspectors who were performing inspections. He said that these incidents were brought to the attention of Robert Marshall, Kaiser Construction Superintendent, who stated that anyone throwing water on a QC inspector would be fired. However, no formal investigation or report was made of these incidents.

6.1.3.15 Interview of Walter Hamm, Sr.

On March 26, 1981, Walter Hamm, Sr., Kaiser General Foreman, was interviewed by NRC. He stated he was aware that water had been thrown on several QC inspectors, including Janice Mulkey. Hamm indicated that the culpable individuals were never identified and no disciplinary action was ever initiated. He stated that according to rumors individuals nicknamed "Fat Frenchie," "Skinny Frenchie," and one pipefitter nicknamed "John Boy" were involved in the incidents. Hamm identified these individuals but he was unable to substantiate their involvement. He personally warned all of these individuals that he would terminate them if he found they were throwing water on QC inspectors.

Hamm was critical of the QC inspection activities at Zimmer and stated that QC inspectors often rejected work that, in his opinion, was acceptable. He also mentioned that he frequently had difficulty in finding inspectors when he needed them to respond to an inspection point in a timely manner. Hamm stated that the QC inspectors delayed construction and increased construction expenses because of their critical inspections. He indicated that he had frequently criticized the inspectors personally and had admonished them for their unavailability to perform inspections.

On March 26, 1981, Hamm provided a sworn statement ~~attesting to the preceding information~~, which is included as Exhibit ●.

6.1.3.16 Interview of Rex Baker

On January 13 and March 3, 1981, Rex Baker, Kaiser Inspection Supervisor, was interviewed by NRC. Baker stated that in January or February 1981, Phillip Gittings suggested that QC Inspectors Ruiz, Hendley, and Wimbish be reassigned because they were "nit-picking" during their inspections and writing too many nonconformance reports. Baker disagreed with this suggestion and expressed his opinion that the inspectors were performing inspections in accordance with Kaiser procedures and were writing valid nonconformance reports. He stated that he did move Inspectors Ruiz and Hendley from weld inspections in the reactor building to inspections in the fabrication shop.

Baker also stated that, when he first arrived on the site, he learned from the previous Inspection Supervisor that the lead welding inspector, Kenneth Shinkle, had also been reassigned.

Baker also understood that QC inspector Janice Mulkey was doused with water while performing an inspection, but he was not exactly sure how or when the incident occurred.

6.1.3.17 Interview of Kenneth Shinkle

On February 18, 1980, Kenneth Shinkle, Kaiser QC Engineer, was interviewed by NRC. He stated that from November 1977 to February 1980 he was lead pipe support hanger inspector at Zimmer. Shinkle stated that in February 1980 Kaiser was involved in a 100% reinspection of all pipe support hanger welds. He said his inspectors were rejecting up to 95% of the hangers inspected and initiating nonconformance reports for deficient hanger welds.

Shinkle stated that he was called into a meeting with both CG&E and Kaiser management, who criticized his group's high rate of rejection, their inspection techniques, and the continuing identification of deficiencies on welds that were found acceptable during previous inspections. He said those Kaiser officials present initially denied they had committed Kaiser to a 100% reinspection, but later in the meeting they admitted this was the commitment for reinspection of pipe support hangers. Shinkle stated that at the end of the meeting a Kaiser official asked him, "Do you understand who you work for now?" He took this comment as an attempt to intimidate him and to pressure his inspectors to accept pipe support hangers undergoing inspection at the time.

Shinkle stated that the next day he submitted nonconformance reports for deficient welds on pipe support hangers, and Kaiser management removed him from his job later that afternoon. He learned that William Schwiers, CG&E QA Manager, had objected to Kaiser about Shinkle's reassignment but was told Robert Marshall had said "it would be a cold day in hell before he'll [Shinkle] touch another pipe hanger." Shinkle stated that he has never been reassigned to pipe support hanger inspection activities.

On September 1, 1980, Shinkle was promoted to Quality Assurance Engineer for civil/structural activities, the job description for which states that he is responsible for pipe support hanger inspections. However, Phillip Gittings told him that this was a typing error in the description and he would have nothing to do with pipe support hanger inspection activities.

On February 18, 1981, Shinkle provided a sworn statement ~~attesting to the preceding information~~, which is included as Exhibit [redacted].

6.1.3.18 Interview of Mack White

On March 11 and 25, 1981, Mack White, QC Inspector, was interviewed by NRC. He stated that on March 11, 1981, at about 10:30 a.m., he was conducting an inspection in the drywell area of the primary containment building at Level 524. White indicated that at this time an unknown individual dumped

a few gallons of water on him from above. He looked up but was unable to identify the individual as he ran away.

White stated he reported the incident to the NRC, QC management personnel, and to Construction Superintendent Adams. He said that Adams commenced an inquiry to attempt to determine who was responsible, but was unsuccessful. White stated he had no idea who threw the water and he was unable to speculate on what prompted the incident.

On March 25, 1981, White provided a sworn statement ~~attesting to the preceding information~~, which is included as Exhibit ●.

6.1.3.19 Interview of James Ruiz

On February 25, 1981, James Ruiz, Kaiser QA Inspector, was interviewed by NRC. He stated that on February 22, 1981 he was reassigned from inspections in the primary containment building to inspections in the fabrication shop. Ruiz stated that Rex Baker had commented to him at the time of his transfer that "you were doing too good a job and so they transferred you." Ruiz stated that prior to his reassignment he had disagreed with Ironworker Superintendent Jerry Adams, who accused him of "nit-picking" inspections.

Ruiz stated he was told by Dennis Donovan that Adams had gone to James Sandlin, Kaiser General Superintendent, and asked Sandlin to have the QA Manager remove him from the containment area. Ruiz stated that his reassignment was an example of Gittings' lack of support for QC inspectors and proved that the QA Department was not independent of construction influence at Zimmer.

On February 25, 1981, Ruiz provided a sworn statement ~~attesting to the preceding information~~, which is included as Exhibit ●.

6.1.3.20 Interview of James Sandlin

On March 13, 1981, James T. Sandlin, Kaiser General Superintendent (structural), was interviewed by NRC. He indicated that QC Inspector James Ruiz had been unable to establish or maintain a good working relationship with construction personnel or his fellow inspectors. Sandlin stated that Ruiz conducted inspections without listening to any advice and did not solicit the cooperation of construction personnel or other QC inspectors.

Sandlin stated that Ruiz had been unnecessarily critical in his inspections and had been accused of "nit-picking." He indicated that this had caused conflict between Ruiz and Gerald Adams, Structural Superintendent, and he brought this matter to the attention of the QA Manager asking him to resolve the situation. Sandlin denied that he asked Gittings to reassign Ruiz from the primary containment area.

On March 25, 1981, Sandlin provided a sworn statement ~~attesting to the preceding information~~, which is included as Exhibit ●.

6.1.3.21 Interview of Gerald Adams

On March 13 and 25, 1981, Gerald Adams, Kaiser Structural Superintendent, was interviewed by NRC. He stated that he received numerous complaints from

construction personnel regarding the inspections of QC Inspector James Ruiz. He said that in his opinion Ruiz was too critical and "nit-picking" on his inspections, thereby delaying construction activities. Adams indicated that Ruiz did not cooperate with craft personnel and, in his opinion, was inspecting according to ASME Code requirements when he should be following the less stringent AWS Code requirements.

Adams stated that he had accused Ruiz of holding up construction and being overcritical in his inspections. He also threatened to have him terminated if he persisted in his unjustified delays of construction. However, Adams denied threatening to have Ruiz terminated unless he accepted welds that did not meet AWS criteria. Adams stated he had complained to Donovan, Baker, Sandlin, and Gittings about Ruiz's inspections and specifically suggested to Baker that it would be better for both him and Ruiz if Ruiz was reassigned to another area. However, Adams denied any responsibility for initiating Ruiz's reassignment.

On March 25, 1981, Adams provided a sworn statement ~~attesting to the preceding information~~, which is included as Exhibit [redacted].

6.1.3.22 Interview of L. Q. Hendley

On March 9, 1981, L. Q. Hendley, Kaiser QC Inspector, was interviewed by NRC. He stated that in February 1980 he was reassigned from pipe support hanger inspection duties to the fabrication shop. Hendley stated that his supervisor, David Painter, told him he was "doing his job too well and that is the reason for your reassignment." Hendley stated that, after his reassignment, nonconformance reports he had written were dispositioned as "Accept-As-Is" by the QC Manager.

6.1.3.23 Interview of David Hang

On February 24, 1981, David Hang, Kaiser QC Inspector, was interviewed by NRC. He stated that prior to his employment by Kaiser he worked for Peabody Magnaflux, the firm which had been responsible for nondestructive examination of welds at Zimmer. He said that in March 1980, while inspecting welds in the containment building, he was doused with a bucket of water from above. Hang indicated this was not an unusual occurrence and that this had happened to other QC inspectors before and after this event.

Hang also stated that during the summer of 1978 he was re-inspecting a weld he had previously rejected when a pipefitter threatened him with bodily harm if he did not pass the weld. Hang said he did not report the incident to anyone, but was intimidated by this threat and did not enter that particular area for some time.

On February 24, 1981, Hang provided a sworn statement ~~attesting to the preceding information~~, which is included as Exhibit [redacted].

6.1.4 Findings and Conclusions

Quality control inspectors were harassed by construction personnel who dumped water on them from above. In one case, inspectors, when entering

the site, were searched by security personnel who allegedly were instructed to perform the search by Construction Department supervisors.

There was no indication that any of these activities were condoned by Kaiser or CG&E management. There were indications that action was taken by Kaiser to identify and disipline those harassing QC inspectors.

The Kaiser Quality Assurance Manager reassigned Quality Control inspectors on four occasions after the Kaiser Construction Department criticized them.

In a related finding, NRC inspectors found that some of the nonconformance reports generated by these inspectors prior to their reassignment were improperly voided or were not entered into the Kaiser nonconformance reporting system following their reassignments (see Section 4.1). QC inspection supervisors interviewed stated that the Kaiser Quality Assurance Manager reassigned inspectors because construction management complained about their inspection activities.

6.1.5 Items of Noncompliance

No items of noncompliance were identified.

6.2 Weld Inspection Criteria Deleted

An allegation concerning the deletion of required weld inspection criteria was received by the NRC during the investigation from a site employee. The employee showed the Region III inspector copies of KEI-1 forms (weld inspection records) that supported the allegation.

6.2.1 Review of Weld Inspection Records

The Region III inspectors observed that weld inspection criteria utilized 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):

Table 6.2-1 Weld Inspection Records

System or Component	Isometric Drawing #	Beam or Mark #	Other Information
(1) Drywell Support Steel	S398B	29	Detail E of S-437
(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 or 493 Detail 2 of 447

Table 6.2-1 (continued)

System or Component	Isometric Drawing #	Beam or Mark #	Other Information
(5) Drywell Support Steel	S398A	C-63 (W8 x 10)	Bottom Plate
(6) Drywell Support Steel	S398A	W8 x 17	Cum Lugs
(7) Service Water System	PSK1WS32	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 weld in the service water system indicated the criteria was designated as not applicable in November 1979.

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

6.2.2 Code Requirements

The welding activities were governed by ASME Code Section III-1971 Edition or by the AWS D1.1-1972 Code. The applicable requirements of both codes are as follows:

ASME Code, Section III 1971 Requirements

1. NA-4130--"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 of weld joints which must be verified.

AWS D1.1-1972 Code Requirements

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 of 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 which 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 5.2."

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."

The weld inspection criteria were deleted or designated as not applicable on weld inspection forms used routinely to inspect welds. This appears to be contrary to 10 CFR 50 Appendix B, Criterion III, and the Wm. H. Zimmer QA Manual, Sections 3.3 and 3.13.1 (358/81-13-26).

This matter is addressed in the licensee's Quality Confirmation Program.

6.2.3 Findings and Conclusions

Weld inspection criteria were deleted from weld inspection forms used to document inspections of welds between July 1980 and January 1981 and were designated as not applicable for one weld made in November 1979. This concern is addressed in the licensee's Quality Confirmation Program.

6.2.4 Items of Noncompliance

One item of noncompliance was identified (failure to delineate required weld inspection criteria).

6.3 QA Surveillance Reports

An allegation concerning Surveillance Report procedure violations was received by the NRC from a site employee during this investigation. 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 QACMI G-14, Revision 3, for initiating and documenting QA Surveillance Reports (SR). 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)." 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, 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 disposition of SR F-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 F-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 F-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 QACMI G-4 would have required dispositions to have been made by the Material Review Board. The Material Review Board is comprised of the KEI Construction Engineer, CG&E QA and Standards Engineer, KEI QA Engineer, CG&E Sponsor Engineer, and the S&L 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 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

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 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 addressed in the licensee's Quality Conformation Program.

6.3.3 Items of Noncompliance

Two items of noncompliance were identified (inadequate procedures to assure nonconformances are subjected to design control measures commensurate with those applied to the original design, and failure to follow procedure to

transfer in-process nonconformances identified on Surveillance Reports to Nonconformance Reports in 30 days).

7.0 Independent NRC Inspection Findings

During the course of the investigation, RIII inspectors performed independent inspections of various plant areas during allegation reviews. In those areas where deficient conditions were observed, further inspection undertaken to determine the extent of the deficient conditions.

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 pertinent design drawing. The beam appeared to be permanently installed and traceability of the beam heat number was not maintained. After extensive and unsuccessful 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 identification 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 15.2.2 (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, (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 (50-358/81-13-06).

This concern is addressed in the licensee's 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).

This concern is 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-procress

inspections related to Design Document Changes would be performed; 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).

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. During checks for cable separation on 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 brief tour of the cable spreading room while inspecting others matters, 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. 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 (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 (358/81-13-22).

The adequacy of cable separation is addressed in the licensee's Quality Confirmation Program.

7.2.3 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 (358/81-13-23).

7.2.4 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).

With regard to the installed conditions identified in paragraph 7.3.2, items 1, 2, and 4, 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.

7.2.5 Findings and Conclusions

Four locations were identified in which the cable separation requirements had not been maintained as specified in the FSAR. The adequacy of cable separation is addressed in the licensee's Quality Confirmation Program.

7.2.6 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).

7.3 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 S&L

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

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

The audits did not address in depth the effectiveness of the nonconformance program. The RIII inspector observed only two items in all of the 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).

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.

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 (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 directed toward identification of new and generic problems. The audits appeared to identify adverse findings for which there were no corrective action taken or followup 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

The CG&E audits of S&L were identifying a recurring problem concerning the performance of design calculation, reviews, and verifications by S&L. The specific problems identified in each audit are described in Table 7.3-1.

Table 7.3-1 CG&E Audit Findings

Audit Date or No.	Problems
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.
	(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.
	(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."

Table 7.3-1 (continued)

Audit Date or No.	Problems
	(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.
	(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 which identified the above problems, or corrective actions instituted addressed 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 (358/81-13-24).

This concern is addressed in the licensee's Quality Confirmation Program.

7.3.4 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.

7.3.5 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, 5.10.3.3, 5.11.3, 4.1.8.2.1, 7.1.3, 7.2.3, 7.2.4, 7.3.2.

9. Open Items

When this investigation was initiated, the NRC interviewed numerous quality control inspectors, construction craftsmen, and management personnel who provided information that deserved review by the NRC. The information provided was prioritized with the highest priority given to the initial four allegations received from a former Zimmer contractor QC Inspector (Section 4), the 19 allegations received from GAP/Applegate (Section 5), and the most significant 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, 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.

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 11, the inspectors and investigators met with licensee representatives periodically during the investigation and on March 26, 1981. Attendees at the March 26 meeting 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

11. 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.

12. NRC Actions and Licensee Commitments

12.1 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 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. Concernirg 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.

12.3 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. This program will independently verify on a sampling basis the licensee's Quality Confirmation Program.

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

To Bob Warnic

From G. BARBER

Zimmer - nits

ELD ① Need Thies on some of the citations and examples in the citation.
i.e.

B.2 Date it was closed
B.3 When?

D.2 what period that inspections were not performed?

E when was the inspection done?

② Letter - p. 2 last sentence.
Make reference to statutory authority and new policy
... Since events cross the effective date of new policy, the new policy is being applied.

(Stello made this point on DEI

Letter - p. 4 change "harassment" paragr

(3) Letter - p.3 next to (last ¶)
Suggest we make request for information pursuant to 50.54(f).

(4) Letter p.5 Add paperwork reduct. act parag.

(5) NOV
Identify severity levels

(6) Citation A
Co-Exit locate part 2(a) and 2(c) in Report

Is item 3 really a falsified record issue?

(7) Citation B
Item 3 appears to be a proced. violation. Should it go with Citation K?

(8) Citation J
Item #1 appears to belong to Citation I.

(9) NOV - page 11
The paragraph about old and new enforcement policies should be in cover letter

(10) NOV - page 12
Delete - paperwork reduction act.

A-69

November 1, 1982

To Whom It May Concern:

Please be advised that the attached tape recording of a telephone conversation between Mr. Ernest Alldredge and Mr. Applegate was made by Mr. Applegate without Mr. Alldredge's knowledge or permission. Despite that fact, its content is innocuous and, therefore, no effort is being made at this time to keep it from being made public.

Magnaflux Corporation

By: William P. Costantini
Vice President