Results of Quality Programs for Construction of Clinton Power Station

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RESULTS OF QUALITY PROGRAMS
FOR CONSTRUCTION OF
CLINTON POWER STATION

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ILLINOIS POWER COMPANY
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EXECUTIVE SUMMARY

A. INTRODUCTION

This report describes and evaluates the major programs and actions implemented to provide confidence in the quality of Clinton Power Station construction.

The quality of Clinton Power Station construction can originate only from two fundamental sources: the strong commitment of Illinois Power Company management to a quality product and the dedication to a quality product of each individual employee. Through these sources, Illinois Power Company has built high quality directly into the Clinton Power Station. In addition, the programs and actions described herein have operated as a systematic, multi-level composite to reinforce and verify the quality built into the Clinton Power Station. The programs and actions described herein have involved both massive efforts toward improvement of Clinton Power Station quality assurance organization activities and equally massive efforts to improve directly the performance of the Clinton Power Station construction work itself.

The major programs and actions described herein are as follows:

1. Quality Assurance Program - From the outset of the project, Illinois Power Company has implemented and continued its efforts to maintain its Quality Assurance Program in accordance with 10 CFR Part 50, Appendix B.

2. Recovery Programs - In response to specific deficiencies identified during 1981 and 1982, Illinois Power Company stopped work in nine major functional areas of construction and implemented extensive recovery programs.

3. Programmatic Improvements - Subsequently, Illinois Power Company instituted a broad range of fundamental programmatic improvements. These programmatic improvements resulted in substantial upgrading of the management and experience level of personnel, quality assurance organizations, nonconformance and corrective action programs, and control of construction and inspection activities.

4. Overinspection Program - Illinois Power Company implemented a major program for reinspection of safety-related, augmented class D (radioactive waste), and fire protection structures, systems, and components in those areas related to the stop work actions. In practice, this has resulted in three separate quality inspections for virtually all such reinspectable structures, systems, and components.

5. Record Verification Program - Illinois Power Company implemented a Record Verification Program which calls for 100% review of completed quality records by the constructor, Baldwin Associates, followed by a 20% sample review by Illinois Power Company Quality Assurance.

6. General Assessment and Corrective Action Activities - Throughout the course of Clinton Power Station construction, Illinois Power Company has maintained or has initiated aggressive assessment and corrective action activities, which augment and complement the programs and actions mentioned above. These activities include the 10 CFR Section 50.55(e) and Part 21 reporting systems, the Material Assurance Program, responses to the Nuclear Regulatory Commission inspections, third-party audits, systems for addressing employee quality concerns, the configuration control system, and the Management Corrective Action Request Program.

B. CLINTON POWER STATION QUALITY-RELATED PROGRAMS IN PERSPECTIVE

The size and complexity of the Clinton Power Station project are such that no summary report could impart a true sense of the efforts that Illinois Power Company has undertaken to assure Clinton Power Station construction quality. In an attempt to aid the reader, the text of this report is structured to present summaries of the evaluations of the major quality-related programs. Detailed information supporting the evaluations discussed in the text is provided in the appendices contained in a separate volume.

This report evaluates the results of each of the six major classes of Clinton Power Station quality-related programs and actions. When these programs and actions are considered on a collective basis, several important overview observations emerge:

- The quality-related programs and actions are designed to identify, document, and correct deficiencies in Clinton Power Station construction.

- While error-free construction may be a goal, it is neither attainable nor required.

- The Clinton Power Station quality-related programs and actions have been effective in identifying and documenting deficiencies.

- The deficiencies identified have not had adverse implications for Clinton Power Station safety.

- Individual deficiencies have been corrected and effective actions have been taken to preclude their recurrence.

- Illinois Power Company has been diligent in examining the root causes of deficiencies and in effecting substantial programmatic changes to remedy those causes.

The magnitude of the Clinton Power Station project has produced quality-related programs and actions of correspondingly large scope. Reinspections conducted to date show high rates of conformance with design drawings and specifications for structures, systems, and components and have not revealed any nonconformances which have safety significance. The overall trend is to even higher rates of conformance, and, in certain judiciously selected areas, it may soon be possible to relax some verification programs where regularly established quality programs have been demonstrably effective. However, Illinois Power Company recognizes that in certain areas the verification programs have been beneficial, and these aspects of the programs will be maintained to ensure that Illinois Power Company will continue to receive the beneficial results of these programs.

C. THE CLINTON POWER STATION QUALITY ASSURANCE PROGRAM

Illinois Power Company management's strong commitment to assuring the quality of Clinton Power Station construction is reflected in the establishment, maintenance, and continuing improvement of the Clinton Power Station quality assurance organization. Illinois Power Company management is actively involved in ensuring the independence and effectiveness of the Illinois Power Company quality assurance organization and providing leadership to ensure that all employees produce and assure a quality product.

The Illinois Power Company Quality Assurance Program, which was established in conformance with 10 CFR Part 50, Appendix B, includes three basic types of activities that are fundamental to achieving adequate confidence in the quality of Clinton Power Station construction:

- Activities affecting quality are conducted in accordance with controlled written instructions, procedures, and drawings by appropriately trained and qualified personnel to ensure that these activities are performed correctly in the first instance.

- Activities affecting quality are subject to inspection by appropriately trained and qualified persons, who did not perform the activities inspected, to verify that the activities have been performed correctly.

- All aspects of the quality assurance program are subject to a comprehensive system of audits and surveillances by appropriately trained and qualified personnel, who do not have direct responsibility for the aspects audited, to verify that those aspects of the quality assurance program are properly implemented.

Because quality-related problems inevitably arise during construction, the Clinton Power Station Quality Assurance Program includes measures to ensure that conditions adverse to quality are promptly identified and corrected, the cause of any such condition is determined, and action is taken to preclude its recurrence. The Clinton Power Station Quality Assurance Program has been subjected to numerous audits by both cognizant Clinton Power Station project personnel (see Appendix B) and third parties (see section VII.E). The results of these audits indicate that activities affecting Clinton Power Station quality, on the whole, have been conducted in accordance with applicable requirements, and numerous specific and programmatic corrective actions have been taken to resolve problems identified by those audits. In short, the audit results portray a quality assurance system which is not problem-free, but which is functioning effectively.

D. RECOVERY PROGRAMS

Prior to 1981, the type of deficiencies identified during Clinton Power Station construction were similar in kind and quantity to those expected during construction of any commercial nuclear power plant. Thereafter, the Nuclear Regulatory Commission, Illinois Power Company, and its contractors identified deficiencies in the implementation of the Clinton Power Station Quality Assurance Program that led Illinois Power Company and Baldwin Associates to stop the affected work activities. The Nuclear Regulatory Commission took confirmatory action in regard to the stop work actions. Illinois Power Company then developed and implemented specific recovery programs to address and correct the deficiencies for each affected area of work.

While the specific corrective actions varied with the area of activity affected, there were certain common denominators within these actions. The major types of actions included upgrading of procedures to assure complete and precise direction for work and inspections, training of personnel to improved procedures, reduction of inspection backlogs, accelerated closure of open nonconformance reports, and, where indicated, the performance of additional inspections in the affected area of activity. After Illinois Power Company implemented the corrective action in each recovery program area, the Nuclear Regulatory Commission conducted inspections to verify effective implementation and gave its concurrence to lifting the stop work actions. By the end of 1983, all stop work actions had been lifted and work had resumed in all affected areas at Clinton Power Station. In addition, Clinton Power Station project audits and surveillances of the recovery programs were performed and, where appropriate, additional corrective actions were taken to ensure that effective implementation continued.

E. PROGRAMMATIC IMPROVEMENTS

Illinois Power Company implemented extensive programmatic improvements in four key areas: (1) management and experience level of personnel; (2) quality assurance organizations; (3) nonconformance and corrective action programs; and (4) control of construction and inspection activities.

In the area of management and experience level of personnel, Illinois Power Company hired a new vice president with extensive nuclear experience to direct key nuclear activities, including quality assurance. It also hired new managers for: Nuclear Station Engineering, Quality Assurance, Nuclear Training, Project Management, Nuclear Support, and Nuclear Planning. In addition, the Illinois Power Company and Baldwin Associates organizations were augmented by more than two hundred experienced Stone & Webster Engineering Corporation personnel. Baldwin Associates also hired a new Manager of Quality and Technical Services and a new Project Manager. In addition, the Baldwin Associates organization was restructured to establish dedicated groups for nonconformance review, traveler review, and training. Illinois Power Company nuclear project personnel were consolidated and moved to the site. Both Baldwin Associates and Illinois Power Company issued policy statements which admonish against intimidation and encourage employee reporting of quality concerns. Both Illinois Power Company and Baldwin Associates established training departments to centralize project training and to establish and upgrade training programs for orientation and job-specific training for all site personnel.

Illinois Power Company and Baldwin Associates also substantially increased the size of their quality assurance organizations. As of July 1984, the Illinois Power Company Quality Assurance organization had grown from 25 in 1982 to more than 300 persons, while the Baldwin Associates Quality and Technical Services organization had grown from 191 in 1982 to more than 900 persons. The Illinois Power Company Quality Assurance organization was restructured to provide a supervisor and staff for each major quality assurance function. In practice, Illinois Power Company Quality Assurance became more involved in all levels of daily project activities, and the number and frequency of audits and surveillances were significantly increased. Finally, a full-time quality assurance/quality control training staff was established, the quality assurance/quality control training program was augmented, and existing inspector certifications were verified.

In corrective action programs, emphasis was placed on increasing control over nonconformance identification and documentation, tracking nonconformances by computer to ensure timely corrective action, and notifying management of delay in resolution of conditions adverse to quality and of the status of corrective actions. The corrective action program was upgraded to include computer-assisted trending of conditions adverse to quality, analyses of individual conditions to identify root causes, and notification to senior management of the results of trend analyses.

Improvements in the controls for construction and inspection activities have concentrated on upgrading the traveler system, project procedures, and measures for document control. Among the major steps were establishment of formal construction and engineering reviews of travelers and a dedicated Baldwin Associates traveler review group. The Illinois Power Company Quality Assurance Department reviewed Baldwin Associates procedures and instructions to ensure conformance with quality assurance requirements and clarity of direction. Document control was enhanced by establishment of a computer-assisted traveler tracking system, an automated system to track controlled documents, and field satellite document stations that maintain updated controlled documents for reference at locations convenient to field workplaces.

Illinois Power Company's ongoing process for audits, surveillances, and third party audits indicate that the programmatic improvements have been implemented effectively. Taken together, this array of programmatic improvements has ensured that Clinton Power Station quality-related activities receive greater attention and more effective execution. These improvements have enhanced confidence in quality and, thus, the success of the project.

F. OVERINSPECTION PROGRAM

The Overinspection Program applies to safety-related, augmented class D (radioactive waste), and fire protection items in those areas in which stop work actions were issued. Both old work and new work are covered. For purposes of evaluation, July 26, 1982, was selected as the point of demarcation between old and new work (see subsection V.C.4). The Overinspection Program provides for additional inspections of completed and previously inspected work on two levels: a sample inspection by the Baldwin Associates Field Verification Group and a subsequent sample inspection by the Illinois Power Company Overinspection Group. As of July 31, 1984, both the Field Verification and Overinspection Groups have performed inspections of nearly 100% of all inspected lots. This has resulted in three inspections for virtually all reinspected work within the scope of the Overinspection Program.

Illinois Power Company has performed an evaluation of the results of the Overinspection Program. This evaluation addressed five issues: (1) whether the available data from the program are sufficient to support reliable inferences as to the quality of Clinton Power Station construction, (2) whether the nonconformances identified by the program would have been safety-significant had they remained undetected by the Overinspection Program, (3) whether the as-constructed plant shows a high rate of conformance with design drawings and specifications, (4) whether the quality of new work differs from that of old work, and (5) whether the results can be applied to work not inspected under the program.

For the purpose of this evaluation, data from the Overinspection Program through July 31, 1984, were used. As of that date, more than 1 million attributes had been subjected to inspections under the Overinspection Program. In terms of the number of items within the scope of the program, approximately 5% of the total number of items have been inspected under the Overinspection Program. Illinois Power Company's analyses show that these data are sufficient to permit reliable conclusions to be drawn regarding the quality of Clinton Power Station construction.

Engineering evaluations of the nonconforming conditions identified by the Overinspection Program were conducted to determine if any such conditions would have been safety-significant if they had remained undetected by the Overinspection Program. These evaluations are Illinois Power Company's primary basis for verification of Clinton Power Station construction quality. All nonconformances identified by the Overinspection Program were evaluated by the Clinton Power Station architect-engineer, Sargent & Lundy. The results of many evaluations were obviously not significant (e.g., cosmetic defects such as superficial arc strikes). Others required detailed engineering analyses to examine the nonconforming condition and its relationship to performance of intended safety functions. No nonconforming condition was safety-significant; that is, even if the nonconformances were to have remained unidentified by the Overinspection Program, it would not have resulted in a loss of capability of a structure, system, or component to perform its intended safety function. The results of the engineering evaluations for safety-related structures, systems, and components are summarized as follows:

<u>Overinspection Program Evaluation</u>

Attributes Inspected	Nonconforming Attributes Identified By Overinspection	Safety-Significant Nonconformances
764,080	36,358	0

In addition to the primary engineering evaluations, Illinois Power Company performed quantitative evaluations of the results of the Overinspection Program to determine whether the as-constructed plant shows a high rate of conformance with design drawings and specifications. The overall conformance rate for field verification inspections is high (95.4%). The rate for the subsequent overinspections by Illinois Power Company Quality Assurance is still higher (98.7%), thereby indicating the effectiveness of the field verification level of inspection. Conformance rates were also calculated on the basis of disciplines and commodities. The results of these evaluations also show generally high conformance rates. The results of the evaluation also demonstrate that the conformance rate for new work is generally higher than for old work, thus reflecting the favorable effect of the recovery program actions and programmatic improvements implemented since 1982. Finally, favorable inferences for the quality of items not inspected under the Overinspection Program (e.g., nonrecreatable attributes and inaccessible items) can be drawn from the results for items inspected within the program.

In broadest terms, the Overinspection Program confirms that the quality of Clinton Power Station construction is adequate. The primary measure of confidence in overall plant safety is gained from the engineering evaluations of the nonconformances identified by overinspection. None of the nonconformances would have caused a loss of capability of any structure, system, or component to perform its intended safety function. In certain areas where favorable results are most apparent, it may be possible to relax or eliminate selected program elements. For present purposes, it is sufficient to conclude that the operation of Illinois Power Company's Quality Assurance Program, coupled with its additional recovery programs, programmatic improvement actions, and Overinspection Program, provides a high level of confidence in the quality of Clinton Power Station construction.

G. RECORD VERIFICATION PROGRAM

Illinois Power Company implemented the Record Verification Program to verify the adequacy of Clinton Power Station construction quality assurance records generated before the stop work actions and to provide additional assurance as to the adequacy of records generated after the stop work actions. The reviews conducted under the program apply to quality assurance records for all completed Baldwin Associates construction work packages and site-generated purchase order documentation packages for safety-related, augmented class D (radioactive waste), and fire protection structures, systems, and, components. These reviews are conducted in addition to the activities governing records under the normal Illinois Power Company Quality Assurance Program. These reviews are conducted on two levels: Baldwin Associates' Document Review Group reviews all records within the scope of the program for acceptability, and Illinois Power Company's Records Review Group reviews a random sample of approximately 20% of the records reviewed by the Baldwin Associates' Document Review Group. A document exception list is prepared and maintained for each work package or purchase order reviewed. The document exception list records the results of the review, including any record deficiencies disclosed during the review.

Illinois Power Company initiated an evaluation of the results of the Record Verification Program as of December 10, 1984. This evaluation consisted of three elements: (1) the safety significance, if any, of potential hardware-related nonconformances resulting from record reviews; (2) the implications for hardware quality, if any, of record deficiencies identified in record verification reviews; and (3) the basis for confidence in the acceptability of Clinton Power Station construction quality assurance records.

When potential hardware-related nonconforming conditions are identified as a result of record reviews, nonconformance reports are initiated. During the course of the record verification review, more than 40,000 record packages, which include more than 5,600,000 attributes, have been placed in review, and 587 nonconformance reports have been initiated. Of these, 171 had a potential safety implication and were subjected to engineering evaluation by Sargent & Lundy. Each of these nonconformance reports was reviewed against the pertinent design criteria, as set forth in the applicable codes or standards, to determine whether the nonconforming conditions identified were safety-significant; that is, if a particular nonconforming condition had remained undetected by the Record Verification Program, it could have resulted in a loss of capability of a structure, system, or component to perform its intended safety function. None of the nonconforming conditions in the 171 nonconformance reports were found to be safety-significant. In round numbers, the results of the engineering evaluation are summarized as follows:

Record Verification Program Engineering Evaluation

Attributes Reviewed	Record Deficiencies Identified	Nonconformance Reports Resulting From Record Reviews	Nonconformance Reports With Potential Implications For Safety	Safety-Significant Nonconformances
5,600,000	132,000	587	171	0

The record deficiencies identified in the Record Verification Program were reviewed to determine whether any had adverse hardware implications. The rates of record deficiencies for the program as a whole, new work and old work, were low (about 2.3% for the entire program). The rate of deficiencies for new work is less than for old work by about a factor of two - an apparent reflection of Illinois Power Company's implementation of improvements and corrective actions in regard to quality records subsequent to the stop work actions. Examination of deficiency rates with respect to individual disciplines, items of work, and types of attributes indicated no outstanding trends that would warrant further action.

Record deficiency resolutions also were reviewed to confirm that none were indicative of adverse hardware quality. This review confirmed that the resolutions had no adverse implications for hardware quality and that the only record deficiencies with a potential for hardware implications were those for which nonconformance reports had been initiated. As stated above, the Sargent & Lundy engineering evaluations of nonconformance reports indicated no instances of safety significance.

Confidence in the acceptability of Clinton Power Station construction quality assurance records is further bolstered by the results of Illinois Power and Baldwin Associates audits and surveillances, third-party audits, and Nuclear Regulatory Commission inspections. While specific open items have been identified through these audits and inspections, Illinois Power Company has taken or will take appropriate corrective action to ensure that record verification program activities will continue to be effectively implemented.

On the basis of the evaluation in this report:

- None of the potential hardware-related nonconformances resulting from record reviews are safety-significant. That is, if the nonconforming conditions were left unidentified by the Record Verification Program, no loss of capability of a structure, system, or component to perform its intended safety function would have resulted.

- The other record deficiencies identified in the program and their resolutions have no adverse implications for hardware quality.

- There is adequate confidence in the acceptability of the Clinton Power Station construction quality assurance records.

H. GENERAL ASSESSMENT AND CORRECTIVE ACTION ACTIVITIES

Throughout the course of the Clinton Power Station project, Illinois Power Company has maintained or initiated many assessment and corrective action activities, which operate in conjunction with the normal Quality Assurance Program, the recovery programs, programmatic improvements, Overinspection Program, and Records Verification Program, to buttress and complement Illinois Power Company's level of confidence in Clinton Power Station construction quality. Among these activities, the following programs and actions have particular importance in maintaining compliance with regulatory requirements and in providing management with effective tools to ensure Clinton Power Station construction quality.

With regard to regulatory compliance, the activities associated with 10 CFR Section 50.55(e) and Part 21 reporting and the responses to Nuclear Regulatory Commission inspections warrant emphasis. In the case of the reporting systems, Illinois Power Company's practice has been to employ these systems for providing the Nuclear Regulatory Commission with early notice and continuing information as to potentially reportable conditions and to ensure that corrective actions are timely and responsive. Illinois Power Company's responses to Nuclear Regulatory Commission inspections have served to focus management attention on ensuring effective corrective action and on maintaining compliance with regulatory requirements. The decline in noncompliances found by the Nuclear Regulatory Commission over the past several years serves as a measure of Illinois Power Company's improved performance in this area.

Third-party audits conducted by the Joint Utility Management Audit team, Lapp-Rice-Staker consultants, the American Society of Mechanical Engineers, and the Institute of Nuclear Power Operations have augmented the Nuclear Regulatory

Commission inspections to provide an additional management tool for Quality Assurance Program improvement and continued effective implementation.

As a result of experience with several findings in a 10 CFR Section 50.55(e) investigation involving material traceability, Illinois Power Company management implemented a Material Assurance Program for all safety-related, augmented class D (radioactive waste), and fire protection activities at Clinton Power Station. This program encompasses an evaluation of procedures, their implementation, and audit and surveillance plans and schedules. Existing audit and surveillance reports related to material issues were reviewed and studies of record reviews of material purchases were conducted to resolve any open materials-related issues. The Material Assurance Program provides additional confidence that Clinton Power Station materials will meet design requirements.

Illinois Power Company developed and implemented a Configuration Management Program consisting of four elements: configuration control, status accounting, verification, and management training. This program provides an additional effective management tool to ensure that Clinton Power Station structures, systems, and components conform to the approved design, that their physical characteristics are properly reflected in technical, procedural, and training documents, and that the plant configuration will meet regulatory requirements and commitments.

Illinois Power Company management has instituted two additional programs that provide mechanisms for raising quality-related issues for management attention and action. The first of these consists of three systems for addressing employee quality concerns: the quality concern telephone hotline, the Executive Vice President's Quality Report System, and the SafeTeam project. In addition, Illinois Power Company management has an open-door policy under which any employee may voice quality concerns and, of course, any employee may report his concerns to the Nuclear Regulatory Commission. Altogether, these systems have been effective in encouraging employees to express concerns and in giving visibility to Illinois Power Company's commitment to quality. The second of these is the Management Corrective Action Request System, which provides a mechanism for bringing specific quality issues to the attention of senior management for immediate action or evaluation. The Management Corrective Action Request System also can be used to identify when previous corrective action proved inadequate or delinquent. That system has been used to effect high priority corrective actions when necessary and has augmented the effectiveness of the Clinton Power Station Quality Assurance Program.

I. CONCLUSION

The programs and actions for quality-related activities provide multiple tiers of assurance for the quality of Clinton Power Station construction. Illinois Power Company's management has maintained its commitment to effective implementation of the Quality Assurance Program, recovery programs, programmatic improvements, Overinspection Program, Record Verification Program, and general assessment and corrective action activities. The evaluation of the results of the programs and actions presented in this report bear out their effectiveness. Collectively, these programs and actions provide high confidence in the quality of Clinton Power Station construction.

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*All appendices are bound separately in an accompanying volume.

I. INTRODUCTION

Illinois Power Company (IP) management has placed the highest priority on building high quality directly into the Clinton Power Station (CPS). IP also has implemented a Quality Assurance (QA) Program to reinforce and verify the quality of CPS construction. In addition, IP has implemented a number of major programs and actions to provide further reinforcement and assurance of quality in those areas in which past problems have been discovered. The programs and actions described herein have involved both massive efforts toward improvement of CPS QA organization activities and equally massive efforts to improve directly the performance of the CPS construction work itself.

This report presents a description and evaluation of the results of the major programs established and actions taken to demonstrate adequate construction quality for safety-related, augmented class D (radioactive waste), and fire protection structures, systems, and components at CPS. These programs and actions can be grouped into three major categories: (1) the CPS QA Program, (2) the programmatic improvements to the CPS quality-related activities, and (3) the various CPS reinspection (or overinspection) and verification programs.

This report is presented in two parts. The text of the report offers a summary of the evaluations of the results of quality-related programs and actions for construction of CPS. The text is accompanied by a separately bound volume of appendices which support, in detail, the discussions and conclusions presented in the text.

The report is organized as described below.

Chapter II gives a brief description of CPS. Chapter III describes the QA program for CPS, including a brief discussion of the history of QA at CPS. Chapter IV addresses the corrective actions taken and programmatic improvements implemented to augment the QA program.

Chapters V and VI discuss the results of the two primary quality verification programs, the Overinspection Program and the Record Verification Program.

Chapter VII addresses a number of general assessment and corrective action activities implemented by IP which have been important in augmenting the assurance of quality provided by the programs and actions discussed in Chapters III through VI.

Chapter VIII provides the conclusions drawn from the previous discussions.

The appendices provide detailed supporting information for the various quality programs and enable readers to assess each of the programs and results in greater depth.

To facilitate the reader's understanding, Table I-1 provides a listing of acronyms used in this report.

The report and its appendices are intended to give the reader a better understanding of the breadth and scope of all of IP's efforts toward enhancing the quality of construction and verifying that accomplishment.

Table I-1

Acronyms

ADS	-	Automatic depressurization system
ANI	-	Authorized nuclear inspector
ANSI	-	American National Standards Institute
ASME	-	American Society of Mechanical Engineers
ASTM	-	American Society for Testing and Materials
AWS	-	American Welding Society
BA	-	Baldwin Associates
BAP	-	Baldwin Associates procedure
BWR	-	Boiling water reactor
CA	-	Corrective action
CAL	-	Confirmation of action letter or confirmatory action letter
CAP	-	Corrective action plan
CAR	-	Corrective action request
CCCD	-	Compliance and Configuration Control Department
CEA	-	Concrete expansion anchor
CFR	-	Code of Federal Regulations
CMTR	-	Certified material test report
CNP	-	Corporate nuclear procedure
CPS	-	Clinton Power Station
CRD	-	Control rod drive
C/S	-	Civil/structural
CWR	-	Construction work request
DCR	-	Design change request

Table I-1

DEL	-	Document exception list
DR	-	Deviation report
DRC	-	Document Records Center
DRG	-	Document Review Group
EAD	-	Environmental Affairs Department
ECN	-	Engineering change notice
ECP	-	Engineering change package
FCR	-	Field change request
FDDR	-	Field deviation disposition request
FDI	-	Field disposition instruction
FECN	-	Field engineering change notice
FPR	-	Field problem report
FSAR	-	Final safety analysis report
FV	-	Field verification
GE	-	General Electric Company
GR	-	Generic resolution
GTP	-	Generic test procedures
HPCS	-	High pressure core spray
HSB	-	Hartford Steam Boiler
HVAC	-	Heating, ventilating, and air conditioning
INPO	-	Institute of Nuclear Power Operations
IP	-	Illinois Power Company
IE	-	Office of Inspection and Enforcement of the NRC
ISI	-	In-service inspection

Table I-1

JUMA	-	Joint Utility Management Audit
LPCI	-	Low Pressure Coolant Injection
LRS	-	Lapp-Rice-Staker
MIL-STD	-	Military Standard
MCAR	-	Management corrective action request
MSIV	-	Main steam isolation valve
M&TE	-	Measuring and testing equipment
MWR	-	Maintenance work request
NCMR	-	Nonconforming material report
NCR	-	Nonconformance report
NDE	-	Nondestructive examination
NRC	-	Nuclear Regulatory Commission
NSD	-	Nuclear Support Department
NSED	-	Nuclear Station Engineering Department
NSPS	-	Nuclear system protection system
NSWP	-	Non-safety work program
NTD	-	Nuclear Training Department
OI	-	Overinspection
OSMR	-	Operating manual status report
PAP	-	Pacific Air Products Company
PGCC	-	Power Generation Control Complex
PMP	-	Project Management procedure
PO	-	Purchase order
PQC	-	Product quality certifications
PSAR	-	Preliminary safety analysis report

Table I-1

PT	-	Penetrant testing
QA	-	Quality assurance
QC	-	Quality control
QCI	-	Quality control instruction
QE	-	Quality Engineering
QICA	-	Quality Improvements and Confirmatory Actions (IP report of 8/30/84)
QSL	-	Qualified suppliers list
Q&TS	-	Quality and Technical Services Department, Baldwin Associates
RDR	-	Record deficiency report
RE	-	Resident Engineering
RHR	-	Residual heat removal
RIM	-	Record index matrix
RIR	-	Receiving inspection report
RPV	-	Reactor pressure vessel
RRG	-	Record Review Group
S&L	-	Sargent & Lundy
SPTMS	-	Suppression pool temperature monitoring system
SRV	-	Safety relief valve
SU	-	Startup
SWA	-	Stop work action
SWEC	-	Stone & Webster Engineering Corporation
TCF	-	Temporary change form
TPRG	-	Traveler Preparation Review Group

Table I-1

TS	-	Technical services
VT	-	Visual testing
WPS	-	Welding procedure specifications

II. DESCRIPTION OF THE CLINTON POWER STATION

The CPS is a 985 MWe boiling water reactor (BWR) plant with a Mark III containment (BWR-6). The plant is being constructed by IP as the principal owner and licensee. Soyland Power Cooperative, Inc., and Western Illinois Power Cooperative, Inc., are co-owners and co-licensees.

The nuclear steam supply system for CPS was designed by General Electric Company (GE) and the balance of the plant was designed by Sargent & Lundy (S&L). The constructor for CPS is Baldwin Associates (BA).

The CPS was authorized by IP in February 1972. A construction permit was issued by the Nuclear Regulatory Commission (NRC) in February 1976. Fuel loading is scheduled for January 1986.

III. THE CLINTON POWER STATION QUALITY ASSURANCE PROGRAM

A. PURPOSE AND FUNCTION OF THE QUALITY ASSURANCE PROGRAM

IP's management is strongly committed to assuring the quality of the CPS construction. This commitment is reflected in the establishment, maintenance, and continuing improvement in the Quality Assurance (QA) organization for CPS. IP management is actively involved in ensuring the independence and effectiveness of the IP QA organization and providing the leadership to ensure that all employees produce and assure a quality product.

Design, construction, and operation of nuclear power plants are subject to the QA requirements of 10 CFR Part 50, Appendix B. A QA program that is established and implemented in accordance with those requirements provides adequate confidence that structures, systems, and components of the nuclear power plant will satisfactorily perform their safety-related functions during operation.

Before construction of CPS commenced, IP established a QA Program in compliance with 10 CFR Part 50, Appendix B. This program was described in section 17.1 of the Preliminary Safety Analysis Report (PSAR) for CPS, which the NRC accepted when it issued a construction permit for CPS. The current QA Program for construction of CPS is described in the IP Nuclear Power Construction Quality Assurance Manual, which is referenced in section 17.1 of the Final Safety Analysis Report (FSAR) for CPS.

The QA program for CPS includes the following provisions that are fundamental to achieving adequate confidence in the quality of CPS construction:

- Activities affecting quality are conducted in accordance with written instructions, procedures, and drawings by appropriately trained and qualified personnel. This ensures that these activities are performed correctly in the first instance.

- Activities affecting quality are subject to inspection by appropriately trained and qualified individuals who did not perform the activities being inspected. The inspections verify that activities affecting quality have been performed correctly.

- All aspects of the QA Program, including activities affecting quality and inspections, are subject to a comprehensive system of planned and periodic audits and surveillances by appropriately trained and qualified personnel who do not have direct responsibilities for the work in the areas being audited. The audits and surveillances verify and assure that the QA Program is being properly implemented and is effective.

In short, the QA Program establishes a multi-tiered system of checks and controls designed to provide reasonable assurance that, as built, CPS can be operated without undue risk to the public health and safety.

The QA Program for construction of CPS was not intended to, and no QA Program could, guarantee error-free construction. Instead, the QA Program for construction of CPS was designed to minimize the creation of conditions adverse to quality. Additionally, in recognition that quality-related problems inevitably arise during construction of any nuclear plant, the QA Program for construction of CPS contains provisions to assure the prompt identification and correction of any conditions adverse to quality. The QA Program also includes measures to assure that the cause of any significant condition adverse to quality is determined and action is taken to preclude its recurrence. Consequently, the fact that conditions adverse to quality may arise at CPS does not demonstrate that the QA Program is not properly functioning, nor does it detract from the confidence in the quality of construction provided by the QA Program. As long as such conditions are identified and appropriate corrective action is taken, the QA Program has accomplished its goal of providing adequate confidence in the quality of construction.

B. QUALITY ASSURANCE HISTORY OF CLINTON POWER STATION

In general, construction of CPS has proceeded in accordance with the provisions of the QA Program for CPS. As is demonstrated in Appendix A, inspections have been performed at CPS for each type of safety-related construction activity to provide assurance of the quality of construction throughout the plant. Any nonconformances identified during these inspections have been or will be subject to the CPS corrective action system to ensure that no identified nonconformance that could affect the safety of operation remains uncorrected. Similarly, as is summarized in Appendix B, audits have been performed for each area encompassed within the QA Program to provide assurance of compliance with the provisions of the QA Program. To the extent that these audits and surveillances have identified deficiencies, the deficiencies have been or will be subject to the CPS corrective action system to rectify the deficiencies. Finally, activities affecting quality (e.g., procurement and installation activities, inspections, audits, surveillances, and corrective actions) have all been documented on QA records. Those records provide objective evidence of CPS construction quality.

In addition to the steps which IP and its contractors have taken under the QA Program for CPS, numerous third parties have performed audits and other types of reviews of the QA Program at CPS. These are discussed more fully in Section VII.E of this report. As that section indicates, the results of these audits and reviews also demonstrate that activities affecting quality at CPS have generally been performed in accordance with applicable requirements. Furthermore, when these audits and reviews have identified problems, IP has taken appropriate corrective action to resolve them.

Prior to 1981, the number and types of nonconformances and deficiencies identified at CPS were similar to those normally found during the construction of any typical commercial nuclear power plant. However, during 1981 and 1982, the NRC, IP, and its contractors identified deficiencies in the implementation of the QA Program for construction of various areas of CPS that led IP and BA to stop certain work activities at CPS. In addition, the NRC took confirmatory action to document the NRC's understanding of the stop work actions and of the actions taken or to be taken by IP to recover from the stop work actions.

In response to these circumstances, IP undertook the following types of programs and actions:

- Recovery Programs - IP developed and implemented recovery programs which addressed and corrected the specific deficiencies. These recovery programs are described in section IV.A of this report.

- Quality Improvements - To preclude recurrence of such deficiencies, IP made extensive programmatic improvements in the organizations, personnel, and programs related to construction of CPS. These actions are summarized in section IV.B of this report and are more fully described in IP's "Summary of Quality Improvements and Confirmatory Actions (QICA)" for CPS which was submitted to the NRC on August 30, 1984.

- Reinspection and Verification Programs - IP established and implemented an Overinspection Program and a Records Verification Program to verify the quality of work and acceptability of QA records prior to the stop work actions and to provide additional assurance as to the quality of work and the acceptability of QA records after the stop work actions were lifted. Chapters V and VI of this report contain a description of these programs together with an evaluation of the results of these programs.

  In addition to the programs described above, IP has undertaken general assessment and corrective action activities to assure quality. Chapter VII of this report discusses these activities, the major elements of which are 10 CFR Section 50.55(e) and Part 21 reporting, the Material Assurance Program, responses to NRC inspections, third party audits, systems to address employee quality concerns, the configuration control system, and the Management Corrective Action Request Program.

IV. QUALITY ASSURANCE PROGRAM IMPROVEMENTS

As discussed in the previous chapter, in response to the stop work actions, IP initiated recovery programs. Those recovery programs are summarized in section A, below. In addition, IP implemented extensive programmatic improvements. The most significant programmatic improvements in organizations, personnel, and programs are summarized in section B, below. As a normal part of the audit program for CPS, IP and its contractors have conducted audits which address the various areas in which IP has taken corrective actions and made improvements. These audits are summarized in section C, below.

A. RECOVERY PROGRAMS

IP maintains an active program to identify, evaluate, and correct potentially defective work affecting plant quality. Any department at CPS responsible for an ongoing activity affecting quality may stop the activity to facilitate or promote performance of the activity in compliance with applicable requirements. Additionally, as one means of ensuring that activities affecting quality are properly performed, the QA organizations at CPS have the authority to stop work.

For those stop work actions (SWA) for which the NRC has taken confirmatory actions, IP has developed corrective action or recovery programs. Although the content of each corrective action and recovery program was dependent upon the area and deficiencies involved, the programs generally had common characteristics. For example:

- The procedures and instructions governing the activities in an area were reviewed and upgraded to make them more precise and complete.

- Personnel implementing the procedures were trained to the new and revised procedures.

- In several areas, inspections had not been performed promptly for outstanding travelers. Before additional travelers were released for construction, IP committed to reduce this backlog of inspections.

- In many areas, nonconformance reports and other deficiency reports were open for relatively long periods of time. IP committed additional resources to close those open reports.

- Because of deficiencies in some programs, including the existence of non-conforming items, IP committed to perform additional inspections to determine whether other items in the program areas also were nonconforming.

The details of these corrective actions and recovery programs are fully described in the individual program plans which were submitted to the NRC. Following a review of these plans (and in some cases following a review of the implementation of trial run programs), the NRC concurred with the lifting of the relevant stop work actions. Table IV-1 and Figure IV-1 provide a summary of the chronology of the individual program plans and NRC actions leading to lifting the stop work actions. Table IV-2 lists the stop work actions at CPS which have not been subject to NCR confirmatory action.

Appendix C provides a brief summary of the deficiencies which led to each of the stop work actions and the corrective action taken for them and shows that IP has implemented appropriate action to remedy the specific deficiencies associated with each stop work action.

The subsections that follow provide brief descriptions of IP's corrective actions and recovery programs for those areas subject to the stop work actions for which the NRC took confirmatory action. As these subsections indicate, IP's actions have assured the adequacy of the programs in each of these areas.

1. <u>Pipe and Supports</u>

   Inspections of large bore pipe support installations were not being performed in a timely fashion. A review of this situation revealed that installation and inspection procedures were inadequate. It also was noted that, for inspections previously performed, BA failed to record accurately the portions of supports that were acceptable versus those portions for which inspection had been deferred until completion of pipe installation.

To resolve these problems, IP established a three-phase program for installation of pipe supports. This program requires separate inspections for (1) attachment of the support to the building structure, (2) completion of the support and attachment of the pipe to the support, and (3) the pipe support system as a whole. A new procedure was written to provide specific installation and inspection criteria for each of the three phases. Additionally, inspection checklists were required to be prepared for each phase and for each type of piping support.

A trial program was implemented that demonstrated the adequacy and effectiveness of the new installation and inspection procedure. NRC concurrence was obtained to resume work using the new procedure.

IP QA conducted surveillances of piping and support activities to verify that the corrective action was being implemented and was effective. These surveillances were directed toward the finished product. Surveillance personnel performed inspections of hardware completed as part of the trial program and confirmed that it was in compliance with design drawings. In this way, IP QA confirmed that the revised procedures and checklists were adequate to produce an acceptable finished pipe support system.

As a result of these corrective actions, the program for installation and inspection of piping supports is better defined, more orderly, and ensures that quality control inspections are accurate, well-documented, and completed in a timely fashion.

In addition, IP QA audits of S&L in 1981 revealed that design calculations for piping supports were not being adequately reviewed and approved prior to issuance of support drawings to the field for construction. The existing pipe support drawings were immediately placed on hold to prevent construction and installation of pipe supports until the design calculations were reviewed and approved. Requirements were reinforced for review and approval of calculations prior to issuance of any further drawings. Furthermore, calculations for all previously issued supports were reviewed and approved to verify that the design was adequate and met requirements.

Finally, IP and S&L began performing more frequent QA audits and design monitoring activities to ensure that future calculations were reviewed and approved before drawings were issued. These actions have ensured that pipe support designs are complete and correct at the time of installation.

2. **Installation of Electrical Cable Trays and Tray Attachments**

As a result of audits, BA QA identified instances in which construction personnel and quality control inspectors were improperly identifying types of cable tray hangers and attachments. SWA 007 was imposed to prevent further installation until the problems could be investigated and resolved. Installation of cable tray hangers and attachments involved compiling information from generic detail drawings based on specific detail requirements on cable tray tabulation lists. Misinterpretation of these generic details by both construction and inspection personnel resulted in uncertainty concerning the adequacy of cable tray hanger and attachment installations. To resolve this problem, separate procedures were issued for installation of cable trays, conduit, attachments, and supports. Installation and inspection criteria were provided in sufficient detail to preclude misinterpretation of requirements. Furthermore, drawings were prepared by BA for review by S&L for each cable tray hanger and attachment to preclude misinterpretation by construction and inspection personnel.

Following an extensive training program, previously installed cable tray and attachments were reinspected using the new procedures and individual drawings. Identified deficiencies were documented, tagged, and resolved in accordance with the nonconformance control program.

The corrective action taken in response to these problems has ensured that previously installed electrical cable trays are in compliance with design requirements. It also ensures that new installation and inspection activities are performed in accordance with the correct requirements and are properly and completely documented.

IP QA verified that training was provided to project personnel on all the revised procedures prior to commencement of work. Cable trays, cable tray hangers, and cable tray attachment travelers that were processed as part of the three-phase recovery effort were reviewed in detail following BA Q&TS review and prior to releasing for work. These reviews assessed the adequacy of the traveler preparation procedures and the sufficiency of the instructions. Surveillance personnel also performed as-built verification of a sample of cable trays, tray hangers, and tray attachments to confirm that the hardware was in conformance with the latest approved drawings. A weld length discrepancy was discovered on one type of tray attachment. A reinspection is being done on all completed connections of this type within the electrical cable tray hanger/support reinspection program.

BA Q&TS also determined that procedural requirements for material identification and traceability for electrical supports were inadequate to assure that correct material was used for construction. In response, a remedial program consisting of the following major elements was established:

- A complete review of purchasing data was conducted to confirm that material types and shapes met the necessary design and quality requirements.

- Sampling programs were instituted to analyze the chemical and physical properties of nontraceable material to confirm that it met design requirements. Material covered by these sampling programs was confirmed to meet design requirements.

- All nontraceable steel in storage was removed from the construction site to prevent its installation.

- Extensive revisions were made to procedures to require controlled transfer of traceability markings at the time of fabrication and verification of material identification as part of installation inspections.

This program was implemented to provide the necessary confidence that previously installed material complies with design requirements and that material traceability is assured for future installations.

3. <u>Activities Associated with Drywell Refueling Bellows</u>

The drywell refueling bellows assembly interconnects the reactor pressure vessel and the drywell to form a watertight seal which permits the refueling pool above the reactor vessel to be flooded with water during refueling. The bellows within the assembly provides the flexibility required to structurally isolate the reactor vessel from the drywell. During normal plant operations, the drywell head forms the refueling pool boundary.

Work on the bellows assembly was stopped (SWA 010) when it was discovered that construction activities had been performed in violation of requirements. Specifically, following temporary installation of the bellows, the bellows were removed without a traveler or quality control verification that precautions and requirements were met. To prevent similar problems in future activities, a detailed traveler was prepared to cover future bellows construction and installation activities, and all personnel involved were trained in the traveler and procedure requirements. IP QA surveillances verified that the traveler which was prepared to install the bellows assembly provided the level of detail necessary and that all personnel who were to be involved in the installation were given appropriate training.

Also, deficiencies that had been identified during BA QA audits of the bellows supplier were investigated. These investigations disclosed that the supplier had failed to meet one of the specification requirements. In particular, the specification required the supplier to perform volumetric nondestructive examination of welds to assure integrity, but the supplier had performed only surface examinations.

To resolve the problem, the site nondestructive examination contractor radiographed all accessible welds on the bellows. The radiographs identified potential flaws in the welds. Ultrasonic examination of the welds also was performed to map the size, location, and orientation of the potential flaws.

S&L performed a fracture mechanics/crack propagation analysis of the potential flaws and concluded, along with the bellows designer, that stresses in the bellows assembly were low. Therefore, the potential flaws would be acceptable, provided that no linear indications were detectable at the surface that could result in a leakage path through the bellows assembly. A liquid penetrant examination was performed on the bellows surface and all linear indications were repaired.

4. Spare and Replacement Parts Procurement

The results of an IP QA special surveillance indicated that there was no documented plan for coordination of replacement part purchasing activities among IP departments. As a result, certain PSAR or FSAR commitments were not being met. Specifically:

- No documented or consistent method was in use for initiation of replacement part procurement.
- The method in use for transfer of parts from BA to IP did not ensure traceability or suitability for their intended applications.
- Nuclear safety classifications were not properly specified for replacement part purchases.
- Verification and acceptance methods and procedures for replacement parts were not adequate to ensure that all applicable requirements were met.
- A program had not been established for determining the disposition of nonconforming replacement parts.

To resolve these concerns, an IP management guide was approved to define and describe the procurement process and associated organizational responsibilities for spare and replacement parts. This management guide was subsequently replaced by a corporate nuclear procedure. The corporate nuclear procedure provides a uniform and coordinated approach for procurement activities. The procurement program for spare and replacement parts includes the following:

- The IP Nuclear Station Engineering Department (NSED) developed a series of procedures for classifying spare and replacement parts according to their nuclear safety-related functions and for specifying the engineering requirements necessary for parts to perform their functions.

- IP QA implemented procedures for specifying QA requirements that must be met by suppliers. Methods were established for evaluating suppliers' capabilities to meet the requirements for placement on the Qualified Suppliers List. QA also was given responsibility for specifying inspection requirements and acceptance criteria for use by quality control personnel for source and receipt inspections.

- The IP nonconforming material report system was upgraded to ensure identification, control, and disposition of nonconforming spare and replacement parts.

- Procedures were developed to permit controlled transfer of parts from BA to IP. The procedures included review of parts and associated documentation by NSED and IP QA to ensure all requirements were met for their intended application.

- A controlled, closely monitored trial program was implemented to verify that the procurement process met all regulatory requirements and that personnel had been adequately trained. Surveillance personnel closely monitored each processing step of procurement requisitions and purchase orders to (1) confirm that procedures were being followed, (2) assess individuals' understanding of their responsibilities, and (3) evaluate the adequacy of the procedures in meeting IP's commitments and controlling the procurement process. Minor deficiencies were identified and corrected before the stop work action was lifted and procurement activities were allowed to continue.

These corrective actions have resulted in a documented, coordinated procurement system which complies with IP's regulatory commitments. The program ensures that items are purchased from suppliers capable of meeting all necessary engineering and quality requirements. Specification of requirements and verification activities assure that equipment performance capabilities are maintained to original design requirements.

5. **Heating, Ventilation, and Air Conditioning Work**

IP initiated a verification of heating, ventilating, and air conditioning (HVAC) work installed by the Zack Company as a result of concerns raised at Commonwealth Edison's LaSalle Station and at Consumers Power's Midland Station where the Zack Company was the HVAC contractor. In addition, an in-depth surveillance of Zack's quality control and construction procedures was performed by BA Q&Ts. Deficiencies identified from these investigations included:

- The QA manual failed to address all specification requirements, particularly those associated with non-safety-related, but seismically-designed, HVAC duct and duct hangers.

- The status of completed construction could not be obtained from Zack inspection records.

- The S&L design drawings for HVAC duct hangers were complex and were not understood clearly by construction and inspection personnel.

- Key management positions in the Zack Company and BA were vacant and contributed to a lack of control of HVAC activities.

- Offsite fabrication activities and site receiving activities were not adequate to assure the quality of HVAC components.

In response, SWAs 014, 015, and 020 were issued to stop all HVAC activities in areas that could adversely affect plant safety until investigations could be completed and corrective action taken. These corrective actions are summarized in the following paragraphs.

A QA manual tailored to installation of HVAC systems at CPS was developed. All of Zack's field construction procedures and field quality control procedures were rewritten to conform to the project requirements, and new procedures were written both to conform to the project requirements and to provide a comprehensive description of the HVAC contractor's responsibilities. These manuals and procedures were reviewed and accepted for use by IP and BA.

The Project Manager and Quality Control Manager staff vacancies at Zack were filled, and an Assistant Project Manager position was established to oversee welding and other special process activities. The vacant BA HVAC Manager position was filled.

IP directed S&L to issue individual HVAC duct hanger drawings to replace the system of hanger details and tables. The new individual hanger drawings were used for all reinspections, new work, and inspection of new work.

IP directed reinspection of completed safety-related and non-safety-related seismic-work to ensure its compliance with new drawings and procedures. Documentation for all previously completed and in-process work was reviewed and supplemented where required to ensure inspection records reflected completed, acceptable work. In addition, all safety-related and non-safety-related seismically-designed HVAC components that had been delivered, but not installed, were reinspected. Finally, subsequent to completion of reinspection and rework, all safety-related and non-safety-related seismic work was subject to inspections under the IP Overinspection Program.

The areas of documentation of fabrication, inspection, material control, and welding procedures were addressed by the reinspection of all fabricated but not yet installed HVAC work. Additionally, IP directed completion of all remaining fabrication work be performed on site. Receiving inspection procedures were revised to provide comprehensive controls and instructions for material receipt and inspection.

In sum, programs and procedures for the control of HVAC construction and inspection activities have been significantly upgraded to provide assurance that construction activities performed after the SWAs comply with design requirements. Furthermore, HVAC work completed prior to the SWAs is being reinspected and reworked, as necessary, in accordance with the upgraded requirements, thereby verifying the quality of this work.

IP QA surveillances verified that the construction and quality assurance manuals and procedures had been revised and were accepted by BA and IP QA. Surveillance also confirmed that training had been completed for all of the new and revised procedures. There was extensive surveillance of completed hardware to verify that the revised programs and procedures would yield acceptable hardware.

6. Electrical Conduit Installation

SWA 016 was issued to stop electrical conduit installation activities because of the large backlog of conduit that had been completed but not inspected. The lack of prompt inspection prevented early identification and resolution of possible conduit problems.

To provide better definition and control of installation activities, the raceway installation procedure was divided into several procedures, one for each raceway type, including conduit. The procedure required use of the traveler system to delineate detailed installation and inspection activities and to document completion and inspection of work. An in-process traveler control group was established to control the flow of work to the field to ensure that inspections were performed promptly following completion of construction.

IP established a program to inspect all completed conduit. Travelers were prepared for all completed conduit, the Construction Department walked down the conduit in accordance with the travelers and performed any necessary work to satisfy the specifications in the travelers, and quality control personnel then performed the inspections required by the travelers.

IP QA surveillance personnel reviewed conduit travelers during an incremental release program, prior to lifting the stop work, to verify that the revised procedures were being implemented as planned. Surveillances also verified that reinspection activities were completed in accordance with procedures and that any nonconformances were identified, documented, and corrected.

7. <u>Electrical Equipment Installation</u>

A BA Q&TS internal audit of electrical equipment installation activities identified traveler control procedural deficiencies. Specifically, travelers for installation and inspection of electrical equipment had not been processed in accordance with procedures and were not being issued for work in a controlled manner. This resulted in failure to complete installations and inspections in a timely manner. SWA 017 was issued so that corrective action could be taken to resolve these conditions.

In response to the SWA, new work was restrained until the backlog of work in progress was reduced to an acceptable level. The traveler logging system was revised to provide better flow of documentation. Additionally, to ensure that a backlog of inspections would not recur, a traveler control group was established to control the flow of work to the field to ensure that inspections would be performed in a timely manner. As a result of these actions, the inspection backlog has been reduced, and timely inspections are now performed to ensure that installation activities comply with design requirements.

8. Electrical Instrumentation Installation

A BA Q&TS internal audit of instrumentation determined that, though piping/mechanical instrumentation activities were being performed adequately, there were numerous procedural deficiencies related to electrical instrumentation construction. The major deficiencies noted were:

- Electrical traveler logs did not accurately identify traveler locations.
- Outdated drawing revisions were referenced in travelers.
- Traveler revisions were not properly processed.

SWA 018 was issued to permit a full evaluation of the extent of these deficiencies and to allow corrective action to be taken to prevent further deficiencies from developing.

The instrumentation traveler procedure was revised to clarify traveler preparation, revision, and control requirements in each of the areas listed above. A comprehensive training program was implemented to ensure that appropriate personnel understood the revised requirements. All existing electrical instrumentation travelers were reviewed and revised to meet the clarified procedural requirements. The revised travelers were reviewed by QA and issued to the field for verification of completed construction or rework if necessary. These corrective actions provide adequate confidence that previously installed instrumentation meets design requirements and that future installations will be properly controlled.

In addition to the above, it also was discovered that S&L instrument data sheets, which provided design data for procurement, installation, and testing of instruments, were not being controlled by BA and that revisions were not always being incorporated into purchase specifications by S&L. All data sheet books were recalled to prevent further use of potentially incorrect instrument data. Data sheets for all instruments were verified by S&L. All instruments with out-of-date data sheets were evaluated to ensure they met current requirements. Instruments that did not meet data sheet requirements were replaced or accepted after engineering evaluations showed that they were adequate. S&L also upgraded its method of issuing data sheet revisions. The BA document control center established a computer-assisted tracking system to ensure that current revisions of instrument data sheets were distributed to all users as controlled documents. These corrective actions ensure that plant instrumentation installed prior to the SWA meets design requirements and will perform its intended safety function. The corrective actions also ensure that ongoing instrument procurement, installation, and inspection activities will be performed in accordance with current requirements.

Surveillances in installation areas of both electrical equipment and electrical instrumentation concentrated on verifying that procedures had been reviewed and approved and that personnel were adequately trained. A sample of travelers was reviewed to ensure that they were being properly prepared, reviewed, and approved and contained the proper level of detail to control construction and inspection.

9. Containment Structural Steel Installation

BA and IP audits and surveillances of containment structural steel construction and inspection activities identified deficiencies, which led IP to issue a management corrective action request and SWA 019 to effect prompt corrective action. The deficiencies which required correction were:

- Structural steel as-built drawings were used to record inspection data. A number of these drawings were inadvertently destroyed and replaced with later revisions of drawings, resulting in loss of inspection data.

- As-built drawings and inspection reports were not filed together and were not cross-referenced. Therefore, it was not possible to determine whether all required inspections had been performed.

- As-built drawings did not have connections dated; dates were to serve as evidence that the connections had been inspected and accepted by quality control personnel.

- Structural steel erection checklists did not identify the items to which they applied.

- The structural steel erection procedure did not address use and reuse of high strength bolts.

- ASTM A-490 bolts for connections had been substituted, in part or completely, for the required ASTM A-325 bolts.

IP implemented a series of corrective actions to demonstrate the adequacy of completed structural steel installation. Initial investigation demonstrated that the deficiencies associated with as-built drawings used as inspection records was limited to the containment. Different and acceptable methods had been used to record inspection data in other structures.

The missing as-built drawings were limited to a small quadrant on one elevation of the containment. All bolted connections in this area that were not documented on available drawings were reinspected. The as-built drawings that had not been destroyed were placed in locked files with restricted access. As-built drawings and inspection reports were collated and filed together.

All connections that had not been stamped and dated on drawings to show evidence of inspection were reinspected. The inspection procedure was revised to clarify inspection records requirements for in-process activities, and connections without evidence of previous inspection were reinspected. Unique traceability was established between erection checklists and connection drawings for previously inspected connections.

The S&L design documents specified use of A-325 bolts and did not explicitly state that bolts equivalent to or better than A-325 could be used. S&L

determined that A-490 bolts were fully acceptable for use in this application where A-325 bolts were specified and issued an engineering change to allow the substitution.

By attending training sessions and by reviewing attendance records for completed sessions, IP QA verified that training was provided to project personnel on revised procedures and instructions. Travelers for bolted friction connections and expansion connections in the containment building that were processed as part of the recovery effort were reviewed in detail prior to release for reinspection activities. In-process surveillances were performed to assess the adequacy of construction's and quality control's understanding of the procedures and instructions covering structural steel erection. Surveillances of reinspection activities were conducted using a specially prepared checklist. Nearly 25% of the approximately 1200 connections reinspected as part of the trial program were covered by surveillances. The surveillances were continued after the stop work was lifted to assure continuing adherence to the procedures. During the initial phase of the recovery effort, surveillances detected a discrepancy related to oversized holes and improper thread engagement for one type of structural steel connection. A complete reinspection was performed on all completed connections of this type, and all discrepancies were resolved before new work was started.

10. <u>Conclusion</u>

IP conducted surveillances to monitor the progress of recovery actions, to evaluate the effectiveness of the corrective action programs, and to uncover areas that required further enhancements. In this way, IP was able to assure itself that the recovery actions were on track and would produce the results necessary to allow the stop work actions to be lifted. The surveillances confirmed that program changes were adequately and effectively controlling work activities and that the causes of the stop work actions had been eliminated.

IP QA continues to implement an extensive surveillance program. The surveillances are accomplished by visiting work sites, witnessing specific work activities, and reviewing objective evidence and records. Since the stop work actions were lifted, the surveillance program has concentrated on performing in-process surveillances of work and inspection activities as they are being performed. The surveillances assess (1) whether procedures and other work controlling documents, such as travelers, provide adequate direction for both construction and inspection activities; (2) the effectiveness of training of personnel performing the activities; and (3) the adequacy of construction and inspection documentation. The surveillances continue to demonstrate that QA program controls are being implemented and are effectively controlling construction, inspection, and associated activities.

B. PROGRAMMATIC IMPROVEMENTS

Along with its recovery programs, IP implemented extensive programmatic improvements, which can be divided into four general categories:

- Improvements in the management and experience level of personnel on the project
- Improvements in the QA organizations for the project
- Improvements in the nonconformance and corrective action programs
- Improvements in the controls for construction and inspection activities

Each of these areas is discussed below, together with a summary of the actions which have been and are being taken to ensure that the improvements have been effectively implemented. A more detailed description of the improvements is provided in the August 30, 1984, QICA report.

1. Improvements in the Management and Experience Level of Personnel

The improvements in the management and experience level of personnel for the project included: (1) more experienced management personnel in a strengthened organizational structure to provide greater control over the project by IP, (2) more emphasis on quality by management to assure the prompt identification and correction of any deficiencies which might arise, and (3) better trained personnel to carry out the programs developed by management. The improvements which have been made in each of these areas are discussed below.

a. **More Experienced Management Personnel in a Strengthened Organizational Structure**

IP and BA have restructured their project organizations, and many management positions have been filled with more experienced individuals. These steps have allowed IP to assume more control over the project and its contractors. These actions are summarized below:

- Improvements in IP's Project Organization - IP improved its project organization by: (1) realigning the responsibilities of IP's Executive Vice President so that his duties are now almost exclusively related to CPS; (2) appointing a new vice president with extensive nuclear experience to direct key nuclear activities, including QA; (3) moving several IP departments to the CPS site; and (4) restructuring IP's project organization to form centralized groups to perform several important functions.

- New Experienced IP Personnel - IP has hired new experienced personnel for several senior management positions, including Vice President, Manager-Quality Assurance, Manager-Nuclear Station Engineering, Director-Nuclear Support, Director-Nuclear Planning, Director-Nuclear Training, and Project Manager. IP also has hired many additional experienced personnel for lower-level managerial positions. Many of the new personnel, including the Project Manager, are being provided by Stone & Webster Engineering Corporation (SWEC) and are functioning in IP positions.

- Improvements in BA's Project Organization - BA has restructured its project organization to give greater attention to areas where deficiencies were identified. Those changes include establishing a

Nonconformance Review Group, a Traveler Review Group, and a Training Department.

- New Experienced BA Personnel - BA has hired new experienced personnel for several senior management positions, including Manager of Quality and Technical Services (Q&TS) and Project Manager. Additionally, BA added a number of experienced personnel for lower-level managerial positions, including personnel from SWEC.

In summary, management of the project and IP control over the project have been improved by: (1) restructuring the IP and BA organizations, (2) moving IP nuclear project personnel to the site, and (3) augmenting the IP and BA organizations with more experienced personnel.

b. Additional Emphasis on Quality by Management

IP has taken several steps to reinforce management's commitment to quality and to emphasize to project personnel the role and importance of quality in construction activities. These steps include the following:

- Policy Statements on Quality Assurance - BA and IP have issued QA policy statements which admonish against intimidation and encourage reporting of quality-related concerns.

- Discouraging Intimidation - IP has taken several steps to discourage and prevent intimidation, including requiring the concurrence of the IP Vice President prior to terminating any QA personnel at CPS and stating that any cases of intimidation will result in immediate disciplinary action (see section VII.F for further details on this program).

- Management Involvement in Quality - Several steps have been taken to ensure the involvement of management in the resolution of significant quality-related problems, including the holding of weekly quality accountability meetings by BA project management, the reporting of the results of trend analyses and significant conditions adverse to quality to IP senior management, and the establishment of a Management Corrective Action Request (MCAR) Program (see section VII.H for further details on this program).

In summary, mechanisms have been established to discourage intimidation and to encourage individuals to identify and report quality-related concerns to management. Moreover, through periodic meetings and involvement in the corrective action system, management is made aware of quality-related deficiencies that may require attention or action. These steps have resulted in a substantial improvement in management's knowledge of, and attitude toward, quality at CPS.

c. Better Trained Personnel

IP and BA have undertaken several steps to centralize training for onsite construction-related activities affecting quality and to improve the structure and effectiveness of the corresponding program. These steps include the following:

- Establishment of Training Departments - Both IP and BA have established training departments to provide centralized management of training for the project.

- Upgrading of Training Programs - IP and BA upgraded the training programs at CPS to consist of (1) orientation for all site personnel, (2) specific training for particular work assignments (including periodic retraining), and (3) department orientation and job-specific training.

- Improvements in Specifics of the Training Program - Many improvements have been made in specific elements of the training program for CPS, the lesson plans used, the training of instructors, the documentation of employee training status, and improvements in onsite training facilities.

In summary, IP and BA have provided for centralized management of training by establishing training departments and have improved training programs within each organization.

d. Audits of Organizations and Personnel

Audits performed by the IP QA audit program and by third parties indicate that improvements in the management and experience level of personnel have been effectively implemented (see Appendices B and L for further details).

2. Improvements in the Quality Assurance Organizations

IP implemented extensive improvements in the QA organizations for the project, including: (1) increasing the number and experience of QA personnel and restructuring the QA organizations, (2) providing for more authority and independence for the QA organizations and more involvement in project activities, and (3) improving the training, qualification, and certification programs for QA personnel. The improvements made in each of these areas are discussed below.

a. Increases in the Number and Experience of QA Personnel and Restructuring of QA Organizations

Substantial changes have been made in both the number and experience level of QA personnel and the structure of QA organizations. These changes include the following:

- Increases in the Number and Experience of QA Personnel - Both IP and BA have hired new QA managers with prior nuclear experience. Experienced new lower-level QA managers also have been appointed. As of July 1984, the IP QA organization had grown from 25 in 1982 to over 300 personnel, and the BA Q&TS organization had increased from 191 in 1982 to more than 900 individuals.

- Restructuring of the IP QA Organization - The IP QA organization has been restructured to enable IP to appoint a supervisor and staff for each of the major QA functions to ensure that each receives appropriate attention.

As a result of these actions, the IP QA organization is more effective and both the IP QA and BA Q&TS organizations have greater personnel resources with which to accomplish their assigned tasks.

b. **More Authority and Independence for the QA Organizations and More Involvement in Project Activities**

Since construction began, both IP QA and BA Q&TS have been structurally independent of organizations responsible for the schedule and cost of CPS construction. IP has taken several additional steps to provide further assurance that the QA organizations will not be influenced by cost and schedule pressures and that the QA organizations will be sufficiently involved in monitoring project activities. These steps include the following:

- Strengthening the QA Departments - The role and capability of the QA departments have been increased by appointing Mr. Donald P. Hall as the Vice President in charge of day-to-day QA matters for the CPS site. In addition, QA department staffing levels were increased and a policy against intimidation was issued and implemented.

- Increasing Involvement of the QA Departments - QA departments' involvement in review, tracking, and verification of day-to-day project activities has been increased.

- Increasing Audits and Surveillances - IP QA has significantly increased the number of audits and surveillances in conducts.

In summary, the independence and authority of the project QA organizations have been bolstered through the hiring of Mr. Hall as Vice President and the implementation of IP's policy against intimidation. Additionally, the involvement of QA in project activities has been increased by assigning QA more authority for review and approval of various activities. These actions, together with a higher rate of audits and surveillances, have greatly strengthened the role of QA at CPS.

c. Improvements in Training, Qualification, and Certification Programs for QA Personnel

Significant improvements have been made in the training, qualification, and certification programs for QA and quality control (QC) personnel at CPS. These improvements include the following:

- Establishing a Full-Time Staff Assigned to Training of QA/QC Personnel

- Augmenting Training Requirements for QA/QC Personnel - Training requirements have been substantially augmented by (1) improving training of QA/QC instructors; (2) establishing formal lesson plans and documenting training; and (3) developing a training manual to govern training, qualification, and certification of IP QA/QC personnel.

- Improvements in Certification of QA/QC Personnel - Certification of past and then currently employed inspectors was verified, and improvements were made in the certification program.

In summary, IP and BA have implemented numerous actions to provide further assurance that the QA/QC personnel are appropriately trained, qualified, and certified to perform their duties.

d. Audits of QA Organizations

Improvements in the QA organizations for the project also have been shown by the IP QA audits, which indicate that:

- Restructuring and reorganizing of IP and contractor QA organizations have been effectively implemented.

- The experience and qualification levels of the large number of personnel added to the QA organizations have been verified to meet established requirements.

- The additional responsibilities, duties, and authority in monitoring and approving day-to-day activities have been effectively implemented and controlled.

- Increased emphasis, formulation, and controls of the improved training, qualification, and certification programs for QA personnel have been adequately implemented and effective in meeting established commitments.

Additionally, audits and evaluations of IP and CPS by independent organizations have recognized that the QA reorganizations, the addition of more experienced QA personnel, and improved training, qualification, and certification activities have significantly enhanced quality assurance at CPS.

3. Nonconformance and Corrective Action Programs

IP implemented improvements in the nonconformance and corrective action programs, including: (1) increased control over nonconformances to ensure that the nonconformances are subject to the corrective action system, (2) tracking of nonconformances and other conditions adverse to quality to ensure that timely corrective action is taken, and (3) evaluation and trending of nonconformances and other conditions adverse to quality to preclude the recurrence of similar incidents. Each of these is discussed below.

a. Improvements in the Control of Nonconformances

Several actions have been taken to improve identification and documentation of nonconforming items for input to the corrective action system, including the following:

- Improving the Procedure for Reporting Nonconformances - The improvements include a provision for in-line review of certain nonconformance reports (NCR) by IP QA.

- Improvements in Documentation of Nonconformances - All nonconformances are now documented on NCRs.

These actions are designed to provide greater assurance that nonconforming items will be properly documented and, once documented, that the nonconformances will be subject to the corrective action program.

b. Tracking of Nonconformances and Other Conditions Adverse to Quality

To ensure that timely corrective action is taken for nonconformances and other conditions adverse to quality, computer-assisted tracking systems have been established. These systems:

- Notify management of delay in resolution or disposition of conditions adverse to quality

- Notify senior management of critical or major conditions adverse to quality and the status of corrective actions

These tracking and reporting systems provide assurance that conditions adverse to quality are tracked from identification, through resolution, to completion of corrective action, and that any conditions which are not resolved and corrected in a timely manner are promptly identified for management attention and action.

c. Evaluation and Trending of Nonconformances and Other Conditions Adverse to Quality

IP substantially upgraded its corrective action program for identification and correction of conditions adverse to quality to include the following:

- Computer-assisted trending of conditions adverse to quality to identify significant deficiencies for corrective action

- Analysis of individual conditions adverse to quality to identify their root causes

- Notification to senior management of significant conditions adverse to quality and of the results of trend analysis

As a result of the trending system, identification of the cause of conditions adverse to quality, and reports to senior management, an effective corrective action program is in place to identify any significant deficiencies and preclude their recurrence.

d. Audits of Nonconformance and Corrective Action Programs

QA audits of nonconformance and corrective action program activities indicate that the improvements are being effectively implemented. Specifically, the audits reveal:

- Reporting, processing, and reviewing of nonconformances are being accomplished in accordance with current approved procedures.

- Computer-assisted tracking systems used to control timely corrective action on nonconformances and other conditions adverse to quality are implemented in accordance with proper procedures.

- Management is notified of the status of corrective actions and delays in resolution or dispositions of conditions adverse to quality.

- Computer-assisted trending programs and systems are implemented in accordance with approved procedures, and results of trend analysis are provided to senior management as required.

4. <u>Controls for Construction and Inspection Activities</u>

IP implemented actions to: (1) improve the traveler system to ensure that the travelers provide the requisite instructions and requirements and that issuance of the travelers is controlled to provide for timely inspections, (2) improve procedures to ensure that they specify the requisite quality standards, and (3) improve document control to ensure that personnel are working with the latest approved documents. The improvements which have been made in each of these areas are discussed below.

a. <u>Improvements in the Traveler System</u>

Work travelers are documents used to provide technical requirements and direction for work and inspection activities. They contain forms for documenting quality-related activities, including inspections. Improvements were made in the CPS traveler system with respect to the adequacy of directions provided in the travelers and the timeliness of inspections required. Several steps have been taken in this regard:

- Construction and field engineering personnel review and monitor the content and implementation of travelers.

- The BA Traveler Preparation and Review Group verifies the content of travelers.

- IP QA ensures that issuance of travelers is compatible with quality control inspection resources.

The steps described above provide greater control over the issuance of travelers. This control ensures that the travelers contain the necessary directions and requirements and that the inspections identified in the travelers can be performed in a timely fashion.

b. <u>Improvements in Procedures</u>

Actions were taken to improve the control of activities by use of procedures, to improve the clarity of procedures, and to provide greater assurance that procedures reference the applicable design bases, criteria, or specifications. In addition to the specific improvements in recovery program procedures discussed above in section IV.A, IP has taken several additional actions:

- IP QA has reviewed BA procedures and instructions to ensure conformance with requirements and clarity of instructions.

- IP has established corporate nuclear procedures to specify management policies for implementing the IP nuclear power program.

The issuance of the corporate nuclear procedures and the review of other project procedures and instructions have produced a set of procedures and instructions which provide clear and adequate direction for the performance of project activities.

c. <u>Improvements in Document Control</u>

To provide greater assurance that work is performed in accordance with the latest approved revisions of applicable documents, several steps have been taken, including:

- Travelers are now tracked using a computer to assist in updating the documents in traveler packages.

- An automated system is being implemented to identify holders of controlled documents and to track distribution of controlled documents.

- Field satellite document stations have been established which contain updated controlled documents for convenient reference.

The tracking of travelers, the use of an automated system for monitoring the distribution of controlled documents, and the establishment of field satellite document stations provide additional assurance that work activities are conducted in accordance with the latest approved documents.

d. Audits of Controls for Construction and Inspection Activities

Overall, IP QA audits demonstrate that CPS document control activities are effective in providing instructions, procedures, and drawings of current revision to work locations. The 1984 audits of document control and associated activities indicate that current instructions, procedures, and drawings are properly controlled; however, isolated examples of procedural noncompliance indicate a continuing need for attention to detail.

QA audits of construction and inspection control activities during 1983 and 1984 generally indicate that the improvements made in these areas have been effectively implemented. Specifically, the audits revealed that work travelers are sufficiently detailed to control construction and inspection activities, are receiving required reviews and approvals, and are issued for implementation in accordance with approved procedures.

5. Conclusion

IP has implemented significant improvements in the organizations, personnel, and programs for construction of CPS.

C. AUDIT PROGRAMS

IP QA provides assurance of the adequacy of CPS construction by performing inspections, surveillances, and audits. Inspections, surveillances, and audits demonstrate that the QA Program is effectively controlling all construction activities and that construction conforms with design requirements. Surveillances and audits further demonstrate that when problems arise, they are identified, evaluated, and corrected in a timely manner. Audits also are used to assist management in evaluating the effectiveness of corrective actions and improvement programs implemented to resolve deficiencies or enhance project quality.

IP's QA Program includes provisions for planned and periodic audits designed to verify compliance with the requirements of the IP QA Program and to determine its effectiveness in meeting program objectives. A copy of each audit report is provided to senior management to keep them informed of the effectiveness of QA Program elements and to enable them to take prompt corrective action for items that require their attention.

A summary of IP QA audits of IP and BA departments conducted since early 1982 is provided in Appendix B. The audits span the stop work, recovery, and post-recovery periods and provide an indication of the effectiveness of the recovery actions. The results of these audits show that, although deviations from procedural requirements have been identified, the QA Program is controlling activities in accordance with applicable requirements. When deviations were identified, corrective action was taken to clarify, reinforce, or enhance program controls to resolve the condition and prevent recurrence. The results of the 1984 audits, when compared to the 1982 audits, show that better trained personnel are working with upgraded procedures within a better defined QA Program.

Table IV-1
NRC Concurrence to Lift Stop Work Actions

SWA No.	Description of Work Stopped	Date of SWA	Date of NRC Confirmatory Action	Recovery Plan Approved by IP	NRC Concurrence with Recovery Plan	NRC Concurrence To Lift SWA
--	Safety-related pipe supports	2/13/81(BA) 3/5/81(S&L)	2/18/81 (BA) 3/5/81(S&L)	- -	3/5/81 (BA) 3/5/81 (S&L)	6/23/81 (BA) 6/23/81 (S&L)
007	Installation of electrical cable trays and tray attachments	1/18/82	1/27/82	9/3/82	7/22/83	7/22/83
010	Activities associated with the drywell refueling bellows	2/26/82	9/1/82	1/14/83	1/17/83	5/19/83
--	Spare parts procurement	3/12/82	--	12/3/82	3/23/83	4/26/83 5/19/83 (clarification letter)
014	Safety-related HVAC work	6/28/82	9/1/82	5/8/83	5/19/83	12/22/83
015	Integral attachment of seismic HVAC hangers to building structures	6/28/82	9/1/82	5/8/83	5/19/83	12/22/83
016	Electrical conduit installation	6/28/82	9/1/82	11/9/82	11/19/82 (oral)	7/29/83
017	Electrical equipment installation	6/23/82	9/1/82	8/9/82	5/19/83	5/19/83

Table IV-1

SWA No.	Description of Work Stopped	Date of SWA	Date of NRC Confirmatory Action	Recovery Plan Approved by IP	NRC Concurrence with Recovery Plan	NRC Concurrence To Lift SWA
018	Electrical instrumentation installation	6/23/82	9/1/82	8/9/82	5/19/83	5/19/83
019	Containment structural steel installation	6/23/82	9/1/82	8/5/82	12/30/82	6/24/83 (oral) 7/6/83 (letter)
020	HVAC work in Category I structures	8/2/82	9/1/82	5/8/83	5/19/83	12/22/83

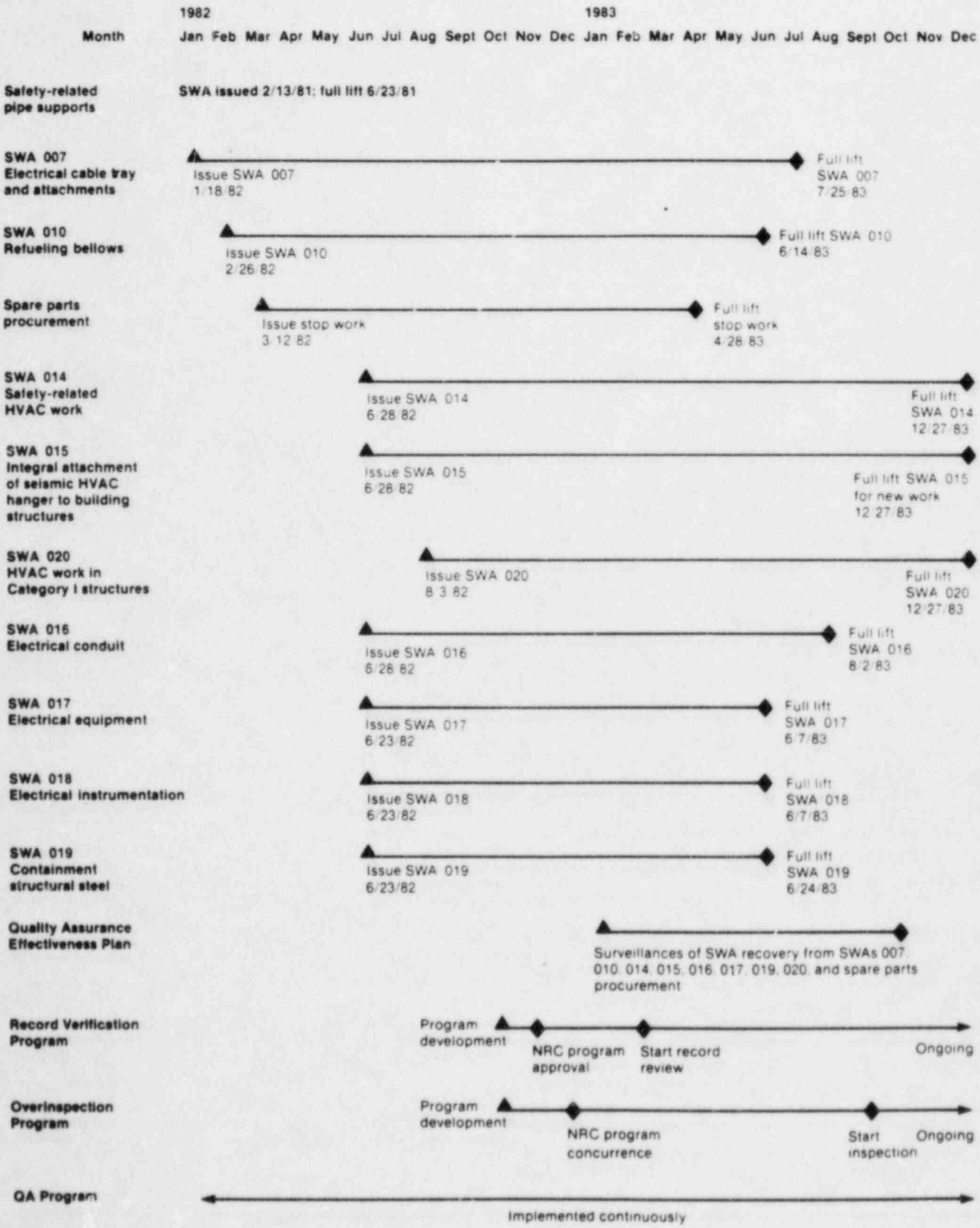
Table IV-2

Stop Work Actions Not Requiring NRC Concurrence

Stop Work No.	Description of Work Stopped	Date of Issue	Date Lifted
001	Installation of safety-related embeds (Civil)	5/17/78	5/17/78
002	Fabrication/installation of HVAC seismic, Class I hangers and associated work	12/6/79	12/7/79
003	Activities involving reactor water cleanup valves 1G36-F033A	10/7/80	10/21/80
004	Lifting and setting of the PGCC cabinets	11/12/80	11/12/80
005	Installation of expansion anchors	4/24/81	5/1/81
006	Preheat and post-heat work except for the N-4 closure spools at azimuth 135° in the containment	6/1/81	6/5/81
008	Work involving reactor - recirculation pump motors	1/19/82	1/20/82
009	All welding	2/16/82	5/20/82
011	Terminations on I-E instrumentation cable of types: 02163, 03163, 04163, 08163, 16163, and 24163 multiconductor #16 AWG	3/2/82	5/18/82
012	Core drilling	3/23/82	5/13/82
013	Fuel pool liner fabrication, repair, or attachment removal work	3/25/82	5/18/82
021	Air infiltration test (H. H. Robertson)	10/27/82	11/4/82

History of Stop Work Actions and Corrective Actions

Figure IV-1



V. OVERINSPECTION PROGRAM

IP established an Overinspection Program in 1982 to verify the quality of construction of CPS. All nonconformances identified by the Overinspection Program have been or will be reworked or determined to be acceptable as is.

This section presents an evaluation of the results of the Overinspection Program for CPS as of July 31, 1984. These results verify that construction of CPS would have been of acceptable quality even if it is assumed that the nonconformances identified by the program had been left uncorrected.

In analyzing the results of the Overinspection Program, IP has relied primarily on an engineering evaluation of the safety significance of the nonconformances identified by the program to verify that structures, systems, and components at CPS are capable of performing their intended safety functions. Secondarily, IP has performed a quantitative analysis of the results of the Overinspection Program to verify that the QA Program for CPS has been effective in providing reasonable assurance that structures, systems, and components comply with design drawings and specifications. Thus, IP has taken two different but complementary approaches to show that the results of the Overinspection Program verify that the quality of construction of CPS is acceptable.

IP originally submitted the Overinspection Program plan to the NRC in a letter dated November 15, 1982. On December 3, 1982, the NRC concurred with the intent of the Overinspection Program. A revision to the program was transmitted on December 20, 1982, and was acknowledged by the NRC on January 25, 1983. A subsequent revision was transmitted on June 18, 1984. The discussion which follows is a brief summary of the Overinspection Program plan.

A. PROGRAM PLAN DESCRIPTION

1. Purpose

The purposes of the Overinspection Program are to verify that the structures, systems, and components within the scope of the program are properly installed and to provide IP with assurance that BA is performing installation and inspection work that satisfies the applicable requirements of codes, standards, drawings, and specifications. These objectives are accomplished by performing additional inspections of completed and inspected work, whether performed before issuance of the stop work actions in 1982 (old work) or after the stop work actions were lifted (new work). The inspections conducted under the Overinspection Program are in addition to those normally performed as part of the QA Program for CPS. Therefore, the Overinspection Program is a supplement to the QA Program and not a substitute for it.

2. **Scope**

Inspections in the Overinspection Program focus on installation of safety-related, augmented class D (radioactive waste), and fire protection items in the following areas:

- Large bore piping
- Small bore piping
- Mechanical equipment
- Structural steel
- HVAC, as defined in the IP HVAC recovery plan
- Electrical hangers
- Electrical conduit and raceways
- Electrical terminations
- Electrical equipment
- Electrical and mechanical instrumentation

Other areas, such as concrete structures and masonry walls, are not subject to the Overinspection Program because no significant concerns have been identified in those areas.

3. **Program Management**

IP QA is responsible for the direction of the Overinspection Program. Within IP QA, the Overinspection Group performs the activities necessary to execute program commitments. The BA portion of the Overinspection Program is executed by the Field Verification Group, which reports to IP

QA through the BA Manager of Quality and Technical Services. Over 200 full-time personnel are currently assigned to perform the supervisory, administrative, and inspection tasks required by the Overinspection Program.

4. <u>Operation</u>

The program consists primarily of the elements described below.

a. <u>Field Verification Inspections</u>

BA Quality and Technical Services performs inspections (termed "field verification" inspections) of a sample of completed and inspected work. If the results of the field verification inspections do not satisfy the acceptance criteria described in subsection V.A.5 below, the results are evaluated to determine the need for further inspections of the lot from which the sample was selected. These further inspections may be limited to those attributes for which the results of the sample inspections did not satisfy the acceptance criteria, or the entire lot may be inspected. When the field verification inspection of a lot is complete, the lot is turned over to IP QA.

Nonconformances identified by field verification inspections are documented and processed according to approved procedures. These procedures require that the nonconformances be reviewed and evaluated and that appropriate corrective action be taken in each case. When rework, repair, or replacement of plant hardware is required to correct a nonconformance, this work also is inspected and the results of the inspections are documented to provide assurance of acceptability.

b. <u>Overinspections</u>

Following the completion of field verification inspections and turnover of the lot to IP QA, IP QA selects a sample of the work and conducts inspections (termed "overinspections"). If IP QA determines from the results of these overinspections that the sample of the work satisfies the acceptance criteria described in subsection V.A.5 below, the work is considered acceptable. If the results of the sample overinspection do not satisfy the acceptance criteria, the work is returned to BA for reevaluation and possible reinspection. For work returned to BA, reinspections may be limited to specific attributes that are identified through reevaluation as having an unacceptable level of deficiencies.

The relationship between overinspection and field verification inspections described above is graphically depicted in Figure V-1.

Nonconformances identified by field verification inspections are not subject to validation by the Overinspection Group. Instead, the Overinspection Group assumes that the nonconformances identified by field verification inspections are valid nonconformances, and it does not include them in the group of nonconformances identified by overinspection. Only nonconformances originally identified by overinspections are documented by the Overinspection Group. These nonconformances are processed according to the same approved procedures used for field verification inspections.

c. <u>Departure Inspections</u>

In addition to conducting overinspections in series with field verification inspections, IP QA also has performed overinspections prior to field verification inspections by BA. These overinspections are termed "departure" inspections. Departure inspections were performed early in the Overinspection Program to enable IP to use overinspection personnel before BA began turning work over to IP QA in sufficient volume to make the program function efficiently.

More than 170,000 attributes were inspected by means of departure inspection. Of these, approximately 35,000 were subsequently inspected by the Field Verification Group as of July 31, 1984, pursuant to the program described in subsection V.A.4.a below. None of these attributes were subsequently subject to the overinspections described in subsection V.A.4.b below. The relationship between departure inspections and field verification inspections is graphically depicted on Figure V-1.

5. Sampling Inspection Criteria

The sampling procedures used by BA and IP in the Overinspection Program are based on sample size and acceptance criteria derived from MIL-STD-105D, a commonly used industry standard for inspection of samples from lots. Attributes inspected under the Overinspection Program are characterized as either critical or noncritical. For critical attributes (i.e., those which, if nonconforming, could adversely affect the safety of the installation) the acceptance quality level is set so that 95% confidence exists that at least 95% of the critical attributes in the entire lot under investigation are conforming. The acceptance quality level for noncritical attributes is set so that 95% confidence exists that at least 85% of the noncritical attributes in the entire lot under investigation are conforming.

It should be noted that although the Overinspection Program was designed for sampling inspections, as of July 31, 1984, due to the small size of the lots and the stringency of MIL-STD-105D and the acceptance criteria, BA has inspected 100% of all of its lots and IP has inspected 100% of all but 10 of its lots.

6. Control

a. Procedures

The Overinspection Program is implemented in accordance with IP- and BA-approved procedures and instructions. Inspections are performed using BA-developed inspection checklists which identify the specific attributes to be inspected. These checklists were initially reviewed by S&L and by Stone & Webster to ensure that the checklists contained adequate inspection requirements, including the proper identification of critical attributes. Revisions to the checklists are reviewed and accepted by S&L. The checklists and revisions also are subject to review and approval by IP QA.

b. Personnel

Personnel performing the field verification inspections and over-inspections are trained and certified under a CPS-specific training program.

c. Records

The results of the inspections are recorded and retained. Nonconformances identified during the Overinspection Program are controlled as described in section V.A.4, and documents generated by the Overinspection Program are tracked from generation through placement in the record vault to provide a management tool for control of the Overinspection Program.

7. Audits and Surveillances

Activities under the Overinspection Program are subject to several layers of audits and surveillances. For example, BA field verification activities are subject to surveillances by IP QA overinspection personnel and to audits and surveillances by IP QA. Similarly, IP overinspection activities are subject to IP QA audits and surveillances. These audits and surveillances provide continuing assurance that Overinspection Program activities are conducted in accordance with procedures and provide IP management with further confidence in the results of the Overinspection Program and the quality of CPS.

8. Summary

As a result of the Overinspection Program, systems, structures, and components must pass through three levels of formal inspections before it is deemed acceptable: (1) an initial inspection of hardware under the normal BA QA Program, (2) the sample field verification inspection by BA Quality and Technical Services, and (3) the sample overinspection by IP QA. This redundancy verifies that systems, structures, and components comply with applicable installation requirements. Additionally, the Overinspection Program is conducted by trained and certified QA personnel in accordance with approved procedures, instructions, and checklists; the results of the program are documented and evaluated; and the program activities are subject to QA audits and surveillances.

B. PROCESS FOR EVALUATING RESULTS

The results of the Overinspection Program were evaluated from several perspectives. Each of these is described below.

First, the results of the Overinspection Program were evaluated to determine whether sufficient data from the Overinspection Program are available to permit reliable conclusions to be drawn regarding the quality of construction of CPS. The results of this evaluation are discussed in subsection V.C.1 below.

Second, the results of the Overinspection Program were subjected to an engineering evaluation to determine whether any of the nonconformances identified by the Overinspection Program would have been safety-significant if left unidentified by the program. The purpose of this evaluation is to verify that structures, systems, and components at CPS are capable of performing their intended safety functions. The results of this engineering evaluation are discussed in subsection V.C.2 below.

Third, the results of the Overinspection Program were evaluated quantitatively to verify that the QA program for CPS has been effective in providing reasonable assurance that construction complies with applicable design drawings and specifications. This evaluation includes a comparison of the results from IP's overinspections and BA's field verification inspections to determine the effectiveness of the BA field verification inspections. The results of these evaluations are discussed in subsection V.C.3 below.

Fourth, the results of the Overinspection Program were evaluated to determine whether the quality of old work is different from the quality of new work. The results of this evaluation are discussed in subsection V.C.4 below.

Finally, the results of the Overinspection Program were evaluated to determine whether the results are applicable to items that have not been inspected in the

Overinspection Program. A summary of this evaluation is presented in subsection V.C.5 below.

It should be noted that the discussion presented below only reflects the results of the Overinspection Program for safety-related structures, systems, and components. The results for the augmented class D (radioactive waste) and fire-protection systems are presented separately in Appendix D, part E, because these systems are not safety-related, have not been subject to all of the QA provisions of 10 CFR Part 50, Appendix B, and, as expected, contain proportionally more nonconformances than the safety-related structures, systems, and components.

C. RESULTS

1. Sufficiency of Data for Evaluation

The Overinspection Program has been in operation since December 1982 and is continuing. For purposes of this evaluation, a reference date was selected to permit evaluation of a fixed set of information from the Overinspection Program. Specifically, information generated by the Overinspection Program on or before July 31, 1984, was evaluated. As is discussed below, the Overinspection Program generated sufficient information by this reference date to permit reliable conclusions to be drawn regarding the quality of CPS construction.

As is shown in Table V-1, BA Quality and Technical Services and IP QA had inspected 1,066,402 attributes under the Overinspection Program as of July 31, 1984. Many of the same individual attributes were inspected by both BA and IP. Nevertheless, BA alone inspected a total of 627,943 different attributes under the Overinspection Program as of July 31, 1984. IP estimates that this number represents approximately 5% of the total number of attributes within the scope of the Overinspection Program.

Appendix D, part A, discusses the distribution of the Overinspection Program inspections among the various construction disciplines and types of items in the plant. As this appendix demonstrates, more than 100,000 field verification inspections have been performed for each discipline.

Futhermore, a large number of field verification inspections have been performed for each type of commodity (except cable trays, mechanical equipment, and instrumentation for which IP is continuing to perform the Overinspection Program and will perform additional evaluations as more specifically applicable data become available for analysis). Consequently, given the magnitude and distribution of these inspections, any significant adverse condition applicable to a type of item or discipline should be evident from the results of the Overinspection Program as of July 31, 1984. Therefore, as shown in Appendix D, part A, these results provide a sufficient basis from which reliable conclusions regarding the quality of construction of CPS can be drawn.

2. Engineering Evaluation

a. Introduction

IP requested S&L (with input from GE as necessary for GE-designed components) to evaluate each NCR to determine whether any of the nonconformances identified by the Overinspection Program were safety-significant. For purposes of this report, a safety-significant nonconformance is defined as a nonconformance which, were it to have remained unidentified by the Overinspection Program, could have resulted in the loss of capability of a structure, system, or component to perform its intended safety function.

NCRs that documented more than one nonconforming attribute were initially reviewed to identify the number of evaluations required to determine the significance of the nonconformance. For many cases in which one of the nonconforming attributes determined the total adverse impact upon the item, only an evaluation of that nonconformance was conducted. For example, if an item contained more than one surface defect such as an arc strike, gouge, and scratch, the most limiting defect (i.e., the defect with the deepest penetration) was selected for evaluation. For cases in which one NCR documented nonconformances on different items or in which one item contained nonconforming attributes of differing natures (e.g., loose bolt and arc strike), separate evaluations of the impact of the nonconforming attributes on each item were conducted to ensure that all possible adverse impacts were addressed.

In general, S&L evaluated each nonconformance by one of three methods. First, many nonconformances on their face have little or no impact on the integrity of an item. Nonconformances in this category, for example, typically include minor documentation errors and cosmetic defects such as those arc strikes which do not reduce base metal thickness. These nonconformances can be designated as having no safety significance, with no need to conduct more detailed evaluations.

Second, there are many types of nonconformances which do not adversely affect the function of an item because of the inherent conservatism of the design for the item. Many of these nonconformances, such as minor cases of undercut and surface slag on welds, are readily identifiable from engineering experience and knowledge of the design without the need to conduct detailed calculations.

Finally, any nonconformance not falling within one of the above two categories was subject to detailed engineering evaluations to determine whether the nonconformance adversely affected the capability of a structure, system, or component to perform its intended safety function.

Although S&L evaluated each nonconformance identified by the Over-inspection Program to determine whether it was safety-significant, it should be emphasized that most of the nonconforming items have been reworked in accordance with applicable design drawings and specifications and the remainder have been determined to be acceptable as they are. Consequently, the evaluations below were undertaken to determine the safety significance of the nonconformances assuming they had been left uncorrected.

b. Results

1) Introduction

The results of the S&L engineering evaluation of the nonconformances identified by the Overinspection Program demonstrate that none of these nonconformances was safety-significant.

The discussion below identifies the type of nonconforming attributes identified by the Overinspection Program and explains, in general, why these nonconformances had no safety significance. Additionally Appendix D, part B, identifies each of the major types of commodities inspected under the Overinspection Program and explains, in general, why the nonconformances in these commodities were not safety-significant.

The nonconforming attributes identified by the Overinspection Program were divided into 43 categories. Table V-2 lists the number of nonconforming attributes occurring within each category. As is evident from this table, four of these categories (insufficient weld size, undercut, arc strike, and incorrect identification markings) comprise more than half of the total number of nonconforming attributes, and 13 of these categories account for over 90% of the total number of nonconforming attributes identified by the Overinspection Program. Since these categories encompass the vast majority of nonconformances discovered by the Overinspection Program, each is discussed below in order of decreasing frequency, together with an explanation of why the nonconformances in each category are not safety-significant. The remaining categories are defined in Appendix D, part C.

It should be noted that the discussion below does not account for two individual nonconformances. S&L was unable to determine the precise impact of these nonconformances on the affected items because the items had been reworked and the NCRs did not contain sufficient information to permit performance of detailed engineering calculations. Nevertheless, as is demonstrated in Appendix D, part D, the NCRs contain sufficient information to determine that none of these nonconformances would have resulted in the loss of capability of a structure, system, or component to perform its intended safety function.

2) Evaluation by Type of Nonconforming Attribute

(a) Weld Size

Nonconformances involving insufficient weld size comprise 17.5% of the total number of nonconforming attributes identified by the Overinspection Program.

Some of the welds which were reported to be undersized were not designed to perform a load-carrying function, including fillet weld caps on full penetration welds. Consequently, the fact that the weld is undersized is immaterial to the function of these welds.

Other welds identified as having insufficient size were evaluated to determine the effect of the reduced size on the load-carrying capacity of the weld. For purposes of the evaluation, the capacity of the weld was calculated based on the reduced size of the weld. In each case, the load-carrying capacities of the connections with the undersized welds were determined to be sufficient to meet the design loading. Consequently, none of the nonconformances was safety-significant.

(b) Undercut

Undercuts comprise 15.7% of the total number of nonconforming attributes identified by the Overinspection Program.

Undercuts are unfilled grooves in the base metal adjacent to a weld which are created during the welding process. Undercut may reduce the thickness of the base metal and, if it exceeds code allowables, may result in a reduction in pressure-retaining or load carrying capacity. Undercut nonconformances identified by the Overinspection Program were evaluated by assuming reduced capacity of the affected item. All connections having undercut were found to provide adequate capacity to meet the code allowable stresses. Consequently, none of these nonconformances was determined to be safety-significant.

(c) Arc Strikes

Arc strikes comprise 14.7% of the total number of nonconforming attributes identified by the Overinspection Program.

An arc strike is a surface indication on the base metal or a weld which results when a source of welding current has inadvertently contacted the weld or base metal and produced some localized fusion. In general, arc strikes are cosmetic defects that do not penetrate the base metal to any appreciable extent. Consequently, most arc strikes are not potentially safety-significant because they do not approach the required minimum wall thickness for pressure-retaining components or reduce the base metal of other components to a sufficent degree to affect load-carrying capacity significantly.

In some cases, the Overinspection Program identified arc strikes on components with relatively thin walls, such as tubing. In these cases, S&L compared the actual wall thickness (as reduced by the arc strike) against the minimum wall thickness requirements. As a result of this comparison, S&L determined that none of the arc strikes violated minimum wall thickness requirements. Consequently, none of the arc strikes affected the required function of any item.

(d) <u>Missing or Incorrect Identification Markings</u>

Missing or incorrect identification markings on items comprise 10.1% of the total number of nonconforming attributes identified by the Overinspection Program.

S&L evaluated all cases of missing, incorrect, or damaged identification markings to determine the proper identity. S&L determined that the as-installed items were of the correct identity and that only the identification markings were incorrect, missing, or damaged. Consequently, none of these nonconformances was safety-significant.

(e) <u>Tolerance</u>

Items installed outside of specified tolerances comprise 5.9% of the total number of nonconforming attributes identified by the Overinspection Program.

For items that were out-of-tolerance, S&L evaluated their as-built condition to determine the impact, if any, on the design loadings and clearance requirements for the items. For example, if, as a result of the evaluation, component loadings for a support changed significantly, a further evaluation was performed to determine the impact of the resultant loads on the design margins of the affected support. None of the nonconformances identified by the

Overinspection Program resulted in an inability of out-of-tolerance items to satisfy calculated loads or clearance requirements. Consequently, none of these nonconformances was safety-significant.

(f) <u>Loose Hardware</u>

Loose hardware comprises 5.6% of the total number of nonconforming attributes identified by the Overinspection Program.

Loose hardware consists primarily of loose nuts and bolts. With the exception of the nonconformances discussed below, these nonconformances were evaluated to assess their impact on the affected item's overall strength. None of the nonconformances was determined to reduce the strength of the item below that required to satisfy design loads.

The most frequently observed example of loose hardware consists of loose jam nuts on adjustable rod and sway strut pipe supports. These items do not have a structural load-carrying function in the present dead load service condition. Furthermore, there is a requirement that these items be examined and corrected in the normal preservice inspection and adjustment checkout. Consequently, these nonconformances were determined to have no safety significance because they would have been identified and corrected even if the Overinspection Program had not been performed.

(g) <u>Overlap</u>

Nonconformances involving overlap on welds comprise 5.4% of the total number of nonconforming attributes identified by the Overinspection Program.

Overlap is the protrusion of weld material beyond the edge of the weld. Welds with overlap pose a potential problem because the overlap could mask a lack of fusion between the weld material and the base metal or mask an insufficiently sized weld.

IP established a program to determine if overlap reported on NCRs at CPS involved lack of fusion or insufficiently sized welds. This program used a selection of 141 structural steel welds with overlap identified by the Overinspection Program which had not yet been reworked. The overlap on these welds was re-examined and, where necessary, subjected to grinding to determine the size of the weld and whether lack of fusion was present beneath the overlap. It was determined that the welds were of sufficient size and that lack of fusion did not exist in any of these 141 welds. Consequently, IP concludes that welds with overlap do not indicate lack of fusion or insufficiently sized welds at CPS and, therefore, they were not safety-significant.

Finally, it may be noted that many nonconformances involving overlap also were determined to be acceptable by confirming that the individual weld had sufficient size and fusion to perform its function or by evaluating the connection assuming lack of fusion or undersized welds.

(h) **Wrong Weld**

Nonconformances involving wrong weld type comprise 3.8% of the total number of nonconformances identified by the Overinspection Program.

Wrong welds were reported when the weld type specified on the design drawings differed from the actual weld on the installed item. An example of this type of nonconformance is the use of an intermittent weld in lieu of a continuous weld or a continuous weld in lieu of an intermittent weld. In each case, the nonconforming weld was evaluated to determine if the load carrying capacity of the connection was sufficient to ensure that allowable stresses were not exceeded. In some cases, the wrong weld was actually stronger than that specified by the design. All of the wrong welds were found to provide adequate strength and, therefore, were not safety-significant.

(i) <u>Gouges</u>

Gouges comprise 2.6% of the total number of nonconforming attributes.

Gouges can reduce base metal thickness. Most of the damage to items due to gouges had only minor impact on the base metal thickness. In each case, it was determined that the reduction in the base metal thickness was not sufficient to violate minimum wall thickness requirements for pipes or to result in a condition in which allowable stresses were exceeded for tubing. Consequently, these nonconformances were not safety-significant.

(j) <u>Missing Hardware</u>

Nonconformances involving missing hardware comprise 2.5% of the total number of nonconforming attributes identified by the Overinspection Program.

Most of the nonconformances involving missing hardware pertained to mechanical and electrical hangers or equipment foundations which were missing nuts, washers, or clamp spacers. Missing jam nuts and clamp spacers on pipe supports did not perform any load-carrying function and were determined not to be safety-significant. Missing hardware on adjustable pipe supports was determined not to be safety-significant because these nonconformances would have been identified by subsequent inspection and testing even if the Overinspection Program had not been performed. Missing hardware on other items was evaluated to determine if any reduction in load carrying capacity of the items would occur or if the function of the items would be jeopardized. As a result of its evaluation, S&L determined that none of this missing hardware would have affected the function of any item. Consequently, the missing hardware was not safety-significant.

(k) <u>Slag</u>

Slag in welds comprise 2.2% of the total number of nonconforming attributes identified by the Overinspection Program.

Slag is a nonmetallic material which results from the welding process. Slag is generally found on weld surfaces as a result of incomplete cleaning after the weld is made and, as such, does not affect the weld integrity. However, if slag is entrapped in the weld itself, the slag reduces the volume of the weld metal and consequenty reduces the weld strength.

Each case of slag inclusion identified by the Overinspection Program was evaluated by assuming that the affected portion of the weld did not contribute to the strength of the weld. In each case, it was determined that the affected connection had sufficient load-carrying capacity to satisfy design loads. Consequently, none of these nonconformances was safety-significant.

(l) **<u>Wrong Hardware</u>**

Nonconformances involving wrong hardware comprise 2.2% of the total number of nonconforming attributes identified by the Overinspection Program.

Nonconformances pertaining to wrong hardware involve the substitution of a hardware item different from that specified on the design drawings. Typically, wrong hardware identifed by the Overinspection Program resulted from incorrect size components being installed, usually bolts, washers, nuts, or lugs. Wrong hardware identified by the Overinspection Program was evaluated to determine if any reduction in load carrying capacity would result. In many cases, components were substituted which actually increased the strength of the item. All items evaluated were found to provide the required load-carrying capacity, and, consequently, none of the wrong hardware was found tc be safety-significant.

(m) Lack of Fusion

Lack of fusion in welds comprises 2.2% of the total number of nonconforming attributes identified by the Overinspection Program.

Lack of fusion generally describes a condition in which the welding material is not completely fused to the base metal. For welds with no load-carrying function, reduction in weld strength caused by lack of fusion was not safety-significant. For other welds, incomplete fusion was evaluated by assuming that the defective portion of the weld provided no load-carrying capability for the weld in question. Furthermore, lack of fusion was evaluated to determine whether it could have caused crack propagation. If it was determined that cracks would propagate such that the entire weld would be lost, the weld was assumed to have zero strength in evaluating the capacity of the connection.

In each case involving incomplete fusion, either the unaffected portion of the nonconforming weld and/or the other welds in the connection were determined to possess adequate strength to satisfy design loads. Therefore, these nonconformances were not safety-significant.

(n) Other Nonconforming Attributes

The remaining types of nonconforming attributes cumulatively account for less than 10% of the total number of nonconformances identified by the Overinspection Program, and each individually accounts for less than 2% of the the total nonconformances identified by the Overinspection Program. These nonconformances range from minor defects which did not impact the integrity of items, such as dirt and debris, to more significant cases, such as cracks in welds.

In particular, cracks were evaluated to determine if localized stresses would cause cracks to propagate. If the cracks could propagate, the strength of the connection or supporting member was evaluated by accounting for any reduction in capacity resulting from the crack. In all cases, the connections were determined to have sufficient capacity to satisfy design loads. Consequently, none of these nonconformances was determined to be safety-significant.

3) Conclusion

Of the more than 1 million inspections conducted under the Overinspection Program, none revealed any safety-significant nonconformances. Therefore, the Overinspection Program has verified that the type of nonconformances being identified by the program would not result in the loss of capability of a structure system, or component to perform its intended safety function.

3. Quantitative Evaluation

a. Introduction

The engineering evaluation of the nonconformances discussed in the preceding section is the primary factor relied upon by IP to verify the quality of construction of CPS because the engineering evaluation verifies that the type of nonconformances being identified by the Overinspection Program would not result in the loss of capability of a structure, system, or component at CPS to perform its intended safety function. To provide a secondary confirmation of quality, IP also has performed a quantitative analysis of the results of the Overinspection Program to verify that the QA program has been effective in providing reasonable assurance that construction complies with applicable design drawings and specifications.

For both overinspections and field verification inspections, several types of information were compiled in order to perform a quantitative evaluation of the nonconformances identified by the Overinspection Program. First, the number of inspected and nonconforming attributes was calculated for the plant as a whole, for each construction discipline, and for each type of commodity. Based on this information, various rates of conformance (expressed in percent attributes conforming with design drawings and specifications per inspected attribute) were calculated. These conformance rates were then evaluated to verify that the QA Program for CPS has been effective in providing reasonable assurance that structures, systems, and components at CPS comply with applicable design drawings and specifications.

In evaluating the conformance rates identified by the Overinspection Program, IP has used a conformance rate of 95% as a threshold indicator that the QA program for CPS has been effective in providing reasonable assurance that construction complies with applicable design drawings and specifications. This rate reflects the fact that a 100% conformance rate is unobtainable and unnecessary in practice and that a conformance rate of 95% is a reasonable indicator of quality. For those disciplines or items with conformance rates of less than 95%, IP has taken various factors, discussed below, into account, including the significance of the nonconformances being identified, to determine whether additional action may be warranted to assure the quality of construction of these disciplines or items.

The discussion presented below is based primarily on the conformance rates for field verification inspection because these rates are the lowest (and thus the most conservative) rates identified by the Overinspection Program.

b. <u>Overall Conformance Rates</u>

As of July 31, 1984, 627,943 attributes had been inspected and 28,756 nonconforming attributes had been identified by field verification inspections, for an overall field verification conformance rate of 95.4%. Additionally, 438,459 attributes had been inspected and 7,602 nonconformances had been identified by overinspection, for an overall overinspection conformance rate of 98.3%.

These high overall conformance rates verify that the QA Program has been effective in providing reasonable assurance that structures, systems, and components at CPS comply with applicable design drawings and specifications.

c. <u>Discipline Conformance Rates</u>

Table V-3 presents the conformance rates found by field verification inspections, departure inspections, and overinspections performed in series with field verification inspections for the three major disciplines (structural, electrical and instrumentation, and piping and mechanical).

Table V-3 shows that the conformance rate for structural attributes is 92.3% for field verification inspections, which is the lowest rate for any of the construction disciplines. However, IP had previously decided to perform overinspections on 100% of the accessible primary structural members in the plant (i.e., those members which must perform their intended design functions during normal operations and safe shutdown, including those members which support safety-related components). Consequently, these inspections will assure that nonconformances in structural steel will be identified for corrective action.

The conformance rates in the other disciplines are more than 96% for field verification inspections and even higher for departure inspections. Consequently, these rates verify that the QA Program has been effective in providing reasonable assurance that construction in these disciplines complies with applicable design drawings and specifications.

Other data on Table V-3 should be noted. First, the conformance rates for departure inspections are lower than the conformance rates for overinspections performed in series with field verification inspections. This is expected because the departure inspections were initial reinspections, whereas the series overinspections have been performed for work on which nonconformances have already been identified for corrective action by the field verification group.

Table V-3 also shows that the conformance rate for overinspections performed in series is extremely high (98.7%) and is significantly higher than the conformance rate for field verification inspections. Since overinspections performed in series have, in practice, been redundant of those conducted by the Field Verification Group, this high rate indicates that field verification inspections have been effective in identifying nonconformances.

Table V-3 also shows that field verification inspections have a lower rate of conformance (95.4% on the average) than departure inspections (97.6% on the average), even though both of these types of inspections were the initial verification inspections conducted after the performance of first-line QA inspections. The discrepancy between the field verification and departure inspection conformance rates is attributable to the fact that some inspection criteria, such as those specified in American Welding Society (AWS) standard D1.1 for certain types of welding, require the exercise of judgment and are susceptible to different applications in the field. Although such differences generally do not have significance, the differences can cause discrepancies between the results of groups of inspectors if those groups consistently apply the inspection criteria differently. Based upon IP's experience with the Overinspection Program, it is IP's opinion that the BA inspectors have applied the inspection criteria even more conservatively than the IP inspectors, which has resulted in a lower conformance rate for field verification inspections than for departure inspections.

d. Commodity Conformance Rates

Table V-4 presents the conformance rates found during overinspections and field verification inspections for each type of commodity. As is evident from this table, with five exceptions, the field verification conformance rates for each commodity are greater than 95%. Therefore, these rates indicate that the QA Program has been effective in providing reasonable assurance that construction of these commodities complies with applicable design drawings and specifications.

For the five types of commodities with field verification conformance rates less than 95%, IP is taking appropriate action to assure that the commodities will be of acceptable quality after completion of construction. Specifically:

1) Structural Steel

The field verification conformance rate for structural steel is 92.3%. As mentioned above, IP has decided to perform overinspections for 100% of the accessible primary structural members, thereby assuring that the quality of the structural steel is acceptable.

2) Cable Trays

The field verification conformance rate for cable trays is 92.9%. As mentioned above, relatively few inspections have been performed on cable trays under the Overinspection Program. IP is continuing to perform the Overinspection Program for cable trays and will perform additional evaluations as more data specifically applicable to cable trays become available.

3) Electrical Hangers

The field verification conformance rate for electrical hangers is 93.6%. Since no safety-significant nonconformances were identified on electrical hangers, the continued performance of the Overinspection Program is sufficient to assure that the quality of electrical hangers is acceptable.

4) Mechanical Equipment

Given the 84.4% field verification conformance rate for and the relatively few inspections conducted on mechanical equipment, IP believes it is appropriate to continue performing the Overinspection Program for mechanical equipment.

5) HVAC Duct

The field verification conformance rate for HVAC duct is 93.5%. Since no safety-significant nonconformances were identified on HVAC duct, continued performance of the Overinspection Program is sufficient to assure that the quality of HVAC duct is acceptable.

It should be emphasized that, although the field verification conformance rate for these commodities does not exceed 95%, the overinspection conformance rates for these same types of commodities were greater than 95%. Moreover as is shown in Table V-5, where departure inspections were performed, the departure inspection conformance rates for these types of commodities exceed 96%. Thus, the results of these overinspections verify that the QA Program has been effective in providing reasonable assurance that these commodities conform with design drawings and specifications. Consequently, the actions outlined above are conservative.

4. **Evaluation of Old and New Work**

To evaluate the effectiveness of corrective actions which IP implemented after the identification of deficiencies in 1982, the work which has been inspected under the Overinspection Program has been divided into old and new work.

For purposes of this report, July 26, 1982, was selected as the date for dividing construction between old and new work (this date is after the issuance of the major stop work actions in 1982 and before the lifting of them). More specifically, construction work is classified as old or new based on the following criteria. All structural work within the scope of the Overinspection Program have been classified as old work for purposes of the Overinspection Program because it was completed prior to July 26, 1982. All HVAC work has been classified as new work because it was turned back to the contractor for rework and inspection after July 26, 1982. Finally, electrical cable and instrument panels for which construction was completed by July 26, 1982, have been classified as old work; electrical and mechanical hangers and raceways inspected by QC personnel by July 26, 1982, have been classified as old work; all other construction work for which documentation was completed by July 26, 1982, has been classified as old work; and all remaining work has been classified as new work. The results of evaluations based on these classifications are conservative because much construction work that was completed but not inspected or documented by July 26, 1982, has been classified as new work. Since the conformance rate for old work is lower than the conformance rate for new work, this has resulted in a lower conformance rate for new work than would have existed if the old work/new work classification had been based solely on the completion date of the installation work.

Table V-6 presents the conformance rates for old and new work for each of the construction disciplines. As can be seen from the field verification inspections, the conformance rate for new work is 97.4%, which is significantly higher than the conformance rates for old work. This indicates improvement in the quality of new work and reflects favorably on the effectiveness of the corrective actions that have been implemented since 1982. Furthermore, the high conformance rate for new work verifies the quality of that work.

Although the conformance rates for new work are generally higher than for old work, there are two exceptions in which the conformance rates for new work are significantly lower than for old work. First, the field verification conformance rate for new electrical equipment is 84.6%, whereas the field verification conformance rate for old electrical equipment is 99.9%. Similarly, the field verification conformance rate for new cable is 94.1%, whereas the field verification conformance rate for old cable is 99.9%. IP is continuing to perform the Overinspection Program on this type of cable and electrical equipment.

5. **Items Not Inspected Under the Overinspection Program**

As discussed above, the scope of the Overinspection Program did not include all types of safety-related items. Additionally, all items within the scope of the Overinspection Program have not been inspected. Nevertheless, the Overinspection Program provides a basis from which conclusions can be drawn regarding the quality of construction for the categories of items that have not been inspected under the Overinspection Program. Each of these categories is briefly discussed below.

a. **Items Within the Scope of the Overinspection Program**

As was demonstrated in subsection V.C.1, given the large number of inspections that have been performed for each construction discipline and for each commodity, any significant adverse condition which is applicable to a class of items would have been identified by the Overinspection Program. Consequently, the results of the Overinspection Program as of July 31, 1984, are generally applicable to the uninspected items within the scope of the program.

b. <u>Items Not Within the Scope of the Overinspection Program</u>

The only safety-related discipline not encompassed within the scope of the Overinspection Program is civil, which consists of such items as rebar, concrete, masonry walls, and soil compaction. Although both the NRC and IP have identified some deficiencies in civil work during construction of CPS, these deficiencies have been relatively minor in both number and severity and have been typical of the types of deficiencies expected during construction of any nuclear power plant. As a result, IP concludes that the QA Program for CPS has been effective for civil work, that the quality of civil work is acceptable, and that a reinspection program for civil work is unnecessary.

Also, to the extent that the Overinspection Program has shown that the overall quality of construction of CPS is acceptable, that conclusion is applicable to civil work since BA performed both the civil work and most of the remaining construction work at CPS. Consequently, the results of the Overinspection Program reinforce IP's position that no reinspection program is necessary for civil work.

c. <u>Non-Recreatable Attributes</u>

During construction of a nuclear power plant, inspections of attributes are performed for many in-process activities. Often, after the process is complete, it is no longer possible to inspect the same attribute because the attribute is non-recreatable. Examples of such attributes are welding preheat and cable pull tension. Consequently, it was impossible for the Overinspection Program to inspect these types of non-recreatable attributes. Nevertheless, there is no reason to believe that the quality of non-recreatable attributes would have been significantly different than the quality of the attributes which were actually inspected by the Overinspection Program.

d. <u>Inaccessible Items</u>

There are individual items within the scope of the Overinspection Program which are not available for inspection because the items have been rendered inaccessible by subsequent construction. An example of such an item is a piece of pipe or conduit that has been embedded in a wall. However, there is no single type of commodity within the scope of the Overinspection Program that is generically inaccessible, i.e., which is always inaccessible to inspection. Since there is no reason to believe that the quality of inaccessible items is significantly different from the quality of accessible items, the results of the Overinspection Program apply equally to inaccessible items and to other items which were not inspected.

e. **Vendor-Supplied Items**

The purpose of the Overinspection Program is to verify the quality of construction and installation activities at CPS. Consequently, the Overinspection Program has included inspection of installation of pumps, valves, and other components fabricated offsite by vendors, but has not included inspection of the internals of these types of items. Fabrication of these components is subject to the vendors' QA programs, with appropriate receipt inspections, surveillances, and audits under the QA Program for CPS. The vendors' QA programs provide adequate confidence that vendor-supplied items will perform their safety-related functions during operation.

D. CONCLUSION

The more than 1 million inspections conducted under the Overinspection Program as of July 31, 1984, verify that the overall quality of construction is acceptable.

None of the nonconformances identified by the Overinspection Program would have adversely affected the capability of structures, systems, and components at CPS to perform their intended safety functions, thereby demonstrating that construction of CPS is of acceptable quality.

Additionally, the overall conformance for field verification inspections is 95.4% and the overinspection conformance rate is even higher at 98.3%. These rates indicate that the QA Program for CPS has been effective in providing reasonable assurance that structures, systems and components comply with applicable design drawings and specifications.

The data from the Overinspection Program also demonstrate other positive trends. For example, the overall conformance rate for new work is higher than that for old work, which indicates that corrective actions and improvements implemented by IP after the identification of deficiencies in 1982 have been effective. Additionally, the conformance rate for overinspections performed in series is very high and significantly higher than the conformance rates for field verification inspections, thereby indicating that BA Quality and Technical Services has been effective in identifying nonconformances in the lots subject to field verification inspections.

Table V-1
Number of Attributes Inspected by
BA and IP Under the Overinspection Program as of July 31, 1984

Number of attributes inspected by BA's field verification	627,943
Number of attributes inspected by IP overinspection	438,459
Total	**1,066,402**

Table V-2
Nonconformances Within Nonconformance Types

Type	Attribute	Number of Nonconforming Attributes	Percent of Total Nonconformances
Welding	Weld size	6,373	17.5
	Undercut	5,714	15.7
	Overlap	1,966	5.4
	Convexity	48	0.1
	Concavity	102	0.3
	Lack of fusion	787	2.2
	Porosity	137	0.4
	Slag	814	2.2
	Crack	81	0.2
	Reinforcement	141	0.4
	Transition	2	0.0
	Subtotal	**16,165**	**44.5**
Installation	Wrong hardware	790	2.2
	Missing hardware	923	2.5
	Loose hardware	2,045	5.6
	Incomplete	156	0.4
	Cold set	30	0.1
	Orientation/configuration	649	1.8
	Tolerance	2,150	5.9
	Clearance/interference	217	0.6
	Slope	22	0.1
	Routing	4	0.0
	Bending radius	34	0.1
	Wrong weld	1,397	3.8
	Gaps	362	1.0
	Thread engagement	60	0.2
	Termination error	12	0.0
	Subtotal	**8,851**	**24.3**

Table V-2
Nonconformances Within Nonconformance Types

Type	Attribute	Number of Nonconforming Attributes	Percent of Total Nonconformances
Damage	Arc strike	5,354	14.7
	Grinding	280	0.8
	Dent/bent/warped	348	1.0
	Gouge/scratch/cuts	929	2.6
	Bolt/nut broken	41	0.1
	Coating missing	66	0.2
	Defective material	81	0.2
	Dirt/debris	54	0.1
	Protection	9	0.0
	Rust	15	0.0
	Holes	105	0.3
	Gaps	29	0.1
Subtotal		7,311	20.1
Documentation	ID missing/incorrect	3,654	10.1
	Drawing incorrect	192	0.5
	Traceability	99	0.3
	Inspection error	86	0.2
Subtotal		4,031	11.1
	Total	36,358	100.0

Table V-3
Conformance Rates by Construction Discipline

Type of Inspection	Discipline	Attributes Inspected	Number of Nonconforming Attributes	Conformance Rate(%)
Field verification (FV)	Structural	223,651	16,303	92.3
	Electrical/instrumentation	177,179	6,589	96.3
	Piping/mechanical	227,113	5,864	97.4
Total		**627,943**	**28,756**	**95.4**
Overinspection departure inspection (prior to FV)	Structural	86,367	3,014	96.5
	Electrical/instrumentation	52,165	838	98.4
	Piping/mechanical	32,980	344	99.0
Total		**171,512**	**4,196**	**97.6**
Overinspection Series Inspections (post FV)	Structural	155,031	3,049	98.0
	Electrical/instrumentation	49,958	146	99.7
	Piping/mechanical	62,958	211	99.7
Total		**266,947**	**3,406**	**98.7**

Table V-4
Nonconformance Rates by Type of Commodity

Commodities	Field Verification: Attributes Inspected	Field Verification: Nonconforming Attributes	Field Verification: Conformance Rate (%)	Overinspection: Attributes Inspected	Overinspection: Nonconforming Attributes	Overinspection: Conformance Rate (%)
Beams and structural steel	223,651	16,303	92.3	241,398	6,063	97.5
Cable	5,808	185	96.8	2,639	23	99.1
Cable termination	31,883	136	99.6	18,087	30	99.8
Conduit	3,269	12	99.6	511	0	100.0
Cable trays	649 46	92.9	0	2[4]	-	
Electrical equipment[1]	11,980	404	96.6	7,152	333	95.3
Electrical hangers	90,052	5,741	93.6	67,769	594	99.1
Instrumentation	153 0	100.0	21	100.0		
Instrument pipe	9,540	65	99.3	1,903	2	99.9
Large bore pipe	19,376	326	98.3	7,634	25	99.7
Small bore pipe	32,114	293	99.1	5,938	14	98.8
Mechanical equipment[2]	1,031	161	84.4	312	17	94.6
Mechanical supports[3]	178,435	4,115	97.7	63,690	494	99.2
HVAC duct	9,007	589	93.5	5,391	0	100.0
HVAC hangers	10,995	380	96.5	5,635	5	99.9
Total	**627,943**	**28,756**	**95.4**	**438,459**	**7,602**	**98.3**

[1] Includes electrical boxes, electrical panels, and switchgear.
[2] Includes compressors, pumps, valves, and miscellaneous equipment.
[3] Includes anchor plates, expansion anchors, and hangers.
[4] Identified during cable inspection; therefore no inspection attributes are credited.

Table V-5
Conformance Rates for Overinspection Departure Inspections for Selected Commodities

Type of Commodity	Number of Attributes Inspected	Number of Nonconforming Attributes	Conformance Rate (%)
Structural steel	86,367	3,014	96.5
Electrical hangers	50,833	507	99.0
Cable trays	0	0	-
Mechanical equipment[1]	161	2	98.8
HVAC duct	0	0	-

[1]Includes compressors, pumps, valves, and miscellaneous equipment.

Table V-6
Conformance Rates for Old Work and New Work

Field Verification Inspections

Discipline	Work	Number of Attributes Inspected	Number of Nonconforming Attributes	Conformance Rate (%)
Structural	Old	223,651	16,303	92.7
	New	N/A	N/A	N/A
Electrical/ instrumentation	Old	87,048	4,284	95.1
	New	90,131	2,305	97.4
Piping/ mechanical	Old	33,322	763	97.7
	New	193,791	5,101	97.3
Totals	**Old**	**344,021**	**21,350**	**93.8**
	New	**283,922**	**7,406**	**97.4**

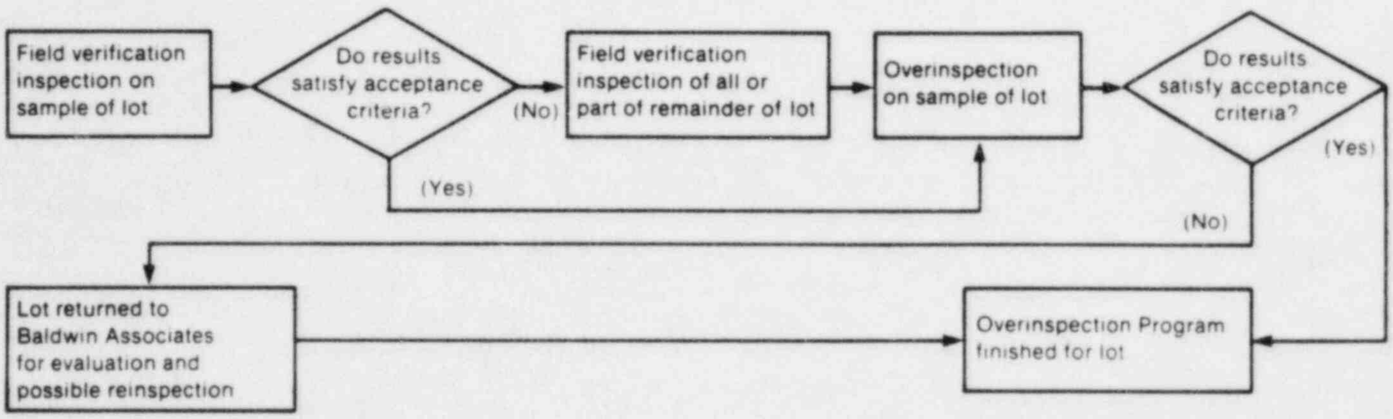
Overinspections

Discipline	Work	Number of Attributes Inspected	Number of Nonconforming Attributes	Conformance Rate (%)
Structural	Old	241,398	6,063	97.5
	New	N/A	N/A	N/A
Electrical/ instrumentation	Old	79,615	688	99.1
	New	21,508	296	98.6
Piping/ mechanical	Old	50,953	239	99.5
	New	44,985	316	99.3
Totals	**Old**	**371,966**	**6,990**	**98.5**
	New	**66,493**	**612**	**99.1**

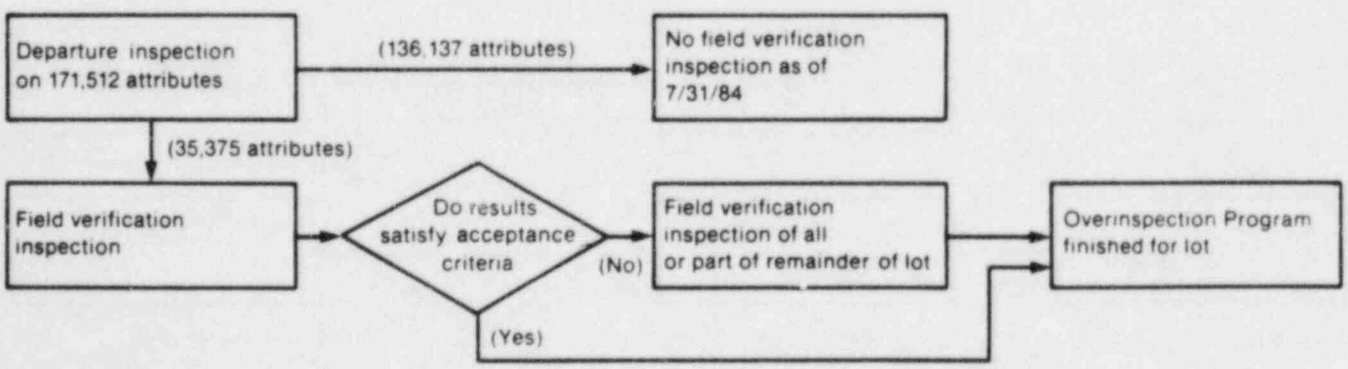
Flow Diagram of the Types of Inspections Performed Under the Overinspection Program

Figure V-1

I. Lots Subject to Field Verification Inspection and Overinspection



II. Lots Subject to Departure Inspections (status as of July 31, 1984)



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VI. RECORD VERIFICATION PROGRAM

IP developed the Record Verification Program in response to the June 1982 stop work actions (SWA) to verify the acceptability of CPS construction QA records. The program serves both to verify the adequacy of construction QA records generated before the issuance of the SWAs and to provide additional assurance as to the adequacy of such records generated after the SWAs. The reviews conducted under the Record Verification Program are performed in addition to those normally performed as part of the QA Program for CPS. They are a supplement to the CPS QA Program and not a substitute for it.

The following discussion presents a summary description of the major elements of the program and an evaluation of the results of the program. This evaluation of results shows that:

- None of the hardware-related nonconformances identified as a result of the records verification review are safety-significant.

- The rates of record deficiencies identified in the program are low, no adverse trends are evident that warrant further action, and none of the record deficiencies identified in the record verification review have adverse implications for hardware quality.

- The program provides adequate confidence in the acceptability of CPS construction records.

A. MAJOR PROGRAM ELEMENTS

The Record Verification Program plan was originally described in detail in IP's November 15, 1982, letter to the NRC. The NRC's December 3, 1982, letter concurred with the intent of the program plan. On January 20, 1983, IP submitted revisions to the program plan in response to NRC comments. On September 26, 1984, IP refined and clarified the program plan as it has developed and evolved during the course of its implementation.

IP QA is responsible for managing the Record Verification Program. The reviews conducted under the program apply to quality records for all completed BA construction work packages for safety-related, augmented class D (radioactive waste), and fire protection structures, systems, and components, and BA safety-related purchase order packages. These reviews are conducted on two levels: BA's Document Review Group (DRG) reviews all records within the scope of the program for acceptability and IP's QA Records Review Group (RRG) reviews a random sample of approximately 20% of the records reviewed by the BA DRG.

As stated above, the reviews are conducted for completed work packages (travelers) and purchase orders drawn from the BA records vault. A document exception list (DEL) is prepared and maintained for each work package or purchase order selected for review. The DEL records the results of the review, including any record deficiencies (referred to as "DEL items") identified during the review.

The reviews and any associated field validations are performed by trained and certified QA personnel using approved checklists that specify the applicable review acceptance criteria. The acceptance criteria include legibility, completeness, traceability, and identification of the item involved, as well as compliance with applicable codes, standards, specifications, and procedures. At completion of CPS construction, there will have been more than 140,000 work packages generated, which include some 18 million reviewable record verification attributes.

Record deficiencies identified in a work package are documented on the DEL and routed to the DEL Resolution Group for resolution or initiation of a nonconformance report (NCR) for potential hardware-related conditions. After resolution, records are reprocessed through the BA DRG for final acceptance review. All documentation packages accepted by the DRG are then transmitted to the IP RRG for selection of the review sample.

The IP RRG sample review of approximately 20% of completed packages transmitted by the BA DRG uses the same criteria and checklists used by the BA DRG. Record deficiencies identified in the IP RRG review are recorded on a record deficiency report (RDR), which is forwarded to the BA DRG for resolution. After evaluation, BA DRG may prepare DEL items or NCRs, as appropriate, and process all deficiencies for resolution. Following resolution, the completed record packages are routed back to the IP RRG for final review and acceptance.

The record review process is monitored by computer-assisted systems that enable BA and IP management to track the status of documents and deficiencies and analyze trends resulting from the records review. In addition, record verification activities are subject to audits and surveillances by the BA and IP QA organizations. Pertinent data developed from the Records Verification Program are presented in Appendix E.

B. EVALUATION OF RESULTS

The following evaluation of the results of the CPS Record Verification Program consists of three elements: (1) the safety significance, if any, of potential hardware-related nonconformances resulting from record reviews; (2) the implications for hardware quality, if any, of record deficiencies identified in record verification reviews; and (3) the basis for confidence in the acceptability of CPS construction QA records. For purposes of this evaluation, the record deficiencies were fixed as of December 10, 1984. The NCRs, NCR resolutions, and record deficiency resolutions were fixed as of January 17, 1985.

1. Potential Hardware-Related Nonconformances

As indicated in the foregoing discussion, potential hardware-related nonconformances identified during the course of record verification reviews are documented on NCRs. As of January 17, 1985, 587 NCRs had been initiated as a result of record verification reviews. The 587 NCRs can be categorized as follows:

NCR Category	Number of NCRs
Open: pending disposition or closure.	1
Invalid: NCRs that have been determined not to document valid nonconformances.	31
Superseded: closed and covered by a new NCR.	34
Material rejected: material rejected in stores before installation. Not used; therefore, no safety significance.	2
Transferred to IP Operations for evaluation as a nonconforming material report (NCMR) (for systems already turned over to IP Operations).	23
Not hardware-related or "use as is" evaluation by S&L: Disposition is used when a nonconformance does not affect permanent plant hardware or S&L has evaluated the item for all engineering functional requirements, including performance, maintainability, fit, and safety. None of these items has safety significance in the operation of CPS.	130
Not hardware-related or "use as is" evaluation by IP or BA: No violation of design, procedure, or plant hardware existed. A "use as is" disposition may be used when it can be established that the discrepancy will result in no adverse condition and that the item under consideration will continue to meet engineering functional requirements, including performance, maintainability, fit, and safety. Therefore, these items are not safety-significant.	218
Dispositioned by rework based on an evaluation by S&L.	19
Dispositioned by rework based on evaluation by IP.	129
Total	**587**

Excluding the NCR that is now pending disposition[1], there are also 67 NCRs that are invalid, superseded, or involve material rejects prior to installation. These NCRs, therefore, do not present a potential for affecting hardware quality or plant safety. Three hundred forty-eight of the NCRs were subjected to the existing CPS process for evaluation and disposition of NCRs and were determined to be unrelated to hardware quality or technically acceptable for use as is (i.e., without any rework).[2] The remaining 171 NCRs were subjected to engineering evaluations by S&L to determine whether any condition significant to plant safety would have existed if the nonconforming conditions had remained undetected by the Record Verification Program.

S&L evaluated each NCR to determine the hardware impact if the nonconforming condition had gone undetected by the Record Verification Program. For NCRs that impacted hardware quality, S&L determined whether the nonconformance was safety-significant. A safety-significant nonconformance is defined for the purposes of evaluation as one which, had it remained unidentified by the Record Verification Program, could have resulted in the loss of capability of a structure, system, or component to perform its intended safety function.

For purposes of describing the S&L evaluation results, the nonconformances can be divided into eight categories. Each category is discussed below, together with an explanation of why the nonconformances were not safety-significant. Nonconformances in the first five categories had no impact on hardware quality. Nonconformances in the last three categories were such

[1] The open NCR relates to incorrect one-half inch diameter threaded rod which was received and installed. Although the NRC has been notified that this condition is potentially reportable under 10 CFR Section 50.55(e), the evaluation is not scheduled for completion until March 1, 1985. The significance of the NCR has not yet been established.

[2] Additional description and discussion of the disposition of these 348 NCRs is contained in Appendix E.

that their presence would not result in the failure of any structure, system, or component to meet the plant design basis.

a. **Documentation and Procedural Nonconformances**

Documentation and procedural nonconformances, with 71 occurrences, were by far the most prevalent type of nonconformance evaluated by S&L. These nonconformances typically dealt with improperly or incompletely documented items in the construction traveler packages, receipt inspection reports, certified material test reports, or other construction documents. In all cases, the acceptability of the material or construction was subsequently confirmed and only the documents themselves had to be corrected. The procedural nonconformances reported instances in which project procedures were not correctly followed. None of these nonconformances were determined to affect hardware quality.

b. **Material Supplier Qualification**

In 10 cases, the material supplied could not be confirmed initially as being supplied in accordance with an ASME Section III acceptable material control program. These items were either downgraded or replaced. In each case, a review of the item's certified material test report demonstrated that the material originally supplied was the same as the material specified, and the hardware was determined to be acceptable.

c. **Welding Preheat Temperature**

Incorrect welding preheat temperatures were identified in 18 cases. The purpose of performing welding at specified preheat temperatures is to reduce the effect of the localized rapid heating and cooling caused by welding on thick material sections. In the worst case, incorrect preheating might result in the weld cracking as it cools. However, acceptability of each weld was verified by nondestructive examinations performed after the weld had been completed and cooled. These examinations determined that the welds had not cracked due to improper preheat.

d. <u>Inspection Not Performed</u>

In 18 cases, either an inspection was not performed or it was performed but not documented properly. In 17 cases, a subsequent inspection was performed to confirm the acceptability of the original material or construction. In the other case, a weld had been reworked so that a subsequent inspection could not be performed. However, the originally-installed condition was determined to be acceptable based on an evaluation of the design loads applied to the connection.

e. <u>Items Identifiable Through Subsequent Inspection and Testing</u>

Fourteen nonconformances were reported that would have been detected and corrected during subsequent plant construction and testing. These nonconformances involved items such as flow direction indicators on valves not being visible, shop hydrostatic testing being waived in lieu of field system hydrostatic testing, meggering electrical cables and equipment, and one case of a valve motor operator qualification that would have been inspected and detected during another program. These nonconformances would have been detected and corrected in the normal course of other programs.

f. <u>Component Substitution</u>

Twelve occurrences of component substitution were reported. These cases dealt with substitution of a heavier schedule pipe spool, substitution of bolting material, substitution of different size bolts, or substitution of plate material thicker than that specified. In each case, it was determined that the substituted component was capable of performing its intended function.

g. Material Traceability

Twenty-seven occurrences of failure to maintain material traceability were evaluated. These cases typically dealt with bolting or structural materials that, upon examination, no longer had the proper identification marks. Each such occurrence was examined assuming installation of the lowest grade material available at the site for bolting material and the lowest grade available commercially for structural material. In each case, there was sufficient margin in the design to allow for the lower grade material substitution. Thus, even though material traceability could not be established, structural integrity was demonstrated to be within the design criteria.

h. Bolt Torque

One case of an inadequately torqued conduit support anchor was evaluated. The reduced torque value was determined to be acceptable based on the capability of the bolt in its original condition to transfer the applied loads within the design basis.

In summary, the S&L engineering evaluations of the nonconforming conditions identified by the Record Verification Program showed that, even if the nonconforming conditions had remained unidentified by the record verification review, no loss of capability of any structure, system, or component to perform its intended safety function would have resulted. That is, none of the nonconforming conditions were safety-significant.

2. Evaluation of Record Deficiencies

The record deficiencies identified in the Record Verification Program as of December 10, 1984, were evaluated to determine: (1) whether there were any outstanding trends in record deficiency rates that would warrant additional action and (2) whether any adverse hardware implications are evident from the resolutions of record deficiencies completed by December 10, 1984. Each of these evaluations is discussed below.

a. Deficiency Rates

As of December 10, 1984, a total of 44,888 work packages or purchase orders have been placed in the Record Verification Program review process. Upon completion of CPS construction, approximately 140,000 record packages will have been generated. Of the 44,888 packages in review to date, 28,627 are for new work and 16,261 are for old work.

The 44,888 packages include approximately 5,679,000 individual attributes that were reviewed by BA for compliance with the applicable acceptance criteria. Within these attributes, 132,374 DEL items or record deficiencies have been identified. Nearly 3,109,000 attributes are associated with new work and over 2,570,000 are associated with old work. Approximately 53,000 DEL items were identified for new work and approximately 79,000 were identified for old work.

The rates of record deficiencies for the total program (2.3%), new work (1.7%), and old work (3.1%) are low. The significantly lower rate for new work relative to old work indicates IP's effective implementation of programmatic improvements and corrective actions in regard to quality records.

The IP RRG conducted a sample review of the record packages previously accepted by the BA DRG. The IP RRG review encompassed over 935,000 attributes, within which 1,144 record deficiencies were identified. The IP RRG deficiency rate of 0.12% can be contrasted with the BA DRG overall program deficiency rate of 2.3%, indicating that the BA DRG reviews have been effective in identifying record deficiencies. The overall trends for the Record Verification Program results are favorable and indicative of an effectively functioning program.

Appendix E presents tabulations of the data for NCRs generated from the Record Verification Program as of January 17, 1985, and record deficiencies as of December 10, 1984, to show the distribution of NCRs and record deficiencies by old and new work, by discipline, by work item type, and by checklist attribute group. These data were evaluated to determine whether there were any adverse trends that might warrant further action. The results are discussed below.

Table E-1 correlates NCRs by work item for both old and new work. All nonconformance rates are low, new work rates are lower than old work rates, and no outstanding adverse trends warranting further action are evident.

Tables E-2 and E-3 correlate DEL items by discipline for both old and new work and for DRG and RRG reviews, respectively. Deficiency rates are generally low and new work rates are essentially all below old work rates. No outstanding trends warranting further action are evident from RRG reviews. In the DRG reviews, two disciplines (old work electrical and procurement) show deficiency rates warranting further examination. These are discussed in Appendix E in connection with the evaluation of Table E-4.

Table E-4 correlates DEL items identified in DRG reviews by item of work for both old and new work. While deficiency rates were generally low and new work rates were lower than old work rates, the rates for seven items warranted further examination. As explained in Appendix E, no further action beyond continuation of the DRG reviews was warranted for any of the seven cases.

Tables E-6 and E-7 correlate record deficiencies by checklist attribute for each work item type for both old and new work and for DRG and RRG reviews, respectively. The rates are low, new work rates are generally less than old work, and no adverse trends warranting further action are evident.

Appendix F presents an analysis of the Record Verification Program data base to show that, with the exceptions noted in Appendix E, the population of records reviewed to date is sufficient to enable reasonable inferences to be drawn for the program as a whole.

In summary, the evaluation of deficiencies for the Record Verification Program shows low deficiency rates for the overall program, lower rates for new work relative to old work, and effective identification of record deficiencies by the BA DRG. Further examination of record deficiencies in terms of their distribution by discipline, by work item type, and by checklist attribute indicate no outstanding trends that warrant further actions. The evaluation indicates that the Record Verification Program has been effectively implemented, and has been effective in confirming the acceptability of CPS QA records.

b. Record Deficiency Resolutions

The resolutions of record deficiencies identified in the Record Verification Program as of December 10, 1984, were evaluated to determine whether any of those deficiencies had adverse implications for hardware quality. In general, record deficiencies are related solely to documentation and do not involve nonconformances in the hardware itself. Of course, each record deficiency is ultimately resolved and any potential hardware deficiencies are documented as NCRs and resolved. Nevertheless, this evaluation examines the two major classes of record deficiency resolutions employed in the CPS Program - generic resolutions and specific resolutions - to confirm that this has remained the case.

1) Generic Resolutions

Of the 132,374 record deficiencies evaluated herein, 56,542 were resolved by generic resolutions (GR). A GR is a preapproved resolution that can be directly applied by a document reviewer for closing a particular type of recurring record deficiency.

Appendix G describes each individual GR, its current status, and function in narrative format. For each GR, the underlying problem and its resolution are described, along with the reasons and justification for the resolution action. These reasons and justification show that all record deficiencies resolved by GRs have no adverse implications for hardware quality.

2) <u>Specific Resolutions</u>

After resolution of nearly 57,000 record deficiencies by GRs, the remaining deficiencies were resolved by specific resolutions. These case-by-case resolutions resort to additional sources of information available to substantiate quality and resolve the record deficiency. The specific resolution process consists of four basic approaches which can be used sequentially as necessary to resolve any particular deficiency. Each of these four basic approaches are described and illustrated in the following discussion:

- Resolution of the DEL item by the BA DRG reviewer by obtaining the necessary information from other documents in the traveler package being reviewed or from supplemental records. Examples of other documents that can be used include:

  - welder qualification log
  - Q&TS certification matrix
  - heat log
  - computer printout of the history of instructions and procedures
  - material requisitions
  - receiving inspection reports

- Resolution of the DEL item by BA DEL resolution personnel by obtaining the necessary information from other documents in the traveler package or from supplemental records.

  The DEL Resolution Group uses the same methods as the BA DRG reviewer in the approach described above. However, this group has more information and evaluations at its disposal. The BA DEL Resolution Group is comprised of Quality Engineering and Resident Engineering personnel. The BA DEL Resolution Group Quality Engineering was developed from the consolidation of Quality Control, Technical Services, and Quality Assurance Level II and III personnel who were previously assigned to DEL resolution activities. This group may review and evaluate drawings, procedures, and other revised documents against the stated deficiency to determine acceptability. This group performs further research and evaluations while the BA DRG reviewer can only evaluate from reference tables and logs contained within the BA DRG Program area.

- Resolution of the DEL item by obtaining the necessary information from reinspection of the stored or installed hardware.

  Most reinspections are conducted to provide additional verification of heat number, serial number, or some form of material or part ID. These inspections are accomplished in accordance with applicable procedures and documented by one or more methods. If the discipline DEL resolver performs the inspection, the results are usually documented on the DEL. If another quality group does the inspection, then a separate inspection report is generated and inserted in the document record package.

- Closure of the DEL item by issuing an NCR for resolution of the deficiency.

The specific resolution approaches described above provide a controlled, systematic method for assuring that all deficiencies are properly resolved and that no questions remain as to hardware quality. The first approach to specific resolution was applied to resolve some 3,900 deficiencies, while the second was used to resolve some 55,422 deficiencies. Hardware inspections resolved another 1,323 deficiencies, and NCRs were used to resolve 587 deficiencies that were identified as having potential hardware-related nonconformances. The NCRs were evaluated and none were determined to be safety-significant.

There are 14,600 record deficiencies that are open pending resolution. The bulk of the open deficiencies have not been resolved because their resolution has not been necessary to support system turnovers. Consequently, there is nothing inherent in these open deficiencies which would suggest that their resolution would be significantly different than the deficiencies which have been resolved. To provide assurance that this is the case, IP selected a random sample of 320 record deficiencies from the 14,600 pending deficiencies and has processed all but 34 of them to closure. This resulted in initiation of eight NCRs. Projecting this NCR rate to cover the balance of open record deficiencies would add 360 NCRs to the total generated by the Record Verification Program to date. This would increase the overall program ratio of NCRs per inspection attribute by only 0.006%. Moreover, the nonconforming conditions identified were similar in kind to those already observed in the evaluation of the overall population for the program. Finally, the distribution of record deficiencies by work item for old and new work was consistent with the distribution observed in the evaluation of the overall program. This confirms that the evaluation of results presented in this report are not significantly affected by the existence of pending record deficiency resolutions. Nevertheless, these deficiencies will be resolved, and the results will be evaluated and documented.

In conclusion, with the exception of the 587 NCRs, the record deficiencies identified by the Record Verification Program do not have adverse implications for hardware quality. For the 587 NCRs, it has been shown in subsection 2 above that none of the nonconforming conditions were safety-significant.

3. Basis for Confidence in Acceptability of Records

The evaluations of deficiency rates discussed above indicate that a small portion (0.01%) of the record deficiencies identified in the Record Verification Program involve potential hardware-related nonconformances and thus result in NCRs. More importantly, the evaluations of the hardware-related nonconforming conditions identified in those NCRs showed that none of the nonconforming conditions were safety-significant. This affords a high level of confidence in the ultimate quality and safety of CPS hardware.

On a secondary level of analysis, the overall deficiency rate for the Record Verification Program is low (2.3%), and the rate for new work is roughly a factor of two less than for old work. This indicates that, in general, CPS construction QA records are of acceptable quality and that IP's programmatic improvements and corrective actions in regard to QA records have been effective. The small rate of deficiencies identified by IP RRG reviews (0.12%) indicates that BA DRG reviews have been effective in identifying record deficiencies. Evaluation of NCR and record deficiency rates for both old and new work by discipline, by work item type, and by checklist attribute isolated seven areas in which further examination was necessary to determine whether further action was warranted. That examination, however, indicated that no further action, beyond continuation of the program in those areas, was warranted.

The methods employed for resolution of record deficiencies have been effective in identifying potential hardware-related record deficiencies and in assuring that identified record deficiencies are properly resolved and do not have adverse implications for hardware quality.

The effective implementation of the Record Verification Program is confirmed by the results of IP and BA QA audits and surveillances, third-party audits, NRC inspections, and IP and BA corrective actions.

The Record Verification Program has been subjected to audits and surveillances by IP QA and BA QA, and audits by third parties. Since December 1982, IP QA has performed three audits and eight surveillances, and BA QA has performed four audits and nine surveillances. In 1982 and 1983, the Joint Utility Management Audit group audited the Record Verification Program. In April 1984, Lapp-Rice-Staker Management Consultants performed a management assessment for the CPS project that included an assessment of Record Verification Program activities. The major findings and recommendations resulting from each of these activities and the corrective actions taken by IP in response are briefly summarized in Table VI-1.

Since the beginning of the program, the NRC has conducted inspections that have included Record Verification Program activities. The results of these inspections are documented in NRC IE Inspection Reports 50-461/83-08, 83-16, 84-02, 84-17, and 84-43. One item of noncompliance was identified by investigation of record verification activities. This finding represents an isolated occurrence and not a generic deficiency in the program. No corrective action is anticipated. No other items of noncompliance have been identified. There are, however, three specific items which remain open from these inspections: 84-02-02, 84-02-04, and 84-17-03. A brief description of each open item and the associated corrective actions taken by IP or the IP action plan and schedule for closure on each item is given in Table VI-2.

The results of the evaluation of the safety significance of NCRs; deficiency rates and trends; resolutions of deficiencies; and audits, surveillances, and inspections together confirm that the Record Verification Program has been effectively implemented and that the program affords high confidence in the quality of CPS QA records.

C. CONCLUSION

This evaluation of the results of the record verification program shows that:

- None of the potential hardware-related nonconformances resulting from record reviews are safety-significant. That is, if the nonconforming conditions were left unidentified by the Record Verification Program, no adverse effect on plant safety would have resulted.

- The rates of record deficiencies identified in the program are low, no adverse trends are evident that warrant further action, none of the record deficiencies identified in record verification reviews have adverse implications for hardware quality, and none of the 587 NCRs contained safety-significant deficiencies.

- There is adequate confidence in the acceptability of the CPS construction QA records.

Table VI-1
Record Verification Program Audit Results and Corrective Actions

Activity	Quantity	Dates Performed	Total Findings	Results	Corrective Action
IP QA and BA surveillances	17	4/25/83 5/3/83 5/6-9/83 6/8-9/83 10/27/83 11/22/83 12/2/83 12/26-30/83 1/5-10/84 3/28-29/84 3/28-4/16/84 3/31/84 4/9-10/84 5/18-21/84 5/24-6/1/84 6/5/84 7/27 and 8/21-22/84	21	No major findings requiring rereviews identified Minor findings were categorized as follows: • Administrative deficiencies • Lack of adherence to instructions or procedures • Checklist inadequacies • Inadequate implementation of generic resolution	• Training was increased • Instructions and procedures were revised and clarified • Upper management directives were issued • Checkout logs were established • Checklists were revised to provide adequate controls to ensure accountability and review of documents • Generic resolutions were revised to ensure proper implementation • Controlled manuals were reviewed and verified as complete and accurate • In several instances, no corrective action was necessary because existing administrative controls were more than adequate

Table VI-1
Record Verification Program Audit Results and Corrective Actions

Activity	Quantity	Dates Performed	Total Findings	Results	Corrective Action
IP QA and BA QA Audits	7	7/6-12/83 8/15-23/83 9/28-10/5/83 10/19-21/83 1/23-25/84 6/5-18/84 8/27-30/84	16	No major findings requiring rereviews identified Minor findings were categorized as follows: • Administrative deficiencies • Lack of training • Lack of adherence to instructions or procedures • Inadequate procedures	• Increased training in specific areas (i.e., administration and instructions and procedures) was incorporated into the training program • Instructions and procedures were revised and clarified • Entry and/or process instructions were printed on back of forms used • Department responsibilities were reassigned
LRS management assessment review	1	4/84	0	No major findings requiring rereviews identified LRS consultants recommended: • Consolidate all documentation verification and control into one organization • Interchange of personnel between TPRG and DRG to reduce inconsistent practices • Improve the QC inspection support to receiving documentation and DEL resolution • Second-shift support of Q & TS organizations to DEL resolution should be increased	The following resulted from the recommendations: • Removed duplication of functions in TPRG and DRG • Checklists used by TPRG and DRG were revised to be consistent • DEL resolution was removed from QC and placed under Quality Engineering where it will receive a higher priority and higher level of attention
JUMA third-party audit	2	9/13-17/82	0	No major findings requiring rereviews identified Recommended IP review the programs used by other utilities in the records retrieval/turnover documentation area	IP was developing a comprehensive records management plan using the services of consultants with expertise from other projects The IP plan addressed the need for the following:

Table VI-1
Record Verification Program Audit Results and Corrective Actions

Activity	Quantity	Dates Performed	Total Findings	Results	Corrective Action
					• A system for the BA QA final review of incoming safety-related, augmented class D (radioactive waste), and fire protection records • A system for transfer of records from BA and S&L • A system for handling records generated during the startup program • A system for handling records generated during operation, maintenance, and modification
		9/26-30/83		The records management and document turnover as planned appears to adequately address IP quality and hardware support requirements	N/A
EBASCO Third-Party Cost Estimate and Construction Schedule Evaluation	1	1/16/84	0	No major findings requiring rereviews identified It was recommended that BA re-evaluate staffing levels, both present and projected, and increase staff appropriately to ensure timely completion of all required QA records review	BA aggressively pursued the hiring of additional review personnel. A resolution group has been established to ensure timely resolution of deficiencies. BA added 23 personnel to DRG as of 7/30/84
Hartford Steam Boiler Inspection and Insurance Co. ANSI N626.0 Audits	2	3/12-14/84 10/15/84	1	No significant findings concerning BA DRG were identified One finding concerning change documents (NCR) identified. During the final review of a traveler by DRG, the attached NCR was a "reference only - Not to be used for construction" copy and was not final reviewed by Q&TS	BA DRG personnel were instructed to ensure that all change documents attached to a traveler are closed out

Table VI-1
Record Verification Program Audit Results and Corrective Actions

Activity	Quantity	Dates Performed	Total Findings	Results	Corrective Action
IP special review of BA DRG final review checklists	1	1/4 to 4/13/84	4	No major findings requiring rereviews identified With some exceptions, the applicable DRG checklists, along with the general checklist, used with the corresponding BQAI-110-series instruction by trained and qualified reviewers, are capable of, and valid for, determining and ensuring the completeness, traceability, legibility, and accountability of records in the package for which they were intended. The exceptions were documented as IP QA surveillance findings and categorized as follows: • Records not addressed by or covered in the BA DRG checklists • S&L-approved and status-stamped copies of DRG checklists were not on file in the document record center • Superseded checklists not deleted from approved instruction • Checklists or instructions were lacking specific points or documents to be checked or reviewed	• Additional record types were identified for review • Checklist revised to provide adequate controls to ensure accountability and review of documents • Instructions and procedures were revised and clarified • Training was increased

Table VI-2
NRC IE Reports Concerning Record Verification Program

NRC IE Report #	Date of Inspection	Results	Status	Comments
50/461/83-08	6/21-25/83	No items of noncompliance were identified	Closed	
50-461/83-16	9/13-16/83	No items of noncompliance were identified	Closed	IP met the requirements for overinspection and document review program as described in the CAL of September 1, 1982
05/461/84/02	9/18-20/84	No items of noncompliance were identified	Closed during routine inspection 50-461/84-15 performed on 5/24-25/84	Open item 50-461/84-02-01 - procedures BQA 184 and BAP 2.1.1 appeared to require further clarification and revision. BAP 2.1.1 was revised 2/13/84 stipulating in Section 6.2.1 the method in which the applicable disciplines review exception list items, including the document distribution order. BQA 184 is in the process of being revised, deleting the portion of the job description for Levels II and III regarding the interpretation and evaluation of results
			Awaiting closure of 50.55(e) report which is estimated to be answered by 3/5/85	50-461/84-02-02 - Cable tray structural support traceability
			Closed during routine inspection 50-461/84-15 performed 5/24-25/84	Open item 50-461/84-02-03 - The generic resolution group supervisor was previously in the process of documenting the 10 CFR Section 50.55(e) review for all Generic Resolutions. During the inspection, the inspector determined that the Generic Resolution Group supervisor has reviewed all generic resolutions for 10 CFR Section 50.55(e) applicability. This review has been documented. The inspector reviewed generic resolutions 1, 5, 10, 15, 20, 24, and 39
			CAR 162 was generated which requires a rereview of all generic resolution corrective actions, such as training and surveillance. Estimated closure of CAR 162 is 2/28/85	50-461/84-02-04 - DEL generic resolutions are not adequately supported by document justification

Table VI-2
NRC IE Reports Concerning Record Verification Program

NRC IE Report #	Date of Inspection	Results	Status	Comments
50-461/84-17	6/11-15/84	No items of noncompliance were identified	Awaiting NRC evaluation of proposed corrective action per C. Anderson letter CEA-1732384, dated 7/13/84	50-461/84-17-03 - Open item: The BA Document Review Program generates DEL items. Recently, the unresolved backlog DEL curve is increasing while the number of DEL items per document package is decreasing. The NRC inspector believes that these two conditions are contradictory
50-461/84-43	12/3-14/84	One item of noncompliance was identified related to BA DRG	Evaluation has been completed and response is in preparation. Preliminary assessment is that finding was related to supplementary data and not part of required documentation to be reviewed as per the approved checklist	BA has accepted documents for 3/4" ASME valves. Five certifications of compliance/conformance, which contained no dates, were provided as back-up to ASME NPV-1 data report. BA DRG failed to identify the missing information

VII. GENERAL ASSESSMENT AND CORRECTIVE ACTION ACTIVITIES

Throughout the course of CPS construction, IP has maintained or initiated a series of general assessment and corrective action activities to provide additional assurance of CPS construction quality. These other major activities include: (1) the Material Assurance Program, (2) 10 CFR Section 50.55(e) reporting, (3) 10 CFR Part 21 reporting, (4) responses to NRC inspections, (5) third-party audits, (6) employee quality concerns reporting, (7) configuration control, and (8) management corrective action responses. Each of these activities is discussed below.

A. MATERIAL ASSURANCE PROGRAM

As a result of the identification of a potentially reportable material traceability deficiency in January 1984 (discussed in detail in Appendix H), IP decided to evaluate the overall effectiveness of material controls in effect at that time. A plan was developed to evaluate the adequacy of procedures for maintaining traceability of material and for preventing incorrect material from being used. The plan also provided for the evaluation of the implementation of these procedures through observations of the material control activities being performed and reviews of audit and surveillance inspection reports covering these activities. The plan is divided into three sections: (1) adequacy of the procedures, (2) implementation of the procedures, and (3) resolution of previously identified problems. Each of these activities is discussed below.

1. Adequacy of the Procedures

The control of material is carried out by individuals in various disciplines (e.g., electrical, mechanical), who perform their assigned activities at various times and locations during the construction phase. Material control activities include:

- Purchasing the correct material
- Assuring that correct material is received
- Marking certain materials for traceability
- Segregating types of materials
- Issuing the correct material for a particular installation

- Documenting the actual material used for particular installations
- Reviewing documentation related to the above steps

A large number of procedures are necessary to provide the proper instructions for material control.

The IP Material Assurance Group identified and reviewed all BA and IP procedures to determine their adequacy in providing instructions to all users who handle the material, inspect the material, or review related documents. These reviews included identification of all procedures that contained instructions for the control of material to ensure that they were adequate with respect to the requirements of federal regulations, codes, standards, design specifications, and commitments made in the CPS Final Safety Analysis Report and the stop work action recovery programs.

The procedures which cover the identification and resolution of problems were reviewed to ensure that instructions are available to be used if material-related deficiencies are identified. Audit and surveillance plans were reviewed both for technical adequacy and frequency to ensure that checks were being made of material control activities.

2. <u>Implementation of the Procedures</u>

In regard to procedure implementation, a list of materials from four specifications was developed from which various items were selected. The documentation and records related to these selected materials were checked to verify the correctness of materials purchased and received on site. Audit and surveillance reports were reviewed to determine their adequacy for monitoring control activities for materials and their capability for detecting adverse conditions. The reports also were reviewed to determine whether programs are being implemented to ensure compliance with purchasing requirements, including the records supplied by the vendors. Audits and surveillance inspection reports of the field verification, overinspection, and record verification activities related to the installation of materials were reviewed to determine the adequacy of the programs which, in turn, check the adequacy of material control.

IP performed additional studies of document and record reviews to resolve questions related to material purchases. They also performed studies of Document Review Group, Record Review Group, Field Verification Group, and Overinspection Group activities to resolve questions related to material installation.

3. Resolution of Previously Identified Problems

The results of other programs which had a bearing on material control issues, such as stop work actions and potential/actual deficiencies, were reviewed to identify those resolutions that would provide answers to questions raised during this material assurance activity.

4. Conclusion

Instructions and guidance for the overall control of materials are incorporated into various procedures at approximately 200 locations. As a result of reviewing the material control procedures, questions have been generated. These questions are currently being researched and resolved. Upon completion, the evaluation results will be documented, and any necessary improvements in material control procedures will be made.

B. 10 CFR SECTION 50.55(e) REPORTING

IP has developed a systematic program to ensure compliance with 10 CFR Section 50.55(e). Each potentially reportable deficiency that is discovered is investigated for significance and is determined to be either reportable or not reportable according to established procedures. IP notifies the NRC when a potentially reportable deficiency is discovered, even though the deficiency may eventually be determined to be not reportable, so that the NRC staff is aware that an investigation is being conducted. There have been 68 potentially reportable deficiencies discovered at CPS as of December 10, 1984. Of these, 30 were determined to be reportable and 27 not reportable. Investigations are still in progress for the remaining 11 potentially reportable items.

Appendix I provides a summary of each potentially reportable deficiency and the action IP has taken to identify the extent of the deficiency, correct the deficiency, and preclude recurrence of the deficiency. IP has either resolved or is taking action to resolve each specific deficiency. Four general observations follow from the data presented in Appendix I.

1. **Potentially Reportable Deficiency Investigations**

After identifying a potential deficiency, IP promptly notifies the NRC and begins an investigation. Responsible organizations are identified, committees are organized as necessary, and all available information is accumulated. The constructor, designer, or vendor is notified, and its participation in the investigation is obtained as necessary to identify the deficiency, correct it, and prevent its recurrence. The data presented in Appendix I indicates that IP's action on 50.55(e) items, taken as a whole, has been prompt, responsive, and effective in achieving resolutions.

2. **Evaluations and Progress Reports**

IP conducts an evaluation of each potentially reportable deficiency to determine whether the deficiency, if it were to have remained uncorrected, could have adversely affected the safety of operations of CPS. Regardless of the outcome of these evaluations, IP considers each potentially reportable deficiency to be a condition adverse to quality for which corrective action must be taken. Therefore, it is IP's practice to send the NRC a series of interim progress reports on the evaluations and IP's corrective action. The final report is sent to the NRC when IP considers the investigation completed and the subject closed. IP's practices in addressing 10 CFR Section 50.55(e) deficiencies reflect a continuing effort to ensure that corrective actions are taken for the potentially reportable deficiencies and that the NRC is informed during the course of IP's investigation.

3. **Types of Deficiencies**

The 68 potential deficiencies summarized in Appendix I can be separated into two categories: (1) a deficiency in the program or process, such as procedures, specifications, or instructions; and (2) a deficiency in the hardware, i.e., the actual installed equipment. The 68 potential deficiencies can be further separated by organization responsible for production of the work item, as shown in Table VII-1.

IP's actions in each organizational area of potential deficiencies can be summarized as follows:

a. <u>Constructor Program</u>

The constructor, through his procedures and instructions, provides the program for constructing the plant. When a procedure is vague or misunderstood, it can be ineffective in ensuring the quality of safety-related activities. For each of the potentially reportable deficiencies in this category, the relevant procedures and instructions were corrected or clarified to ensure that the procedures clearly specified the applicable requirements. As necessary, personnel were retrained in the revised procedures and instructions.

b. <u>Designer Program</u>

The designer also has procedures and instructions to be followed by employees when performing calculations in accordance with appropriate codes, standards, and industry recommended practices. Also, guidelines and drawings are issued by the designer to the constructor to ensure that the work is performed correctly to design requirements, which may be changed as construction progresses. Control of these changes has sometimes been insufficient to keep up with construction. In response to the potentially reportable deficiencies, improvements were made to clarify instructions and design documents for the identified concerns.

c. <u>Vendor Program</u>

In some cases, vendor's or supplier's procedures, drawings, or processes were not sufficient to describe fully the manufacture or assembly of their product. Improper documentation, material certifications, and design control are some examples of reportable deficiencies that have been discovered in this category. In response to the potentially reportable deficiencies, changes were made to the programs to correct the situation and prevent it from recurring.

d. **Constructor Hardware**

At times, the constructor has performed actions which did not comply with procedures. These actions subsequently have been reflected as deficiencies in workmanship or materials. These hardware-oriented deficiencies require repair, rework, or modification to correct the deficiency. In some cases, an engineering evaluation was made to determine the appropriate corrective action. Where workmanship was questionable, relevant procedures were revised to preclude recurrence of the deficiencies and personnel were retrained and recertified. Also, increased surveillances and inspections were performed in the areas subject to the deficiencies.

e. **Designer Hardware**

In cases where the designer may have caused an actual hardware deficiency, the affected design personnel have been retrained so that the appropriate design criteria are clearly understood. In the one reportable deficiency out of the four in this category, design documents supplied to the equipment fabricator did not contain consistent and accurate specification requirements. A follow-up analysis was performed that allowed the use of the pipe as installed, and necessary modifications were made to a penetration sleeve and component supports. Similar subsystems were reviewed and analyzed to ensure compliance with correct design requirements.

f. **Vendor Hardware**

When a deficiency in supplied equipment was discovered, the product was removed and replaced with an acceptable product, or it was repaired, inspected, and tested to ensure its acceptability. Where appropriate, visits to vendors' shops were made to investigate the root cause of the deficiency. Recommendations were made to the manufacturer or supplier to prevent the deficiency from recurring.

Increased inspections of similar items received at CPS also were performed to provide further assurance that a recurrence of this type of deficiency is unlikely.

4. **Other Actions Taken**

In addition to the corrective actions generally described above for each major class of 10 CFR Section 50.55(e) items, IP has undertaken field verifications and reinspections where 10 CFR Section 50.55(e) items have had a potential for hardware quality impact. Appendix I provides a summary of the major field verification and reinspection actions that IP has taken in response to 10 CFR Section 50.55(e) items of this kind and shows that the corrective actions taken have been effective in providing additional assurance of CPS hardware quality.

5. **Conclusion**

In summary, whenever a potentially reportable deficiency in the program or hardware of the constructor, designer, or vendor has been discovered, IP has promptly notified the NRC and initiated an investigation. The investigations have determined the extent of the deficiency and its root cause, the corrective action for the deficiency, and the action necessary to preclude a recurrence of the deficiency. IP also has kept the NRC informed during the course of the investigations, and its corrective actions have been effective. Finally, where 10 CFR Section 50.55(e) deficiencies have had a potential to impact hardware quality directly, IP has conducted field verifications and reinspections that have been effective in assuring CPS hardware quality. IP's practices have assured that potential deficiencies discovered in design and construction of CPS will be identified, reported, and corrected in accordance with 10 CFR Section 50.55(e) requirements.

C. 10 CFR PART 21 REPORTING

IP has established a procedure to define the CPS methodology for the referral, internal notification, evaluation, and reporting of defects and noncompliances in accordance with 10 CFR Part 21. This procedure establishes a controlled process for: (1) identification and referral of potentially reportable defects or noncompliances, (2) preliminary assessment, (3) evaluation, and (4) notification to the NRC.

Once a potential defect or noncompliance is designated for evaluation, the person selected by the Supervisor - Quality Systems to chair the investigation must prepare a formal, sequential plan for the investigation. This plan must detail the corrective action taken or to be taken (both remedial and generic) and include a schedule, with accountability assignments for performing scheduled tasks, and a tracking and reporting system to ensure that work is progressing in a timely manner. An analysis of the adverse condition must be performed to determine the root cause and generic corrective action. This plan is reviewed and concurred with by appropriate management personnel as defined by the Director - Quality Systems and Audits. The plan is submitted to the Director - Quality Systems and Audits for approval, in keeping with the time constraints imposed by the severity level of the potential defect or noncompliance.

Open 10 CFR Part 21 reports of defects and noncompliances are tracked by the Supervisor - Quality Systems. A status report is maintained and updated bi-weekly. After completion of all required actions to correct a 10 CFR Part 21 defect or noncompliance and to prevent recurrence, IP QA verifies these activities. After adequate completion of all corrective action items and QA verification activities, the 10 CFR Part 21 report is considered ready to close.

The report identifies the supplier of the basic component, dates, and other pertinent information pursuant to 10 Part CFR 21. Also included are the following: corrective action which has been, is being, or will be taken; the name of the individual or organization responsible for the action; the length of time that has been or will be taken to complete the action; and any advice (related to the defect or failure to comply) about the facility, activity, or basic component that has been, is being, or will be given to purchasers or other licensees.

The 10 CFR Part 21 reports considered ready to close are presented to the NRC during routine, onsite inspections for review and evaluation of corrective action taken. With the NRC's concurrence, the 10 CFR Part 21 report is closed. In the event that the NRC does not consider the corrective action taken to be adequate or complete, additional action is taken as directed by IP management or the Manager - QA.

Appendix J identifies each potentially reportable condition pursuant to 10 CFR Part 21, the action which was taken to investigate or evaluate the condition, and the corrective action for the condition. As may be observed from Appendix J, the specifics of IP's response have been structured to address the condition in question. In addition, some general conclusions can be drawn regarding the nature of IP's response. For example:

- When informed by a vendor that there may be some defects in a type of product which the vendor supplies, IP has conducted investigations to determine whether the product was actually used at CPS. In several cases, IP was able to resolve the potentially reportable condition by determining that the defective product was not supplied for use at CPS. In several other cases where the defective product was supplied to CPS, IP was able to resolve the potentially reportable condition by inspecting individual items and determining that none of them contained the defect.

- When a potentially defective product has been identified at CPS, IP has conducted evaluations to determine whether the defective product would present any safety hazard at CPS. In several cases, IP has been able to determine that the defect was not reportable by showing that the defective product does not pose any safety hazard at CPS. These determinations have been predicated on various factors, including findings that the product was not safety-related, that the defect did not affect the safety-related function of the product at CPS, or that failure of the product would not pose any undue risk to the health and safety of the public.

- In those cases in which it was determined that the defective product was supplied to CPS and could pose a safety hazard, IP generally took the following actions: (1) inspections or other investigations were conducted to identify the locations of the defective product within the plant and (2) corrective action for the defects was initiated. In general, corrective action consisted of either returning the defective product to the vendor for repair or replacement or having IP, its contractors, or the vendor repair the defective product on site.

In summary, whenever IP has become aware of the possible existence of a condition at CPS that is potentially reportable under 10 CFR Part 21: (1) IP has conducted an investigation to determine whether the condition exists at CPS; (2) if the condition does exist, IP has conducted evaluations to determine whether the condition presents a safety hazard; and (3) if the condition does pose a hazard, IP has repaired or replaced the defective product. In this manner, IP has provided reasonable assurance that identified safety defects in contractors' and vendors' products for CPS will not go uncorrected.

D. RESPONSES TO NUCLEAR REGULATORY COMMISSION INSPECTIONS

The NRC Office of Inspection and Enforcement (IE) is responsible for the IE Program.

The IE Program is administered through NRC IE inspections. During these IE inspections, the NRC identifies conditions that require follow-up activities. Following these inspections, the NRC issues an IE report identifying each item or condition that was of concern to the NRC. Items are classified as being a noncompliance, a deviation, unresolved, or open. Certain statements by the NRC, if not classified in one of the categories listed above, also may be labeled as a concern by IP management and are subject to further follow-up activities. Accountability for these items is achieved by adding a sequential number to the IE report number.

IP maintains a continuous program to promptly identify, provide corrective action for, resolve, and close all NRC IE items. IP and the NRC correspond regularly during the process of closing each item.

As of December 3, 1984, the NRC had identified 131 items of noncompliance or deviations for CPS. A complete summary, including the current status, of all noncompliances and corrective action is provided in Appendix K.

As shown in Appendix K, IP has addressed or is addressing each noncompliance, including those that remain open. The progress being made to resolve these items is being or will be tracked by the IP tracking program until satisfactory resolution has been obtained (corrective action completed) and NRC concurrence is received for the closure of these items.

IP also receives bulletins, circulars, and information notices from the NRC IE office which provide information on events that may have generic implications. Each of these documents is based on events reported by other licensees, NRC inspectors, or others. These documents are received by IP's Nuclear Station Engineering Department and then assigned to the responsible department for appropriate action. Investigations and evaluations are performed to assess the impact of the issue on CPS. After these assessments have been completed and documented, IP then reports back to the NRC on actions taken or to be taken and provides any additional information that the NRC requires for closure. The status of these documents is shown on subsequent IE reports and tracked by IP's tracking program until satisfactory agreement between IP and the NRC has been reached for closure of each item.

A recent example is IE Bulletin 84-02, "Failures of General Electric Type HFA Relays in Class 1E Safety Systems," which was issued due to deficiencies identified at the Duane Arnold, Pilgrim, and Hatch nuclear power plants. As a method of assessing the applicability to CPS, IP verified the location of all HFA relays manufactured by GE used at CPS. In all, 528 HFA relays were inspected and 108 relays in safety-related applications were found to be of the same type which failed at other nuclear plants. IP has taken measures to replace these relays with the improved GE Century Series HFA relays prior to the initial fuel load date. Additionally, IP verified that existing procedures ensure that all safety-related spare or replacement parts are identified and controlled, thus preventing the replacement of safety-related relays with unacceptable models.

E. THIRD-PARTY AUDITS

Third-party audits of CPS construction quality-related activities have been conducted by the Joint Utility Management Audit (JUMA) Program, the American Society of Mechanical Engineers (ASME), the consulting firm of Lapp-Rice-Staker (LRS), and the Institute of Nuclear Power Operations (INPO). Each of these audits has resulted in recommendations for improvements and corrective actions to quality-related activities. In turn, IP responded by implementing appropriate improvements and corrective actions. Appendix L provides a more detailed discussion of the major third-party recommendations and the corresponding specific IP improvements and corrective actions. This discussion shows that third-party audits have proved to be a valuable tool for evaluating and improving the effectiveness of quality-related activities and for early identification of potential problem areas.

F. EMPLOYEE QUALITY CONCERNS

IP has revised its policy statement on QA to reinforce management's commitment to quality and to emphasize to project personnel the role and importance of quality in construction activities. Among other things, the revised policy statement admonishes against intimidation of, or interference with, personnel performing QA functions and makes such behavior subject to disciplinary action.

IP has taken steps to provide multiple avenues for individuals to report to management any quality-related concerns or incidents of inspector intimidation. These avenues include:

- The Executive Vice President of IP has implemented a quality report system which provides a means for any employee to inform IP management of quality deficiencies or concerns which he feels are not being adequately addressed. Each concern is investigated, and the results of the investigation are reported to the employee, or, in the case of anonymous concerns, posted prominently about the site.

- The Vice President of IP has implemented a quality concern telephone hotline. All messages received are investigated by the IP Manager of QA and the results are reported to the Vice President.

- The SafeTeam project has been established to provide opportunities for all onsite personnel to report nuclear safety or other construction-related concerns to IP management. These opportunities are:

  - Periodically, interviews are scheduled with QA, QC, and other employees involved in the inspection or testing of safety-related systems at CPS in which employees may express any concerns.

  - Exit debriefings are conducted for all employees. An opportunity for an interview is provided to elicit any concerns any employee may have.

  - One-on-one interviews with each terminated IP QA and BA Q&TS employee are held prior to the employee's departure.

  - Any onsite employee with a concern can arrange for an interview any time.

  - SafeTeam concern report forms are available at numerous locations throughout the plant. These forms may be used by employees to describe concerns in writing. They also list Illinois and nationwide toll-free telephone numbers which may be used to report concerns.

  The SafeTeam program is voluntary, and the identity of participating individuals is protected. Each concern is investigated and the results of the investigation are reported to the employee raising the concern and to IP management.

In addition to these avenues, any employee may raise quality concerns directly with the NRC.

The current status of the IP programs for reporting of concerns is summarized on Table VII-2. The SafeTeam program has taken additional actions, including increasing personnel from 5 to 20 and training of personnel in interview techniques, to eliminate the backlog of incomplete investigations, existing as of October 31, 1984, by March of 1985. The concerns received to date fall into two general categories:

- <u>Quality Concerns</u>
  Includes concerns related to QA Program, inspection activities, and program documentation. Many concerns deal with specific events or occurrences. In many cases, these concerns are combined during the investigation process. Subsequent corrective action often has resulted in clarification of the QA Program. In conjunction with the broad range of corrective actions taken throughout the course of CPS construction as part of ongoing QA activities, these specific classifications have supplemented the effectiveness of the overall QA Program.

- <u>Non-Quality Concerns</u>
  These normally fall into the categories of management, personnel safety, and industrial safety. As a result of investigations conducted for this type of concern, management becomes aware of personnel problems associated with management interfaces and industrial safety. Actions are taken, as appropriate, to correct or respond to the particular concern. In certain instances, personnel safety problems have been identified, and appropriate corrective action has been taken.

One concern of particular significance brought to the attention of management through the hotline involved potential intimidation of inspection personnel. An individual was discharged; the stated basis was, "Refusing to follow directions, insubordination." When the individual was released he notified the IP QA hotline, stating that he felt he was inappropriately fired because he had raised specific quality questions. As a result of additional interviews by an independent investigator, it was determined that the individual who was discharged had been given inappropriate direction with respect to initiation of NCRs. The investigation indicated that some QC supervisors were pre-screening nonconformances identified by inspectors prior to issuance.

As a result of the investigation, the NCR procedure was revised to clarify initiation of NCRs. The individual was re-hired, and the QC supervisors involved were given time off without pay. To prevent recurrence, training was conducted for QC personnel on the practices that gave rise to the concern.

In addition to the SafeTeam project, quality reports, and hotline reporting systems, IP has established an open door policy to encourage personnel to identify concerns to management. As a result, another significant concern, also involving intimidation of a QC inspector, was brought to the attention of management. An inspector was encouraged to invalidate an NCR to eliminate a reference to unauthorized work. The inspector brought this situation to the attention of management and an investigation substantiated the inspector's concern. As a result of the investigation, the hardware was corrected. BA Quality Control and Resident Engineering personnel were retrained regarding processing of NCRs. Resident Engineering job qualifications were reviewed and four individuals, two from the Quality Control Department and two from the Resident Engineering Department, were terminated.

Aside from the foregoing, no significant safety concerns related to quality have warranted a significant quality program improvement to resolve the concern. No NCRs have been initiated as a result of concerns received within these programs. Finally, no concerns were found to be potentially reportable under 10 CFR Section 50.55(e).

The IP programs for handling concerns have been effective in encouraging employees to express concerns and in giving visibility to IP's commitment to quality. Given SafeTeam's actions to reduce its investigation backlog, these programs are expected to provide a continuing complement to IP's programs for assuring the quality of CPS construction.

G. CONFIGURATION CONTROL

A configuration management program was implemented in February 1983 to provide additional assurance that the plant conforms to design and regulatory requirements. This section discusses the major elements of the program. In addition, this section discusses the more specific programs in place to address "as-constructed" ASME piping and IE Bulletin 79-14.

Configuration management is an administrative process developed to ensure that plant items conform to the approved design and that their physical and functional characteristics are properly reflected in technical, procedural, and training documents. Plant configuration must meet regulatory requirements and commitments by assuring that:

- Plant configuration changes are made only in accordance with approved change documents.
- Design documents are accurate with respect to plant configuration.
- Procedures are valid with respect to plant configuration and design documents.
- Licensing and other commitments are achieved and maintained.
- Adequate training is conducted for appropriate personnel in aspects of configuration management.

The configuration management program is broken down into four elements:

- Configuration control - regulates changes to hardware and software
- Configuration status accounting - records, reports, and tracks changes
- Configuration verification - assures that changes are properly implemented and documented

- Configuration management training - instructs regarding configuration management concepts and programs

The supporting programs for each of the above four elements are discussed in the following subsections.

1. **Configuration Control**

   This element of the program addresses control of changes to configuration items and associated configuration documents. Configuration items are those, including computer systems and components, which make up the nuclear generating unit. Configuration documents are specifically designated drawings, procedures, specifications, manuals, records, indices, and other documents which identify and define plant items or which are essential to configuration control. Programs currently in effect in this area are:

   - Identification of configuration items and documents by the system Responsible Engineer when the system or subsystem is released to plant staff for operation

   - Design change control prior to system release to plant staff

   - Plant modification control subsequent to system release to plant staff

   - Design change control committee and subcommittees to approve design changes during the construction and startup phases

   - IP design drawing custody following system design completion

   - Configuration management process reviews to investigate the adequacy of in-place programs as they relate to configuration control, such as system turnover from construction to startup, procurement, maintenance drawing control, supplier data, commitment management, records and procedures, and training

- Vendor communication program to review changes and update the adequacy of vendor manuals and documents

- Design document hierarchy program to define the documentation required for design completion, design change incorporation, construction support, startup, licensing, operation, and maintenance, and to identify documentation that reconciles the actual configuration to the design documentation

2. <u>Configuration Status Accounting</u>

This element ensures that changes to configuration items and documentation are recorded and reported to cognizant management and that an accurate status log is maintained until all required action has been completed and verified. Programs currently in effect in this area are:

- Interdepartmental procedure verification to ensure that design changes are reflected in changes to the FSAR and technical specifications, when required

- Plant modification and design change tracking programs

- Design change implementation status report system to track all design change control committee approved changes

3. <u>Configuration Verification</u>

This element addresses monitoring of configuration items and documents in conjunction and coordination with QA to verify the status and accuracy of documentation. Programs currently in effect in this area are:

- Development of configuration status drawings to accurately reflect the plant items on an upper tier drawing which are being jurisdictionally transferred from construction to IP startup. This effort is 25% complete, and it will be completed prior to fuel load.

- Completion of a master equipment list to provide a data base for equipment and parts information to provide data for generation of automated maintenance planning documents and derived data documents, such as instrument lists and valve lists. This effort is currently 20% complete, and it will be completed for safety-related items prior to full power operation.

4. <u>Configuration Management Training</u>

Training is provided which enhances personnel awareness and competency. This training ensures that unauthorized changes are not made, that deviations are recognized and reported, that processes are properly carried out, including obtaining proper authorization and documenting completion, and that effects of changes to documents are evaluated and accommodated. Training was conducted for all responsible engineers and their supervisors in November 1984. Ongoing sitewide training has begun. Four classes have been conducted since November 1984. Programs currently in effect in this area are:

- Update and maintenance of training department lesson plans as design changes occur

- Definition of duties and training programs for the NSED Responsible Engineer to carry out the elements of configuration management

In addition to IP's overall configuration management program, IP has specific programs in place to address two particular areas related to the as-constructed condition of piping: (1) the ASME N-certificate program, and (2) the 79-14 walkdown program.

The IP N-certificate program includes specific program elements that require review of as-constructed documentation and reconciliation of as-constructed conditions with design.

Under the requirements of the N-certificate program, IP engineers review the as-constructed documents provided by the piping system installer against the design documents approved by IP. Any discrepancies are identified and resolved. Once agreement has been reached on the as-constructed conditions, this documentation is compared to the piping system stress analysis. This comparison is intended to assure that the as-constructed condition is in agreement with the design calculations. If discrepancies are noted, they are identified and resolved.

IP has applied to the ASME for an N-certificate. The ASME surveyed the IP program during the week of January 14, 1985. On January 16, 1985, the ASME survey team informed IP that they had completed the survey and that the team would recommend to the Subcommittee on Nuclear Accreditation that an N-certificate be granted. Once a certificate is issued, it will probably take two months for IP to complete the documentation and stamping for the first piping system.

In addition to the reconciliation described above, which applies to all ASME Section III piping to be stamped by IP, IP also is committed to meeting the requirements of NRC IE Bulletin 79-14. In this bulletin, the NRC requested licensees and construction permit holders to inspect the as-built condition of computer-analyzed safety-related piping systems to ensure that the as-built condition conforms with the design bases used in the seismic analyses. IP developed a 79-14 walkdown program in response to this bulletin. The 79-14 walkdown program is in addition to the inspections normally performed by quality control personnel. This program began in April 1981 and is scheduled to be completed late 1985.

Under the 79-14 walkdown program, for S&L- and GE-designed systems, the piping contractor is responsible for obtaining as-built dimensions, component attachment orientation information, and any other information necessary to confirm the validity of safety-related piping system analyses. This information (as-built package) is provided to S&L or GE for evaluation. The as-built package information is compared with the design stress analyses, and out of tolerance differences are reconciled. Any changes required to bring the system within ASME code stress limits are issued as design changes. IP conducts audits and technical reviews of these activities to ensure proper implementation. As of December 1, 1984, approximately 12% of the piping subsystems have required reanalysis due to discrepancies in their as-built condition. To date, this has resulted in the revision of 11 supports and addition of 8 new supports. A piping system will be reanalyzed whenever the technical design basis has not been satisfied.

The 79-14 walkdown programs for GE and Reactor Controls piping are similar to the program described above, although their scope of supply is much smaller.

The 79-14 walkdown program provides additional assurance that the CPS as-built condition of piping systems meets applicable requirements. It provides checks independent of the original installation and inspection activities to assure the quality of the piping system installation.

In summary, through its overall configuration management plan, IP has established an effective means to assure that the as-constructed conditions in the plant conform to the design. This overall program is supplemented by the specific N-certificate programs and 79-14 walkdown programs which assure that as-constructed piping conforms to the design. These programs, together with the composite of programs described throughout this report, provide adequate confidence that CPS structures, systems, and components will perform their intended functions during operation.

H. MANAGEMENT CORRECTIVE ACTION REQUEST PROGRAM

IP has established a management corrective action request (MCAR) program for reporting significant adverse conditions to management for attention and action. The IP Manager of QA will issue an MCAR when adverse conditions require immediate corrective action or evaluation or when previous corrective action is inadequate or delinquent. The organization responsible for corrective action must promptly provide a corrective action plan (CAP) to the IP Manager of QA. This CAP must include a proposed plan for resolution of the condition, an identification of its root cause, and remedial action and program improvements to prevent recurrence. The closure of an MCAR occurs only after IP QA verifies the completion of all corrective actions.

Table VII-3 shows the current status of MCARs that have not had major quality program impact. The following discussion summarizes the nature of those MCARs that have had major quality impact and the corrective action taken for each:

1. **MCAR-01**

   IP QA issued MCAR-01 to BA management documenting significant adverse conditions in the BA storage, maintenance, and housekeeping programs. Adverse conditions were identified and documented by IP QA in surveillance reports, BA surveillance reports, and general plant tours. As a result of the actions taken to correct the identified conditions, improvements were made in BA's storage, maintenance, and housekeeping program through:

   - Improved program procedures which clarified responsibilities and program direction

   - Increased inventory and equipment surveys to ensure that storage areas are maintained and controlled properly, i.e., signs posted, areas segregated and clearly marked

   - Formal training, with emphasis on storage and maintenance of equipment during construction

   - Upgraded housekeeping practices, by assigning individuals responsible for housekeeping within specific areas in the plant, posting signs, and increasing general cleanliness

   Formal closure of MCAR-01 was based on the following:

   - BA developed and implemented a corrective action program capable of identifying and correcting deficiencies such as those documented in MCAR-01.

- Regularly scheduled surveillances by IP QA have shown adequate implementation and continued improvement in the BA storage, maintenance, and housekeeping programs.

2. <u>MCAR-03</u>

IP QA issued MCAR-03 to BA as a result of a review of the training activities at CPS. It was determined that BA lacked a documented comprehensive training program for project personnel. This indicated that an adverse condition existed which required immediate corrective action and the attention of management. The concerns were primarily in electrical training. Actions taken to correct the identified deficiencies and improve the program were as follows (other actions to improve training are discussed in section IV.B):

- Upgrade existing training, establish additional training, and develop 5 new training manuals covering QA, QC, technical services, engineering, and construction

- Develop new training program, with emphasis on using training to augment interdepartmental training sessions

- Revise training philosophy to require documented training sessions for all site employees

Formal closure of MCAR-03 was based on the following:

- The corrective actions outlined in BA's response to the adverse condition were completed and verified by IP QA surveillance.

- The BA training manuals were reviewed and approved by IP QA.

- Implementation of the training program is being verified by IP QA surveillance as training is scheduled and performed according to the needs of the project.

3. MCAR-10

IP QA issued MCAR-10 as a result of a request by project management for IP QA to perform a review of all safety-related, augmented class D (radioactive waste), and fire protection records vaulted as of April 13, 1984, that documented grout placements. This review of grout placement records identified the following problems:

- Necessary documentation required by contract specification was not always available.

- Specifications and procedures contained conflicting requirements.

- The vaulted data packages did not contain necessary information to substantiate product quality.

As a result of the identified problems, changes are being made to the program for grout placement in the following areas:

- A responsible engineer selected by the architect-engineer will be requested to develop a list of minimum criteria required for acceptance.

- After review by the responsible engineer, the remaining deficient grout documentation packages will be evaluated analytically for acceptance.

- All acceptable placements in this phase will require a signed technical justification.

The corrective action associated with MCAR-10 is being implemented at this time. MCAR-10 will remain open pending verification of implementation.

4. Conclusion

Since its beginning, the MCAR Program has been an essential element of the overall effectiveness of the QA Program at CPS. The MCAR Program has provided management a tool by which corrective action can be promptly effected. Management support of the MCAR Program has made significant contribution to the overall quality program at CPS.

Table VII-1
Potentially Reportable Deficiencies Under 10 CFR Section 50.55(e)

	Types of Deficiencies	
	Program	Hardware
Constructor	14 (7)*	17 (6)
Designer	8 (2)	4. (1)
Vendor or supplier of services	7 (5)	18 (9)
Total	**29 (14)**	**39 (16)**

* Numbers in parentheses indicate number determined to be reportable under 10 CFR Section 50.55(e).

Table VII-2
Current Status of IP Programs for Reporting Concerns

System	System Initiation Date	Quality Concerns	Non-Quality Concerns	Total Concerns	Investigations Completed	Quality Concerns Substantiated	Non-Quality Concerns Substantiated
Quality report	2/82	74	47	121	121	18 of 74	14 of 47
IP QA hotline	11/83	11	9	20	16	2 of 7	5 of 9
SafeTeam	6/84	923	277	1,200	456	65 of 367	45 of 89

This table reflects the status of concerns as of January 25, 1985.

Table VII-3
Current Status of Management Corrective Action Requests
(With No Major Quality Program Impact)

MCAR No.	Subject of MCAR	Corrective Actions Taken	Status
02	Structural steel erection and inspection	Two 10 CFR Section 50.55(e) items resulted from this MCAR, items 82-04 and 82-06. (See Appendix I of this report for additional information.)	Closed
04	Control of temporary and permanent attachments	Appropriate procedures were revised and a new weld control form was generated to control temporary and permanent attachments.	Closed
05	Structural concrete	Procedures were revised to prevent recurrence. Additional training was completed and a review was conducted of concrete travelers.	Closed
06	Quality documentation	Boxes of documents were found in an uncontrolled area. All buildings were inventoried. Documents were placed in controlled storage areas.	Closed
07	Material traceability	A 10 CFR Section 50.55(e) item was written on this issue item 84-02. (See Appendix I of this report for additional information.)	Closed
08	Electrical hanger drawing deficiencies	This item remains open. Actions are being taken to correct the identified condition by review of drawings, training of personnel, establishment of appropriate accept/reject criteria, and revisions to procedures.	Open
09	Delinquent audit and surveillance findings	To reduce the number of delinquent IP QA audit and surveillance findings, bi-weekly meetings were being held. Personnel levels and training have been increased and revisions made to appropriate procedures.	Closed
11	Nonconformance reporting	Actions are being taken to provide appropriate correction to ensure that nonconformances are reported using the correct mechanisms and that the reports provide appropriate information.	Open

VIII. CONCLUSIONS

The following programs and actions provide reasonable assurance that structures, systems, and components at CPS will satisfactorily perform their safety-related functions during operation:

- Illinois Power Company has established its QA Program in accordance with 10 CFR Part 50, Appendix B, and that program is functioning effectively as intended.

- As a result of certain conditions encountered during 1981 and 1982, IP and BA stopped work in a number of areas and implemented recovery programs to correct those conditions. CPS project audits and surveillances verified the effective implementation of the recovery programs.

- IP implemented extensive programmatic improvements. Experienced managers were hired for key management positions, project QA organizations were reorganized to increase the effectiveness of QA activities, corrective action programs were upgraded, and enhanced controls over construction and inspection activities were instituted.

- To verify the quality of CPS construction, IP implemented an Overinspection Program for all safety-related, augmented class D (radioactive waste), and fire protection activities related to the stop work actions. The primary confirmation of overall plant safety was provided by engineering evaluations of the nonconforming conditions discovered by the Overinspection Program. Even if it were assumed that these nonconforming conditions had remained undetected by the Overinspection Program, none would have resulted in the loss of capability of a structure, system, or component to perform its intended safety functions. On a secondary level of analysis, the conformance rate for the program is generally high for both old and new work. The significantly higher overall rate for new work compared to old work indicates that the recovery programs and programmatic improvements have been effective. In certain areas where favorable results are most apparent, relaxation or elimination of selected program elements may be appropriate. The results of the Overinspection Program confirm that the quality of CPS construction is acceptable.

- To verify the adequacy of CPS construction QA records, IP implemented a Record Verification Program for all completed BA construction work packages and purchase order documentation packages for safety-related, augmented class D (radioactive waste), and fire protection activities. The primary confirmation of overall plant quality and safety was provided by engineering evaluations of the nonconforming conditions identified as a result of these record reviews. Even if it were assumed that these nonconforming conditions had remained undetected by the Record Verification Program, none would have resulted in a loss of capability of a structure, system, or component to perform its intended safety function. On a second level of analysis, the rate of record deficiencies discovered in record reviews is generally low for both old and new work. The significantly lower rate for new work compared to old work indicates that the recovery programs and programmatic improvements have been effective. No trends have been indicated in record deficiencies or their resolutions that might have adverse implications for hardware quality. For certain areas in which favorable results are most apparent, relaxation or elimination of selected program elements may be appropriate. The Record Verification Program has been effectively implemented, and the results of that program confirm the adequacy of CPS construction QA records.

- Throughout the course of CPS construction, IP has maintained or initiated other general assessment and corrective action activities which operate in conjunction with the normal QA Program, the recovery programs, programmatic improvements, Overinspection Program, and Record Verification Program to buttress and complement the CPS

Quality Assurance Program. These activities have been beneficial in ensuring compliance with regulatory requirements and in providing management with additional effective tools to ensure CPS construction quality.

Taken together, the composite of quality-related programs and actions described and evaluated in this report provide high confidence in the quality of CPS construction.

Appendices

Results of Quality Programs for Construction of Clinton Power Station

NRC Docket No. 50-461

ILLINOIS POWER

February 1985

8135-2 01-85—322

RESULTS OF QUALITY PROGRAMS
FOR CONSTRUCTION OF
CLINTON POWER STATION

APPENDICES

NRC DOCKET NO. 50-461

ILLINOIS POWER COMPANY
FEBRUARY 1985

CONTENTS

APPENDIX A

TYPES OF INSPECTIONS PERFORMED AT THE CLINTON POWER STATION

This appendix identifies the types of safety-related inspections performed during construction of the Clinton Power Station (CPS). For each of the various types of items and installation activities at CPS, a list of attributes inspected pursuant to the CPS Quality Assurance Program is presented below. As this list shows, the inspection program at CPS is comprehensive, both in terms of the scope of items and activities inspected and in terms of the extent of attributes inspected.

Concrete Expansion Anchor

1. Location
2. Anchor spacing
3. Anchor diameter, length, and type
4. Spacing to edge of concrete, sleeves, and embed steel
5. Spacing to other anchors
6. Cleanliness of holes
7. Depth of holes
8. Perpendicularity of holes
9. Anchor diameter, length, and type
10. Concrete repairs
11. Anchor embedment
12. Spacing to edge of plate
13. Bearing of nut and washers
14. Installation torque
15. Nut engagement
16. Bearing of plate and shims

Mechanical Equipment

1. Identification
2. Cleanliness
3. Orientation and location
4. Physical damage
5. Grout and dry pack
6. Configuration
7. Foundation bolt diameter and number
8. Foundation bolt and nut material
9. Foundation bolt torque
10. Protective caps and devices
11. Temporary attachments
12. Code data plate
13. Shimming
14. Alignment

Structural and Auxiliary Steel

1. Size of beam and column
2. Connection detail
3. Location of reinforcement or stiffener
4. Size and type of stiffener or reinforcement
5. Fit of connections
6. Copes
7. Re-entrant corners
8. Cuts
9. Interferences
10. Flush flange cuts
11. Bolt locations
12. Bolt numbers, diameter, length
13. Bolt type: bolt head orientation
14. Washers: numbers, size, location
15. Nut type
16. Thread engagement
17. Jam nuts
18. Fastener contact
19. Physical damage
20. Bolt tightness
21. Member size auxiliary steel and plate stiffeners
22. Copes: auxiliary steel
23. Connection to in-place structural steel
24. Auxiliary steel connection
25. Nuts: auxiliary steel
26. Hole size
27. Filler plate size
28. Connection plate and clip angle size
29. Faying surfaces free of foreign material
30. Faying surfaces gap
31. Expansion lengths

Piping Component Supports

Phase I

1. Location and orientation of attachment to structure
2. Concrete expansion anchors (see separate category)
3. Material traceability
4. Material size and type
5. Damage
6. Interference
7. Welding (see separate category)

Phase II

A. General - For All Support Types

1. Material traceability
2. Correct size and type of material
3. Orientation
4. Damage
5. Interference with other components

B. Pipe Clamp

1. Jam nuts and cotter pins installed
2. Spacers installed
3. Nuts and bolts tight and torqued
4. Clamp perpendicularity
5. Lock nuts tight

C. Hydraulic Snubber

1. Vent plug location
2. Reservoir fluid level
3. Pin-to-pin dimensions
4. Piston rod damage
5. Grease fittings
6. Jam nuts and cotter pins

D. <u>Variable Spring</u>

1. Cold and hot settings
2. Travel stops
3. Nuts and bolts tight
4. Locknuts

E. <u>Box Type</u>

Clearances

F. <u>Rod Hangers</u>

1. Thread engagement in fittings
2. Lock nuts

G. <u>Mechanical Snubber</u>

1. Pin-to-pin dimensions
2. Rod-end engagement
3. End bushing spacers
4. Grease fittings
5. Jam nuts
6. Interference and binding between snubber and clamp and bracket

H. <u>Sway Strut</u>

1. Pin-to-pin dimensions
2. Grease fittings
3. Jam nuts
4. Thread engagement
5. End bushing spacers
6. Binding between strut and clamp and bracket

I. <u>Constant Support and Counterpoise</u>

1. Travel and lock pin
2. Thread engagement in fittings
3. Rod size
4. Travel indicator settings

5. Load setting
6. Nuts and bolts tight

J. <u>Rise Clamp</u>

1. Correct size
2. Spacers installed
3. Nuts and bolts tight
4. Clearances

K. <u>U-Bolt</u>

1. Correct size
2. Clearances
3. Lock nuts installed

L. <u>Sliding Type Support</u>

1. Header size and type
2. Header length
3. Header contact
4. Graphite grease applied

<u>Phase III</u>

Same attributes as for Phase II <u>plus</u> the following:

1. Latest loads stamped on counterpoise spring supports
2. Latest hot and cold positions stamped on variable spring supports
3. Snubbers and variable spring supports set in cold position
4. Spring support travel stops removed
5. Snubbers stroked and set in cold position

Welding - Visual

A. **Physical Conditions/Prerequisites**

1. Identification
2. Internal cleanliness
3. Joint and heat-affected zone cleanliness
4. Welder certification

B. **Fit-up**

1. Backing ring placement and gap
2. Ultrasonic reference marks (in-service inspection joints)
3. End preps
4. Internal mismatch (pipe)
5. Root opening (open butt joints)
6. Alignment (fillet joints)
7. Joint configuration
8. Tack welding
9. Socket weld and slip-on flange gap

C. **In-Process**

1. Pre-heat temperature
2. Inert gas purge
3. Shielding gas: type and flow rate
4. Interpass temperature
5. Cup size
6. Essential variables: voltage, amperage, etc.
7. Filler metal type and size
8. Weave width
9. Weld position

D. Completed Welds

1. Cracks
2. Fusion
3. Surface preparation for nondestructive examination
4. Joint fill
5. Undercut
6. Member alignment
7. Cold lap
8. Spatter
9. Concavity and convexity
10. Temporary attachment removal
11. Arc strikes, flux, scale
12. Welder identification
13. Weld size, location, length, profile (fillet welds)
14. Porosity (AWS only)
15. Craters (AWS only)
16. Reinforcement
17. In-service inspection welds surface finish

Nondestructive Examination

A. **Radiography Welds**

1. Porosity
2. Cracks
3. Incomplete fusion
4. Inadequate penetration
5. Slag
6. Inclusions

B. **Magnetic Particle Examination Welds and Materials**

1. Cracks
2. Linear and rounded indications
3. Laminar indications

C. **Liquid Penetrant Examination - Welds and Materials**

1. Craters
2. Porosity
3. Linear or rounded indications

D. **Ultrasonic Examination - Materials**

1. Cracks
2. Lack of fusion
3. Incomplete penetration

E. **Ultrasonic Examination - Materials**

1. Thickness
2. Laminations

F. **Vacuum Box Examination - Welds**

Leakage

Concrete Placement

A. Sample Testing of Materials

1. Fly ash
2. Water
3. Cement
4. Admixtures
5. Aggregate
6. Cadweld splices: tensile, yield, ultimate strength
7. Reinforcing steel: bend, elongation, yield, tensile, ultimate strength

B. Preplacement

1. Formwork
2. Reinforcing: size, spacing, splices, support
3. Anchor bolts: location, size, projection
4. Embedments: location, size, support
5. Construction joints: location, waterstops

C. Placement

1. Cold and hot weather provisions
2. Mix design
3. Placement equipment
4. Placement technique
5. Consolidation technique
6. Embedded items
7. Concrete slump
8. Concrete temperature
9. Concrete air content
10. Method of curing
11. Bonding adhesive (final floor slab)

D. Post Placement

1. Compressive strength of specimens
2. Voids and honeycombing (after form removal)

Piping Systems Fabrication and Installation Walkdown

1. Flow indicators
2. Configuration
3. Material traceability
4. Flange bolts and gaskets
5. Damage
6. Interference
7. Protective seals and covers
8. Code data plates
9. Component tagging
10. Pipe bending

Soils and Earthwork

A. **Material**

1. Sieve analysis
2. Organic impurities
3. Fly ash
4. Cement
5. Water (for admixtures)
6. Particle size
7. Moisture content

B. **Placement**

1. Material type
2. Thickness of material
3. Density
4. Moisture content
5. Compressive strength

Conduit Attachment

1. Attachment type
2. Configuration
3. Defects and damage
4. Attachment location
5. Conduit strap, clamp size, type installation
6. Bolts and cap screws size, installation, type
7. Springnuts seated
8. Fastener torque, tightness
9. Spacer plates
10. Expansion anchor threaded rod
11. Physical separation
12. Maximum span of conduit

Electrical Cable Installation

1. Identification and labeling
2. Cable size, type, color
3. Sequence marker
4. Physical damage
5. Protection
6. Bend radius
7. Support
8. Segregation
9. Separation
10. Routing
11. Moisture seal
12. Cable cut length
13. Tray and conduit cleanliness
14. Ambient temperature
15. Approved lubricant
16. Pull tension
17. Resistance tests

Electrical Raceway Cable Tray

1. Tray identification and marking
2. Correct size and type
3. Tray configuration
4. Tray elevation
5. Hardware installation
6. Bolt torque
7. Gap plate and fillers installation
8. Grounding attachments and system
9. Physical damage
10. Material identification and traceability
11. Tray routing
12. Galvanized areas touched up

Electrical Raceway Conduit

1. Size and materials
2. Routing
3. Elevation
4. Bend radius
5. Identification, numbering, color coding
6. Grounding
7. Number of supports or attachments
8. Critical physical damage
9. Length of cantilevered conduit and conduit beyond last support
10. Locknuts and bushings and fittings
11. Flex length
12. Location
13. Coupling engagement
14. Electrical separation or segregation
15. Physical clearances

Conduit Support

1. Location
2. Configuration
3. Orientation
4. Elevation
5. Damage
6. Torque
7. Expansion anchors
8. Bolts and capscrews
9. Field located hangers

Electrical Raceway Supports and Cable Tray Hangers

1. Location: support and tray hanger
2. Configuration: support and tray hanger
3. Orientation: support and tray hanger
4. Orientation: longitudinal bracing
5. Attachment elevation: support and tray hanger
6. Elevation
7. Materials type and size
8. Material traceability
9. Damage and defects
10. Fastener torque and tightness
11. Primer of welds and damaged galvanized areas
12. Expansion anchor inspections

Cable Tray Attachments

1. Attachment type
2. Defects and damage
3. Bolts torque and tightness
4. Attachment location
5. Welding inspections
6. Primer on welds and damaged galvanized areas
7. Materials type and size
8. Material traceability
9. Attachment detail and configuration

HVAC Structural Bolting

A. **Bolt Hole Verification**

1. New holes
2. Enlarging holes
3. Hole width
4. Clearance, interference

B. **Bolting**

1. Material
2. Tightening

Electrical Equipment

1. Equipment identification
2. Part number
3. Location
4. Assembly
5. Mounting
6. Torquing
7. Internal component installation
8. In-plant storage
9. Grounding
10. Electrical test(s)
11. Part removal and replacement

Instrumentation Piping and Tubing, Valves, and Specialities

1. Valve installation
2. Flow indicators
3. Configuration and orientation
4. Slope of line
5. Material traceability
6. Interference
7. Damage
8. Hangers and supports (see separate category)
9. Component tagging and identification
10. Piping and tubing bends
11. Coating and insulation
12. Code stamping
13. Fittings tightness
14. Condensate reservoirs level
15. Valve/line class
16. Cleanliness
17. Welding (see separate category)
    a) Visual
    b) Nondestructive examination (as required)
18. Material, component sizes, types

HVAC Equipment Installation - Equipment Inspection

1. Identification
2. Orientation
3. Location and elevation
4. Structural bolting, other bolting
5. Welding (see separate category)

Cable Termination

1. Cable identification
2. Termination insulated
3. Correct lug size and type
4. Lug installation
5. Cable tested
6. Terminations tight
7. Cable support
8. Equipment covers
9. Minimum bend radius
10. Drain, ground, shield wire
11. Separation criteria
12. Crimp inspection
13. Flexible conduit
14. Ground wire
15. Cable type, size, color
16. Cable trained
17. Cables and conductors
18. Cable protection
19. Connections correct; torqued and tightened

Instrumentation Hangers and Supports

1. Orientations
2. Material dimensions, sizes, types
3. Material traceability
4. Location elevation
5. Galvanox touchup
6. Fastener torque and tightness
7. Tack welds
8. Clearances and tolerances
9. Welding (see separate category)

HVAC Hanger Installation

A. First Attachment Installation

1. Elevation, location, and dimension
2. Welds (see separate category)
3. Welds complete
4. Welds coated
5. Anchor bolts (see separate category)
6. Structural bolting

B. Hanger Installation

1. Dimensional configuration
2. Welds properly coated
3. Location, elevation, and orientation
4. Bolting
5. Identification
6. Damage

HVAC Duct and Accessories Installation

1. Identification
2. Bolts and other attachments
3. Stiffeners
4. Sealant
5. Gasketing
6. Lock joints
7. Penetrations
8. Elevations and locations
9. Size and configuration
10. Orientation
11. Mechanical operability
12. Damage

APPENDIX B
AUDIT SUMMARY REPORT

Table B-1 summarizes each of the Illinois Power Company (IP) Quality Assurance (QA) audits scheduled and performed during 1982, 1983, and 1984 of Baldwin Associates (BA) and IP organizations. Audit identification codes Q31 and Q38 are for BA and IP, respectively.

The data are current as of January 11, 1985. Where "Open" is noted in the corrective action (CA) columns, CA responses may have been received and evaluated; however, the CA had either not been completed or verified by QA.

TABLE B-1

Audit Summary Report

Audit ID	Organization	Dates of Audit	Areas/Activities Audited	Summary of Audit Results	Findings Issued	CA Taken	Date Finding Closed
Q31-82-1	- BA All departments	1/26-1/29/82	- Procurement - Raceway inspection - CA programs - QA Department activities - Measuring and Testing Equipment (M&TE) - Quality Control (QC) vendor surveillance	"QA Program... for most part, being adequately implemented." "Several areas where QA Program and implementing procedures are not closely followed." "QA Program elements audited effective in their intent." Several comments and recommendations made to improve various programs audited. Six findings issued.	1. Two BA QA procurement personnel were not certified to required level.	Appropriately qualified and certified personnel; records placed in file. Review of work was accomplished by certified personnel (no problems noted). BA QA procurement engineer verbally instructed on requirements.	4/28/83
					2. Discrepancies noted during vendor surveillance were not documented on appropriate forms.	Discrepancies properly documented; a log developed for tracking; and training conducted to prevent recurrence.	6/10/82
					3. Checklist of vendor procedures accepted versus specification requirements for submittal were not being maintained.	Requirement removed; adequate control and tracking available without the checklist or log.	8/31/82
					4. Calibration procedure revision numbers were not recorded on equipment calibration record cards.	Equipment calibration record cards updated to reflect revision numbers; procedure revised to incorporate requirement to record.	10/7/82

Audit Summary Report

Audit ID	Organization	Dates of Audit	Areas/Activities Audited	Summary of Audit Results	Findings Issued	CA Taken	Date Finding Closed
QSI-82-1	(Continued)				5. Nonconformance report (NCR) and deviation report (DR) system was not used for evaluation of validity of inspection/test results obtained with M&TE found out of calibration or tolerance.	Procedures revised to reflect proper use of forms other than NCR/DR to obtain evaluations.	10/25/82
					6. Internal audits not conducted within three specific civil/structural (C/S) areas within the year interval as required by procedures.	Finding in error; one audit conducted which covers the three areas. Better tracking system to ensure all areas covered implemented.	4/27/82
QSI-82-2	- BA All departments	11/15-11/18/82	- Criteria 1, 2, 3, 5, 6, and 14 - Startup and turnover	"Turnover Process inadequate and not being effectively implemented." Responsibilities are not clearly defined; training is not performed; design control changes are not included in exception lists; procedure adherence is not being forced; American Society of Mechanical Engineers (ASME) item turnovers do not meet ASME Code. Eight findings issued.	1. Training to BA turnover procedure not provided.	Training given to applicable personnel.	4/6/83
					2. Portions of ASME system turned over to IP without required hydros and N-5 report forms.	a. Systems turned back to BA. b. Procedures revised to include provisions for ASME hydros and N-5 report prior to turnover. c. Personnel trained to revised procedure. d. System hydros, N-5 reports, and subsequent turnover per turnover schedule.	1/3/83

Audit Summary Report

Audit ID	Organization	Dates of Audit	Areas/Activities Audited	Summary of Audit Results	Findings Issued	CA Taken	Date Finding Closed
Q31-82-2	(Continued)				3. No objective evidence that periodic reviews of safety tagging logs or tags in place accomplished.	Performed audits of all open tags; revised procedure to clarify means and periodicity of review.	4/27/83
					4. Safety tag log/requests not completed in accordance with procedure.	Logs/requests reviewed and corrected; training conducted for those involved.	4/27/83
					5. Procedures do not provide sufficient criteria for verification of QC involvement in turnover activities.	Procedures revised/rewritten to include provisions and criteria; training conducted.	4/29/83
					6. Procedures do not provide sufficient criteria for determining that important activities have been accomplished.	Procedures revised/rewritten to include provisions and criteria; training conducted.	4/6/83
					7. Three outstanding field engineering change notices (FECN) were not included on exception list for Turnover WZ-1. IP Startup (SU) not informed of two DRs.	Exception list corrected; training conducted.	4/6/83
					8. Correction/changes made to turnover package not in accordance with procedural requirements.	Correction/changes processed in accordance with procedure. Procedure revised and training conducted.	4/11/83

Audit Summary Report

Audit ID	Organization	Dates of Audit	Areas/Activities Audited	Summary of Audit Results	Findings Issued	CA Taken	Date Finding Closed
Q31-82-3	- BA All departments	12/13-12/21/82	- Criteria 3, 6, 14, and 17 - Control and incorporation of NCR/field change requests (FCR) into work packages - Design change inspection - Design change accountability and tracking after turnover - Design changes approved by Sargent & Lundy (S&L) incorporated in "as-builts" - Construction work request (CWR) design change control - Accountability of records in support of documentation turnover	BA records control was adequate and effectively implemented except for noted findings. Document and design control was adequate and effectively implemented except for FCRs and NCRs approved by S&L site personnel and later disapproved by S&L in Chicago. Ten findings were issued.	1. Work performed on a field deviation disposition request (FDDR) prior to final disposition from General Electric Company (GE) San Jose (not expedited disposition).	No CA required; procedurally allowed at time work performed. Inspection verified work correct.	2/21/83
					2a. Procedures do not address methods for controlling FCRs approved by S&L site personnel and later disapproved by S&L in Chicago.	a. Review affected (approximately 500) FCRs and resolved on a case-by-case basis. Revised procedures and conducted training.	9/26/84
					b. Also do not address revision to FCRs initiated by S&L in Chicago.	b. No CA required; procedure does address (S&L in Chicago and site personnel have same requirements).	
					3. Discrepancies in revision of drawings listed in two engineering change package (ECP) travelers versus that in the ECP issued by S&L.	Travelers revised to reference correct revision when drawings received by BA.	4/18/83
					4. Two FCRs had not been closed after changes were incorporated into the design document 7 months earlier.	No CA required; finding in error.	2/21/83

Audit Summary Report

Audit ID	Organization	Dates of Audit	Areas/Activities Audited	Summary of Audit Results	Findings Issued	CA Taken	Date Finding Closed
Q31-82-3	(Continued)						
					5. Zack requests for design changes being sent directly to S&L by BA without using the BA FCR form as required by procedure.	Ceased practice; revised and clarified procedure; conducted training to revised procedure.	6/10/83
					6. NCR/DR numbers and (CWR) numbers were not cross referenced on the other documents as required by procedure in two instances.	Requirement intent misinterpreted; Cross reference in these instances was not required. Procedure revised to clarify.	3/25/83
					7. Record transmittal from piping department not signed as required by procedure.	Corrected affected transmittals; conducted training of Piping Department personnel; investigated for BA generic problem.	4/11/83
					8. Copies of CWRs being maintained in senior discipline engineer's suspense file in lieu of original as required.	Revised procedure to delete unwarranted requirement.	4/24/83
					9. Record withdrawals not being accomplished in strict compliance with procedures.	Revised procedure to clarify, and trained Document Records Center (DRC) personnel.	2/14/83

Audit Summary Report

Audit ID	Organization	Dates of Audit	Areas/Activities Audited	Summary of Audit Results	Findings Issued	CA Taken	Date Finding Closed
Q31-82-3	(Continued)				10. No objective evidence that BA procedures used to inspect FDDR and field disposition instruction work had been reviewed and approved by GE.	Identified procedures required and obtained GE's reviews and approvals. Established mechanism to continue process with revisions.	5/26/83
Q31-83-1	BA Quality and Technical Services Department (QATS)	3/7-3/11/83	- Criteria 1, 2, 4 through 7, and 9 through 18.	Applicable criteria effectively implemented, except Criteria 2.	1. Objective evidence of QA specific training and training schedules not available.	Revised procedure to clarify objective evidence to be retained; conducted documented refresher training for all involved personnel.	5/2/84
			- Documentation of nonconformances resulting from BA audits and surveillances	Criteria 2 could not be evaluated due to indeterminate aspects related to training and management audits and reviews for potential reportability.	2. Annual management audit for 1983 was not scheduled; CA was not taken on two findings from 1982 management audit.	1983 management audit was scheduled; two open findings from 1982 management audit were resolved and closed.	6/22/83
			- CA to BA internal audits				
			- Training of QATS personnel	Special concerns: documentation of nonconformances on NCRs/DRs in accordance with procedures; CA to BA internal audits adequate except for BA 1982 management audit.			
				A few comments and recommendations were made for improving activities audited.			
				Six findings issued.			

Audit Summary Report

Audit ID	Organization	Dates of Audit	Areas/Activities Audited	Summary of Audit Results	Findings Issued	CA Taken	Date Finding Closed
QII-83-1	(Continued)				3. Authorized nuclear inspector (ANI) monthly reports were not reviewed by Manager - QA for reportability.	Reports were collected, reviewed and stamped. Manager - QA placed in routing for future reports.	4/27/83
					4a. Test results reviews documented as accomplished by QA, QC, or technical services (TS) personnel other than managers of QC or TS as stated in QA Manual.	a. No CA required; implementing instructions provide authorization.	9/1/83
					b. Not apparent through objective evidence how minimum provisions for test records are satisfied.	b. Revised QA Manual to clarify.	
					5. Several superseded, voided, or completed drawing files were removed from DRC and not stored per QA Manual requirements.	Files were processed and restored in the DRC; space arrangements were made to accommodate future storage needs.	9/19/84
					6. Objective evidence not available to show that CA on all audit findings from I-222 was verified prior to closure of audit.	Audit findings reverified and documented; QA personnel retrained to requirements.	5/27/83

Audit Summary Report

Audit ID	Organization	Dates of Audit	Areas/Activities Audited	Summary of Audit Results	Findings Issued	CA Taken	Date Finding Closed
Q31-83-2	- BA Electrical	4/25-5/3/83	- Criteria 1 through 11, 14, and 15	BA Electrical Department is, with increased attention to areas of findings noted, capable of effectively implementing the applicable criteria.	1. BTSF-055s not issued to disposition three DRs requiring welding.	No CA required; misinterpretation of requirements by auditor; welding accomplished by travelers.	7/1/83
				Criterion 1 (organization) not fully evaluated because of reorganization in progress.	2. No objective evidence that lead QC inspectors perform surveillance of inspector activities.	Evidence provided by review and acceptance of inspection documentation; revised procedure to clarify.	11/1/83
				Criterion 11 (test control) assessed inadequate procedurally and in implementation.	3. Hypot data sheets were not forwarded to DRC by inspector as required by procedure.	Data sheets were included in traveler and sent to DRC with traveler; procedure was revised to clarify; training given.	4/30/83
				Remaining criteria evaluated as adequate.	4a. Cable meggar tests were performed and data were filed prior to instructions being prepared and issued.	a. Finding in error: instructions had been issued.	10/13/83
				A few comments and recommendations made for improving design control and procurement document control activities.	b. M&TE calibration data on meggar data sheets were recorded inconsistently.	b. Revised procedure to provide consistency; conducted training.	
				Five findings were issued.	5. Approved accepted Hypot data sheets for a number of travelers indicate results not in accordance with hypot instructions.	Some deficiencies noted by auditor reevaluated as meeting requirements; NCR was initiated and processed for other deficiencies. Procedure was revised to clarify.	11/16/83

Audit Summary Report

Audit ID	Organization	Dates of Audit	Areas/Activities Audited	Summary of Audit Results	Findings Issued	CA Taken	Date Finding Closed
Q31-83-3	- BA Mechanical	6/13-6/17/83	- Criteria 3 and 6	Document control activities were effectively implemented except as identified in audit findings. Design control interface with S&L not procedurally controlled. A few minor problems were noted and resolved or corrected during course of audit. Three findings issued.	PD-1 A number of FECNs have been distributed as "Approved for Construction" controlled documents prior to S&L review and acceptance (approval).	Revised procedure to allow S&L site approval of FECNs; impact of unapproved FECNs being evaluated and addressed in 50.55(e) evaluation 55-84-01.	2/6/84
					PD-2 Interface procedures were not in place to control review of design changes dealing with procurements by the BA mini-spec system.	Revision to procurement manual was issued to delete mini-spec requirement. All existing mini-specs were reviewed and changes were submitted to S&L via FCR.	7/25/84
					ID-1 Controlled document transmittal instructions were not followed in three instances.	Control document transmittal instruction was implemented (superseded copy was destroyed); training was conducted on procedure requirements.	5/2/84
Q31-83-4	- BA All departments - BA System Release and Completion - Clinton Power Station (CPS) Plant Staff Startup	12/12-12/16/83	- Criteria 1, 2, 3, 5, 6, 10, 11, 14, 15, 16, and 17 - Turnover process - Design change control - BA and subcontractor tests	Limited to non-ASME turnover activities. Turnover process was evaluated as effective. Current administrative control program and failure to perform review of design changes reduces the overall program effectiveness.	PD-1 Lack of detailed implementing procedures or instructions for turnover process.	No CA required; activities discussed are not QA program controlled; concurred with by the IP Manager - QA.	3/21/84
					PD-2 Some document control measures of the operational QA Manual were not addressed in the SU program.	Measures were established and implemented by IP SU.	4/9/84

Audit Summary Report

Audit ID	Organization	Dates of Audit	Areas/Activities Audited	Summary of Audit Results	Findings Issued	CA Taken	Date Finding Closed
Q31-83-4	(Continued)		- BA and IP startup interfaces - Training and certification of BA personnel	One recommendation was made for improving program effectiveness. Five findings were issued.	ID-1 Personnel were not aware of nor were they implementing procedure requirements regarding design change document reviews related to the turnover process.	Personnel were trained; previous turnovers reviewed for impact.	3/12/84
					ID-2 No objective evidence that several personnel had received training.	Training was given and documented; method was established for tracking.	2/21/84
					ID-3 IP Nuclear Station Engineering Department (NSED) responsibility assigned in BA procedure (BAP) was not being accomplished as required.	BAP was revised to reflect interface function; BA, NSED, and S&L established interfaces and incorporated same in applicable procedures.	9/24/84
Q31-83-5	- BA Procurement - BA Piping - BA QATS - BA Construction	12/12-12/16/83	- Criteria 2, 4, 5, 6, 8, 9, 10, 13, and 17 - Piping, procurement, installation, and inspection activities - Training and qualification of personnel	QA program within the audited organizations for the activities audited is effective. Six findings issued.	PD-1 Lack of acceptance criteria to perform required inspections.	Procedure was revised to incorporate acceptance criteria; review of all other inspection procedures was made for same problem and those were also corrected.	5/2/84

Audit Summary Report

Audit ID	Organization	Dates of Audit	Areas/Activities Audited	Summary of Audit Results	Findings Issued	CA Taken	Date Finding Closed
QII-83-5	(Continued)				ID-2 Certificaton records for one nondestructive examination inspector (U.S. Testing) was not on file in DRC.	Proper certification documentation was put in file.	12/30/83
					ID-2 Certification records for one welder were not on file in DRC.	Proper certification documentation was put in file; retraining of clerk responsible.	12/29/83
					ID-3 M&TE calibration status information was not documented on three inspection reports.	Reinspections were performed and properly documented, reviewers and inspectors were retrained to requirements.	4/9/84
					ID-4 Lack of indoctrination and training of three newly hired craft personnel.	Personnel were trained; training was documented.	1/5/84
					ID-5 Vendor-supplied piping spool was modified and not documented on required form.	Procedure was revised to clarify requirement; proper form was completed as required by procedure.	7/18/84

Audit Summary Report

Audit ID	Organization	Dates of Audit	Areas/Activities Audited	Summary of Audit Results	Findings Issued	CA Taken	Date Finding Closed
Q31-83-6	- BA QC - BA TS	4/20-4/22/83	- Criteria 2, 10, and 17 - Nuclear Regulatory Commission (NRC) IE item 81-15-01 - NRC IE item 82-18-01 - NRC IE item 82-18-02 - NRC IE item 82-18-03 - Training, qualification, and certification of inspectors	Records system used for BA QC and TS training was adequate. Implementation of BA QC Training and Qualification Manual R/7 was inadequate. Verification of prior experience of individuals certified for various levels in BA QC and TS was inadequate. Commitments to NRC items 81-15-01, 82-18-02, and 82-18-03 were adequate. Commitments to NRC item 82-18-01 were not implemented. Five findings were issued.	1. Certification period specified for two TS Level III inspectors does not meet American National Standards Institute (ANSI) N45.2.6 requirements.	Procedure was changed to reflect ANSI requirements; personnel recertified.	5/27/83
					2. Verification of resumes for existing BA QC inspectors was not performed per commitments to NRC.	Commitment was not retroactive; procedure change used to clarify; all evaluations conducted.	9/1/83
					3. Personnel qualified and certified to superseded issue of QC Training and Qualification Manual.	Manual was revised to clarify intent and effective date to revision changes.	11/1/83
					4. Conflict in BA QC Training and Qualification Manual regarding training requirements for Level III candidates.	No CA required; reevaluation indicates no conflict exists.	7/12/83
					5. BA QC Training and Qualification Manual does not reflect eye examination method in use.	Manual was revised to reflect new test just incorporated into use.	8/18/83

Audit Summary Report

Audit ID	Organization	Dates of Audit	Areas/Activities Audited	Summary of Audit Results		Findings Issued	CA Taken	Date Finding Closed
QST-83-7	- BA QA	7/18-7/21/83	- Criteria 2 and 18 - Audit programs - Training and qualification of auditors and lead auditors	BA QA procedure for audit process is ineffective. Several comments and recommendations were made to improve the program. Seven findings issued. IP/BA QA management meeting was held to review results and concerns.	PD-1	Pass/fail criteria for auditor or lead auditor exams were not specified in procedure.	Procedure was revised to incorporate criteria.	9/21/83
					PD-2	Procedures do not address use of concerns.	Procedures were revised to incorporate.	11/14/83
					PD-3	Stamp used on audit reports to note review for reportability does not indicate results of review.	Audit report finding forms were revised.	9/30/83
					ID-1	Audits of two suppliers were not accomplished at appropriate times.	Surveys meeting audit intents performed at appropriate times. Procedure change was issued to clarify.	4/13/84
					ID-2	Audit findings closure for three audits was not based on verification of CA.	CA was reverified and documented.	9/21/84
					ID-3	Inadequate follow-up on audit responses.	Appropriate follow-up action was taken and audit findings were closed; training of QA audit personnel was conducted.	11/22/83
					ID-4	Several audit reports did not provide statement regarding effectiveness.	Training of QA audit personnel was conducted.	8/9/83

Audit Summary Report

Audit ID	Organization	Dates of Audit	Areas/Activities Audited	Summary of Audit Results	Findings Issued		CA Taken	Date Finding Closed
Q31-83-8	- BA Piping - BA Electrical Department - BA Document Control - BA Project Control - BA Mechanical - NSED - S&L (Site)	7/19-7/28/83	- Criteria 3, 6, and 17 - FCR program	- Generation, distribution, and release for work of FCRs is effective and adequately implemented. - Ascertaining FCR status, design review/incorporation process, and closure of FCRs is ineffective. - Six findings issued.	PD-1	Procedures do not address activities associated with the use and updating of computer programs for FCR statusing.	Procedure was revised; training was given; complete audit of document management system files and validation of data in other files and programs.	Open
					PD-2	FCR procedure does not adequately detail the methods used to track processing of FCRs.	Procedure was revised; appropriate personnel were trained.	2/1/84
					PD-3	No documented evidence was attainable to verify current outstanding change documents to the S&L valve list due to conflict in QA Manual and implementing procedures.	QA Manual was revised to resolve conflict and reflect method of verifying status of S&L valve list.	8/22/83
					PD-4	Inadequacies in implementing NSED procedure concerning FCRs.	NSED procedure was revised and training was provided; corrected implementation deficiencies noted.	4/12/84
					ID-1	Original tracings of BA rebar and structural drawings were not updated to reflect FCR as required by procedure.	Procedure was revised to clarify updating responsibilities; drawings were updated per procedure revision; training was given.	1/19/84

Audit Summary Report

Audit ID	Organization	Dates of Audit	Areas/Activities Audited	Summary of Audit Results	Findings Issued	CA Taken	Date Finding Closed
Q31-83-8	(Continued)				ID-2 "Controlled copies" of superseded procedures were found in NSED personnel's possession.	Distribution of "controlled copies" of NSED procedures was limited and training was provided.	1/27/84
Q31-83-9	- BA Document Review Group (DRG)	8/15-8/23/83	- Criteria 1, 2, 5, 6, 16, and 17. - Procurement document review activities - Piping and mechanical document review activities - Electrical document review activities	- Except for CA portion of the program, BA document review program is adequate and effectively implemented. - Two findings issued.	ID-1 Document exception list (DEL) items are not being resolved and closed in a timely manner.	a. Generic Resolution process and procedures were established; training was given; and process was implemented. b. Project DEL resolution group was established by IP Vice President. c. Tracking and statusing process was improved. d. Open DEL backlog was reduced.	5/3/84
					ID-2 No objective evidence that DRG activities were being summarized and evaluated for CA or for potential reportable conditions.	a. Hardware system was assembled to allow production of reports as required by procedure. b. Summary and evaluation reports generated and evaluated.	4/16/84

Audit Summary Report

Audit ID	Organization	Dates of Audit	Areas/Activities Audited	Summary of Audit Results	Findings Issued	CA Taken	Date Finding Closed
Q31-83-10	- BA Electrical - BA QC	10/24-10/31/83	- Criteria 1 through 8, 11, and 14 through 17. - Organizational structure and reportability - Training (manual and non-manual) - Control and incorporation of design documents and changes - Procurement, receipt storage, issuance, and control of material and equipment - Testing and test statusing	Program "effective over-all." Training and material control traceability programs were ineffective. Overly complex system with minimal procedure controls for reviewing design documents for constructibility. S&L and GE changes to electrical equipment were not completely audited. Eight findings issued.	PD-1 Current BA organization was not reflected in QA Manual; written description of responsibilities and authorities was not developed for some Electrical Department personnel.	Organization changes and responsibilities were identified and QA Manual and other procedures were revised to reflect same; training was given and written job descriptions were issued for the three persons/positions noted.	6/11/84
					PD-2 Administrative handling of NCRs within Electrical Department was not controlled by procedure.	Finding was reevaluated as not valid; BAP 1.0 adequately covers same.	5/30/84
					PD-3 BAP traceability requirements were contrary to ANSI Standard commitment.	BAP was revised; corrective action report (CAR)-073 was issued.	1/27/84

Audit Summary Report

Audit ID	Organization	Dates of Audit	Areas/Activities Audited	Summary of Audit Results	Findings Issued	CA Taken	Date Finding Closed
Q31-83-10	(Continued)				PD-4 Procedures controlling constructibility review by Electrical do not cover all the owner approved design documents.	Procedures were reevaluated as adequate, with one minor exception which was revised.	2/24/84
					ID-1 BA's training plan in Electrical Department was not being implemented in certain instances: (a) training matrix was not approved; (b) persons were given job authority prior to completing training; (c) training on revisions to procedures was not accomplished; and (d) interdepartment training was not completed and documented.	BA's training plan and manuals were revised to clarify requirements and controls. Required training accomplished and documentation was generated.	12/6/84
					ID-2 Evaluations for required training to recent procedure revisions have not been completed by BA QC.	Documentation of required training was completed and put in files.	11/21/83

Audit Summary Report

Audit ID	Organization	Dates of Audit	Areas/Activities Audited	Summary of Audit Results	Findings Issued	CA Taken	Date Finding Closed
Q31-83-10	(Continued)				ID-3a. Clearly defined areas for segregating non-safety/safety-related items were not provided in some areas.	a. Areas were clearly defined and marked; questionable item was identified and restored; scrap was cleared. Training was given.	3/13/84
					b. Nonconforming material was incorrectly stored and not segregated in some areas.	b. Nonconforming material was retagged and placed in segregated area. Training was given.	
					ID-4 Procedures do not include measures to prevent inadvertent bypassing of insulation resistance testing of cable and equipment prior to termination.	Procedure was revised to include measures. Previous termination practices were reviewed and deemed adequate to have prevented inadvertent bypassing.	1/25/84
Q31-83-11	- BA C/S - BA QC - BA TS	11/28-12/2/83	- Criteria 1, 2, 5 through 10, 12, 13, 15, and 17 - Review of travelers completed since 6/24/83 (lifting of stop work) - Certification and training of QC/TS inspectors	BA C/S QA Program was effectively implemented. Inspection personnel were properly qualified and certified. Material traceability controls were properly implemented. No findings issued.	None	N/A	N/A

Audit Summary Report

Audit ID	Organization	Dates of Audit	Areas/Activities Audited	Summary of Audit Results	Findings Issued	CA Taken	Date Finding Closed
Q31-83-12	- BA All departments	11/16-11/23/83	- Criteria 15 and 16 - NCR processing controls - Verification of implementation of engineering dispositions - Validity of rework dispositions - Timeliness of disposition implementation - CA and prevention of recurring problems - Segregation and tagging methods - Adequacy of CA	QA Program is ineffective for nonformances and corrective action. Several observations, comments, and recommendations were made for program improvements. Eight findings issued. Three of the eight findings were later determined to be invalid.	PD-1 Lack of or inadequate procedures for: (a) management review of invalid NCRs; (b) performing trend analysis, and; (c) control of NCRs in the Nonconformance Review Group (NRG).	Revised procedures and other guidance documents; conducted training; performing appropriate reviews.	6/7/84
					ID-1 Mutilated or torn "hold" tags.	Tags were replaced and surveillance was performed to determine extent of problem obtained more durable tags.	3/2/84
					ID-2a. Proposed CA response evaluations were overdue (CAR-110).	a. Evaluation was performed.	4/27/84
					b. CA ineffective as evident by trend report (CAR-110).	b. CA to CAR-110 was reevaluated, revised, and monitored; trend reversed and evaluated as effective.	

Audit Summary Report

Audit ID	Organization	Dates of Audit	Areas/Activities Audited	Summary of Audit Results	Findings Issued	CA Taken	Date Finding Closed
Q31-83-12	(Continued)				c. CA response overdue (CAR-67).	c. Reinspections delaying CA response were completed; response was submitted and evaluated.	
						Improvement measures for statusing CARs were established.	
					ID-3 Resolution of a number of NCRs do not meet the timeliness classification period based on severity levels.	CAR-143 issued. NRG staff was increased to handle volume and priority; procedures revised to clarify.	7/19/84
					ID-4 Five of 20 NCRs were not available in DRC after invalidation.	NCRs filed in DRC (three delayed for tag removal, two were in transmittal process).	1/3/84
					ID-5 Improper invalidation of 2 of 20 NCRs.	Finding in error. Further investigation showed NCRs were properly invalidated.	1/3/84
					ID-6 Two of 10 NCRs were not included in associated traveler.	Finding in error. NCRs were in the associated traveler.	12/29/84
					ID-7 Approved disposition on one NCR was not implemented as required.	Finding in error. Auditor evaluated the wrong item.	3/20/84

Audit Summary Report

Audit ID	Organization	Dates of Audit	Areas/Activities Audited	Summary of Audit Results	Findings Issued	CA Taken	Date Finding Closed
Q31-84-01	- BA Q&TS	2/6-2/17/84	- Criteria 1, 2, 4 through 14, 16, 12, and 18. - Records vault - Internal and external audit program - Vendor surveillance program - Field verification (FV) - QC certification and qualification program - Receipt inspection - TS training and certification program - Welder qualification program - BA training organization and programs - CA trending program	Not covered: nonconformance programs, Administration, Document Review, and Procedures and Turnover groups. BA Q&TS program is evaluated as effective. Effectiveness is deteriorating. Lack of attention to detail and failure to consistently address changing upper tier requirements appear to be the cause. Serious problems exist in training areas. Several comments or observations and recommendations were made for improving the program. Nineteen findings issued.	PD-1 Vendor surveillance certification procedures and documentation does not identify activities that personnel are certified to perform.	Finding in error; misinterpretation by auditor. No CA required.	5/3/84
					PD-2 Certification record file for three of eight QC inspectors were incomplete in some aspects.	Files were corrected where required; isolated incident.	5/1/84

Audit Summary Report

Audit ID	Organization	Dates of Audit	Areas/Activities Audited	Summary of Audit Results	Findings Issued	CA Taken	Date Finding Closed
Q31-84-01	(Continued)				PD-3 Three record withdrawals were used to permanently withdraw records from DRC, with no procedure provisions to cover.	Clarification was provided, and procedure was revised to include same.	9/21/84
					PD-4 Objective evidence that procedure changes had been reviewed for impact on training lesson plan was not available in some cases.	Implementing procedure and documents were revised to include requirements; training was provided; lesson plans were reviewed and revised as required.	1/3/84
					PD-5 No objective evidence (vendor surveillance or receipt inspection) to assure items conform to procurement document requirements.	Open	Open
					ID-1 Management has not been notified of four CARs where CA has been unsatisfactory or untimely.	Management was notified in all cases; procedure was revised to clarify and incorporate requirements.	4/12/84
					ID-2 Personnel were assigned responsibilities prior to completing required training.	Requirements were clarified; records were updated to requirements.	8/16/84

Audit Summary Report

Audit ID	Organization	Dates of Audit	Areas/Activities Audited	Summary of Audit Results	Findings Issued	CA Taken	Date Finding Closed
QSI-84-01	(Continued)				ID-3 FV personnel certification and qualification records have not been sent to DRC and are being retained in cabinets that do not meet record storage requirements.	Record capture requirements were added to procedure; records were sent to DRC.	7/19/84
					ID-4 Record withdrawals from the DRC were not processed per procedure requirements.	Requirements were clarified; procedures were revised, and training was conducted. Withdrawals were reviewed and corrected.	9/25/84
					ID-5 Audit program deficiencies: a. Concerns noted in lieu of findings. b. 1984 schedule of internal audits was not issued yet. c. Several audit reports were overdue for issuance.	a. Procedure revised to delete "concerns." All concerns were reviewed, verified, addressed, or corrected. b. Schedule was issued. c. Reports were issued; directives were issued to expedite and measures established to track and monitor report issuance.	3/27/84

Audit Summary Report

Audit ID	Organization	Dates of Audit	Areas/Activities Audited	Summary of Audit Results	Findings Issued	CA Taken	Date Finding Closed
Q31-84-01	(Continued)				ID-6 Several fuel rack alignment fixtures did not have documented M&TE acceptance criteria.	Questionable items were used for preliminary work only; did not req 're calibration. No CA required.	4/12/84
					ID-7 Two receiving Inspection reports were not signed or initialed by inspector as required.	Reverified items were acceptable; documentation was corrected.	6/19/84
					ID-8 Objective evidence was lacking to show that senior management had been promptly advised of audit findings assigned Severity Level 1 (critical) or 2 (major).	Notification was made where required; methodology was established to formulize notification in future.	3/14/84
					ID-9 Approved suppliers list does not identify the scope of calibration service for 32 suppliers and the type of material for two suppliers.	Approved supplier list was updated; responsibility was reassigned to trained person.	6/11/84
					10-10 Annual eye examination for one QC inspector was overdue; inspector failed examination.	Eye examination readministered; inspector passed.	3/27/84

Audit Summary Report

Audit ID	Organization	Dates of Audit	Areas/Activities Audited	Summary of Audit Results	Findings Issued	CA Taken	Date Finding Closed
QSI-84-01	(Continued)				ID-11 Uncontrolled copies of documents were used in receiving inspection and calibration lab.	Controlled copies were obtained by receiving inspection. Problem identified in calibration lab was determined not to be applicable.	5/9/84
					ID-12 Examples noted where segregation of non-safety/ safety-related material storage was not maintained in electrical fabrication shop and warehouse 3.	Restored and segregated material; conducted training to requirements.	3/22/84
					ID-13 a. Welder qualification explanation key was not distributed on a controlled document.	a. [illegible] intent to issue as controlled document; personnel were advised of correct revision.	4/26/84
					b. Welding procedure specifications amendments/addenda status could not be determined.	b. Procedure was revised, measures were established to ascertain status.	
					ID-14 Records of eye examinations for five TS inspectors were not retrievable in the DRC.	Records were obtained and refiled in DRC; training to requirements was given.	2/29/84

Audit Summary Report

Audit ID	Organization	Dates of Audit	Areas/Activities Audited	Summary of Audit Results	Findings Issued	CA Taken	Date Finding Closed
Q31-84-02	- BA All departments	6/12-6/18/84	- Criteria 4 through 7, 10, and 14 through 18. - BA procurement - BA vendor surveillance - BA vendor audits - BA vendor qualification - BA receipt inspection	BA procurement activities evaluated as effective in the control of quality-related activities affecting procurement by BA. Several comments, observations, and recommendations were made for improving program. Five findings issued.	ID-1 a. BA vendor audit reports were not issued within specified 30 days.	a. Audit reports were issued.	10/09/84
					b. Monthly contract status report was not issued at specified intervals.	b. Other reports meet intent; procedure was revised; IP QA took over responsibilities from BA for vendor audits and surveillances.	
					ID-2 Discrepancy existed for a lead auditor's examination results (date of examination).	Letter added to file to explain discrepancy.	8/22/84
					ID-3 BA document control center not reviewing S&L correspondence to determine need to distribute as control document.	Procedure in error; revised to clarify.	8/20/84
					ID-4 a. Purchases order (PO) riders issued to supplier not on approved supplier list for material ordered.	a. Suppliers were approved and the approved suppliers list was updated.	7/25/84

Audit Summary Report

Audit ID	Organization	Dates of Audit	Areas/Activities Audited	Summary of Audit Results	Findings Issued	CA Taken	Date Finding Closed
Q31-84-02	(Continued)				b. No objective evidence that Resident Engineering (RE) is provided copy of approved suppliers list.	b. RE was placed on distribution list; copy was provided.	
					ID-5 Standard quality requirements form was not attached to six POs.	Investigation showed no violation of requirements; misinterpretation by auditor. No CA required.	8/22/84
Q31-84-03	- BA Piping - BA Mechanical	7/23-7/27/84	- Criteria 1 through 6, 8, and 13 through 15 - Piping and mechanical travel_rs - Material traceability - Training	Evaluated the activities of BA project management as effective, with exceptions identified in the audit findings. Four findings issued.	ID-1 Personnel were assigned responsibilities prior to completing required training.	Misinterpretation by auditor; procedures and manuals were revised to clarify.	9/19/84
					ID-2 Senior mechanical engineer not on distribution for several K-Specs for which he is responsible.	Senior Mechnical engineer placed on distribution ad K-Specs were distributed.	9/5/84
					ID-3 No objective evidence to show that required checklists were used to review six travelers.	Procedure was revised to delete specific checklist use.	9/5/84

Audit Summary Report

Audit ID	Organization	Dates of Audit	Areas/Activities Audited	Summary of Audit Results	Findings Issued	CA Taken	Date Finding Closed
Q31-84-03	(Continued)				ID-4 No objective evidence to show that changes made to two inspection documents in one traveler were reviewed by lead inspector.	Checklist rereviewed and documented; lead inspectors were retrained to requirements.	9/21/84
Q31-84-04	- BA DRG	8/27-8/31/84	- Criteria 1, 2, 5, 6, 10, 16, 17 - DRG activities and supporting program - Training and certification of DRG personnel - Correctness of data bases used for DRG verifications - CA and DEL resolutions - Commitments to NRC by letter U-10025 dated 1/20/83	DRG quality program was evaluated as effective. Effectiveness is reduced based on finding PD-2. No current instructions, procedures, or listing exist that identify what records are to be reviewed by DRG. Previously identified in surveillance finding C-84-140. Four findings issued.	PD-1 The DRG program for identifying, investigating, and trending of significant conditions adverse to quality is not documented and is not consistent with other project requirements and formats.	Procedures were revised to document and provide consistency.	12/17/84
					PD-2 Q&TS certification matrix data base used in review of records is not being updated.	Matrix was updated; measures were established for maintaining up to date.	12/5/84
					ID-1 Job descriptions for some DRG personnel were unapproved; and latest revision was not available as required.	Job description was approved and made available.	10/17/84
					ID-2 Minimum training requirements for DEL resolution group personnel has not been established.	Minimum training requirements were established per training plan and implemented.	11/9/84

Audit Summary Report

Audit ID	Organization	Dates of Audit	Areas/Activities Audited	Summary of Audit Results	Findings Issued	CA Taken	Date Finding Closed
Q31-84-05	- BA Electrical	10/8-10/15/84	- Criteria 1 through 5, 8, 13, 14 - Review of engineering documents - Generation of travelers - Training - Procurement - Issue and control of material and traceability - Fabrication and installation	BA QA program, as it applies to the Electrical Department, was evaluated as being effective. Effectiveness is reduced due to weaknesses in both training and reconciliation of design and construction activities. Finding of previous audit Q31-83-10 ID-1, addressing training discrepancies, is still open. Several comments and recommendations were made for strengthening the design document review and reconciliation programs. Five findings issued.	PD-1 Procedure for electrical testing does not contain some requirements listed in the BA QA Manual.	Open	Open
					ID-1 Drawing review log was not updated for five drawings that were reviewed.	Open	Open
					ID-2 No objective evidence is available to show that two drawings had been reviewed by RE Electrical.	Open	Open
					ID-3 Three travelers had not been revised in a timely manner to reflect engineering change notices (ECN) reviewed by RE Electrical and noted to affect them.	Open	Open

Audit Summary Report

Audit ID	Organization	Dates of Audit	Areas/Activities Audited	Summary of Audit Results	Findings Issued	CA Taken	Date Finding Closed
Q31-84-05	(Continued)				ID-4 Discrepancy existed in material traceability markings on some material installed versus the traceability data recorded in traveler QC inspection documents.	Reinspection was completed and traveler was supplemented to correct discrepancy.	11/29/84
Q31-84-06	- BA C/S	10/22-10/26/84	- Criteria 1 through 5, 8, 13, and 14 - Review of engineering documents and changes - Traveler generation - Training - Procurement - Fabrication and installation - Issue and control of material and traceability	BA QA program, as it applies to C/S was evaluated as being effective. A few comments and recommendations were made to improve programs. Four findings were issued.	ID-1 Approved suppliers list did not reflect capabilities or limitations of suppliers imposed by C/S procurements.	Open	Open
					ID-2 Written descriptions of three C/S Department personnel's responsibilities and authority were not being maintained.	Job descriptions were obtained and are being maintained.	12/13/84
					ID-3 No objective evidence exists to show that QC inspectors received training on revised acceptance criteria for visual inspections.	Open	Open
					ID-4 No objective evidence exists to show that three "as built" Cadweld drawings had been checked and approved by BA prior to submittal to S&L.	Checked all drawings; revised, approved, and resubmitted the affected three drawings. Retrained responsible personnel.	1/7/85

Audit Summary Report

Audit ID	Organization	Dates of Audit	Areas/Activities Audited	Summary of Audit Results	Findings Issued	CA Taken	Date Finding Closed
Q31-84-07	- BA FV	10/9-10/12/84	- Criteria 2, 6, 10, 12, 15, 16, and 17 - FV activities - Training - BQA 190, Rev. 1	FV program was evaluated as being effective, except as noted on the two audit findings. One minor deficiency was corrected during the audit. Two findings issued.	ID-1 BQA 190 has not been maintained current to reflect changes or revisions to interfacing procedures.	Procedure revised/updated.	1/9/85
					ID-2 All pages of 3 of 10 checklists reviewed were not signed as required.	Procedure revised to clarify signature requirements.	1/9/85
Q31 84-08	- BA All departments	10/29-11/2/84	- Housekeeping activities - Fire prevention and protection - Establishment of cleanness zones - Cleanness control of facilities - Training to housekeeping requirements	Housekeeping program was evaluated as being effective. Two findings issued.	PD-1 Housekeeping procedure does not include adequate criteria to assure identified discrepancies are promptly corrected.	Open	Open
					ID-1 Many QC housekeeping and storage area reports have not been resolved in a timely manner.	Open	Open

Audit Summary Report

Audit ID	Organization	Dates of Audit	Areas/Activities Audited	Summary of Audit Results	Findings Issued		CA Taken	Date Finding Closed
Q31-84-09	- BA Document Control - BA NRG	11/19-11/27/84	- Criteria 1, 2, 5, 6, 14, 15, and 17 - Training - Hold tags - NCRs	- QA program and activities performed by DCC, and DRG to implement; the QA program evaluated as effective except as indicated in findings. - Some comments and recommendations for improving document control aspects made by auditors. - Nine findings issued.	PD-1	Interface between BA DCC and GE has not been clearly established to ensure change documents to GE drawings, and specifications are removed from posting on incorporation.	Open	Open
					PD-2	Some BA generated iso-metric drawings were issued for construction prior to approval by S&L.	Open	Open
					ID-1	Position descriptions for RE and Q&TS personnel do not reflect NCR responsibilities.	Position description generated and approved for one position; governing procedures deter-mined to reflect responsi-bilities in other case.	1/7/85
					ID-2	Requests for conditional release not being referenced or attached to the NCR.	Open	Open
					ID-3	Required training for DCC and NRG personnel has not been established.	Open	Open
					ID-4	Non-manual employees have not been indoc-trinated into the con-tent of the BA QA Manual.	Open	Open

Audit Summary Report

Audit ID	Organization	Dates of Audit	Areas/Activities Audited	Summary of Audit Results	Findings Issued	CA Taken	Date Finding Closed
Q31-84-9	(Continued)					Open	Open
					ID-5 S&L drawings and design changes are issued to the field for construction prior to review by RE.		Open
					ID-6 Superseded pages of vendor manuals have not been sent to the DRC.	Open	
					ID-7 Documents required by document control procedure have not been sent to the DRC.	Open	
Q31-84-10	- BA System Release and Completion	12/10-12/14/84	- Criteria 1, 2, 3, 5, 6, 9, 11, 12, 14, 15, and 17 - Training - Interfaces with other organizations	(Report not completed)			
Q31-84-11	- BA All departments	12/26-12/28/84	- Fire protection activities	(Report not completed)			
Q38-82-01	- CPS Plant Staff Startup	1/25-1/29/82	- Criteria 1 through 17	Implementation of QA requirements generally adequate and effective in all areas except criteria 4, 8, and 16. In these areas, the programs and implementation were inadequate. Twelve findings issued.	1. Supervision has not endorsed the use of plant staff requisitioning procedures; the startup program does not otherwise address these activities. Other procedures found lacking specific details.	Startup program and supporting procedures revised to include necessary details and proceduralize required endorsements.	4/22/82

Audit Summary Report

Audit ID	Organization	Dates of Audit	Areas/Activities Audited	Summary of Audit Results	Findings Issued	CA Taken	Date Finding Closed
Q38-82-01	(Continued)				2. Adequate distribution lists were not used to control design document changes.	Instructions revised to improve control measures. Common computer printouts were subsequently issued for use.	5/10/82
					3. Two flush and test procedures were approved by an uncertified Level III individual	None required. Individual was qualified as Level III. The individual was certified Level III 9 months after approval of the two procedures.	4/22/82
					4. Accept/reject criteria not clearly defined in one generic test procedure (GTP).	All GTPs reviewed and revised to clearly define accept/reject criteria. Two condition reports issued for other GTPs with like conditions.	5/18/82
					5. No procedural requirement or objective evidence exist to show that the review of maintenance work requests (MWRs) for retest and cleaning is being performed.	Procedures revised. Previous MWRs reviewed and necessary retest and cleaning conducted.	5/18/82
					6. One GTP does not provide for a record of test results.	The GTP was revised to include a record of test results. Other GTPs reviewed for like conditions with only one revision necessary.	5/19/82
					7. Completed CWR packages lacked documentation of the review for retest requirements.	All CWRs were reviewed and documentation added to each CWR package. Retraining of responsible personnel was conducted.	5/10/82

Audit Summary Report

Audit ID	Organization	Dates of Audit	Areas/Activities Audited	Summary of Audit Results	Findings Issued	CA Taken	Date Finding Closed
Q32-82-01	(Continued)				8. Flushing water chemistry analysis results were not adequately stored.	Subject documents gathered and filed into a 1-hour fireproof cabinet.	4/22/82
					9. MATE-related QA records are not stored in a fireproof cabinet	Subject documentation gathered and filed into a 1-hour fireproof cabinet.	4/22/82
					10. Temporary alterations for electrical testing were not properly documented.	All documentation reviewed and discrepancies corrected. Responsible personnel have been retrained.	5/10/82
					11. Assistant startup supervisor signed approval for the disposition of three condition reports.	The condition reports were reviewed and reapproved by NSED. Responsible personnel have been retrained.	6/30/82
					12. The field problem report (FPR) procedure does not require determination of cause or review by appropriate levels of Management.	None required. The FPR procedure reevaluated as acceptable.	6/30/82
Q38-82-02	- CPS Site Purchasing	Cancelled	N/A	N/A	N/A	N/A	N/A
Q38-82-03	- NSED Site	03/22-25/82	- NCRs - FCRs - Processing Procurement Documents	Overall, the QA Program elements applicable to the audited areas are effective in their intent. No audit findings issued.	N/A	N/A	N/A

Audit Summary Report

Audit ID	Organization	Dates of Audit	Areas/Activities Audited	Summary of Audit Results	Findings Issued	CA Taken	Date Finding Closed
Q38-82-03	(Continued)		- Interaction analysis activities - Indoctrination and training				
Q38-82-04	- CPS Plant Staff Maintenance	03/15-3/23/82	- Criteria 1 through 17	The Maintenance Department activities are generally adequate and effective in meeting audited criteria except for criteria 6, 8, and 17. In these areas, the Maintenance Department is inadequate. Thirteen findings issued.	1. One cancelled non-safety-related FPR was not forwarded to the vault.	Revised FPR procedure to exclude forwarding cancelled FPRs that were not approved or dispositioned.	5/18/82
					2. Thirteen FPR numbers do not appear on the CPS FPR Log.	The FPR procedure was revised to enhance control over issuance and tracking of FPR numbers.	7/7/82
					3. One MWR lacked QC inspection points.	No CA required; finding issued in error.	6/3/82
					4. Two POs placed with suppliers not suitably qualified.	Surveillance finding P-071 issued to investigate. Materials and POs placed on hold. Suppliers qualified, materials inspected, and holds released.	7/7/82
					5. Lower tier departmental procedures use the word "should" to imply higher tier program "shall" requirement.	Revised departmental procedures to use the word "shall." Retrained responsible personnel.	7/7/82

Audit Summary Report

Audit ID	Organization	Dates of Audit	Areas/Activities Audited	Summary of Audit Results	Findings Issued	CA Taken	Date Finding Closed
Q38-82-04	(Continued)				6. The CPS FPR log is maintained in accordance with an unapproved set of instructions.	No CA required. Instruction referred to as an "unapproved instruction" used as a memory aid.	5/18/82
					7. Two document control-related procedures lack a mechanism for issuing revisions or changes.	Affected procedures revised.	7/7/82
					8. Uncontrolled drawing list being used to verify latest issue of drawings.	No CA required; finding issued in error.	6/3/82
					9. Fifteen safety-related MWRs lacking required inspection reports. Governing procedure lacks details for documenting MWR inspections.	Governing procedures revised to exclude the unnecessary inspection documentation. Responsible personnel retrained.	7/27/82
					10. Receipt inspection procedures lack details for the documentation required to be generated pertaining to packaging and shipping.	Revised procedures and evaluated past work for impact and found none.	7/7/82
					11. Except for stores, maintenance has no procedure to administer tagging of nonconformances.	Existing procedures were revised to incorporate instructions for tagging of nonconformances and control of tags.	7/7/82

Audit Summary Report

Audit ID	Organization	Dates of Audit	Areas/Activities Audited	Summary of Audit Results	Findings Issued	CA Taken	Date Finding Closed
Q38-82-04	(Continued)				12. Completed MWRs being maintained in a nonfire-proof storage cabinet.	Gathered the subject documents and forwarded them to the Records Center.	5/18/82
					13. Calibration records contained several clerical errors (e.g., changes not legible, procedure numbers missing, etc.)	Existing conditions deemed to have no impact. Additional training of personnel conducted. Records updated as necessary.	5/18/82
Q38-82-05	- IP Purchasing and Stores	Cancelled	N/A	N/A	N/A	N/A	N/A
Q38-82-06	- CPS Project Management	5/10-5/12/82	- Control of procedures and records - Training - Review of vendor procedures	Generally, QA program elements audited are being effectively implemented by CPS Project Management. Several recommendations made regarding program improvements. Four findings issued.	1. Approval letter for a U.S. Testing procedure not on file.	Approval letter located and placed into the file.	7/22/82
					2. Written record of who is to receive controlled copies of the CPS Management Procedures Manual has not been developed.	Issued written record of designated personnel.	6/24/82
					3. Unauthorized supervisor provided written access to sensitive information.	Applicable procedure revised to include the subject supervisor as an authorized position.	7/22/82
					4. Written designation granting authority to an individual to sign documents in the absence of the Safeguards Information Supervisor does not exist.	No CA required; written designation did exist.	7/22/82

Audit Summary Report

Audit ID	Organization	Dates of Audit	Areas/Activities Audited	Summary of Audit Results	Findings Issued	CA Taken	Date Finding Closed
Q38-82-07	- CPS Plant Staff Compliance and Configuration Control	Cancelled (Incorporated into Q38-82-13)	N/A	N/A	N/A	N/A	N/A
Q38-82-08	- Environmental Affairs Department (EAD)	6/10-6/11/82	- Criteria 1, 2, 5, 6, 8, 11, 12, 13, 15, 16, and 17 - Training	EAD is adequately implementing those portions of the IP QA Program under their responsibility. One finding issued.	1. EAD does not have a documented corrective action program to correct adverse conditions when identified.	New and revised procedures issued to provide a formal mechanism to document and correct adverse conditions.	9/23/82
Q38-82-09	- NSED Annex	7/19-7/23/82	- Criteria 1 through 4, 6, and 16. - Training of NSED personnel - Procurement of special items/services - Commitment control program - NSED design control program - Equipment qualification program - CPS condition reports - Final Safety Analysis Report (FSAR) maintenance	Overall, the QA program elements audited are being effectively implemented. Certain elements, however, were found to require additional attention to attain total effective implementation. Nine audit findings were issued.	1. Position descriptions for startup and electrical engineering personnel have not been formalized.	Organizational procedure issued which makes the use of position descriptions unnecessary.	10/8/82
					2. NSED's design interface control is not sufficiently defined by procedure.	Procedure developed and issued.	1/20/83
					3. One instruction did not provide adequate instructions for use of an attached form.	Instruction revised to include same.	11/24/82
					4. Several Inspection and Enforcement (IE) information documents had not been entered onto status sheets, as required by procedure. Procedure does not define certain terms used.	Overall program for handling IE documents was re-evaluated. Procedure revised and issued.	3/7/83

Audit Summary Report

Audit ID	Organization	Dates of Audit	Areas/Activities Audited	Summary of Audit Results	Findings Issued	CA Taken	Date Finding Closed
Q38-82-09	(Continued)						
					5. No documented QA review existed for two of five proposed FSAR changes. No formalized mechanism exists to document that the required reviews were conducted.	Procedures revised and issued.	3/8/83
					6. The mechanical section issued an instruction without it being indexed or a sequential number being assigned.	Instruction recalled, indexed, and reissued as MI-1. Procedures revised to establish better controls.	11/24/82
					7. NSED lacks procedural instructions for: NSED follow-up on audit findings; processing specifications; procurement of items and services; and the organization that provides organizational charts.	Procedures developed or revised and issued.	3/2/83
					8. NSED lacks procedural criteria that: require technical references to be identified by title, date of issue, and revisions; and specify the retention time suppliers are to maintain records for IP.	Procedure developed and issued.	3/2/83

Audit Summary Report

Audit ID	Organization	Dates of Audit	Areas/Activities Audited	Summary of Audit Results	Findings Issued	CA Taken	Date Finding Closed
Q38-82-09	(Continued)				9. Form CPS-1-MW references seven American Society for Testing and Materials (ASTM) standards, but does not give the title and addendum number.	Cited condition evaluated and determined not to have any impact on the work associated with the ASTM materials. Procedure revised to clarify documentation requirements.	10/1/82
Q38-82-10	- CPS Plant Staff Operations	Cancelled	N/A	N/A	N/A	N/A	N/A

Audit Summary Report

Audit ID	Organization	Dates of Audit	Areas/Activities Audited	Summary of Audit Results	Findings Issued	CA Taken	Date Findings Closed
Q38-82-11	- CPS Plant Staff Startup	9/27-9/30/82	- Criteria 1, 2, 3, 5, 6, and 9 through 17 - Training - QA Program - Design control - Inspection test and operating status - Nonconforming material, parts, and components - QA records	The IP SU Department was found generally adequate and effective in meeting the audited criteria. Recommendation made that all startup program procedures should be reviewed and revised as needed to provide further detail, clarify requirements, and enhance administrative controls. Five findings issued.	1. Current organization chart in the Startup Manual does not accurately reflect the actual startup organization.	Startup Manual was revised to correctly show the organizational structure.	1/24/83
					2. Documentation of the 18-month review requirement for six startup administrative notices could not be produced.	All startup administrative notices reviewed and found acceptable; measures established to ensure required reviews.	3/9/83
					3. Three generic test packages lacked startup engineer signatures.	Startup instruction revised to eliminate the need for startup engineer's signature.	1/24/83
					4. One startup administrative procedure containing an attachment lacked an attachment section.	Revised procedure to include an attachment section.	1/24/83
					5. Startup administrative procedures do not identify final system walkdown as being IP SU's responsibility	Revised procedure to include.	1/24/83

Audit Summary Report

Audit ID	Organization	Dates of Audit	Areas/Activities Audited	Summary of Audit Results	Findings Issued	CA Taken	Date Findings Closed
Q38-82-12	- CPS Plant Staff Operations - CPS Plant Staff Radiation Chemistry	11/1-11/4/82	- Criteria 1, 2, 5, 8, and 11 through 17. - Training - Action on previous audit findings - Emergency plan development and adequacy - Fire protection plan adequacy and implementation - Control of radioactive sources by Radiation Chemistry - Preventive maintenance adequacy and implementation by Operational and Radiation Chemistry	The results of the audit indicate that activities evaluated were adequate. One condition report was issued to document IP QA as not conducting QA-type orientation for new employees since March 1982. The specific additional items addressed were found adequate. No findings were issued.	None	N/A	N/A

Audit Summary Report

Audit ID	Organization	Dates of Audit	Areas/Activities Audited	Summary of Audit Results	Findings Issued	CA Taken	Date Findings Closed
Q38-82-13	- CPS Plant Staff Training - CPS Plant Staff Services	11/29-12/3/82	- Criteria 1, 2, 5, 6, and 15 through 18 - Action taken on previous findings - Emergency plan development and adequacy - Controls for safeguards information - Emergency and fire protection plans training programs	The departments were evaluated as being adequate and effective in meeting the 10 CFR 50 criteria audited. Three audit recommendations were made on: the tracking of training; effective dates for procedures; and closer review of transmitted records. Six findings were issued.	1. CPS Plant Services could not provide objective evidence of a 2-year review on five procedures.	CPS Plant Services reviewed all departmental procedures and those found lacking the 2-year review were reviewed and approved. OMSR procedure was revised and standing orders issued to include measures for documenting and ensuring reviews accomplished.	8/5/83
					2. The operating manual status report (OMSR) is not reviewed or approved prior to distribution nor is it identified as a controlled document.	OMSR procedure revised to provide for review, approval, and distribution as a controlled document.	4/7/83
					3. No measures established that enable administrative procedure users to determine how many temporary change forms (TCFs) are outstanding against a procedure.	Established and implemented measures through procedure revisions.	4/5/83
					4. Current procedures do not specify the time frame allowed for TCFs and for temporary procedures to be incorporated into approved procedures. Current procedures do not require follow-up activity on overdue transmittals.	Procedure revised to incorporate provisions.	3/9/83

Audit Summary Report

Audit ID	Organization	Dates of Audit	Areas/Activities Audited	Summary of Audit Results	Findings Issued	CA Taken	Date Findings Closed
Q38-83-13	(Continued)				5. Current procedures do not require records withdrawn from the central file to be maintained in a controlled fashion and be protected from damage.	Procedure revised to incorporate requirements.	3/9/83
					6. Training material used after 8/3/82 found lacking a "Training Material Title Page" indicating approval for use.	All lesson plans re-reviewed and approved via "Training Material Title Pages." Department heads reinstructed to the requirements.	2/22/83
Q38-82-14	- CPS Plant Staff Technical	12/13-12/15/82	- Criteria 1 through 6, 11, 15, and 17 - Action taken on previous findings - Development and adequacy of the fire protection plan	The results of the audit indicate that the activities audited were being effectively implemented. One recommendation made to incorporate a commonly used log into a department level procedure. This action was taken during the audit. No findings were issued.	None	N/A	N/A
Q38-83-01	CPS Site Purchasing	Cancelled	N/A	N/A	N/A	N/A	N/A

Audit Summary Report

Audit ID	Organization	Dates of Audit	Areas/Activities Audited	Summary of Audit Results	Findings Issued	CA Taken	Date Findings Closed
Q38-83-02	- CPS Plant Staff Startup	3/28-3/31/83	- Criteria 1 through 6 and 9 through 17 - Training - CA on previous findings - Control of nonconformances and tagging - Temporary alterations being performed in accordance with applicable procedures	CPS SU was found correctly implementing the applicable QA criteria audited. Special activities audited were found adequate. No audit findings were issued.	None	N/A	N/A
Q38-83-03	- IP Purchasing and Stores	Cancelled	N/A	N/A	N/A	N/A	N/A
Q38-83-04	NSED	3/28-3/31/83	- Criteria 3, 5, 6, and 7 - Nonconforming material reports (NCMRs) - NCRs - FCRs - FPRs	Activities audited were effectively implemented in accordance with QA Program requirements, except in Criteria 3 and 5. Four findings were issued.	1. S&L site liason had not signed four FPR dispositions; NSED had signed in their place.	NSED instructions revised to require that the identity of the S&L site liason be on FPR dispositions. All FPRs reviewed, and appropriate identification made.	7/11/83

Audit Summary Report

Audit ID	Organization	Dates of Audit	Areas/Activities Audited	Summary of Audit Results	Findings Issued	CA Taken	Date Findings Closed
Q38-83-04	(Continued)				2. Two FPR instructions did not have the required QA signatures applied.	FPR instructions were returned to QA for review and signature. Reviewed other instructions and verified QA review signatures had been attained as required.	7/11/83
					3. NCRs in possession of IP Quality Engineering (QE) had not been logged into the NCR log as being transmitted to IP QE.	NCR log was corrected. Verified that no other like conditions existed. Supplemental instructions were issued to logging personnel to prevent recurrence.	6/21/83
					4. NSED comment sheet format was not used as required during review of four procedures.	NSED comments documented incorrectly placed on the correct comment sheets. Reviewers reminded of the procedural requirements via memo.	7/11/83

Audit Summary Report

Audit ID	Organization	Dates of Audit	Areas/Activities Audited	Summary of Audit Results	Findings Issued	CA Taken	Date Findings Closed
Q38-83-05	- CPS Plant Staff Maintenance	4/25-4/28/83	- Criteria 1, 2, 4, 5, 7, 9, 11 through 15, and 17 - CA on previous findings - Implementation of a surveillance schedule for Institute of Electrical and Electronics Engineers Class 1E (qualified equipment) - Training	The audit results demonstrate that the CPS Maintenance Department is effectively implementing the QA criteria audited, except criteria 4, 8, and 12. Four findings were issued.	1. No objective evidence exists to show that off-site shipment requisitions imposed QA Program criteria for items that had been shipped off site.	Procedures revised to require QA Program requirements be specified on offsite shipment requisitions. Training on revised procedures conducted.	11/1/83
					2. No objective evidence exists to show that uniform temperatures in storage area were maintained and periodically verified by inspection.	Measures established and implemented to record and verify uniform temperature.	9/16/83
					3. Calibration and maintenance records page 2 (back side) is not identified to the item involved when the original is copied front and back.	All copies of the calibration and maintenance records page 2 (back side) have been made identifiable to the item involved; revised procedure to include requirement.	9/1/83
					4. Two NCMRs had changes made without the changes being reviewed and approved by the original review and approval organization.	Routed NCMR changes to the original review and approval organization for concurrence of the changes. The individual who made the changes counseled on the need to follow procedure requirements.	7/11/83

Audit Summary Report

Audit ID	Organization	Dates of Audit	Areas/Activities Audited	Summary of Audit Results	Findings Issued	CA Taken	Date Findings Closed
Q38-83-06	- EAD	5/24-5/27/83	- Criteria 1, 2, 5, 16, 17, and 18	EAD: organization; control of instructions, procedures, and drawings; CA program; records; and audits were found effectively implemented. One finding was issued.	1. Operational QA Manual showed EAD performing certain responsibilities for which the CPS plant staff was actually responsible.	Operational QA Manual revised to correct error.	11/3/84
Q38-83-07	- NSED	5/16-5/19/83	- Criteria 2 through 17 - Adequacy of NSED classification of items and services - Adequacy of NSED control of computer code verification - Training of NSED personnel	QA Program implementation by NSED was determined to be ineffective. Amending and control of FSAR and computer code verification was assessed to be effectively implemented. Ten findings were issued.	1. Design review record form not properly used to document and record review of several K-Specs.	Procedure revised to clarify signature requirements; training was conducted.	11/7/83
					2. Requirements for reviewing and processing of interaction analysis review activities and reports not accomplished for last 6 months.	Revised procedure to incorporate flexibility in review and reporting requirements; conducted training.	9/27/83
					3. NSED instructions not transmitted on proper form.	Previous transmittals evaluated as controlled; comply with procedure in future.	9/1/83

Audit Summary Report

Audit ID	Organization	Dates of Audit	Areas/Activities Audited	Summary of Audit Results	Findings Issued	CA Taken	Date Findings Closed
Q38-83-07	(Continued)				4a. Class designations specified in NSED instruction were not in agreement with CPS record index matrix (RIM), resulting in safeguard information being coded incorrectly.	a. NSED instruction revised to be consistent with CPS RIM. Two transmittals incorrectly coded had been corrected on receipt.	9/1/83
					b. No receipt acknowledgement and follow-up activity existed for a particular transmittal.	b. Follow-up was accomplished and receipt acknowledged. Training was conducted on transmittal follow-up.	
					5a. One NSED procedure manual was missing a procedure (corrected during audit).	a. Determined to be an isolated case.	10/13/83
					b. Verification of transmittal information was done using an uncontrolled copy of CPS RIM.	b. No errors resulted from use of uncontrolled matrix. Controlled copy of CPS RIM made available for use.	
					c. Uncontrolled copies of reference documents used to identify applicable programmatic requirements.	c. Controlled copies of all reference material has been requested and will be used for future procurement-related work. Department training was conducted on proper use and reproduction of controlled documents.	

Audit Summary Report

Audit ID	Organization	Dates of Audit	Areas/Activities Audited	Summary of Audit Results	Findings Issued	CA Taken	Date Findings Closed
Q38-83-07	(Continued)				6. Conflict within NSED procedure concerning deviation reviews by IPQA of NSED procedures.	Procedure revised to resolve conflict.	10/5/83
					7. Some persons performing activities for which records do not reflect completion of required training.	Reviewed and verified work accomplished meets requirements; completed and/or documented training in records.	10/5/83
					8. Issue date of material spec not identified in NSED review package for one procurement.	Review package corrected prior to placement of order.	9/6/83
					9. Formal review of large bore piping design performed per a memorandum without a procedure.	Procedure developed, approved, and issued. NSED engineers trained.	11/7/83
					10. Nonconformances identified during large bore piping design reviews not documented on condition reports.	Procedure issued or revised to clearly indicate when a condition report is to be used. Nonconformances noted documented in accordance with the issued procedures.	10/5/83

Audit Summary Report

Audit ID	Organization	Dates of Audit	Areas/Activities Audited	Summary of Audit Results		Findings Issued	CA Taken	Date Findings Closed
Q38-83-08 -	CPS Project Management	12/12-12/14/83	- Criteria 2, 5, and 6 - Record control - System turnover - Review and approval of BA procedures - Reporting deficiencies - Reporting of defects and noncompliances - Training	QA Program elements audited are effective. Purchasing and control of safeguard information not covered. Three findings issued.	PD-1	Three project management procedures (PMP) do not contain the necessary detail or required quantitative or qualitative criteria.	Procedures reviewed and revised as necessary. Personnel trained to revised procedures.	3/14/84
					PD-2	Applicable BA personnel have not been trained to the PMPs.	Applicable BA personnel trained; PMPs added to the BA training matrix.	4/26/84
					TD-1	Three completed repair/rework/work requests had not been processed in accordance with procedure in that they lacked BA QA's review and safety classification.	Project Management directed BA to stop work on all outstanding work requests. Work requests reprocessed for proper review and classification. Investigated, evaluated, and verified adequacy of previous work on those classified as safety-related. Procedure revised to have project management indicate classification. Training accomplished.	4/26/84
Q38-83-09 -	CPS Plant Staff Radiation Chemistry	10/10-10/14/83	- Criteria 1, 2, 5, 6, 7, 8, and 11 through 17. - Training	Based on this audit, the CPS Plant Staff Radiation Chemistry Department was evaluated as working to an adequate and effective program. No findings issued.		None	N/A	N/A

Audit Summary Report

Audit ID	Organization	Dates of Audit	Areas/Activities Audited	Summary of Audit Results	Findings Issued	CA Taken	Date Findings Closed
Q38-83-10	- IP QA Surveillance	12/5-12/6/83	- Implementation of QAP 118.05 "QA Surveillance Program" - Surveillance of in-process versus final work - Determining if the total scope of surveillance activities is sufficient	The QA Surveillance Program was considered effective. The specific areas of attention were evaluated and found to be adequate. One finding issued.	1D-1 Published monthly surveillance schedules did not reflect additional unscheduled surveillances that had been performed.	Procedure revised to delete the unnecessary requirement to note unscheduled surveillances on surveillance schedules.	2/1/84
Q38-83-11	- CPS Plant Staff Technical	Cancelled	N/A	N/A	N/A	N/A	N/A
Q38-83-12	- CPS Plant Staff Services - CPS Plant Staff Training	Cancelled	N/A	N/A	N/A	N/A	N/A
Q38-83-13	- IP QA QE	5/25-5/27/83	- Criteria 1, 2, 4 through 7, and 15 through 17. - Training of QE personnel	The audit demonstrated that QE is effectively implementing the applicable criterion audited except for area noted deficient in finding. One finding issued.	1. Only 13 of 30 identified training sessions for QE were held between October 1, 1982, and May 25, 1983.	Finding determined to be in error. Only 29 sessions were scheduled; 25 had been rescheduled and training conducted; the other 4 were not mandatory and were cancelled. Records verified available or generated to reflect.	9/20/84

Audit Summary Report

Audit ID	Organization	Dates of Audit	Areas/Activities Audited	Summary of Audit Results	Findings Issued		CA Taken	Date Findings Closed
Q38-83-14	IP QA Quality Systems	6/29-7/1/83	- Criteria 1, 2, 5, 6, 16, and 17. - Training of QA personnel.	The portion of the IP QA program implemented by the Quality System Section is considered to be effective. Four findings issued.	PD-1	Corporate nuclear program (CNP) requirements regarding training plans and schedules have not been formally incorporated into the IP QA training program procedures.	Procedure revised to incorporate requirement; requirement had been satisfied.	9/20/83
					ID-1	Certain QA records identified in the CPS RIM were not on file in the CPS central file.	Record files in the CPS central file reviewed for completeness. Documents not previously transmitted were forwarded for filing per file code. Responsible personnel retrained.	8/18/83
					ID-2	Annual summary report of NRC IE inspections of IP was not generated for 1982.	The report was not issued since it would duplicate the computerized trending of NRC IE item started in 1983. Procedure revised to eliminate the unnecessary duplication. Responsible personnel trained to revised procedure.	9/22/83
					ID-3	Several deviations from procedures being done without prior written approval from the cognizant Director and/or Manager-QA.	Written deviations approved by the QA Manager. Procedure revised to show correct organizational responsibility to generate subject documents. Retrained responsible personnel.	8/19/83

Audit Summary Report

Audit ID	Organization	Dates of Audit	Areas/Activities Audited	Summary of Audit Results	Findings Issued	CA Taken	Date Findings Closed
Q38-83-15	- IP QA Over-inspection (OI)	10/2-10/6/83	- Criteria 2 - Inspector training and qualification	Training and qualification of OI inspectors evaluated as effective. Procedures for this program were adequate, with regard to program commitments. Three findings issued.	PD-1 No approved and issued procedures defining responsibilities to maintain training files by QA Department Training Coordinator.	Reviewed higher tier documents for other requirements that may affect the training manual. Requirements on responsibilities incorporated into IP QA Department Training, Qualification, and Certification Manual.	12/27/83
					ID-1 Test props for color discrimination for one inspector was not approved.	Procedure revised; supervisor approval of test props deleted. Approved test props identified in IP QA Training Manual.	11/10/83
					ID-2 No objective evidence of inspectors satis-factory completion of some capability requirements of IP QA Training Manual.	Capabilities of inspectors observed during the general, specific, and practical tests. Requirements deleted from manual.	11/10/83
Q38-83-16	- CPS SU - BA	Cancelled	CWRs	N/A	N/A	N/A	N/A

APPENDIX B
Audit Summary Report

Audit ID	Organization	Dates of Audit	Areas/Activities Audited	Summary of Audit Results	Findings Issued	CA Taken	Date Finding Closed
Q38-83-17	- CPS Plant Staff Stores - IP QA QE - IP QA/QC	7/27-8/3/83	- Criteria 2, 5, 10, 13, 15, and 17 - IP QA's receipt inspection process - Training of QA/QC personnel	The effectiveness of IP QA's program for receipt of inspection is considered adequate. Four observations were made: (1) There were no provisions to notify stores when a condition report is written. (2) Items in the QC hold area lack maintenance. (3) There was a lack of proper handling of QA records. (4) There was no method to identify special handling requirements. One finding issued.	QA records were not being stored in temporary fireproof file cabinets when not in use. Standard cabinets are currently being used for storage.	Fireproof cabinets ordered and received. When not in use, QA records being stored in the new fireproof cabinets.	10/24/83
Q38-83-18	- CPS Plant Staff Maintenance	8/30-9/15/83	- Criteria 2, 5, 6, 10, 14, 15, 16, and 17 - MWR - QA interface - Deficiency and safety tagging - Inspector hold points - Retention of records - Use of MWR in maintenance planning and trending	MWR program was evaluated as adequate. Procedures adequate. No findings issued.	None	N/A	N/A

[redacted]

Audit Summary Report

Audit ID	Organization	Dates of Audit	Areas/Activities Audited	Summary of Audit Results	Findings Issued	CA Taken	Date Finding Closed
Q38-83-19	- CPS Site Purchasing - IP Purchasing and Stores - NSED - IP QA QF	8/28-9/2/83	- Criteria 2, 4, 5, and 6 - Interfaces between departments - IP procurement process - Training	- IP's procurement process evaluated as an effective program. - Program geared at backlog or "crisis" level of procurement. - Process needs streamlining. - Each group in compliance; but, viewed as a whole, the system is cumbersome and has a potential for problems. - Several recommendations made. - Three findings issued.	PD-1 NSED could not show objective evidence of NRC approval of ASME code case contrary to FSAR requirements.	Code case incorporated into NRC Regulatory Guide.	11/1/83
					ID-1 NSED reviewing and classifying procurement documents using uncontrolled documents.	NSED personnel were trained to use only controlled or documented sources of information in classification and review process.	11/1/83
					ID-2 PO issued to a vendor for a particular item not covered in the QA qualified supplier list (QSL) scope of supply work for that vendor.	Vendors' scope expanded to cover item procured. Reviewed all ASME vendors on the QSL to expand vendors' capabilities where objective evidence was found that vendors met 10 CFR 50 and ANSI N45.2 requirements. QE and Site Purchasing personnel were trained in scope of QA QSL. Procedure revised to incorporate checking scope of work in procurement document against QA QSL.	10/7/83

Audit Summary Report

Audit ID	Organization	Dates of Audit	Areas/Activities Audited	Summary of Audit Results	Findings Issued	CA Taken	Date Finding Closed
Q38-83-20	- CPS Plant Staff Maintenance - CPS Plant Staff Operations - CPS Plant Staff Services - CPS Plant Staff Technical	9/6-9/13/83	- Criterion 6 - Document control for CPS	Document control activities audited were evaluated as adequate and effective with the exception of the findings issued. Two findings issued.	PD-1 Outstanding TCFs were not incorporated or re-issued to subsequent procedure revisions.	Analysis was made of TCF/revisions and approvals, including the cited instances. Four new TCFs issued incorporating the outdated criteria. Procedure revised to include measures for preventing recurrence.	1/5/84
					PD-2 Procedures do not address the document control requirements for issuance and distribution CNPs.	Changes made to existing procedures to clearly address document control requirements for issuance and distribution of CNP.	1/3/84
Q83-83-21	- NSED - CPS Plant Staff SU	9/13-9/16/83	- Criterion 5 - FPR system	Activities associated with FPR system was evaluated to be effective. No findings issued.	None	N/A	N/A
Q83-83-22	- CPS Plant Staff Operations - CPS Plant Staff Technical	Cancelled	N/A	N/A	N/A	N/A	N/A
Q38-83-23	- CPS Plant Staff	Cancelled	- Nuclear Safeguards Information	N/A	N/A	N/A	N/A
Q38-83-24	- CPS Plant Staff Compliance and Configuration Control Department (CCCD)	11/1-11/3/83	- Criteria 1, 2, 5, 6, and 14, through 17 - Control of Condition Reports	Based on the audit results, the CCCD activities and program are evaluated as effective.	PD-1 QA procedure does not address the requirements of CNP for follow-up on deliquent CA to NCMRs.	Procedure revised to incorporate the requirements. Computer CA program modified to correspond to CNP requirement. Overdue follow-up conducted per procedure and CNP.	4/10/84

Audit Summary Report

Audit ID	Organization	Dates of Audit	Areas/Activities Audited	Summary of Audit Results	Findings Issued	CA Taken	Date Finding Closed
Q38-83-24	(Continued)		- NCMR department interface	One audit observation: procedure references an outdated ANSI standard.	PD-2 Failure of the CPS system controlling NCMRs to provide bi-weekly reports on CA status as required by CNP.	Plant Staff procedures revised to implement the bi-weekly requirements of the CNP. Bi-weekly reports issued. CNP revised to clarify requirements.	2/24/84
			- Personnel indoctrination and training	Two findings issued.			
Q38-83-25	- Various	Cancelled	- IP Fire Protection Program	N/A	N/A	N/A	N/A
Q38-84-01	- IP QA Quality Systems	1/23-1/27/84	- Criteria 2, 5, 15, and 16	QA elements audited were effective with the exception of findings noted.	ID-1 Mandatory training was not completed as scheduled and was not rescheduled.	Computer tracking program developed to monitor and control personnel requiring mandatory training.	9/24/84
	- IP QA Record Review		- CA - Records verification	Personnel exhibited a high awareness for quality requirements and a high degree of professionalism.			
			- Information management operation		ID-2 Some computer data entered was not verified.	Data entered re-reviewed. Future data entries will be monitored by Information Management Lead. Procedure revised for completing and inputing computer services request. Section personnel trained.	5/4/84
			- Training - Stop Work Action - Reporting deficiencies	Observations noted and recommendations made for improving the trending of proposed CA and effectiveness of CA and the scheduling of training.			
			- MCARs - IE activities	Four findings issued.	ID-3 Record deficiency reports were not issued for BA final accept travelers; DEL line items were used instead. DEL status on checklists was not indicated.	Reviewed all inadequate record packages checklists to ensure deficiencies were either documented on DELs or record deficiency reports, and status and signatures were noted as applicable.	4/13/84

Audit Summary Report

Audit ID	Organization	Dates of Audit	Areas/Activities Audited	Summary of Audit Results	Findings Issued	CA Taken	Date Finding Closed
Q38-84-01	(Continued)				ID-4 At QE's request, two condition reports were invalidated without adequate justification.	A letter of justification for invalidation was generated as a supplement to the two condition reports. Training was conducted for QE personnel.	4/10/84
Q38-84-02	- CPS Plant Staff Maintenance	3/5-3/9/84	- Criteria 1, 2, 4 through 9, 11, 12, 13, 16, and 17 - Review control of MWRs - Procurement documents - Spare and replacement parts - Special processes - M&TE - Performance of surveillance tests - Established interfaces for In-service Inspection Program (ISI) - Preventive Maintenance Program	CPS Maintenance Department's QA Program was evaluated as effective. Personnel demonstrated a high degree of knowledge of the quality requirements. Five findings issued.	PD-1 Procedure for ISI does not address Maintenance Department's processing of records from subcontractor, and procedure for control of M&TE does not address function of index in M&TE master equipment identification number list.	Procedures revised to address.	12/5/84
					ID-1 Maintenance Department procedure does not reflect current organizational structure or functional responsibilities.	Revised procedures to incorporate.	9/10/84
					ID-2 Inspection and test requirements not specified in process control procedures for welding.	Inspection and test requirements were incorporated into the procedures via TCFs.	4/19/84
					ID-3 Condition reports not used to document discrepancies found during receiving inspection of special items.	Procedure was revised to incorporate use of over, shortage, damage, and incorrect report.	4/10/84

Audit Summary Report

Audit ID	Organization	Dates of Audit	Areas/Activities Audited	Summary of Audit Results	Findings Issued	CA Taken	Date Finding Closed
Q38-84-02	(Continued)				ID-4 Temporary change to welder qualification and certification procedure was approved and issued without NSED review and approval.	NSED evaluated change to procedures; procedure does not rquire NSFD review and approval. No CA required.	9/11/84
Q38-84-03	- IP QA QF - IP QA Administration	4/23-4/25/84	- Criteria 1 through 9, 11, 15, 16, and 17	The QF and Administrative sections of IP QA are evaluated as effectively implementing the activities audited. Three audit findings issued.	PD-1 The QA procedure for quality verification plans does not contain sufficient detail to control activities pertaining to the quality verification plans.	QA procedures and instructions revised to include the necessary controls.	7/18/84
					PD-2 Safeguards information procedure lacks approval by the QA Manager and other details.	Procedure revised to incorporate the required information. Approved by the QA Manager.	7/16/84
					ID-1 NSED failed to evaluate AMP Special Industries prior to issuance of two POs to them.	NSED evaluated and documented approval of AMP Special Industries: NSED reviewed their files for like conditions and corrected those in error.	5/8/84
Q38-84-04	- NSED	4/23-5/1/84	- Equipment qualification - Site acceptance of qualification packages - Design change document reviews and interfaces	QA Program elements as applied were ineffective. Activities were not accomplished under QA Program.	PD-1 Equipment qualification program activities were not accomplished under the QA Program. Procedures were not reviewed and approved by QA.	Program and procedures revised and reviewed by QA; previous activities accomplished in accordance with new program/procedure.	1/2/85

Audit Summary Report

Audit ID	Organization	Dates of Audit	Areas/Activities Audited	Summary of Audit Results	Findings Issued	CA Taken	Date Finding Closed
Q38-84-04	(Continued)		- Records control - Input to maintenance - Task progress	Several observation, comments, and recommendations were made for program improvements. Two findings issued.	PD-2 All design changes made to qualified equipment are not being reviewed by S&L for impact.	Open	Open
Q38-84-05	- EAD	4/23-4/25/84	- Criteria 1, 2, 4, 5, 6, 13, 14, 16, and 17	The activities performed by EAD were evaluated as effective in meeting the criteria audited. One finding issued.	PD-1 [illegible]ment control system [illegible] use by EAD does not ensure that the proper documents to be used in an activity are identified and that personnel are provided with approved, current documents.	Procedure was reviewed and revised to incorporate the necessary document control criteria.	7/9/84
Q38-84-06	- CPS Plant Staff SU	5/16-5/25/84	- Criteria 1, 2, 3, 5, 6, 11, 15, and 17 - Training and certification - Temporary alterations - Rework, repairs - Turnover	IP QA evaluated the activities of the SU Group as effective with exception to the findings issued. One recommendation was that more attention be given to using indelible ink on QA records. Two audit findings were issued.	PD-1 Proper and current procedures, instructions, and drawings were not being used to perform SU activities.	No CA required; items investigated and were found invalid.	9/10/84
					ID-1 Many design changes had been incorrectly assigned and forwarded for evaluation.	a. Assigned design changes were recalled and reassigned. b. Personnel trained on guidelines for reassignment. c. Procedure revised to clarify assignment requirements and guidelines.	9/10/84

Audit Summary Report

Audit ID	Organization	Dates of Audit	Areas/Activities Audited	Summary of Audit Results	Findings Issued	CA Taken	Date Finding Closed
Q38-84-07	- IP QA QC	5/22-5/25/84	- Criteria 1, 2, 4, 6, 7, 9, 10, and 12 through 17 - Training and Certification - Receipt Inspection - Inspection to Quality Control inspection procedures - Nondestructive examination (NDE) - Control of M&TE - Tagging of Nonconformances	QC section activities evaluated as effective. Three findings issued.	ID-1 Two obsolete/superseded documents had not been replaced in a timely manner.	Documents were replaced with current documents; verification accomplished for other documents.	9/18/84
					ID-2 Qualification test record for NDE procedures was not processed or used properly.	Procedure was revised to clarify requirements, and personnel trained to requirements.	8/27/84
					ID-3 One inspector's annual vision test was 30 days overdue.	Vision test given and passed. Inspection records were reviewed for impact (none affected). Established control measures to track eye examination expirations.	10/15/84
Q38-84-08	- CPS Plant Staff - RA System Release and Completion - [illegible]	5/29-6/1/84	- CWR program - Criteria 2, 3, 5, 6, 10, 11, 16, and 17 - SAP - 2 - BAP - 2.27	CPS CWR Program is effective in controlling quality-related activities. Four findings issued.	PD-1 Procedures or instructions not available to determine if a retest on CWR work is necessary.	Procedure revised to refer to proper procedure for retest evaluation.	9/11/84
					PD-2 Procedure or instruction not available to determine if traveler is required.	No CA required. Procedure reevaluated as adequate.	7/13/84
					ID-1 Three travelers did not contain copies of the CWR.	Copies of CWRs were included in travelers where required.	6/29/84

Audit Summary Report

Audit ID	Organization	Dates of Audit	Areas/Activities Audited	Summary of Audit Results	Findings Issued	CA Taken	Date Finding Closed
Q38-84-08	(Continued)				ID-2 Safety-tagging log not maintained per procedure.	Appropriate requirements implemented; procedure revised to clarify; training conducted.	7/17/84
Q38-84-09	- NSED	6/25-6/29/84	- Criteria 1, through 7, 9, 11, 15, 16, and 17 - ASME QA Program manual activities	QA Program implemented by NSED evaluated as effective based on results of audit and limited ASME activity available for review.	PD-1 Departmental procedure regarding responsibility assignment not consistent with CNP.	Procedure revised and work rereviewed to ensure compliance with CNP; reviewed other procedures to ensure consistency.	9/10/84
			- NSED training	Five findings issued.	ID-1 Personnel performing activities prior to receiving training.	Personnel determined to have received training but it was not documented; retraining provided and documented.	9/10/84
					ID-2 Administrative errors in updating department procedures manuals.	Inventory and correction of affected manuals.	9/10/84
					ID-3 Engineering review approvals do not document approval by responsible engineer as required by ASME QA Manual, only the Supervisor-Engineering.	One signature determined to be sufficient; ASME QA Manual revised.	9/10/84
					ID-4 Identification of cause and CA not included on NCMRs processed by NSED.	Responsibility for identifying cause and CA assigned to plant staff per procedure revisions. Affected NCMRs were rereviewed and data included.	9/10/84

Audit Summary Report

Audit ID	Organization	Dates of Audit	Areas/Activities Audited	Summary of Audit Results	Findings Issued	CA Taken	Date Finding Closed
Q38-84-10	- CPS Project Management - IP QA - Nuclear Support - Nuclear Training - CPS Plant Staff	7/8-7/13/84	- IP ASME document control and records programs - Criteria 6 and 17 - Receipt, issuance, control, and recall of design documents - Review of system that provides status of design documents - Issuance and control of ASME QA Manual and supporting departments, procedures, and instructions - Review, approval, and transmittal of records - Storage and retrievability of records	Programs were not implemented to the point where evaluation of effectiveness could be made. No findings issued.	None	N/A	N/A

Audit Summary Report

Audit ID	Organization	Dates of Audit	Areas/Activities Audited	Summary of Audit Results	Findings Issued	CA Taken	Date Finding Closed
Q38-84-11	- CPS Project Management - IP QA - Nuclear Support - Nuclear Training - CPS Plant Staff	7/9-7/13/84	- IP ASME QA Program - Criteria 1, 2, 4, 5, and 7 through 16	Results indicate ASME QA Program has not been implemented to the extent necessary for complete evaluation. Recommendations were made to enhance CA Program. Some items of concerns were noted: - training has not been fully implemented. - CWRs do not reference repair/modification PO and QE review of CWRs, and startup procedure does not address this requirement. - No specific NCMRs were identified to ASME piping systems. No findings issued.	None	N/A	N/A

Audit Summary Report

Audit ID	Organization	Dates of Audit	Areas/Activities Audited	Summary of Audit Results	Findings Issued	CA Taken	Date Finding Closed
Q38-84-12	- IP QA OI	6/23-6/26/84	- Overinspection activities - Criteria 1, 2, 5, 6, 10, 15, and 17 - Training and certification - Procedure control and implementation Inspections - M&TE - Nonconformances - QA records	- OI quality-related activities were evaluated as effective. - Personnel had an excellent working knowledge of instructions and inspection techniques and exhibited an excellent awareness for quality. - Program is well delineated in instructions and procedures and controlled in a professional manner. - One observation was noted where an attribute was marked satisfactory instead of N/A on checklist. No findings issued.	None	N/A	N/A

Audit Summary Report

Audit ID	Organization	Dates of Audit	Areas/Activities Audited	Summary of Audit Results		Findings Issued	CA Taken	Date Finding Closed
Q38-84-13	- NSED - Nuclear Support - CPS Plant Staff - Nuclear Training - IP QA - CPS Plant Staff SU - IP Purchasing and Stores - CPS Site Purchasing - CPS Project Management	7/24-7/27/84	- CPS control of safeguards information - 10 CFR 73.2 and 10 CFR 73.21	Based on the audit results, the CPS program for controlling safeguards information is evaluated as ineffective. Twelve findings issued.	PD-1	NSED has not performed an evaluation of the control of safeguards information.	Program evaluation performed. Procedure revised to clarify the periodic program evaluation requirements.	10/25/84
					PD-2	NSED Safeguards Information Program authorizes access to information without documenting an established need-to-know.	The finding is not a valid interpretation of 10 CFR 73.21. No documentation of the need-to-know determination needed and no CA required.	9/10/84
					PD-3	Nuclear Training has not established a custodian and alternate for controlling safeguards information.	The safeguards custodian designation form was revised to include primary and alternate custodians as required.	8/31/84
					PD-4	Nuclear Training's procedure does not adequately address all requirements of the CNP.	Procedure was revised to include the CNP criteria and subsequently cancelled on 10/30/84. Nuclear Training has been removed from the authorization list to control safeguards information, dated 9/20/84.	11/13/84

Audit Summary Report

Audit ID	Organization	Dates of Audit	Areas/Activities Audited	Summary of Audit Results	Findings Issued	CA Taken	Date Finding Closed
Q38-84-13	(Continued)				PD-5 IP QA authorizes access to information without documenting an esta-bli hed need-to-know.	Open	Open
					PD-6 Purchasing and Stores has not established a custodian and alternate for controlling safe-guard information.	Purchasing and Stores removed from the authorized list to control safeguards informa-tion, (-te. 9/20/84.	10/16/84
					PD-7 Purchasing and Stores does not have an esta-blished procedure to control safeguards information.	Purchasing and Stores removed from the authorized list to control safeguards informa-tion, dated 9/20/84.	10/16/84
					ID-1 Startup could not locate objective evidence of document transmittals receipt acknowledgements.	Startup accounted for transmittals in question and obtained receipt acknowledge-ments; personnel with safeguard information access trained to the requirements.	10/5/84
					ID-2 NSED lost documents were not identified to the Manager-NSED or Administrative Supervisor.	Lost documentation evaluated as not impacting CPS security interests; retraining on reporting requirements conducted.	9/7/84

Audit Summary Report

Audit ID	Organization	Dates of Audit	Areas/Activities Audited	Summary of Audit Results	Findings Issued	CA Taken	Date Finding Closed
Q38-84-13	(Continued)				ID-3 NSED's safeguards information file cabinet does not meet Government Services Administration approval requirements of 10 CFR 73.2.	Subject cabinet meets 10 CFR 73.2 via use of alternative criteria written by the NRC. No CA required.	9/10/84
					ID-4 NSED transmitting safeguards information to other departments without an established need-to-know.	Finding reevaluated invalid. No CA is required.	9/10/84
					ID-5 Nuclear Training does not have a GSA-approved file cabinet per 10 CFR 73.2.	The subject file was modified via addition of a locking bar and padlock to meet requirements. Nuclear training removed from the authorization list to control safeguards information, dated 9/20/84.	12/5/84
Q38-84-14	- NSED - CPS Plant Staff - IP QA	8/6-8/13/84	- IP response to NRC Generic Letter 83-28, "Salem ATWS"	Response to Sections 1.1, 1.2, 2.1, 2.2, 3.1, and 3.2 of the Generic Letter is adequate. Proposed responses addressed the subjects directly or by specific reference. Responses requiring more detail were revised and corrected during course of audit. No findings issued.	None	N/A	N/A

Audit Summary Report

Audit ID	Organization	Dates of Audit	Areas/Activities Audited	Summary of Audit Results	Findings Issued	CA Taken	Date Finding Closed
Q38-84-15	- Nuclear Support	8/6-8/9/84	- Criteria 1, 2, 5, 6, 16, and 17 - Status of Emergency Planning Program - Training of Nuclear Support Department (NSD) personnel - Records management	Activities performed by NSD to implement QA program evaluated as effective. Effectiveness of Emergency Planning Program could not be evaluated due to the limited program implementation. Some comments, observations, and recommendations were made for improving program implementation. One finding issued.	ID-1 Documented evidence of training program requirements for NSD personnel not available.	Training program requirements not documented were performed and filed in records. Training coordinator assigned and responsibilities defined.	9/25/84
Q38-84-16	- CPS Site Purchasing - IP Purchasing and Stores - NSED - IP QA QE	8/20-8/28/84	- Criteria 1, 2, 4 through 7, 15, 16, and 17 - Procurement document control - Training of personnel involved in procurement document processing and control	IP activities for procurement document control effective, with exceptions identified in findings. Six findings were issued.	PD-1 NSED personnel were not trained on revision to department procedures.	Personnel trained, and training documented and filed. Procedure revised to require such training.	10/25/84
					ID-1 Documentation of transmittals not being maintained by Purchasing and Stores as required.	Training conducted and documented.	10/1/84
					ID-2 Independent reviews of some special procurement POs not accomplished or documented by Site Purchasing.	Affected POs reviewed and documented; retraining accomplished.	10/4/84
					D-3 Instructions for logging receipt of vendor document information were not established by NSED.	NSED instruction developed and issued; documentation received to date was processed accordingly.	10/25/84

Audit Summary Report

Audit ID	Organization	Dates of Audit	Areas/Activities Audited	Summary of Audit Results	Findings Issued	CA Taken	Date Finding Closed
Q38-84-16	(Continued)				ID-4 Supplier not removed from QA-QSL when major deficiencies were noted in recent audit.	Supplier deficiencies reviewed earlier did not warrant removal from QA-QSL. Procedure revised to clarify.	11/15/84
					ID-5 Some active suppliers of non-ASME material/supplies not audited on a triannual basis.	QA-QSL updated. Audits scheduled as required. Trained QE personnel on requirements for identifying when audit due.	11/15/84
Q38-84-17	- CPS Plant Staff Startup - CPS Plant Staff Maintenance	11/7-11/15/84	- Criteria 1, 2, 3, 5, 6, 11 through 14, 16, and 17 - MWRs	Based on the results of this audit, the activities performed by IP SU to implement the QA Program were evaluated as effective. The CPS Maintenance Department processing of MWRs was found to be effective. Two findings issued.	ID-1 Design change evaluations had not been initiated to review revisions to S&L M06 series drawings for effect on test program and schedule.	Open	Open
					ID-2 Controlled copies of the Startup Manual and associated procedures/instructions were not being properly maintained.	Open	Open
Q38-84-18	- Various	Cancelled	- CA to Institute of Nuclear Power Operations findings	N/A	N/A	N/A	N/A

Audit Summary Report

Audit ID	Organization	Dates of Audit	Areas/Activities Audited	Summary of Audit Results	Findings Issued		CA Taken	Date Finding Closed
Q38-84-19	- CPS Site Purchasing IPQA - Nuclear Support - CPS Plant Staff - NSED - Nuclear Training	9/17-9/25/84	- IP ASME QA Program - Criteria 1, through 7, 9, 11, 15, 16, and 17 - Training for ASME activities	ASME Program evaluated as effective, except as noted in findings. Eight of 13 program elements evaluated as satisfactory with no findings. Nine findings issued in other program elements.	PD-1	Procedure does not explicitly require removal of supplier from QSL when audit is not performed.	Procedure was revised to clarify; no specific violations were noted.	10/19/84
					PD-2	Not issued; clarified and withdrawn at exit.	N/A	N/A
					PD-3	Conflicts existed in NSD procedures with ASME QA Manual regarding document control and records control.	Revised NSD procedures and/or ASME QA Manual to provide consistency and resolve conflicts; conducted training.	11/20/84
					PD-4	One approved pressure test procedure was not retained by NSED.	Missing procedure obtained and filed. Procedure revised to routinely provide.	11/5/84
					ID-1	Some NSED training records did not contain signatures or initials of personnel receiving training.	Obtained necessary signatures/initials and updated records. Revised procedures to specifically require.	10/25/84
					ID-2	No objective evidence available to show ANI was notified of impending pressure test.	ANI had been notified, as evident by his signature on the test data sheets. Issued notification point letter to redirect responsibility to BA under the BA-K-2882-27 contract.	11/5/84

Audit Summary Report

Audit ID	Organization	Dates of Audit	Areas/Activities Audited	Summary of Audit Results	Findings Issued	CA Taken	Date Finding Closed
Q38-84-19	(Continued)				ID-3 PMP distribution list was not approved, and follow-up of transmitted documents was overdue.	Distribution list controls established (approval by transmittal); follow-up was accomplished and completed.	11/5/84
					ID-4 NSED distribution list not approved; wrong transmittal used and follow-up of transmitted documents was overdue.	Distribution list controls were established (approval by supervisor), follow-up was accomplished; correct transmittal was being used.	11/5/84
					ID-5 QSL and supporting documents were not issued as controlled per ASME QA Manual.	QSL was updated, revised, and reissued; procedures revised to clarify requirements.	10/25/84
					ID-6 Incomplete documentation to support IP approval of S&L as design contractor for ASME.	Appropriate documentation obtained and placed in file.	10/19/84

Audit Summary Report

Audit ID	Organization	Dates of Audit	Areas/Activities Audited	Summary of Audit Results	Findings Issued	CA Taken	Date Finding Closed
Q38-84-20	- Nuclear Training Department (NTD)	10/3-10/5/84	- Criteria 1, 2, 5, 6, and 17	Activities performed by NTD are evaluated as effective.	ID-1 The required reading list does not specifically identify the documents which were read.	Open	Open
				Observation: the planning and scheduling of activities performed by the NTD requires attention to assure that the overall effectiveness of the program will not be impaired.	ID-2 Implementing schedule has not been established for review of departmental training procedures and issue of NTD manual and procedures.	Schedule established and implemented. Responsible person employed.	1/7/85
				Four findings issued.	ID-3 Schedule has not been established for implementation of CNP requirements.	Open	Open
					ID-4 Quarterly training schedules for NTD have not been established.	Open	Open

Audit Summary Report

Audit ID	Organization	Dates of Audit	Areas/Activities Audited	Summary of Audit Results	Findings Issued	CA Taken	Date Finding Closed
Q38-84-21	- CPS Plant Staff	10/15-10/30/84	- Criteria 1 through 8 and 11 through 17 - Phase II Release Program - Condition report and NCMR programs	The QA Program and the activities performed by Plant Staff to implement the QA Program are evaluated as effective, except as indicated in the audit findings. Several weaknesses were noted in the Phase II release program. No findings were issued in this area since no safety-related systems have been released. Four findings issued.	PD-1 The Chemistry and Radwaste Departments do not have an approved training program. The previously approved procedure controlling training was cancelled on 10/18/84.	Open	Open
					ID-1 No objective evidence to show that biannual review of Plant Staff procedures was performed.	Existing objective evidence placed in files; revised procedure to clarify type of objective evidence to be generated.	12/31/84
					ID-2 Chemistry Department records, approximately 2 years old, have not been transmitted to the Records Management Group.	Open	Open
					ID-3 Control of plant procedures in the Radwaste Department was not being performed. Extra set of procedures found and an outdated revision was being used.	The extra set of approved procedures were in fact controlled, yet the distribution lists had not been updated. Distribution lists have been updated. The superseded procedure was replaced by latest revision. Applicable personnel were retrained.	12/5/84

Audit Summary Report

Audit ID	Organization	Dates of Audit	Areas/Activities Audited	Summary of Audit Results	Findings Issued	CA Taken	Date Finding Closed
Q38 84-22	- CPS Project Management	11/19-11/21/84	- Criteria 2, 5, 6, 15, 16, and 17	QA Program activities audited were evaluated as effective with exception to the audit findings issued. Three findings issued.	ID-1 The Construction Manager has not maintained sta' ASME Section XI repairs since 10/2/84.	Open	Open
					ID-2 Vendor site representatives were brought on site without following procedural requirements.	Open	Open
					ID-3 Scheduled dates were not met for commitments, and new schedule dates were not established or revised in the commitment tracking log.	Open	Open

APPENDIX C
STOP WORK ACTIONS

This appendix provides a summary of all of the stop work actions (SWA) that Illinois Power Company (IP) has taken to ensure that activities affecting quality are properly performed at the Clinton Power Station (CPS). Table C-1 contains a brief description of the reason for the SWA and the corrective action or recovery program that IP developed to correct the specific deficiencies in those identified areas.

Table C-1

Stop Work Actions

Subject of Stop Work	Reason	Recovery/Corrective Action
SWA-001: All civil installation of safety-related embedments	1. Lack of proper control in using the traveler system. Embedment plates were being withdrawn from the warehouse and installed prior to issuance of embedment traveler.	1. Baldwin Associates Procedure (BAP) 2.9, Embedment Installation, was revised to require embedment bills of material to be part of the traveler; therefore, the traveler must be issued before embedment material could be withdrawn.
	2. Previous corrective action for this problem was not effective.	2. Memo was issued requiring tighter adherence to procedures.
		3. It was verified that quality control (QC) had inspected and accepted all embed work that had been completed without travelers. Dimensions and material traceability were verified.
SWA-002: Heating, ventilating, and air conditioning (HVAC) seismic category I hangers and associated work	The HVAC subcontractor's (Zack) procedure for fabrication and installation did not cover all activities necessary to assure quality.	1. The subcontractor agreed to submit logic flow charts and inspection forms that would be used to develop procedures.
		2. The subcontractor agreed to revise their procedures to meet the methodology contained in their flow charts.
		3. The subcontractor agreed to submit new procedures covering plant fabrication, site fabrication, and site installation.
		4. The subcontractor agreed to submit a schedule for completion of procedures.

Stop Work Actions

Subject of Stop Work	Reason	Recovery/Corrective Action
SWA-003: Installation of reactor water cleanup valves 1G36-F033A and F033B	Construction received a "speed letter" that identified problems associated with welding soft-seated valves into the system. Construction used the letter to disassemble the valves without travelers or other documentation or QC inspection.	1. Procedure for valve disassembly and re-assembly was prepared by Balwin Associates (BA) and approved for use by General Electric Company (GE). 2. Traveler was prepared to include step-by-step instructions and inspections. 3. Affected superintendent was instructed in documentation requirements.
SWA-004: Lifting and setting of power generation control complex panels in the main control room	Bypassing a QC hold point.	1. Affected personnel were reinstructed regarding traveler requirements. 2. Sequence of work operations was reviewed with all affected personnel. 3. Superintendent was instructed to ensure that all necessary persons were present prior to commencing work.
SWA-005: Installation of expansion anchors	Core drilling for installation of expansion anchors was performed by the subcontractor (Zack) in violation of specification requirements.	1. The subcontractor's concrete expansion anchor procedure was revised to prohibit core drilling. The procedure was approved by Sargent & Lundy (S&L). 2. The subcontractor's personnel were trained per the new procedure.

Stop Work Actions

Subject of Stop Work	Reason	Recovery/Corrective Action
SWA-006: All preheat and post-weld heat treatment except N-4 closure spools at azimuth 135° in containment), which were in progress when the stop work was imposed	Accidental welding of a ground lead to the reactor pressure vessel.	1. All extra leads were removed from the containment. 2. All leads in use were marked with the applicable welding operation. 3. Protective covers were provided for cable connectors. 4. All power leads were routed to preclude contact with reactor vessel. 5. Job instruction P-024, Control of Pre-heat of Weldments, was revised. 6. Cognizant personnel were retrained.
SWA-007: Installation of electrical cable tray attachments; installation of Class IE cable in any tray that has deficiencies which could be a hazard to the cable	CAR No. 077: QC inspectors may have improperly identified the raceway attachment type used for numerous attachments on 118 raceway inspection packages. In addition, other system problems associated with documentation of raceway installation may have existed, which could affect the acceptability of the raceway.	1. BAP 3.3.1, Covered Raceway Installation, was divided into several procedures: - BAP 3.3.1: Conduit Installation - BAP 3.3.6: Electrical Raceway Supports - BAP 3.3.10: Cable Tray Installation - BAP 3.3.11: Cable Tray Attachments 2. Cable tray packages were replaced with detailed travelers to provide better control of installation and inspection activities.

Stop Work Actions

Subject of Stop Work	Reason	Recovery/Corrective Action
		3. Detailed individual cable tray hanger and attachment drawings were prepared to provide installation details and inspection criteria. 4. BAP 3.3.9, Cable Protection, was initiated to provide cable protection during rework activities. 5. Personnel were trained per the new or revised procedural requirements. 6. Existing cable tray and attachments were reinspected using the new procedures and travelers.
SWA-008: Reactor recirculation system pump motors	Work was performed without a traveler. The shipping plate was unbolted, cooling coil assembly lowered, and thermocouple removed in order to implement a GE field disposition instruction.	1. Accountability for the motors was transferred from BA to GE. 2. The field disposition instruction work was completed by GE. 3. The motors were transferred back to BA.
SWA-009: All welding	Weld rod labeled as AWS E-7018, which is carbon steel, was found to be non-ferrous.	1. All weld rods in the field were returned to the custody of Technical Services. 2. All weld rods manufactured by Airco, supplier of the mislabeled rod, were impounded. 3. Mislabeled rod was analyzed and found to be similar to AWS E-309, which is austenitic stainless steel.

Stop Work Actions

Subject of Stop Work	Reason	Recovery/Corrective Action
		4. Tests were conducted using E-309 wire coated with E-7018 flux to determine as-deposited weld characteristics. 5. All welds previously made with rods from the affected lot were identified and tagged. 6. A statistical sample of welds made with the rod from the affected lot was analyzed. All were acceptable. 7. The supplier problem that resulted in the mislabeled rod was corrected. 8. BA Technical Services instituted a program to check all ferrous weld rod with a magnet before releasing for use.
SWA-010: All work on drywell refueling bellows assembly	1. Refueling bellows assembly was temporarily installed with a traveler, but subsequently removed without a traveler or QC verification of the work.	1. Trained craft and supervisory personnel in the proper use of travelers.
	2. The supplier, Pathway Bellows, Inc., examined welds using surface method, liquid penetrant, rather than volumetric, ultrasonic/radiography, as required by the specification.	2. A. Accessible welds were radiographed on site. Results were evaluated by S&L. B. Ultrasonic examination was performed by Southwest Research Institute to map indications for S&L evaluation.

Stop Work Actions

Subject of Stop Work	Reason	Recovery/Corrective Action
		C. S&L performed fracture mechanics or crack propagation analysis.
		D. Liquid penetrant examination was performed and linear indications were repaired.
	3. Pathway purchased weld filler material from an unapproved supplier, Sandvik, and without a purchase order.	3. A. Pathway's material control program was audited by BA and found to be acceptable.
		B. BA determined Sandvik to be an acceptable supplier.
		C. BA reviewed Pathway documentation and verified the traceability of weld filler material through the Pathway fabrication process.
SWA-011: Terminations on all Class IE instrumentation cable of the following types: 02163, 03163, 04163, 08163, 16163, and 24163 multiconductor #16 AWG	Shorting problems associated with terminating the shield drain lead.	1. S&L developed a new splice configuration.
		2. Previously affected cables were reworked using the new configuration.

Stop Work Actions

Subject of Stop Work	Reason	Recovery/Corrective Action
SWA-012: All core drilling	Core drilling had been performed in violation of procedure. QC was not informed of core drilling prior to the operation; therefore, required inspections were not performed.	1. The core drilling release form was revised to required QC sign-off as a mandatory hold point.
		2. The core drilling procedure was revised to require QC involvement in the issue, use, return, and storage of core drilling bits.
		3. The concrete expansion anchor installation procedure was revised to require QC to verify that S&L's approval had been obtained to cut rebar and that only rebar and not concrete was cut with core drills.
SWA-013: All fuel pool liner fabrication, repair, and attachment removal	Incorrect or insufficient definition of ASME Code Classification for work being performed.	1. S&L confirmed which specifications were applicable to the various types of work.
		2. BAP 1.9, Control of Stainless Steel, was revised to clarify applicability of ASME code and S&L specification requirements to temporary attachment work.
		3. A matrix was issued to clarify ASME code requirements for the various portions of fuel pool liner work.
		4. All affected travelers were reviewed and revised as necessary to state correct requirements.

Stop Work Actions

Subject of Stop Work	Reason	Recovery/Corrective Action
SWA-014: All safety-related HVAC work	Significant deficiencies were identified by IP's Verification Team and by BA Quality Assurance (QA) Group in the HVAC QA Program and in documentation of inspections.	One recovery program encompassed these three SWAs. The scope of the program included site receipt, installation, inspection, and turnover of all safety-related and seismically designed HVAC systems and components; material procurement, fabrication, and shipment of HVAC material, prefabricated components, and sub-tier vendor-supplied items; and verification that all work installed prior to the SWAs met all specification and regulatory requirements. Specific CAs were as follows: 1. The subcontractor's QA and construction program was completely revised and approved by BA, IP, and S&L. 2. A CPS-unique QA manual was developed by the subcontractor, tailored to the CPS HVAC specification. 3. All subcontractor field construction procedures and field QC procedures were rewritten and approved for use. 4. Additional procedures were written by the subcontractor to better define activities affecting quality. 5. IP directed S&L to issue individual HVAC duct hanger drawings to replace the previous hanger schedules and specific details. All inspections, reinspections, and new work used the new hanger drawings.
SWA-015: All attachments of non-safety-related hangers to seismic category I structures.	Inadequate QA and QC procedures for inspection and documentation of this work.	
SWA-020: All non-safety HVAC work in seismic category I structures.	Inadequate controls for construction and inspection of non-safety, seismically designed duct and hangers.	

Stop Work Actions

Subject of Stop Work	Reason	Recovery/Corrective Action
		6. The subcontractor filled the Project Manager and QC Manager vacancies and established an Assistant Project Manager position for welding and special projects. 7. IP filled the BA HVAC Manager vacancy. 8. The subcontractor QA reviewed inspection documentation for all completed and in-process work. Installations with incomplete or questionable documentation were reinspected. 9. All HVAC quality documentation which was vaulted at the time of the SWA was reviewed in accordance with the records verification program. 10. All accessible completed non-safety seismic work was reinspected by the subcontractor. Nonconformances were corrected and evaluated for impact on inaccessible work. All accessible non-safety seismic work was then subjected to 100% inspection by BA field verification (FV), and 20% overinspection (OI) by IP. 11. All accessible completed safety-related work transferred to BA was subjected to 100% inspection by BA FV, and 20% OI by IP.

Stop Work Actions

Subject of Stop Work	Reason	Recovery/Corrective Action
		12. The IP Overinspection Program was expanded to include 100% FV by BA and 20% OI by IP until adequate confidence was gained in the corrective action to permit a sampling plan to be implemented.
		13. The subcontractor reinspected all safety and seismic work that was delivered to CPS but not installed.
		14. The subcontractor was directed by IP to complete all remaining fabrication work on site.
		15. IP and BA increased audits and surveillances of the subcontractor.
SWA-016: All new conduit installation except containment (later revised to cover all conduit installation)	Inspection backlog	1. Procedures for conduit installation were revised to require travelers for control and documentation of construction and inspection activities.
		2. An in-process traveler group was established to control the flow of work to the field to ensure that inspections were performed in a timely manner following completion o construction.
		3. Training was conducted per the new requirements.

Stop Work Actions

Subject of Stop Work	Reason	Recovery/Corrective Action
		4. Prepared travelers for and reinspected all previously completed conduits. Portions of this corrective action were completed as part of the phased release of the SWA; the remainder was completed after the SWA was lifted. IE Report 83-13 documents Nuclear Regulatory Commission concurrence to lift the SWA.
SWA-017: Electrical equipment installation	Improper processing and review of travelers and lack of a controlled system existed for issuance of travelers. This resulted in electrical equipment installations not being completed and inspected in a timely fashion.	1. The traveler logging system was revised to provide a better flow of documentation and promote prompt completion of work. 2. An in-process traveler group was established to control the flow of work to the field to ensure that inspections were performed in a timely manner following completion of equipment installation. 3. Personnel were trained per the new requirements.
SWA-018: Electrical instrumentation installation	1. Traveler preparation, review, revision, and control procedures were not adequate. Procedures were not adhered to.	1. A. The instrumentation traveler procedure was revised. B. Personnel were trained per the new requirements. C. Existing travelers were reviewed and revised as necessary to meet latest requirements.
	2. CAR 094: S&L instrument data sheets were not being maintained up-to-date.	2. A. All existing data sheet books were recalled.

Stop Work Actions

Subject of Stop Work	Reason	Recovery/Corrective Action
		B. S&L revised the method of issuing revised data sheets.
		C. BA Document Control Center established a computer tracking system.
		D. Data sheet books were re-issued as controlled documents.
		E. Affected instruments were evaluated for adequacy.
SWA-019: Containment structural steel	IP management corrective action request No. 02:	
	1. The structural steel erection procedures did not address the use and re-use of high-strength bolts.	1. The procedure was revised to prohibit re-use of high-strength bolts.
	2. As-built drawings did not have connections dated.	2. All previously completed connections not dated or stamped were re-inspected.
	3. As-built drawings and inspection reports were not filed together or cross-referenced.	3. Previously completed drawings and inspection reports were filed together.
	4. There was no evidence of in-process inspections on some structural steel installations.	4. The procedures were revised to clarify inspection records requirements. Connections with no evidence of inspection were reinspected.

Stop Work Actions

Subject of Stop Work	Reason	Recovery/Corrective Action
	5. Bolted connections have ASTM A-490 bolts substituted in part or completely for the required ASTM A-325 bolts.	5. S&L issued an engineering change to allow the substitution.
	6. Structural steel erection checklists did not identify the items to which they applied.	6. Unique traceability was established between checklists and connection drawings for previously inspected connections.
	7. Structural steel as-built drawings that had been used as inspection records were destroyed when revised drawings were issued.	7. All bolted connections that were not documented on available drawings were reinspected. Remaining drawings were placed in locked files with appropriate access controls.
SWA-021: The air infiltration test of the containment gas control boundary was performed by the subcontractor	Lack of approved test procedure.	1. Test procedure was prepared and approved. 2. Specific training was given to personnel involved with the test. 3. All supervisory personnel were counseled in the need for procedures for safety-related activities.

Stop Work Actions

Subject of Stop Work	Reason	Recovery/Corrective Action
IP purchasing of spare and replacement parts	The results of a special surveillance indicated that commitments to the safety analysis reports were not being met. Specifically:	
	1. There was no documented plan for coordination of replacement part purchasing among IP departments.	1. A management guide (later a corporate nuclear procedure) was approved to describe the procurement process for spare and replacement parts and organization responsibilities. IP QA assumed procurement document approval responsibilities.
	2. No documented or consistent method was in use for initiation of replacement part purchases.	2. A uniform and coordinated approach was implemented via the management guide.
	3. The method for transfer of parts from BA to IP did not assure traceability.	3. Stores transfer procedures were developed and implemented to provide control and traceability of parts.
	4. Safety classifications were not properly used for replacement part purchases.	4. Nuclear Station Engineering and QA developed a series of procedures for spare and replacement part classification.
	5. Verification and acceptance methods for replacement parts were not adequate.	5. Source and receipt inspection requirements and procedures were established.
	6. A method had not been established for disposition of nonconforming replacement parts.	6. The nonconforming material report system was upgraded to better control and disposition nonconforming items.

Stop Work Actions

Subject of Stop Work	Reason	Recovery/Corrective Action
Installation of safety-related large bore pipe hangers	1. The hanger installation and inspection procedure was incomplete because it did not cover all necessary inspection attributes.	1. A new procedure covering the installation and inspection of piping component supports was prepared, reviewed, approved, and issued for use. This procedure provided specific installation and inspection instructions and criteria. A trial program for installation and inspection of hangers was implemented to evaluate the new procedure.
	2. The existing hanger inspection program was inadequate because it did not provide for timely inspections and did not distinguish the inspection requirements for each phase of hanger installation.	2. A three-phase program for installation and inspection of hangers was instituted. The hanger will be inspected as each phase is completed. The checklists are trended to identify and correct generic or repetitive problems and to prevent recurrence.
	3. Pipe suspension system components were fabricated and installed prior to review and approval of the design calculations.	3. All released but uninstalled hangers were placed on hold to prevent installation prior to calculation approval. All calculations for previously installed hangers were reviewed and approved. All new hangers had calculations reviewed and approved before drawings were released. (This was done in conjunction with the new loads verification effort.)

APPENDIX D

OVERINSPECTION PROGRAM SUPPLEMENTAL INFORMATION

Contents

Tables

APPENDIX D
OVERINSPECTION PROGRAM SUPPLEMENTAL INFORMATION

A. SUFFICIENCY OF DATA FROM THE OVERINSPECTION PROGRAM FOR PURPOSES OF EVALUATION OF THE QUALITY OF CONSTRUCTION

Baldwin Associates (BA) and Illinois Power Company (IP) have conducted more than 1 million inspections under the Overinspection Program as of July 31, 1984. Moreover, as is demonstrated in Table D-1, BA has inspected at least 100,000 attributes in each of the major construction disciplines. Given the large number of attributes inspected within each discipline, any significant adverse condition applicable to a class of attributes should be identifiable.

In order to confirm that the inspection samples were sufficiently comprehensive within each discipline, IP has calculated the number of attributes inspected under the Overinspection Program for each type of major item within the scope of the program. The results are presented in Table D-2. As this table demonstrates, each type of major item has had at least 2,000 attributes inspected by BA (with the exception of cable trays, mechanical equipment, and instrumentation). Any significant adverse condition applicable to a type of item should be evident from such a large number of inspections. Thus, sufficient data are available to evaluate the quality of each type of item with 2,000 or more inspected attributes.

Cable trays, mechanical equipment, and instrumentation have had less than 2,000 inspections because these items are largely associated with turnover packages that are completed and turned over toward the end of construction. Nevertheless, the results of the Overinspection Program should be generally applicable to cable trays, mechanical equipment, and instrumentation since the installation of these types of items involves the same processes, including the same procedures and personnel, as installation of other types of items such as conduits, pipes and ducts, and electrical equipment. Consequently, there is no reason to believe that the quality of these items is significantly different from the quality of other items that received more extensive inspection under the Overinspection Program. To confirm this conclusion, IP is continuing to perform the Overinspection Program for cable trays, mechanical equipment, and instrumentation and will perform additional evaluations as more data specifically applicable to the commodities become available for analysis.

Statistical analysis lends support to the judgment that sufficient data from the Overinspection Program are available for analysis. The large number of attributes inspected under the Overinspection Program permits judgments regarding the quality of construction of Clinton Power Station (CPS) to be drawn with a high degree of statistical confidence. For example, based on an overall total of 627,943 attributes inspected by BA, and assuming an infinitely-sized lot, statistical analysis predicts that the rate of conformance in the lot would have a maximum uncertainty of only 0.1% at the 95% confidence level.[1] Finally, for a type of item such as conduit that has been subject to relatively few inspections (3,269 field verification inspections of attributes), the maximum uncertainty in the conformance rate is reasonably low at only 1.7% at a 95% confidence level. These small uncertainties indicate that sufficient data are available for evaluation from the Overinspection Program as of July 31, 1984.

It may be noted that, as of July 31, 1984, the Field Verification Group inspected approximately 10 to 30% of the large and small bore piping, mechanical equipment, and mechanical supports, 3% or less of most of the commodities in the electrical discipline, 3% of the structural steel beams, and 4% or less of the heating, ventilating, and air conditioning (HVAC) ducts and hangers. As is discussed above, given the large number of inspections that have been conducted, these percentages permit reliable conclusions to be drawn on both a statistical and judgmental basis.

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[1] At the 95% confidence level, the maximum uncertainty is determined from the following equation:

$$\sigma = \frac{1.96\ \sigma}{N} \times 100\%, \text{ where } \sigma^2 = N[p(1-p)]_{max} = .25N$$

and where U = maximum uncertainty in conformance rate at a 95% confidence level
σ = Standard deviation
N = Number of inspected attributes
p = Probability that an attribute is nonconforming

B. ENGINEERING EVALUATION OF NONCONFORMANCES BY TYPE OF COMMODITY

The results of the Overinspection Program were evaluated for each type of commodity within the program. The number of nonconforming attributes for each type of commodity (including augmented class D [radioactive waste]) is presented in Table D-3, together with an indication of the number of nonconformances that have been determined to be safety-significant. As is evident from this table, none of the commodities contains any safety-significant nonconformances. For each commodity (except augmented class D [radioactive waste] which is discussed in part E below) a discussion is provided which explains, in general, why the nonconformances are not safety-significant.

1. Conduit Supports

The Overinspection Program identified 5,547 nonconforming attributes on conduit supports. As is discussed below, none of these was safety significant.

Approximately one-third of the nonconformances were minor, involving documentation nonconformances (such as unsigned travelers), minor damage (such as gouges), and installation errors (such as tolerance nonconformances, wrong welds, and wrong hardware). These types of nonconformances generally do not significantly reduce the strength of the conduit support since the attributes in question have little or no bearing on support strength.

More than two-thirds of the nonconformances (3,742 in total) pertained to arc strikes and welds between the conduit support and the supporting steel. Of these, 1,666 nonconformances were arc strikes and weld profile violations that generally are cosmetic and do not reduce the strength of the weld. Most of the remaining welding nonconformances involved weld size, undercut, slag, and other descrepancies which were determined to reduce the strength of the weld but not to affect the capability of the weld to satisfy design loading conditions. None of the nonconformances was determined to be safety-significant.

2. <u>Cable Tray Hangers</u>

The Overinspection Program identified 788 nonconforming attributes on cable tray hangers. In general, these nonconformances were similar to those identified on conduit supports. Approximately 54% of the nonconformances were minor, having little or no relationship to the strength of the hangers. The remaining nonconformances all pertained to descrepancies in the welds attaching hangers to supporting steel. All of these welding nonconformances were either cosmetic or did not reduce the strength of the weld below that required to satisfy design loading conditions. Consequently, none of the nonconformances was determined to be safety-significant.

3. <u>Cable Tray</u>

Forty-eight nonconforming attributes were identified on cable trays by the Overinspection Program. As is discussed below, none of these was safety-significant.

Seventeen nonconformances involved the lack of proper support for cables which drop out of the bottom of ladder-type trays. This support was only required to prevent the weight of the cables from bending the supporting rung of the cable tray. These nonconformances were determined not to affect the function of the cables or the cable trays' ability to function as designed.

Twenty nonconformances involved dirt and debris in cable trays. This condition, though not desirable, was evaluated as having no impact on the system design capabilities.

The remaining nonconformances involved the lack of tray identification tags, a missing wear strip, an inspection error dealing with cable routing, or tolerances. All of these were shown not to affect the tray design capabilities or the subsequent installation of cables in the trays because (1) other documentation properly identified the trays, (2) the wear strips provide an extra measure of cable protection, but are not necessary in and of themselves, (3) the cable routing was verified to be correct, and (4) the tolerances were not exceeded by a significant margin and the affected items were capable of performing their design functions.

IMAGE EVALUATION
TEST TARGET (MT-3)

150mm

6"

4. Electrical Equipment (Electrical Boxes, Switchgear, Panels)

a. Electrical Boxes

One hundred seventy-nine nonconforming attributes were identified on electrical boxes by the Overinspection Program. As is discussed below, none of these was safety significant.

Fifty-one nonconformances involved damage such as dents or arc strikes and gouges on pull boxes or junction boxes or associated supports. The damage was minor and did not affect the functional capabilities of the boxes.

Forty-one nonconforming attributes were identified in the welding for structural attachments and supports for the electrical boxes. These nonconforming items were evaluated and determined to provide adequate strength to support the electrical boxes.

Nineteen nonconformances involved documentation nonconformances such as missing dimensions on drawings or threaded fasteners not having identification markings. Drawings with missing dimensions were evaluated to determine if the missing information was critical to the installation of the electrical box or if the existing dimensional information was adequate to allow proper installation. Threaded fasteners were previously dispositioned "use-as-is" on the NCRs and, therefore, were found to be acceptable with no replacement required. In all cases, the nonconforming conditions involving documentation on electrical boxes were minor and had no impact on the design function.

Sixty-eight nonconformances involved electrical box installation discrepancies, such as installation outside of specified tolerances and wrong or missing hardware. The tolerance discrepancies were evaluated for possible structural impact on the support member to which the electrical box is attached. In all cases, the as-installed condition had negligible effect on the supporting member. Wrong and missing hardware discrepancies primarily involved washers used on electrical boxes. Many washers were not installed per the detail drawings, or a material was substituted other than that specified per the details. In all cases, other notes existed on electrical drawings which either allowed the material substitution or made installation of the designated washer an option. None of these nonconforming attributes was found to be safety-significant.

b. **Switchgear**

One hundred forty-eight nonconforming attributes were identified by the Overinspection Program on the switchgear. As is demonstrated below, none of these nonconformances was safety-significant.

Sixty-one of these nonconforming attributes involved the switchgear hold-down welds. Although these nonconformances were postulated to reduce the strength of these welds, all nonconforming welds were found to be acceptable due to the large margin between the calculated stresses in the welds and the maximum allowable stresses in the welds permitted by the applicable code.

Forty-five nonconforming attributes involved loose, missing, or incorrect hardware, such as nuts, bolts, and vibration washers. In each case, the strength or vibration damping of the affected connection was determined to be sufficient to satisfy design loads and damping requirements.

Twelve nonconforming attributes involved insulated low voltage wires which touched bolt threads. An inspection showed that the wires were touching but not resting on the bolt threads. Also, the bolt threads were dull and were not causing any damage to the wire insulation. Thus, these nonconformances were not affecting the design function of these wires.

Eleven nonconforming attributes involved low voltage molded case panel breakers. Six breakers were missing shunt trips which were in the process of being replaced when inspected under the Overinspection Program; thus a valid nonconformance did not exist. Five attributes involved breakers with the wrong size trip elements. These breakers are primarily for short circuit protection of the connected low voltage circuits, and subsequent pre-operational inspection and/or testing would have discovered and corrected these five nonconformances.

The remaining nonconforming attributes involved loose terminal strips or damaged hardware (such as screws). Any movement of the loose terminal strips would have been restricted by wire training and wire wraps used to hold in place the conductors terminated on the terminal strips. Additionally, any possible movement of the terminal strips would not affect the function of the switchgear because the movement would not be sufficient to disrupt any connections. Similarly, the damaged hardware were located in a door-locking device that did not affect the operation of the switchgear. Consequently, the loose terminal strips and damaged hardware were not safety-significant.

c. <u>Electrical Panels</u>

Three hundred ninety-eight nonconforming attributes on electrical panels were identified by the Overinspection Program. As is discussed below, none was safety-significant.

Two hundred forty-five of the nonconformances involved missing washers on bolts. The evaluation of these nonconformances found that the structural integrity of the bolts and the seismic capability of the panels were not affected.

Fifty-six nonconformances involved missing or loose bolts and screws on panel-to-panel connections. The results of the evaluations show that these nonconformances had no impact on the panel's dynamic qualifications.

Ten nonconformances were attributable to inspectors who interpreted documents incorrectly or too stringently. None of these cases involved hardware that did not satisfy design specifications or drawings. Three nonconformances involved incorrect or missing identification tags, but this equipment was properly identified on the drawings. Consequently, none of these nonconformances was safety-significant.

Thirty nonconformances involved panel hold-down welds. An analysis was performed which showed that the panels would have remained fixed at all four corners during a seismic event. Consequently, these nonconforming welds did not affect the design function of the panels.

Finally, none of the remaining 57 miscellaneous nonconformances in electrical panels was determined to be safety significant.

5. <u>Conduit</u>

Twelve nonconforming attributes were identified on conduits by the Overinspection Program. As is discussed below, none of the nonconformances was safety significant.

Eight nonconformances involved missing or damaged conduit identification labels. However, in each case, other documentation (such as installation drawings) was available to verify the identity of the conduits.

The remaining nonconformances were missing nylon bushings (also called insulated throats) and one dent. The insulated throats provide an extra measure of cable protection, but are not necessary to the function or protection of the cables. Similarly, the dent was very small and did not affect the integrity of the conduit.

6. <u>Cable</u>

The Overinspection Program identified 208 nonconforming attributes affecting cable. As is described below, none of these nonconformances was found to be safety significant.

The majority (110) of the nonconforming attributes involved documentation nonconformances, such as the absence of or damage to a cable's identifying tag. Since other documentation verified that the correct types of cable were properly installed, this type of nonconformance did not affect the cable's capabilities.

Thirty-three other nonconformances involved hardware, including missing edge guards for cables and missing cable supports. Edge guards provide an extra margin of cable protection, but each multiconductor cable and each conductor's insulation was provided with a protective jacket. Thus, the conductor insulation, as per design, was adequately protected even though some edge guards were missing. With respect to the missing cable supports, the cable manufacturer's cable support requirements are less restrictive than project requirements. When missing supports for cables were evaluated against the cable manufacturer's criteria, it was determined that the cables were adequately supported.

Eighteen small cuts were reported in the insulation of the conductors near the termination points. These cuts, which did not remove any insulation, were on conductors whose insulation is rated 600 volts (the applied voltage was only 125V DC or 120V AC, which is far lower than the rated 600 volts). Also, the cuts in the insulation were all located inside a junction box, termination cabinet, or other such controlled environment which would prevent further damage. The locations of all cuts were evaluated and found not to provide a grounding fault path. Thus, none of these nonconformances affected the design function of the cables.

The remaining nonconformances included incorrect, improperly installed, or loose hardware, which were primarily cable grips; and cable routing errors (in the routing itself or in bend radius). Each of these was evaluated and determined to have no safety significance.

7. <u>Cable Terminations</u>

One hundred sixty-six nonconforming attributes in cable terminations were identified by the Overinspection Program. As is discussed below, none of these nonconformances was found to have safety significance.

One of the more frequently occurring nonconforming attributes (11%) involved lugs that were not tightly connected to the terminal block (inspector could move the lug from side to side). However, all lugs used were of the ring-tongue type, which were specifically used to prevent the lug from coming off of the terminal block even if the hold-down screw is not properly tightened. Thus, electrical continuity was ensured.

Other nonconformances (16%) involved conductor termination errors. IP will be conducting preoperational system testing which will include operation of all interlocks, alarms, lights, and relays. This will ensure construction completeness and proper system operation and will identify nonconformances involving electrical termination errors. Consequently, these nonconformances were not safety-significant because they would have been identified and corrected even if the Overinspection Program had not been performed.

Discrepancies concerning bending radii of the control conductors near the termination point comprised 11% of the nonconformances. The specifications for bending radius at CPS are more conservative than required by the manufacturer. The actual bending radius was compared to the manufacturers' requirements and 11 were found slightly to exceed those requirements. These were further reviewed and found to be installed in a physically protected and controlled environment. Consequently, even if the insulation at the bend were to have developed a crack, the connection would not have been grounded.

Bent lugs comprise 9% of the nonconformances in cable terminations. Information furnished by the suppliers of these lugs showed that these bends did not adversely affect the integrity or function of the lugs. Consequently, none of the bent lugs were safety-significant.

Approximately 7% of the nonconformances involved wire crimps in which the wire did not extend out the far side of the lug barrel. However, in each case, it was determined that the wire was firmly secured in the lug barrel, and, therefore, the termination was able to perform its design function.

An additional 7% of the nonconformances involved documentation errors such as missing wire code labels. These lables are only for later convenience in maintenance and checkout. They are not needed for correctly terminating the wire.

About 5% of the discrepancies involved use of mechanical compression connections instead of ring-tongue lugs. However, use of the compression connections was permitted by the equipment supplier. Thus, these terminations were capable of performing their intended design function.

Approximately 16% of the nonconformances pertained to spare conductors, trimming and cosmetic scratches to the lugs, untidy bundling of conductors in panels, and missing wear strips. Spare conductors, trimming of lugs to fit the terminal block, and cosmetic scratches would not prevent the terminations from meeting their design requirements. Neat bundling of conductors is not necessary but is desirable to facilitate later checkout and maintenance. Also, wear strips are an extra measure of protection for the control wire, but are not necessary because the wires are provided with a tough outer jacket which prevents damage to the underlying insulation. Consequently, none of these nonconformances was safety-significant.

None of the remaining 18% miscellaneous nonconformances was determined to be safety-significant.

8. Structural Steel

The Overinspection Program identified 22,366 nonconforming attributes on structural steel. As is discussed below, none of these nonconformances was found to have safety significance.

The majority of the nonconforming attributes (11,096) involved welding nonconformances. Most of the welding nonconformances were insufficient weld size, undercut, or overlap. Insufficient weld size included reductions in the effective throat size of the weld, as well as the length of the weld. Undercut involved reductions in the effective thickness of the base metal. Both insufficient weld size and undercut can reduce the strength of the structural steel. Each nonconformance that affected strength was evaluated, and it was determined that the reduced capacity in each case was sufficient to support the required loads. Finally, since S&L determined by a sampling program that overlap identified by the Overinspection Program did not mask lack of fusion or undersized welds, the overlap did not reduce the strength of the structural steel. Therefore, overlap nonconformances were not safety-significant.

The second largest category of nonconforming attributes identified in structural steel involved installation nonconformances (5,154). This category of nonconformance generally consisted of minor tolerance nonconformances or loose hardware. The tolerance nonconformances and other strength reducing nonconformances were reviewed, and adequate capacity was found in the structural members to accept the nonconformances. Loose hardware in structural steel normally consisted of loose high-strength bolts. While this condition may reduce the ability of the connection to perform as a friction connection, the connections had adequate capacity when the bolts were considered as bearing bolts.

The third largest category of nonconforming attributes identified in structural steel involved documentation (3,238). For the most part, these nonconformances consisted of missing nut and bolt identification. Since these nonconformances did not physically affect the structural steel, none was found to be safety-significant.

The last category of nonconformances was damage (2,878). The majority of the instances of reported damage to structural steel were arc strikes (1,794), which are only cosmetic and do not reduce the capacity of the structural steel.

The other cases of damage were evaluated on a case-by-case basis. While some cases of damage did reduce the strength of the structural steel, adequate reserve capacity was available for the structural steel to support the required loads.

9. **Piping**

The Overinspection Program identified 658 nonconforming attributes on piping. As is discussed below, none of these nonconforming attributes was determined to be safety-significant.

The majority (387) of the nonconforming attributes involved minor damage to pipe walls. Damage to pressure-retaining components was evaluated by considering if the reduction in the wall thickness was acceptable considering the minimum allowable wall thickness. Arc strikes constituted almost all of this type of damage and were determined to be acceptable based on the minimum allowable wall requirements for piping. The gouges, scratches, and cuts in piping also were judged to be acceptable based on minimum allowable wall thickness requirements.

Ninety-nine welding nonconformances affecting piping were evaluated. About one-fourth of the nonconformances were determined to be localized cosmetic surface defects, such as concavity, porosity, and surface slag. For more severe welding problems involving overlaps, undercut, lack of fusion, and undersized welds, localized pipe stresses were examined to determine the adequacy of the weld under all loading conditions. In no case was the applicable code allowable stresses exceeded.

There were 55 installation nonconforming attributes identified. These items were mostly small installation tolerance nonconformances that were acceptable. One hundred three documentation and procedural nonconformances were examined which required only "paper" corrections that had no impact on the physical design.

10. <u>Mechanical Equipment</u>

Mechanical equipment consists of valves, pumps, HVAC fans, other miscellaneous equipment, and equipment foundations. One hundred seventy-eight nonconforming attributes were identified that affected mechanical equipment. The majority of these items (119) dealt with missing or damaged identification tags and arc strikes on valve bodies. The arc strikes were evaluated to be acceptable within the original design basis since none violated minimum wall thickness for the valves in question. The missing or damaged identification tags had no impact on the design function of any component. The remainder consisted of miscellaneous types of nonconformances, none of which were evaluated to be safety-significant.

11. Instrument Tubing

Sixty-seven nonconforming attributes were identified by the Overinspection Program in instrument tubing. The primary nonconforming attributes involved damage and installation nonconformance.

Damage to instrument tubing was primarily due to arc strikes. All damage penetrating into the exterior wall of the tubing was evaluated for minimum wall violations. Although one gouge (see part E below) violated minimum wall thickness requirements, it was determined that none of the damage would have resulted in the failure of any instrument tubing.

Nonconforming attributes identified in the installation of instrument tubing were comprised primarily of improper slope and, in some cases, inadequate clearance. Installation nonconformances were evaluated to determine the affect on the design function of the instrument line in the overall system performance. It was determined that all lines with improper slope could still perform their design function, and all nonconformances were found to have no safety significance. Most clearance problems involved instrument lines in contact with insulation from surrounding piping. The interaction of the piping with the tubing was evaluated to assess potential failure of the tubing. The evaluation indicated that no failures would occur, and none of the installation-related nonconformances was determined to be safety-significant.

Finally, some welding nonconformances were identified, primarily involving concavity in welds. None of these was safety-significant.

12. Piping Supports

A total of 4,609 nonconforming attributes were identified by the Overinspection Program in piping supports. The largest number (2,071) of nonconforming attributes identified were in the welding area. The next most prevalent nonconforming attributes were in the area of arc strikes (1,256) and installation nonconformances (929).

Welding nonconformances on pipe supports primarily involved undersized welds, overlap, undercut, and slag inclusion. When the nonconforming welds could not be determined to be acceptable by other means, the nonconforming welds were evaluated by comparing the actual weld stresses (excluding damaged areas) to maximum stresses allowed by design. This comparison verified that sufficient margin existed in the nonconforming weld and the remaining welds on the support to preclude failure of the support.

Over 28% of the nonconforming attributes involved arc strikes. The majority of the remaining damage was comprised of gouges, defects caused by grinding, and bent component items. Arc strikes and gouges were evaluated to determine the effect of the reduction in base metal on the support's design capacity. No support was found to have sufficient reduction in base metal to cause any piping support to fail. None of the remaining damage was determined to be safety-significant.

Installation nonconformances on pipe supports involved loose or incomplete hardware installation, incorrect adjustment of supports, lack of clearance or interference, and construction tolerance nonconformances. Each nonconforming condition was evaluated to determine if the nonconformance was of a type that would be specifically examined in subsequent preoperational testing. For example, inspections that specifically check for hot and cold positions of adjustable support components would ensure that proper construction tolerances and construction completeness are verified prior to operation. Consequently, these nonconformances were not significant because they would not have been left unidentified and uncorrected if the Overinspection Program had not been performed. For supports which are not adjustable, such as rigid or welded supports, specific preoperational programs to inspect for proper installation and fitup do not exist (other than 79-14 walkdowns conducted on piping and support systems). In these cases, the nonconforming attributes were evaluated for their impact on the structural integrity of the support. In no case was a safety-significant condition found to exist.

Documentation-related nonconformances accounted less than 2% of pipe support nonconforming attributes and typically pertained to the lack of a welder ID or hardware ID tag. Since evaluations determined that all identifications required for safety-related hardware were recoverable from other records, there were no safety-significant nonconformances in this group.

13. HVAC Ducts and Duct Supports

Over 900 nonconforming attributes were identified by the Overinspection Program in HVAC. These nonconforming attributes affected both HVAC ductwork and the duct supports and primarily involved installation and welding nonconformances. As is discussed below, none of those nonconformances was safety-significant.

Over half of the nonconforming attributes identified were minor tolerance violations, incorrect orientation or configuration, and loose, missing, or wrong hardware. The nonconforming conditions involving tolerance, orientation, and configuration were evaluated against the design drawings and were determined to have no impact on operational performance of the duct system or the support system. Other hardware nonconformances involved duct companion angles for which design criteria had been revised subsequent to the performance of the Overinspection Program for the items. When compared against these revised criteria, the items were acceptable.

Nonconforming attributes involving loose and missing hardware primarily involved nuts and bolts used to connect duct companion angles. These were not tightened adequately, were improperly installed, or were missing from the connection. Wrong hardware was reported primarily for incorrectly-sized access door assemblies in the ductwork. None of these nonconforming attributes were determined to adversely affect the integrity of the connections or the function of the duct systems.

Nonconforming attributes involving welding consisted of minor nonconformances in weld size and various weld defects, resulting in reduced capacity of the weld connection. Each nonconforming condition was evaluated to determine if the connection, excluding the defective weld, would cause code allowable stresses to be exceeded. No nonconforming conditions were found to result in excessive stresses in the ductwork or support system.

All cases of physical damage were evaluated to determine if the integrity of the duct system was violated or if a reduction in strength of a duct support occurred as a result of base metal damage. None of the nonconformances was determined to affect the design function of the duct system.

14. Instrumentation

No nonconformances were identified affecting this commodity.

C. NONCONFORMING ATTRIBUTE TYPES

Provided below are definitions of the various types of nonconforming attributes and a brief description of the nature of the possible impact of the nonconformances on the integrity of affected items.

Arc strike: Damage on or adjacent to a weld resulting in localized fusion caused by the inadvertent establishment of current between electrical arc welding equipment and a weld on base metal. In general, arc strikes are cosmetic defects. Severe cases of arc strike can result in a reduction in the volume of the weld or base metal.

Convexity: Weld metal on the face or surface of a weld that is in excess of the weld metal necessary for the required weld size. Convexity results in a weld of poor appearance, but has no adverse effect on the capability of the weld to perform its design function.

Concavity: A condition where a weld face or surface has less weld metal than is required for the specified weld size. If severe enough, concavity can reduce the strength of the weld.

Slag: A nonmetalic material which results from the welding process. Slag is generally found on weld surfaces as a result of incomplete cleaning after the weld is made and, as such, is a cosmetic defect. If slag is entrapped in the weld itself, it reduces the volume of the sound weld metal and, therefore, the load-carrying capacity of the weld.

Undercut: A groove that is melted into base metal adjacent to a weld and that remains unfilled with weld metal. Undercut may result in a reduced thickness of the base metal and may affect the strength of the metal.

Weld size: A welding attribute that identifies an inadequacy in the size, dimension, or length of a weld as specified by code or on the design documents. Inadequate weld size typically will result in a weld that will have reduced load-carrying capacity.

Lack of fusion: A condition in a weld when the base and weld metal fail to fuse during the welding process. Lack of fusion may cause a reduction in weld strength and, in the worst case, a potential for weld failure.

Overlap: Excessive weld metal that protrudes over the interface of a weld and the adjacent base metal. Overlap is not a concern unless it obscures lack of fusion or an insufficiently-sized weld.

Reinforcement: A condition in a weld due to the deposit of excess weld metal. Reinforcement does not cause a reduction in weld strength.

Porosity: Cavity type discontinuities formed by gas entrapment during the solidification of a weld. Porosity is a nonpropagating defect with minimal inpact on weld capacity.

Crack: A linear discontinuity in material that reduces material strength and may propagate under stress and cause failure of an item. To determine if a crack will propagate, the localized stresses must be determined and a fracture mechanics analysis applied.

Cold set: The position of a variable support when the piping system is at the temperature of the environment. This position is confirmed during preoperational testing to document functional capability and does not present a safety concern during construction.

Transition: The weld surface exceeds a 3 to 1 slope between two metals of different thicknesses. Typically, the strength of the weld is not reduced by improper transition.

Grinding: The base metal thickness of a commodity is reduced by abrasion from a grinding tool. The reduction in base metal could reduce the strength of a component.

Dent, bent, warped: The commodity has been dented, bent beyond specified limits, or warped, which could result in a reduction in design capacity, improper fit-up, or modification in the performance of an item.

Ovality: The flattening that may occur when a pipe has been bent. Excess ovality can hinder performance by restricting flow or causing localized overstressing of the piping system.

Gouge, scratch, cut: Surface defects in an item due to removal or severance of base material. These can result in a reduction in the strength of a component or provide a potential path for shorts in electrical components.

Bolts/nuts broken: A broken nut or bolt resulting in loss of connection strength.

Coating missing: Paint, galvanized coating, or other protective coating missing from a surface specified to be coated. Typically, coatings are not required for the strength of a commodity, only for its protection against adverse elements. The specific purpose of each missing coating must be evaluated based on the intent of the original design specification.

Defective material: Material that does not satisfy all of the specified design requirements. This nonconformance presents a potential for a reduction in capacity.

Dirt/debris: Dirt or debris allowed to collect on an item in violation of storage and maintenance procedures. Typically, dirt and debris will not affect an item's structural integrity or component operation and is flushed out of a piping system during preoperational flushing.

Protection: Failure to protect an item from surrounding elements per established storage and maintenance requirements. Lack of protection could result in damage from subsequent work in the area.

Rust: Accumulation of iron oxide on the surface of an item. Rust typically has no safety significance unless left for extended periods of time or allowed to become pervasive, reducing the strength of the component or hampering its operating characteristics.

Holes: An item has holes drilled through a surface meant to be free of holes. Holes can cause a reduction in strength.

ID missing/ incorrect/damaged: An item identification tag, nameplate, or label is either missing, incorrect, or damaged. This does not imply lack of material traceability. In most cases, the item can be identified through other documentation or field inspection.

Drawing incorrect: A fabrication or construction drawing does not correctly reflect the design. The drawing errors require review on a case-by-case basis to determine if the errors could cause a reduction in a component's capability to perform its design function.

Traceability: The ability to trace or verify through certified documents that an item is constructed from the specified material. Incorrect material can result in various adverse conditions such as material incompatibility or strength reduction. In general, nonconformances involving lack of traceability can be determined not to be safety significant by conducting investigations to re-establish traceability, testing, or determining that traceability is not a requirement for the commodity identified.

Inspection error: This consists of nonconformance reports (NCRs) written incorrectly against a conforming attribute. Since no nonconformance actually exists, these NCRs have no effect on hardware quality.

Wrong hardware: Installation of items not specified or referenced on design documents, or substitutions of components not specifically allowed by appropriate codes or standards. The impact of using the wrong items depends on the strength and capabilities of the substituted hardware. In some cases, the substituted hardware may actually have greater capacity than hardware specified in the design.

Hardware missing: Missing items required by design documents. The impact of the nonconformance depends on the function of the item and the existence of other hardware that serves similar functions (e.g., one missing bolt on a multiple bolt connection).

Hardware loose: Items that are not adequately torqued or snug tight. Loose hardware may reduce the strength of the overall connection.

Incomplete: Items or materials for which the installation has not been completed. In some cases, incomplete installation may result in a reduction in strength of the component.

Orientation/ confirguration Items which are not oriented or configured in accordance with design requirements. Typically, nonconformances involving orientation or configuration involve cases in which construction tolerances were not specified for the installation or inspection process. Such nonconformances could potentially impact upon adjacent components or affect the function of, or stresses in, the nonconforming item.

Tolerances: Tolerance nonconformance involves installation of an item outside the dimensional envelope permitted by design. The actual location of the item must be evaluated to determine whether there is any change in the stresses on the item or adjacent items.

Clearance/ interference:	The space between two items is less than the minimum allowable space specified by design. The actual movements of the items during operating conditions, thermal transients, or seismic events must be evaluated to determine whether any interactions might result.
Slope:	Incorrect slope of an instrument sensing line or other line requiring a slope for proper function. Improper slope could affect the function of the line.
Routing:	The routing of a commodity (e.g., cable tray, conduit) does not agree with construction drawings. The as-routed configuration could alter support loads and stresses used in the original design analyses.
Bend radius:	The bending radius of the electrical cables or electrical conduits are less than the minimum specified by design. This could impact the ability to pull cables, but would not affect cable function if the cable is undamaged or if the cable is protected in a controlled environment.
Wrong welds:	Welds installed were not the type specified (e.g., intermittent welds in lieu of continuous welds). The strength of the weld could be altered if the wrong weld is installed.
Gaps (Installation):	A gap which exists between two items that is not in accordance with design documents. The as-installed gap could impair the function of one or both of the items.
Thread engagement:	When the threads of a bolt do not extend through the entire nut as required to provide maximum contact of load-bearing surfaces. This condition reduces the strength of the connection.

Gaps (Damage): A gap caused by damage to a supporting or interfacing concrete surface, such as by spalling of concrete caused by the heat generated in welding. The gaps in this category could cause a reduction in the ability of the concrete to support a load.

Termination/error: When electrical cables have not been connected to the correct terminals or were connected in an improper manner. This nonconformance could result in improper operation if not identified by subsequent testing.

D. NONCONFORMANCE REPORTS CONTAINING INSUFFICIENT INFORMATION

Two NCRs prepared during the Overinspection Program did not contain sufficiently detailed information, and the nonconforming item was reworked prior to commencement of the S&L evaluation. Therefore, it was not possible for S&L to evaluate the impact of those nonconformances on the integrity of the affected item. However, as is demonstrated below, S&L was able to determine that none of the nonconformances was significant to safety.

The first nonconformance involved a half-inch diameter stainless steel instrument tube in the main stream system that had "numerous nicks and gouges." The depth of the gouges was not documented on the NCR. The tubing was subsequently replaced, eliminating both the nonconforming condition and the information required to evaluate its significance. However, this particular instrument line is connected to one of four redundant first-stage turbine low-pressure transmitters. The pressure transmitters signal the turbine stop valve and control the valve fast closure trip bypass, using a two-out-of-four logic. As such, the signal from any one transmitter cannot initiate any plant system response. Consequently, even if it is assumed that this item would fail, failure of this item would not impact plant safety.

The second nonconformance involved a half-inch stainless steel instrument tubing line in the residual heat removal system which had several arc strikes. The depth of the arc strikes was not recorded on the NCR, and the tubing was subsequently replaced, eliminating both the nonconforming condition and the information required to evaluate it. However, even if it is assumed that this item would fail, the loss of this line would not impact plant safety. The line provides the residual heat removal pump minimum flow control valve positioning (open/close) signals, based on the low pressure coolant injection flow rate. If the instrument line lost pressure, the minimum flow control valve would be automatically closed and the full low pressure coolant injection flow rate would be provided to the reactor vessel.

E. EVALUATION OF THE QUALITY OF AUGMENTED CLASS D (RADIOACTIVE WASTE) AND FIRE PROTECTION SYSTEMS

The augmented class D (radioactive waste) and fire protection systems are not safety-related and have not been subject to all of the quality assurance provisions of 10 CFR Part 50, Appendix B. Consequently, the results of the Overinspection Program for the augmented class D (radioactive waste) and fire protection systems are discussed separately from the results for safety-related structures, systems, and components.

More than 19,000 attributes of the augmented class D (radioactive waste) system were inspected by the Field Verification Group as of July 31, 1984. No inspections were conducted in the fire protection system as of July 31, 1984. IP is continuing to perform the Overinspection Program for the fire protection system and will perform additional evaluations as more data specifically applicable to this system become available for analysis.

On the augmented class D (radioactive waste) system, 6,331 nonconforming attributes were reported. Of these, 2,446 nonconforming attributes were evaluated by S&L. The remaining 3,885 nonconforming attributes could not be evaluated for significance because the nonconformance reports did not contain sufficiently detailed descriptions to permit performance of these evaluations.

Of the engineering evaluations that could be performed, the results are similar to their safety-related counterparts. Minor damage, such as arc strikes, gouges, and grinding marks on the pipe surface, was involved in 1,244 of the nonconforming attributes. In all cases, it was determined that the minimum allowable wall thickness was not violated.

Seventy-two nonconforming welding attributes were evaluated. While these welding problems may have resulted in a reduced weld capacity, in no case were the applicable code (ANSI B31.1) allowable stresses exceeded.

The 260 installation nonconformances associated with the augmented class D (radioactive waste) systems and components are primarily due to the increased use of flanged connections in these systems. Installation problems dealt with loose bolts, insufficient thread engagement, missing gaskets, poor alignment, or other flange-related problems. The flange-related problems that result in a loose or poor connection would have been discovered during the system hydrostatic testing and would have been reworked to an acceptable condition. All others were determined to be acceptable based on an evaluation. This group of installation problems was found not to be significant.

The Overinspection Program identified 870 nonconformances involving documentation. The most prevalent documentation nonconformance dealt with use of a substitute bolting material. However, this material was previously determined to be generically acceptable. Another common type of nonconformance dealt with installed spool length that did not agree with the constructor's installation isometric drawing. However, the nonconforming spools were found to be in accordance with the design drawings, and the contractor's isometric drawings were reworked to reflect the design and the installed condition.

Of the nonconforming attributes not evaluated due to lack of information on the NCRs, 91% involved damage, 6% welding, 2% installation, and 1% documentation. The description of the nonconforming attributes noted on these NCRs is similar to those already evaluated. Consequently, there is no reason to expect that these nonconformances would have adversely affected the function of the augmented class D (radioactive waste) system if left uncorrected.

Table D-1
Number of Attributes Inspected by Construction Discipline

Type of Inspection	Construction Discipline	Number of Attributes Inspected
Field verification	Structural	223,651
	Electrical/instrumentation	177,527
	Piping/mechanical	226,765
Total		**627,943**
Overinspection	Structural	241,398
	Electrical/instrumentation	101,536
	Piping/mechanical	95,525
Total		**438,459**

Table D-2
Number of Attributes Inspected by Type of Major Commodity

Commodity	Number of Inspected Attributes FV	OI
Structural steel	223,651	241,398
Cable	5,808	2,639
Cable termination	31,883	18,087
Conduit	3,269	511
Cable trays	649	0
Electrical hangers	90,052	67,769
Electrical equipment[1]	11,980	7,152
Instrumentation	153	21
Instrument pipe	9,540	1,903
Large bore pipe	19,376	7,634
Small bore pipe	32,114	16,047
Mechanical equipment[2]	1,031	312
Mechanical supports[3]	178,435	63,960
HVAC duct	9,007	5,391
HVAC hangers	10,995	5,635
Total	**627,943**	**438,459**

[1]Includes electrical panels, switchgear, and electrical boxes

[2]Includes compressors, pumps, valves, and miscellaneous equipment

[3]Includes anchor plates, expansion anchors, pipe hangers, and instrument supports

Table D-3
Nonconforming Attributes by Commodity

Commodity	Attribute	Number of Nonconformances	Number of Safety-Significant Nonconformances
Conduit supports	Weld size	667	0
	Undercut	518	0
	Overlap	246	0
	Convexity	4	0
	Concavity	22	0
	Lack of fusion	185	0
	Porosity	5	0
	Slag	436	0
	Crack	17	0
	Reinforcement	2	0
	Wrong hardware	201	0
	Hardware missing	43	0
	Hardware loose	47	0
	Incomplete	5	0
	Orientation/configuration	111	0
	Tolerance	402	0
	Clearance/interference	14	0
	Wrong welds	189	0
	Gaps	113	0
	Thread engagement	17	0
	Arc strike	1,640	0
	Grinding	56	0
	Dent/bent/warped	46	0
	Gouge/scratch/cut	79	0
	Bolt/nut broken	7	0
	Coating missing	42	0
	Defective material	1	0
	Dirt/debris	11	0
	Rust	12	0
	Holes	43	0
	Gaps (damage)	19	0
	ID missing/incorrect/ damaged	206	0
	Drawing incorrect	93	0
	Traceability	20	0
	Inspection error	28	0
	Total	**5,547**	**0**

Nonconforming Attributes by Commodity

Commodity	Attribute	Number of Nonconformances	Number of Safety-Significant Nonconformances
Cable tray hangers	Weld size	167	0
	Undercut	69	0
	Overlap	37	0
	Concavity	6	0
	Lack of fusion	26	0
	Porosity	7	0
	Slag	45	0
	Crack	2	0
	Reinforcement	5	0
	Wrong hardware	15	0
	Hardware missing	35	0
	Hardware loose	17	0
	Incomplete	4	0
	Orientation/configuration	15	0
	Tolerance	52	0
	Clearance/interference	3	0
	Wrong weld	94	0
	Gap	8	0
	Arc strike	96	0
	Grinding	22	0
	Dent/bent/warped	8	0
	Gouge/scratch/cut	6	0
	Bolt/nut broken	1	0
	Coating missing	2	0
	Dirt/debris	1	0
	Holes	6	0
	Gaps (damage)	3	0
	ID missing/incorrect/ damaged	28	0
	Drawing incorrect	6	0
	Traceability	1	0
	Inspection error	1	0
	Total	**788**	**0**

Nonconforming Attributes by Commodity

Commodity	Attribute	Number of Nonconformances	Number of Safety-Significant Nonconformances
Cable Tray	Wrong hardware	1	
	Hardware missing	17	0
	Tolerance	4	0
	Dirt/debris	20	0
	ID missing/incorrect/ damaged	5	0
	Inspection error	1	0
	Total	**48**	**0**
Electrical equipment	Weld size	54	0
	Undercut	36	0
	Overlap	14	0
	Lack of fusion	2	0
	Crack	1	0
	Reinforcement	4	0
	Wrong hardware	51	0
	Hardware missing	302	0
	Hardware loose	30	0
	Incomplete	1	0
	Orientation/configuration	29	0
	Tolerance	47	0
	Clearance/interference	17	0
	Wrong welds	1	0
	Gaps	9	0
	Thread engagement	1	0
	Arc strike	38	0
	Grinding	1	0
	Dent/bent/warped	17	0
	Gouge/scratch/cut	9	0
	Bolt/nut broken	10	0
	Coating missing	10	0
	Defective material	7	0
	Rust	1	0
	Holes	13	0
	ID missing/incorrect/ damaged	16	0
	Drawing incorrect	8	0
	Inspection error	8	0
	Total	**737**	**0**

Nonconforming Attributes by Commodity

Commodity	Number of Attribute	Number of Safety-Significant Nonconformances	Nonconformances
Conduit	Hardware missing	3	0
	Dent/bent/warped	1	0
	ID missing/incorrect/ damaged	8	0
	Total	**12**	**0**
Cable	Wrong hardware	12	0
	Hardware missing	33	0
	Hardware loose	1	0
	Orientation/configuration	5	0
	Tolerance	10	0
	Clearance/interference	1	0
	Routing	4	0
	Bend radius	14	0
	Gouge/scratch/cut	18	0
	ID missing/incorrect/ damaged	98	0
	Drawing incorrect	8	0
	Inspection error	4	0
	Total	**208**	**0**
Cable terminations	Wrong hardware	12	0
	Hardware missing	15	0
	Hardware loose	19	0
	Incomplete	14	0
	Orientation/configuration	6	0
	Tolerance	32	0
	Clearance/interference	3	0
	Bend radius	19	0
	Termination error	12	0
	Dent/bent/warped	16	0
	Gouge/scratch/cut	4	0
	Bolt/nut missing	1	0
	ID missing/incorrect/ damaged	3	0
	Drawing incorrect	4	0
	Traceability	1	0
	Inspection error	5	0
	Total	**166**	**0**

Nonconformance Attributes by Commodity

Commodity	Attribute	Number of Nonconformances	Number of Safety-Significant Nonconformances
Structural steel	Weld size	4,510	0
	Undercut	4,537	0
	Overlap	1,023	0
	Convexity	37	0
	Concavity	51	0
	Lack of fusion	471	0
	Porosity	87	0
	Slag	224	0
	Crack	45	0
	Reinforcement	111	0
	Wrong hardware	382	0
	Hardware missing	361	0
	Hardware loose	1,659	0
	Incomplete	94	0
	Orientation/configuration	170	0
	Tolerance	1,266	0
	Clearance/interference	56	0
	Wrong welds	1,033	0
	Gaps	114	0
	Thread engagement	19	0
	Arc strike	1,794	0
	Grinding	101	0
	Dent/bent/warped	201	0
	Gouge/scratch/cut	666	0
	Bolt/nut broken	21	0
	Coating missing	12	0
	Defective material	50	0
	Dirt/debris	21	0
	Holes	11	0
	Gaps (damage)	1	0
	ID missing/incorrect/ damaged	3,118	0
	Drawing incorrect	31	0
	Traceability	65	0
	Inspection error	24	0
	Total	**22,366**	**0**

Nonconforming Attributes by Commodity

Commodity	Attribute	Number of Nonconformances	Number of Safety-Significant Nonconformances
Piping	Weld size	42	0
	Undercut	25	0
	Overlap	2	0
	Convexity	2	0
	Concavity	7	0
	Porosity	11	0
	Slag	1	0
	Crack	1	0
	Reinforcement	7	0
	Transition	1	0
	Wrong hardware	6	0
	Hardware missing	6	0
	Hardware loose	6	0
	Incomplete	6	0
	Orientation/configuration	22	0
	Tolerance	6	0
	Slope	2	0
	Bend radius	1	0
	Arc strike	348	0
	Grinding	16	0
	Dent/bent/warped	7	0
	Gouge/scratch/cut	23	0
	Protection	7	0
	ID missing/incorrect/ damaged	68	0
	Drawing incorrect	18	0
	Traceability	8	0
	Inspection error	9	0
	Total	**658**	**0**

Nonconforming Attributes by Commodity

Commodity	Attribute	Number of Nonconformances	Number of Safety Significant Nonconformances
Mechanical equipment			
	Wrong hardware	2	0
	Hardware missing	5	0
	Hardware loose	18	0
	Incomplete	1	0
	Orientation/configuration	8	0
	Tolerance	2	0
	Arc strike	77	0
	Dent/bent/warped	1	0
	Gouge/scratch/cut	4	0
	Defective material	1	0
	Protection	2	0
	Holes	6	0
	ID missing/incorrect/ damaged	42	0
	Drawing incorrect	3	0
	Inspection error	6	0
	Total	**178**	**0**
Augmented class D (radioactive waste)	Weld size	60	0
	Undercut	31	0
	Overlap	27	0
	Convexity	3	0
	Concavity	43	0
	Lack of fusion	42	0
	Slag	1	0
	Reinforcement	48	0
	Transition	48	0
	Wrong hardware	35	0
	Hardware missing	28	0
	Hardware loose	41	0
	Incomplete	16	0
	Orientation/configuration	99	0
	Tolerance	25	0
	Clearance/interference	9	0

Nonconforming Attributes by Commodity

Commodity	Attribute	Number of Nonconformances	Number of Safety Significant Nonconformances
Augmented class D (radioactive waste) (Cont.)	Slope	25	0
	Bend radius	1	0
	Wrong welds	3	0
	Thread engagement	49	0
	Arc strike	4,515	0
	Grinding	46	0
	Dent/bent/warped	16	0
	Ovality	12	0
	Gouge/scratch/cut	178	0
	Defective material	5	0
	Dirt/debris	6	0
	Protection	3	0
	Rust	1	0
	ID missing/incorrect/ damaged	830	0
	Drawing incorrect	51	0
	Traceability	25	0
	Inspection error	9	0
	Total	**6,331**	**0**
Instrument tubing	Weld size	1	0
	Concavity	11	0
	Reinforcement	1	0
	Clearance/interference	6	0
	Slope	20	0
	Arc strike	21	0
	Dent/bent/warped	1	0
	Gouge/scratch/cut	3	0
	Dirt/debris	1	0
	ID missing/incorrect/ damaged	1	0
	Drawing incorrect	1	0
	Total	**67**	**0**

Nonconforming Attributes by Commodity

Commodity	Attribute	Number of Nonconformances	Number of Safety-Significant Nonconformances
Piping supports	Weld size	793	0
	Undercut	472	0
	Overlap	585	0
	Convexity	5	0
	Concavity	3	0
	Lack of fusion	65	0
	Porosity	18	0
	Slag	106	0
	Crack	12	0
	Reinforcement	11	0
	Transition	1	0
	Wrong hardware	67	0
	Hardware missing	44	0
	Hardware loose	176	0
	Incomplete	15	0
	Cold set	30	0
	Orientation/configuration	52	0
	Tolerance	250	0
	Clearance/interference	115	0
	Wrong welds	77	0
	Gaps	80	0
	Thread engagement	23	0
	Arc strike	1,303	0
	Grinding	55	0
	Dent/bent/warped	37	0
	Gouge/scratch/cut	107	0
	Bolt/nut broken	1	0
	Defective material	13	0
	Rust	2	0
	Holes	14	0
	Gaps (damage)	6	0
	ID missing/incorrect/damaged	60	0
	Drawing incorrect	10	0
	Traceability	1	0
	Total	**4,609**	**0**

Nonconforming Attributes by Commodity

Commodity	Attribute	Number of Nonconformances	Number of Safety-Significant Nonconformances
HVAC ducts and supports	Weld size	139	0
	Undercut	57	0
	Overlap	59	0
	Concavity	2	0
	Lack of fusion	38	0
	Porosity	9	0
	Slag	2	0
	Crack	3	0
	Wrong hardware	41	0
	Hardware missing	59	0
	Hardware loose	72	0
	Incomplete	16	0
	Orientation/configuration	231	0
	Tolerance	79	0
	Clearance/interference	2	0
	Wrong welds	3	0
	Gaps	38	0
	Arc strike	37	0
	Grinding	29	0
	Dent/bent/warped	13	0
	Gouge/scratch/cut	10	0
	Defective material	9	0
	Holes	12	0
	ID missing/incorrect/ damaged	1	0
	Drawing incorrect	10	0
	Traceability	3	0
	Total	**974**	**0**

APPENDIX E
RECORD VERIFICATION DATA

This appendix presents the data as of January 17, 1985, for nonconformance reports (NCRs) and as of December 10, 1984, for record deficiencies generated from the Record Verification Program. The data are tabulated to establish the distribution of NCRs and record deficiencies by old and new work, by discipline, by item type, and by checklist category.

Table E-1 gives the number of NCRs developed by work item type and a breakdown between old and new work. Tables E-2 and E-3 give the status of the Document Review Group's (DRG) review and Records Review Group's (RRG) review, respectively, by discipline for total record attributes inspected and for old and new work. Table E-4 displays the distribution of new and old work document exception list (DEL) items for DRG versus the total record attributes inspected by work item category.

Table E-5 gives the number of record deficiency reports (RDR) for old and new work versus the total number of attributes by work item category.

Table E-6 gives the distribution of DEL items for old work by checklist attribute in each work item category.

Table E-7 shows the same information as Table E-6 for new work.

A description of the checklist attributes used for Tables E-6 and E-7 is given in Table E-8.

A. "USE AS IS" NCRs

As discussed in chapter VI, out of the total of 587 NCRs initiated from the Record Verification Program, 348 were dispositioned not hardware related or "use as is" by Illinois Power Company (IP)/Baldwin Associates (BA) or Sargent & Lundy onsite reviewers. The distribution of these NCRs and a discussion of the rationale for disposition "use as is" is discussed below.

1. Process or Procedure Issues

A number of NCRs, 111, dealt with deviations from process or procedure requirements. Examples of these are incorrect weld preheat, incorrect weld interpass temperatures, concrete placement time violations, or concrete curing temperature deviations. In all NCRs of this type, the impact of the process or procedure deviation was evaluated to have an acceptable impact on the finished product; hence, no rework was recommended. In the welding issues, the condition of the final welds were all determined not to impact the functional requirements of the item. On the concrete process questions, test cylinder results, rebound hammer tests, and other results were used to determine that no structural impact existed.

2. Material Specification, Substitution and Traceability Issues

In the broad area of material specification, substitution, and traceability, 99 NCRs were initiated and dispostioned "use as is". Examples of these are deviations in specified materials installed, missing material traceability, and missing material code certifications. In each case, the NCR was evaluated and the replacement material determined to be one of the following: (1) acceptable for the function intended, (2) traceability not required or equivalent traceability established, or (3) downgraded code requirements acceptable for the function intended. In a few cases, a higher grade material was used and later verified to be acceptable. In all cases in this category, the issue was rigorously pursued and evaluations completed to allow a "use as is" decision, with no requirements for rework.

3. Sequence or Inspection Signoff Issues and Traveler Entry Errors

In the broad area of inspection or inspector signoff and incorrect traveler entries, 80 NCRs were issued. Use as is determinations were made using additional follow-up information for all NCRs of this type. For example, for incorrect signoff sequence or hold points bypassed, the condition of the item was determined acceptable by subsequent inspection documentation. For missing or improperly documented weld travelers, the correct information was recovered and, based on this information, no rework was required. Questions on welds or inspector certifications were later verified to be acceptable, and evaluations indicated no hardware impact.

4. <u>Missing or Incorrectly Documented Tests or Inspections</u>

In 46 instances, NCRs were initiated due to missing or incorrectly documented tests, calibrations, or inspections. In each case, either an additional test or calibration was performed, a vendor statement of certification was received, actual test reports were recovered, or the test was determined not to be essential to the performance of the items. In each of these cases, a use as is determination was made based on equivalent or replacement documentation, and no deviation was found to put the item performance outside the plant design basis.

5. <u>Drawing Issues</u>

In 12 cases, NCRs were initiated due to drawings that did not properly reflect as-built conditions. In each case, a drawing discrepancy was identified and the as-built condition was verified as correct and acceptable within the plant design basis. All of these NCRs resulted in use as is determination with no rework required.

6. <u>Summary</u>

As a result of the Record Verification Program, 348 NCRs were initiated that originally raised potential questions as to the adequacy of quality documentation and ultimately resolved with a non-hardware or "use as is" disposition. In each case, the issue was rigorously pursued to determine whether or not the item function would be impaired with respect to the plant design basis, the documentation was corrected, and none of the items required any rework within the process of NCR evaluation.

B. DOCUMENT EXCEPTION LIST ITEM DEFICIENCY RATES

Table E-4 gives the distribution of old and new work DEL items by work item. Some individual categories of work items have deficiency rates which warrant further examination to determine whether further action is warranted in regard to the individual work item categories, as explained below.

1. <u>Old Work</u>

a. Cable Trays - The relatively high (20%) deficiency rate should be considered in light of the relatively limited data available for evaluation in this work item category to date. In addition, over 79% of the deficiencies involve accountability, legibility, procedure and drawing revisions, or non-checklist items. The resolutions of these deficiencies to date have indicated no adverse implications for hardware quality. Only one record deficiency related to cable trays resulted in an NCR, and this was not safety-significant. IP is continuing to perform the Record Verification Program for records related to cable tray old work and will perform additional evaluations as more record review data applicable to cable tray old work becomes available.

b. Electrical Hangers - The deficiency rate for records related to electrical hangers is 4.2%. Since no safety-significant nonconformances were identified as a result of record reviews related to electrical hangers, the continued performance of the Record Verification Program for records related to electrical hanger old work is sufficient to assure that the quality of these records is acceptable.

c. Electrical Equipment - The 7.5% deficiency rate for records related to electrical equipment is concentrated in only 118 records. Most of the electrical work at Clinton Power Station (CPS) that is subject to the Record Verification Program is new work. The number of new work attributes reviewed is eight times that for old work and the deficiency rate for new work is only 1.6%. Since only eight NCRs resulted from record reviews related to electrical equipment and none were safety-significant, the continued performances of the Record Verification Program for records related to electrical equipment old work is sufficient to assure that the quality of these records is acceptable.

d. Mechanical Equipment - Within the 4.9% deficiency rate, more than 50% of the deficiencies involve such attributes as accountability, completeness, legibility, improper corrections, whiteout, and procedures and drawing revisions. The resolutions to date have been shown to have no adverse hardware implications. Since only twelve NCRs resulted from the 2,318 record deficiencies (0.5%), and none were found to be safety-significant, the continued performance of the Record Verification Program for records related to mechanical equipment old work is sufficient to assure that the quality of these records is acceptable.

e. Purchase Orders - Within the 6.4% deficiency rate, more than 65% of the deficiencies involve such attributes as accountability, legibility, completeness, improper corrections, whiteout, and line through. The resolutions to date have been shown to have no adverse hardware implications. Since only 90 NCRs resulted from the 22,952 record deficiencies (0.4%) and none was found to be safety-significant, the continued performance of the Record Verification Program for old work purchase orders is sufficient to assure that the quality of these records is sufficient.

2. <u>New Work</u>

a. Cable Trays - 80.7% of the record deficiencies that make up the 12.1% deficiency rate involve such attributes as accountability, legibility, completeness, procedure and drawing revisions, and non-checklist items. The resolutions to date have been shown to have no adverse implications for hardware quality. Only two NCRs resulted from the identified record deficiencies, and neither was found to be safety-significant. The continued performance of the Record Verification Program for records related to cable tray new work is sufficient to assure that the quality of these records is acceptable.

b. Electrical Hangers - More than 50% of the record deficiencies that make up the 4.5% deficiency rate involve such attributes as procedures and drawing revisions, checklists, and support documents. The resolutions to date have been shown to have no adverse implications for hardware quality. Only seven NCRs resulted from 18,659 record deficiencies and none was safety-significant. The continued performance of the Record Verification Program for records related to electrical hangers new work is sufficient to assure that the quality of these records is acceptable.

3. **Summary**

The individual work items generally show a decline in deficiency rates from old work to new work. In one case (electrical hangers), there was a 0.3% increase from old to new work, but that difference is not considered significant in light of the nature and extent of the deficiencies identified (see paragraphs 1.b and 2.b above). All record deficiencies have a very low rate of potentially significant nonconformances. These low record nonconformance rates and the fact that no safety-significant hardware deficiencies have been found indicate that there are no adverse implications for CPS hardware quality and safety.

Table E-1
Nonconformance Report
Distribution by Item

Item	Old Work: Attributes	Old Work: NCRs	Old Work: Rate (%)	New Work: Attributes	New Work: NCRs	New Work: Rate (%)
Beams and structural steel	199,650	33	0.02	72,930	7	0.01
Civil-earthwork	231,863	26	0.01	16,422	1	0.006
Cable	6,199	3	0.05	193,615	1	0.0005
Cable terminations	2,511	1	0.04	119,367	1	0.0008
Conduit	0	0	0	79,560	0	0
Cable trays	335	1	0.3	19,292	2	0.01
Electrical boxes	0	0	0	22,344	0	0
Electrical hangers	499,699	62	0.01	413,667	7	0.002
Electrical equipment	10,030	8	0.08	80,240	4	0.005
Instrumentation	85	0	0	7,140	0	0
Instrument pipe	41,616	19	0.05	275,604	35	0.01
P/M hydro packages	826	3	0.4	35,400	2	0.006
Large bore pipe	166,618	34	0.02	349,126	21	0.006
Small bore pipe	880,760	29	0.003	556,604	28	0.005
Mechanical equipment	47,117	12	0.03	56,763	1	0.002
Mechanical supports	118,198	27	0.02	667,419	35	0.005
Purchase orders (includes HVAC)	357,315	90	0.03	89,565	35	0.04
Meggers/hypots (cable tests)	10	0	0	6,530	6	0.09
Miscellaneous (non-traveler)	7,638	35	0.5	47,396	17	0.04
Totals	**2,570,470**	**384**	**0.015**	**3,108,984**	**203**	**0.007**

Non Conformance Rates by Type of Item Per Attribute

Table E-2
Document Review Status
Document Review Group
Distribution by Discipline

Discipline	Total Attributes	Old Work Attributes	Old Work DEL Items	Old Work Rate (%)	New Work Attributes	New Work DEL Items	New Work Rate (%)
Electrical	1,446,859	518,774	21,653	4.2	928,085	25,543	2.8
Piping/mechanical	2,878,831	1,213,519	21,600	1.8	1,665,312	18,358	1.1
Instrumentation	324,445	41,701	1,207	2.9	282,744	4,235	1.5
Civil/structural	520,865	431,513	11,591	2.7	89,352	2,153	2.4
Purchase orders (includes HVAC)	446,880	357,315	22,952	6.4	89,565	1,564	1.7
Meggers/hypots (cable tests)	6,540	10	0	0	6,530	216	3.3
Miscellaneous (non-traveler)	55,034	7,638	159	2.1	47,396	1,143	2.4
Totals	**5,679,454**	**2,570,470**	**79,162**	**3.1**	**3,108,984**	**53,212**	**1.7**

Table E-3
Document Review Status
Records Review Group
Distribution by Discipline

Discipline	Total Attributes	Old Work Attributes	Old Work RDRs	Old Work Rate (%)	New Work Attributes	New Work RDRs	New Work Rate (%)
Electrical	202,996	54,574	147	0.3	148,422	340	0.2
Piping/mechanical	566,050	292,979	238	0.08	273,071	194	0.07
Instrumentation	44,748	7,696	34	0.4	37,052	38	0.1
Civil/structural	10,354	6,012	7	.12	4,342	3	0.7
Purchase orders (includes HVAC)	11,445	0	0	0	11,445	78	0.7
Meggers/hypots (cable tests)	1,792	0	0	0	1,792	1	0.06
Miscellaneous (non-traveler)	97,980	0	0	0	97,980	64	0.07
Totals	935,365	361,261	426	.12	574,104	718	.13

Table E-4
Document Review Status
Document Review Group
Distribution by Type of Item

Item	Total Attributes Reviewed	Deficiency Rates by Type of Item					
		Old Work			New Work		
		Attributes	DEL Items	Rate (%)	Attributes	DEL Items	Rate (%)
Beams and structural steel	272,580	199,650	4,771	2.4	72,930	1,907	2.5
Civil-earthwork	248,285	231,863	6,820	2.9	16,422	246	1.5
Cable	199,814	6,199	212	3.4	193,615	1,551	.8
Cable terminations	121,878	2,511	32	1.3	119,367	701	.6
Conduit	79,560	0	3	0	79,560	805	1.0
Cable trays	19,627	335	67	20.0	19,292	2,335	12.1
Electrical boxes	22,344	0	0	0	22,344	222	.99
Electrical hangers	913,366	499,699	20,582	4.2	413,667	18,659	4.5
Electrical equipment	90,270	10,030	757	7.5	80,240	1,270	1.6
Instrumentation	7,225	85	1	1.2	7,140	192	2.7
Instrument pipe	317,220	41,616	1,206	2.9	275,604	4,043	1.5
P/M hydro packages	36,226	826	16	1.9	35,400	493	1.4
Large bore pipe	515,744	166,618	3,810	2.3	349,126	2,925	.8
Small bore pipe	1,437,364	880,760	11,822	1.3	556,604	2,982	.5
Mechanical equipment	103,880	47,117	2,318	4.9	56,763	1,172	2.1
Mechanical supports	785,617	118,198	3,634	3.1	667,419	10,786	1.6
Purchase orders (includes HVAC)	446,880	357,315	22,952	6.4	89,565	1,564	1.7
Meggers/hypots (cable tests)	6,540	10	0	0	6,530	216	3.3
Miscellaneous (non-traveler)	55,034	7,638	159	2.1	47,396	1,143	2.4
Totals	**5,679,454**	**2,570,470**	**79,162**	**3.1**	**3,108,984**	**53,212**	**1.7**

Table E-5
Document Review Status
Record Review Group
Distributed By Type of Item

Item	Total Attributes Reviewed	Deficiency Rates by Type of Item: Old Work Attributes	Old Work RDRs	Old Work Rate (%)	New Work Attributes	New Work RDRs	New Work Rate (%)
Beams and structural steel	10,354	6,012	7	0.12	4,342	3	0.07
Civil-earthwork	0	0	0	0	0	0	0
Cable	39,513	620	1	0.16	38,893	56	0.14
Cable termination	28,117	62	0	0	28,055	58	0.21
Conduit	8,900	0	0	0	8,900	6	0.07
Cable trays	4,068	0	0	0	4,068	35	0.86
Electrical boxes	1,760	0	0	0	1,760	1	0.06
Electrical hangers	104,618	51,934	136	0.26	52,684	159	0.30
Electrical equipment	16,020	1,958	10	0.51	14,062	25	0.18
Instrumentation	1,068	0	0	0	1,068	0	0
Instrument pipe	43,680	7,696	34	0.44	35,984	38	0.11
P/M hydro packages	3,172	610	1	0.16	2,562	1	0.04
Large bore pipe	78,318	28,854	34	0.12	49,464	40	0.08
Small bore pipe	302,280	229,000	163	0.07	73,280	42	0.06
Mechanical equipment	14,250	4,500	2	0.04	9,750	21	0.22
Mechanical supports	168,030	30,051	38	0.13	138,015	90	0.07
Purchase orders (includes HVAC)	11,445	0	0	0	11,445	78[1]	0.68
Meggers/hypots (cable tests)	1,792	0	0	0	1,792	1[1]	0.06
Miscellaneous (non-traveler)	97,980	0	0	0	97,980	64[1]	0.07
Totals	**935,365**	**361,261**	**426**	**0.12**	**574,104**	**718**	0.13

[1]Non-traveler items: old or new, not identified in data base

Table E-6
Document Exception List Item Per Checklist Attribute Group
Old Work by Item

	QA/QC/TS[1] Personnel Qualification	Welding	Inspection Report Checklist Support Document	Accountability Completeness Legibility	Improper Correction White Out Line Through	Personnel Sign-off	Traceability Material	Procedure and Drawing Review	Calibration	Engineering Approval Change Document	Inspection Test Requirements	Vendor Requirements	General Non-List Miscellaneous Items	Input Errors	Totals
Beams and Structural Steel	148	341	467	551	286	763	348	373	0	868	0	0	412	214	4,771
Civil-earthwork	820	8	0	324	329	224	942	1,324	89	542	0	0	403	1,815	6,820
Cable	10	0	5	20	94	1	0	0	1	4	5	0	31	41	212
Cable termination	0	0	0	11	18	0	0	0	1	2	0	0	0	0	32
Conduit	0	0	0	0	0	0	0	0	0	0	0	0	0	3	3
Cable trays	1	0	0	16	7	3	0	15	0	2	0	0	22	1	67
Electrical boxes	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Electrical hangers	4,085	265	2,181	776	1,432	2,277	724	6,081	16	452	1	0	1,742	550	20,582
Electrical equipment	175	22	56	84	31	83	25	144	0	43	4	0	81	9	757
Instrumentation	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1
Instrument pipe	17	28	1	168	164	105	99	401	3	175	0	0	25	20	1,206
P/M hydro packages	0	0	0	3	1	0	0	0	0	1	0	0	1	10	16
Large bore pipe	63	152	5	417	666	522	337	947	4	473	0	0	90	134	3,810
Small bore pipe	227	192	1	1,208	2,161	1,870	649	3,730	2	1,416	0	2	204	165	11,822
Mechanical equipment	98	112	19	400	286	186	86	602	59	158	0	0	118	194	2,318
Mechanical supports	100	356	21	447	426	547	157	1,189	3	282	0	23	46	37	3,634
Purchase orders (includes HVAC)	2,442	0	219	10,529	4,796	3,063	950	1	0	103	0	578	246	25	22,952

Table E-6
Document Exception List Item Per Checklist Attribute Group
Old Work by Item

	QA/QC/TS[1] Personnel Qualification	Welding	Inspection Report Checklist Support Document	Accountability Completeness Legibility	Improper Correction White Out Line Through	Personnel Sign-off	Traceability Material	Procedure and Drawing Review	Calibration	Engineering Approval Change Document	Inspection Test Requirements	Vendor Requirements	General Non-List Miscellaneous Items	Input Errors	Totals
Stand alone NCRs	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Meggers/hypots (cable tests)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Miscellaneous	0	0	0	0	0	0	0	0	0	0	0	0	0	159	159
Totals	8,181	1,476	2,975	14,954	10,697	9,644	4,317	14,807	178	4,521	10	603	3,422	3,377	79,162

[1]QA = Quality Assurance
QC = Quality Control
TS = Technical Services

Table E-7
Document Exception List Item Per Checklist Attribute Group
New Work by Item

	QA/QC/TS Personnel Qualification	Welding	Inspection Report Checklist Support Document	Accountability Completeness Legibility	Improper Correction White Out Line Through	Personnel Sign-off	Traceability Material	Procedure and Drawing Review	Calibration	Engineering Approval Change Document	Inspection Test Requirements	Vendor Requirements	General Non-List Miscellaneous Items	Input Errors	Totals
Beams and Structural steel	28	134	148	440	56	67	241	127	9	601	0	0	66	10	1,907
Civil-earthwork	6	0	0	15	2	25	53	94	1	6	0	0	35	9	246
Cable	104	1	96	123	83	535	76	18	1	30	130	0	315	39	1,551
Cable termination	111	0	17	150	76	59	0	31	22	31	0	0	200	4	701
Conduit	17	24	31	41	4	186	47	48	9	12	0	0	386	5	805
Cable trays	44	5	18	405	96	108	43	725	34	45	0	0	755	57	2,335
Electrical boxes	10	2	1	2	1	19	5	19	5	4	0	0	151	3	222
Electrical hangers	1,242	172	2,794	1,074	948	1,867	459	6,646	42	934	0	0	1,722	759	18,659
Electrical equipment	278	3	173	154	55	103	57	260	1	30	16	0	125	35	1,270
Instrumentation	32	3	50	17	2	23	2	23	0	4	2	0	24	10	192
Instrument pipe	125	260	10	669	162	259	1,094	998	18	329	0	0	54	65	4,043
P/M hydro packages	25	3	1	110	4	28	24	154	7	69	0	1	22	50	493
Large bore pipe	102	179	10	462	283	294	389	704	48	310	0	0	50	94	2,925
Small bore pipe	117	135	1	408	163	317	443	843	1	390	0	0	42	122	2,982
Mechanical equipment	39	26	11	268	82	114	71	361	25	43	0	0	54	78	1,172
Mechanical supports	364	1,103	72	1,191	473	1,142	1,105	4,371	28	606	0	30	163	138	10,786
Purchase orders (Includes HVAC)	178	1	53	875	147	39	193	0	0	9	0	24	62	3	1,564

Table E-7
Document Exception List Item Per Checklist Attribute Group
New Work by Item

	QA/QC/TS Personnel Qualification	Welding	Inspection Report Checklist Support Document	Accountability Completeness Legibility	Improper Correction White Out Line Through	Personnel Sign-off	Traceability Material	Procedure and Drawing Review	Calibration	Engineering Approval Change Document	Inspection Test Requirements	Vendor Requirements	General Non-List Miscellaneous Items	Input Errors	Totals
Stand alone NCRs	36	8	0	38	5	50	50	299	21	151	0	0	30	4	650
Meggers/hypots (cable tests)	67	0	34	4	4	16	0	0	18	1	0	0	72	0	216
Miscellaneous	2	0	0	40	1	0	1	15	0	13	0	0	10	411	493
Totals	2,977	2,059	3,500	6,486	2,605	5,731	4,548	15,756	285	5,998	148	95	4,338	1,896	55,212

Table E-8

Checklist Attribute Groups

Group Number	Checklist Group Description	Comments
1	QA/QC/TS personnel certifications/qualifications	This is the review of quality-related documentation to ensure that non-certified individuals did not sign for quality-related activities, and that inspection personnel did not exceed the limits of their certified capability, i.e., cross-discipline sign-off of quality inspections.
2	Welding information, welder qualifications, needed ID, and inspection	This is the review of quality-related documentation to ensure that the required information for welder-listed variables and inspection personnel is correct for the welding process listed on the documentation.
3	Inspection reports/checklists supporting documentation	This is the review of inspection documentation that checks for compliance to the quality instructions and for inspection documentation that reflects the type of inspection performed.
4	Accountability, completeness, and legibility	This is the review of quality documentation to verify that all documentation required by procedures, standards, and codes have been completed and can be read.
5	Improper corrections, whiteouts, line throughs, etc.	This is a review of documentation to verify that corrections were made by individuals authorized to correct errors or entries and to ensure that any obliterated data does not have an impact on the quality of the hardware.
6	Personnel sign-offs, initial and final review, and hold and inspection points	This is a review to assure that all required hold or inspection points were completed and that all necessary reviews were completed. This review is completed in conjunction with Groups 1 and 2.
7	Material traceability	This is a review of material to verify that the material listed on the installation is traceable to the receiving or purchase documentation. Additionally, this review verifies that the material listed on the installation agrees with the material shown on design or installation drawings.
8	Procedure and drawing revisions	This is a review to verify that procedure or drawing revisions listed on the installation documentation are correct for the time period used.
9	Calibration	This is to ensure that properly calibrated tools were used to perform quality inspections.

Table E-8

Checklist Attribute Groups

Group Number	Checklist Group Description	Comments
10	Change documents and AE review and concurrence, engineering change notices, nonconformance reports, field change requests, field engineering change notices, red-line drawings to blue-line drawings, etc.	This is to ensure that the documentation package contains the correct change documents required for the installation, that the documents are referenced in the installation package, and that all in-process drawing changes have been incorporated into the final blue-line drawing contained in the installation package.
11	Inspection and test requirements	This is to ensure that all tests and inspections required by procedures, codes, and standards have been completed and are documented in the traveler package and that the test is acceptable.
12	Vendor requirements	This is a review of purchase and receiving documentation to ensure that all vendor- and site-generated documentation complies with the purchase order and that all procedural requirements have been complied with.
13	General items not covered by specific checklist attribute	This group is used for special cases not covered by a checklist attribute in the preceding 12 categories.
14	Data base input errors	This group accounts for errors in the computer data base caused by typographical keypunch errors or reviewer errors entered into the computer.

APPENDIX F

ANALYSIS OF RECORD VERIFICATION DATA BASE FOR SUFFICIENCY OF DATA

The Record Verification Program has completed more than 5,600,000 attribute examinations as of December 10, 1984. As is demonstrated in Table F-1, at least 300,000 attributes have been examined in each of the major construction disciplines. Given the large number of attributes examined within each discipline, any significant adverse record conditions applicable to a construction discipline class of attributes should be identifiable.

In order to confirm that inspection samples were sufficiently comprehensive within each discipline, Illinois Power Company has calculated the number of attributes evaluated under the Record Verification Program for each type of major item within the scope of the program. The results are presented in Table F-2. As this table demonstrates, each type of major item has had at least 7,000 record attributes evaluated. In all catagories except instrumentation, the number of record attributes examined exceeds 19,000. Any significant adverse record condition applicable to a type of item should be evident from such a large number of record attributes evaluated. Thus, sufficient data are available to evaluate the quality of records for each type of item.

Statistical analysis lends support to the judgment that sufficient data from the Record Verification Program are available for analysis. The large number of record attributes examined under the Record Verification Program permits judgments on the quality of construction records of the Clinton Power Station to be drawn with a high degree of confidence.

For example, based on the overall total of 5,600,000 record attributes examined and assuming an infinitely large lot, statistical analysis predicts that the nonconformance rate in the lot would have a maximum uncertainty of only 0.04% at the 95% confidence level.[1] For the instrumentation item category, which has the least number (7,225) of record attributes evaluated, the maximum uncertainty in the nonconformance rate is reasonably low at only 1% at a 95% confidence level. These small uncertainties indicate that sufficient data are available from the Record Verification Program as of December 10, 1984, to permit evaluation.

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[1] At the 95% confidence level, the maximum uncertainty is determined from the following equation:

$$U = \frac{1.96}{N} \sigma \times 100\%, \text{ where } \sigma^2 = N[p(1-p)]_{max} = .25N$$

and where U = maximum uncertainty in nonconformance rate at a 95% confidence level

σ = standard deviation
N = number of inspected attributes
p = probability that an attribute is nonconforming

Table F-1
Number of Record Attributes Examined
by Construction Discipline

Construction Discipline	Number of Attributes Evaluated
Electrical	1,446,859
Piping/mechanical	2,878,831
Instrumentation	324,445
Civil/structural	520,865
Procurement	446,880
Others	61,574
Total	5,679,454

Table F-2
Number of Record Attributes Examined
by Type of Major Item

Item	Number of Evaluated Record Attributes
Beams and structural steel	277,000
Civil-earthwork	248,285
Cable	199,814
Cable terminations	121,878
Conduit	79,560
Cable trays	19,627
Electrical boxes	22,344
Electrical hangers	913,366
Electrical equipment	90,270
Instrumentation	7,225
Instrument pipe	317,220
P/M Hydro packages	36,226
Large bore pipe	515,744
Small bore pipe	1,437,364
Mechanical equipment	103,880
Mechanical supports	785,617
Purchase orders	446,880
Others	61,572
Total	5,679,454

APPENDIX G

GENERIC RESOLUTIONS IN THE RECORDS VERIFICATION PROGRAM

Table G-1 lists the current status and function of generic resolutions (GR) in a narrative format. For each GR, the underlying problem and its resolution are described, along with the reasons and justifications for the resolution action taken. These reasons and qualifications show that all record deficiencies resolved by GRs have no adverse implications.

GRs are numbered sequentially as they are proposed. If a proposed GR is disapproved, the number is retired and not used again. The issuance and distribution of GRs are handled and controlled as a controlled document under standard Baldwin Associates (BA) document control procedures.

GRs are prepared in a standard format which includes subject, references, problem description, resolution, and justification sections. Specific criteria and instructions are written in the resolution section so that the application and use of each GR can be clearly understood. Training in their use is an integral part of the program.

Each controlled GR write-up includes references to applicable procedures, codes, and backup documentation. Underlying problems and root causes are presented, along with a detailed account of the resolutions. A justification statement must be included in each GR which explains why the resolution is suited to the problem. The justification includes accurate references to historical policy and policy changes, procedure and code citations, quotations or references to commitments from Illinois Power Company (IP) or the Nuclear Regulatory Commission (NRC), and explanations or clarifications of procedures, drawings, or systems. The GR acknowledges the role of quality assurance (QA) field verification in assuring project quality by citing specific QA field verification activities that will relate to the GR's subject. The Manager of Quality Engineering must evaluate each proposed GR and each revision for potential 10 CFR Section 50.55(e) and 10 CFR Part 21 reportability and must document the results in writing. These evaluations by the BA Manager of Quality Engineering, reviews and approvals by cognizant disciplines, and the concurrence of IP QA provide the controls and assurance that GRs do not affect the safety of plant operations or quality by violating established site commitments or procedures.

Once approved, a GR is implemented into the Document Review Group (DRG) review process by training users to assure accurate understanding of the criteria for use, the reason and justification for its use, and when it cannot be used. Revisions to GRs are approved and implemented in the same way as new GRs.

The GR Program assures that records accepted through the use of a GR acceptably document that the hardware was properly purchased or installed to perform its safety-related function during operation.

Table G-1
Generic Resolutions

GR No.	Rev.	Subject	Discipline[1]	Reason/Problem	Justification and Significance to Safety
1	1	Improper corrections made to documents, including correction fluid and tape	(All)	Corrections, additions, and deletions have been improperly made on documents. This violates American National Standards Institute (ANSI) N45.2.9 requirements, project directives, and procedures.	Per site procedures, documents that must be corrected due to update or deletion of information, human error, or other shall be done by placing a single line through the original entry, the date of the correction, and the initials of the individual making the change. Contrary to this, corrections, additions, and deletions have been made on quality documents that did not comply with site procedures. This GR allows these improperly corrected documents to be reviewed and evaluated by a certified Level II or Level III reviewer. If the correction does not involve acceptability, traceability, identification of the hardware, vendor documents, or BA records and does not leave indeterminate or identify a condition found to be potentially adverse to the quality, it may be accepted.

1 C/S-Civil/Structural
E-Electrical
P/M-Piping/Mechanical
PRO/SUB-Procurement/Subcontract
ALL-All disciplines

Generic Resolutions

GR No.	Rev.	Subject	Discipline	Reason/Problem	Justification and Significance to Safety
1	1	(Continued)			However, the reviewer evalutes the condition and determines that hardware may be affected. As mentioned above, he indicates the condition as a document exception list (DEL) item, which is then closed after initiation of a nonconformance report (NCR) that is used to bring the item back to a conforming condition. Plant quality and safety at Clinton Power Station (CPS) is maintained with the use of this GR.
2	2	Illegible data on documents due to mishandling, poor reproductions, holes, folds, tears, or creases	(All)	Data on documents are illegible due to mishandling and poor reproduction.	The Level II reviewer evaluates and determines if the obliterated entries affect the acceptability, traceability, or identification of the hardware, vendor records (documents provided by the hardware and material suppliers), and BA documents. BA documents are records that provide architectural design criteria, construction, and quality inspection data. The data indicates the receiving, fabrication (putting material together to make a completed item), and installation status of items and equipment. If the obliterated entry does not affect the acceptability of the documentation or hardware, or if other records within the traveler substantiate the missing information, no DEL item is required. When the obliteration makes a complete evaluation impossible or affects the acceptability of a document or hardware, a DEL item is written. The resolution of the DEL item may be to insert a replacement copy of the document into the package. The replacement copy contains the legible data. If the item requires re-inspection by a quality inspector, the results are attached to the DEL to substantiate that the hardware is acceptable.

Generic Resolutions

GR No.	Rev.	Subject	Discipline	Reason/Problem	Justification and Significance to Safety
3		Same as GR2 (not issued)			The use of this GR relieves the reviewer of having to document each and every obliteration when it is clear that the obliterations do not affect the quality of the documentation or hardware installed in the plant.
4	2	Red-line as-built drawings in vaulted augmented class D (radioactive waste) traveler packages	(P/M)	Augmented class D (radioactive waste) travelers do not have complete blue-line as-built drawings as required by JI-P-020, although Specification K-2882 and FCR-18008 accept red-line drawings.	GR 4 addresses the attachment of red-line construction drawings to a traveler when blue-line as-built drawings were required by an engineering job instruction. When drawings are issued by the design engineer to construction, they are commonly known as blue-line drawings (because they have a blue tint). These drawings give the construction information needed to install the equipment. It is often necessary to make field changes during installation. These changes are noted on a blue-line drawing by using red ink or red pencil, thus giving the drawing the term, red-line. These changes are approved by engineering and quality control (QC) prior to implementation by construction. After completion of the installation, QC uses the red-line drawing for inspection and acceptance of the item. When inspection and acceptance of the item is completed, the red-line drawing becomes the reflection of the item as it is installed in the plant or as-built.

Generic Resolutions

GR No.	Rev.	Subject	Discipline	Reason/Problem	Justification and Significance to Safety
4	2	(Continued)			The engineering job instruction required the engineering/drafting department to incorporate the red-line changes onto a master drawing. A copy of the master drawing was made and termed the "blue-line as-built." This copy was then required to be inserted into the traveler. If it was not, the DRG reviewer identified it on the DEL. The engineering job instruction imposed requirements not specified by the contract specifications. GR 4 allows the red-line as-built to be accepted in place of a blue-line as-built. When a DRG reviewer determines that a red-line as-built drawing is not complete, a DEL item is generated and the appropriate changes are noted on the drawing by the engineering department. The use of this GR does not adversely affect the quality of the hardware or documentation at CPS.
5	0	QA/DRG generic disposition to accept "D" in the "class" space of the title block of augmented class D (radioactive waste) traveler	(P/M)	Part of the system description was omitted from the title block of the traveler. "D" was used instead of "Aug D." DEL items were written on these.	This GR allows the use of the letter "D" in the "class" space of the title block of augmented class D (radioactive waste) travelers (Form JV-577). The use of this GR does not adversely affect the hardware or documentation of CPS.

Generic Resolutions

GR No.	Rev.	Subject	Discipline	Reason/Problem	Justification and Significance to Safety
6		Not issued			
7	1	Absence of welder identification (ID) on ANSI and American Welding Society (AWS) related travelers	(C/S) (E) (P/M)	QA/DRG is unable to verify welder qualification for some welds on AWS and ANSI related travelers where the welder ID was not documented on the traveler.	The DEL items that stimulated this GR were written in response to a checklist item that called for verification of welder qualifications. Many travelers do not show welder ID, and, therefore, welder qualifications in these cases cannot be verified from the documentation. Both ANSI and AWS standards require that welder ID be placed either on the documentation or near the weld. Consistent with these requirements, BA's general welding specification, BTS-401, requires only that the welder ID be placed adjacent to the weld. Welder ID and qualifications are verified in the field by BA Technical Services (TS) welding inspectors per project procedure BTS-405. Accordingly, the absence of welder ID on the traveler violates no requirements and in no way compromises the integrity of the documentation of the quality of the welds.
8a	2	Level I inspection sign-offs on travelers and supporting inspection reports	(C/S) (E) (P/M)	Travelers and inspection documents have been signed off by Level I inspectors without objective evidence of a Level II review.	Level I personnel have been trained and certified to implement inspection and test procedures and to record the results of such inspections. After the Level I inspector implements the applicable inspection procedure, a Level II inspector evaluates the inspection results and documents their validity by signing the traveler "final review" block.

Generic Resolutions

GR No.	Rev.	Subject	Discipline	Reason/Problem	Justification and Significance to Safety
8a	2	(Continued)			When inspections are signed-off by Level I inspectors and there is objective evidence of Level II review (Level II certified in the same discipline, i.e., electrical, mechanical, civil/ structural), the document reviewer does not document this as an exception. However, when no objective evidence of a Level II review exists, the condition is written on a DEL. The appropriate Level II discipline DEL resolver, certified in the appropriate discipline, reviews the scope of work of the Level I inspector for technical adequacy, which is an evaluation of the validity and acceptability of the inspection, examination, and test results. This review ensures that the integrity of the documentation or the safety of the plant is not affected.

Generic Resolutions

GR No.	Rev.	Subject	Discipline	Reason/Problem	Justification and Significance to Safety
8b	1	Initial and final review sign-offs on travelers	(C/S) (E) (P/M)	QC traveler initial and/or final review was performed by an individual either who was not a certified Level II QC inspector or who was not certified as Level II in the discipline appropriate to the activity documented by the traveler.	The initial or final review of installation/fabrication travelers was to have been performed by individuals who were certified as Level II QC inspectors in the activity or discipline documented on the traveler. Contrary to this requirement, the initial/final review of travelers was performed by individuals other than Level II QC inspectors. The traveler review process is not now considered to be an inspection, and since it was performed by authorized individuals, the initial/final review by other than a QC Level II is acceptable provided that all QC inspections documented in the traveler package have been reviewed by four Level II QC inspectors certified in the discipline documented in the traveler. If no documentary evidence exists indicating that QC Level II review of inspections were documented by a QC Level I inspector, then a DEL item must be issued and resolved by QC in accordance with the requirements of GR 8a.

Generic Resolutions

GR No.	Rev.	Subject	Discipline	Reason/Problem	Justification and Significance to Safety
8b	1	(Continued)			The above review is performed while the traveler is in process. QA/DRG reviews completed travelers using criteria equal to, or more stringent than, those of the QC traveler final reviewer, thus ensuring the quality of the documentation and that the safety of the plant is not compromised.
9		Not issued			
10	3	Missing and incorrect governing procedures and revisions on travelers	(C/S) (E) (P/M)	Reference procedures and their revisions are missing from the travelers or are erroneous. This violates BA QA Manual, paragraph 10.4.1, that requires listing of procedures and applicable revisions on all travelers.	The BA QC Manual requires that applicable procedures and their proper revision be listed on all travelers. Due to human error, and in some cases because more than one revision of a procedure was in effect at different times when a work activity extended over a long period, this was not always done. The resident engineering (RE) DEL Resolution Group has evaluated over 5,000 DEL items identifying this deficiency on a case-by-case basis, with no NCRs being generated. In other words, it has been determined that no safety-related, hardware impacting conditions adverse to the quality of the plant have been detected. Based on this, it is clear that there is no statistically significant relationship between this type of DEL item and hardware nonconformances. Plant safety is therefore not compromised.

Generic Resolutions

GR No.	Rev.	Subject	Discipline	Reason/Problem	Justification and Significance to Safety
11	2				Since GR 11, revision 2, was superseded by GR 10, revision 1, all descriptions and significance to design and safety are contained within the superseding GR.
12a	2	Incorrect revisions for M06, M07, and isometric drawings on component support travelers except headfittings	(P/M)	DRG reviewers were writing DEL items for incorrect M06, M07, and isometric drawing revisions listed in the reference block on component support travelers (excluding headfittings).	GR 12a was initiated to cover cases of incorrect revisions of M06, M07, and isometric drawings listed in the reference block of component support (hanger) travelers. This GR is not used for headfitting travelers. These drawings are listed on component support travelers as references only, and the revision level is not always updated on the travelers. The piping drawings show the layout of the pipe system including location of the valves, fittings, component supports, etc. They do not govern the installation of the hangers and, therefore, do not directly affect the work performed in component support travelers. The construction and installation of a hanger is governed by Sargent & Lundy's (S&L) hanger drawing included in the traveler package. This drawing gives the exact locations of the hanger attachments. Any changes to the referenced piping drawings that affect the hanger design are incorporated by S&L in the hanger drawing. Quality of the hardware construction, installation, and acceptance is not affected, and, therefore, the use of this GR can have no impact on the safety of the operation of CPS.

Generic Resolutions

GR No.	Rev.	Subject	Discipline	Reason/Problem	Justification and Significance to Safety
12b	0	QA/DRG's GR for incorrect isometric drawing revision referenced on fabrication travelers	P/M	QA/DRG's GR for incorrect isometric drawing revision referenced on fabrication travelers.	A fabrication traveler is used to provide documentation of the construction, inspection, and assembly of hardware items that will be physically incorporated into the plant at a later date per an installation traveler. An installation traveler is used to provide documentation of the installation of fabricated hardware items into the plant. Final QC inspection and acceptance is documented in these travelers and will confirm or supersede any previous inspections that were made in the fabrication travelers. This GR is applied only if the following conditions are met: - There is a piping system fabrication or installation traveler walkdown inspection checklist (Form JV-734) in the fabrication traveler that lists the correct isometric drawing revision. - The installation traveler reflects the correct or later revision of the traveler, and QC has accepted the installation of the fabricated items based on the latest revision of the isometric drawing. If one or both of the above conditions are met, there is documented evidence provided that the installed hardware items have been inspected and accepted as meeting the latest design requirements. Therefore, there is no impact on the quality of construction or safety of operation of CPS.

Generic Resolutions

GR No.	Rev.	Subject	Discipline	Reason/Problem	Justification and Significance to Safety
12b	0	(Continued)			If the above conditions are not met, QA/DRG documents the condition as a DEL item and forwards it to the DEL Resolution Group for resolution.
12c	0	QA/DRG GR for incorrect isometric drawing revisions listed in the drawing reference block of piping travelers	(P/M)	QA/DRG GR for incorrect isometric drawing revisions listed in the drawing reference block of piping travelers.	This GR can be used only if the correct isometric drawing revision is listed in the attachment block of the traveler. A document listed in the attachment block must be included in the traveler package. Construction and inspection activities must adhere to the latest drawing revision included in the traveler. Therefore, if the correct revision is attached and listed in the attachment block, assurance is provided that construction and inspections were performed to the latest design requirements. QA/DRG reviewers are instructed not to write DEL items on this condition because there is no impact on the quality of construction nor safety of operation of the plant.
12d	0	GR for incorrect revisions of M04 drawings referenced on mechanical equipment installation travelers	(P/M)	GR for incorrect revisions of M04 drawings referenced on mechanical equipment installation travelers.	GR 12d applies exclusively to drawings M04-1005, M04-1006, M04-1007, M04-1008, M04-1009, and M04-1035. This GR is used only if other M04 drawings having a sequence number of 1037 or above with the correct revision are referenced in the traveler.

Generic Resolutions

GR No.	Rev.	Subject	Discipline	Reason/Problem	Justification and Significance to Safety
12d	0	(Continued)			M04 drawings concern equipment foundations and provide a means of identifying the location of a piece of equipment. The 'ower numbered drawings listed above are general in scope, cover large areas, and give the location of several pieces of equipment. M04 drawings numbered 1037 and above contain this same information, plus greater detail. Any design change in the lower numbered drawings are incorporated into revisions of the higher numbered drawings. If the correct revision of these higher numbered drawings is listed in the traveler, the lack of correct revisions on the subject drawings can have no adverse impact on the quality of construction or safety of operation of the plant. If the correct revision of the higher numbered drawings is not listed in the traveler, the QA/DRG reviewer will issue a DEL item and forward it to the DEL Resolution Group.
13	2	Deletion of QC and TS inspection and sequence points indicated by initial review Level II on augmented class D (radioactive waste) and fire protection travelers	(P/M)	QC and TS inspection personnel marked "N/A" or left blank the inspection/sequence points on augmented class D (radioactive waste)/fire protection fabrication/installation travelers (JV-577).	Inspection and sequence points were assigned to certain inspection attributes during initial review of augmented class D (radioactive waste) and fire protection travelers. These inspection points specify a particular attribute that must be inspected before work continues on other items or specifies a particular sequence of events in the construction activity.

GR No.	Rev.	Subject	Discipline	Reason/Problem	Justification and Significance to Safety
13	2	(Continued)			QC and TS personnel marked "NA" or left blank the inspection and sequence points that were designated by initial Level II review personnel on augmented class D (radioactive waste) and fire protection/fabrication/installation travelers (Form JV-577). These conditions are documented as DEL items and accepted per GR 13 with the following exceptions: - Location and orientation, alignment and configuration, final dimensions, or protective seals and covers. If these attributes are not inspected on the corresponding installation traveler, DELs are written and submitted to the DEL resolver group for resolution. - Block 8 of Form JV-577, GR 13 applies to all items in block 8 other than "weld complete." If welding is performed, the weld complete block must be filled in or a DEL item is submitted to the DEL Resolution Group. The only required sign-off by code or standard is "weld complete."

Generic Resolutions

GR No.	Rev.	Subject	Discipline	Reason/Problem	Justification and Significance to Safety
13	2	(Continued)			Fabrication travelers are inspected prior to installation travelers; therefore, the acceptance of the installation traveler would supersede the acceptance of the fabrication traveler. The acceptance criteria is the same for both travelers. A final review is performed for each completed traveler in accordance with site procedures by a certified Level II inspector. This review includes, but is not limited to, verifying that all required inspections have been completed and that deleted inspection and sequence points are not applicable. The Level II personnel performing final review are trained and certified and have demonstrated capabilities in the validation and acceptance of inspections, examinations, and test results. Therefore, the deletion of these inspection points has no adverse effect on the quality of the plant or the integrity of the applicable documentation.
14		Not issued			
15		Not issued			

Generic Resolutions

GR No.	Rev.	Subject	Discipline	Reason/Problem	Justification and Significance to Safety
16	0	QA GR for discrepancies involving the JV-118 (requisition/purchase order [PO] review form)	(PRO/SUB)	QA GR for discrepancies involving form number JV-118.	JV-118 is an obsolete checklist type form that was used by procurement engineers as an aid to assure that the information on a requisition was incorporated on the PO. At no time did it provide documentary evidence of the quality of items or activities. The information provided on JV-118 was a reiteration of the information provided on both the PO and the purchase requisition. Both the PO and the requisition are subject to review for quality requirements and require management level approval, which is authenticated by date and signature. The use of this GR does not compromise the safety of the plant or of the documentation because all quality-related requirements are extracted from approved codes, standards, and specifications, which in themselves are used by DRG for the review and approval of the requisitions and PO, not the JV-118.
17		Not issued			
18	0	QA/DRG GR for cases where final cleaning was designated as a "sequence" but was not signed-off	(P/M)	QA/DRG GR for cases where final cleaning was designated as a "sequence" but was not signed-off.	GR 18 was initiated for cases where final cleaning was designated as a sequence step on travelers, but was not signed by BA inspection personnel. Per site procedures and directives, sequence points must be signed and dated by authorized personnel.

Generic Resolutions

GR No.	Rev.	Subject	Discipline	Reason/Problem	Justification and Significance to Safety
18	0	(Continued)			Final cleaning is designated by S&L in Specification K-2882 as IP's responsibility. Though it is considered a procedural violation to leave a sequence step blank, the quality of the hardware is not affected in these instances because IP verifies that the final cleaning during startup and pre-op testing has been performed per design requirements. It was never the responsibility of BA and should not have been sequenced on the travelers. Therefore, a deficiency of this nature can have no impact on the quality of documentation or construction nor on the safety of operation of CPS.
19	1				Since GR 19, revision 1, was superseded by GR 72, revision 0, all descriptions and significance to design and safety are contained within the superseding GR.
20		Retracted			This GR dealt with material traceability or the lack of material traceability documented on NCRs or discrepancy reports which were part of corrective action request (CAR)-073. The use of this GR did not compromise the safety or design of the installation because the problems associated with material traceability on electrical installations prior to 1/1/84 have been resolved by CAR-073, NCR 23422, and GR 111.

Generic Resolutions

GR No.	Rev.	Subject	Discipline	Reason/Problem	Justification and Significance to Safety
21	0	QA/DRG GR for items and materials with non-safety receiving inspection report (RIR) numbers listed on augmented class D (radioactive waste) travelers, form JV-577	(P/M)	QA/DRG GR for items and materials with non-safety RIR numbers listed on augmented class D (radioactive waste) travelers, form JV-577.	Non-safety RIR numbers (RIR numbers with an "N" prefix) do not denote a lack of QA involvement. The use of the non-safety RIR number was generated by QC to document receipt of items and materials purchased in accordance with attachment A of the procurement manual for non-safety POs. Because items and materials received on safety- and non-safety-related RIRs are inspected per the same criteria, it is assured that the implementation of this GR could have no adverse effect on the design or safety of the plant.
22	0				GR 22 addressed incorrect heat or RIR numbers on electrical installations. Since GR 22 was superseded by GR 111, all descriptions and significance to design and safety are contained within the superseding GR.
23		Not issued			
24	0				GR 24 addressed various sizes and dimensions of sheared plate installed in electrical installations without heat or RIR numbers for material traceability. Since GR 24 was superseded by GR 111, all descriptions and significance to design and safety are contained within the superseding GR.
25		Not issued			

Generic Resolutions

GR No.	Rev.	Subject	Discipline	Reason/Problem	Justification and Significance to Safety
26		Not issued			
27	1	Missing JV-146 forms and deleting duplicate data on JV-146 and JV-155 forms from scope of QA/DRG review	(PRO/SUB)	Completed JV-146 and JV-155 forms that are required to be included in record packages are missing. Also, data on these forms is missing, incorrect, or has been improperly corrected, etc., but this data is duplicated data on other project records.	GR 27 addresses two site documents: JV-146 (QA documentation checklist) and JV-155 (QC receiving inspection instructions). This GR is used where one or both of these documents are missing from record packages and for deleting duplicate data entries made on these forms. Where one of these documents is missing, an acceptable copy of the missing original <u>must</u> be obtained, reviewed, approved, and inserted in the package or a new original must be initiated, reviewed, approved, and inserted in the package. Certain data (e.g., requisition numbers, names of suppliers, CPS unit numbers) appear on numerous site documents (RIRs, the PO, the subcontracts, etc.) and are duplicated on both JV-146 and JV-155. The data do not significantly affect the quality of the plant, hardware, or vendor documentation as it is not used to accept or reject documents. The PO, subcontract, and RIR contain this same data and it is on these forms that this data is reviewed and approved or rejected; therefore, no design or safety significance exists.
28		Not issued			
29		Not issued			

Generic Resolutions

GR No.	Rev.	Subject	Discipline	Reason/Problem	Justification and Significance to Safety
30		Not issued			
31	2	Arrows, continuation lines, and ditto marks used to carry data forward on BA travelers and checklists	(C/S) (E) (P/M)	Arrows, continuation lines, and ditto marks have been used to carry data forward on BA travelers and checklists, and their use is not addressed by codes, standards, etc.	Though the use of ditto marks, arrows, and continuation lines is a practice widely used in many other industries to signify inclusiveness, its use had not been addressed by site procedures, codes, or directives until 9/15/83, per memo JF 34883. This policy memorandum accepts this practice for use on BA documentation prior to 9/15/83, providing that after review by a certified Level II reviewer, the subject documentation is found to be legible and readily comprehensible. Any other condition would leave the quality of the item indeterminate and require that a DEL item be generated. This situation would automatically make the item subject to reinspection or resolution by an NCR where the quality of the hardware is determined to be questionable.
32		Not issued			
33		Not issued			
34		Not issued			

GR No.	Rev.	Subject	Discipline	Reason/Problem	Justification and Significance to Safety
35	0	GR for acceptance of Level I inspector sign-offs on receiving inspection documentation forms.	(PRO/SUB)	GR for acceptance of Level I inspector sign-offs on receiving inspection documentation forms.	This GR was initiated to accept Level I inspector sign-offs on receiving inspection documentation forms. The DRG will not write DEL items when the following conditions exist: - RIR (form JV-152) is signed and dated in the "inspected by" block by a Level I inspector and the "reviewed by" block is signed by a certified Level II inspector. Level I inspection personnel are trained and certified in accordance with industry standards, which allow a Level I inspector to implement inspections, examinations, and test procedures. The RIR is subject to a review by a Level II inspector who evaluates the inspection results and documents their validity by signing the "reviewed by" block. - RIR form JV-155 is signed, initialed, and dated by a Level I inspector and the "reviewed by" block on RIR form JV-152 is signed by a certified Level II on or after the Level I inspection date. Receiving inspection instruction form JV-155 is part of the inspection documentation and must be attached to RIR form JV-152 at the time the Level II reviewer performs the documentation review. The Level II reviewer will not accept the documentation package without a completed JV-155 form. The Level II reviewer evaluates the inspection results recorded by the Level I inspector and documents their validity by signing the "reviewed by" block on form JV-152.

Generic Resolutions

GR No.	Rev.	Subject	Discipline	Reason/Problem	Justification and Significance to Safety
35	0	(Continued)			- Script or printed names or initials that are in agreement with the authorized signature card are acceptable, provided there is no disagreement noted with the authorized signature card. If a disagreement does exist, the presence of a higher level review resolves the item. Incorporating this GR into the document review program does not adversely affect the quality of the documentation or the physical integrity of the plant.
36	1	Referenced change documents not in traveler packages	(C/S) (E) (P/M)	Change documents, such as NCRs, deviation reports (DR), field change requests (FCR), field engineering change notices (FECN), and engineering change notices (ECN), required by governing procedures are to be listed as attachments to traveler packages and included in the traveler packages. However, they are not included in packages or are not marked with "approved for construction" control stamps.	This GR has been issued because change documents that are required by procedure to be listed as attachments to a traveler package or that are not marked with "approved for construction" control stamp as required are not attached to the package. This applies to travelers in the civil/structural, electrical, and piping/mechanical disciplines. This GR ensures that traveler packages list and contain the required change documents in the following manner: The Level II or III reviewer must first determine that the suspect document is, in fact, required. If they are required but missing, the QA/DRG reviewer will obtain a copy of the change document and place it in this package after verifying that it is complete, closed by site procedures, and stamped "approved for construction."

Generic Resolutions

GR No.	Rev.	Subject	Discipline	Reason/Problem	Justification and Significance to Safety
36	1	(Continued)			If the above conditions cannot be met, a DEL item is generated and remains open until the above requirements are satisfied. In this way, the quality of the plant is assured and no design of safety significance exists.
37		Same as GR 13 (not issued)			
38		Not issued			
39		Not issued			
40	0	Use of non-black ink on project records is deleted from the scope of QA/DRG review	(All)	Use of non-black ink on project records deleted from the scope of QA/DRG review.	ANSI and site requires that documentation be suitable for microfilming. The onsite microfilm equipment will reproduce any color ink, and using black ink or non-black ink will neither enhance nor detract from the quality of the documentation. The use of this GR, therefore, has no effect on acceptability of the documentation or on the quality of the hardware installed in the plant, and no design or safety significance exists.
41	0	Blank inspection checklists in electrical traveler packages	(E)	Blank inspection checklists in electrical traveler packages.	As part of the initial traveler review (R/O of traveler), blank inspection checklists are inserted into the traveler package per project procedures. The requirement for placing blank checklists into the traveler for subsequent traveler revisions has been deleted. For subsequent traveler revisions, checklists will be added when necessary by the QC inspector at the time of inspection.

Generic Resolutions

GR No.	Rev.	Subject	Discipline	Reason/Problem	Justification and Significance to Safety
41	0	(Continued)			Placing electrical inspection checklists into traveler packages at the time of the initial review is in complete accordance with project procedures. Deleting the requirement to add checklists at each initial review for subsequent traveler revisions does not affect project quality. When a traveler is found with blank forms, initiated prior to the procedure changes, a DEL item is written to document the occurrence. It is resolved by accepting the package with the blank forms under this GR. Project quality is not adversely affected, using the same logic as described above.
42	0	Verification of signature and initials authorization deleted from scope of QA/DRG review	(All)	Delete authorized release signature list.	GR 42 deleted a requirement to use the authorized release signature list to verify that people were authorized to sign particular signature blocks on documentation whether the signature was quality related or not. This GR clarified that people had to be certified to sign quality inspection or review and acceptance blocks on documentation. These certifications are found on the Quality and Technical Services (Q&TS) certification matrix, which is a computerized record of all quality personnel listing the different types and certification levels for each person (a person's certification is determined by education, experience, and test results).

Generic Resolutions

GR No.	Rev.	Subject	Discipline	Reason/Problem	Justification and Significance to Safety
42	0	(Continued)			Non-quality signature blocks do not indicate acceptance of a quality-related attribute, and the reviewer verifies only that a signature is in the block. The authorized release signature list is used only to match a signature with a name. The name is then used to verify certification status of the individual. The use of this GR does not adversely affect the quality of the hardware or documentation at CPS.
43	0				GR 43 addressed improper corrections on BA documents. Since this was superseded by GR 1, revision 1, all descriptions and significance to design and safety are contained within the superseding GR.
44	1	QC hold points deleted on augmented class D (radiocative waste) and fire protection piping travelers (JV-577)	(P/M)	Travelers (JV-577) containing QC hold points assigned at the time of initial review have been deleted during inspection activities.	This GR was issued because augmented class D (radioactive waste) and fire protection fabrication and installation travelers (form JV-577), which contained QC hold points assigned at the time of initial review, had been deleted during inspection activities. A hold point is an inspection point established on the traveler by QC beyond which work cannot proceed without the QC inspector's initial and date sign-off on the traveler.

Generic Resolutions

GR No.	Rev.	Subject	Discipline	Reason/Problem	Justification and Significance to Safety
44	1	(Continued)			DRG document reviewers document findings for this condition on a DEL, unless any one of the following conditions exist: - All mandatory hold points (all raw material has been identified with heat and RIR numbers) have been satisfied or the item being installed on an installation traveler has had all hold points satisfied on the fabrication traveler. - Work has not progressed beyond a point where the inspector could witness the operation and verify that the initial and date sign-offs on the traveler (or on other approved documents attached to the traveler package) are in the proper sequence. - The initial and date sign-offs for deleting a hold point for material traceability is concurrent with or later than the initial and date sign-offs for material issued within the traveler package. Site procedures state that mandatory hold points must be placed on travelers covering the fabrication of spools furnished by Southwest Fabricators to ensure that the raw material has been identified with a heat and RIR number. Each hold point requiring a QC inspector signature must be signed and dated before the next operation in the fabrication sequence can be performed.

Generic Resolutions

GR No.	Rev.	Subject	Discipline	Reason/Problem	Justification and Significance to Safety
44	1	(Continued)			Since all mandatory hold points required by site procedures were satisfied, deletion of other established hold points would not adversely affect the quality of the hardware or the documentation.
45	0	JV-874 deleted from scope of QA/DRG review	(PRO/SUB)	JV-874 deleted from scope of QA/DRG review.	DEL items are not to be written on items involving form JV-874 (vendor documentation review) and vendor documentation review letters. The documentation checklist (JV-146) is the form used for vendor documentation received onsite with or for a given PO and its subsequent acceptance by BA vendor QA. Form JV-874 and vendor documentation review letters are not required to verify assurance of quality of the documentation or of the plant.
46	1	Interdiscipline QC inspector sign-offs on C/S fabrication/installation travelers for embedded items	(C/S)	Interdiscipline QC inspectors sign-offs on C/S fabrication/installation travelers for embedded items.	C/S QA/DRG reviewers generated DEL items when QC inspectors who were not certified in C/S discipline signed off C/S fabrication/installation travelers for embedded items. GR 46 was initiated to resolve those DEL items and to more clearly define signature and authorization requirements of QC inspectors for the QA reviewer.

Generic Resolutions

GR No.	Rev.	Subject	Discipline	Reason/Problem	Justification and Significance to Safety
46	1	(Continued)			Inspection of embedment material by QC inspectors not certified in the C/S discipline does not compromise the quality of the fabrication or installation because all QC inspectors are trained and certified to perform work governed by BAP 2.14 (fabrication/installation of items, systems, and components). The required general knowledge in this procedure is not limited to specific QC disciplines. When a QC inspector other than C/S signs for embedment material intended for electrical or piping/mechanical use, the final location and orientation of the embedment is inspected by C/S QC prior to placing the concrete. This inspection is documented on a pre-placement inspection checklist and is included in its respective concrete pour traveler. Per this clarification, the presence of any certified QC inspector's signature on embedment fabrication or installation is acceptable and assures that the items have been constructed, inspected, and accepted as meeting design requirements. Therefore, this matter has no impact on the quality of construction or safety of operation of CPS.
47	0	Items/materials rejected on RIRs (JV-152) for cleanliness	(PRO/SUB)	Items/materials rejected on RIRs (JV-152) for cleanliness.	Items or materials rejected for cleanliness during receipt inspection are acceptable per this GR. DRG reviewers accept items listed on the RIR, form JV-152, with a final disposition of "A" (conforming) even though the comments block of the RIR indicates the item was rejected for not meeting the cleanliness requirements.

Generic Resolutions

GR No.	Rev.	Subject	Discipline	Reason/Problem	Justification and Significance to Safety
47	0	(Continued)			Items that conform except for cleanliness may be accepted by QC at receipt inspection by flagging the discrepant items with red tape to denote cleaning is required. Cleaning is performed by the responsible discipline and is verified by QC to be acceptable in accordance with site procedure. An NCR is not required for minor contaminations that can be cleaned onsite. Shipments of all pipe and piping components received without closure caps attached are either flagged with red tape or documented on an NCR. Therefore, the use of this GR does not affect the quality of the hardware of the plant.
48					GR 48 was issued to accept open change documents against BA installations, provided the changed document was identified on the IP system turnover punchlist. The GR was approved, issued, and retracted on 10/19/83. GR 48 was not used to resolve DEL items, and the original was marked as voided and vaulted.
49	0	GR for augmented class D (radioactive waste) travelers listing incorrect revisions of the non-safety work program (NSWP)	(C/S) (E) (P/M)	Augmented class D (radioactive waste) work was covered by the NSWP until BAP 2.26 was issued on 9/15/81. Specific quality requirements that should have been accomplished prior to this date were not delineated in the NSWP.	For work on augmented class D (radioactive waste) and fire protection systems performed under the NSWP, the proper revision of the NSWP was not always recorded in the documentation. This prompted the writing of DEL items during review.

Generic Resolutions

GR No.	Rev.	Subject	Discipline	Reason/Problem	Justification and Significance to Safety
49	0	(Continued)			Analysis of the NSWP revisions 10 through 24 and separately imposed safety requirements revealed that, except for work types delineated in GR 49, all of the revisions met requirements for plant quality. Therefore, any revision is acceptable for all but the excepted work types. The acceptance of documentation for work in the excepted work types requires QC involvement to assure that safety requirements were met. For these areas, reviewers write DEL items that are appropriately handled on a case-by-case basis by QC and any other appropriate disciplines. The use of this GR does not affect the quality of the hardware or documentation at CPS.
50	0	Welders qualified for alternative welding procedure specifications (WPS) for non-ASME travelers	(C/S) (E) (P/M)	Welders qualified for alternative WPS for non-ASME travelers.	QA/DRG reviewers were unable to verify the qualification of a welder to an alternative welding procedure specified on a non-ASME type traveler. This GR allows QA/DRG reviewers to accept the qualifications of a welder to an alternative welding procedure when those procedures have similar acceptance criteria.

Generic Resolutions

GR No.	Rev.	Subject	Discipline	Reason/Problem	Justification and Significance to Safety
50	0	(Continued)			The similarities in alternative welding procedures and the welder qualifications to those procedures are verified in the field by BA's TS welding inspectors. Therefore, quality is not adversely affected.
51	0	Missing JV-155 for RIRs (JV-152) that contain the signed-off inspection requirements	(PRO/SUB)	Missing JV-155 for RIRs (JV-152) that contain the signed-off inspection requirement.	Prior to 9/28/76, the QC receiving inspection instructions were included on the QC RIR form JV-152. Prior to 9/28/76, RIR form JV-152 contained sufficient evidence to document the activities affecting quality as required by 10 CFR Part 50, Appendix B, Section XVII, and ANSI N45.2.9. Also on 9/28/76, revision 0 of Baldwin Associates procedure (BAP) 2.3 was issued to remove the inspection instructions from form JV-152 and placed them on form JV-155. As shown, the requirements of receiving inspection are met throughout the process, thus assuring the safety and design integrity of the plant and the documentation.

Generic Resolutions

GR No.	Rev.	Subject	Discipline	Reason/Problem	Justification and Significance to Safety
52	2	Q&TS acceptance marking of vendor records	(PRO/SUB)	Vendor records have been marked as acceptable by combinations of various Q&TS review stamps and sign-offs that are inconsistent and in disagreement with both current and previous project procedure requirements.	Though the method of signifying review and acceptance of records is inconsistent, the criteria for acceptance has not significantly changed. In other words, even though particular stamps or methods of sign-off differ, they all signified that the vendor records are acceptable to codes, standards, project procedures, and procurement document requirements. As long as the acceptability of each record is clear, the application of this GR will have no adverse effect on the safety of the plant, its design intent, or the quality of documentation.
53	1	Non-quality vendor documents deleted from scope of QA/DRG review.	(PRO/SUB)	Present QA/DRG document review has generated numerous DEL items on the following non-quality documents: - bills of material* - transmittals - bills of lading/shipping papers* - invoices - packing slips* * **Note:** When referenced on vendor certificate of compliance or certified material test reports (CMTRs) and required to assure traceability, these documents become quality records, and this GR does not apply.	GR 53 addresses the acceptance of DEL items written against specific non-quality documents such as invoices, transmittals, packing slips, shipping papers, bills of lading from transportation companies, etc. These documents (unless they are referenced by the vendor on his certificate of compliance or CMTRs to assure material traçeability) are not considered records and have no bearing on the safety, hardware, or quality of documentation mandated by the codes, standards, and specifications used in the construction of CPS.

Generic Resolutions

GR No.	Rev.	Subject	Discipline	Reason/Problem	Justification and Significance to Safety
53	1	(Continued)			In those instances where the above referenced documents have been used by the vendor to provide or assure traceability, these documents become quality records and are subject to the same review and approval cycle as any other quality record, and this GR cannot be applied. Therefore, in instances where this GR is used, no design or safety significance exists.
54	0	Controlled documents referenced or contained within PO packages used for basis, justification, or making purchases deleted from the scope of QA/DRG review	(PRO/SUB)	DEL items have been written on controlled documents (for example, NCRs, DRs, FCRs, design specifications, ECNs, FECNs, field deviation disposition requests, drawings, etc.) in PO packages or have been referenced on the requisition, PO, or riders that were used only as a basis or justification for the purchase of items, materials, etc. These controlled documents were attached to or referenced on the requisition, PO, and riders, but were not imposed on the vendor by the PO or riders.	GR 54 addresses the acceptance of DEL items written against controlled documents ("Those documents which have been formally reviewed and approved for project construction activities which require strict control for distribution and/or traceability." Ref. BAP 2.0, paragraph 2.1) that were used only as a basis or justification for making purchases. This practice does not compromise the safety of the plant or quality of the documentation because the above defined documents were used only as attachments or references, and therefore no design or safety significance exists.

Generic Resolutions

GR No.	Rev.	Subject	Discipline	Reason/Problem	Justification and Significance to Safety
55	3	Q&TS certification type and level required for Q&TS sign-offs on JV-146, VJ-155, JV-418, JV-540, and JV-661	(PRO/SUB)	QA/DRG checklists, departmental/project procedures/instructions and forms require Q&TS sign-offs of forms JV-146 (documentation checklist), JV-155 (QC receiving inspection instructions), JV-661 (engineering documentation checklist), JV-540 (request to upgrade materials), and JV-418 (items or materials returned report), but do not clearly stipulate the specified levels and types of certifications that are acceptable.	This GR is used to address those instances where both departmental and project procedures, instructions, and forms require Q&TS sign-offs on documents, but do not clearly specify the level or type of certification required. This GR defines those parameters in conjunction with the aforementioned procedures, instructions, and forms and, in and of itself, has no impact on the design or safety of the plant or the hardware.
56		Not a GR			
57		Not a GR			
58		Not a GR			
59		Not a GR			
60		Not a GR			
61		Not a GR			
62		Not a GR			

Generic Resolutions

GR No.	Rev.	Subject	Discipline	Reason/Problem	Justification and Significance to Safety
63	0	TSIVI listed on piping travelers in lieu of TSIVI-1	(P)	Many entries on piping hanger travelers for the TS instruction were written as TSIVI, instead of TSIVI-1. This problem existed for approximately 1-1/2 years.	This GR was initiated to cover cases in which TS had incorrectly identified an instruction (TSIVI-1) on piping hanger travelers. For approximately 1-1/2 years, this instruction was often listed on piping hanger travelers as TSIVI, omitting the suffix -1. TSIVI-1 is the instruction for TS Phase I inspection of location and orientation of hangers and is applicable to piping hanger travelers. At the time the Phase I inspection program began (4/16/81), only one TS inspection instruction (TSIVI-1) was in effect. On 9/10/81, TSIVI-2 became effective and caused confusion in distinguishing between the two instructions. TSIVI-2 is a general instruction written to direct TS inspectors on the generation of NCRs for deficiencies found during the inspection of a weld. The dissimilarity between the two instructions admits no confusion as to the traveler's function or intent. Further, neither site procedures nor directives required that these instructions be referenced on travelers, and TS no longer references them. The quality of the installation documentation is not adversely affected by omission of the suffix after TSIVI, and there is no impact significant to plant operational safety.

Generic Resolutions

GR No.	Rev.	Subject	Discipline	Reason/Problem	Justification and Significance to Safety
64	0	Missing cleanliness requirements on POs for piping items.	(PRO)	DEL items have been written on requirements for piping items, end protection, closure and end caps, or cleanliness that were stated on the purchase requisitions but were omitted from the POs.	It has been determined that items and materials received on site that conform except for cleanliness may be accepted by QC at receipt inspection by identifying the descrepant items to denote that cleaning is required. Cleaning is then performed by the responsible discipline and verified by QC as acceptable to the applicable cleanliness class, prior to issuance for construction. Shipment of all items received without end protection or cleanliness are either identified as such and cleaned or are documented on an NCR, depending on the severity of the contamination. In addition, approved site procedures require QC personnel to verify cleanliness of all piping items prior to issuance to construction for field installation or use. With the above stated requirements in effect, it is assured that the quality of the documentation and safety of the plant meet the requirements of the design intent.

Generic Resolutions

GR No.	Rev.	Subject	Discipline	Reason/Problem	Justification and Significance to Safety
65	0	Usage frequencies and effective dates for forms JV-146, JV-155, JV-436, and JV-661.	(PRO/SUB)	DRG procurement checklist, project/departmental procedures/instructions, and the forms themselves required issuance and completion of forms JV-146 (documentation checklist), JV-155 (QC receiving inspection instructions), JV-436 (standard quality requirements for BA procurement), and JV-661 (engineering documentation checklist). The problem is further complicated by revisions to the forms or governing procedures and instructions that affected the form's usage frequencies or their effective dates.	This GR was used to establish the frequencies and effective dates for the inclusion of forms required by site procedures and instructions into document packages. These parameters have since been incorporated into the current site procedures and instructions for those forms still in use. This GR does not affect either the design or safety of CPS or the quality of the documentation.
66	1	Welding interpass temperature that exceeds WPS maximum.	(P/M)	Welds fabricated under K-2882 jurisdiction were made using an interpass temperature which exceeds the maximum allowed per the WPS used.	Welds under S&L specification K-2882 jurisdiction were made using an interpass temperature (the temperature of the weld metal before the pass is started) that exceeds the maximum allowed per the WPS used. DEL items will not be written when the traveler specifies an interpass temperature of no more than 100° in excess of that specified by the WPS used for piping welds made on carbon steel materials which do not require impact testing.

Generic Resolutions

GR No.	Rev.	Subject	Discipline	Reason/Problem	Justification and Significance to Safety
66	1	(Continued)			The interpass temperature is an essential variable only for piping welds that require impact testing. Piping welds made on carbon steel material, which do not require impact testing, are acceptable even though the interpass temperature violates a site welding procedure. The integrity of the physical plant is not affected.
67	1	Phase I inspection signed out of sequence with the fit-up sign-off on piping hanger travelers.	(P/M)	The Phase I inspection for piping hangers on form JV-597 has been signed off as acceptable by TS either prior to or after the primary attachment fit-up sign-off date. Phase I sign-offs that are prior to or after the date of the fit-up for the primary attachment weld violates BAP 3.2.5, paragraph 6.4.1, which states that the primary attachment location and orientation will be verified by a TS inspector during the fit-up inspection hold point.	The TS inspector's signature on the traveler form (JV-597) for Phase I location and orientation of the primary attachment to the building documents that he has verified that the location of the attachment meets design requirements. In addition, this verification is documented on a TS Phase I hanger inspection checklist (JV-728). The TS inspector's signature on the traveler form for the fit-up sequence documents that the weld has been done in accordance with codes, specifications, and site procedures. At one time, the governing procedure for the fabrication and installation of hanger support travelers (BAP-3.2.5) specified that these inspections be performed at the same time. In violation of BAP 3.2.5, Phase I sign-offs have been documented on the traveler form prior to or after the date of the fit-up inspection.

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GR No.	Rev.	Subject	Discipline	Reason/Problem	Justification and Significance to Safety
67	1	(Continued)			Per the GR, this violation will not be written as a DEL item if the hanger was tack welded into its permanent location on or prior to the Phase I inspection date. Tack welds can be verified by documentation of weld rod issuance. This information can be found in the subject traveler. Futher, a DEL item is not required if there is a JV-728 included in the traveler package documenting that the location and orientation of the primary attachment was inspected and conformed to design requirements. If neither of the above conditions are met, the QA/DRG reviewer writes a DEL item and forwards it to the DEL Resolution Group. The procedural violation does not adversely affect the quality of the inspection because verification of location and orientation can be performed any time after the attachment has been tacked in its permanent location. If the limiting conditions stated in the GR are met, the required back-up documentation will assure that this has been done. This situation can have no impact on the quality of construction or operational safety of the plant.

Generic Resolutions

GR No.	Rev.	Subject	Discipline	Reason/Problem	Justification and Significance to Safety
68	1	Acceptance of any DEL items on the receiving inspection "performed by-date" section on JV-146 forms.	(P/M)	Old JV-146 forms (documentation checklist) contain a receiving inspection "performed by date" section. This section was left blank, partially completed, improperly lined out, marked N/A, etc.	Prior to 9/82, the JV-146 contained an informational signature type block which was used to identify the QC receiving inspector who receipt-inspected the items and materials as they were received on site. As this block was informational, quite often it was either left blank, partially completed, improperly lined out, marked N/A, etc. This section of the JV-146 is a duplicate of those sign-offs on the JV-152 (RIR). The JV-152 is the quality record used to document the actual receipt and inspection of the hardware. GR 68 is used to address errors and omissions of the receiving inspection "performed by" block of the old JV-146 (prior to 9/82) only. It has no impact, therefore, on the design of safety of the plant, the hardware, or the documentation.

Generic Resolutions

GR. No.	Rev.	Subject	Discipline	Reason/Problem	Justification and Significance to Safety
69	0	Acceptance of document examiner and lead auditor certification in lieu of QA procurement engineer, Level II or III, prior to 3/29/77	(PRO/SUB)	Q&TS personnel, certified as document examiners or lead auditors, have signed off procurement-related documents in lieu of QA procurement engineers, Level II or III, prior to the 3/29/77 approval date of BQA-182, revision 1, "Qualification and Certification for QA Procurement Personnel."	This GR addresses those instances where Q&TS personnel, certified as document examiners or lead auditors, signed off procurement-related documents in lieu of QA procurement Level II and III engineers prior to 3/29/77. On 3/29/77, revision 1 of BQA-182 was issued. Since both lead auditors and procurement engineers are certified under ANSI N45.2 and the certification requirements for lead auditor are more stringent than those for procurement engineers, this GR has no impact on the design or safety of the plant or hardware.
70		Not a GR			
71	0	Acceptance of missing, incorrect, improperly corrected, etc., RIR number prefixes	(PRO/SUB)	Prefixes to the control numbers on RIR, JV-152, that should be listed as "S" for safety-related and "N" for non-safety related, are missing, incorrect, improperly corrected, etc.	This GR resolves instances of missing, incorrect, improperly corrected, etc., JV-152 numbered RIR prefixes. These prefixes consist of an "S" for safety-related and an "N" for non-safety-related RIRs, and are used as an in-house aid only to denote the status of the RIR. The prefixes are unique to CPS and are not required by codes, standards, or procedures. In and of itself, the RIR prefix has no impact on the design or safety of the plant, hardware, or documentation.

Generic Resolutions

GR. No.	Rev.	Subject	Discipline	Reason/Problem	Justification and Significance to Safety
72	1	BA GR for improperly filled out or missing containment hanger location data or missing QC witness sign-offs on JV-668 (QC electrical hanger installation checklists) and JV-719 (containment electrical hanger location forms)	(E)	BA GR for improperly filled out or missing containment hanger location data or missing QC witness sign-offs on JV-668 and JV-718.	GR 72 has a two-fold purpose. First, it accepts an engineering location verification instead of QC location verification for conduit supports (hangers) in the containment building. Second, this GR provides direction for accepting an N/A in the "location drawing and rev." block of the QC electrical hanger installation checklist (JV-668) for containment conduit supports. Prior to 3/27/81, it was QC's responsibility to verify that the location of all safety-related electrical hangers was in accordance with construction drawings. On 3/27/81, a procedural change shifted the responsibility to verify location of electrical hangers in the containment building from QC to the senior containment engineer. In May 1982, another procedural change required QC to witness the location verification by the senior containment engineer and to sign and date the containment electrical hanger location form (JV-718). In August 1982, QC was directed to sign the JV-718 form only if the senior containment engineer put the exact location of the hangers on the JV-718.

GR. No.	Rev.	Subject	Discipline	Reason/Problem	Justification and Significance to Safety
72	1	(Continued)			Using the aforementioned dates, DEL items were generated for missing QC signatures on the JV-718 (after they were required) and if the exact location was not noted on the JV-718. When the original procedural change occurred on 3/27/81, QC was no longer required to list the location drawing and revision number on their inspection checklist JV-668. They could put "N/A" in the block. There was a conflict between the procedure and the QC instruction which made it difficult for the DRG reviewer to determine if QC was or was not allowed to "N/A" the drawing location and revision block. Since this was not clear, DEL items were generated. GR 72 directs that any containment electrical hanger location form (JV-718) that is signed by a containment engineer is acceptable. It also defines 3/27/81 as the date QC could "N/A" the location drawing and revision block on the QC checklist JV-668. If QC marked "N/A" on this block prior to 3/27/81, a DEL item was written. Therefore, no safety significance to operation of CPS exists.

Generic Resolutions

GR. No.	Rev.	Subject	Discipline	Reason/Problem	Justification and Significance to Safety
73	0	Certification of QC inspector sign-offs on travelers for miscellaneous metals	(C/S)	Inspections of miscellaneous metal installation (including masonry columns), which are governed by K-2949, BAP 2.14 and applicable installation traveler, were signed off by Level II C/S inspectors not having structural steel certification.	QC inspections of miscellaneous discipline installation (including masonry columns), which are governed by K-2949, "Specification for Miscellaneous Metal Work and Embedded Work," BAP 2.14, "Installation/ Fabrication of Items, Systems, and Components," and the applicable installation traveler, have been signed and accepted by Level II C/S inspectors not having structural steel certification.

Although miscellaneous metals, including masonry columns and tee's, are installed per K-2949, they are not considered structural steel and are installed per site procedure BAP 2.14, and the applicable traveler instructions.

In this instance, a structural steel certification is not required to sign-off this type of inspection because all C/S inspectors are trained and qualified to BAP 2.14. They are, therefore, qualified to inspect miscellaneous metal fabrications and installations.

Because the inspectors were trained and certified to the requirements of BAP 2.14, it is assured that the quality of the plant has not been altered by the use of this GR. Therefore, no design or safety significance exists.

GR. No.	Rev.	Subject	Discipline	Reason/Problem	Justification and Significance to Safety
74		Not a GR			
75	0	Piping hanger inspections with no record of tool serial numbers or calibration due dates	(P/M)	QC inspections prior to QC instruction QCI-300, revision 4, did not require entering tool serial numbers and calibration due dates for measurements made during Phase II piping hanger inspections.	Per site procedures, various measuring devices are required to be periodically checked to ensure accuracy. The BA QA Manual requires entering tool serial numbers and their corresponding calibration due dates on the applicable quality documents. DEL items are written for this condition unless the hanger inspections were performed prior to 9/24/82. Quality records for hanger inspections (travelers and inspection records) did not document tool numbers or calibration due dates prior to issuance of QCI-300, revision 4, on 9/24/82. Phase II inspections are now and have been considered in-process type inspections, with ultimate hanger acceptability depending on the results of the final inspection. The final inspection will both determine the final acceptance and provide the documentation required by the QA Manual. All in-process items requiring the use of calibrated tools are re-checked during final inspection and documentation on a Phase III checklist.

Generic Resolutions

GR. No.	Rev.	Subject	Discipline	Reason/Problem	Justification and Significance to Safety
76	0	Fitting/material type, traceable code, and RIR data entered in wrong blocks	(P/M)	Entries for fitting type, material type, traceable code, and RIR numbers were entered in blocks of instrumentation travelers that were not labeled to accept these types of data. RIR numbers for fittings were entered in the RIR/heat number column instead of in the filler heat number or lot number columns of block 12, as required by BAP 2.6. The codes have been entered in filler type column, the material requisition column, or RIR/heat number column instead of the filler heat number columns as required by BAP 2.6.	This GR was issued for fitting type, material type, traceable code, and RIR numbers entered in blocks of instrumentation travelers that were not specifically labeled to accept this type of data. This GR applies only to Parker-Hanifin type fittings. Site procedures do not state where this extra information is to be entered. Because this information goes beyond procedural requirements, it could confuse future documentation users after the plant is licensed. The DRG does not write DEL items for this extra information, except for fitting traceable code or RIR numbers that are entered in columns other than the filler heat and lot number columns. These DELs are to document the condition only and are closed by entering the following in the DEL resolution column: "Traceable Code (and/or RIR #) for fitting accepted per GR 76 R/O." This extra information benefits traveler users, both during construction and DRG review and throughout the life of the plant. It is particularly useful to the authorized nuclear inspector during his review. Also, since there is no block for this extra information, having the data on the same line as the base material (tube or pipe) makes the data more useful and less subject to confusion or transcription error. This

Generic Resolutions

GR. No.	Rev.	Subject	Discipline	Reason/Problem	Justification and Significance to Safety
76	0	(Continued)			added information is not detrimental to the quality of the documentation or the safety of the plant.
77	0	Acceptance of QC checklist (JV-689) without referenced construction work requests (CWRs)	(CWRs) (E)	QC inspection personnel are required to reference all of the applicable CWRs in the comments section on form JV-689. This has been a requirement since BAP 3.3.7, revision 3, was issued on 9/17/82, but QC inspection personnel have not followed those procedural requirements. Also, traveler preparation review group reviewers have overlooked this requirement in their review; subsequently, these travelers have been sent to the vault without complying with the procedural requirements of BAP 3.3.7, revisions 3 through 5.	This GR addresses a disregard for a procedural requirement to list CWRs in the remarks section of QC checklist, form JV-689. The GR allows this oversight when the applicable CWR used to perform the work is referenced on an attached JV-707. The JV-707 form is used by engineering to reference all engineering directives needed to complete an installation. Included in this form is a block for each referenced directive that the QC inspectors initial and date when installation is complete and is acceptable per the referenced directive. This procedure requirement has been changed, allowing the QC inspector to omit reference to the CWR in the remarks section of the QC checklist. The lack of the referenced CWR on the QC checklist does not affect the quality of the hardware as long as it is referenced on the JV-707. The use of GR 77 does not adversely affect the quality of the hardware or documentation at CPS.

Generic Resolutions

GR. No.	Rev.	Subject	Discipline	Reason/Problem	Justification and Significance to Safety
78	1	Delete form JV-185, QC traveler review from the scope of QA/DRG review	(C/S) (E) (P/M)	Form JV-185 was an inventory of document reviews for individual traveler packages and was a required traveler attachment from 1/77 to 10/77. Form JV-185 has not been a regular part of applicable traveler packages nor has it been filed separately in the vault. This has resulted in traveler packages with no form JV-185, contrary to the procedural requirements that were then in force.	GR 78 deletes form JV-185 from the scope of the DRG review. The JV-185 form was required documentation from 1/77 to 10/77. Form JV-185 was an inventory of reviewed documents, such as other JV forms, drawings, and instructions, that applied to a particular traveler. These documents were reviewed prior to being listed on form JV-185. Data required by this form are documented and accepted using the review signatures on other applicable JV forms which are also contained in the traveler packages. Form JV-185 only provides redundant data. Its presence is superfluous and does not significantly affect the quality of the plant.
79	0	JV-668 not having same location drawing and revision as JV-667	(E)	QC inspection personnel are required to record the location, document number, and revision of S&L-approved documents used to verify hanger location on the QC checklist (JV-668). Per QCI-401 R/7, paragraph 7.2, "These numbers (the location document) shall agree with the traveler except that an earlier revision may be listed on the traveler." The document listed on the electrical hanger traveler is usually the area location drawing (EIH series drawings); however, the individual	This GR was written because the electrical conduit hanger location drawing referenced by QC inspectors on the QC checklist did not always agree with the hanger location drawing referenced by engineering on the cover of the traveler package. By project procedure, the location drawing listed on the traveler must also be referenced on the QC checklist. However, the drawing listed on the traveler is usually the area location drawing and is not always detailed enough to determine the exact location of a particular hanger. When this occurs, elevation drawings are used to determine the location of an individual hanger. It is this evaluation drawing that QC inspectors have been referencing on the QC checklist.

GR. No.	Rev.	Subject	Discipline	Reason/Problem	Justification and Significance to Safety
79	0	(Continued)		hanger locations are sometimes shown as section views located on elevation drawings (EI 1200 series) which are supplemental drawings to the area location drawings. The QC inspection personnel have been recording the actual drawing number and revision used, even though it does not agree with the traveler.	The elevation drawings used by QC inspectors are actually supplemental drawings to the main hanger location drawings. They appear on the location drawings as "cut" or "section" views and have traceability from the main location drawing to the supplemental drawing and vice versa. The supplemental drawing, when used in conjunction with the main location drawing, actually enhances the assurance of proper conduit hanger location; therefore, quality is not adversely affected.
80	0	Incorrect revisions on reference drawing	(C/S) (E) (P/M)	DEL items are being generated against BA drawings because referenced drawings are not up to the current revision. S&L design drawings that are referenced on the BA drawings are revised without BA updating the revision block on the BA drawing. The revision block for reference drawings on the BA drawing is updated only when a reference drawing affects the BA drawing.	This GR deals with BA-generated drawings that have S&L drawings listed as reference drawings, but list incorrect drawing revisions. The aforementioned S&L drawings are currently not being used for construction and are listed on the BA drawing or traveler as a reference only. Any changes to the S&L reference drawings that affect the BA drawing will result in a change to the BA drawing to incorporate the change. In addition, if field personnel or quality inspectors need to refer back to the S&L reference drawing, they must use the

Generic Resolutions

GR. No.	Rev.	Subject	Discipline	Reason/Problem	Justification and Significance to Safety
80	0	(Continued)			current revision of the "approved for construction" controlled drawing. Plant safety is further assured because field verification performs a review of design documents during their overinspection. In consideration of these facts, it can be concluded that no design or safety significance exists with the use of this GR.
81		Not a GR			
82	0	Missing or incomplete data for block 9 of form JV-488	(C/S)	Senior discipline engineers (C/S) often omitted or did not fully complete entering applicable data in block 9 of form JV-488 (fabrication/installation traveler).	This GR was issued because the senior discipline engineers (C/S) often omitted or did not fully complete entering applicable data in block 9 (sub-assembly information) of form JV-488. DEL items are not written for this condition since the information for block 9 is the same information as entered in block 8 of the form. Due to the lengthy description required in listing sub-assemblies for block 8, they were often not repeated in block 9 because of inadequate space. The omission of

GR. No.	Rev.	Subject	Discipline	Reason/Problem	Justification and Significance to Safety
82	0	(Continued)			this information does not affect either the hardware or the documentation and, therefore, does not compromise the safety of the plant or quality of the documentation.
83	0	Incorrect or missing heat/RIR numbers on form JV-668	(E)	BAP 3.3.6 and QCI-401 did not address spaces or filler plate material traceability requirements directly; however, the procedures defined how traceability was to be maintained for all materials listed on the bills of material. Inspection personnel verified heat and/or RIR numbers on filler plates and shim plates used in bolted connections on Category I electrical conduit supports.	This GR was issued to resolve deficiencies where heat or RIR numbers were missing from the QC fabrication and inspection checklist for filler or shim plates used in bolted connections on Category I electrical conduit supports. S&L design drawings E05-1980, sheet 1, revision AH, note 40, and E05-1980, sheet 2 revision B, note 55 (hanger installation notes) were revised to allow the use of any commercial grade of steel in bolted connections for electrical supports. Traceability of the material to a specific type or grade or manufacturer's heat or lot number was no longer required. This change deletes the requirement to document heat or RIR numbers on QC checklists for electrical conduit hangers. This GR is used to apply current construction and inspection requirements to hanger installations completed prior to the effective date of the drawings and eliminates the need to document missing or incorrect heat or RIR numbers (for filler or shim plate) on QC inspection or fabrication checklists for electrical conduit hangers. There is, therefore, no design or safety significance.

Generic Resolutions

GR. No.	Rev.	Subject	Discipline	Reason/Problem	Justification and Significance to Safety
84	0	Deletion of traveler transmittal forms JV-340 and JV-386 from the scope of QA/DRG review	(C/S)	Forms JV-340 and JV-386 were traveler transmittal forms used for initial and final reviews and were required traveler attachments from 9/19/77 to 3/20/78. Forms JV-340 and JV-386 have not regularly been part of applicable traveler packages nor have they been filed separately in the vault. This has resulted in traveler packages that are missing the subject forms, in violation of the procedural requirements in effect at the time.	This GR was issued to delete the traveler transmittal forms (JV-340 and JV-386 used for initial and final review, respectively) from the scope of the DRG review. These two forms were used to provide instruction for the administrative processing and engineering, QC, and TS review of embed and platework travelers. They were required to be an attachment to the traveler between 9/19/77 and 3/20/78. Consequently, when they were missing from the affected traveler package, a DEL item was written. The use of this GR does not affect the quality of the hardware since the instructions listed on the applicable forms were transcribed from applicable approved procedures and documents in the traveler itself. The DRG review is based on the instructions contained in the applicable procedures. These forms are not required to verify assurance of quality.
85	1	Equipment installation travelers lacking JV-488 forms.	(E) (P/M)	From 6/23/80 until 6/11/82, BAP 2.10 stated "...where welding operations are required for installation, the Senior Discipline Engineer shall prepare a Fabrication/Installation Traveler, Form JV-488, JV-488-1, and as required, JV-488-2..."; from 6/11/82 until present, "....where welding operations require in-process	From 6/23/80 until 6/11/82, piping/mechanical equipment travelers where welding was involved required the use of the welding fabrication and installation form (JV-488). From 6/11/82 to the present, the JV-488 form is now required in all equipment installation travelers (piping, mechanical, and electrical) where welding operations require in-process inspections. This GR was written because the majority of equipment travelers requiring welding operations issued by engineering

Generic Resolutions

GR. No.	Rev.	Subject	Discipline	Reason/Problem	Justification and Significance to Safety
85	1	(Continued)		inspections for installation, the Senior Discipline Engineer.....".	during the aforementioned time frame did not contain the JV-488 form. However, the GR allows QA/DRG reviewers to accept those travelers provided they satisfy the following criteria: - A qualified welding procedure is listed in the equipment traveler - A TS welding inspector has accepted and signed-off the weld - The in-process inspections are documented in the traveler - The in-process inspections meet the requirements of the applicable welding specification. When these criteria are met, project quality is not compromised and no design or safety significance exists.
86	0	BA drawings that do not indicate S&L status	(C/S)	BA structural drawings are not statused or stamped, and QA/DRG reviewers have not been trained that this is not a requirement.	This condition is acceptable and is not written as a DEL item per this GR.

[redacted]

Generic Resolutions

GR. No.	Rev.	Subject	Discipline	Reason/Problem	Justification and Significance to Safety
86	0	(Continued)			BA has created these drawings to show locations of embedded plates. The drawings are reproductions of S&L structural drawings to be used as a construction aid in placing embeds, material take-offs, and procurement. Therefore, they do not need review by S&L and are acceptable without the S&L status stamp. The safety of the plant or the quality of the documentation is not affected by this GR.
87	0	Capitol Manufacturing Company CMTRs	(PRO/SUB) (P/M)	CMTRs from Capitol Manufacturing Company have a Ø prefix to some heat codes; BA QC does not consistently reference the Ø prefix on the associated BA documents (for example, RIR, material withdrawal slips, travelers, etc.).	Certified material test results from Capitol Manufacturing Company have a Ø prefix to some heat codes that BA QC does not consistently reference on associated BA documents, such as RIRs, material withdrawal slips, and travelers. DEL items are not written on this condition; however, the DRG will ensure that the heat code is entered in the heat log, both with and without the prefix, to indicate to all subsequent users of the RIR, CMTRs, associated travelers, or other related documentation that the heat numbers without the Ø are acceptable.

GR. No.	Rev.	Subject	Discipline	Reason/Problem	Justification and Significance to Safety
87	0	(Continued)			Acceptance of the existing paperwork is based on the suppliers' statement and confirmation in writing that Ø is a registered trademark and is used to identify items manufactured from bar stock at their Columbus, Ohio, plant from bar stock. The integrity of the hardware and the documentation is not affected; therefore, there is no significance to the safe operation of CPS.
88		Not a GR			
89		Not a GR			
90	0	Incomplete checklists for embedded electrical raceways	(C/S) (E)	The embedded raceway checklist form, JV-506, has sections that have not been used during the post-pour inspection (attribute 15 indicating that the installed raceway has been swabbed; attribute 16 indicating that the installed raceway has been mandrilled; and attribute 17 indicating that the installed raceway is capped or plugged). These attributes have been either marked N/A or left blank. In addition, the post-pour inspection section has no QC inspector or a QC Level II review sign-off.	The embedded raceway checklist used by QC inspectors during post-pour (concrete) inspections have attributes 15, 16, and 17 either marked N/A or left blank. In addition, the post-pour inspection section has no QC inspector or QC Level II review sign-offs. This GR was written to allow QA/DRG reviewers to close all open DEL items written against JV-506s where attributes 15, 16, and 17 were left blank or marked N/A and where there was no QC inspector or QC Level II review signature sign-offs. This is justified because attributes 15 and 16 are covered by JV-353 (cable installation checklist), are governed under BA procedure 3.3.2, and require that

Generic Resolutions

GR. No.	Rev.	Subject	Discipline	Reason/Problem	Justification and Significance to Safety
90	0	(Continued)			conduits be swabbed or cleaned. Attribute 17 does not apply because embedded conduit cannot be capped or plugged after the cable has been pulled through the embedded conduit. Therefore, quality is not adversely affected.
91	0	Improper processing of concrete test cylinders	(C/S)	During concrete test cylinder processing, attributes that create optimum curing conditions were out of installation specification requirements. Despite this, the concrete test cylinders reached the required strength. The various optimum attributes that have been found out of specification requirements are: initial cure temperature, cure room temperature, early stripping of test cylinders, and late stripping of test cylinders.	During the processing of concrete test cylinders, various attributes (which create optimum curing conditions) were out of specification requirements. These optimum attributes are curing temperatures and stripping times (the time of removing the cylinders from their molds). Codes, specifications, and site procedures stipulate that concrete test cylinders are to be processed in a uniform manner. This aids in developing a uniform statistical base for evaluating concrete performance in reaching its required strength. The curing temperature is one of the many variables affecting the strength of the concrete specimens. Minor variances from the optimal curing conditions would not cause a significant change in the strength of the concrete cylinders. The affect on the statistical base would be even less significant.

Generic Resolutions

GR. No.	Rev.	Subject	Discipline	Reason/Problem	Justification and Significance to Safety
91	0	(Continued)			A minimum stripping time for concrete cylinders is stipulated so that the cylinders are not damaged by premature stripping. Late stripping of the cylinders could result in difficulty in stripping the molds from the cylinders. Both early and late stripping are procedural violations and could reduce the compressive strength if the test cylinders were physically damaged. This would not enhance the cylinder strength. Acceptance of cylinder strengths is based on minimum design required strengths. Therefore, this GR instructs QA/DRG reviewers not to write DEL items for violations in processing the concrete test cylinders, provided that the minimum design strength is met. As long as minimum strength requirements are met, violations of this type have no significant impact on the quality of construction, inspection, or safety of operation of the plant.
92	0	Missing revision numbers for supplemental travelers	(C/S) (E)	The supplemental travelers have been improperly identified by the omission of the revision level from the traveler identification in the traveler number block. **Note:** This does not apply to cable pull cards completed prior to 5/3/84 (BAP 3.3.2) and cable termination cards prior to 7/6/84 (BAP 3.3.3).	Supplemental travelers are issued when the original traveler has been previously vaulted. To properly identify a supplemental traveler, the word "SUPP" is written on the traveler, followed by the next sequential traveler number, i.e., SUPP. 01, or SUPP. 02, etc.

Generic Resolutions

GR. No.	Rev.	Subject	Discipline	Reason/Problem	Justification and Significance to Safety
92	0	(Continued)			The GR allows QA/DRG reviewers to close all open DEL items where the traveler SUPP revision level has been omitted from the traveler identification. The omission of supplemental traveler revision level is a proper problem and does not affect the quality of the hardware.
93	1	U.S. Testing personnel not certified to perform test per ASTM D421	(C/S)	U.S. Testing personnel that performed tests in accordance with ASTM D422, D423, and D424 were certified to perform such tests. However, for the document of qualification, several U.S. Testing employees do not indicate certification for ASTM D421. ASTM D421 specifies the proper method of obtaining samples for tests ASTM D422, D423, and D424.	This GR is used to address document exceptions in which U.S. Testing personnel were not certified to prepare soil samples per ASTM D421, "Dry Preparation of Soil Samples for Particle-Size Analysis and Determination of Soils Constants." This soil sample preparation operation was necessary when performing the following soils tests: ASTM D422, "Particle Size Analysis of Soils," ASTM D423, "Liquid Limit of Soils," and ASTM D424, "Plastic Limit and Plasticity Index of Soils." For an individual to be certified for a specific ASTM test, he must be able to perform the test as described by the ASTM method.

Generic Resolutions

GR. No.	Rev.	Subject	Discipline	Reason/Problem	Justification and Significance to Safety
93	1	(Continued)			Each of the tests (ASTM D422, D423, and D424) specifically references ASTM D421 when describing the sample preparation method, making ASTM D421 part of the method and separate certification unnecessary. U.S. Testing management concurs with the justification of GR 93, letter UST-JAG-10/ 84-10 from J. A. Grimm (U.S. Testing) to R. McCullough (BA/QE). Therefore, this condition has no impact on the quality of construction nor the safety of operation of CPS.
94	0	Incorrect data on the "check if received" column on the JV-146	(PRO/SUB)	Numerous DEL items have been written on missing or incorrect QA documentation checklists (Form JV-146). These forms are used to identify required vendor documentation and to document its receipt. Frequently, the receipt status is missing or was added after the material had been received, as in the case of a JV-146 being reconstructed to replace a missing one. Many times, vendor documents have been noted as received on the JV-146 ("check if received" column); however, when the package reaches QA/DRG for review, some of the	JV-146s are the project records used to identify the required vendor documentation and to indicate its receipt. This GR is used to address those instances where the data in the "check if received" column is incorrect, i.e., a document shown as received in 1977 is no longer in the package or is incorrect. Since the JV-146 is not the project record used to review vendor documentation, the application of this GR has no impact on either the design or safety of the plant or the hardware.

Generic Resolutions

GR. No.	Rev.	Subject	Discipline	Reason/Problem	Justification and Significance to Safety
94	0	(Continued)		documentation has often become separated from the package. This results in two separate DEL items: - a DEL item stating that JV-146 is incorrect; it shows receipt of a document no longer in the package, and - another DEL item for missing documentation as referenced on the requirements side of the JV-146.	
95	0	K-specification amendment not current at final review	(C/S) (E) (P/M)	K-specifications referenced on BA documents have incorrect amendments listed at the final review. This does not show that documents have been reviewed to all changes of the K-specification.	This GR allows the acceptance of improper K-specification (contract specification) amendments (revision levels) being referenced on travelers at the time of traveler final review. K-specifications provide the basic rules, regulations, and specifications for the design, construction, and installation activities at CPS. In accordance with site procedures, the current K-specification amendment was required to be referenced on the traveler when the traveler underwent final review. The lack of this did not mean that changes were made to the specifications without any evaluations being performed to determine impact on hardware or documentation.

Generic Resolutions

GR. No.	Rev.	Subject	Discipline	Reason/Problem	Justification and Significance to Safety
95	0	(Continued)			BA's RE Group performs a design review of all K-specification changes independent of the travelers. During this review, RE identifies changes that are more restrictive and evaluates if they will impact any travelers or procedures. There are also two checks on RE's performance. First, IP's Nuclear Services Engineering Department reviews all specification changes to determine site impact. Second, S&L incorporates changes in the K-specifications into the design drawings. Changes in the design drawing will be incorporated into the traveler or procedures or will cause the issuance of supplemental travelers (supplemental travelers are issued to continue work on an item that had previously been completed and accepted). The lack of proper K-specifications amendment and the implementation of this GR does not adversely affect the quality of the hardware or the documentation of the plant.
96		Not a GR			

Generic Resolutions

GR. No.	Rev.	Subject	Discipline	Reason/Problem	Justification and Significance to Safety
97	0	Traveler document packages where attached documents (except change documents) are not listed as attachments	(All)	GR for traveler document packages where attached documents (except change documents) are not listed as attachments.	This GR addresses a problem where documents (such as inspection reports, equipment requisitions, engineering changes, etc.) are present in the traveler packages without being listed as attachments. This violates project procedures. When a traveler package is reviewed by DRG, all documents in the package are listed on the DRG table of contents (JV-942), which then becomes the official listing of all documents within the traveler package. There is no reason to re-enter documents as attachments to the original traveler cover page once the table of contents has been filled out. No DEL item is required as all documents will be listed by the DRG reviewers. This GR does not adversely affect the quality of the documentation.
98		Not a GR			

Generic Resolutions

GR. No.	Rev.	Subject	Discipline	Reason/Problem	Justification and Significance to Safety
99	0	Hold Points signed without correct traveler revision level	(E)	TS welding inspection hold points have been signed-off and dated, but the inspector failed to enter the traveler revision that was current at the time of the weld inspection.	This GR resolves cases where a TS weld inspector fails to enter the current traveler revision in effect at the time of the TS hold point sign-off. TS hold points are designated steps in the installation process where an inspection is required to take place. Inspectors are trained to complete their work to the latest revisions of the traveler. Since current traveler revisions are the only revisions available to the inspectors when they do their inspections, the weld sign-off has to be accomplished during the current revision. The correct traveler revision that should be listed by an inspector can be ascertained by comparing the TS weld sign-off date to the closest traveler initial review date, that is, prior to the sign-off date. When this situation occurs, a GR stamp is applied next to the deficiency to indicate it was noted by the DRG reviewer. This GR does not adversely affect the quality of the hardware or the documentation for CPS.

Generic Resolutions

GR. No.	Rev.	Subject	Discipline	Reason/Problem	Justification and Significance to Safety
100	0	Pre-inspection checklists (JV-531, JV-541, JV-542, and JV-543) that conflict with quantities on design drawings	(C/S)	Pre-inspection checklists have been completed with an item quantity that does not agree with design drawings. BAP 3.1.1 prescribes completing these checklists, but there are no procedural requirements that govern their use or define their ultimate purpose. Acceptance criteria were obtained from drawings and change notices. However, errors have occurred in transferring quantity information from the design criteria onto the pre-placement checklists.	This GR was issued to resolve DEL items written that identify pre-inspection checklists (JV-531, JV-541, JV-542, and JV-543) having quantities that conflict with quantities given on design drawings. Site procedure BAP 3.1.1 prescribes completing these forms, but only as an aid to inspection and not as an instrument to delineate the inspection criteria requirements. This procedure requires using the applicable drawings and change notices to determine the pour scope and inspection requirements. Acceptance of item quantities are then documented on form JV-526 to reflect the requirements stated in the design drawings and applicable change documents. Installation and quality attributes, such as quantity, are documented on form JV-191 (pre-placement checklist). Information concerning quantities of penetration and cadwelds are documented in the applicable travelers and then listed on the traveler checklist (JV-525) and pre-inspection checklists (JV-531, JV-541, JV-542, and JV-543). In addition, surveyors, concurrence on quantities, and location is documented by the C/S engineer's signature on the concrete pour travelers (JV-259).

Generic Resolutions

GR. No.	Rev.	Subject	Discipline	Reason/Problem	Justification and Significance to Safety
100	0	(Continued)			In summary, although the information on forms JV-531, JV-541, JV-542, and JV-543 is misleading, the true quality configuration is properly documented on forms JV-525, JV-526, JV-191, and applicable travelers, thus assuring that the quality of documentation and intent of design are maintained.
101	0	Heat number not documented for bolting material 1" and under	(PRO/SUB)	Because of past interpretations of procedures, heat numbers are not documented on the RIR for bolting materials 1" and under that do not have heat numbers physically marked on the material. This violates current and past BAP 2.3 revisions. (This GR only applies to document packages completed before 1/3/84.)	Because of past interpretations of procedures, heat numbers are not documented on the RIRs for bolting materials 1" and under that do not have heat numbers physically marked on the material. This violates current and past site procedures. When the JV-146 (documentation checklist) and the PO required the vendor to submit CMTRs, the DRG reviewer verifies that the applicable CMTRs are reviewed, found acceptable, stamped with the correct RIR number, and included in the PO package. DRG reviewers will accept cases that meet this criteria. RIRs with JV-146 forms prescribing CMTRs require that the material purchased be traceable to individual test analysis. When the CMTRs are stamped with the applicable RIR number and are reviewed, found acceptable, and included in the PO package, this provides traceability to the CMTRs and PO through the RIR, thus ensuring the quality of the documentation and safety of the plant significance would exist.

Generic Resolutions

GR. No.	Rev.	Subject	Discipline	Reason/Problem	Justification and Significance to Safety
102	0	Traveler items in which content is not required are marked N/A per JV-488	(C/S) (P/M)	Note 1 on back of JV-488 states, "All items shall be completed on the face of the form. If contents is not required, the items shall be marked 'N/A' by the responsible department." This requirement was not met.	The traveler has been reviewed and signed by the RE, QC, and TS departments signifying that the scope of work defined on the traveler had been completed; therefore, the absence of N/A in drawing items outside the scope of the traveler does not affect the quality of hardware or installation. Further, the DRG reviewer must verify that the traveler documents the scope of work defined in the traveler. By signing, the DEL is signifying that the use of this GR does not have any impact on quality of the plant or hardware.
103	0	Absence of JV-938 from traveler packages	(C/S)	Form JV-938, "Document Review Checklist for Concrete Travelers," was a required concrete traveler attachment from 11/1/82 to 3/28/84. Form JV-938 has not been part of applicable concrete traveler packages nor has it been filed separately in the vault. The absence of form JV-938 from concrete travelers is contrary to procedural requirements that were then in force.	This GR resolves deficiencies noted where JV-938 forms are missing from concrete travelers. The JV-938 was required as an attachment to concrete travelers from 11/1/82 to 3/28/84 and was used to assist in the traveler review by BA engineering and TS final review personnel. The BA DRG final review is performed in accordance with procedures and specifications in effect at the time the work was completed from requirements independent of the JV-938 forms. Therefore, the use of this GR does not affect the quality of the hardware or the plant when the form is missing because it is redundant to the review of the traveler and is not used to verify QA.

GR. No.	Rev.	Subject	Discipline	Reason/Problem	Justification and Significance to Safety
104	0	Improperly checked attribute for proper cable tension on the JV-353 inspection form	(E)	The maximum tension attribute on the QC inspection checklist (JV-353) has been erroneously marked as acceptable, even though cable has been hand-pulled or hand-layed and no tension monitoring or tension limiting devices have been used. BAP 3.3.2 requires the attribute to be marked N/A.	The maximum tension attribute is only observed when a tension monitoring or limiting device is prescribed by project engineering and is used for installation. The requirements stated in K-2999 and project procedures governing cable installations are that a tension monitoring or limiting device will be used if the tension expected by the pull will exceed 75% of the cable's maximum allowable tension. Project engineering will indicate on the cable installation traveler when tension monitoring or limiting equipment will be required. Therefore, the GR allows QA/DRG reviewers to accept these erroneously marked attributes without compromising project quality.
105	0	Sequenced TS in-process welding inspection hold points were deleted after "weld complete" sign-off on structural attachments (AWS code work)	(C/S) (E)	Sequenced TS in-process welding inspection hold points were deleted after work was completed, without revising the traveler as required per BAP 2.14; in most cases to date, the traveler has the statement "only weld complete required" as a hold point.	AWS D1.1, "Structural Welding Code," only requires as a minimum that the final weld be inspected and documented 100% of the time. AWS D1.1 does not require that in-process inspection such as fit-up, cleanliness, and weld pre-heat be documented; and BA welding inspection procedure BTS-405 requires that the various in-process inspection be conducted on a random surveillance basis to assure compliance to codes or standards. By signing for final weld inspection, the weld inspector is signifying that the completed weld meets the requirements stated by both AWS D1.1 and BTS-405 and that either he or the BA TS final reviewer may delete the pre-established

Generic Resolutions

GR. No.	Rev.	Subject	Discipline	Reason/Problem	Justification and Significance to Safety
105	0	(Continued)			hold points for AWS D1.1 welding without a traveler revision. Therefore, since the final weld is acceptable, the use of this GR will not compromise the safety or design of the plant.
106	0	Fabrication/installation traveler initiation review by engineering, TS, and QC was signed-off out of sequence	(ALL)	Fabrication/installation traveler was reviewed by QC after the engineering review but prior to TS review. This is contrary to procedural requirements which state that the resident engineer will forward the traveler to TS for review, and then TS will forward the traveler to QC for review.	Fabrication and installation traveler initial review by BA engineering, QC, and TS was signed out of sequence. BA procedures require that traveler initial review be performed in a specific sequence (1: engineering, 2: TS, 3: QC). Regardless of the sign-off sequence, all required reviews are completed and signed off prior to the traveler being issued to the field for work. Each traveler review group has independent criteria to follow which do not interface with other departments; therefore, this GR does not affect the safety of the plant or quality of the hardware.
107	0	IP-purchased material not listed/statused I on the equipment document list	(P/M)	BA/DRG is reviewing docmentation for IP-purchased materials that are in augmented class D (radioactive waste) systems. This documentation has been identified as being outside of the scope of BA/QC review, but it has still not been officially excluded from the scope of BA's Records Verification Program.	GR 107, revision 0, was issued because BA/DRG was responsible for reviewing documentation for IP-purchased materials that are in the augmented class D (radioactive waste) systems. The documentation has been identified as being outside of the scope of BA/QC review, but was still not excluded from the scope of BA's Records Verification Program. BA's responsibility is to install IP-purchased augmented class D (radioactive waste) materials. Also, in letter M60-84-(03-30)-L, IP authorized BA to perform a documentation inventory as a service to IP, in order that they might scope IP-purchased equipment.

GR. No.	Rev.	Subject	Discipline	Reason/Problem	Justification and Significance to Safety
107	0	(Continued)			In letter LW-24484, Mr. L. W. Osborne received the inventory of IP-purchased equipment from BA personnel. Since the documentation for IP-purchased equipment is not a BA responsibility and since BA personnel have been relieved of the requirement to inventory IP documentation, the removal of this attribute from BA's review checklist and usage of this GR has no detrimental affect on the quality of CPS.
108	0	QC checklists (JV-550) missing from traveler revisions and supplemental travelers.	(E)	QC checklists (JV-550) are missing from traveler revisions and supplemental travelers. This occurs when the supplemental traveler does not affect the anchor location or torque, when there was no technical need for the form, and when QC was notified to perform an in-process inspection. This form was required by BAP 3.3.6, revision 6. When anchor bolts were included within the scope of the supplemental travelers, a JV-550 form was not used. Before 2/13/84, QCI-401 required the use of JV-668 to re-verify torque.	This GR was written because anchor bolt installation checklists (JV-550) were missing from revised and supplemental electrical conduit hanger travelers. The checklist documents that the torquing requirements of the anchor bolts have been met during the installation of the hanger support. From 2/13/84 to 6/10/84, project procedure BAP 3.3.6, revision 6, (which governs the installation of electrical conduit hanger supports) required the inclusion of JV-550 for all revised and supplemental conduit hanger travelers. JV-550 was required whether or not the anchor bolt location or torque had been affected by the revised or supplemental work.

Generic Resolutions

GR. No.	Rev.	Subject	Discipline	Reason/Problem	Justification and Significance to Safety
108	0	(Continued)			Prior and subsequent revisions to BAP 3.3.6 do not require that JV-550 be included in revised or supplemental hanger travelers, unless the anchor bolt location or torque will be disturbed. The GR allows QA/DRG to accept those supplemental travelers where the scope of work does not affect the anchor bolt location or torque. Therefore, project quality is not adversely affected.
109	0	Errors and omissions or missing forms from JV-667 and JV-668 for conduit electrical hanger travelers vaulted before 7/26/82	(E)	Prior to 7/26/82, inspection data and other information was incorrect, omitted from, or incomplete on BA QC support fabrication/ installation checklists (JV-668) and TS "electrical welding inspection" sections on conduit hanger travelers (JV-667). In some areas, no JV-668 is in the package.	This GR was written because conduit hanger fabrication and installation checklists (JV-668) and the welding inspection sections on conduit hanger travelers (JV-667) completed prior to 7/26/82 had incorrect data, errors and omissions, and incomplete information recorded on the traveler. The GR allows QA/DRG to accept these travelers if the following criteria have been met: - The conduit hanger traveler was vaulted prior to 7/26/82 - The conduit hanger was reinspected under the conduit support Field Verification Program. - All affected attributes or data have been verified to be complete and acceptable on the new inspection reports. When these criteria are met, project quality is not adversely affected.

Generic Resolutions

GR. No.	Rev.	Subject	Discipline	Reason/Problem	Justification and Significance to Safety
110	0	Lack of JV-1340 forms for flex-conduit and missing calculations for cable pulls	(E)	DRG reviewers are writing DEL items for missing JV-1340 forms and for lack of calculations on JV-1340 forms for cable pull-through flex-conduit. Sidewall tension is not measurable in flex-conduit as the conduit is fixed only at one end during the cable pull.	This GR was written because cable pull installation travelers involving cable pulls through flex-conduit were missing either the pull-tension calculation form (JV-1340) or the actual pull-tension calculations. K-2999 and project procedure BAP 3.3.2, governing electrical cable installations, required that maximum pull-tension calculations be included in all cable pull travelers. However, sidewall tension is not measurable in flex-conduit if the conduit is fixed at only one end during the actual cable pull. The flex-conduit is slipped over the cable during the pull. The final coupling of the flex-conduit is accomplished after completion of the cable pull. Therefore, QA/DRG's use of GR 110 does not adversely affect project quality.
111	0	Missing or incorrect heat and RIR numbers on QC inspection checklists or travelers installed prior to 1/1/84	(E)	Electrical material identification required per BAP 1.5 was not noted or was noted incorrectly on QC inspection checklists or travelers for items installed prior to 1/1/84. This lack of information made it impossible to determine if the purchased material was safety-related. Also, NCRs were written documenting this fact, with the disposition from S&L to "accept as is, providing BA QA verifies material is A-36." There was no documentation provided	Site procedures required that the material traceability (heat and RIR numbers) be noted on QC inspection checklists for specific types of material used in electrical installations. This was not done in many instances, which made it impossible to determine if the purchased material was safety-related. This missing information was documented on NCRs. Finally, a program was developed that required intensive testing and sampling to verify that all materials installed prior to 1/1/84 met the contract specifications to be considered safety-related.

Generic Resolutions

GR. No.	Rev.	Subject	Discipline	Reason/Problem	Justification and Significance to Safety
111	0	(Continued)		affirming that such verifications had been made.	The results of this program were written on an NCR which was accepted and dispositioned "use-as-is" by IP and S&L. The result of this NCR provided direction (through GR 111) to accept all material installed in electrical installations prior to 1/1/84. Material installed on or after 1/1/84 is required to have the material traceability information noted on the QC inspection checklist. If it is missing or incorrect, a DEL item will be generated and resolved on a case-by-case basis in accordance with site procedures. The use of this GR does not or will not adversely affect the quality of the hardware or documentation of CPS.

APPENDIX H

POTENTIALLY REPORTABLE DEFICIENCY RELATED TO MATERIAL TRACEABILITY

A. STRUCTURAL SHAPES AND PLATES

Some of the structural shapes (angles, W-shapes, etc.) and plate materials used in the fabrication of electrical supports have incorrect or missing heat or receiving inspection report (RIR) numbers that are necessary for quality control (QC) verification.

This deficiency has been partially resolved by the revision of Baldwin Associates (BA) procedures to require material verification via heat or RIR numbers in future installations. The remaining concern was to provide assurance that the installations made prior to the implementation of the revised procedures have used materials capable of meeting design requirements. A sampling program has been developed and implemented using Military Standard (MIL-STD)-414, Level V (the most stringent level) and a representative population of electrical hangers with traceability problems identified on deviation reports (DR) and nonconformance reports (NCR). The sample size specified in the MIL-STD for the population of 75,000 items is 150. Actually, 169 samples were taken from 65 individual electrical hangers (each hanger is comprised of several items) and sent to an independent testing laboratory for chemical analysis and physical (i.e., yield and tensile) testing. The results, as reported to (via an NCR) and evaluated by the Sargent & Lundy (S&L) engineers, demonstrated a mean value which exceeded the minimum design requirements. The sample, which had test results less than the minimum requirements, was found to be acceptable, as noted on the NCR. This resulted in the NCR disposition of "use-as-is," indicating that the material was acceptable and that this problem was not design- or safety-significant. This item is considered closed by Illinois Power Company (IP).

B. UNIQUE MATERIAL IDENTIFICATION

The practice of marking ASME Section III, Subsection NF, Classes 2 and 3 safety-related items with pink paint and no other markings (e.g., heat, RIR, material specification and grade, or code numbers) has raised a concern as to whether unique identification or traceability is required.

The practice of marking the above items with pink paint has been discontinued per IP Quality Assurance (QA) direction; materials are to be identified with heat or RIR numbers. An evaluation of the code requirements for material identification is being performed to address concerns on past installations. This evaluation is expected to be completed by March 15, 1985.

C. STRUT AND STRUT FITTINGS

NCRs were generated indicating that Certificates of Compliance had not been validated (i.e., an evaluation of the vendors' QA programs had not been performed) for the B-line, superstrut, and unistrut materials used in the fabrication of electrical and instrumentation supports.

The concerns related to B-line and unistrut materials were resolved through BA QA survey audits of the vendors. However, concerns related to superstrut remained, and sampling programs were conducted by the electrical discipline for superstrut material using MIL-STD-414, Level V. This program consisted of a selection of 150 representative samples of both superstrut materials and fittings. These samples were then sent to an independent testing laboratory for chemical analysis and physical (i.e., yield and tensile) testing. The results, as reported to (via an NCR) and evaluated by the S&L engineers, demonstrated a mean value that exceeded the minimum design requirements. Those samples that had test results less than the minimum requirements were found to be acceptable through an engineering evaluation. This resulted in the NCR disposition of "use-as-is," indicating that the material was acceptable and that this problem was not design- or safety-significant.

Prior to these sampling programs, any superstrut material used in fabricating an instrumentation support was replaced with unistrut. Currently, all procurements of strut materials are made safety-related (vendors have approved QA programs). This, in conjunction with the sampling program results and the strut's unique shape, allows all onsite strut materials to be considered safety-related and exempt from heat or RIR number traceability requirements. This item is considered closed by IP.

The remaining item under investigation was a field-fabricated bracket in which the identity of a triangular-shaped gusset plate was questioned. Of the 150 brackets fabricated by BA, 22 have been located. The material was identified correctly (RIR number) on all of these. Therefore, IP concludes that no material traceability concern exists for these brackets, and this item is considered closed by IP.

D. HILTI ANCHOR BOLTS

Hilti anchor bolts are a specific brand of wedge-type expansion anchors normally used to bolt components (i.e., electrical and pipe hangers, equipment, etc.) to concrete. The specification that governs the installation of these bolts states in part, "For safety-related work, Certification of Compliance with this Specification for expansion anchor material shall accompany each delivery of these anchors...." BA has purchased most Hilti anchor bolts with certificates of compliance but without evaluating or approving the Hilti QA Program.

Using documentation obtained through the Coordinating Agency for Supplier Evaluation and other sources, BA's QA Group has qualified Hilti as a safety-related supplier. Past purchase orders are currently being evaluated for upgrading in accordance with approved procedures. This review is expected to be completed by March 15, 1985.

E. UNMARKED BOLTS

Many installed bolts that were purchased as ASTM A-307 do not have manufacturer's code mark (identification) on the head. The current documentation does not provide assurance that the material meets, as a minimum, ASTM A-307 strength requirements.

A sampling program was developed and implemented using MIL-STD-414, Level V. This program selected 200 sample hexhead bolts with diameters ranging from 5/16 inch to 3/4 inch, which were received by the electrical and heating, ventilating, and air conditioning disciplines (the largest users of A-307 bolts). The samples were sent to an independent testing laboratory for chemical analysis and physical (i.e., yield, tensile, and hardness) testing. The results, as reported to (via an NCR) and evaluated by the S&L engineers, demonstrated a mean value that exceeded the minimum design requirements. The sample that had test results less than the minimum requirements was found to be acceptable as noted on the NCR. This resulted in the NCR disposition of "use-as-is," indicating that the material was acceptable and that this problem was not design- or safety-significant.

The civil/structural and mechanical disciplines are currently reviewing the use of unmarked bolts. This review is expected to be completed by March 15, 1985. Similar testing by these disciplines may also be required.

F. FIELD FABRICATED/MODIFIED CABLE FINGER ASSEMBLIES

The purpose of the finger assemblies is to provide support to vertical cable runs. These assemblies are fabricated from structural steel. Most of the assemblies were safety-related and purchased from an approved vendor; however, traceability of each assembly to the appropriate RIR number cannot be determined because the number is hidden by the installation. The remaining portion of the assemblies were field fabricated (using BA-purchased material) or modified via BA's traveler (work instructions) system.

The material used to fabricate the finger assemblies has been evaluated and tested through the electrical hanger sampling program (see subsection A above). In addition to these materials, a finger assembly from stock was also tested. The results of all the tests demonstrated that the materials are capable of meeting the design requirements. This item is considered closed by IP.

G. WASHERS AND SHIM STOCK

The documentation, identification, and traceability requirements for these items were unclear.

Washers and shims used in bolted applications were acceptable without performing additional investigations since these applications involve compressive loading and, as such, the material type is not of concern. This eliminates the need for traceability. However, shims used in welded installations were further investigated to determine the suitability of the material for welding. The tested shims were those in the 65 electrical hanger installations which were removed per the electrical hanger sampling program (see subsection A above). Since the hangers were part of a representative population of typical installations, the shims were also representative of typical shimming installations. The shims were tested (chemical analysis, as a minimum, and physical testing) by an independent testing laboratory and the results, as reported to (via an NCR) and evaluated by the S&L engineers, demonstrated that the material was capable of being welded (<0.30% carbon). This resulted in the NCR disposition of "use-as-is," indicating that the material was acceptable and that this problem was not design- or safety-significant. This item is considered closed by IP.

H. OTHER ACTIONS

In addition to the specific items, mentioned above, IP is further investigating material-related problems by searching NCRs, DRs, and audit findings. Furthermore, IP has taken actions to address the programmatic implications of the material traceability problems discussed above. The problems associated with traceability were, in part, due to the lack of clarity and consistency in procedural requirements resulting in a lack of adherence to those procedures. Therefore, several of BA's installation procedures, associated job instructions, and QC instructions have been revised to prevent recurrence. The changes included marking or tagging permanent plant materials receipt and requiring the crafts to notify QC prior to subdividing materials to maintain traceability through installation. In addition, most materials (structural shapes, plates, strut, strut fittings, bolts, etc.) are purchased safety-related. The need for traceability after receipt inspection is not required for certain items, including strut and strut fittings (unique shape and application) and bolting hardware (identification provided by head markings). Finally, steps have been taken to reorganize the laydown yards to segregate materials, and a purging of the site has been performed to remove any non-traceable structural shapes, plates, and unmarked bolting material.

In summary, IP's investigation of material traceability problems and its testing programs have demonstrated the acceptability of several types of previously questioned material. Furthermore, corrections to procedures and instructions have enhanced material traceability to assure that similar problems will not recur.

APPENDIX I

10 CFR SECTION 50.55(e)

This appendix contains a summary of major investigations and reinspection activities for 10 CFR Section 50.55(e) items and a table (Table I-1) of all 10 CFR Section 50.55(e) deficiencies and actions taken.

A. ITEM 55-82-01

This item involves inadequate 1E cable tray attachment procedures for controlling installation, inspection, and documentation of inspection records. As a result of this deficiency, Illinois Power Company (IP) decided to reinspect all documentation packages for cable tray attachments. A significant number of problems were found which became part of a stop work action (SWA-007). As described in chapter IV, subsection A, the Recovery Program for SWA-007 included changes to procedures to enhance controls over installation and inspection activities, documentation requirements, and handling of nonconformances. Further, a 100% reinspection of the completed 1E cable tray and attachments was performed.

B. ITEM 55-82-02

This item involves improper weld electrode material. A welder noted that the weld rod he was using did not work as it should in making a carbon steel weld. He stopped welding, and later an investigation was initiated into why the weld rod marked for carbon steel use was found to have a core for stainless steel welding. An SWA was issued for all welding. All weld rod was returned to controlled custody. Samples of the suspect rod were sent to a St. Louis laboratory for testing. It was determined that a large quantity of suspect rod could not have passed through the manufacturer's Quality Assurance (QA) Program, but that the two rods discovered must have slipped into a tote tray from another order. Recommendations were made to tighten up procedures so that this incident would not recur. Procedures at the site were improved to magnetically check weld rods to ensure proper use for carbon steel (magnetic) and stainless steel (nonmagnetic) welds. A verification program was performed to determine if similar incorrect electrodes were used in other safety-related weldments. A 10% sample of approximately 4,450 welds made from electrodes of the suspect lot were chemically analyzed for the presence of stainless steel. Using these data, it was eventually concluded with a high level of confidence that no weldments at Clinton Power Station (CPS) contain stainless steel which could have originated from incorrectly manufactured electrodes from the suspect lot.

C. ITEM 55-82-04

This item involves nuts, which were found to be finger tight, that were placed on bolts to secure a second nut from becoming loose. These jam nuts are supposed to be tightened snugly against the high strength nuts on the bolted connection of structural steel slip joint connections. The cause of this deficiency was determined to be ambiguous notes describing the installation of the jam nuts which were misinterpreted by field personnel. Sargent & Lundy (S&L) revised the structural drawings to remove the ambiguities relating to high strength and jam nut installations. All structural steel slip joint connections were reworked and reinspected to assure that high strength nuts were finger tight and that jam nuts were tightened against the high strength nuts as required by the revised S&L drawings.

In addition to reinspection and rework, as necessary, of the structural steel connections, a major review of other jam-nut applications was performed. These areas include block wall seismic supports, cable tray hangers, electrical conduit hangers, component supports, heating, ventilating, and air conditioning (HVAC) duct connections, and other miscellaneous connections. The results of this extensive review and reinspection assure that jam nuts are properly installed at CPS.

D. ITEM 55-82-09

This item is safety-related and involves errors in small bore pipe support calculations. An evaluation of the calculation discrepancies showed that the supports were adequate as designed. However, suspect calculations identified by this reevaluation were corrected, and a review of electrical conduit support calculations also was performed. A reinspection of installed conduit was made to assure that as-built hardware agreed with new design requirements.

As a result of the errors discovered in small bore pipe support calculations, a program was completed for review of other CPS areas that used similar design procedures. The areas included HVAC supports, cable tray supports, large bore pipe support auxiliary steel, reinforcement of branch connections in piping, pipe whip restraints, and expansion anchors. Problems found by this review were identified and corrected and were found not significant to plant safety.

E. ITEM 55-82-11

This item involves incorrect identification of both base materials and weld procedures on pipe hanger travelers. A review of nearly 9,000 pipe hanger installation records and addenda was completed to determine if similar problems existed. Of these, approximately 3,600 records required revision to correct or clarify base materials or weld procedures. However, only three hangers required physical rework due to the use of an unacceptable weld procedure. This deficiency was considered not significant because there would have been no adverse impact on safety of operations at CPS if the deficiency had not been corrected.

F. ITEM 55-83-01

This item involves the use of calibration suppliers that were not on the qualified suppliers list. This item was determined to be nonreportable because the investigation did not disclose adverse conditions in past calibration services or adverse impact on hardware. Nevertheless, IP performed an extensive evaluation of calibration services used at CPS. Purchase orders or calibration certificates were reviewed to identify 195 calibration suppliers at CPS. Sixty of these suppliers were already qualified by IP and Baldwin Associates (BA) audits. The remaining 135 suppliers were qualified by IP based on the results of audits, surveys, and evaluations that had been conducted by other utilities and organizations. The adequacy of past calibration services performed was verified and many procedures were reviewed and revised to address the requirements for procurement of calibration services. The Nuclear Regulatory Commission (NRC) verified that actions taken to correct the problem were documented, and their review of records indicated that the actions were comprehensive and thorough.

G. ITEM 55-83-07

This item involves inadequate shop welds on pipe spools fabricated by South-West Fabricating and Welding Company and supplied to BA for use at CPS. The welds in question were ASME Code Classes I and II found in safety-related piping systems, as well as some ANSI B31.1 welds found in other CPS piping systems.

The radiographs for 68 welds were selected at random for review. Fourteen of these welds were found to contain questionable indications. The radiograph films for five additional welds showed surface conditions that could possibly mask defects. A joint review of radiograph film of the 19 welds was performed by Southwest Fabricating and Welding Company, BA, and an independent designated reviewer representing IP. The results of the review showed that three welds required an engineering evaluation and disposition of the indications found, the quality of one weld was indeterminate due to difficulty in interpreting film, and one weld was considered acceptable. However, film density did not meet code requirements. Radiographs for an additional 2,980 welds were reviewed, and identification was made of 104 welds that possessed structural discontinuities. Also, 31 of the 2,980 welds possessed software problems, such as radiographic film quality and weld identification problems.

As a result of these investigations, nonconformance reports (NCR) were written to document the structural weld and software problems. These NCRs resulted in the repair or re-radiograph of the affected welds.

H. ITEM 55-84-06

This item involves damage to Conax cable penetrations through the containment wall. An investigation was performed on all installed instrumentation Conax type penetrations to identify any cases of damage. As a result, 118 NCRs were written. A special review was performed to classify the reported damage into specific areas for 1E and non-1E applications, and the effect on safety for each type of damage was evaluated. There were 23 different types of damage or deficiencies. These deficiencies were documented by the NCRs referenced above and were properly dispositioned.

Table I-1

10 CFR Section 50.55(e)

Item Number	Subject of 50.55(e)	IP Action Taken To Identify Extent Of Deficiency	IP Action to Correct the Deficiency	IP Action Taken to Preclude Recurrence of the Deficiency
55-77-01 Not reportable Closed telecon	Construction concerns on C-6 pour for the unit I basemat (Improper lift thickness, vibration techniques, sloping, horizontal movement, and free-falling concrete. Also, embedded 3' 2" x 4" and 2' temporary vent duct.)	Reviewed the corrective action request (CAR). Initiated investigative procedures and discontinued concrete pours during investigation.	Initiated an evaluation by S&L via an NCR. S&L issued a report on 3/1/77, "Evaluation of C-6 Pour." S&L concluded that the capability of the concrete mat structure is in accordance with design requirements.	Redirected IP surveillance of BA concrete placement. This action assured that BA Quality Control (QC) job supervision interface remedied discrepancies during concrete pour evolution, not after the fact.
55-77-02 Reportable Closed IE 82-07	Improper procurement of shutdown service water piping (Purchase order did not contain all of the technical requirements.)	Organized an investigating committee composed of members from IP, S&L, and construction management group. Reviewed safety-related BA purchase orders.	S&L revised procedures to incorporate guidance in procurement of safety-related items. S&L performed an engineering analysis to determine whether the purchased service water pipe met design.	IP evaluated CPS safety-related procurement actions initiated by BA for conformance to regulatory requirements. BA procurement manual BAP 1.7, "Purchasing," was revised to resolve IP investigating committee findings.
55-77-03 Not reportable	Potential loading effects from the "second pop" of boiling water reactor safety relief valves (In isolation transient, the activation of the safety relief valve on second pressure transient did not take into account valve reset characteristics.)	After notification by General Electric Company (GE) of a potential reportable condition, IP notified the NRC by a 10/7/77 telecon of a 10 CFR Part 21 reported by GE. It was subsequently determined that this item was not reportable per 10 CFR Section 50.55(e).	IP followed the status of GE tests and remedial program for resolving the 10 CFR Part 21 with the NRC.	IP adopted the GE remedial program described in GESSAR Appendix 3B, as committed to in the CPS Final Safety Analysis Report, Amendment 1.

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Item Number	Subject of 50.55(e)	IP Action Taken To Identify Extent Of Deficiency	IP Action to Correct the Deficiency	IP Action Taken to Preclude Recurrence of the Deficiency
55-78-01 Not reportable Closed IE 81-21	Control rod drive (CRD) drywell wall penetration assemblies (Shop drawings did not specify a 1/16" gap between pipe and coupling for socket welds.)	Investigated the reason why a vendor's shop drawings were different than ASME code requirements. A verbal stop work was issued during the investigation.	S&L was requested to evaluate the effect of fabricating process pipe to assembly without a 1/16" gap in end as required by code. S&L determined that a failure of the weld without a gap would not adversely affect safe operation of the plant.	S&L obtained GE concurrence that a failure in these lines would not affect the health and safety of the public; therefore, this deficiency was determined to be a non-reportable item. No further action was required.
55-78-02 Not reportable Closed telecon	Improper weld-end preparation on segments of the reactor pressure vessel (RPV) pedestal (Shop-fabricated segments were delivered without inspection and finish grinding of weld-end preparation.)	An investigating committee was formed with IP's QA supervisor, IP's assistant supervisor of construction, and S&L's site representative. The committee was organized to report on the circumstances leading to delivery of the RPV pedestal segments with improper weld-ends.	Receipt inspection noted that weld-end preparations did not conform to dimensions on S&L's drawings. An NCR was issued by BA QC to perform repair and establish control to achieve proper dimensions by performing weld build-up and grinding.	The investigating committee determined that there was no systematic deficiency in the vendor's QA program that would cause a recurrence of the problem. This situation was a singular adverse condition, so no further action was required.
55-79-01 Not reportable Closed IE 79-04	Drywell wall embed defects (17 randomly scattered linear indications and slag inclusions; 14 required repair.)	An investigating committee was formed to determine the extent of the deficiency.	The 14 welds were repaired. Even though the effect of the deficiency was judged to be minimal, an engineering analysis would have required more expense than repair.	After completion of the weld repairs, a deficiency no longer existed.

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Item Number	Subject of 50.55(e)	IP Action Taken To Identify Extent Of Deficiency	IP Action to Correct the Deficiency	IP Action Taken to Preclude Recurrence of the Deficiency
55-80-01 Reportable	Defective plug welds on swinging dividers for power generation control complex (PGCC) termination cabinets (Weld of swing barriers had failed during shipment.)	An NCR was written to document this deficiency and was submitted to GE for dispositioning. IP designated Quadrex Corporation (formerly Nuclear Services Corporation) to perform investigations with GE to determine the cause and extent of the problem.	One barrier in each of 3 of the 21 cabinets had separated from the hinge attaching it to the cabinet frame. Other welds were suspect; therefore, all barriers were removed and repaired.	All barriers were removed and additional plug welds were made on each per a new design. The new design was demonstrated as adequate by load testing.
55-80-02 Not reportable Closed IE 84-05	S&L usage of incorrect soil value input to computer model for building response spectra (Modulus of elasticity for compacted fill decimal error, i.e., a factor of ten.)	A committee was formed to investigate the cause of the deficiency and any effects on the seismic response spectra curves used for mechanical and electrical design. S&L and GE performed evaluations of the impact of the error on building response, structural design, and component design.	Results of S&L's and GE's evaluations confirmed CPS design is adequate with sufficient margin to accommodate increased loads due to modulus correction. No design changes were necessary.	S&L performed an internal audit to determine the circumstance of the deficiency. The design review process was determined to be adequate; but simply, the incorrect entry was not identified. In addition, IP QA performed an audit of S&L's independent party design verification process and found it was effectively conducted.
55-80-03 Reportable Closed IE 82-07	Breakdown of GE controls and instrument division quality system (Improper documentation for local panels with Rosemount pressure transmitters.)	This deficiency was reported to IP by GE. Product quality certifications (PQCs) were released by the GE CPS project office without a conditionally released statement. Eight local panels were affected.	The PQCs were revised to indicate that the eight panels were conditionally released.	A review was made of all PQCs for panels with safety-related devices conditionally released to assure that no discrepancies existed. GE committed to reinstruct personnel in PQC preparation, especially when conditional releases existed.

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Item Number	Subject of 50.55(e)	IP Action Taken To Identify Extent Of Deficiency	IP Action to Correct the Deficiency	IP Action Taken to Preclude Recurrence of the Deficiency
55-80-04 Reportable Closed IE 81-11	Undersized concrete embeds for residual heat removal (RHR) heat exchangers (Eight embeds for restraints to RHR heat exchangers were of incorrect size; two were not correctly located.)	The two mislocated embeds were documented on an NCR and an investigation was made to determine the extent of the deficiency. It was discovered that eight embeds were of incorrect size, so another NCR was written to assure correction of the deficiency.	S&L performed an evaluation to determine the effect of using the embeds as a hinged connection rather than a moment connection. GE specified that established stiffness criteria be maintained, so IP directed that redesign of the lateral support steel connection details be made using the undersized embeds.	An IP special surveillance was performed to confirm that a population of non-standard embeds was selected for reinspection to demonstrate that this was an isolated deficiency. Also, it was confirmed that additional instruction was made to appropriate personnel in adhering to design details and inspection criteria.
55-80-05 Reportable Closed IE 81-21	CRD drywell wall penetrations (Various tubes were found to contain heavy oxides, burn through, and suck-back on internal tube surface at area of tube-to-plate fillet welds.)	The deficiency was observed during a cleanliness inspection of one tube. NCRs were issued to investigate the extent of the problem in other tubes and for repairs, as necessary.	All tubes in the CRD drywell penetration assemblies were inspected. Tubes that displayed this deficiency were replaced in accordance with an NCR and travelers associated with the repair and replacement.	IP QA performed a special surveillance to verify the repair work associated with CRD tube replacement. Welding procedures were used that had less likelihood of burn-through or suck-back, and inspection confirmed acceptability of the tubes after repair.

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Item Number	Subject of 50.55(e)	IP Action Taken To Identify Extent Of Deficiency	IP Action to Correct the Deficiency	IP Action Taken to Preclude Recurrence of the Deficiency
55-80-06 Reportable Closed IE 81-01	Nonconforming elbow in 2" RPV drain line (Radiography revealed minimum wall violation in outside radius, oval inside surface discontinuity, and foreign material in pipe.)	The deficiency was discovered by BA QC, reported in an NCR, and submitted by IP to GE (supplier of the elbow) for investigation, evaluation, and resolution. The elbow was removed and sent to GE San Jose for further analysis.	The elbow was replaced with an elbow having acceptable wall thickness and material properties. Similar elbows supplied by GE were inspected and found to be acceptable.	An evaluation by GE determined that an indentation was in the pipe prior to forming the elbow. The indentation happened to be in the outside radius, so the forming process produced the unacceptable wall thickness. The elbow manufacturer agreed to perform visual inspections of future elbows.
55-80-07 Reportable Closed IE 81-11	Deficient welds on RHR piping in containment dome (Component support welds for RHR containment spray piping did not meet acceptance criteria.)	Routine IP QA surveillance showed that welds were defective. A re-inspection of the entire 59 welds on the RHR hangers found that 29 were unacceptable. Two inspectors had failed to adhere to acceptance criteria for visual testing (VT). An NCR was written to document the problem.	A CAR was initiated to ensure corrective action. The two inspectors were suspended from the inspection program; one was terminated, the other was retrained and recertified. All welds previously inspected by these inspectors were checked and defective welds were repaired.	Increased training sessions on proper VT requirements have been conducted for all BA welding inspectors. Welding inspection supervisors have been instructed to closely monitor future inspection activities. A periodic inspection verification program has been implemented for the inspector who was retrained.

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Item Number	Subject of 50.55(e)	IP Action Taken To Identify Extent Of Deficiency	IP Action to Correct the Deficiency	IP Action Taken to Preclude Recurrence of the Deficiency
55-80-08 Reportable Closed IE 81-29	Suspect cracking in bends of certain superstrut hangers for safety-related electrical hardware (Fittings formed by bending were discovered to have cracks at bends. Some had been weld repaired in the factory. In addition, it was discovered that the manufacturer's catalog load data were inappropriate.)	Investigation of cracked fittings entailed tensile tests and onsite VT of all stock, followed by testing of typical connection assemblies. Test results were used as revised design loads which required re-evaluation of electrical hanger design.	All cracked and weld repaired fittings were removed from stock. Testing was inconclusive, i.e., no failures of cracked fittings occurred, but it could not be proved that cracked fittings would not fail in seismic event. Therefore, all cracked fittings were replaced.	100% inspection of fittings, both during manufacturing and receipt at site, was performed. Production line changes were made to prevent cracks from forming. Revised design loads established by testing have been applied and modifications made where necessary. The manufacturer has indicated that catalog data will be changed.
55-80-09 Reportable Closed IE 83-10	Inadequate construction control on electrical raceway ha ger installation (A number of electrical raceway hangers were found to be in nonconformance with current revision of design documents.)	Investigation revealed that deficiency resulted due to the complexity of information supplied to the field. Documenting the as-built condition of hangers was found to be difficult and was an inadequate process for effecting changes to constructed hangers. The entire process o, hanger design and installation was reviewed.	Hanger construction controls were upgraded to facilitate documentation of hanger details, implement revisions to existing hangers, and streamline the process for providing information to the field.	IP QA performed a special surveillance to verify implementation of all reported corrective actions. An evaluation of the adequacy of these corrective actions was confirmed.

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Item Number	Subject of 50.55(e)	IP Action Taken To Identify Extent Of Deficiency	IP Action to Correct the Deficiency	IP Action Taken to Preclude Recurrence of the Deficiency
55-80-10 Reportable	Welding of temporary and permanent non-safety attachments to safety-related structures and components (Instructions and procedures were inadequate to document compliance of these welds to governing standards and codes.)	Investigation revealed that the welding and removal of temporary attachments to safety-related structures was being performed without adequate documentation. An indeterminate condition existed that prompted a stop work by IP supervisor-construction QA.	Temporary attachments were removed from reactor pedestal, biological shield, and containment structures. A penetrant inspection or a magnetic particle inspection was performed on base metal. ASME Section III minor permanent attachments were reworked and suitably documented.	A new procedure was developed to control and document attachments. Interface weld procedures between safety-related and non-safety-related structures, systems, and components have been revised to ensure applicable codes and standards are met.
55-81-01 Not reportable Closed IE 83-11	Pre-heat control for main steam line closure spool welds (Uncontrolled and unmonitored preheating of the A and C main steam closure spool joints to RPV safe-ends.)	An investigation was performed to determine circumstances leading to excessive unknown temperatures, possibly exceeding maximum interpass temperatures allowed by welding procedure. IP issued a stop work pending a GE evaluation of the maximum temperature and its effect on the spool welds.	GE was directed to perform an evaluation of effects caused by this deficiency. The maximum possible temperature was determined, and its effects analyzed. A significant deficiency does not exist based on documented decisions.	Training sessions were held (and documented) with all department personnel involved in the control of pre-heat of the weldments. Increased attention to monitoring and controlling temperatures was stressed.

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Item Number	Subject of 50.55(e)	IP Action Taken To Identify Extent Of Deficiency	IP Action to Correct the Deficiency	IP Action Taken to Preclude Recurrence of the Deficiency
55-81-02 Not reportable Closed IE 81-11	Control of special processes (Welding in the containment using wrong or unqualified welding procedure specifications.)	BA discontinued all welding on the containment liner, reactor pedestal, and biological shield structures. Work was started only after weld procedures were identified for specific material configurations. Thirteen NCRs were written and dispositioned.	A CAR was initiated to provide control and tracking of NCRs associated with the deficiency. Although wrong procedures were used, essential weld variables did not exceed acceptable limits.	Engineers were directed to specify the type of material to be welded on all new travelers or amendments. A matrix was developed describing acceptable procedures for various combinations of base materials, including those not previously covered under procedures.
55-81-03 Not reportable Closed IE 81-29	Half-inch type 304, cold finish stainless steel seamless annealed tubing (Linear indications identified on several heats of 1/2" schedule 80 stainless steel tubing.)	An investigating committee was assigned to determine the circumstances that caused the deficiency. Onsite penetrant testing was performed, and the pipe vendor was called to the site for assistance. Material not installed (greater than 99%) was returned to the vendor for ultrasonic testing.	In addition to vendor testing, pipe samples were sent to the St. Louis testing lab for chemical and metallographic examination. Also, hydrostatic and pneumatic tests were performed by BA. Pipe material was found acceptable and indications were within ASME-SA-213 Class II requirements for non-injurious defects.	An IP QA special surveillance was performed on inspection practices employed by BA. It was determined that the subject pipe was adequately inspected in accordance with requirements of bulk-type shipments, and no changes were necessary to preclude the minor indications discovered.

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Item Number	Subject of 50.55(e)	IP Action Taken To Identify Extent Of Deficiency	IP Action to Correct the Deficiency	IP Action Taken to Preclude Recurrence of the Deficiency
55-81-04 Reportable	Inconsistencies in the material certifications for HVAC (Zack Company, contractor) (Some material certifications for certain purchase orders were missing or contained errors.)	An investigating committee was formed to report on the circumstances of the deficiency. This deficiency extended into a generic problem with document control, also associated with the LaSalle and Midland plants. IP QA accompanied BA and surveyed BA audits of document revalidation.	IP was involved in the subcontractor revalidation program by requesting a definite plan of action and schedule for completion. Monitoring of the program was done by reviewing periodic reports and reporting the status to the NRC. The resolution of similar problems at LaSalle and Midland was used to coordinate CPS corrective action.	The subcontractor has revised its corporate and CPS QA Manual to assure that requirements are met. The number of QA personnel, and their appropriate training, has been increased. Increased IP and BA surveillances and audits of documentation operations have been instituted.
55-81-05 Not reportable Closed IE 83-08	Minimum separation requirements for certain components of the 4160V switchgear (Violations of separation requirements between Class 1E and Non-class 1E circuits inside switchgear cubicles.)	An investigation was performed to determine several areas of potential deficiencies including design, construction procedures and controls, and QC training, based on three NCRs on 4160V switchgear.	An S&L technical analysis of the subject 1E equipment demonstrated that the safety function of the switchgear was not compromised. A review of all wiring diagrams was performed to confirm that other equipment met separation requirements. No additional violation of separation requirements was identified from those in the three NCRs.	S&L design personnel were retrained in applicable separation criteria. BA procedures and instructions were revised to enhance controls for identification of separation violations; and personnel have received appropriate retraining. S&L has provided simplified reports for cable identification.

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55-81-06 Reportable	Cracking of certain electrical hanger fittings (E-212, A-211) during installation (Several fittings used in raceway support applications cracked or failed during installation.)	Suspect fittings were submitted to independent test labs for chemical and mechanical testing. Material was within specification requirements. Next, it was determined that fitting flange angle was too tight so that reverse bending tolerance was exceeded. Fittings with a minimum 1/8" radius brake lines were found acceptable.	Raceway support work continued using acceptable radius bends. Fittings with sharp (less than 1/8") radii brake lines were removed from stock and returned to the vendor. Inspection of all possibly affected completed raceways was performed.	All possibly affected fittings were returned and replaced with acceptable fittings. As a result of an IP QA surveillance to verify corrective action, it was necessary to reopen this deficiency item and confirm that specific bend radii, chemical test results, and physical application of the fittings (wall or strut mounting) were considered for proper resolution.
55-82-01 Reportable Closed IE 83-14	Design, construction, inspection process, and records for safety-related electrical hanger attachments to cable trays (Fabrication of electrical raceway was performed using a confusing and complex set of documents.)	An investigating committee was formed and an SWA was initiated. Executive direction was established to correct and resolve this deficiency. A task force made up of top IP and BA personnel was formed to resolve problems and to direct all work activities.	A corrective action was to consolidate information from many documents into one set of drawings. Hanger tray attachments were made by the traveler system; one traveler for each hanger allows centralization of installation and inspection information.	In addition to the control established to correct the cable tray construction deficiency, many significant actions were taken by IP to increase management involvement in the construction and overall IP QA Program. Satisfactory resolution of this deficiency was confirmed in NRC's letter concurring in the lifting of the SWA.

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55-82-02 Not reportable Closed IE 83-11	Discovery of improperly manufactured weld electrodes (E7018) (A welder noted non-ferrous behavior of weld rod while making a carbon steel weld. He immediately stopped welding and reported the problem to a technical services [TS] inspector.)	An SWA was initiated until results of a thorough investigation were reviewed. All welds were inspected, and a plan was implemented to determine that none of the suspect material was used in existing welds. All E7018 electrodes were withdrawn from the field and collected together. It was determined that two rods were affected.	Welds were identified that used electrodes from the suspect lot. A 10% sample of the welds was drilled and shavings were chemically analyzed for presence of non-ferrous material. No indications were found. Weld electrode stubs from the power block area were magnetically checked to further verify that no additional improperly marked electrodes were used.	An audit was performed at the manufacturer's facility which determined that their QA programs were adequately implemented, and no finding resulted. Recommendations were made and accepted to prevent any repetition. In addition, BA initiated a program to magnetically check all E7018 electrodes prior to issuance to further assure adequacy of the rod.
55-82-03 Reportable Closed IE 83-14	Ground faults occurring in instrument cable due to termination splice and tape practices (Parallel splices to join drain wires of shielded instrument cable to a ground wire would pierce adjacent conductor insulation.)	A condition report was written by the CPS startup organization on this deficiency. An SWA was initiated on terminations of associated instrument cable until the cause of the deficiency was determined. Investigation revealed six cables were affected by the termination practice.	The six cables using the suspect splicing methods were disconnected and cables repulled where necessary. The cables were reterminated using new splicing information for taping the drain wire parallel splice and preparing the cable for termination.	S&L provided revised instrument cable termination information to the field to eliminate the possibility of future ground faults. BA has retrained instrument cable termination personnel in the new termination methods to preclude any recurrences of this problem.

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55-82-04 Reportable	Improperly tightened jam nuts (Some jam nuts on heavy hex nuts in slip-joint connections were loose because of unclear instructions.)	An investigating team found loose jam nuts in a number of structural steel joint connections. Design information on other S&L mechanical, electrical, and HVAC drawings was found unclear or misleading. IP issued a management corective action request (MCAR) to BA, which subsequently resulted in an SWA.	Design drawings for all jam-nut applications were revised to clarify high-strength bolting and jam-nut installation requirements. BA has reworked and reinspected all affected structural steel slip joint connections under revised S&L drawings and BA procedures.	BA has revised their procedures and instructions to clarify and assure proper installation and inspection of structural steel jam nuts. All other applications of jam nuts are similarly being reworked and reinspected to be certain that proper jam-nut installation is performed. Also, training was provided to S&L personnel on the correct way to specify installations.
55-82-05 Reportable Closed IE 84-13	QA Program breakdown, Zack (A Zack verification program performed by BA revealed concerns with the adequacy of meeting 10 CFR Part 50, Appendix B. Zack QA Manual and Field QC procedures do not describe the CPS QA Program; and inspection records are not accurate to installed hardware in accordance with the latest design drawings.)	IP management established a verification inspection program which prompted an overall investigation into both safety-related and non-safety-related seismic Category I activities performed by the subcontractor. Three SWAs were issued, and an IP recovery plan for HVAC was developed.	A 5-phase recovery plan was developed and concurred with the NRC. The plan includes activities for material procurement and shipment, site receipt of sub-tier vendor-supplied items, fabrication, installation, inspection, and turnover of subcontractor-supplied HVAC. Each phase of the recovery plan was performed under NRC cognizant inspection and approval. An overinspection program performed by IP and BA was instituted.	IP QA surveillance reports verified prerequisite corrective actions taken in response to the SWAs. IP and BA have increased surveillance and audit activities. S&L has developed and issued new individual HVAC duct hanger detail drawings for increased clarity. The subcontractor's QA organization has been realigned to report directly to BA Management of Quality and TS.

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55-82-06 Reportable Closed IE 84-05	Structural steel inspection records (Inadvertent loss of QC documentation rendering the quality of affected structural steel indeterminate.)	During a special surveillance by a team of IP QA personnel, it was discovered that structural steel inspection documentation had been inadvertently destroyed. This discovery prompted a review of other plant structures, which led to three surveillance findings that were associated with a lack of proper documentation for quadrant elevations of the containment building.	A reinspection of all affected structural steel connections was performed to reverify and reestablish the quality documentation packages. This action was incorporated in IP's structural steel recovery plan that was submitted, concurred with, and monitored by the NRC. (See also 55-82-04.)	All drawings used to document structural steel inspections are placed in locked cabinets with limited access under QC responsibility. BA procedures and instructions were revised to incorporate these requirements.

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55-82-07 Reportable Closed IE 83-14	Potential breakdown in QA Program, Criteria X and XVI (A program of QC inspections to verify conformance of construction to specifications was not conducted in a timely manner. Also, certain conditions adverse to quality were not corrected promptly.)	Criterion X (inspection): an investigation was made into the cause of a backlog of partially completed construction work in a number of hardware disciplines. A review of traveler status was used to measure the amount of backlog.	Criterion X (inspection): priorities were established to expedite substantially completed travelers which allowed work to be presented to QC for final inspection in a timely manner. Backlog travelers were subsequently reduced.	Criterion X (inspection): timeliness of inspection was ensured by splitting large amounts of work into smaller packages, allowing inspection in-process. Procedural changes were made to strengthen and promote timely inspection. Tracking systems were established to follow and control in-process backlog.
		Criterion XVI (corrective action): Investigation was made to determine why identified nonconformances were not being promptly resolved. Open reports (e.g., NCRs, deviation reports, MCARs, CARs, and inspection items) were analyzed for appropriate expediting.	Criterion XVI (corrective action): A corrective action recovery plan was implemented to enhance the system, providing timely resolution to new quality problems and preventing their recurrence.	Criterion XVI (corrective action): a corporate nuclear procedure was issued defining the establishment of an improved tracking, scheduling, and timely corrective action system for all CPS commitments and remedial programs. A QA effectiveness plan was established to measure results.

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55-82-08 Not reportable Closed IE 83-19	Distribution control of instrument data sheets (A concern was raised regarding failure to control instrument data sheet revisions issued to the field.)	Follow-up action was initiated for identifying any similar problem. In addition to the data sheets, instrument set point log sheets and electrical relay setting sheets were also not being properly controlled.	The affected instrument data sheets were checked for use of appropriate calculations and review and approval procedures.	Both establishment of and changes to instrument/relay setpoints are controlled by S&L procedures. These procedures ensure that the preparer uses appropriate input information and guidelines, that the calculations are reviewed separately, and that the calculations are reviewed and approved by a department head. In addition, there is an independent final check of relay settings within 6 months of fuel loadings.
55-82-09 Not reportable	Small bore/instrumentation piping and electrical conduit support design calculations (Errors were discovered in small bore piping support calculations.)	A hold was placed on release of small bore piping support documents until corrective action was implemented. S&L performed a review of small bore piping calculations. IP also reviewed these calculations and S&L's small bore piping procedures. In addition, IP performed a review of S&L's conduit support calculations.	S&L's procedures for small bore pipe support design were corrected, expanded, and clarified. Calculations that contained errors were revised and affected design documents and hardware were modified as necessary. A procedure has been issued for electrical conduit support design incorporating the experience gleaned from this small bore piping discrepancy.	A special surveillance was performed by IP QA which verified that S&L corrective action was adequate to prevent recurrence of the types of errors discovered. A program was developed to perform technical reviews and QA audits in other areas of CPS design that use similar procedures. These areas include HVAC supports, cable tray supports, large bore pipe supports, pipe whip restraints, and expansion anchors.

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55-82-10 Reportable	Safety-related piping, minimum wall violations (A pipe was discovered that had a measured wall thickness less than that specified in the installation documents.)	Investigation revealed that the installation documents did not agree with design information. Design documents supplied to the piping fabricator contained inconsistencies. Other piping systems were reviewed to determine if similar problems existed. It was determined that the cause of incorrect pipe thickness was an omission of increased loading, made during design, due to pool swell loads.	One RHR line and two low pressure core spray lines were determined to contain piping with less than minimum allowable wall thickness. An analysis was performed that allowed the piping to be used as installed, modifying them with additional support to withstand external loads.	A review was made of design information for safety-related piping subject to external loads to ensure that design documents were consistent. Safety-related, augmented class D (radioactive waste) and fire protection piping drawings were checked to ensure that the correct wall thickness was specified. IP conducted a program for technical review of S&L's large bore piping design of selected piping subsystems. Recurrence of this problem is unlikely because large bore piping design and fabrication is essentially completed.

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55-82-11 Not reportable Closed IE 84-28	Incorrect identification of base material and weld procedures on piping hanger travelers (During final review of piping hanger installation travelers, wrong embed base material and improper procedures were identified.)	Investigation revealed that BA's Piping Department did not realize that an alternative material was allowed for embed plates. Subsequently, only one material was specified on travelers, but two types of material were used. A review of 9,000 pipe hanger travelers and addenda were reviewed to determine if similar problems existed for other base materials.	Investigation revealed that an ASME code case states that an ASME weld procedure qualification with a base metal in one P-number and group number qualifies for all other base metals in the same S-number and group number. It was determined that the welds were acceptable even though an incorrect weld procedure may have been specified.	BA's Piping Department training was conducted emphasizing the importance of supplying correct material identification information on work-related documents. Piping hanger documents were corrected to show that alternative materials and weld procedures existed. BA's procedures were revised to clarify methods of documenting the materials of pipe hangers on travelers.
55-82-12 Reportable	Binding of sway strut and snubber piping component supports (The welded male rod extension piece binds in the pipe clamp and rear bracket, limiting the designed range of motion.)	An inspection program was implemented by vendor personnel on site to measure the clearances available and critical dimensions for installed sway struts and snubbers. Results of this inspection showed the necessary corrective action and that binding could appear to exist in the cold condition on some supports.	Installed supports that did not have the required clearances were reworked to provide the necessary freedom of movement. Specific inspection criteria were developed for the supports that may appear bound when in cold condition.	The interferences were due to accumulative fabrication tolerances on the vendor's data sheets. Surveillance of the vendor's fabrication activities was increased to prevent defective hanger parts from being released. Detailed instructions were issued for making binding inspections for supports that appear to bind in the cold condition.

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55-82-13 Reportable Closed IE 84-05	Detailing and fabrication of structural steel connections (Welds for certain structural steel beams were undersized; and inspection criteria were not provided for thread engagement in drill-and-tap connections.)	As part of the IP structural steel recovery plan, an overinspection of installed structural steel was performed. Two nonconformances were generated which prompted an investigation of shop connection detail drawings. A review was made of the calculated capacity of the potentially deficient connections. The drill-and-tap problem was investigated and evaluated and a review was made to determine whether drill-and-tap connections by other vendors were acceptable.	The two questionable weld connections were repaired. The 25 connections affected by the drill-and-tap problem were reworked under new criteria for thread engagement necessary to assure adequate joint strength.	The structural steel vendor has revised its shop drawing to clarify the requirements for the connections where this deficiency occurred. IP QA's scope of audits was increased to specifically include S&L's process for reviewing vendor design drawings. Also, BA's vendor surveillance program was enhanced to include a larger scope and increase the number of surveillance inspection points.
55-83-01 Not reportable Closed IE 83-19	Qualification of calibration service vendors (Suppliers of measuring and testing equipment calibration services were not on the qualified suppliers list.)	An investigation plan was implemented to determine the adequacy of past calibration services. Necessary corrective action was evaluated for future services.	An investigation of calibration service suppliers revealed no adverse conditions in past calibration services and no adverse impact on hardware. Sixty calibration services suppliers were qualified by IP and BA.	IP and BA procurement document review instructions were revised to address calibration service requirements. In the future, only QA qualified suppliers will calibrate measuring and test equipment.

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55-83-02 Reportable Closed IE 84-28	Counterboring of safety-related piping (Piping weld preparations requiring field counterboring were not being inspected and documented.)	Subsequent to discovery of this deficiency, an IP QA surveillance confirmed that required inspections were not always being conducted. A CAR was issued to identify what piping joints were affected. NCRs were written for joints requiring rework. An additional review of site documentation has been conducted to verify that all field counterbored piping joints have been identified and investigated to determine adequacy.	The pipe joints identified as having questionable internal geometries have been documented on reports for tracking appropriate rework or resolution. Pipe joints welded under the previous program are thus assured to meet S&L and ASME code requirements.	BA's Piping Department has conducted on-the-job training for craft personnel involved with pipe counterbore. BA's procedures and instructions were revised to address piping counterbore. Inspection of counterbore will be performed and documented on all new piping travelers.
55-83-03 Not reportable Closed IE 83-05	Certification of startup personnel (A particular individual assigned to perform an upcoming retest of Class IE protective relays was not certified.)	A review of records for the testing activities was performed by the startup group to evaluate the certifications of personnel performing the tests. Those records that indicated the test activity was performed by individuals not certified under the startup administrative procedure were evaluated to determine acceptability.	In addition to startup test record reviews, a review of documents which define requirements for the certification of startup test personnel was conducted. The results of this review indicate that there has been no impact on testing activities or system operations.	Clarification of certification requirements for individuals who perform testing under the startup program has been incorporated into the training program. Startup administrative procedures were revised to clearly define the qualification and certification requirements for technicians and electricians who perform startup test activities.

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55-83-04 Reportable	Document control of design change documents (Some GE design change documents, i.e., field deviation disposition requests (FDDRs) and field disposition instructions (FDIs), did not ensure that drawings properly identified all outstanding changes.)	An investigation was performed to determine the effectiveness of the GE design change program. The results were evaluated, and recommendations were made for improvement.	A complete review of GE drawings was conducted to ensure that current design change status was indicated. FDDRs and FDIs not yet incorporated into design drawings have been identified and field engineering change notices (FECN) were issued for posting against design drawings until changes are incorporated.	Construction has progressed correctly and in a controlled manner. IP has revised their procedures and instructions to clarify how future design change documents shall be received, reviewed, and issued in a controlled manner. Training has been performed accordingly.
55-83-05 Not reportable	Failure of certain 1/4" hex head screws during installation (Some failures were occurring during torquing of hex head screws used in conduit strap attachments.)	An IP QA surveillance identified a concern regarding the installation of hex head screws lacking identification marks on the heads. During the processing of an NCR, it was discovered that some screws were elongated, and subsequently, actual failures were reported. An investigation into the design, installation, procurement, and ASTM requirements for these screws was performed.	Evaluation of this deficiency determined that failures of the hex head cap screws during installation did not indicate a deficiency in either design requirements or in construction that could adversely affect the safety of CPS operation. However, improvements are being made to assure a high degree of quality installation.	Cap screws will be purchased as safety related in the future, and only marked cap screws will be used for new installations. ASTM requirements will be specified, and installation techniques will be improved (i.e., torque requirements will be revised, and more accurate torque wrench will be required.)

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55-83-06 Reportable	Welding of structural steel connections (Vendor shop welds contained defects in connection angles of structural steel members used to reinforce concrete block walls.)	All types of structural steel supplied by the vendor were surveyed to determine whether this condition existed elsewhere. This connection angle weld was discovered while removing a connection angle during modification of a block wall support column. Similar column supports where the steel is used were inspected.	Blockwall columns that were not installed were returned to the vendor for repair. Defective welds were identified on installed blockwall columns and were repaired. An engineering evaluation was performed for inaccessible welds, and modifications to the design were made where necessary. All other steel connections supplied by the vendor were inspected, reworked as necessary, and re-inspected.	Future orders of structural steel will favor only stock material so that assemblies can be fabricated on site under controlled conditions. BA's vendor surveillance program has been enhanced to increase overall effectiveness.
55-83-07 Reportable	Pipe shop welds contain deficiencies (Certain large bore piping welds were found to contain questionable indications.)	BA performed a second review of radiographs that were originally received with the prefabricated pipe welds. As a result, the vendor filed a 10 CFR Part 21 with the NRC which concluded that one weld was indeterminate due to surface conditions. IP performed an investigation on the questionable welds by repeating the radiography, and performed a second review of the vendor-supplied piping.	All piping supplied by the vendor was reviewed, and radiographs were repeated where necessary. One hundred sixteen NCRs were written to document and control the repair of any welds needing rework.	Large bore piping fabrication is essentially complete for CPS, so IP efforts have focused on identifying both the scope of this issue and the correction of any identified deficiencies.

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55-83-08 Not Reportable	Damage to guard pipe bellow assemblies (Small dents, nicks, scratches, and arc strikes were experienced during installation and construction activities.)	An evaluation was performed to determine remedial actions necessary to establish the acceptability of the damaged bellows. A prototype bellows (damaged in a manner similar to the assemblies installed at CPS) was tested under design conditions. Proposed repairs to the installed bellows were made on the prototype for verification of an acceptable method of repair.	Prototype tests provided assurance that the damaged bellows can be restored to perform their necessary design functions.	Completion of the acceptable repair procedure will result in an absence of any significant deficiency.
55-83-09 Not reportable	Damage to PGCC cable termination connectors (Bent conductor pins caused a puncture of dielectric in matching sockets.)	An investigation was made to determine the number of installed damaged connectors. It was determined that the number of nonconformances produced an insignificant failure rate.	The affected connectors were repaired or replaced, as necessary, and were re-tested.	It was determined that the scope of the problem is minimal and detectable by functional circuit testing. Training has been expanded to include special hands-on training workshops for work on cable connectors by contractor and IP technicians.

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55-83-10 Reportable Closed IE 84-42	Containment liner dome welds (Welding deficiencies were observed on the containment liner dome closure seam weld.)	IP has implemented an investigation of the weld deficiencies and other irregularities that have been noted. Chemical tests were used to identify a foreign substance, and dimension deviations were evaluated and found acceptable. Suspect welds were given VT and magnetic particle inspection, and an independent third party was retained to act as IP's designated reviewer.	Results of the investigation have indicated that the noted weld discrepancies were insignificant or were repaired to be within design tolerances.	The results of the investigation were analyzed and it was shown that the surface of the dome liner was suitable for inspection and interpretation.
55-83-11 Not reportable Closed IE 84-28	Laminations in 3/8" steel plate (Splitting of steel plate thickness gives the appearance of two laminated plates separating.)	An investigating committee was formed to determine the application of the steel plates and the cause of the splitting. Examination of other uninstalled plates of the same heat number uncovered additional examples of laminations. The location of potentially defective plates was determined.	As a result of the investigation, it was determined that adequate controls exist to identify defective plate materials.	No trends or root causes were determined. Installation is the responsibility of craft and TS personnel who follow appropriate standards and procedures for rejection of plate material.

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55-84-01 Potential	Design change control NCRs and field change requests (FCR) (A potential problem has been identified on the coordination and control of field initiated design changes and their incorporation into affected design documents.)	IP QA audits have identified control problems with processing NCRs and FCRs. An investigation is being performed to review FCRs and NCRs to assure that all directly affected documents associated with the field change have been properly identified.	A plan is being implemented to review changes to FCRs and NCRs to ensure that hardware installations were performed, where required, and that they agree with the latest plant design.	Results of the investigation now in progress will be reviewed, and appropriate changes in procedures and instructions will be evaluated to prevent discrepancies.
55-84-02 Potential	Material traceability (A trend of a number of deviation reports, NCRs, and IP QA audit findings indicated a problem with identification and traceability of materials.)	An MCAR was issued to investigate and report results of this adverse trend. A review of historical documentation has been performed to evaluate software adequacy. Hardware installations affected by material traceability have been listed. Areas where traceability could be a problem have been identified and are being investigated.	Procedures have been revised to include hard marking or tagging of all material received. Laydown yards have been reorganized to clearly segregate materials. Sampling and testing of installed systems are being performed. A site purge of all non-traceable structural shapes, plates, and unmarked bolting material has been performed.	In addition to the changes in procedures already done, any recommendations resulting from the investigation now in progress will be incorporated in the CPS QA Program. Future occurrences of this potential deficiency will be prevented.

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55-84-03 Not reportable Closed IE 84-42	Concrete expansion anchor (CEA) installation (Irregularities have been observed in welded anchors, embedment depth, and foreign material in anchor bolt holes.)	An investigation of the extent of this problem is being done by a sampling program of all anchors. Results have shown that nonconforming conditions have no safety significance. A reinspection program was developed for the anchors where the initial problem was observed.	A reinspection of all CEAs known to be installed by the suspect craftsman was performed, and resolution of any irregularities is in progress. A hold was placed on CEA installation until procedures and instructions were changed and appropriate training was performed for proper installation.	In-process QC inspections and QC hold points have been incorporated into procedures and instructions. Craftsmen and QC personnel have received documented training in required installation techniques.
55-84-04 Not reportable Closed IE 84-42	Heavy schedule pipe fittings (Substitution of greater than specified wall thickness on certain pipe fittings by the piping fabricator.)	S&L performed an evaluation to determine the effects of using heavier wall thickness fittings. Investigation was made into the acceptability of this practice.	Locations of pipe fittings with the greater than specified wall thickness were identified. An evaluation was performed that determined that use of the fittings as-is was acceptable.	Use of thickness greater than nominal value is an industry-wide practice and is not specific to CPS. Identification of substitutions has been completed at CPS, and the substitutions have been evaluated for appropriate use within design requirements.

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55-84-05 Not reportable Closed IE 84-42	Incorrect material substitutions of large bore pipe (Improper substitution of 12" standard wall pipe in place of 12" schedule 40 wall pipe in the main stream downcomers resulted in a wall thickness less than that specified.)	BA's Piping Engineering Department performed a review to identify all weld joints where internal diameter mismatch may require inside diameter grinding or counterboring; and the installation travelers for the main stream downcomers were reviewed to verify that the material used conformed to code/class specification.	NCRs were written for all discrepancies identified; appropriate site procedures were revised to include the specific attributes for verification of piping wall thickness and material classification; training was performed using revised lesson plans for Document Review Group personnel; and, measurements of installed pipe wall thickness are being performed in accordance with BA's field verification and IP's overinspection programs to assure that piping of adequate wall thickness has been installed at CPS.	BA's QA Department has established additional checks at the issue point to verify wall thickness and class.

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55-84-06 Reportable	Damage of Conax penetrations (Conax cable penetration assemblies had bent terminal studs and broken barriers on terminal blocks.)	A review was conducted of all NCRs written against Conax penetrations to classify the reported damage into specific areas for IE and non-IE applications and the effect on safety for each type damage was evaluated; a review of the Conax installation instruction manual and BA's installation and inspection procedures was conducted to determine adequacy and compliance; BA's work travelers were reviewed to verify that the vendor's recommended procedures were followed; Conax was consulted to determine the effect of the damage to the penetration assemblies and proper means of correcting the damage; BA's procedures for inspection and termination of field cables to penetrations were reviewed to determine quality hold points prior to connecting cables; and field verification methods for assurance of equipment integrity were evaluated to identify damage prior to turnover of the penetration assembly.	One hundred eighteen NCRs were written against installed Conax penetrations. Of the 118, 81 are closed and the remaining NCRs are in the process of being worked; a specific inspection checklist will be issued to combine the pertinent requirements of the QC instructions for electrical equipment and electrical cables and to include inspections on the penetration itself (welding, electrical and mechanical components, corrosion, etc.).	Measures are being taken to improve existing procedures to preclude recurrence of similar damage and deficiencies during future replacement operations.

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55-84-07 Reportable	Use of GE non-site-specific design specifications for CPS application (Use of GE documents not directly applicable to CPS may result in incomplete preoperational test procedures.)	A report was prepared by GE outlining the specific listing and means to determine the correct documents and instruction manuals applicable to CPS; procedures used by CPS personnel to identify the correct controlled GE documents and instruction manuals were reviewed to uncover any ambiguities in the selection of controlled documents for use in writing testing and other procedures; and the documentation control used for other equipment was reviewed for similar problems in selecting controlled information.	Training is being conducted on the proper use of GE documentation; appropriate CPS procedures are being revised to specifically state that the master parts list (MPL) should be used to determine appropriate GE documents; IP test procedure PTP-RD-07 was revised to reference and agree with the correct design specification; testing procedures were revised where appropriate to correct identified discrepancies.	To assure that documents specific to CPS are used for future test procedures, preparation of a startup library is being provided with a controlled copy of the master parts list for use in determining applicable GE documents; and an engineering information system terminal is being provided for use by the startup and plant operations groups to allow on-line computer capability for determining the latest revision to GE documents.
55-84-08 Not reportable	Cleanliness class of suppression pool (Downgraded the suppression pool cleanliness requirements from "B" to "C" on Traveler SF-001.)	IP QA determined that per BAP 3.2.2, Rev. 9, there is no difference between Class B and Class C cleanliness for stainless steel. There were several other reasons for recommending withdrawal.		Withdrawn on May 5, 1984.

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Item Number	Subject of 50.55(e)	IP Action Taken To Identify Extent Of Deficiency	IP Action to Correct the Deficiency	IP Action Taken to Preclude Recurrence of the Deficiency
55-84-09 Not reportable	Certification of materials supplied by Rockwell Engineering and Carbon Steel Products (Improperly certified pipe penetration head fitting materials were supplied to CPS by the subject vendors: Rockwell Engineering and Carbon Steel Products.)	A review was conducted of S&L's material and design requirements found in design documents and specifications; a review of construction QC procedures and inspection bases were performed, where appropriate; a review of material procurement and receiving inspection methods was performed; a review of the record review programs was conducted to determine the capability of these programs to identify certification deficiencies; a review was conducted of deficiency documents (NCRs, audit findings, etc.) that identify certification discrepancies.	The Class 1 head fittings which were not examined in accordance with NB-2530 were replaced; Class 1 shear lugs were also replaced; Class MC head fittings which were not Charpy V-Notch impact tested at the correct temperature were replaced or material of the same heat was tested at the correct temperature; the materials used to fabricate Class 1, NF, nonintegral supports were replaced.	Training programs were developed and conducted for personnel involved with ASME materials, requisitions, purchase orders, vendor qualification, and document review. BA's Resident Engineering expanded their review of procurement requisitions to ensure that material requirements are specified.

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Item Number	Subject of 50.55(e)	IP Action Taken To Identify Extent Of Deficiency	IP Action to Correct the Deficiency	IP Action Taken to Preclude Recurrence of the Deficiency
55-84-[illegible] Reportab[illegible]	Debris in nuclear system protection system (NSPS) panels (Various types of metallic debris were found in the NSPS power supplies and could conceivably, under certain conditions, cause an electrical fault resulting in the loss of a power supply. Loss of a power supply may degrade the level of redundancy within the NSPS circuits.)	A review of GE's, IP's, and BA's procedures was conducted to determine the adequacy of these procedures with respect to the inspection and cleaning requirements for electronic equipment; a review of this problem was performed with respect to the effects on other similar type equipment with perforated enclosures used for mechanical protection and provision for air circulation; a review (for adequacy) of GE's cleaning, inspection, and shipping preparation procedures at the San Jose fabrication facility was performed; a review of BA's procedures for protecting equipment during installation was performed.	Per the reviews, it was determined that CPS work is performed in accordance with applicable IP procedures, and that necessary precautions are taken when performing work inside panels by placing protective covers over the equipment immediately below the work area. This practice prevents debris from falling inside equipment enclosures. IP's instructions also provide the necessary guidance to clean instrument panels containing static-sensitive devices. A review of other safety-related equipment has not identified any other similar component enclosures where hidden debris could be a problem.	GE has indicated that they believe their procedures to be adequate, but that emphasis will be given to training courses in housekeeping for future work involving electronic panels.

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Item Number	Subject of 50.55(e)	IP Action Taken To Identify Extent Of Deficiency	IP Action to Correct the Deficiency	IP Action Taken to Preclude Recurrence of the Deficiency
55-84-11 Potential	Uncertified flanges installed in ASME systems (Various stainless steel thread-o-lets were manufactured from stock material not purchased under the provisions of ASME NCA-3800 and which did not include the product analysis for upgrading per ASME requirements.)	A review was conducted to determine the extent of this problem using S&L's material and design requirements found in design documents and specifications; review was performed of construction and contractor QC procedures and inspections; a review was conducted of material procurement and receiving inspection methods; a review of the record review programs was conducted to determine capability to identify certification deficiency documents (NCRs, audit findings, etc.) which identify certification discrepancies. These data will be reviewed to establish the root cause of the problem.	All flanges were replaced. The stainless steel thread-o-lets were use-as-is.	Training programs were developed and conducted for personnel involved with ASME materials, requisitions, purchase orders, vendor qualification, and document review. BA's Resident Engineering expanded their review of procurement requisitions to ensure that material requirements are specified.

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Item Number	Subject of 50.55(e)	IP Action Taken To Identify Extent Of Deficiency	IP Action to Correct the Deficiency	IP Action Taken to Preclude Recurrence of the Deficiency
55-84-12 Potential	Installation of CEAs in floors with finishing/topping slabs (Installation of CEAs in floors with finishing/topping slabs where the installed anchor bolt is required by specification to be fully embedded in rough concrete. Rough or structural concrete floors are sometimes finished with an additional pour of concrete for smoothness and appearance. This topping slab has no reinforcing steel embedded and, therefore, has no structural value. CEAs must meet their embedment depth (not including the depth of the topping/finishing slab). Certain CEAs may have been installed to embedded depths based on measurements including the topping slabs.)	A review of construction procedures governing the installation/inspection of concrete expansion anchors was conducted to determine adequacy and compliance; based on the rough as-built drawings already generated, a complete listing of all potentially affected equipment/components will be compiled; a complete list of composite as-built drawings is being generated identifying all equipment and components installed on finishing and topping slabs which use CEAs for installation. This list will be entered on computer to search for all documentation (NCR, FCR, etc.) that may have addressed these components; the documents identified by the search will be reviewed to identify those documents which address the problem of expansion anchor embedment. All components with expansion anchors that violate the effective embedment criteria and that do not have	A stencilling program was implemented to aid personnel in locating finishing slabs; BA issued a memo reminding supervisory personnel of the requirements to install expansion anchors into the structural slab in order to achieve full embedment per S&L Specification K-2944. Several procedures and checklists were revised to ensure proper installation and verification of the embedment depth. S&L provided a list identifying all of the safety-related finishing and topping slabs at CPS.	

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Item Number	Subject of 50.55(e)	IP Action Taken To Identify Extent Of Deficiency	IP Action to Correct the Deficiency	IP Action Taken to Preclude Recurrence of the Deficiency
		prior approval documentation will be documented on NCRs and will be resolved.		
55-84-13 Potential	Suppression pool temperature monitoring system (SPTMS) (The SPTMS, as designed, meets the GE design requirements for normal pool monitoring, but does not meet the GE recommendation for providing a post-loss of coolant accident pool monitoring capability.)	S&L performed an evaluation of the current design for adequacy to meet design basis accidents which could result in uncovering the suppression pool temperature sensors. The results of this evaluation were submitted to IP for review. IP's Nuclear Station Engineering Department reviewed these results to determine the significance to safety of operations of the CPS. The Department directed S&L to develop and issue a redesign of the SPTMS to preclude the possibility that the temperature sensing elements would be uncovered during a design basis accident.	The SPTMS design has been modified to include additional temperature monitoring elements in each of the four quadrants of the suppression pool at the 14'-10" water level, placing them below the potential minimum water level. This modification will be performed concurrently with the SPTMS completion. With this design modification, the SPTMS will be in full compliance with both GE and NRC recommendations. As a result of this modification, it will be necessary to revise the operating and emergency procedures to direct the operator to note the suppression pool water level and to monitor the lower	

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Item Number	Subject of 50.55(e)	IP Action Taken To Identify Extent Of Deficiency	IP Action to Correct the Deficiency	IP Action Taken to Preclude Recurrence of the Deficiency
			temperature elements if the upper elements are uncovered. Also, an internal S&L audit was performed which showed that a survey of GE documents is required to determine whether other requirements or recommendations in the A-22 series of documents have been adequately addressed. The results of this survey will then be audited.	
55-84-14 Potential	Breakdown in BA QA vendor surveillance program (A significant number of discrepancies were identified with contracts that were assigned to a specific BA QA Vendor Surveillance Engineer during his employment with BA. This condition leaves the quality of certain electrical equipment and components indeterminate.)	A review of BA's documentation was conducted to identify all contracts that were assigned to the specific BA QA Vendor Surveillance Engineer (identified by CAR 173). A review of all appropriate contracts was conducted to identify all material, equipment, and components to be evaluated for compliance with design requirements. NCRs were generated to document all material, equipment, and components evaluated as not conforming with design requirements or that are classified as indeterminate. The NCRs generated will be dispositioned	BA has developed a 3-phase corrective action plan to address and provide resolution to CAR 173. The three phases include the review of various types of documentation, including procedures and applicable contracts. After completion of this 3-phase review, a surveillance will be performed and a surveillance activity report will be prepared as objective evidence that the corrective action has been completed.	

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Item Number	Subject of 50.55(e)	IP Action Taken To Identify Extent Of Deficiency	IP Action to Correct the Deficiency	IP Action Taken to Preclude Recurrence of the Deficiency
		and evaluated for safety significance. A sample of contracts, other than those identified on CAR 173, was reviewed to determine whether similar deficiencies exist. A review was performed of BA QA's vendor surveillance program requirements to determine adequacy.		
55-84-15 Not reportable	Skewed auxiliary steel connections and beam end connections (The fabrication and installation of skewed [angles less than 90°] auxiliary steel connections without the required approved design details.)	A review was performed to identify all conduit and cable tray supports using skewed auxiliary steel connections that were installed without approved design details. S&L analyzed and evaluated as-built connections identified as nonconforming or indeterminate for adequacy to carry design loads. BA's QA group evaluated this problem for similar skewed connections which may have been installed by other disciplines.	Forty-four NCRs were generated to document those connections identified as nonconforming or indeterminate. All NCRs have been dispositioned in accordance with approved procedures. NCRs 17544, 50984, and 50998 were also generated to document the fabrication and installation of structural steel beam end connections without approved design details. These were resolved in accordance with approved procedures.	S&L issued FECNs 4986, 4996, 5098, 6001, 6003, 6004, 6005, 6224, and 6227 covering generic skewed connection details. These FECNs will be used for all future cable tray and conduit support installations. To ensure that skewed connections do not become a potential problem in other disciplines, it has been verified that standard skewed connection details are covered in design drawings.

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Item Number	Subject of 50.55(e)	IP Action Taken To Identify Extent Of Deficiency	IP Action to Correct the Deficiency	IP Action Taken to Preclude Recurrence of the Deficiency
55-84-16 Reportable	Internal wiring workmanship deficiencies in electrical panels high pressure core spray for the diesel generator (General workmanship discrepancies in wiring of electrical control panels for the high pressure core spray for the diesel generator)	A review and evaluation of background facts concerning the internal wiring deficiencies is being performed to determine if poor workmanship was performed at the factory prior to shipping or was performed at CPS during equipment installation/modification. A review will be performed of CPS receiving inspection and panel installation procedures to determine what work, if any, was performed on the subject panels subsequent to the receiving inspection. BA's procedures for field modifications and inspection of the control panels will be reviewed to determine quality hold points prior to traveler completion; field testing methods used to verify equipment and circuit integrity will be reviewed to identify internal wiring deficiencies prior to energizing. IP will evaluate the effect of the problem on other equipment supplied by the same supplier or manufacturer. Identified		

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		discrepancies are being documented on NCRs and will be resolved in accordance with approved site procedures.		
55-84-17 Not reportable	Work performed on GE components (Electrical work involved the PGCC modification in the control room and GE safety-related equipment modifications outside the control room.)	An investigation plan was implemented, including a review of appropriate BA procedures and instructions to determine any GE quality inspection requirements that have not been incorporated. BA's procedures were revised to resolve identified discrepancies. A review was conducted of BA's training program, SAM 21, for electrical control and instrumentation work. A review was conducted to identify all safety-related electrical FDDRs and FDIs incorporated into travelers involving work on safety related GE components; a review of applicable travelers was conducted to determine if additional	Investigation of this potentially reportable deficiency has determined that the existing means of verifying the quality requirements for work associated with GE change documents are satisfactory. No further action was required.	Withdrawn December 6, 1984

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Item Number	Subject of 50.55(e)	IP Action Taken To Identify Extent Of Deficiency	IP Action to Correct the Deficiency	IP Action Taken to Preclude Recurrence of the Deficiency
		QC inspection and checks are needed to meet GE quality requirements. Closed safety-related electrical equipment travelers to be supplemented as appropriate to incorporate additional QC inspections or checks needed to meet GE quality requirements.		
55-84-18 Potential	ASTM A-36 plate material (The quality of the A-36 plate material became suspect during mechanical cutting operations by craft personnel, specifically certain 15" x 15" x 1/2" A-36 steel plates (Heat No. 8117721, RIR No. S-12949) whose quality is indeterminate.)	IP has prepared and is implementing an investigation plan which includes: a review of the material specification and testing requirements for the suspect A-36 material and other materials received from the same supplier; a review to identify installations which used the suspect material; a review to identify all remaining stock of the suspect material; the testing performed in order to assess the acceptability of the suspect material; and the compilation of the above data to be reviewed and evaluated to determine the significance to the safety of operations of CPS.		

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Item Number	Subject of 50.55(e)	IP Action Taken To Identify Extent Of Deficiency	IP Action to Correct the Deficiency	IP Action Taken to Preclude Recurrence of the Deficiency
55-84-19 Potential	Nelson studs on embed plates (Nelson studs were found detached from back of embed plate located in containment, elevation 753', azimuth 128°, exterior face of the drywell wall.)	An IP QA surveillance was performed on the excavated Nelson studs (identified by BA NCR 20031 and NCR 21516), to provide approximate measurements and notes of various attributes examined, and to provide comments independent of IP CPS Project Management.		
55-84-20 Potential	Structural steel coating (Some structural steel inside the containment is coated with a primer other than that specified.)	Several documentation reviews have been performed on structural steel purchase orders. Testing is currently being conducted to identify the suspect primer coating. NCRs have been written to resolve this issue.		
55-84-21 Potential	Battery charger electrical lug crimps; (Improper crimping of the battery charger wire lugs may result in insufficient contact surface.)	Vendor crimping is suspect; therefore, a review will be performed of receiving inspection reports for the safety-related battery chargers. Corrective action on the lugs will be also reviewed, and the cause of the improper crimping will be investigated.		

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Item Number	Subject of 50.55(e)	IP Action Taken To Identify Extent Of Deficiency	IP Action to Correct the Deficiency	IP Action Taken to Preclude Recurrence of the Deficiency
55-84-22 Potential	Screenhouse gallery platforms (Three Category I gallery platforms have been installed as non-safety related.)	An investigation plan has been implemented to review documentation associated with the receipt and installation of these platforms. S&L will perform an evaluation to determine if the gallery steel is usable in a Category I structure. Also, a thorough review will be performed to ensure this problem is limited to the three identified platforms.		

APPENDIX J
10 CFR PART 21

Table J-1 summarizes each potentially reportable condition pursuant to 10 CFR Part 21, the action taken to investigate or evaluate the condition, and the corrective action taken in response to the condition.

Table J-1

10 CFR Part 21

Item Number	Subject of Part 21 Report	IP Action to Identify Extent of Defect	IP Action to Correct the Defect
21-77-01 Not reportable	Safety relief valve (SRV) control system (General Electric Company [GE]) (GE advised the Nuclear Regulatory Commission [NRC] that under certain transient isolation events, the relief valve control system would allow more than one relief valve to reopen, resulting in load combinations not currently specified in licensing documentation.)	Illinois Power Company (IP) concluded that a reportable defect does not exist based on the fact that Clinton Power Station (CPS) design was not yet completed. Design activities were on-going, which would result in the analysis and development of specific SRV-related design details based on GE's identification of SRV loads.	N/A
21-79-01 Not reportable	National Electrical Manufacturers Assocation size 3 starters (Gould, Inc.) (Seizure or binding of the carrier assembly occurs within the support plate.)	N/A - No defective starters for safety-related equipment were shipped or received at the CPS.	N/A
21-80-01 Not reportable	Rosemount Model 1152 pressure transmitters (GE) (This potential defect pertains to ambiguous output from Rosemount Model 1152 pressure transmitters when over or under pressured.)	GE determined this condition is a reportable defect and subsequently informed IP. GE established a corrective action plan to replace the A- and D-type printed circuit boards with new E-type printed circuit boards from Rosemount. IP determined that this condition is not reportable.	N/A

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Item Number	Subject of Part 21 Report	IP Action to Identify Extent of Defect	IP Action to Correct the Defect
21-80-02 Reportable	Divisional separation in power supply panel P011 to nuclear system protection system (NSPS) (GE) (There is inadequate electrical separation as specified in Regulatory Guide 1.75.)	GE notified the NRC of a defect in power distribution panels master parts list C71-P011 and informed IP of defective panels.	NSPS panels were removed and shipped to GE on 5/27/83 per field deviation disposition request (FDDR) LH1-1227. Rework was completed by GE per field disposition instruction (FDI)-SKKJ on 6/5/84.
21-80-03 Not reportable	Containment Atmosphere Monitoring System hydrogen sensors failure (GE) (Hydrogen sensors failed to perform as required after a loss of coolant accident)	GE filed a Part 21 on this condition; however, this failure does not affect the CPS equipment.	N/A
21-80-04 Reportable	Grounding of power generation control complex (PGCC) flexible conduit (GE) (NSPS panels rely on flexible conduit providing a low resistance ground path back to termination cabinets. Improper grounding could prevent a fuse from properly melting and thus allow a short circuit to be maintained, which could lead to erroneous signals and control of safety systems.)	This problem was noted in the field at other projects, and GE subsequently notified IP of panels requiring rework.	Grounding was accomplished via FDI-SKJC, which included quality assurance (QA) requirements for verification.

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Item Number	Subject of Part 21 Report	IP Action to Identify Extent of Defect	IP Action to Correct the Defect
21-80-05 Reportable	Half-inch threaded pipe tees (Capitol Pipe and Steel Products Company) (Tensile strength does not meet minimum ASME Section II specification requirements. The receiving inspection inadvertently overlooked the low tensile readings on the certified material test report [CMTR] and the material was accepted.)	An investigation revealed that Baldwin Associates (BA) had received 50 subject fittings, all of which were still in the warehouse. Further evaluation was made of 60 randomly selected CMTRs previously submitted to determine compliance with ASTM/ASME Section II. No additional discrepancies were noted.	A "hold for quality control (QC) clearance" tag was immediately hung on the 50 subject tees, which were later returned to the supplier, Capitol Pipe and Steel Products Company.
21-81-01 Reportable	Centrifugal and axial flow fan housings (Buffalo Forge) (The thickness of numerous fan housings was undersized by almost a factor of two, thus possibly allowing the escape of missiles and subsequent damage to safety-related equipment, pipes, and cables.)	Subject fans are not safety-related and are not installed in safety-related systems. However, per investigation, all but four are located in Category I buildings and have safety-related equipment located nearby, thus damage (to safety-related cable) would be possib'	Fan housings will be reinforced by welding plates to the existing housings. This repair method was reviewed and approved by IP and Sargent & Lundy (S&L) and corrective action is currently in process. IP QA will perform a notification point surveillance of the repair work.
21-81-02 Reportable	Failure of coaxial cable (Rockbestos Company) (Series 100 cable failed under LOCA conditions during laboratory testing. IP was notified by Rockbestos.)	All Series 100 cable from Rockbestos was received on RIR #S-12550. The 20 reels were intact with the exception of a 105' section for cable 1WX84B, which was installed. This cable was removed and wound around a reel for return to the supplier.	Defective cable was placed on hold by BA QC, and nonconformance reports (NCR) 4967 and 8098 were generated. Per the disposition of these NCRs, the cable was returned to Rockbestos and replaced with properly qualified second generation coaxial cable.

Item Number	Subject of Part 21 Report	IP Action to Identify Extent of Defect	IP Action to Correct the Defect
21-81-03 Not reportable	NUPIPE computer codes (Control Data Corporation) (IP was advised of a possible error in the NUPIPE computer program that could cause a defect as described in 10 CFR Part 21.)	Indicated error does not affect the CPS design verification.	N/A
21-81-04 Reportable	Incorrect reactor pressure vessel water level transmitter ranges (Rosemount) (GE) (Wide-range reactor vessel water level scram transmitters and trip units are installed instead of the correct narrow-range device.)	GE notified the NRC and IP of this 10 CFR Part 21 defect, which affects CPS. GE provided the list of affected transmitters to IP. IP assigned specific personnel to follow the resolution of this condition.	The wide-range transmitters will be replaced with narrow-range transmitters. Replacement transmitters have been received onsite and will be installed per GE FDDR-LH1-1527 R/1 and FDDR-LH1-1785 R/0. Corrective action is in progress.
21-81-05 Reportable	NSPS load driven connection plugs (GE) (Jumpers are missing on the NSPS load-driven connection plugs, thus preventing their safety function of energizing or deenergizing their loads.)	The defect was originally identified on condition report No. 1-81-12-001 after IP's startup group was alerted by GE to the possibility of the missing jumpers. As IP does not take credit for any factory performance tests performed by GE on the NSPS panels, all tests would have been repeated by IP during checkout and startup, and the missing jumpers would have been discovered.	The NSPS circuit card jumpers were reworked by GE-San Jose per FDDR-LH1-767, and will be installed in NSPS panels by GE. IP QA has verified the work was signed off as complete.

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Item Number	Subject of Part 21 Report	IP Action to Identify Extent of Defect	IP Action to Correct the Defect
21-81-06 Reportable	PGCC termination modules incorrectly wired - Group 53 (GE) (Subject T-mods are premanufactured subassemblies consisting of a terminal board and a connector receptacle mounted on a metal bracket. The wiring from the terminal board to the connector is incorrectly wired on all T-mods with part No. 137D7743G053.)	During normal testing in October 1981, one T-mod was found incorrectly wired, and it was corrected. A maintenance work request (MWR) verified that the remaining 28 T-mods were also incorrectly wired.	IP Maintenance Department has correctly rewired the T-mods in accordance with applicable GE wire lists using MWR A-0434.
21-82-01 Reportable	Design defect on the microcomputer circuit board (Eberline) (Design defect is a potential source of error in the interrupt structure of the central processing unit board. The defect can potentially cause a loss of memory which resets all calibration parameters, including alarm trip levels.)	The defect was detected during a testing program by the Eberline Instrument Corporation. Eberline notified BA, who subsequently supplied the information to IP. A list of the equipment containing the defective circuit board was assembled, along with the proposed locations of the same.	A piggyback circuit board which will alleviate the problem with no change in the operating characteristics of the instrument was supplied by Eberline for each piece of affected equipment. IP will direct the installation of the piggyback circuit boards. Corrective action is in process.
21-82-02 Not reportable	Loose terminals on the relays in main steam isolation valve leakage control panels (GE) (Loose terminations on Potter-Brumfield relays were discovered at the Grand Gulf Plant. IP has evaluated this item for reportability at CPS.)	GE issued FDI-SKKA instructing IP to perform a sample audit on 10% of Potter-Brumfield relay terminations to determine and verify adequacy. This audit, accomplished via MWR 0643, showed that the defect does not exist at CPS.	N/A

Item Number	Subject of Part 21 Report	IP Action to Identify Extent of Defect	IP Action to Correct the Defect
21-82-03 Not reportable	Potential for cracked cells in Model No. KC-11 of C&D Batteries (C&D Batteries) (C&D Batteries reported to BA that a number of cells produced in the same time period as the ones supplied to CPS may develop a crack or craze in the container.)	Per IP inspection of the Divisions 3 and 4 batteries for the condition described, no crazing or cracking was found. The batteries will be inspected in the future as per battery, cell, and rack inspection procedure 9382.03.	N/A
21-82-04 Not reportable	4160 Volt Division 3 switchgear (GE) (There are two potential problem areas associated with the high pressure core spray [HPCS] switchgear provided for CPS: (1) capability of switchgear to withstand momentary short circuit of 80,000 amps, and (2) potential inadvertent operation of the breaker elevating motor.)	Per IP investigation, the switchgear supplied to CPS was built at the factory using the required bracing; therefore, CPS switchgear does not contain the defects noted in item (1). Interlocks in the breaker prevent operation of the elevating motor mechanism when the breaker unit is not properly inserted or is beyond breaker raise and lower limits; thus, item (2) is not a reportable defect.	N/A

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Item Number	Subject of Part 21 Report	IP Action to Identify Extent of Defect	IP Action to Correct the Defect
21-82-05 Not reportable	Self Test System cable pins (King Electronics Company, Inc.) (The center conductors of certain cables are pinned with one gold-plated pin and one silver-plated pin. The pins have a solder-type connection to the conductors. As the arrangement of the pins appears to be random, there are occurrences where a silver-plated surface is in direct contact with a gold-plated surface. The concern is that corrosion may occur and affect signal transmission.)	IP's Nuclear Station Engineering Department (NSED) evaluation concluded that the gold and silver interface would have no adverse effects as to corrosion or signal transmission.	N/A
21-82-06 Reportable	Electroswitch Series 20 (GE) (There is a possibility of the slip contacts inadvertently opening when the switch handle returns to the center normal position, providing false indications on the CPS panels.)	IP directed S&L to examine the safety-related systems other than the nuclear steam supply system to determine if slip contacts from Electroswitch are used and, if so, whether there is a safety impact as a result of an accidental change-of-state. The response to both items was yes. Several additional types of switches were identified as having the slip contact failure.	All Electroswitch Series 20 switches used in safety-related applications will be replaced by a redesigned version of the switch manufactured by Electroswitch.

Item Number	Subject of Part 21 Report	IP Action to Identify Extent of Defect	IP Action to Correct the Defect
21-82-07 Not reportable	PIPERUP V.1.3 computer program (Control Data Corporation) (There is a possibility of 10 CFR Part 21 defect [error] in computer program PIPERUP V.1.3)	IP's NSED has not used this code for safety-related design activities; therefore, the quality of CPS is not adversely affected by this error.	N/A
21-82-08 Not reportable	PGCC termination modules incorrectly assembled (Group 52) (GE) (A GE termination module was found to be marked incorrectly. IP's NSED referred the condition to IP QA for evaluation.)	IP concluded that the condition was not reportable based on: (1) all 190 T-mods of this type were visually inspected per MWR and A-4941, and only the one T-mod previously identified was found to be mis-assembled; and (2) the three cables which terminate on this T-mod are all non-safety; therefore, no safety hazard could have occurred.	N/A
21-82-09 Not reportable	Type CO-4 relays (Westinghouse) (During testing, the synchronous timer on the Westinghouse type CO-4 relays did not give repeatable times when set according to specifications.)	IP QA performed an assessment of the subject condition and determined that the condition described does not constitute a defect per 10 CFR Part 21 based on (1) no safety-related equipment involved in test failure; (2) non-safety-related relays are spot checked at the factory, whereas safety-related are checked 100%; and (3) none of the safety-related relays had been tested	N/A

Item Number	Subject of Part 21 Report	IP Action to Identify Extent of Defect	IP Action to Correct the Defect
		at that time. If, after testing, they exhibit the same condition, a re-evaluation will be made.	N/A
21-82-10 Not reportable	4160 volt bus 1C1 breakers (GE) (While testing 4160 volt bus 1C1 breakers, it was noted that the breaker interference plates are incorrect and do not allow normal breaker insertion removal.)	IP's evaluation of the defect showed that the condition is not reportable because (1) the standard interference plate feature serves no purpose at CPS, (2) the existence or lack of interface plates does not affect operation of the Division 3 switch-gear, and (3) the correct breaker lineup with matching cubicle is determined by GE and verified by IP's startup group.	N/A
21-82-11 Reportable	See page from Okonite cable (Okonite) (Certain power and control cables supplied by Okonite exhibit seepage of an oily substance (deposited during manufacture of the cable) from the end of installed and terminated non-divisional power and control cable.)	IP has evaluated this condition as being reportable. Although testing by Okonite verified that the lubricating oil has no effect on the cable integrity or qualification, the effect of this oil on the equipment connected to the cable is of concern. The scope of the cable involved was determined by using the jacketing dates.	Per NCR 7334, all divisional power cable using the old filler material was returned to Okonite for analysis and replacement. Okonite has provided a qualified means of sealing the installed non-divisional cable to prevent oil leakage. Corrective action is in process.

Item Number	Subject of Part 21 Report	IP Action to Identify Extent of Defect	IP Action to Correct the Defect
21-82-12 Not reportable	NSPS circuit cards failure (GE) Out of approximately 700 NSPS circuit cards, 148 have failed since installation and power up in January 1982.	Analysis of 60 of the 148 failed cards which were returned to GE determined that no single failure would have resulted in a significant safety hazard. IP QA had concurred with the GE evaluation of non-reportability.	Though a defect as per 10 CFR Part 21 is not present and thus corrective action is not required, IP QA concurs with NSED that the failure rates, as experienced, could limit the operational availability of the plant. Therefore, IP will actively pursue resolution of the problem.
21-82-13 Reportable	HFA relay contact setting (GE) (The defect is an incorrect wipe setting of normally closed contacts on some HFA relays during their conversion from normally open contacts.)	IP evaluated the adequacy of GE's investigation and corrective action and determined that, after proper implementation of GE's proposed corrective action, the FDI would adequately provide for correction of the defect. GE reported the defect to the NRC.	GE issued FDI-SKKQ to inspect all safety-related HFA relays and adjust normally closed contacts to assure proper contact wipe setting.
21-82-14 Potential	Zack Company weld records (Zack) (There are possible discrepancies between the welder of record and the welder who may have actually performed the welding on certain safety-related HVAC ductwork and hangers.)	IP and BA conducted an extensive evaluation and verification of action taken by Zack in reference to the subject defect, which included electrical audits, surveillances, and field inspections.	The corrective action delineated in NCR dispositions, audit responses, and the HVAC recovery plan include approval of Zack's test plan for welds; selection of welds to be sample tested to determine the acceptability of welds produced by Zack welders having questionable qualifications; and submittal of a final report to IP and BA for review and approval. Corrective action is currently in progress.

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Item Number	Subject of Part 21 Report	IP Action to Identify Extent of Defect	IP Action to Correct the Defect
21-82-15 Reportable	Control switches in the automatic depressurization system (ADS) (GE) (During testing for the pressure relief function of the ADS, several control switches failed by not allowing the respective relief valves to operate automatically when the switch was positioned to "AUTO.")	After the first switch failed, further investigation revealed that 9 out of the 14 checked were defective. Condition Report 1-82-10-028 documented the failure, and the condition was referred to IP QA for evaluation as a 10 CFR Part 21 defect.	The switches have been replaced in accordance with the instructions contained in FDI-SKQK. IP verified that the switches were properly installed.
21-83-01 Not reportable	Raised face socket weld flanges not heat treated (Capitol Pipe and Steel) (An audit of Tube-Line Corporation, [the manufacturer of subject fittings] by Capitol Pipe [the supplier] revealed that certain flanges were not heat treated as required by ASME Material Specification SA-105. The lack of heat treatment could result in residual stresses remaining in the components after forging.)	An evaluation of the use of these flanges identified the possible end uses of the flanges and probable effects of flange failures had they been used. This evaluation found only two systems where the flanges may have been used. In each case, it was determined that failure of these flanges would not result in a substantial safety hazard.	N/A

Item Number	Subject of Part 21 Report	IP Action to Identify Extent of Defect	IP Action to Correct the Defect
21-83-02 Reportable	Design of band clamp on control rod drive housing (GE) (It appears that the band clamp support for the insert and withdraw lines under the vessel is not designed in accordance with ASME, Section III, Subsection NF. This could invalidate the GE design of the insert and withdraw lines and their CPS-unique evaluation of the interface loads on the insert and withdraw lines.)	IP has determined that the band clamps are used as a support and are required to comply with ASME Subsection NF. Various avenues of corrective action were pursued, i.e., replacement or upgrade of band clamps to comply with subsection NF. S&L's evaluation showed that the band clamps are adequate for design purposes, though they do not meet subsection NF requirements.	The decision was made to remove and replace the existing band clamps with a qualified support designed by Stone & Webster Engineering. GE has reviewed their design documents in an attempt to eliminate misinterpretation regarding qualification of the band clamp. Corrective action is in process.
21-83-03 Not reportable	Linear indications on 45° and 90° elbows supplied by Midland Pipe/-Standard Fittings Company. (Midland Pipe/Standard Fittings Company) (While conducting penetrant testing, linear indications were found on two 2" 90° elbows and one 45° elbow.)	IP has evaluated the potential 10 CFR Part 21 defect and found it to be not reportable. Minimum wall thickness has not been violated, the indications found are noninjurious, and there are no safety implications involved.	N/A
21-83-04 Reportable	Defects in shielded multi-conductor cable installed in HVAC panels by MCC Powers (MCC Powers) (Individual conductors were cut during removal of shield and outer insulation from the multi-conductor cable.)	All MCC Powers' safety-related and non-safety-related HVAC control panels were inspected, and NCRs were generated as required. The cause of the defect was established and associated training was performed.	The defective cable was repaired as per the disposition of NCRs 10076 and 10409, and the repair was documented on associated repair checklists. Training was given to the electrician who wires all of the MCC Powers control panels, MCC Powers QA inspectors at the home office, and the site QA engineer to preclude recurrence.

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Item Number	Subject of Part 21 Report	IP Action to Identify Extent of Defect	IP Action to Correct the Defect
21-83-05 Potential	Welding discrepancies on electrical hangers fabricated by Burndy-Husky (Burndy-Husky) (Site surveillance of electrical hangers using connection detail DV-10 found welds that were undercut, undersized, and had insufficient weld leg size.)	An inspection of electrical hangers using various connection details that were welded by Burndy-Husky will be performed per the Burndy-Husky weld sample plan. The evaluation is still in progress.	Corrective action to be taken, if required, has not yet been decided.
21-83-06 Potential	Fittings supplied by Tube-Line Corporation through Guyon Alloys and Capital Pipe (Fittings supplied by Tube-Line do not conform to ASME Section III.)	A review is being made to locate all Tube-Line material; all installed and stock material will be documented via an NCR. In order to accept this material for ASME application, it will have to be retested and recertified by an ASME certificate holder. All new certification and documentation associated with this potential defect will be reviewed to determine the extent of the material problem.	It is not yet known if corrective action will be necessary since the evaluation is currently in progress to to determine whether this condition is reportable under Part 21.
21-83-07 Not reportable	1-1/2" Pipe Guyon Alloys/ Sharon Tube (The Sharon Tube Company issued CMTRs for 1-1/2" pipe as a material manufacturer although they functioned as a material supplier. The pipe was manufactured by U.S. Steel Corporation.)	After initial notification, the piping in question was placed on hold. Pending further investigation of the subject, it seems that the nature of the nonconformance by Sharon Tube appears to be a "technical violation of the ASME code quality system program." The matter of safety is not questioned because the material does not appear	Nonconforming materials were returned to Guyon Alloys.

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Item Number	Subject of Part 21 Report	IP Action to Identify Extent of Defect	IP Action to Correct the Defect
		to be in violation of the specification. For these reasons, IP has determined that this condition is not reportable.	
21-83-08 Not reportable	Brazed contacts in Westinghouse switchgear, 21-PE-11 (Westinghouse) (Switchgear contacts which were not brazed to the switchgear mechanism in a satisfactory manner were identified.)	The investigation plan for this potential Part 21 defect included: determination of applicable requirements of existing condition, the effect of the deviation, and the root cause. A portion of the contacts was destructive-tested, and Westinghouse provided additional certification statements. The condition was determined to be not reportable based on the investigation.	N/A
21-83-09 Reportable	Failure of ADS initiation logic (GE) (During testing, the failure of fuse F3 on the digital signal conditioner cards inhibited the ADS logic from actuating the SRVs from either an automatic or manual initiation signal.)	IP's evaluation identified the root cause of the fuse failure as a design deficiency on the part of the manufacturer. The number and location of all of the components which contained a defect were assembled. All other printed circuit cards in the NSPS panels were reviewed for edge connector pin assignments for all fused signal paths.	The NSPS printed circuit cards were returned to GE for replacement of fuse F3 with a 2.2K resistor per FDDR LH1-777. A subsequent test of each card will be performed before they are returned to CPS.

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Item Number	Subject of Part 21 Report	IP Action to Identify Extent of Defect	IP Action to Correct the Defect
21-83-10 Not Reportable	Case cracking of relays in the PGCC System (Amerace) (During a QC inspection of GE-supplied panels, several safety-related Agastat GP relays were found with cracked covers.)	IP has coordinated the evaluation of both the relay manufacturer, the Amerace Corporation, and the safety-related equipment supplier, GE. Both conclude that the cracked relay covers would not impair the operation or safety function of the Agastat relays.	N/A
21-84-01 Reportable	Anti-rotation set screws on Anchor Darling valves supplied by GE (A set screw holding the stem collar in position on the valve stem may vibrate loose, allowing the key between the stem and stem collar to be displaced. This displaced key allows the stem collar to slide down the stem, resulting in free rotation at the stem and rendering the valve inoperable.)	GE determined the condition reportable and notified the NRC and IP. GE assumed the responsibility of initiating an FDI to modify the Anchor Darling valves, and IP performed a surveillance to verify that required modifications were completed.	Valves E22-F010/F011/F023 had set screws modified by GE as per FDI 103-20122. The remaining valves were modified as specified.
21-84-02 Not reportable	Failure of linear converters (Pacific Air Products [PAP] Company) (The PAP Company has identified a failure of a linear converter at a non-nuclear plant. A preliminary analysis indicated that the failure was caused by excessive wear of the brass shaft guides on the input and output shafts.)	In parallel with PAP Company's investigation, IP has evaluated the potential defect for reportability. PAP Company determined the root cause to be inadequate lubrication of the shafts during operation, and IP has concurred. With the proper maintenance program, the excessive wear noted at other sites will not be present.	Although this condition is not reportable, IP's NSED has recommended a maintenance program for dampers and linear converters to prevent this problem from occurring at CPS.

Item Number	Subject of Part 21 Report	IP Action to Identify Extent of Defect	IP Action to Correct the Defect
21-84-03 Not reportable	Paint and oil contamination in oil reservoir of pump motors (GE) (On four emergency core cooling system pump motors, the paint coating on the upper reservoir of the thrust bearing housing was discovered to be deteriorated and was releasing paint particles into the storage oil.)	GE conducted an investigation into the cause of the degradation which revealed that the paint is not required for the motor to perform its safety function, the paint flakes are small enough that they have no effect on the system, and the cause is attributable to the use of rust-inhibiting storage oils. Based on IP's investigation and GE's evaluation, IP determined that the condition is not reportable.	The motors identified were returned to GE for repainting of the reservoir. No further action is required.
21-84-04 Not reportable	ASME Class 1 material not properly ultrasonic tested per code (Hub, Incorporated.) (During ASME's survey of Hub, Incorporated files, it was discovered that Class 1 material only received 2-direction ultrasonic scanning in the longitudinal direction when code requirements also called for a 2-direction scan in the transverse direction.)	IP requested S&L to perform a safety significance evaluation which concluded that the deficiency did not affect the safe operation of CPS. (Based on Specification K-2882 which allows Class 1 pipe and fittings to be accepted if requirements of NC2500 are met in lieu of NB2500.) IP therefore determined that the condition is not reportable.	N/A

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Item Number	Subject of Part 21 Report	IP Action to Identify Extent of Defect	IP Action to Correct the Defect
21-84-05 Not reportable	ASME Class I Piping, 90^{0} elbows Minimum wall violation to code (Southwest Fabricating & Welding Company, Inc.) (Numerous elbows procured from Southwest Fabricating & Welding Company, Inc., manufactured by Ladish, were found to violate minimum wall thickness.)	IP requested S&L to perform an evaluation of the defect for safety significance. This evaluation showed that there would have been no effect on safety if the elbows installed in the reactor core isolation cooling system were left uncorrected. (A search for similar fittings manufactured by the same company located 13 of the elbows.)	Although the condition is not determined to be a defect, further investigation and corrective action will be handled as part of NCR 15120 and other applicable QA Program requirements.
21-84-06 Not reportable	Loctite-242 causing valve plunger to bind (ASCO) (The presence of Loctite-242 was detected in the solenoid plunger of the scram pilot solenoid valve of the control rod drive hydraulic control units at another nuclear plant. This thread-locking material prevented the solenoid valve from functioning properly, resulting in a slower than normal scram.)	GE has informed IP that no Loctite-242 or Loctite of any kind was used on the scram pilot valve assembly supplied for CPS.	N/A

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Item Number	Subject of Part 21 Report	IP Action to Identify Extent of Defect	IP Action to Correct the Defect
21-84-07 Potential	Improper installation of rectifiers in generator (Beloit Power Systems) supplied by GE (The potential noncompliance identified on the 2200 kW diesel generator is created by the improper connection of the exciter's armature windings in the rotor of the generator. This condition could cause the premature failure of the generator.)	It was determined that the subject unit was tested by Stewart & Stevenson Services, Inc. by using a soft-start circuit in the exciter field; thus, the equipment was not damaged during testing. Further investigation is in progress.	The corrective action suggested by the manufacturer was to modify the exciter's armature connection. GE did this via FDDR-2196. Final substantiation of the system to perform per design specification will again be accomplished when the field acceptance tests are run.
21-84-08 Now a 10 CFR 50.55(e)	Stainless steel thread-o-lets manufactured from unqualified material. (Hub, Inc.) (Certain materials lacked the chemical analysis required by ASME Section III.)	This investigation has been transfered to 10 CFR Section 50.55(e), No. 55-84-11.	N/A
21-84-09 Now a 10 CFR 50.55(e)	Poor workmanship of the wiring terminations on the HPCS panels (GE) (General workmanship discrepancies were noted in the wiring of the HPCS electrical panels.)	This investigation has been transferred to 10 CFR Section 50.55(e), No. 55-84-16.	N/A

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Item Number	Subject of Part 21 Report	IP Action to Identify Extent of Defect	IP Action to Correct the Defect
21-84-10 Not reportable	Rosemount transmitter amplifier board functional problem (Rosemount) (There could be a functional problem with amplifier boards using components from a particular lot and manufacturer. IP could have received one of these suspect boards under purchase order [PO] X-03411.)	By inspecting the eight boards received from Rosemount under PO X-03411, it was determined that IP did not receive the defective part. Follow-up activity included verification from Rosemount that the defective part was not supplied under any other PO. This condition is, therefore, not applicable at CPS.	N/A
21-84-11 Potential	Limitorque QA Program not in compliance with spare parts procurement documents (Limitorque Corporation) (Limitorque failed to implement a QA Program as required by IP's purchasing documents.)	The basis of this potential defect was an audit performed by IP which resulted in seven deficiency findings. Subsequent meetings have been held with IP and Limitorque to discuss resolution of the audit findings. The investigation is currently underway.	All Limitorque material has been placed on hold pending completion of the investigation. Further corrective action will be delineated at that time.
21-84-12 Potential	Cardinal Industrial Product QA Program deficiencies for vendor procurement (Cardinal) (BA conducted an investigation based on NRC IE Information Notice 84-52 was to determine the adequacy of the Cardinal Quality Program. Several deficiencies were identified during the investigation.)	IP has developed an investigation plan which is being followed to determine the root cause, extent of defect, and corrective actions required.	Corrective action is not yet delineated.

Item Number	Subject of Part 21 Report	IP Action to Identify Extent of Defect	IP Action to Correct the Defect
21-84-13 Reportable	Topaz low voltage inverter shut-off (GE) (The adjustment of the low voltage shut-off and turn-on for GE-dedicated Class IE inverters was set too high--this could result in an inverter trip and a failure to restart during a design basis accident.)	An investigation is being performed. (Reported to NRC by GE.)	GE will issue an FDI for implementing corrective action.
21-84-14 Potential	Rosemount Model 1153B transmitters (Rosemount) (There is a potential leak path in the threads between the sensor module and the electronics housing of Rosemount Model 1153B series transmitters.)	An investigation is being performed.	The transmitters that are installed will be removed and returned to Rosemount for rework. The uninstalled transmitters will also be returned for rework.
21-84-15 Potential	Hexcel crushable elements in pipe whip restraints (Hexcel Company) (During Hexcel's retesting of their energy-absorbing honeycomb material that is used in pipe whip restraints, it was discovered that some of the materials had crush strength less than required.)	An investigation is being performed.	Corrective action is unknown at this time.

APPENDIX K

INSPECTION AND ENFORCEMENT TABULATION: IDENTIFIED NONCOMPLIANCES AND CORRECTIVE ACTIONS IMPLEMENTED

Table K-1 provides a summary of the 131 items of noncompliance or deviation identified by the Nuclear Regulatory Commission (NRC) inspection and enforcement effort for the Clinton Power Station (CPS). Each noncompliance is described, the corrective actions (CA) are itemized, and the current status is given.

Table K-1

Inspection and Enforcement Tabulation Report

Report Number	Date Issued		Identified Noncompliances and Corrective Actions Implemented	Date of Closure/ Report Number
76-06	1-3-77	76-06-01	(Noncompliance) - There appeared to be inadequate procedures and quality control (QC) inspection documentation to control and document concrete placement activities. CA: Baldwin Associates (BA) revised BA Procedure (BAP) 3.1.1, "Concrete," to more adequately clarify control measures and required QC inspection documentation.	4-21-77/77-05
		76-06-02	(Noncompliance) - Three nonconformance reports (NCR), which recorded reinforcing bars not in conformance with design drawings, were not properly closed. The inspections which were required by procedures for closure could not be conducted since the rebars had already been embedded in concrete. CA: The three NCRs had been dispositioned "use-as-is" prior to concrete placement. BA revised their noncompliance procedure, BAP 1.0, to eliminate the need to reinspect items affected by a "use-as-is" resolution.	4-21-77/77-05

Report Number	Date Issued		Identified Noncompliances and Corrective Actions Implemented	Date of Closure/ Report Number
		76-06-03	(Deviation) - The door for the quality assurance (QA) document vault had only a 2-hour National Fire Protection Association fire rating. This was contrary to ANSI N45.2.9 and Illinois Power's (IP) commitment in the Preliminary Safety Analysis Report (PSAR), which requires a 4-hour rating. In addition, the Halon Inert Gas System had not yet been installed. CA: IP justified to the NRC's Nuclear Reactor Regulation and NFPA committees that the use of a fire door with a 2-hour rating in combination with the installed Halon system was adequate.	11-18-77/77-11
77-01	2-1-77	77-01-01	(Noncompliance) - Welding on the containment liner plate was being performed when the ambient temperature was below 0°F. Sargent & Lundy (S&L) Specification K-2816 stated that no welding was to be performed when the ambient temperature was below 0°F. CA: Temporary shelters were erected to protect in-process welding. Chicago Bridge & Iron Company's welding procedures had been qualified for sub-zero welding provided preheat of base metal was performed. Preheating had been employed at the time of the NRC inspection. S&L revised Specification K-2816 to reflect base metal preheat criteria.	8-10-77/77-08

Inspection and Enforcement Tabulation Report

Report Number	Date Issued		Identified Noncompliances and Corrective Actions Implemented	Date of Closure/ Report Number
		77-01-02	(Noncompliance) - Material certification records were not readily retrievable without use of an unofficial receiving inspection report (RIR) number to heat number cross-reference index. CA: BA issued a new "Records Control" procedure officially incorporating the use of an RIR number to heat number cross-reference index.	8-10-77/77-08
77-02	3-2-77	77-02-01	(Noncompliance) - QC inspection procedures for concrete placement were inadequate in that they did not assure recognition and use of all applicable acceptance criteria, including latest changes to the specifications. CA: BA revised the concrete quality control instruction (QCI) to include a comprehensive listing of acceptance criteria.	4-21-77/77-05
		77-02-02	(Noncompliance) - Nonconforming reinforcing steel arrangements had not been properly identified. CA: The nonconforming conditions identified by the inspector, as well as by the final prepour inspection were reported, resolved, and corrected as necessary prior to the pour. Procedure changes were made to further define the method and responsibility for reporting nonconformances and to better describe the manner in which field changes were to be processed. Training was conducted on the procedure changes.	8-1-77/77-07

Report Number	Date Issued		Identified Noncompliances and Corrective Actions Implemented	Date of Closure/ Report Number
		77-02-03	(Noncompliance) - BA QCI, "Concrete," Revision 0, Dated 1-31-77 being used by inspectors had not been reviewed and approved as required by the BA QA Manual.	4-21-77/77-05
			CA: The QCI was reviewed, approved, and issued as a new revision in accordance with the BA QA Manual. BA was instructed by IP to adhere to their entire QA Manual requirements.	
		77-02-04	(Noncompliance) - Previously identified improper concrete placement practices had not been properly corrected. Problems relative to improper use of vibrators and systematic consolidation of concrete, which had been identified by IP in November 1976, still existed.	8-1-77/77-07
			CA: Training was given on the proper use of vibrators for concrete consolidation and QA/QC records of deficiency trending related to concrete placement.	
77-04	4-20-77	77-04-01	(Noncompliance) - IP had not established a control program providing periodic review of construction activities to assure conformance with the environmental conditions of the construction permit.	5-4-78/78-03
			CA: IP developed a formal program to implement the Final Environmental Impact Statement commitments on June 13, 1977.	

Report Number	Date Issued		Identified Noncompliances and Corrective Actions Implemented	Date of Closure/ Report Number
		77-04-02	(Noncompliance) - IP analyzed stream bottom sediments for lead, mercury, zinc, polychlorinated biphels (PCB), and most commonly used herbicides and insecticides. CPS construction permit required fish to be analyzed instead of bottom sediments. CA: Insufficient quantities of fish existed in the streams. IP's bottom sediment analysis was accepted by the NRC Environmental Project Manager.	5-4-78/78-03
77-05	4-21-77	77-05-01	(Noncompliance) - Some instructions concerning maintenance of onsite safety-related equipment were not in approved formats and were not transmitted in accordance with approved procedures. CA: BAP 2.4, "Storage, Maintenance and Issuance," was revised to incorporate all applicable instructions concerning onsite maintenance activities on May 26, 1977.	8-1-77/77-07
77-06	6-8-77	77-06-01	(Noncompliance) - Some of the Unit 1 containment penetrations and anchor bolts for one of the residual heat removal pumps were not protected in accordance with work procedures. A weld preparation for one of the penetrations was damaged. CA: The damaged penetration was documented on an NCR. Additional craft training was administered. IP and BA increased power block surveillances to ensure that similar conditions are avoided.	8-10-77/77-08

Inspection and Enforcement Tabulation Report

Report Number	Date Issued		Identified Noncompliances and Corrective Actions Implemented	Date of Closure/ Report Number
77-09	9-16-77	77-09-01	(Noncompliance) - Field change requests (FCR) and engineering change notices (ECN) were not on the jobsite for current drawings relative to the work in progress.	11-18-77/77-11
			CA: IP determined that FCRs and ECNs were on the jobsite but not available in the work area. BA revised BAP 2.0, "Document Control," and associated instructions to provide these documents to the field.	
		77-09-02	(Noncompliance) - Procedures were not followed relative to an NCR concerning damage to a weld preparation area on a containment penetration. BA Quality and Technical Services Department (Q&TS) and IP had not reviewed and approved the "use-as-is" resolution.	11-18-77/77-11
			CA: BA NCRs 672, 793, 850, and 854 were written and dispositioned. BAP 1.0 was revised to incorporate the proper identification procedures for nonconforming items.	
77-10	10-17-77	77-10-01	(Noncompliance) - Quality-listed (safety-related) piping was observed to be stored in the outside laydown area with inadequate protection on the pipe ends.	1-20-78/78-01
			CA: All missing or damaged end protectors were replaced or repaired. BA instituted a daily inspection program to confirm the ongoing presence of proper end protection.	

Report Number	Date Issued		Identified Noncompliances and Corrective Actions Implemented	Date of Closure/ Report Number
77-11	11-18-77	77-11-01	(Noncompliance) - American Society of Mechanical Engineers (ASME)-qualified welders and procedures were used for the welding of American Welding Society (AWS) joints inside the containment.	8-4-78/78-05
			CA: IP contended that ASME welders and welding procedures equaled or exceeded AWS requirements relevant to the cited containment activities. The NRC accepted this position with the understanding that the Final Safety Analysis Report (FSAR) would reflect the choice of ASME or AWS in these applications.	
78-05	8-4-78	78-05-01	(Noncompliance) - The procedure qualification for liquid penetrant testing (PT) specified a 22°F minimum base metal temperature. However, the procedure qualification record did not state that the PT materials were at 22°F during qualification.	2-1-79/78-07
			CA: It was verified that no PTs were performed below 45°F, the temperature to which the procedure was qualified. The procedure was deleted from further use and, if needed again, the NRC would be notified.	
		78-05-02	(Noncompliance) - Unqualified personnel were performing PT on safety-related pipe welds.	4-25-80/80-04
			CA: A memo dated 5-31-78, from the Manager of BA, stated that all required nondestructive examination (NDE) personnel would be qualified and certified prior to performing NDE. It was noted that although the PTs were performed by unqualified personnel, they were witnessed by qualified Level II personnel.	

Inspection and Enforcement Tabulation Report

Report Number	Date Issued		Identified Noncompliances and Corrective Actions Implemented	Date of Closure/ Report Number
		78-05-03	(Noncompliance) - Several NDE personnel certifications did not document previous NDE experience in accordance with SNT-TC-1A requirements. This was applicable to BA and U.S. Testing. CA: BA included the NDE experience in the certifications and recertified all NDE personnel. U.S. Testing added NDE experience records to personnel training records and began updating them monthly.	2-1-79/78-07
		78-05-06	(Noncompliance) - A procedure was not developed to assure protection, cleanliness, and integrity of the stainless steel drywell liner during construction activities. Conditions adverse to quality, such as splatter of concrete and accumulation of pools of water inside the drywell, were observed. CA: Concrete splatter was removed from the stainless steel drywell weir wall and the cleaned area was inspected. Also, craft personnel were informed, by memo, that BAP 1.9, "Control of Stainless Steel," must be complied with.	2-1-79/78-07

Report Number	Date Issued	Identified Noncompliances and Corrective Actions Implemented	Date of Closure/ Report Number
	78-05-07	(Noncompliance) - The procurement document for laboratory testing services, K-2937, does not specifically include or reference the requirement for the laboratory to comply with the requirements of American Society for Testing and Materials (ASTM) E-329. Furthermore, the onsite concrete testing laboratory, operated by U.S. Testing, has not met the requirements of ASTM E-329, in that the laboratory procedures, equipment, and personnel have not been inspected by a qualified national authority, such as Concrete and Cement Research Laboratory, as evidence of its competence to perform the required test. CA: Specification K-2937 was revised to omit the ASTM E-329 requirements for CCRL type inspections.	4-10-84/84-07
	78-05-08	(Noncompliance) - S&L reinforcing steel detail drawing R394, Revision 0, indicates in excess of 50% of the vertical #18 bars to be mechanically spliced at both elevation 779'-0" and 781'-0" on both the interior and exterior faces of the containment wall. (Failure to translate design basis specified in the license application.) CA: IP responded to the NRC by letter stating that this was not an item of noncompliance. ACI 318-71 permitted an alternative method of design. (ACI 318-71 is the Building Code Requirements for Reinforced Concrete.) S&L selected ASME Section III, Division II which permits more than 50% spliced rebar. The NRC agreed that this was not an item of noncompliance.	9-29-78/78-05

Report Number	Date Issued		Identified Noncompliances and Corrective Actions Implemented	Date of Closure/ Report Number
		78-05-10	(Noncompliance) - Instruction No. 5 of ERICO (cadweld supplier) Procedure No. RB20M73 was not being complied with relative to the location of the wicking material on top of the end alignment fitting, rather than on top of the sleeve under the end alignment fitting as is specified.	5-9-79/79-03
			CA: A review of the QC surveillance records was performed, and an examination of existing cadwelds indicated that the cadwelding performance met the requirements for use of wicking material.	
		78-05-11	(Noncompliance) - Containment cadweld no. 1-DWV-39-1 was found by an NRC inspector to have a porosity for 360° at the top end of the sleeve, although it had been inspected and accepted by BA.	2-1-79/78-07 and 5-9-79/79-03
			CA: S&L issued an ECN to Specification K-2944 to further clarify the term "general porosity," and to more clearly define what constitutes acceptable and unacceptable porosity. Cadweld 1-DWV-39-1 was properly dispositioned.	
		78-05-12	(Noncompliance) - In excess of 55 Type "B" cadwelds installed on the containment drywell wall at or about the thirty degree azimuth were found to be either unprotected or inadequately protected and/or the required ID cap plugs were missing or defective. Moreover, crucibles and other cadwelding devices were observed to be stored exposed to rain and weather within the rebar framework.	5-9-79/79-03
			CA: IP established and was successfully enforcing additional storage and protection procedures (BAP 5.3.1).	

Report Number	Date Issued		Identified Noncompliances and Corrective Actions Implemented	Date of Closure/ Report Number
		78-05-14	(Noncompliance) - Containment reinforcing steel was installed and wired in place with cadweld sleeves in position, even though two splices were noted by the inspector to have gaps in excess of 2 inches and 3/4 inch, respectively. These cadwelds had not been fired.	5-9-79/79-03
			CA: Since the work had not been completed, and the final fit-up had not occured, the noted condition was corrected. NRC verified IP's correction.	
		78-05-16	(Noncompliance) - Three new Type "B" sleeve-to-sleeve field welds were documented as repair welds, when in fact they were not, and the new welds were accepted without nondestructive testing.	5-9-79/79-03
			CA: Weld repair reports for new cadweld sleeve-to-sleeve welds are to be annotated to show that they were new welds not requiring the implied nondestructive testing.	
78-06	12-15-78	78-06-02	(Noncompliance) - Activities affecting quality were not described by documented instructions and procedures in that there were no documented instructions or procedures for the automatic resistance spot welding of straight cable tray that was fabricated for CPS by Burndy/Husky, Inc.	3-2-79/79-01
			CA: A procedure for set-up and operation of Husky's automatic resistance spot-welding process was developed and approved.	

Report Number	Date Issued		Identified Noncompliances and Corrective Actions Implemented	Date of Closure/ Report Number
		78-06-03	(Noncompliance) - Measures were not established to assure that gauges and instruments used with the automatic resistance spot welding unit at Burndy/Husky had been controlled and calibrated to maintain accuracy.	3-2-79/79-01
			CA: Spot-welding machine gauges and instruments were calibrated. A program was established to ensure periodic calibration per manufacturer's recommendations.	
		78-06-04	(Noncompliance) - A Burndy/Husky procedure was qualified as a welding procedure instead of a brazing procedure.	3-2-79/79-01
			CA: Husky changed that welding procedure to a brazing procedure and qualified it as a brazing procedure.	
79-03	5-9-79	79-03-01	(Noncompliance) - The licensee failed to assure that all internal concrete vibrators used to consolidate concrete met the 8,000 vibrations per minute required by S&L Specification K-2944.	8-24-79/79-08
			CA: All concrete vibrators at the site were tested to confirm their capability to operate at a minimum frequency of 8,000 vibrations per minute. A revision was made to BAP 3.1.1 that requires each vibrator used on a safety-related pour to be verified to be operating at 8,000 vibrations per minute.	

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Report Number	Date Issued		Identified Noncompliances and Corrective Actions Implemented	Date of Closure/ Report Number
79-06	7-19-79	79-06-02	(Noncompliance) - Several structural components with bent clip-angles were stored with acceptable items without being identified with a hold tag. It was apparently due to shipping damage. CA: BA receiving inspection instructions were revised to include the requirement that all major physical damage be documented on an NCR. Minor damage would be reported on a special inspection report for referral to the Job Site Engineer. All safety-related structural steel was reinspected and the damage documented and repaired.	2-26-80/80-02
		79-06-04	(Noncompliance) - Zack Welding Procedure Specification C-B-QCP22 was reviewed and approved even though the procedure erroneously stated that it was qualified to AWS D1.1-1977, Section 5, Part B, when it should have stated Section 5, Part A. CA: Zack's welding procedure specification was revised to correctly reference Part A of AWS D1.1, Section 5.	11-9-79/79-09
		79-06-05	(Noncompliance) - Measures for the control of purchased material, equipment, and services did not include provisions to provide objective evidence of quality for non-shrink grout material prior to its use. CA: A vendor's certification of conformance was obtained to support certification of the grout material that had been used on site. Future purchase orders required that the certificate of conformance be provided with grout shipments.	11-9-79/79-09

Report Number	Date Issued		Identified Noncompliances and Corrective Actions Implemented	Date of Closure/ Report Number
79-11	11-27-79	79-11-01	(Noncompliance) - At least 11 U.S. Testing personnel who were certified for NDE Level I or II did not meet experience requirements. CA: Correspondence and procedures were reviewed (UST-TQ-1, QCP-6, QCP-9, Audits Y-10727, and Y-10875). This review verified that all U.S. Testing personnel were properly qualified for their assigned tasks.	6-11-80/80-09
80-02	2-26-80	80-02-01	(Noncompliance) - Licensee failed to provide measures for obsolete or superseded documents against inadvertent use, in that a superseded calibration instruction, No. 009, had not been replaced in BA QA Copy No. 4. CA: The obsolete instruction, No. 009, was replaced with the current revision. Also, to prevent recurrence, all manual holders were informed of the importance of promptly replacing obsolete material.	10-7-80/80-19
		80-02-04	(Noncompliance) - Licensee did not take prompt corrective action to preclude repetition of nonconformances, in that an excessive number of NCRs were allowed to occur prior to taking corrective action. (Corrective action request (CAR) Nos. 048 and 040.) CA: IP contended that no noncompliance existed, but added a corrective action applicability block to the NCR form to clarify the decision-making process relevant to the significance of an NCR warranting corrective action.	6-18-82/82-07

Report Number	Date Issued		Identified Noncompliances and Corrective Actions Implemented	Date of Closure/ Report Number
80-04	4-25-80	80-04-01	(Noncompliance) - The licensee failed to: 1) Assure that S&L provided adequate instructions as to the number of holes in the 408V switchgear which should be welded to the embedded angle iron, and 2) Assure that the architect-engineer correctly translated the PSAR requirements stated in paragraph 3.8.5.2 by specifying the AWS D1.1-72 code for welding and inspection in the drawings/instructions. CA: S&L design drawings were revised to show the correct number of mounting holes and welding criteria to meet AWS D1.1-72.	10-7-80/80-19
80-06	5-20-80	80-06-02	(Noncompliance) - Requirements for the preservation and maintenance of equipment removed from the warehouse and stored in-place or installed in the plant were not addressed in procedure BAP 2.4, "Storage and Maintenance." CA: BAP 2.4 was revised to reflect requirements for the preservation of material and equipment.	12-15-81/81-29

Report Number	Date Issued		Identified Noncompliances and Corrective Actions Implemented	Date of Closure/ Report Number
		80-06-03	(Noncompliance) - The IP QA Program did not provide control of the Site Settlement Monitoring Program which was inadvertently identified as Non-Category I on drawing S-20-1004, Revision C. CA: The NRC required no response to this item since, at the time of this finding, IP designated the Settlement Monitoring Program as seismic Category I and included the program within the scope of the QA program.	5-20-80/80-06
		80-06-05	(Noncompliance) - Measures were not established to assure that stud welding performed by the fabricator of embedded plates met procurement documents. Both the fabricator and BA had accepted four examples of welding-related conditions that violated procurement documents. CA: Approximately 40% of 12,962 embedded plate welds were visually reinspected. Bend tests were performed on stud welds not meeting visual inspection criteria. These inspections, tests, and subsequent evaluations were completed on April 21, 1980, and found acceptable by the NRC.	2-9-81/81-01

Report Number	Date Issued		Identified Noncompliances and Corrective Actions Implemented	Date of Closure/ Report Number
		80-06-07	(Noncompliance) - Applicable elements of the QA Program have not been audited annually in that General Electric Company (GE) has been involved in directing the installation activities of the reactor internals at CPS for greater than one year and has not been audited by the licensee.	8-20-80/80-14
			CA: An audit was performed on June 17 and 18, 1980. Also, a complete review was made of the formal Audit Program of IP to ensure completeness.	
80-07	5-9-80	80-07-01	(Noncompliance) - Sandwiches were being stored in a weld rod oven along with type 308L weld rod.	7-18-80/80-11
			CA: The immediate corrective action was to remove the sandwiches and weld rod from the oven. All filler metal issued from the oven during the day was evaluated for possible weld deposit contamination. Other ovens were inspected to assure similar conditions did not exist. Responsible personnel were retrained.	
		80-07-02	(Noncompliance) - A weld fill pass was made with an incorrect diameter electrode.	7-18-80/80-11
			CA: The weld was repaired and the records were reviewed and verified.	

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Report Number	Date Issued		Identified Noncompliances and Corrective Actions Implemented	Date of Closure/ Report Number
		80-07-03	(Noncompliance) - BA Quality and Technical Services Department inspectors had inspected and accepted a weld joint with an internal diameter mismatch larger than allowed by procedure.	7-18-80/80-11
			CA: The specific joint identified by the NRC was reworked in accordance with an NCR resolution. A number of other joints were inspected; no other mismatch problems were found. Training was conducted to prevent recurrence.	
80-08	5-14-80	80-08-01	(Noncompliance) - Four out of five Zack working welders interviewed were not aware of the location of their weld procedure nor were they aware of its basic content.	5-14-80/80-08
			CA: Zack welders were instructed as to the contents of their procedure and copies of the procedure were included in a reference book for each foreman.	
		80-08-02	(Noncompliance) - The Zack reject/hold area was in disarray, the enclosure dismantled, and unauthorized scrap was within its bounds. The Zack reject/NCR tags and logs did not indicate the location of the nonconforming material.	11-12-80/80-23
			CA: Unauthorized scrap was removed. Hold/reject boundary markers were established. The location of all nonconforming materials was determined and the status log was updated. Responsible personnel were retrained.	

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Report Number	Date Issued		Identified Noncompliances and Corrective Actions Implemented	Date of Closure/ Report Number
80-09	6-11-80	80-09-01	(Noncompliance) - Five inadequate inspection areas were identified in containment building concrete work activities for pour CTW-21. These areas of inadequate inspection were: reinforcing steel inadequately secured, inadequate number of inspectors, curing temperatures not monitored, test cylinders not identified, and provisions had not been made for verifying that water was not added to concrete during transportation to the pour area. CA: A stop work action was issued May 21, 1980. Recovery from the stop work action included enhanced inspection in the areas identified as lacking and retraining of personnel.	6-11-80/80-09
80-10	6-23-80	80-10-01	(Noncompliance) - A three-inch hole was cut in the reactor building drywell wall without approved procedures, traveler, or design change. CA: The hole was repaired to approved procedures and personnel were instructed that proper paper work was required for safety-related work.	9-11-80/80-17
80-11	7-18-80	80-11-01	(Noncompliance) - Some non-safety-related electrical cable was stored with safety-related cable. CA: Safety- and non-safety-related cables were segregated. All safety-related cable was marked S and a stripe of red paint applied. Personnel were retrained.	10-7-80/80-19

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Report Number	Date Issued		Identified Noncompliances and Corrective Actions Implemented	Date of Closure/ Report Number
80-14	8-20-80	80-14-01	(Noncompliance) - Applicable control rod drive housing to reactor pressure vessel bottom head welding procedure specifications required welders to be qualified in the 1G/2F positions. Qualification records of six out of nine welders indicated they had been qualified in the 1G/1F position. CA: Welders were confirmed to have been qualified in the 1G/2F and applicable welder qualification documents were revised.	2-9-81/81-01
80-16	8-28-80	80-16-04	(Noncompliance) - Two-hundred and fifty containment rebar cadwelds were installed out of their normal position and without following the manufacturer's instructions. CA: Cadweld operators and QC inspectors were instructed in the proper techniques for non-standard cadweld installations, sample testing and reinspections were performed on subject cadwelds, and procedure (BAP 3.1.5, "Embedments/Reinforcing Steel/Cadwelding") was revised for the assurance of future quality.	1-9-81/80-27
		80-16-05	(Noncompliance) - Safety-related heating, ventilating, and air conditioning (HVAC) hangers were installed incorrectly and in disagreement with the disposition instructions of NCR 3030. CA: A complete reinspection of all HVAC hangers similar to those cited in NCR 3030 was performed, and nonconforming results were documented on NCR 3515. NCR 3515 was dispositioned, and all necessary hangers were reworked.	4-10-84/84-07
		80-16-06	(Noncompliance) - Zack inspection records did not reflect the as-built status of each safety-related hanger. CA: ZACK reinspected and documented the as-built status of each safety-related hanger. Personnel were retrained.	4-10-84/84-07

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Report Number	Date Issued		Identified Noncompliances and Corrective Actions Implemented	Date of Closure/ Report Number
80-17	9-11-80	80-17-01	(Noncompliance) - Non-seismic Category I floor drains in the reactor fuel building were being installed and routed over, and in close proximity to, electrical power and seismic Category I control cable trays. CA: At the time of the NRC inspection, the cited floor drain was under construction and not complete. S&L subsequently determined that the installation of these drains was adequate. There is an established Interaction Analysis Program for IP to identify potential interactions in the plant.	11-16-84/84-32
80-19	10-7-80	80-19-01	(Noncompliance) - Completed travelers did not contain the welder identification and the weld material heat/lot number as required by BA Procedure BTS 402. CA: BTS 402 was revised to clearly show traceability requirements for each category of welding. NRC reviewed the revisions and concurred with the use of BTS 402.	6-19-81/81-11
80-20	10-10-80	80-20-01	(Noncompliance) - Approximately 2,000 temporary attachments, such as scaffold brackets, gussets, and plates, had been welded to the drywell wall liner and the primary containment liner without the control required for safety-related equipment. Welds were performed without traveler documentation. QC inspections and NDE were not performed or documented. CA: To date, IP issued one stop work order (9-24-80); IP notified the NRC of a potential 10 CFR Section 50.55(e) deficiency (10-24-80); all inadequately documented temporary attachments were removed from drywell liner; and new procedures were implemented to control future temporary attachments. The new procedures ensure that all specifications, codes, and standards are met. The noncompliance is pending NRC closure.	

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Report Number	Date Issued		Identified Noncompliances and Corrective Actions Implemented	Date of Closure/ Report Number
80-21	10-31-80	80-21-01	(Noncompliance) - An ultrasonic examination instrument used for examination of control rod drive housing welds to the reactor vessel was out of calibration. CA: A review was performed of the calibration records traceable to National Bureau of Standards. The instrument was found to be within specified limits.	2-9-81/81-01
80-23	11-12-80	80-23-01	(Noncompliance) - Installation of the inclined fuel transfer tube was performed using the containment polar crane beam as a load carrying support. Written approval and engineering calculations/rationale of the architect-engineer were not obtained prior to the rigging and load application. CA: Training sessions were held for riggers and handlers. The crane manufacturer and the architect-engineer agreed that the crane had not been overloaded. A follow-up inspection was performed.	4-21-81/81-06
81-02	2-6-81	81-02-01	(Noncompliance) - No periphyton sample was collected at location 7 during the first quarter of 1979. CA: Documents were reviewed, and they indicated that this was an isolated case. IP had been in compliance with requirements since early 1979. As a result of the Yellow Creek Decision, the NRC no longer inspects in this area which is under the jurisdiction of the state and the National Pollution Discharge Elimination System.	4-24-84/84-04

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Report Number	Date Issued		Identified Noncompliances and Corrective Actions Implemented	Date of Closure/ Report Number
81-03	2-10-81	81-03-01	(Noncompliance) - A 12-inch lift of concrete was poured in the Category I diesel generator building floor without sandblast cleaning and removal of the curing compound from the construction joint surface. CA: BAP 3.3.1 was changed to clearly address the surface preparation requirements; Field Engineering Change Notice 138 to Specification K-2944 was approved by S&L to better define the requirements for the preparation of base slab concrete prior to placement of separate floor finish concrete; and two letters were issued providing further clarification.	8-25-81/81-21
		81-03-03	(Noncompliance) - Non-traceable steel plate material was installed in some electrical hanger assemblies in the auxiliary, diesel generator, and control buildings. CA: To date, all unidentified and/or untraceable hanger material was removed from electrical hanger fabrication areas; controlled areas were established with signs and flags for identification; closed electrical travelers were reviewed to ensure that appropriate identification of sheared plate installations was made; and a QC surveillance program was established and implemented to assure the transfer of heat and receiving inspection numbers when plate material is divided and to assure that no unidentified pieces are lying around. The noncompliance is pending NRC closure.	

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Report Number	Date Issued		Identified Noncompliances and Corrective Actions Implemented	Date of Closure/ Report Number
81-05	4-21-81	81-05-01	(Noncompliance) - Mechanical installation and inspection procedures were inadequate or missing. CA: To date, a new procedure has been developed (BAP 3.2.5, "Piping Component Supports") covering installation and inspection of piping component supports/hangers. The procedure provides more specific instructions for installation and inspection. A trial program was completed to verify the adequacy of the procedure. The results of the trial program were reviewed by the NRC. The noncompliance is pending NRC closure.	
		81-05-02	(Noncompliance) - Pipe supports and pipe restraints were not installed in accordance with design requirements. CA: To date, the new piping support procedure (BAP 3.2.5, described above) was developed which covers this item; an NCR was issued documenting nonconforming conditions and was dispositioned "use-as-is"; S&L determined the installed conditions to be acceptable. The noncompliance is pending NRC closure.	

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Report Number	Date Issued	Identified Noncompliances and Corrective Actions Implemented	Date of Closure/ Report Number
		81-05-03 (Noncompliance) - Hanger inspections were not being done in a timely manner. Also, there was no provision for post-installation inspection of the pipe penetration seismic guide.	
		CA: To date, BAP 3.2.5 was issued incorporating a three-phase program for installation and inspection of all new safety-related pipe hangers; an NCR was issued for seismic guides which were previously installed; and work on seismic guides has been suspended pending disposition of the NCR and revision of the travelers for the remaining seismic guides. The noncompliance is pending NRC closure.	
		81-05-04 (Noncompliance) - Relative to pipe hanger design and installation activities, the licensee audit of S&L, the licensee audit and surveillance of BA performance, and BA's internal audits were considered inadequate in that detailed hanger audit requirements were absent, problems were not prevented from recurring, and programmatic audit planning, scheduling, and implementation were absent for on-going safety-related hanger installation and QC inspection activities.	
		CA: To date, a detailed plan of IP and BA audits and surveillances has been implemented to assess periodically the adequacy and effectiveness of programs for design, fabrication, installation, and inspection; and a new checklist was developed for this purpose. The noncompliance is pending NRC closure.	

Report Number	Date Issued		Identified Noncompliances and Corrective Actions Implemented	Date of Closure/ Report Number
		81-05-05	(Noncompliance) - Welding was not being accomplished in accordance with applicable codes in that welding procedure specifications were not available at the location where the welding was being done. CA: Color-coded booklets containing welding parameters from the welding procedure specification were revised and reissued to individual welders.	12-15-81/81-29
		81-05-06	(Noncompliance) - Reviews of NCRs, audits, and surveillances for reportability pursuant to 10 CFR Section 50.55(e) were not being documented to enable verification of proper review. CA: The Nonconformance Report Form, IP QA Audit Finding Form, and IP QA Surveillance Finding Form were revised to include a review for 10 CFR Section 50.55(e) reportability. Documentation of the 10 CFR Section 50.55(e) reviews also is required.	12-15-81/81-29
		81-05-09	(Noncompliance) - Neither prompt nor effective corrective actions were taken to preclude recurrence of items identified during audits and surveillances. CA: IP established a tracking system for outstanding action items to provide greater visibility and timeliness of corrective action.	1-17-84/83-23

Report Number	Date Issued		Identified Noncompliances and Corrective Actions Implemented	Date of Closure/ Report Number
		81-05-11	(Noncompliance) - Seismic pipe supports were being fabricated and installed prior to the completion of formal calculations and inadequate action was taken by management to stop the practice. CA: To date, all pipe suspension system component drawings have been reissued based on approved design calculations. S&L placed the remaining hangers on hold until the load verification was complete. The load verification has been completed and the hold lifted. This noncompliance is pending NRC closure.	
		81-05-15	(Noncompliance) - The licensee failed to provide QA controls over the preparation, review, and approval of "as-built" electrical hanger drawings prepared by IP engineers. As a result, activities affecting quality of safety-related hangers were performed without approved procedures. CA: The responsibility for preparing as-built electrical hanger drawings was transferred from IP to BA. Also, IP QA Audit Q31-83-01 was performed and found the As-Built Drawing Program adequate.	1-17-84/83-23

Report Number	Date Issued		Identified Noncompliances and Corrective Actions Implemented	Date of Closure/ Report Number
		81-05-16	(Noncompliance) - Changes and current revisions to electrical drawings were not being used in the field. Outstanding design change documents were not posted on drawings, and superseded revisions of drawings were being used in the field. CA: FCRs were listed on the field copy of the drawings. The latest drawing revisions were placed in the field, and superseded drawings were removed. Four more people were assigned to Document Control to ensure that current drawings are sent to the field as soon as possible after issuance.	11-24-81/81-27
		81-05-18	(Noncompliance) - An RIR had not been revised in accordance with procedures when electrical penetration primary header plate bolts were returned to the vendor for rethreading. CA: Procedures were revised to delete requirements to revise the RIR when the material or item is returned to the vendor. These actions are documented on the Material Return Transmittal Form, JV-418. Also Specification K-2978 was revised to clarify the use of certificates of compliance.	1-17-84/83-23

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Report Number	Date Issued		Identified Noncompliances and Corrective Actions Implemented	Date of Closure/ Report Number
81-08	6-17-81	81-08-01	(Noncompliance) - The following were observed inside and outside the power block buildings: improper storage of pipe, structural steel, and electrical materials; improper segregation of safety- and non-safety related material; improper weatherproofing of residual heat removal heat exchanger insulation; and improper housekeeping.	
			CA: To date, the specific examples identified were corrected; training was provided on housekeeping; improvements were made in surveillance of housekeeping and corrective action to resolve surveillance findings; additional dumpsters and trash/scrap barrels were provided; and Management Corrective Action Report #001 was issued to obtain immediate attention to correct serious adverse conditions and has been closed. The noncompliance is pending NRC closure.	
81-09	5-4-81	81-09-01 (and) 81-09-02	(Noncompliances) - Non-divisional cables were enclosed in flexible conduits which were routed with divisional cables in the control room floor ducts.	1-17-84/83-23 (Both)
			CA: The inspectors verified that the flexible conduit was being grounded in accordance with IP's letter to the Division of Nuclear Reactor Regulation committee, dated April 20, 1982.	
		81-09-03	(Noncompliance) - Sharp edges in the power generation control complex floor duct were observed at three locations resulting in damage to two cables.	9-16-81/81-20
			CA: Damaged cables were repaired. Rubber edge guards were placed over sharp edges to preclude further cable damage.	

Report Number	Date Issued		Identified Noncompliances and Corrective Actions Implemented	Date of Closure/ Report Number
81-12	7-13-81	81-12-02	(Noncompliance) - The rigging, handling, and installation of the residual heat removal pump column assembly (IE12-C002B) was performed without applicable detailed written procedures for PT on safety-related pipe welds. CA: To date, BAP 2.11 was revised to require that alternative instructions be provided by a responsible discipline engineer when hoisting and handling operations cannot be conducted according to instructions on the traveler; BA Training Program, TPS-30, was revised to include the additional requirements of BAP 2.11; and training for all discipline superintendents and engineers was given. The noncompliance is pending NRC closure.	
81-15	5-17-82	81-15-01	(Noncompliance) - Activities affecting quality were not accomplished under suitably controlled conditions in that QC inspectors signed statements to the effect that 1) answers to the certification exams were provided prior to and during the exam, and 2) incorrect answers were allowed to be corrected. CA: A program of retesting was undertaken and all inspectors passed satisfactorily. The NRC performed several inspections with no deficiencies identified.	11-7-84/84-31

Report Number	Date Issued		Identified Noncompliances and Corrective Actions Implemented	Date of Closure/ Report Number
		81-15-02	(Noncompliance) - In some cases, NCRs were prepared by initiators in draft form and not on an NCR. The nonconformance or suspected nonconformance was then documented on an NCR at the discretion of personnel other than the initiator. CA: Procedure BAP 1.0, "Nonconformances," was revised to ensure nonconformances are identified, documented, and processed in a controlled manner. The originator of an NCR now receives a copy of the actual NCR at the time of initial distribution.	11-7-84/84-31
		81-15-03	(Noncompliance) - Per BAP 1.5 and BAP 3.3.6, the electrical fabrication shop was to be inspected daily. Only 7 inspections were made from February through June 1981. CA: BAP 1.5, "Material Identification," and BAP 3.3.6, "Raceway Hanger Installation," were revised to require QC verification prior to subdividing the material. (The previously required daily inspections had been for material subdivision purposes only.)	11-16-84/84-32
		81-15-04	(Noncompliance) - NCR 4055 was dispositioned "use-as-is" and closed (without reinspection to determine that the cable for radiation monitoring equipment had been enclosed in conduit) rather than being dispositioned "rework" and being reinspected before being closed. CA: To date, IP has reopened and revised NCR 4055 to require QC verification that the subject cables were enclosed in conduit. The noncompliance is pending NRC closure.	

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Report Number	Date Issued		Identified Noncompliances and Corrective Actions Implemented	Date of Closure/ Report Number
		81-15-05	(Noncompliance) - Measures were not properly established to preclude inadvertent bypassing of inspections in that anchor bolts and straps used to hang electrical conduit were torqued to prescribed values and painted green to indicate that they had been inspected and accepted prior to installing the conduit, which required loosening the anchor bolts without benefit of retorquing and reinspection. CA: Applicable procedures were revised to require reinspection of concrete expansion anchors which are loosened for any reason, and personnel were trained in the use of the revised procedures.	5-9-84/84-10
81-18	8-12-81	81-18-01	(Noncompliance) - The Zack Company did not prepare a trend analysis for the Clinton site pertaining to January 1981. CA: IP determined that this condition was limited to January 1981 and that the correct trend analysis had been conducted for February through August 1981. The responsible engineer was retrained.	12-15-81/81-29
		81-18-02	(Noncompliance) - Zack NCR ZC-CB-325, prepared on December 12, 1980, was closed by the Zack Company on March 13, 1981, and was never forwarded to BA for review by S&L as required. CA: BA NCR 5340, dated September 14, 1981, had been issued on the same subject as the Zack NCR. A review was performed and the matter closed.	12-15-81/81-29

Report Number	Date Issued		Identified Noncompliances and Corrective Actions Implemented	Date of Closure/ Report Number
81-20	9-16-81	81-20-03	(Noncompliance) - Adequate procedures were not developed to provide qualitative and quantitative acceptance criteria for resolving discrepancies noted during pre-pull walkdown of raceways. CA: BAP 3.3.2 and QCI 406 were revised to require that raceways be installed and accepted prior to installation of safety-related cables. Also, QCI 407 was revised and a new procedure, BAP 3.3.9, was developed to address the protection of installed cables during rework of raceway assemblies.	1-17-81/83-23
81-22	9-18-81	81-22-01	(Noncompliance) - The contractor was performing stainless steel welding operations using oversized electrodes and unmarked wire brushes, discs, chisel, and chipping hammer. CA: To date, NCR 5263 was issued to document the use of oversized welding electrodes. The NCR was dispositioned "use-as-is," and the procedure was revised to permit use of the larger electrode. Unmarked tools were replaced with tools marked for stainless steel use. Personnel were given additional training. The noncompliance is pending NRC closure.	
81-24	11-12-81	81-24-01	(Noncompliance) - Physical protection was not provided for installed Class IE electrical cable 1DC03D, thereby res ing in damage from ongoing HVAC construction activity. CA: NCR 5325 was issued to document the damaged cable and was satisfactorily dispositioned and closed. Additional training was provided, and an overall effort was implemented to protect electrical items.	5-9-84/84-10

Report Number	Date Issued		Identified Noncompliances and Corrective Actions Implemented	Date of Closure/ Report Number
		81-24-02	(Noncompliance) - Procedures for an Interaction Analysis Program were not implemented in that monthly identification tours and design engineering analyses were not being performed.	11-16-84/84-32
			CA: IP directed S&L to perform the required interaction surveillance. Also, a comprehensive program was established in the field and in S&L's offices to perform interaction surveillance and analysis of potential interactions.	
		81-24-03	(Deviation) - NDE of reactor core isolation cooling tank not performed per FSAR.	
			CA: To date, S&L determined that the NDE requirements in the FSAR exceeded the requirements of the tanks purchase specification K-2838B and were unnecessary. FSAR requirements beyond K-2838B requirements were deleted by S&L. The deviation is pending NRC closure.	
81-25	12-9-81	81-25-01	(Noncompliance) - Physical and environmental protection from nearby construction activity was not provided for five installed Class IE electrical cabinets and numerous precut, coiled, temporarily-stored Class IE electrical cables.	11-7-84/84-29
			CA: Construction materials and debris were removed from the area. Protective coverings were applied to plant materials and equipment. Special maintenance crews were added to maintain suitable physical and environmental protection. Applicable BA procedures were revised to incorporate the additional protection and control measures.	

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Report Number	Date Issued		Identified Noncompliances and Corrective Actions Implemented	Date of Closure/ Report Number
		81-25-02	(Noncompliance) - QC inspectors failed to follow procedures by accepting twelve incorrectly marked, color coded, Class IE electrical cables.	5-9-84/84-10
			CA: A combination deficiency report and NCR was issued, corrective actions were completed and closed; the report was annotated on applicable pull card and checklist; and personnel were trained to revised procedures.	
81-27	11-24-81	81-27-01	(Noncompliance) - Design documents failed to translate the minimum cable tray separation criteria specified by the PSAR.	1-17-84/83-23
			CA: Appropriate drawings were revised to include tray covers which will provide an acceptable fire barrier in accordance with PSAR commitments; and the CPS FSAR was revised by amendment to permit the use of ladder rack tray with or without covers, solid bottom tray without covers, or raceways shared with control cables (when internal barriers are provided) for instrumentation cables.	
81-32	1-22-82	81-32-01	(Noncompliance) - The contractor was performing cleaning activities on the steam separator (reactor internal) without the use of written procedures or instructions.	
			CA: To date, NCR 6073 was issued to identify the lack of procedural direction and to evaluate physical impact; and a corrective action request was issued to evaluate and correct the cause of the problem. Applicable procedures were revised to require cleaning operations to be directed by established work documents, such as a traveler. The noncompliance is pending NRC closure.	

Inspection and Enforcement Tabulation Report

Report Number	Date Issued		Identified Noncompliances and Corrective Actions Implemented	Date of Closure/ Report Number
82-02	8-4-82	82-02-01	(Noncompliance) - BA failed to comply with a stop work order, and QA/QC personnel were intimidated. CA: BA supervisory personnel and craft personnel were trained regarding intimidation and stop work authority; the BA QA Manager and Assistant QC Manager were replaced; IP and BA endorsed policy statement against inspector intimidation; and the IP Vice President is required to concur in any contemplated BA Quality personnel terminations.	8-26-83/83-10
		82-02-02	(Noncompliance) - Failure to document known nonconforming conditions (10 examples were cited). CA: BA reviewed audit/surveillance findings; IP reviewed outstanding surveillance findings; and all BA-related procedures, job instructions, and QC instructions were revised to require that deficiencies be documented on nonconformance or discrepancy reports.	8-26-83/83-10
		82-02-03	(Noncompliance) - BA failed to control the issuance of changes to procedures. CA: BA issued a new QCI that required all changes to instructions to be documented, controlled, and subjected to the same review as the original document.	10-12-83/83-16
		82-02-04	(Noncompliance) - IP failed to verify that purchased material conformed to procurement documents and failed to control the issuance of nonconforming material in accordance with QA Program provisions. CA: IP revised applicable procedures to clarify the responsibilities and requirements for receiving inspection activities; personnel were retrained; and remedial action on related NCRs was completed on June 30, 1983, with a spot check of installed trays being completed.	1-17-84/83-23

Report Number	Date Issued	Identified Noncompliances and Corrective Actions Implemented	Date of Closure/ Report Number
	82-02-05	(Noncompliance) - Inadequate design interface and coordination (four examples were cited). CA: To date, BA procedures revised for clarification of requirements; ECN 2826 issued to help clarify requirements; and control measures added to: (1) report field interferences to the architect-engineer, (2) allow field routing subject to final approval by S&L, and (3) make use of interaction analysis findings. The noncompliance is pending NRC closure.	
	82-02-06	(Noncompliance) - QC inspections failed to verify conformance of cable installation with documented instructions, procedures, and drawings (nine examples were cited). CA: ECN 2826 was issued by S&L to provide the as-built configuration per design criteria; several deficiency reports (617, 974, 987,1046-1051) and NCRs (6724, 6730, 6731) were written to document the identified nonconformances; procedures were revised to address further cable installation; and IP Over-inspection Group performed further inspections of the reinspected items.	8-26-83/83-10

Report Number	Date Issued		Identified Noncompliances and Corrective Actions Implemented	Date of Closure/ Report Number
		82-02-07	(Noncompliance) - IP/BA failed to verify and control the storage, cleaning, and preservation of material and equipment in accordance with QA Program provisions. CA: BA storage and maintenance procedures were revised to establish tighter controls on the Storage and Maintenance Program; additional personnel were assigned and trained to work in the Storage and Maintenance Group; Management Corrective Action Request 01 was issued documenting problems and requiring immediate corrective action; the Storage and Maintenance Inspection Report Transmittal System was improved; and all safety-related and non-safety-related items to be included in the Storage and Maintenance Program were identified.	1-17-84/83-23
		82-02-08	(Noncompliance) - Conditions adverse to quality were not promptly identified and corrected with appropriate documentation (three examples were cited). CA: A general review of the nonconformance program was performed which indicated that nonconforming conditions were being identified, corrected, and supporting documentation is attached to NCRs.	5-9-84/84-10

Inspection and Enforcement Tabulation Report

Report Number	Date Issued		Identified Noncompliances and Corrective Actions Implemented	Date of Closure/ Report Number
		82-02-10	(Noncompliance) - The acceptance criteria of S&L Specification K-2978 were not incorporated into penetration installation travelers. CA: 1) A vendor manual was revised, 2) IP submitted a 10 CFR Section 50.55(e) Report to Region III; 3) the proper documentation was made of the torque wrench number and calibration due date; and 4) NCRs 16665 thru 16672 were prepared (leak rate tests were performed and found acceptable).	11-7-84/84-29
		82-02-11	(Noncompliance) - Welding material identification numbers had not been recorded on Conax electrical penetration travelers or on BA weld material field requisitions per ASME QA Program requirements. CA: It was determined that the subject welds were under AWS jurisdiction not ASME. AWS criteria do not require weld material identifications to be recorded. The Conax installation manual was revised to reference the AWS criteria.	11-16-84/84-32
		82-02-13	(Noncompliance) - An audit or surveillance of the new Deviation Report System was not performed. CA: IP QA performed a surveillance of the Deviation Report System in February 1982; BA performed a surveillance of the Deviation Report System in March 1982; and IP's scheduling of audits and surveillances was determined to be consistent with ANSI N45.2.12 criteria.	10-12-83/83-16

Inspection and Enforcement Tabulation Report

Report Number	Date Issued		Identified Noncompliances and Corrective Actions Implemented	Date of Closure/ Report Number
82-14	11-22-82	82-14-02	(Noncompliance) - A Radwaste Reprocessing System recirculation, chemical test, and dump evolution was performed without procedures.	8-15-83/83-09
			CA: IP revised applicable procedures to allow the use of the lineup configuration that was to be used and responsible personnel were retrained.	
82-18	11-23-82	82-18-01	(Noncompliance) - Inadequate QC inspector qualification and certification records (14 examples were cited).	2-29-84/84-02
			CA: The actual qualification and certification of the QC inspectors was determined to be acceptable. Misfiled records were corrected.	
		82-18-05	(Noncompliance) - The BA QA Manual did not describe the QA organization that was currently being implemented.	2-29-84/84-02
			CA: The BA QA Manual was revised to reflect the present organization, and interviews indicated that the organization was being implemented.	
82-19	11-24-82	82-19-02	(Noncompliance) - The subcontractor, H. Robertson, was performing a pressure test of the containment gas control boundary structure without a procedure approved by the principal contractor, BA, or IP.	7-5-84/84-11
			CA: Stop Work Action 021 Recovery Plan was implemented to provide the properly approved procedure for testing purposes.	

Inspection and Enforcement Tabulation Report

Report Number	Date Issued		Identified Noncompliances and Corrective Actions Implemented	Date of Closure/ Report Number
82-20	1-18-83	82-20-01	(Noncompliance) - The design analysis for the emergency diesel exhaust piping did not include bellows expansion joint pressure thrust calculations. CA: To date, S&L performed a reanalysis of the effects of exhaust pressure for postulated events. The reanalysis determined that existing design capacity of affected supports had not been exceeded. Also, S&L incorporated procedures detailing criteria to be followed during design calculations to preclude further noncompliance. The noncompliance is pending NRC closure.	
83-02	5-16-83	83-02-01	(Noncompliance) - Vaulted (complete) cable tray hanger documentation packages were not complete in that several traveler revisions were missing from the packages. CA: All superseded electrical hanger travelers on site were transmitted to the vault for filing. An inventory of all first- and second-generation travelers was made. A cross reference computer file was established to provide access to traveler history.	1-17-84/83-23

Report Number	Date Issued		Identified Noncompliances and Corrective Actions Implemented	Date of Closure/ Report Number
83-09	8-15-83	83-09-07	(Noncompliance) - ASME code requirements were not translated to drawings, procedures, travelers, or other quality documentation. The licensee had classified, constructed, and installed thousands of large and small bore component support pipe hangers to the American Institute of Steel Construction Standards rather than ASME.	
			CA: To date, IP has reviewed the design provisions and believes that component support classification, construction, and inspection adequately comply with ASME requirements. FSAR and Specification K-2884 were revised to clarify requirements. The noncompliance is pending NRC closure.	
		83-09-08	(Noncompliance) - Corrective action was not taken by IP with regard to a known condition adverse to quality. Incomplete weld inspections and improper code applications on component support pipe hanger drawings were not properly identified, documented, reported to management, or corrected in a timely manner.	
			CA: To date, IP has reviewed the design provisions and believes that component support classification, construction, and inspection adequately comply with ASME requirements. FSAR and Specification K-2884 were revised to clarify requirements. The noncompliance is pending NRC closure.	

Inspection and Enforcement Tabulation Report

Report Number	Date Issued		Identified Noncompliances and Corrective Actions Implemented	Date of Closure/ Report Number
83-15	9-29-83	83-15-03	(Noncompliance) - Five procurement documents for ASME Section III welding filler metal did not specify that the provisions of 10 CFR Part 21 applied. CA: To date, other procurement documents pertaining to the same vendor were reviewed with six other like conditions being found. IP reviewed all safety-related procurement documents issued after January 6, 1978, to evaluate those that lacked reference to the provisions of 10 CFR Part 21. The noncompliance is pending NRC closure.	
		83-15-05	(Noncompliance) - Instructions, procedures, or drawings did not require that measurements be performed for all 2" and under pipe bends to assure that the bends were in compliance with the 8% ovality tolerance. Consequently, sufficient records were not available to furnish evidence of acceptable bent pipe. CA: ASME bends were reinspected and documentation now shows the actual measurement for ovality; training was conducted for piping/mechanical inspectors to address ovality inspection.	6-12-84/84-15

Inspection and Enforcement Tabulation Report

Report Number	Date Issued		Identified Noncompliances and Corrective Actions Implemented	Date of Closure/ Report Number
83-19	2-24-84	83-19-01	(Noncompliance) - Deviation reports were dispositioned "accept as is" without the deficiency report being upgraded to an NCR, which, in effect, includes the designer approval of "accept as is" conditions. CA: To date, each deficiency report has been evaluated and a disposition has been assigned that calls for rework of the documentation to conform with established requirements. The noncompliance is pending NRC closure.	
		83-19-02	(Noncompliance) - Acceptance criteria had not been established for dispositioning NCRs that identified non-hardware conditions adverse to quality. CA: BAP 1.0, "Nonconformances," was revised to address conditions of an administrative or procedural nature.	11-7-84/84-31
		83-19-05	(Noncompliance) - The plan used to perform a sampling inspection of electrical supports was not formulated in accordance with standard practices of providing adequate justification for the sample size, selection process, and acceptance criteria for reviewing results. CA: To date, a revised sample plan was prepared and executed to provide adequate justification for the sample size, selection process, and acceptance criteria for reviewing results. The noncompliance is pending NRC closure.	

Report Number	Date Issued		Identified Noncompliances and Corrective Actions Implemented	Date of Closure/ Report Number
		83-19-06	(Noncompliance) - Six deviation reports that document inspection discrepancies relative to one inspector's work were signed off by the QC staff engineer without acceptance criteria to substantiate the acceptance of the discrepancies. CA: To date, CAR 107 was issued to verify acceptability of the QC inspector's work; staff engineer's comments were written on the deficiency reports and attached to CAR 107. The original deficiency reports were processed in accordance with normal site procedures and reworked as necessary. The noncompliance is pending NRC closure.	
83-22	1-27-84	83-22-01	(Noncompliance) - The following examples of inadequate control of a special process were identified: 1. A concrete expansion anchor (CEA) was welded to a pipe support plate 2. Wire was inserted in the holes of three CEAs 3. Numerous abandoned anchor holes were improperly patched 4. Anchor bolts and abandoned holes violated minimum space requirements. CA: To date, a construction hold was placed on CEA installations on 11-29-83. A reinspection plan was established to investigate the extent of the problem. Additional QC hold points were incorporated into work instructions. CEA procedures were revised and <u>only</u> qualified craft personnel are allowed to install CEAs. The noncompliance is pending NRC closure.	

Report Number	Date Issued	Identified Noncompliances and Corrective Actions Implemented	Date of Closure/ Report Number
		83-22-02 (Noncompliance) - Containment dome liner cracks were not reported to the NRC per 10 CFR Section 50.55(e) requirements. CA: To date, an approved plan was implemented to further investigate the potential weld deficiencies. An NCR was prepared documenting the existence of the crack. Appropriate personnel were retrained in the requirement to document known nonconforming conditions. The noncompliance is pending NRC closure.	
		83-22-03 (Noncompliance) - Chewing gum, or a similar substance, was found smoothed over or sculptured in an area of porosity in a containment liner seam weld. The subject deficiencies were not documented on an NCR. CA: To date, an approved plan was implemented to further investigate the condition. NCRs were issued for the identified nonconforming conditions. Appropriate personnel have been retrained in the requirements to document known noncompliances. The noncompliance is pending NRC closure.	

Inspection and Enforcement Tabulation Report

Report Number	Date Issued	Identified Noncompliances and Corrective Actions Implemented	Date of Closure/ Report Number
83-23	1-17-84	83-23-01A (Noncompliance) - The licensee was not implementing their Interaction Analysis Program in accordance with commitments to the NRC. CA: Licensee developed an Interaction Analysis Program walkdown schedule. The NRC inspector verified that the program was being effectively implemented.	11-7-84/84-29
		83-23-01B (Noncompliance) - BA failed to document a known nonconforming condition relating to the degradation of the paint/coating in the upper oil reservoir of the thrust bearing housing of the low pressure coolant injection (LPCI) system pump motor 2E21-C001M, despite the fact that the vendor (GE) had begun analysis and resolution of this condition. CA: To date, an NCR was written to document this condition. As a result of routine annual inspections, two more instances were identified. Further investigation identified one more. These four motors (2-residual heat removal, 1-high pressure core spray, and 1-LPCI) had NCRs generated against them. IP and GE dispositioned the NCRs. The noncompliance is pending NRC closure.	

Report Number	Date Issued		Identified Noncompliances and Corrective Actions Implemented	Date of Closure/ Report Number
		83-23-02	(Noncompliance) - BAP 3.3.2, "Cable Installation," was revised to negate the requirement for the inspection and acceptance of seismic Category I raceway prior to the installation of balance-of-plant cables. As part of Stop Work Action 007, IP had committed to verifying that seismic Category I raceway be inspected and accepted by BA prior to installation of cables in raceway. BAP 3.3.2 was subsequently revised to require that raceways be accepted prior to installation of Class IE cables only, not all cables.	11-16-84/84-32
			CA: IP issued a revised directive covering balance-of-plant cable installation; BAP 3.3.2 was revised to require inspection and acceptance of seismic Category I raceway prior to installation; and IP reviewed cable pulling activities performed between 10-10-83 and 1-5-84 and determined that no balance-of-plant cable was installed in seismic Category I raceways during the period.	
		83-23-03	(Noncompliance) - The disposition in response to Deviation Report 3239 was found to be inadequate in that it states "written in error," when in fact it was a valid deviation. This response did not identify the cause, resolution, or the corrective action to prevent recurrence of the deviation.	
			CA: To date, an NCR was issued to obtain an engineering evaluation and disposition of the as-found condition. Other equipment was reviewed to identify similar conditions. One additional instance was found and documented on an NCR. The NCR has been dispositioned and the item is pending NRC closure.	

Report Number	Date Issued		Identified Noncompliances and Corrective Actions Implemented	Date of Closure/ Report Number
84-04	4-24-84	84-04-02	(Noncompliance) - Two installed load bolts of residual heat removal pipe riser clamps were of incorrect diameter; and installed load bolts had threads located in the load bearing part of the shank (shear plane).	
			CA: To date, changes have been made to design specifications to clarify the use of fasteners to counteract shear plane forces. Also, appropriate personnel received training to reemphasize that fastener threads were not allowed in shear plane of ASME piping hangers except as permitted by design. The noncompliance is pending NRC closure.	
		84-04-03	(Noncompliance) - BA QC inadvertently invalidated (closed in-process) NCR 15334 on the basis of a subcontractor memo, thereby bypassing the specified NCR corrective action reviews.	
			CA: To date, NCR 15976 was initiated to document and disposition the improper closure of NCR 15334. The required change to the design drawing has been made and NCR 15976 has been closed. Training was given to reiterate the requirements for in-process closure of NCRs. The noncompliance is pending NRC closure.	

Report Number	Date Issued		Identified Noncompliances and Corrective Actions Implemented	Date of Closure/ Report Number
84-15	6-12-84	84-15-01	(Noncompliance) - Required impact testing was not being performed for pipe support shear lugs which were identified in drawing RH-12. (Nine piping spools were identified as having lugs attached. Of the nine, four had not been impact tested.) CA: To date, NCRs were issued to resolve these four piping spools (NCRs 18443, 18462, 18463, and 18609). These NCRs have been dispositioned in accordance with approved site procedures. The noncompliance is pending NRC closure.	
84-17	7-27-84	84-17-01	(Noncompliance) - The construction contractor failed to follow-up outstanding document control transmittals required by BAP 2.0. CA: To date, BA has increased attention in this regard by using a revised suspense file for transmittal acknowledgements. BA completed processing the backlog of transmittals. Also, personnel changes have been made to increase management attention to document control. Distribution lists were revised to eliminate unnecessary controlled copies. The noncompliance is pending NRC closure.	

APPENDIX L
THIRD-PARTY AUDITS

Contents

APPENDIX L
THIRD-PARTY AUDITS

Third-party audits of Clinton Power Station (CPS) construction quality-related activities have been conducted by the Joint Utility Management Audit, American Society of Mechanical Engineers, Lapp-Rice-Staker, and Institute of Nuclear Power Operations. The major recommendations resulting from audits conducted by each of the four organizations, and the nature and effectiveness of Illinois Power Company's (IP) specific corrective actions in response, are discussed in the following four subsections.

A. JOINT UTILITY MANAGEMENT AUDIT

IP is a participant in a Joint Utility Management Audit (JUMA) program. Annual audits are performed to assess the effectiveness of member utilities' Quality Assurance (QA) programs. The audits are performed by teams of experienced auditors and QA managers from participating utilities. JUMA audits of IP QA have been conducted annually since 1978. The JUMA audits have had two principal objectives:

- To evaluate compliance of the IP QA organization with QA manual and procedure requirements

- To evaluate the effectiveness of the IP QA Program in meeting regulatory requirements and assuring quality of design, procurement, and construction activities

Adverse findings identified by JUMA audits have been evaluated by IP management and QA, and appropriate corrective action has been taken. Corrective action has generally been one of two types: (1) action to ensure compliance with program and procedure requirements; or (2) revision of the program and procedures to accurately describe methods of accomplishing activities, and thus avoid future adverse findings.

The JUMA audit team members made recommendations to IP management regarding changes and enhancements that could be made to improve the effectiveness of the QA Program. Some improvements recommended by JUMA audits and implemented by IP include:

- Establishment of a commitment tracking system
- Improvement in corporate nuclear procedures
- Improvement in the CPS audit program
- More clearly defined QA Department goals and objectives

The major recommendations from, and IP corrective actions in response to, individual JUMA audits are summarized below:

1. 1978 Audit

The 1978 JUMA audit reviewed and evaluated implementation of the responsibilities assigned to the IP QA organization by the IP QA manual and project procedures. The audit findings and IP's responses are summarized in the following paragraphs.

a. Project Procedures

Many project procedures had been in place since the beginning of the project and did not reflect the current IP organizational structure or the current methods for accomplishing activities. Departmental procedures were written to replace the project procedures and to more accurately describe and define methods and responsibilities for accomplishing activities. Some procedural controls were found to be too restrictive or unnecessary and were revised or deleted.

b. Audit Program

The JUMA auditors considered that the IP QA Program did not adequately describe auditor training requirements, audit reports had not been processed in a timely fashion, and procedures did not specify requirements for audit planning and scheduling. New departmental procedures were written to clarify training requirements for audit personnel and to initiate audit planning and scheduling that would be in compliance with regulatory requirements.

c. Surveillance Activities

Specific surveillance activities had been conducted using unapproved draft procedures and uncontrolled checklists. Investigations indicated that the surveillance activities had been adequately performed. The procedures were approved to avoid future deficiencies. The uncontrolled checklists were deemed to be adequate because they were used only as guidelines for monitoring work activities, not for work product acceptance.

d. Records

A project records index had not been developed even though IP's commitments to industry standards covering record activities required one. A project procedure for records verification had been in existence for some time but had never been implemented. Completion of the records index and initiation of records verification were deferred by management until the computerized records system, which was then under development, was implemented. The records index system was subsequently developed. Records verification activities had been ongoing, but have recently increased in scope.

The JUMA team offered recommendations for improvements in document control, procedure format and minimum content, auditing, and supplier QA program evaluations. While none of the recommendations were considered major, nor were they required, IP did implement them to the maximum extent practicable.

2. 1979 Audit

The 1979 JUMA team reviewed the corrective action taken in response to the 1978 findings and concluded that, although corrective action on all items was not yet complete, all items had been adequately handled.

The team evaluated audits and surveillances, training, nonconformance review, vendor QA program evaluations, and QA work assignments. Their overall evaluation was that procedures and instructions were adequately implemented. The team identified several adverse findings that are summarized below, along with IP's corrective action.

a. Design Control

IP QA had not reviewed all revisions of all design specifications to ensure that appropriate quality requirements were included. Additionally, for some specifications, not all of IP QA's comments were resolved prior to contract placement. This was determined to be a result of procedures that did not accurately provide instructions and responsibilities. It was IP's intent that Sargent & Lundy (S&L) perform the reviews and IP QA simply perform an overview "spot check". The procedure implied that IP QA would perform a 100% review. The procedure was revised to clearly state IP's intent.

b. Procedures/Instructions

The team identified some procedurally-required surveillances that had not been performed. The surveillances were not required by regulatory commitments and had proven to be impractical to perform. Therefore, they were discontinued. However, the procedure had not been revised to delete them. To prevent further noncompliance, the procedural requirement was deleted.

c. QA Records

The audit record files for about six audits were missing some required documents. To correct the condition, all audit record files were examined for missing documents, and the missing documents were obtained from other sources to complete the files.

The team recommended that more effort be devoted to ensuring the completeness, correctness, and retrievability of quality records. Since IP's records program was under development, the team recommendations were helpful in enhancing the program.

3. 1980 Audit

The 1980 JUMA audit team evaluated IP's audit and surveillance program, procurement activities, and the project corrective action program. The team expressed concerns about IP QA authority and responsibilities, management's support for QA, and IP's effective use of QA as a management tool.

While IP did not concur with all of JUMA's concerns, IP did recognize a need for increased attention to enhancement of the QA organization and responsibilities. The recommendations from this JUMA audit were taken into consideration when IP created an independent Quality Assurance Department in August 1980.

Two findings considered major by IP were identified by the audit team:

a. Training

QA training was not being conducted by all IP departments associated with CPS. To correct the condition, QA implemented a plan to provide orientation and indoctrination training related to QA for all departments. QA also made available material for more detailed training.

b. Corrective Action

Corrective action reports were not being reviewed and verified in a timely fashion, and thus were not being used to their optimum. This concern had been identified by IP prior to the JUMA audit, and procedures were actually being revised during the audit to correct the condition. Once the revisions were implemented, requirements for timely responses to, and evaluations of, corrective action reports were more clearly stated.

4. 1981 Audit

The 1981 JUMA audit encompassed the review and evaluation of IP QA duties and responsibilities, as well as the effectiveness of the QA Program. The audit identified two primary findings which are summarized, along with IP's responses, as follows:

a. Quality Assurance Program

Department and corporate management were not provided regular status updates on the adequacy of the QA Program and its implementation. To correct this condition, QA implemented a system of periodic meetings and briefings to keep management informed.

b. Records

Methods for identifying and classifying records were not sufficiently detailed. Turnover of records from construction to startup and operations was no covered by procedures. Procedures were being developed at the time of the audit and have since been implemented.

In addition to the findings, the JUMA team offered recommendations for improvements in the corrective action program, particularly related to timeliness of responses.

The team acknowledged that the QA Program had significantly improved since the last JUMA audit. This was attributed to more involvement by IP QA in daily project activities.

5. 1982 Audit

The scope of the 1982 JUMA audit included the IP QA reorganization, corrective action program, audit and surveillance program, training, and procurement activities. The audit concluded that the QA Program appeared to be well defined and was in the process of being fully implemented. Newly written procedures had not yet been adequately implemented because of the recent QA Department reorganization, but the implementation process had begun. The recent IP organization changes, as well as the appointment of the Vice President for QA, were seen as indicative of management's commitment to quality. While most areas reviewed were adequately implemented by QA, the audit did identify the need for additional management attention to QA organization, QA Program, and corrective action, as follows:

a. <u>QA Organization</u>

The QA manuals did not adequately describe the respective roles and responsibilities of IP, Baldwin Associates (BA), General Electric Company, and S&L in regard to interfaces for quality-related activities. The independence of these organizations had resulted in differences in quality policies, goals, and direction among the different companies. There was no mechanism to resolve these differences. IP corporate nuclear procedures were established to resolve the differences and realign project direction. IP took the lead role in defining project quality goals and objectives. The IP QA manuals were expanded to clearly provide definition of organizational responsibilities and interfaces. IP departmental procedures were expanded to implement corporate nuclear procedure requirements, including those related to control of contractors. For example, Nuclear Station Engineering Department procedures provided for IP's control of S&L's design activities related to CPS.

b. <u>QA Program</u>

The IP QA manuals did not provide the details and guidance needed for all quality functions nor the "corporate muscle" needed to enforce commitments and resolve conflicts. IP did not have a regulatory commitment control and tracking program. The QA manuals were rewritten to clarify functions and activities among organizations. Corporate nuclear procedures were written to provide the detailed guidance that had not previously existed. A computerized tracking program was implemented to facilitate control of commitments to the Nuclear Regulatory Commission. A commitment control program was in place to trace Final Safety Analysis Report, Environmental Report, and technical specification commitments. This program has since been significantly expanded.

c. Corrective Action

Several audit findings had not been adequately responded to in a timely manner. Once they were pointed out, they were resolved expeditiously. A corporate nuclear procedure was issued to provide for more management involvement in determining corrective action and for ensuring that completion dates were met.

6. 1983 Audit

The 1983 JUMA audit was a general assessment of the effectiveness of the QA Program. This was considered timely in light of the major program revisions and other recovery actions that had been implemented in 1982. The team observed that changes made within the IP organizational structural had very positive effects on morale and QA effectiveness. Additional management attention and action taken in the areas of QA organization, QA Program, and corrective action had paid dividends as evidenced by the JUMA team's overall assessment of effectiveness of the QA Program.

The team identified two adverse findings.

a. Training

The IP QA Department training, qualification, and certification manual did not specify the qualifications required for the person with primary responsibility for conduct of training. This was considered by JUMA to be a violation of a corporate nuclear procedure. This finding was, however, determined to be invalid because the qualifications for the training administrator were specified.

b. Procedures

IP QA's requirements for control, review, and approval of procedures specified a 3-year re-review cycle. IP's commitments to industry standards required a 2-year cycle. The QA procedure was revised to require a 2-year review cycle.

Improvements seen as necessary by the audit team were:

- Establishment of a Nuclear Department commitment-tracking system, including mechanisms to ensure that procedure revisions do not delete or alter commitments

- Better defined corporate nuclear procedures

- More effective translation of commitments into procedures, and less use of the term "should"

- Improvement in the efforts of IP QA to obtain timely response to audit findings

IP has implemented all of these recommendations for improvement.

7. 1984 Audit

The 1984 JUMA audit was conducted to determine the adequacy or effectiveness of the following activities conducted under the QA program:

- Audit, surveillance, and inspection of startup activities
- Corrective action program
- Procurement and receipt inspection
- Quality engineering document reviews

In the opinion of the JUMA team, the QA/quality control (QC) activities examined were adequate and effectively implemented except in the areas of vendor evaluation and receipt inspection. Findings identified in these two areas indicated a need for increased management attention.

In response to findings associated with lack of adequate procedures, not following procedures, and not adequately controlling and monitoring vendor activities, IP appointed a Director of Quality Assurance to implement corrective actions and to manage quality-related procurement activities. Procurement-related procedures were clarified and requirements were more closely monitored to ensure compliance.

The audit team viewed IP's assumption of responsibility for all project audits and surveillances as a positive step. In the opinion of the team, the IP QC Program was adequate and effectively implemented. This conclusion was based on observations that inspections were conducted in a planned and systematic manner by qualified QC inspectors as required by IP procedures. Overall, the corrective action program appeared to them to be adequate and working, but it was their opinion that IP management needed to continue to be sensitive to the large number of past-due open responses.

B. AMERICAN SOCIETY OF MECHANICAL ENGINEERS SURVEY

In order to comply with state and federal law and the rules of the American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code for the construction, fabrication, and installation of nuclear power plant components, BA's QA Program was reviewed and accepted by the ASME. To meet these requirements, BA filed an application with the ASME requesting that its QA Program be reviewed and that a certificate of authorization be issued. Surveys are required to be performed by the ASME every 3 years after initial issuance of the certificate of authorization. In addition, the authorized inspection agency (Hartford Steam Boiler) is required by ANSI

Standard N626.0 to perform audits to show compliance to the QA program and the ASME code.

Areas of the QA Program that are reviewed in ASME surveys generally correspond to the 18 criteria of 10 CFR Part 50, Appendix B, i.e.: the organization; the program; design control; procurement document control; instruction; procedures and drawings; document control; control of purchased material, items, and services; identification and control of material and items; control of construction processes; examination, tests, and inspections; test control; control of measuring and test equipment; handling, storage, shipping, and preservation; examination and test status; nonconforming material or items; corrective action; QA records; and audits.

The following information provides a chronological summary of pertinent ASME and Hartford Steam Boiler (HSB) activities, reviews, and surveys, and the corrective actions taken in response to the major findings and recommendations of each such review or survey.

1. <u>April 22, 1974</u>

   HSB was awarded the contract as the authorized inspection agency.

2. <u>January 29 to January 31, 1975</u>

   The first ASME survey of BA was conducted. No adverse findings were disclosed by the survey, which consisted of an in-depth evaluation of the BA QA manual. The survey indicated that the QA system described in the BA QA manual was satisfactory and therefore accepted by the ASME.

3. <u>April 1, 1975</u>

   As a result of the January 29-31, 1975, survey, BA was issued an interim letter of authorization by the ASME with an expiration date of April 1, 1976.

4. June 7, 1976

BA was issued an interim letter of authorization by the ASME with an expiration date of June 7, 1977.

5. December 22, 1976

The HSB resident Authorized Nuclear Inspector (ANI) arrived on site.

6. June 7, 1977

BA was issued an interim letter of authorization by the ASME with an expiration date of June 8, 1978.

7. June 5 to June 7, 1978

The ASME conducted the first full-scope implementation survey of the BA QA Program as described by the BA QA manual and supporting sub-tier procedures and instructions.

Three items requiring corrective action were disclosed during the survey as follows:

- An audit of Wilkins Piping & Supply Company had not been performed.

  Response: An audit was conducted on Wilkins Piping & Supply Company, and it was found to be acceptable.

- No letter of agreement existed between the nondestructive examination (NDE) site subcontractor and BA for accomplishment of NDE.

Response: A letter of agreement was developed.

- Contrary to the American Society for Non-Destructive Testing Recommended Practice SNT-TC-1A (1975), the Level II test questionnaire for liquid penetrant testing for the NDE site subcontractor did not contain the required number of test questions.

  Response: The test questionnaire was corrected.

The ASME team concluded that the BA QA program was effective, properly implemented, and acceptable.

8. August 4, 1978

As a result of the acceptable survey conducted by the ASME, BA was issued the following certificates of authorization:

- Certificate Number N-2157 - "NA" symbol, expiration date August 4, 1981. The scope of the certificate was: Class 1, 2, 3 and CS installation of components, parts, appurtenances, piping subassemblies, and component supports at CPS, Units 1 and 2, Clinton, Illinois, only.

- Certificate Number N-2158 - "NPT" symbol, expiration date August 4, 1981. The scope of the certificate was: field fabrication of Class 1, 2, and 3 component parts and appurtenances, piping subassemblies, and component supports and class CS core support structure parts at CPS, Units 1 and 2, Clinton, Illinois, only.

9. March 5 to March 6, 1980

HSB conducted a site audit as required by ANSI N626.0 of the BA QA system and as described by the BA QA manual. Four items were disclosed, and acceptable corrective actions were taken:

- The date recorded to close out follow-up transmittal did not reflect the actual receipt date.

  Response: The date recorded for close-out is not significant. Personnel, however, were instructed to record the return received date in the future.

- A welding qualification form was not completed properly.

  Response: The individual qualification record was completed and the balance of the qualification forms were reviewed and corrected as required.

- The liquid penetrant procedure did not include certification required by Section VIII, Division 1.

  Response: The procedure was revised to include certification.

- Purchasing and receiving documents did not reflect the acknowledgement by the vendor that material was supplied under a qualified program.

  Response: Attachments to safety-related purchase orders satisfy the intent of the requirement. Previous purchase orders to suppliers not qualified by the society were reviewed and the suppliers were notified to supply necessary qualification information.

10. August 11 to August 12, 1980

HSB conducted a site audit as required by ANSI N626.0 of the BA QA system and as described by the BA QA manual. Two items requiring corrective action were disclosed during the audit, and acceptable corrective actions were taken:

- Superseded drawings were not returned to document control in a timely manner.

  Response: Direction was issued and implemented by document control to ensure 48-hour processing.

- Internal audits do not reflect the specific paragraphs of the QA manual being audited.

  Response: Checklists for future audits were revised to reflect applicable QA manual paragraphs selected for the audit. A matrix which reflects the particular QA manual requirements that have been audited was prepared and is maintained.

11. February 18 to February 19, 1981

HSB conducted a site audit as required by ANSI N626.0 of the BA QA system and as described by the BA QA manual. One item requiring corrective action was disclosed during the audit, and acceptable corrective actions were taken:

- The procedure for qualification and certification of NDE personnel conflicted with the June 1975 SNT-TC-1A requirements.

Response: The auditor was not provided the current revision of the subject procedure, which is in compliance. Action was initiated through IP to review and appropriately stamp all NDE procedures on file.

12. June 1 to June 3, 1981

The ASME conducted a nuclear survey for site renewal of NA and NPT certificates of authorization (N-2157 and N-2158).

13. July 10, 1981

Based upon acceptable results of the ASME re-survey conducted June 1-3, 1981, BA certificates of authorization N-2157 (NA) and N-2158 (NPT) were renewed with an expiration date of August 4, 1984.

14. November 10 to November 13, 1981

HSB conducted a site audit as required by ANSI N626.0 of the BA QA system and as described by the BA QA manual. Four items requiring corrective action were disclosed during the audit, and acceptable corrective actions were taken:

- A traveler in the field was found in very poor physical condition.

  Response: The traveler and its contents were reproduced to stop deterioration.

- The NDE subcontractor corrected radiographic testing film identification with a vibra tool. This violated the current procedure.

Response: The procedure was revised to allow corrections.

- Certain ultrasonic testing Level I NDE certifications for U.S. Testing Company Inc. employees were not in the records center.

  Response: U.S. Testing Company, Inc. provided the required certifications and forwarded them to the records center.

- A traveler did not contain paperwork for counterboring.

  Response: The documentation was generated, and the closed inspection report reflects incorporation of the correct documentation into the traveler.

15. **April 20 to April 23, 1982**

HSB conducted a site audit as required by ANSI N626.0 of the BA QA system and as described by the BA QA manual. All areas reviewed during the audit were found satisfactory.

16. **March 15 to March 17, 1983**

HSB conducted a site audit as required by ANSI N626.0 of the BA QA system and as described by the BA QA manual. Two items requiring corrective action were disclosed during the audit, and acceptable corrective actions were taken:

- Inspections for counterbore were missing from the traveler in the field.

Response: A deviation report was generated and dispositioned to cut out the weld, make the correct fit-up, and reweld.

- Document record and distribution cards were not as shown in the QA manual and did not show status.

  Response: The QA manual was revised to reflect that cards must be in accordance with project procedures. The applicable project procedure states that drawing status is maintained in the document management system.

17. October 18 to October 20, 1983

HSB conducted a site audit as required by ANSI N626.0 of the BA QA system and as described by the BA QA manual. There were no deficiencies noted during this audit.

18. March 12 to March 14, 1984

HSB conducted a site audit as required by ANSI N626.0 of the BA QA system and as described by the BA QA manual. Eleven items requiring corrective action were disclosed during the audit, and acceptable corrective actions were taken:

- Records supporting NDE procedure qualification were not available.

  Response: The NDE procedures were documented, requalified, and demonstrated to the satisfaction of the ANI.

- The revision level of welding procedures used was not recorded in the travelers during the performance of welding, but rather during final records/traveler review using a computer printout identifying procedure revision history.

Response: The procedures that identify the initiation and control of travelers were revised to incorporate instructions regarding which procedures, documents, and respective revision levels are required to be noted in the traveler. In addition, all previous affected travelers were reviewed and corrected to ensure that the revisions noted were current at the time the activity was performed.

- The responsibilities of the Assistant Manager of Quality & Technical Services (Q&TS) were not described in the BA QA manual.

  Response: The QA manual and the organization chart were revised to include the responsibilities of the Assistant Manager of Q&TS.

- BA engineering did not have an approved procedure for the preparation of piping drawings.

  Response: A procedure is not necessary since the drawings are prepared from the architect-engineer's approved design drawings and are subsequently reviewed by the architect-engineer.

- In travelers (work packages) requiring NDE to be performed, the examination procedure numbers were not indicated; only the type of examination to be performed was indicated.

  Response: A procedure matrix identifying the examination procedures was prepared and distributed to appropriate personnel. Personnel were instructed to note the procedure number and revision on the traveler. All travelers in the field were corrected.

- There was no training matrix or on-the-job training records for three individuals in the Document Review Group.

Response: The three identified individuals are clerical staff and do not require training for document reviewers in accordance with the training procedure for document review personnel.

- An individual in the technical services discipline had not received the QA manual indoctrination training and the training file did not contain the mandatory reading matrix.

  Response: The individual was provided the manual indoctrination training and the training file was updated to include the reading matrix.

- Inspection instrument checkout logs were not properly filled out.

  Response: Log entries were corrected and appropriate personnel were instructed on the importance of proper completion of check out logs.

- Work was being performed under a traveler identified as being on engineering hold.

  Response: Construction personnel were notified not to perform work on travelers identified as being on engineering hold.

- BA had not qualified IP as a supplier of auditing services for audits performed on the site nondestructive examination subcontractor.

  Response: The audits performed on the subcontractor were joint audits performed by BA and IP and are in compliance with the BA QA manual.

- The heat treatment record for a weld did not indicate the total accumulated heat treatment time.

Action Taken by BA: A review was made to ensure there was no violation of code requirements for the accumulated heat treatment time. No violation existed and the record was corrected.

19. **May 30 to June 1, 1984**

The ASME conducted a nuclear survey for site renewal of NA and NPT certificates of authorization (N-2157 and N-2158). One item requiring corrective action was disclosed as a result of the survey, and acceptable corrective action was taken:

- Superseded copies of drawings were found in traveler packages for ASME code work.

  Response: The superseded drawings were removed from the work packages (The superseded drawings were originally included in the work for record purposes only.)

The ASME team concluded that the BA QA Program was properly implemented and found acceptable.

20. **July 26, 1984**

Based on acceptable results of the ASME survey conducted from May 30 to June 1, 1983, BA certificates of authorization N-2157 (NA) and N-2158 (NPT) were renewed with an expiration date of August 4, 1987.

21. **October 31 to November 2, 1984**

HSB conducted a site audit as required by AWSI N626.0 of the BA QA system and as described by the BA QA manual. Five items were disclosed during the audit and BA responded as described below:

- The procedure for upgrade of materials did not meet the requirements of ASME Section III, Division I, Subsection NA, 1974 Edition, summer 1975 Addenda.

  Response: BA is constructing CPS in accordance with ASME Section III, Division I, 1974, Edition, summer of 1974 Addenda. The procedure for material upgrade is in compliance with the governing code of record.

- Contrary to requirements in the BA QA manual, BA-generated drawings were being used for installation without prior architect-engineer approval.

  Response: The BA QA manual does not prohibit installation without prior approval of the drawings. However, it is a requirement of the BA project procedures that the final inspections be performed using an architect-engineer approved drawing.

- Copies of the approved suppliers list were not identified as being required by the QA manual.

  Response: The approved suppliers list was reissued with the required control stamps.

- Nonconformance reports (NCRs) did not contain ANI concurrence signature.

  Response: Piping on NCRs does not require code ("N") stamping per design specification; ANI concurrence is not required.

- The 1984 audit schedule did not include all required subjects.

Response: Audits were inadvertently omitted from the schedule, and all will be complete by the end of January 1985.

Based on a review of the findings of the ASME and HSB surveys and audits of BA, BA has effectively implemented its ASME QA Program in accordance with governing codes, standards, and regulations. No significant findings were disclosed that affected the construction quality of installed nuclear power plant components. In addition, where identified deficiencies were noted, BA implemented timely and effective corrective action to resolve these conditions.

C. LAPP-RICE-STAKER

Lapp-Rice-Staker (LRS) has conducted two management assessments of CPS. The first LRS audit was conducted in August 1982 and the second was conducted in February and March of 1984. Below is an assessment of the more significant improvements made as a result of each management assessment.

1. 1982 Audit

The scope of the management assessment conducted in 1982 primarily was limited to the activities associated with engineering, construction, and construction turnover, including preoperation and startup testing. The purpose of the audit was to provide IP with an independent evaluation of the project management and supervision and of the methods used to control the project.

Improvements recommended by LRS can be summarized in three major categories:

- Increased management experience in certain positions and upgrading of others

- Improved timeliness and control of inspection activities and corrective action documents

- Centralized training program

The overall LRS assessment of CPS was that the management of both IP and BA is dedicated to designing, building, and operating CPS in accordance with all of the applicable regulatory requirements.

Actions taken to correct the conditions identified in this audit are:

- Improvements in the management and experience level of personnel of the project (see section IV-A of the CPS Report, "Summary of Quality Improvements and Confirmatory Actions [QICA] August 1984).

- Improvement in the controls for construction and inspection activities (see section IV-D of the QICA).

- Better trained personnel (see section IV-A-3 of the QICA).

2. <u>1984 Audit</u>

The scope of this management assessment included all of the crucial areas related to completion of the CPS project in a timely and quality fashion. The purpose of the audit was to provide IP with a status report on the recovery from the quality problems that had developed prior to 1982 and to make recommendations for further improving their performance.

The major improvements recommended by LRS can be summarized in four major categories:

- Training for all supervisors and upper management on intimidation should receive increased emphasis.

- The Q&TS organization should be streamlined.

- The IP nuclear organization should prepare a policy on documentation and records.

- IP should develop a long-range plan that would ensure the orderly transition of startup test engineering personnel into appropriate engineering and operations organizations to retain the inventory of valuable plant-specific experience and knowledge gained in the startup process.

The following actions are being taken to implement the recommendations resulting from this audit:

- A new training lesson plan was developed to provide instruction to supervisory personnel on what constitutes intimidation and the supervisor's role in assuring that intimidation will not occur.

- IP QA has assumed the responsibility for all site surveillance and audit activities previously performed by BA except those audits required by BA's ASME certification program. As a result, the BA Q&TS organization has been streamlined.

- The IP nuclear support organization has developed a policy on documentation and records. This policy provides the requirements for the management of documents and records prepared by IP or collected from its agents, consultants, vendors, and contractors.

- Plans are being developed and implemented to ensure an orderly transition from construction to operation, with emphasis on placement of experienced personnel into appropriate engineering and operations organizations.

In summary, the LRS audits have provided valuable recommendations to strengthen IP's quality programs and their implementation. In turn, IP's actions in response to these recomendations have strengthened the effectiveness of the quality programs and their implementation.

D. INSTITUTE OF NUCLEAR POWER OPERATIONS

The Institute of Nuclear Power Operations (INPO) conducted an evaluation of the CPS construction project and the S&L design offices during the weeks of November 28 and December 5, 1983.

INPO conducted the evaluation at the site and at the principal design offices in Chicago to evaluate the control of design and construction processes and to identify areas needing improvement. The INPO team examined organization and administration, design control, construction control, project support, training, quality, and test control. The team observed actual work performance and test performance. At the design office, they reviewed design control. A portion of the evaluation focused on a detailed vertical path examination through the design and construction of the project, combined with a horizontal examination at appropriate points.

INPO's goal is to assist utilities in achieving the highest standards of excellence in nuclear plant construction. Thus, the findings in each area are based on best practices, rather than minimum acceptable standards or requirements. Accordingly, areas identified for improvements are not necessarily indicative of unsatisfactory performance. Rather, the findings were intended to assist IP in ongoing efforts to improve all aspects of its nuclear programs.

The following favorable practices and accomplishments were noted in the INPO report:

- Supervisors and managers in the architect-engineer design office are competent and knowledgeable.

- The site radiography program is excellent. Both the technique and quality of radiographs were judged to be quite good.

- There is an effective program in effect for acquiring, maintaining, using, and disposing of construction equipment.

- A diverse program has been implemented to receive quality concern feedback from site personnel. The program includes written suggestions as well as a telephone hot line.

The evaluation identified a number of areas where improvement was needed. The following are the most important:

- Training of workers need improvement. Some workers and craft supervisors exhibit a lack of knowledge in specific work tasks.

- Improvement is needed in construction planning and scheduling. The coordination and effectiveness of detailed planning for recovery from identified problems needs strengthening.

- The traveler system is hindering effective control of work. Field work could not start without a traveler. Traveler preparation was complicated by the use of multiple forms, attachments, and references. They were broad in scope and remained in the field for long periods of time, thereby increasing the probability of loss. Any rework required a revision, addendum or supplement to the traveler, and closeout and review were complicated by non-essential content.

- The QA Program could be improved by decreasing reliance on review of paperwork, improving the performance of QA personnel in identifying substantive problems, and upgrading some procedures.

- Some managers have not always taken effective actions to ensure that project quality and schedule goals are met.

An analysis of the areas requiring improvement was conducted by IP and action plans were developed to focus on the following:

1. <u>Improving Craft Training</u>

The training program was revised to provide scheduled training for specific work tasks in support of the project schedule. Requirements for training in functional areas were developed and reviewed for completeness and applicability to each craft. The need for training in performance of field work was identified and factored into the training program, including a requirement for demonstration of learned skills. Finally, a training coordinator for each construction discipline was designated to ensure that training is provided in a timely fashion for scheduled construction activities.

2. <u>Enhancing Planning and Scheduling</u>

A new position (Director - Nuclear Planning, Programming, and Scheduling) was established and filled. He reports to the Vice President (nuclear) to oversee planning and scheduling efforts. His responsibilities include:

- Consolidation of planning and scheduling efforts to allow better control of schedules and enhanced interdepartmental coordination of activities

- Performance measurement and reporting, including recommendations for improved effectiveness

- Conducting independent assessments of problem areas and development of corrective action plans

- Monitoring programs developed to correct deficiencies noted in external assessments, evaluations, and audits

- Coordinate management inspection program and track deficiencies resulting from the inspections

- Produce summary management reports

Level I and Level II schedules are prepared and analyzed monthly to provide management tools to identify and take corrective action for potential scheduling conflicts and difficulties. Schedules are developed to reflect recovery plans.

3. <u>Reviewing the Traveler System and Initiating Necessary Improvements</u>

An independent review was conducted of the entire traveler program by an experienced nuclear construction group, Stone & Webster Engineering Corporation. The results of the review were used in streamlining the traveler program. To protect documentation, IP is duplicating partially completed travelers on which a significant amount of work has been completed and which require lengthy time in the field. Preapproved dispositions and stand-alone NCRs are being used. Preapproved dispositions allow the disposition and rework of minor items, and the stand-alone NCRs eliminate the necessity of traveler revision, addendum, or supplement in those cases where the NCR contains sufficient information to control and document work. These actions also have simplified the final review and approval of travelers.

4. <u>Continuing To Upgrade Quality Programs</u>

Quality programs were improved to provide early identification of problems in work performance. A program of increased surveillance of both work and oversight of construction quality programs has been developed. Plans, schedules, and procedures to support these improvement programs have been developed.

Surveillance plans have been issued which emphasize surveillance of hardware rather than review of documentation. This change in emphasis also has led to increased surveillance of inspection activities. To support this effort, personnel qualified to perform inspection of hardware have been added to surveillance teams.

All construction, engineering, and quality requirements for a specific category of activity have been assembled into a single procedure to provide additional assurance that quality design and quality requirements are apparent at each stage of the activity.

5. Increasing Emphasis To Ensure That Project Quality and Schedule Goals Are Met

Initiatives have been taken to ensure that plans and schedules support the critical path. A plan was implemented emphasizing IP nuclear program management actions to ensure that quality and schedule goals are met. This plan provided the corporate goals and objectives for 1985 and 1986. The theme of this plan is commitment to excellence, with emphasis on safety, reliability, and quality performance by all employees. Departmental goals and objectives have been developed in support of the corporate goals and objectives and are an internal part of the executive plan.

6. Implementing a Management Effectiveness Program

A management effectiveness program has been implemented which establishes departmental goals and objectives in support of corporate goals, a monthly performance monitoring management report, and a program to enhance management involvement.

Evaluations of the effectiveness of these improvements are ongoing, as indicated by the following:

- QC has experienced a drop in its average daily rejection rate from 12% to 10% from February through July 1984.

- 56% of the QA surveillances in 1984 were oversight of construction field activities, as compared to 38% of the surveillances in 1983.

- The 1984 evaluation by the JUMA Group judged that the improvements made in the QA programs are effective.

In summary, the scope of the INPO evaluation encompassed virtually every aspect of construction of CPS. INPO complimented several CPS programs and found most of the remainder to be adequate to accomplish their intended purposes. In those areas where INPO did identify a potential for making improvements, IP has taken effective action to upgrade performance in these areas.