

THE CINCINNATI GAS & ELECTRIC COMPANY

WM. H. ZIMMER NUCLEAR POWER STATION

UNIT 1

DRAFT PROPOSAL FOR:

QUALITY ASSURANCE IMPROVEMENT PROGRAM

AND

QUALITY CONFIRMATION PROGRAM

May 18, 1981

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Introduction

Responses to the Following Inspection Report Items:

1. Bristol Structural Beam Welds
2. Lack of Bristol Quality Assurance Program
- 3a&b. Material Traceability - Beams in Reactor and Auxiliary Building
- 3c&d. Lack of Traceability of Materials
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- 14. Non-Verified Socket-weld Fit-ups
- 17. Uncontrolled Design Document Changes

INTRODUCTION:

The Cincinnati Gas & Electric Company is developing more comprehensive programs directed toward assuring the quality of construction at the Wm. H. Zimmer Nuclear Power Station. The stages covered by these programs are twofold:

1. Ongoing work toward construction completion. NRC/RIII has identified ten items of concern relative to the quality of ongoing construction related activities in their April 8, 1981 Immediate Action Letter. These concerns are addressed in CG&E's Quality Assurance Improvement Program.
2. Past construction work. NRC/RIII has identified areas of concern (Inspection Report items) during their continuing investigation at the Zimmer site relative to the quality of existing work. CG&E's Quality Confirmation Program is being established to validate existing construction including these areas and others. In some cases, Inspection Report (IR) items are covered under specific Immediate Action Letter items and so noted where appropriate.

The Cincinnati Gas & Electric Company has had several discussions with NRC/RIII staff in developing these programs. The following proposal represents the outline of the programs in their current state of development. This proposal is submitted for RIII staff review with a request for an opportunity to discuss any questions that may arise during the review.

QUALITY ASSURANCE IMPROVEMENT PROGRAM

IAL 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. We understand CG&E will utilize temporary personnel qualified in these areas until permanent staff members have been hired.

Response

CG&E expects to have an experienced nuclear QA Manager at the Zimmer Site by mid-June, 1981. An offer for this position has been made with tentative acceptance.

Listed below are present and planned QA/QC manpower resources supporting the Zimmer project. Efforts are underway to retain experienced, permanent employees in this field. However, recognizing the shortage of qualified candidates in this discipline, technically qualified current and new employees are being assigned to fill some of the positions in the QA Department. Experienced QA contract personnel are being melded into this group to assist in the present effort and to train permanent CG&E employees.

The Quality Confirmation Program is being organized separately from the QA group supporting current operations in order to optimize the performance in each area.

A Quality Control group under the direction of an experienced CG&E QA engineer has been established and is functional as described under the response to Item 3 of the April 8, Immediate Action Letter.

<u>Position</u>	<u>Present</u>	<u>Planned</u>	
		<u>Construction</u>	<u>Operation</u>
Mgr. QA/QC	1	1	1
Quality Assurance:			
Engineers	1	8	5
Records	3	3	2
Procedures/Training	2	1	1
Auditors	2	5	3
Admin. Support	3	3	2
Quality Control:			
Supervisor	1	1	1
Inspectors	16	21	8
NDE/III	3	1	1
Quality Confirmation:			
Supervisor	1	1	-
Engineers	1	3	-
Inspectors	0	As Required	-
Totals	34	48	24

Not included in this listing is temporary headquarters support assigned to the QA/QC group during this reorganization which includes:

- Manager of General Engineering
- Chief Draftsman
- Supervisor - GED Clerical Group
- Civil Engineer (Previously GE)
- Ad Hoc: Supervisor - GED Records Group
- Miscellaneous Technicians

Additionally, support is provided in selected areas by the Zimmer A/E, Sargent & Lundy.

See the attached list of persons currently assigned and supporting the CG&E QA/QC organization.

QA ORGANIZATION

5/18/81

Job
Description

QA Manager	W. W. Schwiers	
Quality Engineers	R. P. Ehas	
	M. F. Rulli	
	D. Schulte	
	J. H. Hoffman	(6)
	(1) B. Reid	
	(1) G. Orlov	
Adm. Assistant	H. G. Gadd	(6)
Procedure Preparer & Indoct. Trainer	(3) S. E. Martin	
Records Control	P. L. Adkins	
	J. B. Holland	(6)
	J. F. Shaffer	(6)
Auditors	(1) J. C. Buck	
	(2) V. Ferretti	
	(1) E. Carlson	
QC Inspection Supvr.	D. C. Kramer	
QC Inspectors	See Attached	
NDE Trainer	(4) J. Rodriguez	
NDE Level III	(4) R. Vannier	
Clerks	(5) E. Carr	
	(5) E. Carter	
	(5) D. Smith	
	(5) A. Crowder	

Before Name

- (1) - SAI
- (2) - NES
- (3) - Independent P.E.
- (4) - Sargent & Lundy
- (5) - HJK Company
- Unnumbered indicates
CG&E Employee

Behind Name

- (6) - Temporary CG&E

IAL 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. Region III will be informed of actions taken.

Response

In a letter dated April 7, 1981, to the President of Henry J. Kaiser Company, CG&E outlined the steps to be taken by H. J. Kaiser in their QA/QC effort for the Zimmer Project. In that letter, the Kaiser organization was directed to eliminate any domination by construction of the QA organization and the QC inspectors. They were further instructed to stress the independence of the QA/QC organization and to provide effective leadership to allow that independence to be maintained and for the organization to properly function.

Related to the above directive, but independent of it, the Henry J. Kaiser Company restructured its corporate organization April 1, 1981. The changes provide that the Manager of Corporate Quality Assurance now reports directly to the President. This change reinforces the independence and separation of QA/QC from Construction.

The Henry J. Kaiser Company Site QA/QC Organization is being restructured in accordance with the attached chart to strengthen the management and supervision of QA/QC activity. A Manager of Documentation position has been added to manage all quality related documents. A new QA/QC Site Manager will be supported by an outside Quality Assurance Consultant and added headquarters QA Staff.

The CG&E Site QA/QC Staff outlined under Item 1 response to this Immediate Action Letter is being structured into an organization paralleling that of Henry J. Kaiser Company to facilitate monitoring factors such as independence and separation of the Kaiser Construction and QA/QC operations.

All QC inspection procedures currently under review in accordance with Item 4 of the Immediate Action Letter will no longer require approval by Construction.



2. TEMPORARY DUAL
RESP - OF CIP

IAL 3. Concerning QC Inspections

Using the personnel described in Item 1 above, CG&E will conduct 100% reinspections of QC inspections conducted by Kaiser and other contractors after the date of this letter. This will continue until a revised CG&E Audit Program as described in Item 10, below, is implemented by these qualified individuals and RIII releases this requirement.

Response

CG&E has established a Quality Control Organization to meet the requirements stated above. Twenty qualified inspectors are currently employed and assigned as shown on the attached list. They will conduct reinspection of the inspections performed by Kaiser QC personnel on a closely monitored basis encouraging feedback of observations.

The CG&E QC program does not relieve the Henry J. Kaiser Company from the final responsibility for quality control. The CG&E reinspections will reflect agreement or disagreement with the results of the Kaiser inspection and will not constitute an acceptance or rejection of the work.

Construction of essential work will be allowed to proceed only as it may be supported by the CG&E reinspection program. This program is being implemented as the inspection procedures are reviewed and the inspectors can be trained in these procedures and certified in their respective areas.

THE CINCINNATI GAS & ELECTRIC COMPANY

WM. H. ZIMMER NUCLEAR POWER STATION

QC INSPECTORS

Donald Kramer CG&E - Supervisor

Electrical

Chuck Spinks	SAI
Dale Hallenbeck	SAI

Electrical Hangers

Jerry Rheinhardt	SAI	
Frank Rivera		NES
Ralph Powers		NES

Structural

Linsey Caison	SAI
Alan Ashworth	SAI

NDE

Ron Shope	SAI
Ralph Murphy	SAI
L. J. Victory	SAI

Pipe Support

Rodger Taylor		NES	
Robert Cannon			CG&E
Keith Deck			CG&E
Warren Hopka		NES	
Eric Antinarelli		NES	
Dave Fox	S&L		
John Paquin		NES	

Piping

Ron Wilson	NES
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Warehouse

Jim Weissenberg	CG&E
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WY&B

<u>SAI</u>	<u>NES</u>	<u>CG&E</u>	<u>S&L</u>		
8	7	4	1	=	20 Total

IAL 4. Concerning QC Inspection Procedures

All QC inspection procedures will be reviewed and revised (where appropriate) by qualified design engineers and QA personnel. These reviews will be conducted by personnel independent of the construction organization to confirm that the procedures include appropriate inspection requirements and applicable hold points. The construction activities controlled by these QC inspection procedures will not be performed after the date of this letter until the applicable procedure has been reviewed and approved.

Response

A program under CG&E control has been established to review and approve all QC inspection procedures as follows:

1. All QC inspection procedures are being reviewed by qualified design engineers and QA personnel. The object of the review is to confirm that the QC inspection procedures include appropriate inspection requirements and are technically correct.
2. The reviews are being conducted by personnel who are independent of the construction organization.
3. Construction activities controlled by these QC inspection procedures are not performed until after the applicable procedures have been reviewed, revised (where appropriate), approved by CG&E, and the respective inspectors trained in any revision.

This procedure review program has two phases:

- Phase I. Initial Review. Attached is a current summary of the Phase I QC procedure review status. As work and reinspections proceed on the basis of these approved procedures, feedback on potential improvements is solicited from all parties associated with the QC program.
- Phase II. Continuing Review. Comments for those implementing the approved QC procedures, plus an ongoing re-assessment of QA/QC programs, will be the basis for continuing reviews of the procedures approved under Phase I.

QUALITY CONTROL INSPECTION PROCEDURES

Total No. of Procedures	118
Total No. of HJK Procedures	93
Total No. of HJK Deleted Procedures	26
Total No. of HJK Procedures to be Reviewed	67
Total No. of CG&E Technical Reviews	64
Total No. of CG&E QA Reviews	55
Total No. of Waldinger-Young & Bertke Procedures	12
Total No. of CG&E Technical Reviews	12
Total No. of CG&E QA Reviews	12
Total No. of NES Procedures	12
Total No. of CG&E Technical Reviews	12
Total No. of CG&E QA Reviews	2
Total No. of Field Construction Procedures	1
Total Deleted Field Construction Procedures	1
Total No. of Issued Procedures:	
Kaiser	40
WYB - 5-19-81	12
NES	0

5. Concerning Training

QA/QC personnel at the Zimmer site will receive training on any new procedures and practices resulting from actions taken to fulfill provisions of this letter prior to implementation of the procedures. In addition, refresher training will be given prior to June 1, 1981, on (a) 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, and (d) the avenue of appeal should the identifying individual disagree with the adequacy of the resolution.

Response

QA/QC personnel at the Wm. H. Zimmer Nuclear Power Station are receiving training on new procedures and practices resulting from actions taken to fulfill provisions of the immediate action letter as follows:

1. Both the H.J.K. and C.G.&E. training groups responsible for QA/QC training are notified when a new or revised procedure is approved or when specialized training needs to be conducted.
2. The training groups appropriately schedule and conduct a training session for the personnel affected. This training is performed prior to implementation of the procedure.

Refresher training on items 5.a through 5.d above is in progress. This refresher training will be completed prior to June 1, 1981.

Regarding item 5.c above, various feedback systems on nonconformances have been evaluated. It has been decided that the report of all open nonconformances will be positioned with the QC supervisor and made available to all inspectors. Similarly, the records of dispositioned nonconformances will be available to the originating individual for review. Indoctrination training will include detailed instructions in the use and availability of these nonconformance records.

regarding item 5.d above, the "avenue of appeal" available to anyone disagreeing with the resolution of a nonconformance report is outlined in Kaiser April 28 Inter-Office Memorandum to all Inspectors as follows:

Interested party sends Inter-Office Memo to Manager of inspection stating reason for disagreement. Manager of inspection is obligated to review and resolve, if possible.

If not satisfied with resolution by Manager of inspection, the interested party sends Inter-Office Memo to HJX Site QA Manager for final resolution. HJX Site QA Manager is obligated to provide the final resolution with copies to CG&E QA Manager, KEI Corporate QA Manager and KEI VP - Power Division.

These instructions will be placed in the procedure and included in the refresher training program to be concluded by June 1, 1981.

IAL 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.

Response

A. Construction Forces

The DDC and NR procedures have been reviewed. Comments have been incorporated and the revised procedures are being circulated for final approval at this time.

B. QC Inspection Forces

Both the Design and QA review of QC inspection procedures have been aggressively pursued. A large percentage of these reviews have now been completed as noted in the response to Item 4 of the I.A.L.

Construction activities controlled by these QC procedures are being resumed only after the applicable procedure has been reviewed and approved and the QC inspectors have been trained in any procedure changes.

C. Design Forces

Organizations responsible for design of safety related equipment are being audited to assure that they have sufficient procedures and training to identify deviations from Codes and FSAR statements (Ref. IR Item #18).

The FSAR is being re-reviewed for correctness and consistency with respect to the design by the responsible system engineers. This re-review remains on schedule for completion by July, 1981.

New Project Procedures are being drafted establishing the need to submit corrections to the FSAR as changes are identified. Formal issue of FSAR changes will be made on a semi-annual basis.

A new Sargent & Lundy Project Instruction has been issued to provide a requirement to identify changes or deviations from industry codes and standards. This revised instruction has been issued (Ref. IR #10c).

IAL 6. Concerning Deviations from Codes and FSAR Statements
(Cont'd)

C. Design Forces (Cont'd)

Sargent & Lundy is reviewing on a company generic basis the adequacy of the procedure of using design calculations to justify deviations. This review along with the identification of specific corrective actions is on schedule for June 1981 completion (Ref. IR Item #10a).

Preparation of a CG&E Owners Project Procedure that will provide management directives and a summary of the implementing procedures for identifying, reporting and resolution of deviations from Codes and FSAR statements is on schedule for July 1981 completion (Ref. IR Item #10b).

IAL #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.

Response

The procedures governing nonconformance reporting have been reviewed for adequacy and are determined to be satisfactory. In junction with those NR's that have been voided the following corrective action is being implemented.

1. An independent qualified QA engineer has been assigned to review the approximate 740 voided NR's, which have been segregated by category.
2. The category "Superceded" which included approximately 370 NR's was the start point for the CG&E review. HJK had started the same review and they were instructed to continue but to submit copies of the required documentation so that CG&E can validate each voided document. Monitoring of this activity shall be conducted by the CG&E QA engineer.
3. The approximate 105 documents category "found or changed" will be researched and the proof of validity for voiding the NR shall be requested from HJK. Each individual NR shall be analyzed and the voiding accepted or the NR will be reopened and closed as required.
4. The "reinspection" category will require individual review of each NR voided, and justification will be required or the NR will be reopened.
5. Procedures established for the prior categories will be applied to the balance of the voided NR's. Those which cannot be validly voided will be reopened.
6. There will be documentation and justification for the voiding of each NR covered by the above categories or the NR will be reopened.
7. Completion of the above reviews will be accomplished by October 1, 1981.
8. An audit of the HJK NR Log will be conducted to validate that NR's have not been voided without processing, or assignment of a number other than a control number.

IAL 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.

Response

All Kaiser QC records were relocated on April 7, 1981 and will be under the care, custody and control of CG&E Quality Assurance until agreed to by Region III. This item also addresses the concerns of I.R. #16.

CG&E has established a program to assure all necessary attention to effect the care, custody and control of QA/QC documentation. It is the intention of CG&E to continue to have HJK process the records in an environment of surveillance by CG&E. In order that records are managed more effectively and efficiently; the following activities are being implemented:

1. Improve the physical facilities for record handling and storage.

CG&E is constructing an underground record storage vault meeting ANSI N45.2.9 requirements. An office complex to process and manage these records will be located immediately above this vault.

2. Establish procedures that provide for improved receipt, control and maintenance of QA documentation.

CG&E has promulgated new procedures and is planning additional procedures.

3. Involve CG&E and HJK interactively for improved communication, surveillance, audit and control of records.

CG&E has arranged for relocation of HJK QA and CG&E QA personnel to provide a better environment for communication and interaction. The new Construction QA Records Center will house both HJK and CG&E personnel. HJK will process the records and CG&E will provide surveillance and audit.

4. Develop commitment control program to effectively "Close the loop".

The Record and Information Management System at the station is being extended to support a "commitment control program". Software is in place and operating at the station for this purpose. Additional hardware is being procured to provide this capability in the QA complex.

5. Staff this activity sufficiently to allow orderly progress in a well controlled environment.

CG&E has a full time management employee assigned to documentation, surveillance and audit of activities in the new Construction QA Records Center. This person will have additional clerical support as necessary.

Figure 1 shows the basic interface points for documentation - It is not intended to show all document movement options.

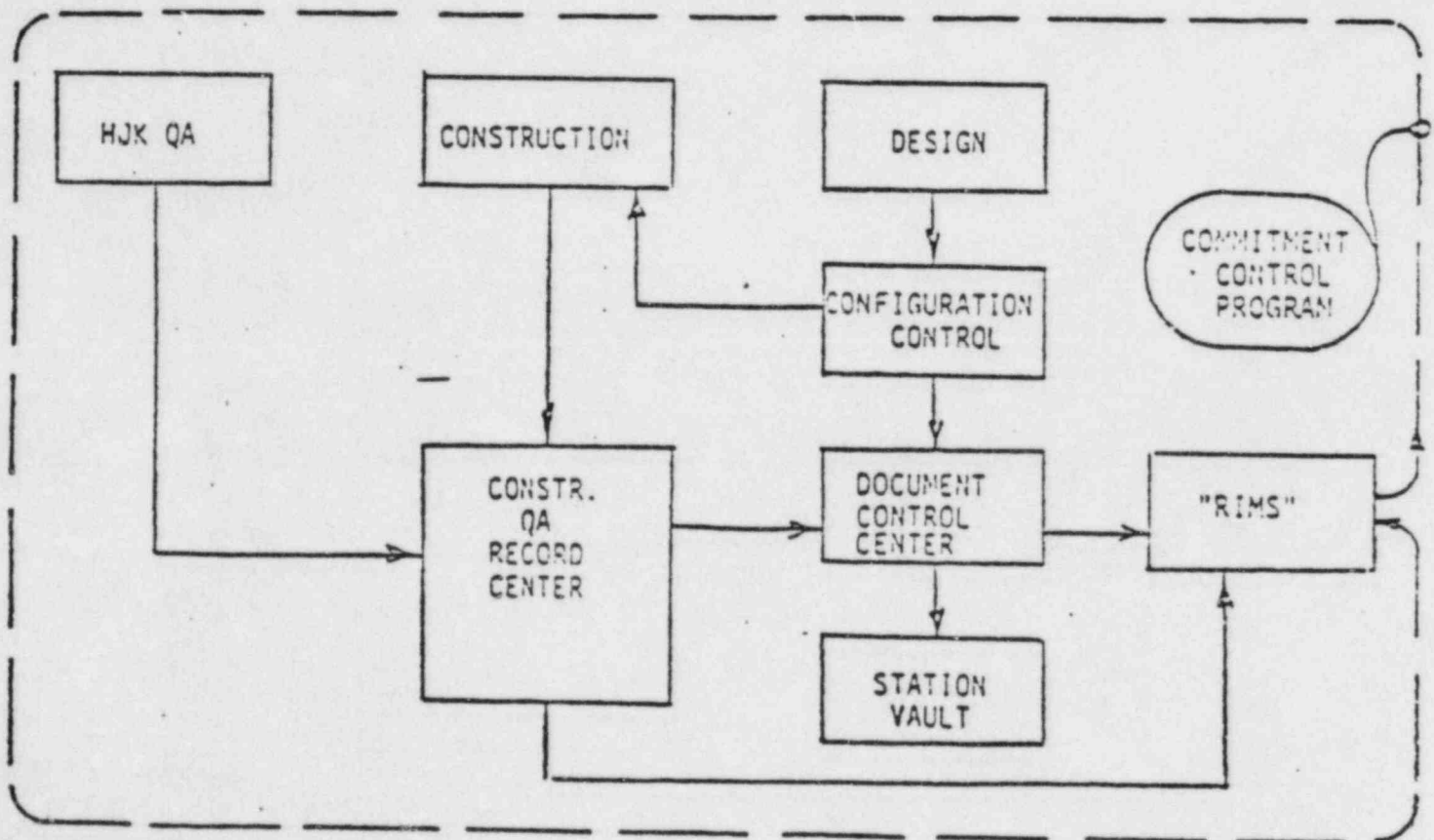


FIGURE 1

IAL #9 - Concerning Conditions Adverse to Quality

CG&E will perform a 100% review of all surveillance and non-conformance reports written by contractor personnel after the date of this letter. This program will continue until RIII releases this requirement.

Response:

H. J. Kaiser Company has been instructed to issue a copy of each NR and surveillance report to C.G. & E. QA for review. These reports are issued at time of preparation. The following describes the method of control established by C.G. & E.

1. NR's issued by H. J. Kaiser for C.G. & E. review shall be controlled and filed by Control Number.
2. The C.G. & E. File for the NR's received per (4) above will be reviewed on a monthly basis to assure that each NR has been received or a reason for their void has been provided. If adequate reason for non issue of an NR is not provided C.G. & E. will take appropriate corrective action to resolve this problem.
3. Procedure QA 15-QA-03 has been prepared and approved for review of NR's that are issued by HJK.
4. Training of those Quality Engineers responsible for review of NR's will be completed by May 26, 1981.
5. All unacceptable NR's prepared or dispositioned by HJK will be returned for correction and retraining in their preparation if required.
6. The surveillance procedure is being reviewed to assign authority for issue of surveillance reports to QA Personnel.
7. A form and method for providing the means of QC inspection to request information regarding inspection criteria is in preparation.
8. Documentation Deficiency Reports are prepared by QA Personnel. These reports are related only to QA and do not involve QC inspections.
9. In Inspection Report is prepared at time of receipt inspection and covers those items which are returned to vendors. These reports are utilized to evaluate the performance of qualified vendors.

Note: The above also addresses concerns expressed in Inspection Report Items 4 and 7.

IAL 10. Concerning the Audit Program

The existing 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.

Response

The CG&E Quality Assurance Manual requires a comprehensive system of planned and periodic audits to verify compliance with all aspects of the quality assurance program.

The audit schedule has been reviewed, revised, and expanded (attached) to include hands-on field audits and audits of a technical nature at firms providing design services. The audits will be in-depth and comprehensive covering all applicable requirements including deviations from codes and the FSAR.

A second audit schedule is being developed that will address required audits for suppliers who are supplying essential materials for the Zimmer Project.

The existing plan for the review and revision of the audit program is as follows:

1. Review and revise the audit schedule to assure that site organizations and firms supplying design services are audited to all requirements of the QA program including technical aspects. This activity is complete except for final approval.
2. Review the CG&E approved vendors list to develop an audit schedule for vendors actively supplying essential components to the Zimmer project. Vendors to be placed on this schedule are those which meet the following criteria:
 - a) The components being supplied require engineering and/or shop fabrication (i.e. not an off the shelf item).
 - b) The quality of components supplied cannot be verified by vendor surveillance or source inspections.
 - c) The quality of components supplied cannot be verified by receiving inspections or performance testing.

3. A sample of past CG&E QA audits of HJK, S&L, GE, EPD, EOTD, GED and GCD will be reviewed to determine the depth and adequacy of these audits particularly with respect to nonconformance programs. In the areas where deficiencies in the past audit program were identified and corrective action not yet verified, new audits will be scheduled as soon as practical (Ref. IR #12).
4. A formal audit of the items contained in the NRC's, April 8, 1981 Immediate Action Letter and the inspection report items is planned for the week of June 1, 1981. The purpose of this audit will be to determine the status of the action taken to meet these commitments.

Addendum to #10

Regarding inspection report item #11 - Lack of C.G. & E. Follow-up on Repetitive Problems (Inadequate Corrective Action) the following shall be implemented relative to the C.G. & E. audit program.

Responses to audit findings now require that corrective action taken to avoid further noncompliance must be supplied by the auditee. In verification of this action, the auditor must have assurance that this corrective action is adequate to address any possible generic deficiency. Also an Unresolved Deficiency Summary is issued monthly from the Manager-Quality Assurance to the Senior Vice President and the Manager of any organization responsible for corrective actions to deficiencies that are past due. This includes deficiencies which are delinquent past the due date and deficiencies which have exceeded the planned completion date and QA verification was not possible due to lack of, or inadequate corrective action on the part of, the audited organization.

The deficiencies addressed by this procedure are those identified during audits conducted in accordance with audit and surveillance procedures.

A new procedure has been established to define the method for the reporting of repetitive, generic, procedural, or significant concerns adverse to quality to the appropriate levels of management.

Conditions for which Corrective Action Reports are issued as follows:

- 1) The condition indicates a trend of declining quality.
- 2) The condition is repetitive indicating current controlling measures are inadequate or insufficient.
- 3) Evaluation indicates that the condition is a result of a program deficiency.
- 4) The condition indicates failures to obtain required approvals for changes in procedures or documents.
- 5) Failure to resolve a deficiency in a timely manner.
- 6) The condition indicates negligence or disregard of document or procedural requirements.
- 7) QA follow-up review of conditions adverse to quality show that the approved corrective action has not been taken, or has been improperly or incompletely accomplished.

The Corrective Action Reports are distributed to the appropriate management of the organization to which the corrective action was addressed as well as those responsible for implementation of the

corrective action and the CG&E Senior Vice President.

CAR's must be responded to and corrective action verified within 10 working days or a Stop Work Order is issued in accordance with the applicable Stop Work Order Procedure.

Regarding inspection report Item #12 - CG&E has not performed any audits to verify compliance with the effectiveness of the S&L nonconformance program the following shall additional be implemented to Item #3 above concerning the Audit Program.

Inspection Report #12

1. Identify previous audits conducted at S&L, HJK, EOTD, EPD, GE, GCD, and GED.
2. A matrix shall be developed for each organization which lists the 18 criteria and identifies those elements of the program audited.
3. For each organization covered by Item 1, the 18 criteria will be analyzed for applicability to that organization's program.
4. For those criteria that were not audited and were applicable to the subject organization's program, the next audit of the organization will include audit of these criteria.
5. Based on the results of the audit covered by Item 4, an analysis will be made to determine whether items not audited may have affected the quality of the component or service included in the organization program.
6. Items which are indeterminate will require a quality and engineering disposition to determine the corrective action necessary to validate quality elements.

QUALITY CONFIRMATION PROGRAM

INTRODUCTION

In order to address the concerns expressed with past quality assurance activities at the Wm. H. Zimmer Nuclear Power Station - Unit I, a Quality Confirmation Program (QCP) will be instituted. The purpose of this program will be to verify the quality of past construction.

The following items from the inspection report will be included in the program:

- Item #1 - Bristol Structural Beam Welds
- Item #2 - Lack of Bristol Structural Beam Welds
- Item #3a & b - Material Traceability - Beams in Reactor and Auxiliary Buildings
- Item #3c & d - Lack of Traceability of Materials
- Item #3e - Lack of Traceability of Materials
- Item #5 - Welds Inspected after Painting
- Item #6 - Unacceptable Technique for Radiographs of Prefabricated Pipe Welds
- Item #8 - Design Violation Contrary to FSAR - Cable Separation
- Item #9 - Lack of Inspection Control to Verify Cable Separation
- Item #13 - Deleted Design Criteria
- Item #14 - Nonverified Socket Weld Fit-ups
- Item #17 - Uncontrolled Design Document Changes

The remaining items from the inspection report will be addressed in the response to the Immediate Action Letter (IAL). These items are:

- Item #4 - Surveillance Reports Not Being Converted to Nonconformance Reports in 30 days (see IAL #9)
- Item #7 - Nonconformance Reports Are Being Voided Improperly (see IAL #9)
- Item #10 - S&L Cable Tray Loading Design Control (see IAL #6)
- Item #11 - Lack of C.G. & E. Follow upon Repetitive Problems
- Item #12 - Audit of S&L Nonformance Program (see IAL #10)
- Item #15 - This item has been deleted
- Item #16 - Deviations from Codes and FSAR (see IAL #8)

Item #18 - Deviations from Codes and FSAR - Cable Tray Hanger Welds (see IAL #6, copy of the report justifying the exception will be made available to R III)

In addition, a list of items to be included in the QCP has been identified by C.G. & E. A task force met for two (2) days to define potential problem areas including such things as organizations involved, materials, procedures, structures, components, QA programs, etc. The list is as follows:

- HVAC Damper Field Welds
- Copper Pipe Welds on the Refrigeration System
- HVAC High Pressure Duct Welds
- Fire Protection Pipe Hangers - Design Review
- Essential Hangers Not Affected by New Loads Program
- Essential Floor and Wall Penetrations as Installed by the Installation Contractor
- Welded Attachments on Safety Related Piping
- Conduit Support Welds
- Review of Documentation for Containment Liner against Installation
- Stabilizer Truss
- Review of Fuel Pool Liner Documentation and Selected Welds
- Review of Refueling Bellows Documentation and Selected Welds
- Review of Pipe Whip Restraint Documentation and Selected Welds
- Configuration Confirmation and Inspection of Selected Welds on Service Water Intake Flume
- Upgraded Concrete Block Walls - Configuration

For those items not requiring 100% reinspection a sample plan will be established. Two types of sampling are planned.

1. Discovery Audit Plan

This plan will begin by determining the quality of the documentation. This will be accomplished by reviewing the documentation against the QA/QC procedures in use at the time the documents were generated.

Verify the documentation by checking a small random sample of the work performed in the field.

If a problem is found to exist the use of a more rigorous statistical sampling plan will be investigated. If no problem is found, the work and documentation will be considered acceptable.

2. Statistical Sampling Plan

This plan will begin by determining the sample size, the confidence level to be achieved, and the method of selecting the sample population.

Qualified inspectors will verify that proper construction techniques, configuration, etc. exists and that the equipment is properly installed.

The inspection plan will consist of procedures detailing the size of the inspection teams, qualification of inspectors, inspection methods to be used, and sample inspection forms. The teams will be comprised of C.G. & E. personnel as well as employees of H. J. Kaiser, Sargent & Lundy, and other contract personnel as required. These procedures will be prepared by C.G. & E., Sargent & Lundy, or other contract personnel and reviewed and approved by C.G. & E. All inspectors will be trained in the appropriate inspection procedures.

A report will be generated giving the results of our investigations and inspections.

Cincinnati Gas and Electric has undertaken programs in the past 2 to 3 years to verify the quality and adequacy of various components. The following is a list of items for which a high degree of confidence in the quality of construction and installation exists:

- Large Percentage of Essential Pipe Hangers (those that have not been verified will be inspected as a part of the QCP)
- Duct Hangers
- Expansion Anchors - test conducted by Commonwealth Edison and C.G. & E., all non-conforming anchors have been identified
- Pre-stressing Tendons
- Quenchers
- MSRV Discharge Pipe and MSRV Supports
- Leak Proof Doors

INSPECTION REPORT #1 - BRISTOL STRUCTURAL BEAM WELDS

CONCERN: Apparent lack of an adequate QA program covering field welding by Bristol resulting in some unacceptable structural welds.

DISCUSSION: Inspection of Bristol structural beam welds in the 546' elevation of the Auxiliary Building, Cable Spreading Room, and RHR Heat Exchanger Room revealed that several field welds are unacceptable to AWS weld inspection criteria.

- QCP ACTION:
1. Establish a drawing review to determine where Bristol Structural Steel field welding exists. This review will also determine the location of other vendor field welds (i.e., HJK, FEC, WY&B).
 - a) Use S&L structural drawings marked by Bristol (framing plans).
 - b) Superimpose added beam drawings installed by other contractors (HJK, FEC, WY&B).
 - c) Identify beams which may have been installed by HJK on field work orders.

Note: This review is in progress in the Auxiliary Building with elevation 546' now completed and elevation 567' in progress.

2. Determine areas of structural steel field welds and identify same.
 - a) Uncover embedments
 - b) Uncover one end of beam. If bolted, assume other end is bolted.

- c) Search Bristol DDC's to identify Bristol field welds.
- d) Mark drawings to identify locations of structural steel field welds.
- e) Determine requirements for acceptable welds.

Note: Identification of structural steel field welds is in progress on elevation 546' of the Reactor Building.

- 3. Remove paint or other material from the welds that may preclude proper weld inspection.
- 4. Conduct a 100% visual inspection of Bristol structural steel field welds.
- 5. Conduct a visual inspection of other vendor structural steel field welds and Bristol shop welds using a 95% confidence factor that 84% of the sample is acceptable. This program would have the following sample and defect criteria:

<u>Sample Size</u>	<u>Maximum Number of Defects</u>
19	0
30	1
39	2
48	3
57	4
66	5

If more defects are found, further inspection of random samples will be done.

- 6. Write Nonconformance Reports on all unacceptable welds and disposition as "rework".

7. A review of Bristol records, procedures, and documentation has been conducted to determine the types of welding procedures used on the job, special requirements called out in these procedures, and types of weld rod specified for field welding. A further review of Bristol weld rod material receiving reports and weld rod issue slips will be conducted to determine the type of weld rod actually used.

Inspection Report #2

Concern

The QA Program required only inspection by a non QC person.

Discussion

Due to the uniqueness of the contractual relationship between Bristol and H.J. Kaiser and the limited scope of the work, we believe that this is an isolated incident. However, as part of the QCP, we will investigate work done by other subcontractors who were on site at the same time as Bristol.

As a result of a review of the Bristol shop QA program and documentation, we believe that the shop QA Program was adequate.

QCP Action

See Inspection Report Item #1.

INSPECTION REPORT #3a & b: MATERIAL TRACEABILITY - BEAMS IN REACTOR
AND AUXILIARY BUILDING

CONCERN: Several hundred feet of beams have been received from an unapproved vendor, and cannot be accounted for as to where installed or other disposition.

DISCUSSION: H. J. Kaiser purchased W8X17 beams from a non-approved vendor. These beams were placed in essential steel stock on the basis that they were supplied with valid mill certificates by the vendor at time of purchase.

QCP ACTION:

1. Conduct an audit of all steel received on site and determine the supplier.
2. Conduct a random audit of other essential material ie: piping, weld rod, fittings, cable, etc, and determine the suppliers of such material.
3. Verify that the supplier of this material is an HJK or CG&E approved vendor.
4. CG&E/HJK Q.A. will perform a vendor survey in accordance with approved procedures to verify the credibility of the mill certifications and the vendor performance to their Q.A. manual.
5. If the vendor is found to be unacceptable, then the manufacturer of the beams will be surveyed.
6. If all surveys are unacceptable, a program will be initiated to identify those beams which were supplied by an unapproved vendor.

7. If these attempts are unsatisfactory, a random sampling of bean material will be made to insure that material meets the required chemical and physical certifications.
8. A program will be established to determine the cause for release of "non-approved vendor" material to determine if the problem is symptomatic.

INSPECTION REPORT #3c & d - LACK OF TRACEABILITY OF MATERIALS

Problem

Traceability of heat numbers on small bore piping for the Diesel Generators.

No records exist to show that some of the installed pipe is acceptable. The heat numbers do not appear on the H.J. Kaiser list of acceptable heat numbers.

Discussion

A review of the documentation of the small bore piping in the diesel generator system followed by a walk down of the piping revealed some lack of traceability in accordance with ASME Code requirements. An inspection program will be implemented to correct this situation. Small bore piping on other systems will also be included in the program as well as some large bore piping.

QCP Action

1. Conduct an inspection of 100% of the accessible field installed small bore piping on the diesel generators for traceability in accordance with ASME Code requirements.
2. Conduct an inspection of 100% of the accessible field installed small bore piping on the High Pressure Core Spray, Low Pressure Core Spray, and Low Pressure Coolant Injection systems for traceability in accordance with ASME Code requirements.
3. Selectively compare the Control Rod Drive System documentation against accessible field installed small bore piping for traceability in accordance with ASME Code requirements to achieve a 95/95 confidence level.
4. If a 95/95 confidence level is found for step 2 and step 3 no further inspections are required. If a 95/95 confidence level is not achieved, a further review will be initiated of other accessible field installed small bore piping to achieve a 95/95 confidence level.
5. A discovery audit will be performed on large bore pipe for traceability in accordance with ASME Code requirements. This audit will consist of a review and inspection of 6 DDC's on the Safety Relief Valve Discharge Lines and 6 DDC's on the Reactor Building Closed Cooling Water System.
6. Take appropriate corrective action for any deficiencies found.

INSPECTION REPORT #3e - LACK OF MATERIAL TRACEABILITY

Concern: Weld rod heat numbers are being transferred to the KE-1 weld form from the KE-2 form by individuals other than the QC Inspector who inspected the weld.

Discussion:

At the present time the quality documents are under the care, custody, and control of C.G. & E. H. J. Kaiser has been ordered to stop the transfer of information between the KE-1 and KE-2 forms.

QCP Action

1. Weld filler material verification will be made a hold point
2. The number of welds will be determined for which KE-1 forms do not have heat numbers properly entered.
3. Appropriate corrective action will be taken

INSPECTION REPORT #4 - SURVEILLANCE REPORTS NOT BEING
CONVERTED TO NONCONFORMANCE
REPORTS IN 30 DAYS

Concern

Surveillance reports not being converted to nonconformance reports in 30 days.

Discussion

This item will be addressed as part of Immediate Action Letter Item #9.

INSPECTION REPORT #5 - WELDS INSPECTED AFTER PAINTING

CONCERN: Structural welds were inspected after painting.

DISCUSSION: FEC has installed structural beams and cable tray supports and have used Galvanox and other coatings to prevent the corrosion of the welds. Although no documentation exists that verifies that these welds were inspected at that time, hanger inspection along with its associated structural steel was in-process inspected and all work was assumed to be acceptable by construction unless reported unacceptable by Quality Control inspectors.

QCP ACTION: 1. Determine those areas where weld inspection has taken place on cable tray and conduit supports and the welds have been accepted.

NOTE: This portion of the program has been completed. The inspection covered under Item 1 will determine those structural field welds which were painted prior to inspection.

2. Conduct a sampling program consisting of a 95% confidence factor that 84% of the sample is acceptable. This program would have the following sample and defect criteria:

<u>SAMPLE SIZE</u>	<u>MAXIMUM NUMBER OF DEFECTS</u>
19	0
30	1
39	2
48	3
57	4
66	5

QCP ACTION:
(Cont'd)

If more defects are found, further inspection of random samples will be done.

3. Determine the weld acceptance criteria per design specifications and approved inspection procedures.
4. Inspect the welds using CG&E inspectors and document inspection reports.
5. All welds that are deemed unacceptable will be documented on a nonconformance report.
6. An evaluation of the sampling program shall be conducted to verify weld acceptability for those welds not inspected.
7. Any coatings found on the welds to be inspected will be removed prior to inspection.

Inspection Report #6 - Unacceptable Techniques for Radiographs of Prefabricated Pipe Welds

Concern

Radiographic technique was inadequate on 25% of the prefab welds that the NRC Inspector reviewed. The penetrameters were not adequately shimmed.

Discussion

A sample, covering a variety of pipe sizes and systems, of radiographs rejected by the NRC Inspector has been identified. The welds identified are being reradiographed reproducing the original shop configuration as near as practicable and adding a second penetrameter shimmed to the thickness of the maximum allowable reinforcement for the pipe. The systems and pipe sizes are listed below:

3"	Main Steam
4"	Fuel Pool Cooling
6"	Fuel Pool Cooling
8"	Fuel Pool Cooling
8"	Scram Discharge Volume Header
10"	Main Steam
10"	Recirc.
18"	Feedwater
20"	Recirc.
20.4"	High Pressure Core Spray
23.8"	Feedwater

Field welds as well as shop welds will be reradiographed.

In addition, Pullman Power Products has radiographed a series of test coupons using no shim and a shim equal to the maximum allowable reinforcement and several shims of intermediate thickness. The radiographs were taken on 4", 8", and 16" pipe.

Preliminary results from both programs indicates that the original radiographs meeting the -15%/+30% density requirements are adequate to evaluate weld quality.

QCP Action

1

1. Reradiograph a representative sample of radiographs rejected by Mr. K. Ward (NRC) reproducing, as nearly possible, the shop set up and also shimming a second penetrameter to the thickness of the maximum allowable reinforcement for the weld to demonstrate that the radiographs rejected for technique meeting the -15% / $+30\%$ density requirements are adequate to evaluate weld quality.
2. Verify to a 95/95 confidence level that the Pullman Power Products shop radiographs fall within the -15% / $+30\%$ density requirements.
3. For those radiographs sampled that do not meet the density requirements, the welds will be reradiographed with the penetrameter shimmed to at least the thickness of the weld.
4. A sample of shop welds welded by vendors other than Pullman Power Products will be reviewed against the density criteria.
5. A sample of field welds will be reviewed against the density criteria.

INSPECTION REPORT #7 - NONCONFORMANCES

ARE BEING VOIDED IMPROPERLY

Concern

Nonconformances are being voided improperly.

Discussion

This item will be addressed as part of Immediate Action Letter Item #9.

INSPECTION REPORT #8: DESIGN VIOLATION CONTRARY TO FSAR -
CABLE SEPARATION

CONCERN: A 6 in. green cable tray was designed and installed inside a white tray. The green tray includes green Class 1E cables and the white tray contains blue/white and yellow/white associated cables.

DISCUSSION: The original FSAR criteria did not stipulate separation requirements from an essential cable tray to a non-essential tray. The FSAR criteria is being clarified for separation of essential, associated and non-essential cable in both cable trays and conduits.

QCF ACTION:

1. Using the clarified separation criteria, CG&E will conduct a 10% discovery audit of associated cables will be performed. This audit will be expanded, if necessary, to arrive at a 95% confidence level that 95% of associated and non-essential cables are properly separated in trays and conduits.
2. A 100% audit for separation will be conducted of essential, associated, and non-essential cables which are installed between the cable spreading room and the control panels in the main control room.
3. Sargent and Lundy will perform a 100% computer assisted analysis of associated cables to demonstrate that the reliability of Class 1E circuits is at acceptable levels considering the separation criteria.
4. The green cable tray identified under "concern" will be removed and reinstalled in accordance with FSAR criteria.

INSPECTION REPORT #8 (cont'd)

CG&E is prepared to conduct a technical discussion relative to associated cables as applied to the Zimmer Project with the NRC at their convenience.

INSPECTION REPORT #9: LACK OF INSPECTION CONTROL TO VERIFY
CABLE SEPARATION

In response to the concerns identified in Inspection Report Items 9a through 9d, CG&E has reviewed the Quality Assurance procedure governing the inspection of cable pulling (QACMI-E7). This procedure has been revised in accordance with the results of the review. The revision to the procedure incorporates a method of verifying that non-safety related cables are installed in accordance with the design documents. The QC inspectors are being retrained in accordance with the revised procedure.

The following responses are made to each of the specific items of concern identified:

9a.

CONCERN: From the end of tray points up to the control panels, two blue cables in the Cable Spreading Room have been pulled into a green tray section leading up to the Control Room.

DISCUSSION: CG&E investigation of this problem revealed that the blue cables were not pulled into the green tray section; however, the blue cables were too close and incorrectly bundled together with the green cables when the green cables were installed in a riser.

QCD ACTION: The corrective action is to remove the blue cables from the green bundle and relocate for proper separation.

9b.

CONCERN: Yellow/white cable coming out of conduit and suspended approximately 6 in. above the cables in the blue tray (in the Cable Spreading Room).

INSPECTION REPORT #9: LACK OF INSPECTION CONTROL TO VERIFY
CABLE SEPARATION (cont'd)

DISCUSSION: If the conduit, containing the yellow/white cables were extended to the wall penetration, no separation deviation would exist.

QCP ACTION: The corrective action is to extend the conduit containing the yellow/white cable to the wall penetration.

9c.

CONCERN: In the Instrument and Relay Room, a non-safety related white cable, No. DC258 (also labeled DC257) has been misrouted into a yellow tray No. 1040B.

DISCUSSION: The unterminated white cable was incorrectly installed in the yellow tray.

QCP ACTION: The corrective action is to remove cable No. DC258 from the yellow tray, and install it in a white tray.

9d.

CONCERN: Tray loading and cable separation concerns.

DISCUSSION: Cable tray loading is addressed in the response to inspection report #10. Cable separation concerns are addressed in the response to inspection report #8.

Inspection Report #10 - S&L Cable Tray Loading Design Control

Concern

Lack of controls to require design verification calculations to be performed for thermal loading of power sleeves and dead weight loading of all trays.

Lack of controls for deviations from the FSAR. S&L did deviate from the tray loading design basis.

Lack of internal controls to document design deviations when identified by engineers.

Discussion

This item is being addressed as part of Immediate Action Letter Item # 6.

Inspection Report #11 - Lack of CG&E Follow-up on
Repetitive Problems

Concern

Inadequate corrective action taken by CG&E in regards to repetitive problems concerning design calculations and verifications not being performed by S&L. The problems were identified in 5 different CG&E audits.

The R-III Inspector identified the lack of requirements to perform design calculations for tray loading during the investigation.

Discussion

This item is being addressed as part of Immediate Action Letter Item #10.

Inspection Report #12 - Audit of S&L Nonconformance
Program

Concern

CG&E has not performed any audits to verify compliance with and the effectiveness of the S&L nonconformance program.

Discussion

This item is being addressed as part of Immediate Action Letter Item #10.

INSPECTION REPORT #13 - DELETED DESIGN CRITERIA

CONCERN: Weld inspection criteria has been deleted from the KE-1 form from 7-80 - 2-81.

DISCUSSION: Weld inspection criteria has been deleted from the KE-1 form for AWS structural welding on the drywell steel, and other instructions added as follows:

Deleted: Item 1 on KE-1 form in its entirety

Added: Item 1 on KE-1 form "Rod slip (KE-2 form) to be part of package"

Deleted: Item 2 on KE-1 form except for "Verify Mark Numbers"

Unless the welds are full penetration welds, this criteria need not be hold points; however, proper weld procedure, welders qualification and proper filler metal verification must be conducted prior to weld acceptance. (See KE-2 form)

- QCP ACTION:
1. Identify dates for which criteria was deleted on KE-1 forms for AWS structural steel field welds.
 2. Conduct a 100% audit of KE-1 forms on structural steel field welds for the time frame established.
 3. Document all full-penetration structural field welds during the time frame and determine if any hold points were violated.
 4. Any welds so found will be documented on a Nonconformance Report, properly dispositioned and corrected.
 5. The procedures governing the use of KE-1 forms will be revised to designate Item #1 on the KE-1 form as a witness point, rather than being shown as "N/A" as in the past for partial penetration

INSPECTION REPORT #14 - NONVERIFIED SOCKET-WELD FIT-UPS

CONCERN: Socket weld fit-up has not been verified on numerous small bore pipes.

DISCUSSION: According to HJK Procedure SPPM 4.6 and the KE-1 form used for the inspection of small bore piping, the fit-up of socket weld joints is required. ASME Section NB4427-1 requires that approximately a 1/16" disengagement be met on socket welds. Numerous socket welds have been made without the proper documentation witnessing the proper visual inspection of pipe fit-up as documented on several surveillance reports.

QCP ACTION: 1. Determine all small bore piping socket welds for which verification for disengagement does not exist as documented on surveillance reports.

NOTE: This program so far has identified 104 socket welds for which verification for disengagement does not exist. A sampling of these welds is presently being identified for radiography, with emphasis being placed on those in ECCS systems and in systems which are unisolable from the reactor. It is being found that some of these socket welds have been cut-out and replaced as a result of piping modifications.

2. Document these welds on a Nonconformance Report.

INSPECTION REPORT #14 (cont'd)

3. Disposition the Nonconformance Report such that a random sampling program is initiated to radiograph these welds which will give a 95% confidence factor that 90% of the welds are acceptable. This program would have the following sample and defect criteria:

<u>Sample Size</u>	<u>Maximum Number of Defects</u>
59	0
93	1
124	2
153	3
181	4
208	5

A similar program for small size lots would be as the following table describes:

<u>Lot Size</u>	<u>Maximum Number of Defects</u>	0	1	2	3	4
114		46	68	85	98	107
88		43	63	76		
79		42	60	71	<u>Sample Size</u>	
38		30				

If more defects are found, further inspection of random samples will be done.

4. During the review of the small bore document packages by QA, any socket welds that do not have documentation of fit-up will be documented on a Nonconformance Report and a radiograph taken to determine if proper disengagement exists.

Inspection Report #15

This item has been deleted.

Inspection Report #16 - Deviations from Codes and FSAR

Concern

The KE-2 (Rod Issue Slip) is being used as justification for QC inspection and verifications. The KE-2 is not a QC document and neither requires nor has QC signatures.

Discussion

This item will be addressed as part of Immediate Action Letter Item #8.

INSPECTION REPORT #17 - UNCONTROLLED DESIGN DOCUMENT CHANGES

CONCERN: The KEI Configuration Control Center does not know the status of DDCs written prior to late 1980....When a DDC is written against one document and subsequent changes are made to one or more other documents (drawings not referenced by the original DDC.

DISCUSSION: In accordance with Sargent and Lundy project instruction PI-ZI-2.1, the designer is responsible for ensuring that all documents that require a revision by a DDC are in fact, revised even though all affected drawings are not stated on the DDC. For the past year, CG&E and S&L have been in a mode of resolving all DDC's which still appear open in the Configuration Control Center master DDC Index.

QCP ACTION:

1. Sargent and Lundy has revised their project instruction PI-ZI-2.1 requiring a cover sheet be attached to all DDC's returned to the HJK Configuration Control Center which would indicate all drawings affected by the DDC. This will permit the CCC to close out the DDC when all affected drawings are revised and issued.
2. Sargent & Lundy has also added to their project instruction the requirement for incorporating DDC's into the next revision of the applicable engineering design documents or within two months, whichever is less.

INSPECTION REPORT #17 - UNCONTROLLED DESIGN DOCUMENT CHANGES (cont'd)

3. CG&E presently has nine persons working on reconciling our DDC computer listing with that of Sargent and Lundy. This list, when finalized, will include the status of every DDC as to whether it is incorporated into the design documents. It is anticipated this effort can be completed in 2 or 3 months. CG&E has ordered an additional keypunch machine, which will speed-up input into the computer program, and certain personnel are working overtime and on Saturdays on this effort.
4. The question raised earlier by Mr. Gwynn concerning DDC's originating from Waldinger-Young & Bertke in the field referencing only one drawing, while more than a single drawing might actually be affected has subsequently been listed as a violation by Region III. (50-358/81-07-07). A complete and thorough response is being prepared on this item in addressing IE Inspection Report 81-07.
5. The check which exists to assure that DDC's are built into the plant is at time of system walkdown for Electrical, Mechanical and C&I DDC's, prior to system turnover. Structural DDC's, not normally identified with a particular system are checked during a walkdown of the structure prior to area structural turnovers. This method coupled with the computer listing provides sufficient control to assure implementation of DDC's.