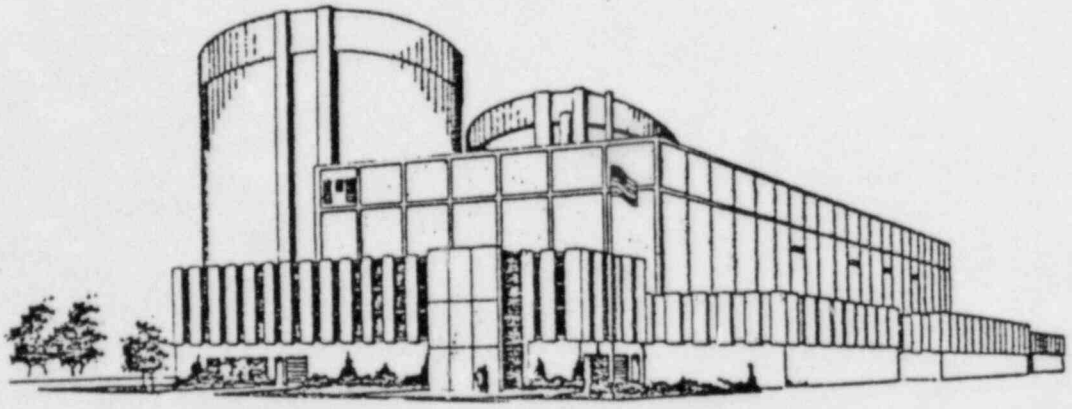
2/8/83

MIDLAND INDEPENDENT DESIGN VERIFICATION PROGRAM FOR THE AFW SYSTEM AND ANOTHER SYSTEM TO BE DETERMINED



FEBRUARY 8, 1983

TERA CORPORATION

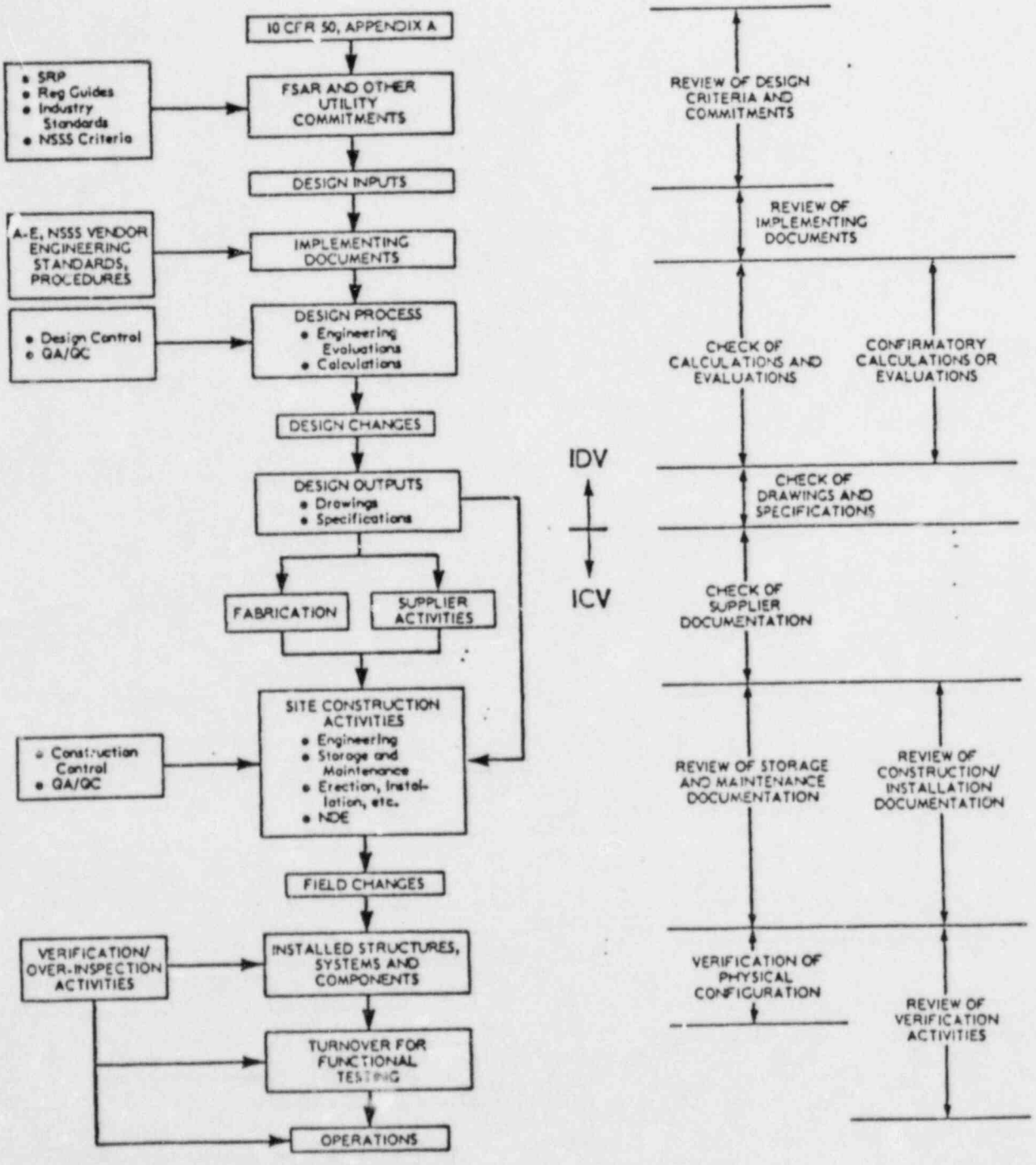
PRESENTATION OUTLINE

- PROGRAM STATUS
- INTER-RELATIONSHIP BETWEEN THE DESIGN AND CONSTRUCTION PROCESS AND THE MIDLAND IDV
- PHILOSOPHY OF REVIEW
- BASES FOR SAMPLE SELECTION
- SCOPE OF DESIGN VERIFICATION
- SCOPE OF CONSTRUCTION VERIFICATION
- REPORTING PROCESS
- SCHEDULE

PROGRAM STATUS

- PROJECT QUALITY ASSURANCE PLAN
  - DEVELOPED, APPROVED, AND UNDER IMPLEMENTATION
  - INCLUDES PROJECT CONTROL PROCEDURES, INSTRUCTIONS AND REPORTING REQUIREMENTS
- ENGINEERING PROGRAM PLAN
  - DEVELOPED, APPROVED, AND UNDER IMPLEMENTATION
  - 44 DESIGN TOPICS/5 CATEGORIES OF REVIEW
  - 15 CONSTRUCTION TOPICS/5 CATEGORIES OF REVIEW
- DESIGN VERIFICATION
  - IN PROGRESS FOR AFW SYSTEM
  - DESIGN CHAIN IDENTIFIED
  - PROJECT EXPERIENCE UNDER REVIEW TO ASSIST IN FOCUSING THE DESIGN VERIFICATION
- CONSTRUCTION VERIFICATION
  - RECENTLY INITIATED
  - INITIAL AS-BUILT CONFIGURATION VERIFICATION FOR PIPING/SUPPORTS NEARING COMPLETION

INTER-RELATIONSHIP BETWEEN THE MIDLAND DESIGN AND CONSTRUCTION PROCESS AND THE MIDLAND IDV PROGRAM



DESIGN AND CONSTRUCTION PROCESS

MIDLAND IDV PROGRAM

GOAL

- PROVIDE AN INDEPENDENT EVALUATION OF THE QUALITY OF THE MIDLAND PLANT DESIGN AND CONSTRUCTION

PHILOSOPHY OF REVIEW

- SELECT A REPRESENTATIVE SAMPLE OF ENGINEERED SYSTEMS, COMPONENTS, AND STRUCTURES WHICH WILL FACILITATE:
  - AN INTEGRATED ASSESSMENT OF IMPORTANT PARAMETERS AFFECTING THE FUNCTIONAL CAPABILITY OF THE TWO SYSTEMS, AND
  - THE ABILITY TO EXTRAPOLATE FINDINGS TO SIMILARLY DESIGNED FEATURES WITH A HIGH DEGREE OF CONFIDENCE
- CONSIDER POSITIVE AND NEGATIVE FINDINGS WHICH WILL ALLOW A BALANCED VIEW OF OVERALL QUALITY
- ASSESS ROOT CAUSE AND EXTENT OF IDENTIFIED FINDINGS
- REVIEW CORRECTIVE ACTION TAKEN TO ADDRESS FINDINGS

BASES FOR SAMPLE SELECTION

- SIMILAR TO SYSTEM SELECTION CRITERIA
  - IMPORTANCE TO SAFETY
  - INCLUSION OF DESIGN/CONSTRUCTION INTERFACES
  - ABILITY TO EXTRAPOLATE RESULTS
  - DIVERSE IN CONTENT
  - SENSITIVE TO PREVIOUS EXPERIENCE
  - ABILITY TO TEST AS-BUILT INSTALLATION
- STRONG RELIANCE UPON ENGINEERING JUDGMENT
- POTENTIAL USE OF STATISTICAL TECHNIQUES TO ESTABLISH SAMPLE SIZE FOR REPETITIVE PRODUCTION ACTIVITIES (E.G., CONCRETE AND STEEL PROPERTIES, WELDING RECORDS, ETC.)
- INDUSTRY DESIGN/CONSTRUCTION EXPERIENCE
- INDUSTRY OPERATING EXPERIENCE
- PROJECT DESIGN/CONSTRUCTION EXPERIENCE
  - AREAS EXPERIENCING REPEATED PROBLEMS
  - AREAS WHICH MAY NOT HAVE RECEIVED EXTENSIVE PRIOR REVIEW
- AREAS WHERE FINDINGS HAVE BEEN IDENTIFIED

INITIAL SAMPLE REVIEW MATRIX FOR THE AUXILIARY FEEDWATER SYSTEM MIDLAND INDEPENDENT DESIGN VERIFICATION PROGRAM

DESIGN AREA	SCOPE OF REVIEW				
	REVIEW OF DESIGN CRITERIA AND COMMITMENTS	REVIEW OF IMPLEMENTING DOCUMENTS	CHECK OF CALCULATIONS AND EVALUATIONS	CONFIRMATORY CALCULATION OR EVALUATION	CHECK OF DRAWINGS AND SPECIFICATIONS
I. AFW SYSTEM PERFORMANCE REQUIREMENTS					
SYSTEM OPERATING LIMITS	X	X	X		
ACCIDENT ANALYSIS CONSIDERATIONS	X				
SINGLE FAILURE	X	X	X		
TECHNICAL SPECIFICATIONS	X	X			
SYSTEM ALIGNMENT/SWITCHOVER	X	X			
REMOTE OPERATION AND SHUTDOWN	X				
SYSTEM ISOLATION/INTERLOCKS	X	X			
OVERPRESSURE PROTECTION	X				
COMPONENT FUNCTIONAL REQUIREMENTS	X	X	X		X
SYSTEM HYDRAULIC DESIGN	X	X	X		
SYSTEM HEAT REMOVAL CAPABILITY	X	X	X		
COOLING REQUIREMENTS	X				
WATER SUPPLIES	X	X			
PRESERVICE TESTING/CAPABILITY FOR OPERATIONAL TESTING	X				
POWER SUPPLIES	X	X			
ELECTRICAL CHARACTERISTICS	X				
PROTECTIVE DEVICES/SETTINGS	X	X			X
INSTRUMENTATION	X	X	X		X
CONTROL SYSTEMS	X	X	X		
ACTUATION SYSTEMS	X				
NDE COMMITMENTS	X				
MATERIALS SELECTION	X	X			

INITIAL SAMPLE REVIEW MATRIX FOR THE AUXILIARY FEEDWATER SYSTEM
MIDLAND INDEPENDENT DESIGN VERIFICATION PROGRAM (CONTINUED)

DESIGN AREA	SCOPE OF REVIEW				
	REVIEW OF DESIGN CRITERIA AND COMMITMENTS	REVIEW OF IMPLEMENTING DOCUMENTS	CHECK OF CALCULATIONS AND EVALUATIONS	CONFIRMATORY CALCULATION OR EVALUATION	CHECK OF DRAWINGS AND SPECIFICATIONS
II. AFW SYSTEM PROTECTION FEATURES					
SEISMIC DESIGN	X				
• PRESSURE BOUNDARY	X	X	X	X	X
• PIPE/EQUIPMENT SUPPORT	X	X	X	X	X
• EQUIPMENT QUALIFICATION	X	X	X		X
HIGH ENERGY LINE BREAK ACCIDENTS	X				
• PIPE WHIP	X	X	X		X
• JET IMPINGEMENT	X				
ENVIRONMENTAL PROTECTION	X				
• ENVIRONMENTAL ENVELOPES	X	X	X	X	X
• EQUIPMENT QUALIFICATION	X	X	X		X
• HVAC DESIGN	X				
FIRE PROTECTION	X	X	X		
MISSILE PROTECTION	X				
SYSTEMS INTERACTION	X	X	X		
III. STRUCTURES THAT HOUSE THE AFW SYSTEM					
SEISMIC DESIGN/INPUT TO EQUIPMENT	X	X	X		X
WIND & TORNADO DESIGN/MISSILE PROTECTION	X				
FLOOD PROTECTION	X				
HELBA LOADS	X				
CIVIL/STRUCTURAL DESIGN CONSIDERATIONS	X				
• FOUNDATIONS	X	X	X		
• CONCRETE/STEEL DESIGN	X	X	X		X
• TANKS	X	X	X		

INITIAL SAMPLE REVIEW MATRIX FOR THE AUXILIARY FEEDWATER SYSTEM
MIDLAND INDEPENDENT DESIGN VERIFICATION PROGRAM

SYSTEM/COMPONENT	SCOPE OF REVIEW				
	REVIEW OF SUPPLIER DOCUMENTATION	REVIEW OF STORAGE AND MAINTENANCE DOCUMENTATION	REVIEW OF CONSTRUCTION/ INSTALLATION DOCUMENTATION	REVIEW OF SELECTED VERIFICATION ACTIVITIES	VERIFICATION OF PHYSICAL CONFIGURATION
I. MECHANICAL					
• EQUIPMENT	X	X	X	X	X
• PIPING	X		X	X	X
• PIPE SUPPORTS	X		X	X	X
II. ELECTRICAL					
• EQUIPMENT	X	X	X	X	X
• TRAYS AND SUPPORTS	X				X
• CONDUIT AND SUPPORTS	X				X
• CABLE	X	X	X	X	X
III. INSTRUMENTATION AND CONTROL					
• INSTRUMENTS	X	X	X	X	X
• PIPING/TUBING	X				X
• CABLE	X				X
IV. HVAC					
• EQUIPMENT	X	X	X	X	X
• DUCTS AND SUPPORTS	X				X
V. STRUCTURAL					
• FOUNDATIONS	X		X		
• CONCRETE	X		X		X
• STRUCTURAL STEEL	X		X		X

SCOPE OF CONSTRUCTION VERIFICATION REVIEW

- REVIEW OF SUPPLIER DOCUMENTATION
  - SAMPLING CHECK AGAINST DESIGN SPECS AND DRAWINGS; REVIEW OF
    - DRAWINGS
    - TEST REPORTS
    - CERTIFIED MATERIAL PROPERTY REPORTS
    - STORAGE AND INSTALLATION REQUIREMENTS
    - OPERATION AND MAINTENANCE REQUIREMENTS
- REVIEW OF STORAGE AND MAINTENANCE DOCUMENTATION
  - RECEIPT INSPECTION DOCUMENTATION
  - STORAGE, INCLUDING IN-STORAGE AND IN-PLACE MAINTENANCE
    - REQUIREMENTS INCLUDING PARAMETERS SUCH AS TEMPERATURE, HUMIDITY, CLEANLINESS, LUBRICATION, ENERGIZATION, ETC.
  - OBSERVATION OF ON-GOING ACTIVITIES
- REVIEW OF CONSTRUCTION/INSTALLATION DOCUMENTATION
  - IMPLEMENTATION OF PROPER REQUIREMENTS SUCH AS ERECTION SPECIFICATIONS, INSTALLATION REQUIREMENTS, CONSTRUCTION PROCEDURES, CODES AND STANDARDS, ETC.
  - REVIEW OF DESIGN CHANGES, FIELD MODIFICATIONS, ETC.
  - EVALUATION OF DOCUMENTATION FOR ITEMS SUCH AS CONCRETE, WELDING, BOLTING ACTIVITIES, ETC.

SCOPE OF CONSTRUCTION VERIFICATION REVIEW
(continued)

- OBSERVATION OF ON-GOING CONSTRUCTION ACTIVITIES

- REVIEW OF SELECTED VERIFICATION ACTIVITIES
  - CABLE SEPARATION, PIPE SUPPORT, AND BOLTING OVER-INSPECTION PROGRAMS, ETC.
  - OBSERVATION OF VARIOUS WALKDOWN ACTIVITIES (E.G., SYSTEMS INTERACTION - SEISMIC II/I)
  - COLD HYDROS
  - COMPONENT AND SYSTEM FUNCTIONAL TESTING PROGRAMS
  - CONSTRUCTION COMPLETION PROGRAM

- VERIFICATION OF PHYSICAL CONFIGURATION
  - INSTALLATION OF SYSTEM IN ACCORDANCE WITH PIPING AND INSTRUMENTATION DIAGRAMS
  - INSTALLATION OF COMPONENTS AND PIPING IN ACCORDANCE WITH ARRANGEMENT DRAWINGS AND ISOMETRICS (APPROXIMATE LOCATION AND ORIENTATION)
  - INSPECTION OF SELECTED FEATURES FOR COMPLIANCE WITH DESIGN DETAILS (APPROXIMATE DIMENSIONS)
  - VERIFICATION OF IDENTITY (EQUIPMENT PART NUMBERS, ETC.) IN ACCORDANCE WITH DRAWINGS, SPECIFICATIONS, OR SCHEMATICS
  - QUALITY OF WORKMANSHIP

RFW

Consumers Power Company

James W Cook
Vice President - Projects, Engineering and Construction

General Offices: 1945 West Parnall Road, Jackson, MI 49201 • (517) 788-0453

January 10, 1983

Mr J G Keppler, Administrator, Region III
Nuclear Regulatory Commission
799 Roosevelt Road
Glen Ellyn, IL 60137

MIDLAND NUCLEAR COGENERATION PLANT
MIDLAND DOCKET NOS 50-329, 50-330
CONSTRUCTION COMPLETION PROGRAM
FILE 0655 SERIAL 20428

REFERENCE LETTER TO J W COOK, DATED DECEMBER 30, 1982, FROM NRC REGION III REGARDING CONSTRUCTION COMPLETION PROGRAM

On December 2, 1982, Consumers Power Company met with Mr Warnick and other members of your staff to discuss the general concept of our proposed Construction Completion Program. The enclosure to this letter documents in detail the Construction Completion Program, as requested at the meeting and in your follow up letter (Reference).

Since our meeting, the program has undergone considerable development and evolution. Details have been supplied and more specific objectives and implementing methods have been established. Further details are still being developed. While the Company expects the Program, as presently constituted, to be a workable and sufficient framework for future action, revisions may be necessary as future needs and experience dictate.

The Construction Completion Program is a positive step in the overall advancement of Project goals. It represents the best efforts of Project management, support and quality assurance personnel. We believe it will produce an improvement in Project installation and inspection status, systems construction and QA implementation. The quality verification effort should provide increased confidence of the NRC that the plant has been properly built. Other aspects of the Program, including the measure to improve ongoing inspections and scheduling interfaces, should contribute to that result. This Program, together with recent Consumers Power Company commitments regarding quality assurance and remedial soils work, can establish a basis for improved relations between the Company and the NRC Region group assigned to inspect Midland. The Construction Completion Program demonstrates the Company's responsiveness to both NRC concerns and the particular needs of this Project. It is our expectation that the Program, created out of a desire to enhance the

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Page 1 of 2

orderliness and quality of construction, will achieve its intended purpose and lead to the successful "completion of construction" of the Midland Plant in accordance with regulatory requirements.

We hope that this submittal fulfills your request for written information regarding the Construction Completion Program. Consumers Power Company is prepared to support the public meeting proposed for January 26, 1983 in Midland, Michigan.

James W. Cook

JWC/DMB/cl

CC Atomic Safety and Licensing Appeal Board
CBechhoefer
FPCowan, ASLB
JHarbour, ASLB
DSHood, NRC
MMCherry
RWHernan, NRC
RJCook, Midland Resident Inspector
FSKelley
HRDenton, NRC
WHMarshall
WDPaton, NRC
WDShafer, NRC
RFWarnick, NRC
BStamiris
MSinclair
LLBishop

oc0183-0308a100

CONSUMERS POWER COMPANY
Midland Units 1 and 2
Docket No 50-329, 50-330

Letter Serial 20428 Dated January 10, 1983

At the request of the Commission and pursuant to the Atomic Energy Act of 1954, and the Energy Reorganization Act of 1974, as amended and the Commission's Rules and Regulations thereunder, Consumers Power Company submits its Construction Completion Program.

CONSUMERS POWER COMPANY

By /s/ J W Cook
J W Cook, Vice President
Projects, Engineering and Construction

Sworn and subscribed before me this ___ day of _____.

/s/ Patricia A Puffer
Notary Public
Bay County, Michigan

My Commission Expires _____

oc0183-0308a100

Construction Completion Program
Executive Summary

The Construction Completion Program has been formulated to provide guidance in the planning and management of the design and quality activities necessary for completion of the construction of the Midland Nuclear Cogeneration Plant. Construction completion is defined in this Plan as carrying all systems to the point they are turned over to Consumers Power Company for component checkout and preoperational testing. The Construction Completion Program does not include the Remedial Soils Program which is treated in separate interactions between Consumers Power Company and the Nuclear Regulatory Commission.

Background

The Construction Completion Program was developed in response to a number of management concerns that have been identified during the period preceding the initiation of the Program. The Midland Project had been proceeding at a high level of activity as it approached completion. The final transition from area construction to system completion, using punch lists, has been difficult for most nuclear projects. The Midland Project has not escaped these difficulties which have been compounded due to the congested space and the continuing numerous design changes, both generally attributable to the age of the Project. These factors lead to the need for improved definition of work status, increased emphasis on overall Project objectives as well as continued focus of construction and inspection resources on completion of systems for short-term milestones and increased effort to complete engineering ahead of field installation.

The Midland Project has been criticized by the NRC regional office as not having met their expectations for implementation of the Project's Quality Assurance Program. The result has been that the Project management has too often, during the past few months, been in a reactive rather than proactive posture with regard to quality assurance matters.

In recognition of these conditions, management has concluded that a change in approach was needed to effectively complete the Project while maintaining high quality standards.

Objectives

The development of the Program has considered the Project's current status and recent history and attempts to address the underlying or root causes of the problems currently being experienced. In order to develop the Program the following overall objectives were established under three general headings. The Program must:

Improve Project Information Status By:

- Preparing an accurate list of to-go work against a defined baseline.

- Bringing inspections up-to-date and verifying that past quality issues have been or are being brought to resolution.

- Maintaining a current status of work and quality inspections as the Project proceeds.

Improve Implementation of the QA Program By:

- Expanding and consolidating Consumers Power Company control of the quality function.

- Improving the primary inspection process.

- Providing a uniform understanding of the quality requirements among all parties.

Assure Efficient and Orderly Conduct of the Project By:

- Establishing an organizational structure consistent with the remaining work.

- Providing sufficient numbers of qualified personnel to carry out the program.

- Maintaining flexibility to modify the Plan as experience dictates.

Description

The Construction Completion Program entails a number of major changes in the conduct of the final stages of the construction process and can be described in summary as a two-phase process.

First, after certain necessary preparations, the safety-related systems and areas of the plant will be systematically reviewed. This first phase will be carried out on an area-by-area basis, but will be accomplished mainly by teams organized with systems responsibility and a separate effort to verify the completed work. The product from this phase of the program will be a clear status of remaining installation work and a current inspection status which provides quality verification of the existing work. The teams organized to carry out this first phase will continue to function in the second phase as the responsible organizational units to the complete the work.

In order to achieve its complete set of objectives, the Program contains a number of activities and elements that support and are linked to the two major phases described above. The major components of the Plan, which are discussed in more detail in the balance of this report, can be described as follows:

. A significant reduction in the construction activity in the safety-related portion of the plant, material removal and a general cleanup will be carried out in preparation for installation and inspection status assessment and quality verification activities.

- A review will be made of equipment status to assure that the proper lay-up precautions have been implemented to protect the equipment until the installation work is completed.

- The integration of the Bechtel QC function into the Midland Project Quality Assurance Department (MPQAD) under Consumers Power Company management will be completed.

- The Consumers Power Company is carrying out recertification program of Bechtel QC inspectors, and a review of the inspection procedures to be utilized.

- The system completion teams will be organized, staffed and trained according to procedures developed to define the team's work process.

- The systems completion teams will 1) accomplish installation and inspection status assessment, 2) perform systems construction completion and construction quality performance and 3) determine that all requirements have been met prior to functional turnover for test and operation.

- Quality verification of completed work will be carried out in parallel with installation and inspection status activities of the system completion teams.

- A series of management reviews will be carried out to carefully monitor the conduct of the Program and to revise the plan as appropriate.

- Review and resolution will proceed on outstanding issues related either to QA program or QA program implementation as raised by the NRC or third party overviews of the Project.

- Third party reviews will be undertaken to monitor Project performance and to carry out the NRC's requirements for independent design verification.

Schedule Status

The Program was initiated on December 2, 1982 by limiting certain ongoing safety-related work and starting preparations for the phase-one work of status assessment and quality verification activities. Since the Program also has incorporated a number of commitments made to the NRC during the past few months, activities in support of these commitments such as QC integration into MPQAD and the recertification of QC inspectors, had been initiated prior to December.

Status and schedules for each element of the Plan are enumerated in the text. In general, preparation for the Phase 1 activities are underway and will continue through January. A pilot team to develop the procedures and training requirements will be initiated during January. It is expected that the first

areas to undergo Phase 1 status assessment will be defined and teams mobilized during March.

Quality verification of completed work will start in late January or early February.

The Program provides for the Phase 1 results on a system or partial system to be reviewed and evaluated prior to initiating Phase 2 system completion work on that system or partial system. Management will monitor both process readiness and Phase 1 evaluation results.

The major areas of continuing safety-related work are NSSS construction as performed by B&W Construction Co, HVAC work under the Zack subcontract, the Remedial Soils Program and post-turnover punch list work released to Bechtel construction by Consumers Power Company. The Zack work is currently limited until a recently identified question on welder certification is resolved.

During the implementation of the Program in 1983, the NRC Resident Inspectors can use the Plan to monitor safety-related construction activities at the site. Since a substantial portion of the Plan directly relates to commitments made to NRC management, Consumers Power Company intends to schedule periodic reviews of Program status and progress with the NRC.

TABLE OF CONTENTS

1.0 INTRODUCTION

The Construction Completion Program has been formulated to provide guidance in the planning and quality activities necessary for completion of the construction of the Midland Nuclear Cogeneration Plant. Construction completion is defined in this Plan as carrying all systems to the point they are turned over to Consumers Power Company for component checkout and preoperational testing. The Construction Completion Program does not include the Remedial Soils Program which is treated in separate interactions between Consumers Power Company and the Nuclear Regulatory Commission. The Construction Completion Program will be referred to as the Program in this document which contains the Plan for Program development and implementation.

Background

The Construction Completion Program is being developed in response to a number of management concerns that have been identified during the period preceding the initiation of the Program. The Midland Project had been proceeding at a high level of activity as it approached completion. The final transition from area construction to system completion, using punch lists, has been difficult for most nuclear projects. The Midland Project has not escaped these difficulties which have been compounded due to the congested space and the continuing numerous design changes, both generally attributable to the age of the Project. These factors lead to the need for improved definition of work status, increased emphasis on overall Project objectives as well as continued focus of construction and inspection resources on completion of systems for short-term milestones and increased effort to complete engineering ahead of field installation.

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In recognition of these conditions, Consumers Power Company has concluded that a change in approach is needed to effectively complete the Project while maintaining high quality standards.

Objectives

The development of the Program has considered the Project's current status and recent history and attempts to address the underlying or root causes of the problems currently being experienced. In order to develop the Program, the following overall objectives were established under three general headings. The Program must:

Improve Project Information Status By:

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- Maintaining a current status of work and quality inspections as the Project proceeds.

Improve Implementation of the QA Program By:

- Expanding and consolidating Consumers Power Company control of the quality function.

- Improving the primary inspection process.

- Providing a uniform understanding of the quality requirements among all parties.

Assure Efficient and Orderly Conduct of the Project By:

- Establishing an organizational structure consistent with the remaining work.

- Providing sufficient numbers of qualified personnel to carry out the Program.

- Maintaining flexibility to modify the Plan as experience dictates.

PLAN CONTENTS

The Program was initiated on December 2, 1982 by limiting on-going work on Q-systems to pre-defined tasks and preparing the major structures housing Q-systems for an installation and inspection status assessment and verification of completed work. The relationship of the major elements of the Plan is shown in Figure 1-1. The sections of the Plan address the following major activity areas:

PREPARATION OF THE PLANT (Section 2.0)

The buildings are being prepared for a status assessment and verification of completed work.

QA/QC ORGANIZATION CHANGES (Section 3.0)

A new QA organization that integrates the QA and QC functions under a Consumers Power Company direct reporting relationship is being established. As a part of this transition, the Bechtel QC inspectors are being recertified to increase confidence in the quality inspection performance.

PROGRAM PLANNING (Section 4.0)

The overall Plan for the Program is being developed in two major phases.

The first phase includes:

- A team organization assigned on the basis of systems is being developed to determine present installation and inspection status. The inspection status assessment includes performing inspections on completed work to bring them up to date. A closely coordinated effort involving the construction contractor and Consumers Power Company (QA/QC, testing and construction) will improve quality performance.

- The quality verification of completed work will be based, in part, on a sampling technique using re-certified inspectors as described in Section 3.0.

The second phase includes:

- Following installation and inspection status assessment the team organization will retain responsibility for systems completion work.

- The QC inspection process of new work will be integrated with the systems completion work to ensure adequate quality performance.

PROGRAM IMPLEMENTATION (Section 5.0)

The first phase implementation of the Program will be initiated with a review of the process, procedures and team assignments that will be used. The plan for verification of completed work will be reviewed separately. The teams will conduct the installation and inspection status assessment; verification of completed and inspected work will proceed, as planned, in coordination with the team effort. Following phase 1 completion of the first work segment, a management review of the plan effectiveness will be made.

In second phase Program implementation, the assigned team will plan and schedule the remaining work needed for completion including QC inspections.

QUALITY PROGRAM REVIEW (Section 6.0)

The adequacy and completeness of the quality program will be reviewed on an ongoing basis, taking into consideration questions raised by NRC inspections and findings by third party reviewers. The results of these reviews will be considered as part of the management review that are a part of the Program implementation (Section 5).

THIRD PARTY REVIEWS (Section 7.0)

Independent assessments of the Midland Project will provide management and NRC with evaluations of Project performance.

SYSTEM LAY-UP (Section 8.0)

The on-going work to protect plant equipment and systems will be augmented as necessary to provide adequate protection during implementation of this Plan.

CONTINUING WORK ACTIVITIES (Section 9.0)

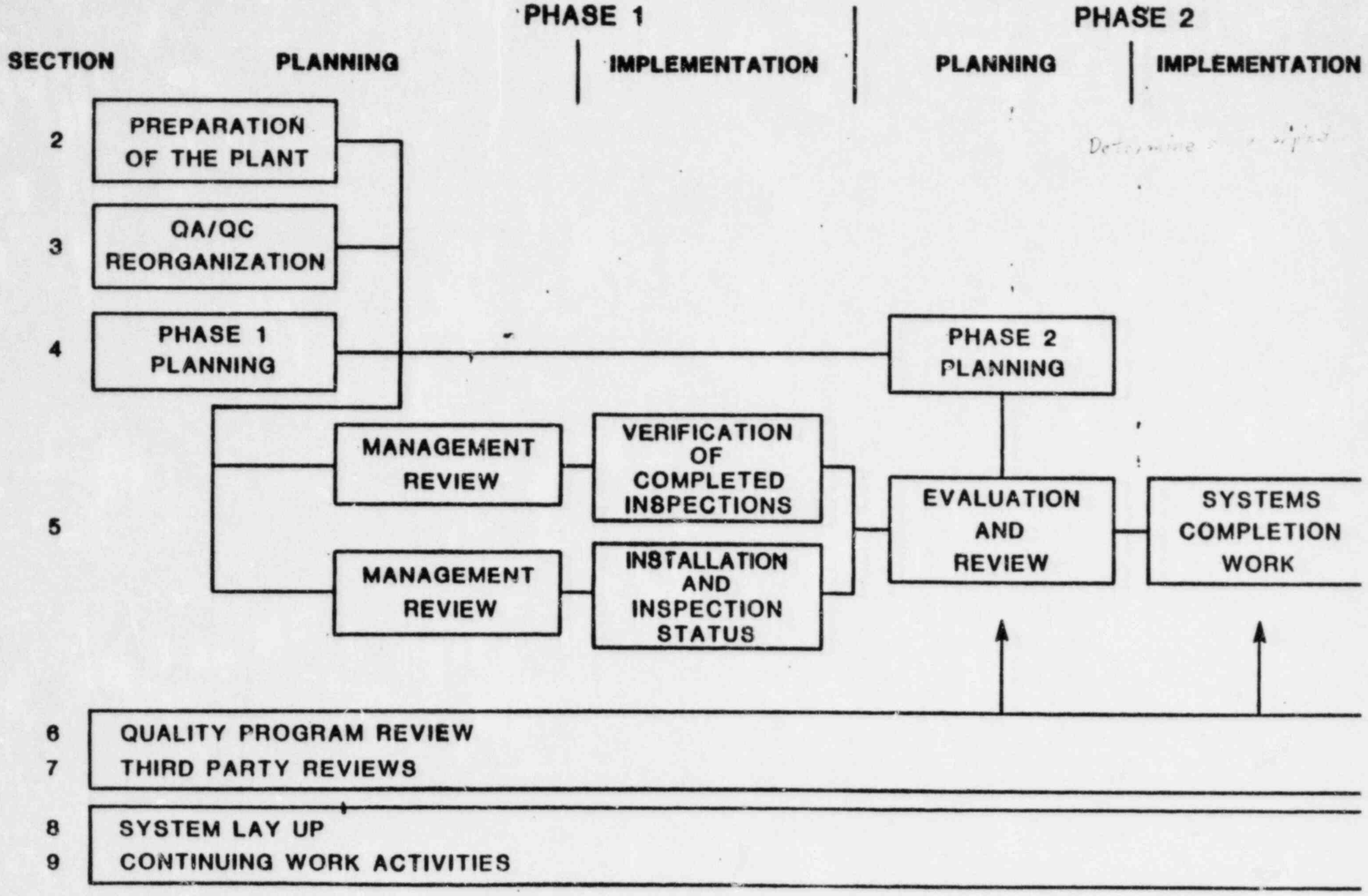
Work on Q-Systems has been limited to specific activities. This limitation permits important work to proceed while allowing building preparation for status assessment and verification activities.

SUMMARY

Each section of this Plan presents detailed objectives, a description of the activity involved, and a schedule for achieving major milestones. The Program, however, is still in an evolutionary state and revisions to the Plan may be necessary as Consumers Power Company gains experience in the implementation of Program elements.

FIGURE 1-1

CONSTRUCTION COMPLETION PROGRAM SCHEMATIC



2.0 PREPARATION OF THE PLANT

2.1 Introduction

The preparation of the Plant will clear the auxiliary, diesel generator and containment buildings and the service water pump structure of materials, construction tools and equipment and temporary construction facilities.

2.2 Objective

To allow improved access to systems and areas for the Program activities.

2.3 Description

The preparation activities minimize obstacles and interferences for the Program activities. This is being accomplished through the following steps.

1. Limitation of Q-work to activities and areas defined in Section 9 resulting in substantial work force reduction.

2. Removal and storage of construction tools and equipment, and temporary construction facilities (scaffolding, etc) from the buildings identified in Section 2.1.

3. Removal, control and storage of uninstalled materials from the buildings identified in Section 2.1.

4. Appropriate housekeeping of all areas following material and equipment removal.

The preparation for each area will be complete before initiating further Program activity. The on-going work described in Section 9 will continue as scheduled during the preparation.

2.4 Schedule Status

The preparation of the Plant began on December 2, 1982. It will be complete by January 31, 1983.

3.0 QA/QC ORGANIZATION CHANGES

3.1 Introduction

The Consumer Power Company's Midland Project Quality Assurance Department (MPQAD) is being expanded to assume direct control of Bechtel QC activities. The new organization and the plan for the transition are described below. The transferred QC Inspectors will be recertified as part of this transition.

3.2 Objectives

Establish New QA/QC Organization

Establish an integrated organization which includes the transition of Bechtel QC to MPQAD while accomplishing the following objectives:

1. Establish direct Consumers Power Company control over the QC inspection process.

2. Establish the responsibilities and roles of the QA and QC Departments in the integrated organization.

3. Use qualified personnel from existing QA and QC departments and contractors to staff key positions throughout the integrated organization.

Recertify QC Inspectors

Ensure that those Quality Control inspection personnel transferring to MPQAD from Bechtel will be trained and recertified in accordance with MPQAD Procedure B-3M-1.

3.3 Description

Establish New QA/QC Organization

A new organization will be implemented under Consumers Power Company and will be described in appropriate Topical Reports (CPC-1A and BQ-TOP-1) and quality program manuals (Volume II, BQAM and NQAM). Changes to these documents will be submitted to NRC.

Features of the new organization include:

1. Lead QC Supervisors report directly to a QC Superintendent who reports to the MPQAD Executive Manager. Any required support from Bechtel Corporate QC and QA functions (except ASME N-Stamp activities) is provided at the level of the MPQAD Executive Manager.

2. The MPQAD Executive Manager will review the performance of lead personnel in his department.

3. QA will develop and issue Quality Control inspection plans and be responsible for the technical content and requirements of such plans. QC will be responsible to implement these plans.

4. QA will continue to monitor the Quality Control inspection process to insure that program requirements are satisfactorily implemented.

5. MPQAD will continue to use Bechtel's Quality Control Notices Manual (QCNM) and Quality Assurance Manual (BQAM) as approved for use on the Midland Project.

6. ASME requirements imposed upon a contractor as N-Stamp holder will remain with that contractor. MPQAD QA will monitor the implementation of ASME requirements.

An organization chart (Fig 3-1) showing reporting relationships in the new organization is attached.

Recertify QC Inspectors

The training and recertification process for QC inspectors has been revised to include commitments made during the September 29, 1982 public meeting with the NRC. Those inspectors transferred from Bechtel to MPQAD will be trained and examined in accordance with MPQAD Procedure B-3M-1. Upon satisfactory completion of the training and examination requirements, inspection personnel will be certified for the Project Quality Control Instruction(s) (PQCI(s)) they are to implement. Inspection personnel will be certified on a schedule which supports ongoing work and system completion team activities.

3.4 Schedule Status

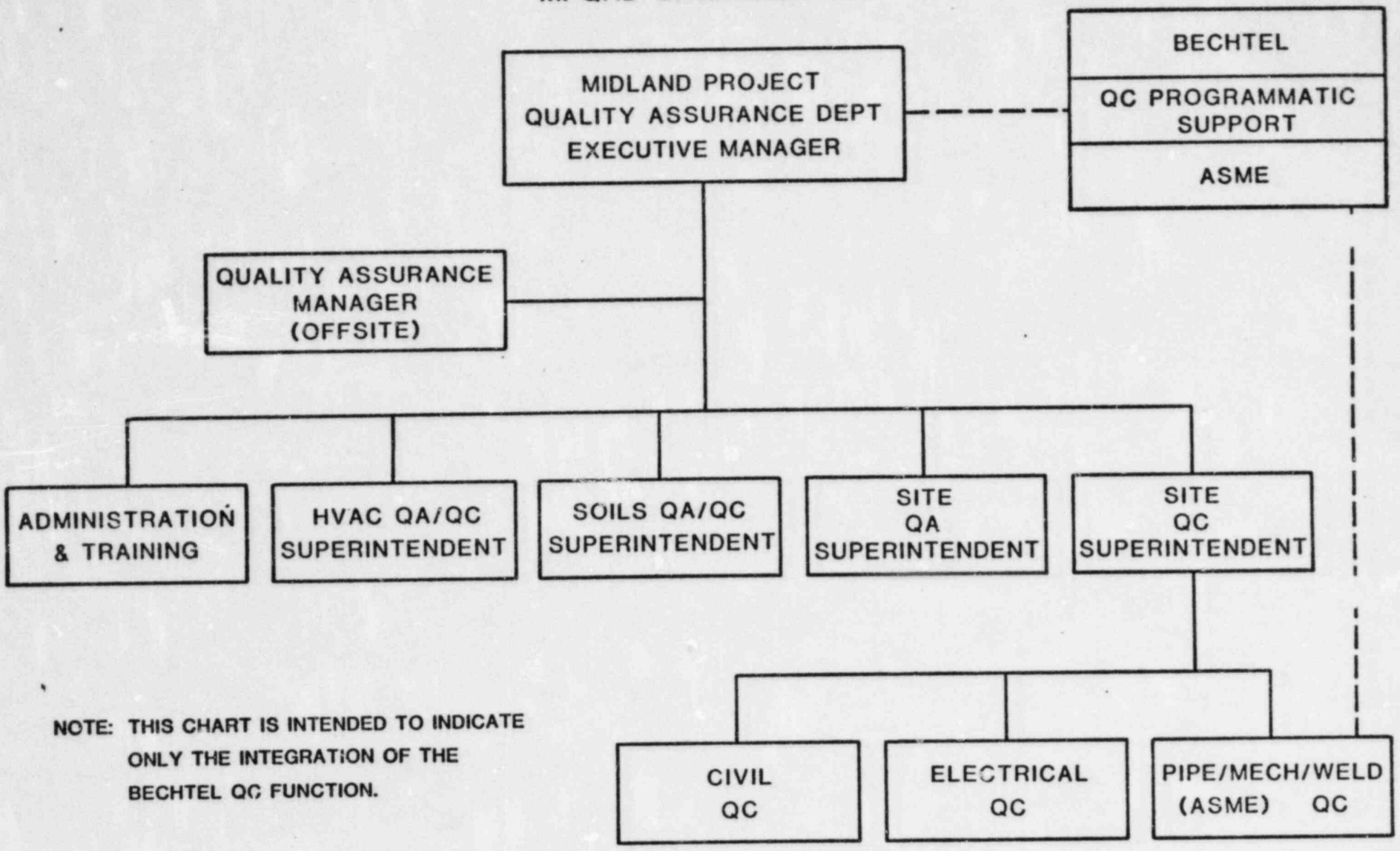
Establish New Organization

Advise NRC of the structure of the integrated organization.	12/15/82
Transfer the Bechtel QC Organization to MPQAD.	1/17/83
Submit changes to Topical Reports and quality program manuals to NRC.	2/17/83

Recertify QC Inspectors

Specify the revised training and examination requirements for certification (B-3M-1).	10/25/82
Complete recertification	4/01/83

FIGURE 3-1
MPQAD ORGANIZATION



NOTE: THIS CHART IS INTENDED TO INDICATE ONLY THE INTEGRATION OF THE BECHTEL QC FUNCTION.

4.0 PROGRAM PLANNING

4.1 Introduction

The detailed planning for the major portion of the Construction Completion Program is described in this section.

Planning in support of Phase 1 consists of the activities to set up a team organization to assess the installation and inspection status of Q-systems within major structures (Section 4.2) and to verify the adequacy of completed inspection effort (Section 4.3).

The Phase 2 planning effort covers the process and procedures that will be used by the team organization for systems completion work (Section 4.4). The procedures to integrate the quality program requirements with continuing systems completion work will be developed (Section 4.5).

4.2 Team Organization (Phase 1)

4.2.1 Introduction

Organize and train teams and prepare procedures for an installation and inspection status assessment.

4.2.2 Objective

1. Establish and implement a team organization ready to inspect and assess systems for installation and inspection status.

2. Develop the organizational processes and procedures necessary to implement the team approach for status assessment.

3. Provide training to ensure required inspection and installation status assessment activities are satisfactorily performed.

4.2.3 Description

1. The team organization structure will vary depending upon the assigned scope of work. The organization will consist of a team supervisor and personnel as appropriate from field engineering, planning, craft supervision, project engineering, NPQAD and Consumers Power Company Site Management Office. The team may be augmented by procurement personnel, subcontract coordinators and turnover coordinators.

   Teams will be assigned a specific scope of work and held accountable for status assessment and overall completion within this scope. The scope includes the requirements

to develop a viable working schedule and insure early identification and resolution of problem areas. Project processes and procedures will be reviewed and modified to incorporate the team organization. The team MPQAD representative is responsible for providing the QA/QC support for the team. He receives scheduling direction from the Team Supervisor and technical direction from MPQAD. For his team's work, he analyzes the quality requirements and plans the QC activities to integrate them with the team effort. He assures the necessary PQCI's and certified inspection personnel are available for performing the inspections. He maintains cognizance of the quality status of the verification activities.

The Washington Nuclear Plant #2 (WNP-2) team organization will be used as a starting point for a Midland specific approach.

A pilot team or teams will be utilized to develop and test processes and procedures during the development stage to assure that Program objectives can be met. This will also provide practical field input to assure that efficient and workable methods are used.

Team members will be physically located together to the extent practicable to improve communication, status assessment, problem identification and problem resolution.

2. Training for inspection and installation status assessment will be provided to team members. It will include responsibilities, reporting functions, indoctrination of project processes and procedures and familiarization with the project quality program to ensure effective implementation.

3. A separate organization of design engineers (presently existing) will coordinate spatial interaction, review and examination with the activities of these teams.

4.2.4 Schedule Status

. Designate pilot team.	1/21/83
. Complete grouping of systems for assignment to teams.	2/28/83
. Complete assignment of team supervisors and members to designated systems.	3/31/83

4.3 Quality Verification (Phase 1)

4.3.1 Introduction

The verification program is the activity undertaken to determine, using a variety of methods, that the inspections performed on completed work were done correctly.

4.3.2 Objectives

The objectives of the verification program are to:

- Review existing PQCI's and revise as necessary to assure that:

  a. Attributes important to the safety and reliability of specific components, systems, and structures are identified for verification.

  b. Accept/reject criteria are clearly identified.

  c. Appropriate controls, methods, inspection and/or testing equipment are specified.

  d. Requisite skill levels are required per ANSI N45.2.6 or SNT-TC-1A.

- Develop and implement verification inspection plan for completed work which considers:

  a. Re-inspection of accessible items.

  b. Review of documentation for attributes determined to be inaccessible for re-inspection.

  c. Sampling techniques using national standards.

4.3.3 Description

PQCI's will be revised as necessary to meet the objectives in Section 4.3.2. Verification of the quality of accessible completed contruction, which has been previously inspected will be performed by use of sampling plans based on MIL-S-105D (1963) or other acceptable methods. Attributes determined to be inaccessible for direct re-inspection due to embedment or the status of completed construction or installation (eg, weld preparation of completed welds, reinforcement in placed concrete, installed anchor bolts, etc) will be verified as appropriate, by examination of records.

4.3.4 Schedule Status

- Complete review and revision of PQCI's. (Date to be determined.)
- Establish verification inspection plan for completed work. (Date to be determined.)

4 4 System Completion Planning (Phase 2)

4.4.1 Introduction

Establish the processes for system completion, prepare procedures and expand training to cover systems completion work.

4.4.2 Objective

The objectives of the systems completion planning are as follows:

- Establish processes and interfaces for system completion.
- Prepare procedures defining tasks of each system completion team.
- Train team members by expanding upon training received previously for inspection and status assessment.
- Establish scheduling methods to be used during system completion activities.

4.4.3 Description

The team organization (developed in Section 4.2) and the processes and procedures will be extended to accomplish the systems completion work.

- Training will be conducted to assure that supervisors understand the team objectives and their role. Emphasis will be placed on completion of all work in accordance with the design requirements, the change control process used when the design must be modified, and changes to the established team processes and procedures.

4.4.4 Schedule Status

- Complete team preparation for systems completion work. (Date to be determined.)

4.5 QA/QC Systems Completion Planning (Phase 2)

4.5.1 Introduction

The QA/QC systems completion activity covers the planning to support of system completion work.

4.5.2 Objectives

Establish in-process inspection program and complete review and modification of PQCIs.

4.5.3 Description

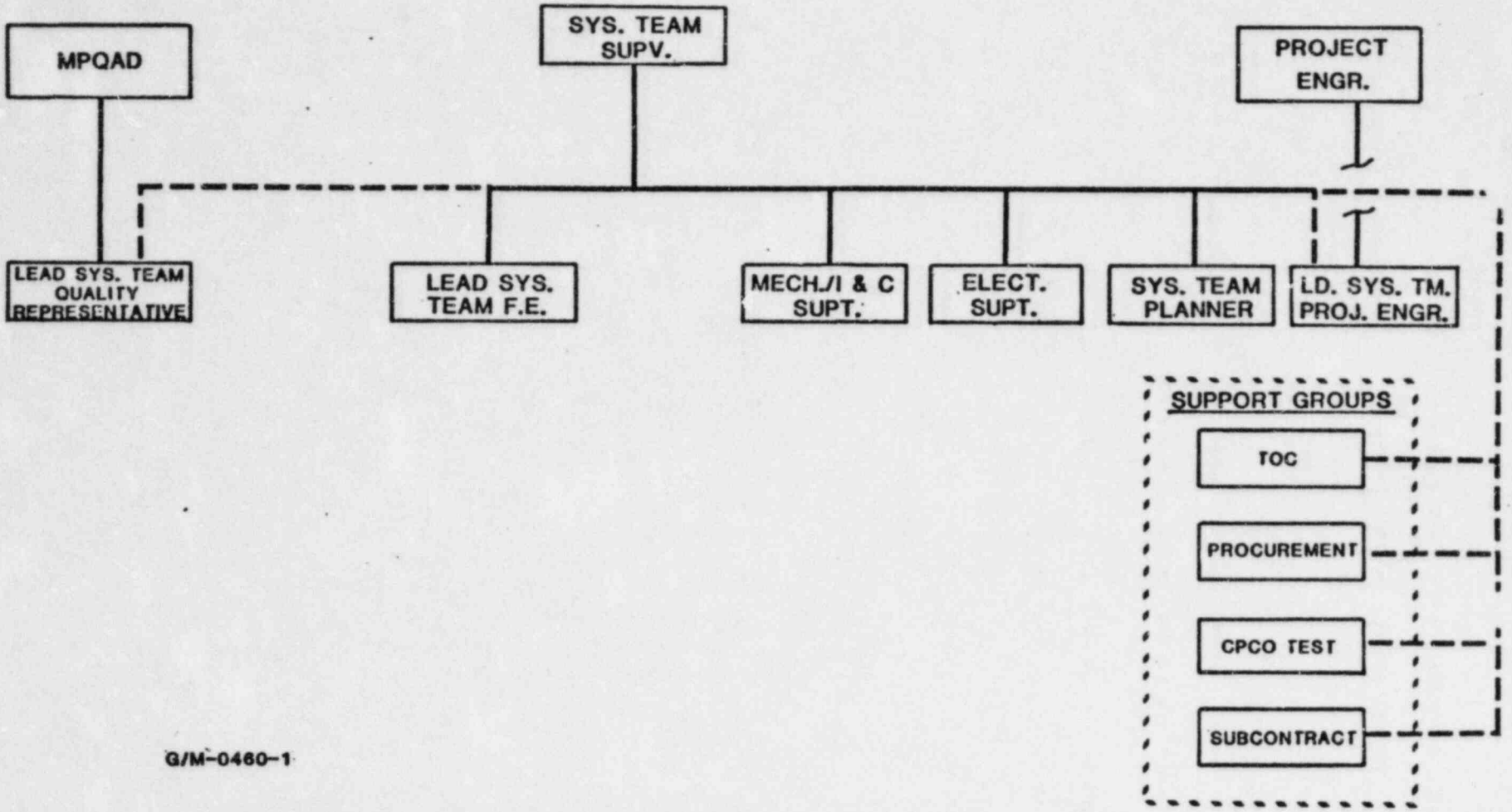
The QC in-process inspection program will be directly coordinated with future installation schedules to insure that inspection points, identified by MPQAD QA in the PQCI's, are integrated with the installation schedule. The identification of applicable PQCI's and required inspection points will be used by system completion teams to insure that QC inspections are adequately scheduled into the process. The system completion team quality representative will be responsible for providing the link between the system completion team and MPQAD to insure that quality requirements are satisfied.

PQCI's will be reviewed, and modified as necessary, to insure that proper attributes are being inspected, that inspection plans are clear and concise, that inspection points are specifically scheduled with installation activities and that inspection results are properly documented. MPQAD QA will be responsible for the PQCI review activity and will obtain assistance, as required, from other project functions, such as Project Engineering and Quality Control. Revised PQCI's will be used to conduct inspection of future installation activities.

4.5.4 Schedule Status

Issue procedure for integrating inspection points into the construction schedule. 2/22/83

FIGURE 4-1
CONCEPTUAL TEAM ORGANIZATION



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5.0 PROGRAM IMPLEMENTATION

5.1 Introduction

The implementation of the Phase 1 Construction Completion Program activities will be initiated after a management review of the overall process insures that Project performance and quality objectives have been addressed. The Phase 1 work will then be carried out by the various teams in accordance with the procedures described in the preceding sections. The installation and inspection status assessment of a system or partial system will be followed by a review of results by MPQAD and a second management review before initiating the Phase 2 systems completion work. The Phase 2 work will then be initiated on that system or partial system.

5.2 Objectives

The objectives to be met are:

- Establish the present installation completion and quality status.
- Integrate the construction and quality activities for all remaining work.
- Improve performance in demonstrated conformance to quality goals in all system completion work.

5.3 Description

Management Reviews

Project management will conduct formal review of the plans for implementation activities prior to initiation of team activities for the Phase 1 work. These reviews will ensure that identified project management and quality issues have been adequately addressed by specific actions and that Program objectives are met. The reviews will cover the process for both 1) the verification of completed inspection activity and 2) the installation and inspection status activity.

The installation and inspection status assessment will be performed on a system and/or area basis. Phase 2 is initiated after a formal Project management review of the first status assessment results to evaluate implementation effectiveness. After completion of this review, a work segment will be released for systems completion. Subsequent status assessment results will be reviewed by site management prior to initiation of additional systems completion segments. Reports will be made to Project management at regularly scheduled meetings.

Phase 1 Implementation

The existing installation and inspection status will be established in accordance with the plan presented in Section 4.

Evaluate Phase 1 Results

MPQAD will review the status assessment results to determine if any programmatic or implementation changes must be made. Verification scope will be adjusted, as necessary, based on evaluation results. Also, the evaluation will check for reportability to the NRC (as required by 10 CFR 50.55(e)) and Part 21.

Phase 2 Implementation

This activity starts systems completion for turnover. Work will be scheduled as installation and inspection status assessments are completed and reviewed. Correction of identified problems will be given priority over initiation of new work, as appropriate, and the system completion teams will schedule their work based on these priorities.

5.4 Schedule Status

- Complete Management review and initiate implementation of plan for verification of completed inspections. (Date to be determined.)
- Complete Management review and initiate implementation of plan for status assessment. (Date to be determined.)
- Complete Management review of initial installation and inspection status results and initiate systems completion work. (Date to be determined.)

6.0 QUALITY PROGRAM REVIEW

6.1 Introduction

The adequacy and completeness of the quality program is reviewed as part of the ongoing Project management attention to quality. These reviews consider any questions raised by NRC inspections or findings raised by third party evaluations.

6.2 Objective

Address issues raised by internal audits, NRC inspections and third party assessments. Program changes, if needed, will be evaluated and, as findings are processed, will be factored into the Project work.

6.3 Description

Consumers Power Company believes Midland QA program is sound. From time to time, questions arise on detailed aspects of the program or program implementation. The normal process of addressing these issues ensures that all necessary information is provided to NRC and that internal confidence in the program is maintained.

The recent inspection of the diesel generator building has raised several issues of programmatic concern. These are in the areas of material traceability, design control process, Q-system related requirements, document control and receipt inspection. Project management has directed that MPQAD provide an expeditious evaluation of these issues to be considered as part of the management review prior to initiation of Phase 2. Once the NRC inspection report is received and specified items are identified, these items will be addressed and resolved through the normal process of closing the inspection findings. Any corrective action or program changes will be implemented as appropriate in Project work on a schedule provided in the inspection report response.

The Project will also receive, from time to time, findings from third party assessments (Section 7). These findings or recommendations may also result in program modification or adjustments. Corrective action taken by the Project will be implemented on a schedule stated in the response to these findings.

7.0 THIRD PARTY REVIEWS

7.1 Introduction

This section describes third party evaluations and reviews that have been performed and are planned to assess the effectiveness of design and construction activity implementation. Third party reviews being conducted as part of the Remedial Soils Program are not included in this activity.

7.2 Objectives

To assist in improving Project implementation and assessment of Midland design and construction adequacy, consultants will be utilized in order to:

- Achieve a broad snapshot of current Project practices and performance in relation to a national program.
- Provide continuous monitoring and feedback to Management of Project performance.
- Identify any activities or organizational elements needing improvement.
- Improve confidence (including the NRC's and the public's) in overall Project adequacy.

7.3 Description

The use of consultants to overview Project design and construction activities with particular emphasis on construction is part of the effort to improve the Project's implementation of the quality program. Specifically, the plan overview employs the use of consultants for three separate functions: (1) To carry out a self-initiated evaluation (SIE) of the entire Project under the INPO Phase I program, (2) to utilize a third party overview of ongoing site construction activities to provide monitoring of the degree of implementation success achieved under the new program and (3) to conduct a third party Independent Design Verification (IDV) Program.

1. The INPO self-initiated evaluation was planned as part of an industry commitment to the NRC in response to concerns over nuclear plant construction quality assurance. For the Midland SIE, the evaluation was contracted to be carried out entirely by third party, experienced personnel from the Management Analysis Company.

   The evaluation was performed by a team of 17 consultants familiar with the INPO criteria and evaluation methodology. Over a period of a month they interviewed Project personnel at various locations and observed work in progress. The initial results of their evaluation have been presented to the Company

and a Project response to each finding will be prepared and included as part of the evaluation report to be submitted first to INPO and then to the NRC Region III Administrator, together with the INPO overview.

2. A third-party installation implementation overview is being undertaken using, as a model, the program developed specifically for the underpinning portion of the soils remedial work. The overview will be initiated by retaining an independent firm, having considerable experience and depth of personnel in the nuclear construction field. The consultant's overview team will be located at the Midland Plant site and will observe the work activities being conducted in accordance with this Plan on safety-related systems. The overview will continue for a period of six months, after which the Project's cumulative performance will be evaluated. Based on the overview team's findings, a determination will be made by the Company's top management on what modification, if any, should be made to the consultant's scope of work. Findings identified by the installation overview team will be made available to the NRC in accordance with the procedures established for the conduct of independent verification programs.

3. An Independent Design Verification (IDV) is being conducted by Tera Corporation.

   The IDV is directed at verifying the quality of design and construction for the Midland Plant. The approach selected is a review and evaluation of a detailed "vertical slice" of the Project design and construction. The design and as-built configuration of two selected safety systems will be reviewed to assure their adequacy to function in accordance with their safety design bases and to assure applicable licensing commitments have been properly implemented. The field work done in support of this activity will not take place until after Phase I implementation (Section 5) has been completed on the systems being reviewed.

   The Unit 2 Auxiliary Feedwater System (AFW) plus another system to be selected with NRC concurrence, will be reviewed to fulfill the requirements of the IDV.

7.4 Status/Schedule

1. INPO Construction Project Evaluation

Select consultant and conduct evaluation	Complete
Submit report to INPO	Jan 20, 1983

2. Independent Construction Overview

Define scope	Dec 30, 1982
Select consultant	Jan 31, 1983
Mobilize assessment team	(Date to be determined)
Receive assessment team report	(Date to be determined)

3. IDV

Select 2 Systems	
.AFW System	Complete
.Obtain NRC concurrence for second system.	(Date to de determined)
Complete Evaluation	(Date to be determined)

8.0 SYSTEM LAYUP

8.1 Introduction

Perform system lay-up activities to protect plant equipment.

8.2 Objectives

Expand the protection of completed and partially completed plant systems and components until plant start-up, to take into account any special considerations during the status assessment.

8.3 Description

Procedures and instructions are provided in the Testing Program Manual to protect equipment during the on-going installation and test work. These will be extended to cover special considerations associated with the Program implementation. Both the pre- and post-turnover periods are covered. System and component integrity is ensured through existing programs and implementation of control and verification procedures.

In summary, these procedures and instructions require: Test Engineers to complete walkdowns of Q-Systems (in the auxiliary, diesel generator and containment buildings and the service water pump structure), paying particular attention to systems/components that are open to the atmosphere (eg open ended pipes, open tanks, missing spools, disconnected instrument lines, etc). Systems that have been hydrotested but are not currently in controlled layup require action to place the system in layup. Layup will vary from system to system but in general will consist of air blowing to remove moisture and closing the system from the atmosphere.

8.4 Schedule/Status

. Start extended layup activities	1/15/83
. Issue walk down schedules	1/15/83
. Complete the layup preparation walkdown	2/28/83

9.0 CONTINUING WORK ACTIVITIES

9.1 Introduction

This section describes the activities that are proceeding in accordance with previously established commitments during the implementation of the Program.

9.2 Objectives

- Maintain installation and support effort on work that will alleviate work interference in congested portions of the plant and facilitate completion and protection of equipment on systems turned over to Consumers Power Company.

- Meet previous NRC commitments on activities which do not impede the execution of the Program.

- Provide design support for orderly system completion work and resolution of identified issues

- Establish a management control to initiate additional specified work that can proceed outside of the systems completion activities

9.3 Description

Those activities that have demonstrated effectiveness in the Quality Program implementation will continue during implementation of the Construction Program.

These are:

1. NSSS Installation of systems and components being carried out by B&W Construction Company.

2. HVAC Installation work being performed by Zack Company. Welding activities currently on hold will be resumed as the identified problems are resolved.

3. Post system turnover work, which is under the direct control of Consumers Power Company, will be released as appropriate using established work authorization procedures.

4. Hanger and cable re-inspections which will proceed according to separately established commitments to NRC.

5. Remedial Soils work which is proceeding as authorized by NRC.

6. Design engineering which will continue for the Midland Plant as will engineering support of other project activites.

Additional activities related to the systems completion effort, may be initiated, as appropriate, to support orderly completion of the overall Project. Any activities in this category that are initiated prior to release of an area for systems completion work will be reviewed with the NRC Resident Inspector before initiation.

9.4 Status Schedule

These activities are proceeding with schedules that are independent of this Plan.

Consumers Power Company

James W Cook
Vice President - Projects, Engineering and Construction

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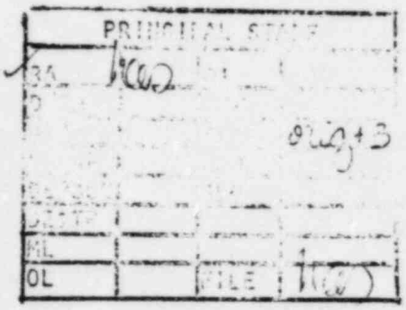
December 3, 1982



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MIDLAND NUCLEAR COGENERATION PLANT
MIDLAND DOCKET NOS 50-329, 50-330
MIDLAND PLANT INDEPENDENT REVIEW PROGRAM
FILE: B1.1.5 SERIAL: 19750

REFERENCES: (1) J W COOK LETTER TO H R DENTON AND J G KEPPLER, SERIAL 18879 DATED 10/5/82

(2) NRC SUMMARY DATED 11/8/82 OF 10/25/82 MEETING ON INDEPENDENT DESIGN VERIFICATION

Reference (1) provided a description of the Midland Plant Independent Review Program. Reference (2) summarized the October 25, 1982 meeting wherein Consumers Power Company and their contractors, Management Analysis Company (MAC) and Tera, discussed in more detail the Independent Review Program. During this meeting, questions posed by the Staff were responded to by the Company and its contractors.

At the end of the meeting, Consumers Power Company requested the Staff to provide the applicant with policy guidance on the proposed Independent Review Program. The Staff agreed to provide preliminary feedback to Consumers Power Company by October 29, 1982 and to arrange for additional meetings as deemed appropriate. This was subsequently done and an additional meeting was held on November 5, 1982 to provide the NRR Staff more details of the Stone and Webster third party assessment of the implementation of the soils underpinning work.

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Based upon the meeting of October 25, 1982 and subsequent feedback from the NRC Staff, Consumers Power proposes the following changes to the Independent Review Program as submitted in Reference (1) and discussed at the October 25, 1982 meeting:

(1) The three specific evaluations will not be combined into a single program with coordination of the individual reports by MAC.

(2) The Tera Independent Design Verification (IDV) effort will be completely separate from the MAC effort with neither subcontractor having members from their company involved in the other company's efforts.

(3) The Tera IDV will be on the Auxiliary Feedwater System (AFWS) as originally planned, and will also be implemented on another system which the Staff is to select based on three candidates provided by Consumers Power Company on a risk assessment basis. The three candidate systems proposed by Consumers Power Company are:

    a. Electric Power System (Diesel Generator)
    b. Safeguards Chilled Water System
    c. Containment Isolation System

(4) The Tera IDV will be expanded to include a more in-depth review of construction activities to provide assurance of as-built construction adequacy of the systems included in the Tera (IDV).

(5) For the IDV, any discussions between project personnel and Tera on confirmed findings will take place in formal meetings with the NRC being notified of the meetings in time to attend, if they desire.

(6) For the INPO Construction Project Evaluation, a copy of the final report will be given to the NRC when it is sent to INPO.

We believe that this letter documents the conclusions reached between our organizations regarding the Midland Independent Review.

James W. Cook

JWC/GSK/bjb

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CONSUMERS POWER COMPANY
Midland Units 1 and 2
Docket No 50-329, 50-330

Letter Serial 19750 Dated December 3, 1982

At the request of the Commission and pursuant to the Atomic Energy Act of 1954, and the Energy Reorganization Act of 1974, as amended and the Commission's Rules and Regulations thereunder, Consumers Power Company submits Midland Plant Independent Review Program.

CONSUMERS POWER COMPANY

By _____
J W Cook, Vice President
Projects, Engineering and Construction

Sworn and subscribed before me this 3 day of December, 1982

_____
Notary Public
Jackson County, Michigan

My Commission Expires September 8, 1984

oc0982-0249a100

12/2/82
RFW

PRESENTATION TO NRC

CONSTRUCTION COMPLETION PROGRAM (CCP)

AGENDA

INTRODUCTION

EVALUATION CRITERIA

BASIC PROGRAM DESCRIPTION

DETAILED PLAN DISCUSSION

PLAN RESPONSES TO CRITERIA

EVALUATION CRITERIA

EVALUATION CRITERIA

TO REBUILD CONFIDENCE IN BECHTEL "Q" WORK THE PROGRAM MUST:

1. BRING PLANT INSPECTION STATUS UP TO DATE AS SOON AS POSSIBLE.

2. VERIFY THAT QUALITY ISSUES IN PAST WORK HAVE BEEN IDENTIFIED AND ARE BEING TRACKED.

3. PROVIDE AN INSPECTION PROGRAM THAT CLOSELY TRACKS ALL FUTURE CONSTRUCTION.

4. INSURE THAT ANY NEW WORK DOES NOT COVER UP PAST PROBLEMS.

5. INSURE THAT THE PLAN IS FULLY CONTROLLED BY CPCo AND MONITORED BY KNOWLEDGEABLE PERSONNEL.

6. IDENTIFY AND PROVIDE SUFFICIENT RESOURCES TO ACCOMPLISH THE PLAN.

7. BE SPECIFIC ENOUGH FOR A SATISFACTORY MUTUAL UNDERSTANDING AMONG ALL PARTIES.

8. RESOLVE OUTSTANDING QUESTIONS REGARDING QA PROGRAM.

9. GIVE CONSIDERATION TO ORDERLY AND EFFICIENT CONDUCT OF THE PROJECT.

10. PROVIDE FLEXIBILITY FOR PLAN ADJUSTMENT AS REQUIRED BASED ON INITIAL FINDINGS.

CONSTRUCTION COMPLETION PROGRAM (CCP)

THEME OF CCP

IMPROVE PROJECT PERFORMANCE (FORWARD)
AND DETERMINE THE STATUS OF THE PLANT (BACKWARD)

CCP

REDUCE MANUAL MANPOWER ON THE PROJECT TO ACCOMPLISH THE FOLLOWING:

- WORK NON-Q SYSTEMS TO COMPLETION AS SOON AS POSSIBLE
- PROVIDE STAFFING TO WORK OFF TURNOVER EXCEPTIONS AND SUPPORT TEST ACTIVITIES ON TURNED-OVER SYSTEMS
- IMPLEMENT THE BUILDING CONSTRUCTION COMPLETION PROGRAM (SEE NEXT PAGE)
- COMPLETE ZACK ACTIVITIES
- COMPLETE B&W ACTIVITIES
- PERFORM REMEDIAL SOILS WORK

CONTINUE WITH QA REINSPECTION

- CABLE
- HANGERS

SPECIFIC BUILDING CCP

A. PREPARE THE BUILDING FOR REINSPECTION (COORDINATED WITHDRAWAL)

REMOVE ALL CONSTRUCTION MATERIAL AND CLEAN ALL AREAS OF THE BUILDING.

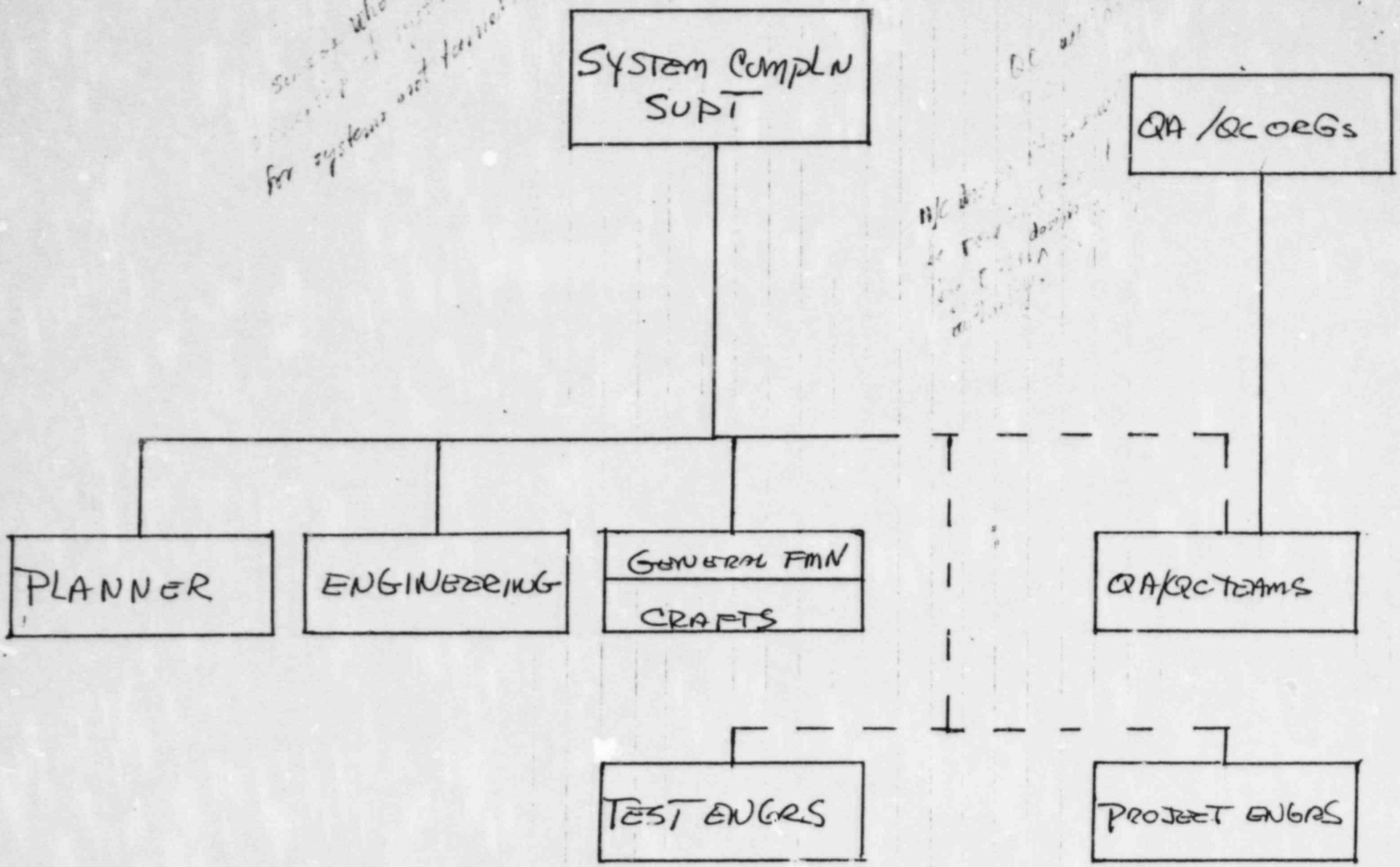
AS WITHDRAWAL IS MADE, PLACE SYSTEMS AND EQUIPMENT IN LAYUP (TEST ENGINEERS TO COORDINATE). COMPLETE CONSTRUCTION NECESSARY TO LAYUP EQUIPMENT.

ALL CONSTRUCTION EQUIPMENT REMOVED TO AN AREA FOR INSPECTION AND SCRAPPING AS NECESSARY.

B. AS AREAS ARE CLEANED, ASSEMBLE SYSTEM TEAMS (SEE NEXT SHEET) AND PERFORM AN INSPECTION OF THE AUXILIARY BUILDING ON A SYSTEM-BY-SYSTEM BASIS. INCLUDE ENGINEERING WALKDOWNS (SEISMIC II/I, PROXIMITY, ETC) AS PRACTICABLE.

C. AFTER A REVIEW OF THE SYSTEM OPEN ITEMS, COMPLETE CONSTRUCTION ON A SYSTEM BASIS AND TURN OVER TO CPCo.

D. AS THE AUXILIARY BUILDING PROGRAM DEVELOPS, MOVE INTO THE DIESEL BUILDING AND THE CONTAINMENTS. SERVICE WATER PUMP STRUCTURE TO BE LAST DUE TO THE NUMBER OF SYSTEMS IN THAT BUILDING THAT HAVE BEEN THROUGH THE TURNOVER PROCESS.



CONCEPTUAL TEAM ORGANIZATIONS

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Consumers Power Company

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October 5, 1982

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MIDLAND NUCLEAR COGENERATION PLANT
MIDLAND DOCKET NOS 50-329, 50-330
MIDLAND PLANT INDEPENDENT REVIEW PROGRAM
FILE: 0485.16 SERIAL: 18879

REFERENCES: (1) R L TEDESCO LETTER TO J W COOK DATED JULY 9, 1982.
(2) J W COOK LETTER TO H R DENTON, SERIAL 18850 DATED SEPTEMBER 17, 1982.

ENCLOSURES: (1) MIDLAND PLANT INDEPENDENT REVIEW PROGRAM
(2) PERFORMANCE OBJECTIVES AND CRITERIA FOR CONSTRUCTION PROJECT EVALUATION INPO, SEPTEMBER 1982

The ACRS interim report on the Midland Plant, dated June 8, 1982, contained a recommendation for a broader assessment of Midland's design adequacy and construction quality. In its correspondence of July 9, 1982, which is Reference 1 above, the NRC endorsed this ACRS recommendation and requested our proposal for performing an independent design adequacy review.

We briefly outlined several assessment activities for the Midland Project in our correspondence of September 17, 1982, identified above as Reference 2. Additional details of the program referred to in Reference 2 are enclosed for the NRC's review.

We have contacted our NRC Project Manager, Darl Hood, to arrange a meeting with the NRC Staff to discuss our Independent Review Program and to receive your concurrence or redirection of our plans. We will complete the planning phase, including team orientation and training, for the INPO program by

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OCT 7 1982

October 29, 1982. We wish to initiate the implementation phase of the INPO program by November 8, 1982, in order to support our own and industry commitments to NRC.

James W. Cook

JWC/GSK/RLT/bjw

CC Atomic Safety and Licensing Appeal Board, w/a 1
CBechhoefer, ASLB, w/a 1
MMCherry, Esq, w/a 1
FPCowan, ASLB, w/a 1
RJCook, Midland Resident Inspector, w/a 1 & 2
RSDecker. ASLB, w/a 1
SGadler, Esq, w/a 1
JHarbour, ASLB, w/a 1
GHarstead, Harstead Engineering, w/a 1
DSHood, NRC, w/a 1 & 2 (2)
FJKelley, Esq, w/a 1
WHMarshall, w/a 1
WDPatton, Esq, w/a 1
WDShafer, NRC, w/a 1 & 2
BStamiris, w/a 1
MSinclair, w/a 1
LLBishop, Esq, w/a 1

CONSUMERS POWER COMPANY
Midland Units 1 and 2
Docket No 50-329, 50-330

Letter Serial 18879 Dated October 5, 1982

At the request of the Commission and pursuant to the Atomic Energy Act of 1954, and the Energy Reorganization Act of 1974, as amended and the Commission's Rules and Regulations thereunder, Consumers Power Company submits Midland Plant Independent Review Program.

CONSUMERS POWER COMPANY

By J W Cook
J W Cook, Vice President
Projects, Engineering and Construction

Sworn and subscribed before me this 5 day of Oct, 1982.

Barbara R Townsend
Notary Public
Jackson County, Michigan

My Commission Expires September 8, 1984

oc0982-0249a100

MIDLAND PLANT INDEPENDENT REVIEW

1. INTRODUCTION & SUMMARY
2. BIENNIAL QUALITY AUDITS
3. INPO CONSTRUCTION EVALUATION
4. INDEPENDENT DESIGN VERIFICATION
5. APPENDIX: PREVIOUS ASSESSMENTS

1. INTRODUCTION AND SUMMARY

The ACRS report dated June 8, 1982 on Midland Units 1 and 2 stated that "the NRC should arrange for a broader assessment of Midland's design adequacy and construction quality with emphasis on installed electrical, control, and mechanical equipment as well as piping and foundations."

On July 9, 1982, the Staff issued a letter to Consumers Power Company requesting a report on Midland Design Adequacy and Construction Quality. In this letter, the Staff stated that "With respect to assessment of Midland's design adequacy, such assessment would represent a significant contribution to the licensing review process if performed by a qualified, independent source following procedures utilized by some operating plants for Independent Design Verifications."

On September 17, 1982, the Company issued a letter to Mr Harold R Denton and Mr J G Keppler outlining the approach Consumers Power Company proposed for an Independent Review of the Midland Project and indicated that there had also been a Bechtel Corporate Staff project evaluation performed (described in more detail in attached appendix). It was stated that Consumers Power Company believes that the approach we are proposing for the forthcoming Independent Review will give a broader overview than assessments currently being recommended by the NRC for other NTOL plants.

(1) The overall Independent Review Program described herein consists of three specific evaluations combined into a single program. The INPO type construction evaluation (horizontal type review) will examine the current

overall project against the criteria developed by INPO for this program (a copy of the INPO Performance Objectives and Criteria for Construction Project Evaluations is attached). As indicated in the September 17, 1982 letter to Mr Denton and Mr Keppler, the INPO program for Midland will be different from most of industry's self-initiated evaluations in that an independent contractor rather than utility personnel will carry out the INPO evaluation.

(2) The second part of the Program described is the Biennial QA Audit which has been a requirement of the Company's QA Program for several years. The third

(3) part of the Program described in more detail is the Independent Design Verification (Vertical slice of all aspects, historical and current, of a critical plant system or subsystem).

Consumers Power Company received proposals from several potential contractors to perform the complete program described above. With respect to the INPO type construction evaluation and Biennial QA Audit, we have selected

#2 Management Analysis Company (MAC) to perform these activities based on our evaluation of their technical capabilities and experience.

MAC has many years of experience in the Nuclear Industry and has performed Biennial QA Audits in addition to other type reviews of Company activities. MAC has previously consulted extensively at nuclear construction sites with identifed QA problems. MAC was also a major participant in the development and implementation of the Palisades Regulatory Performance Improvement Program which has resulted in significant improvement to date at that facility. A description of other MAC assessments of Midland activities is included in the Appendix to this document.

The MAC Team will be under the direction of Mr L J Kube who has over 20 years experience in project management, engineering management, marketing, planning/scheduling, and design engineering having been employed by General Atomic and A O Smith Corporation prior to his employment with MAC. Mr Kube has been involved in the development of the INPO evaluation criteria, has participated in the three INPO Pilot evaluations and is the Project Manager for MAC for conducting an INPO evaluation on River Bend. The INPO type evaluation will be independent in that no Consumers Power Company or Bechtel personnel will be involved and MAC has never performed a direct line engineering or construction activity for Consumers Power Company.

(3) For performance of the Independent Design Verification, we have selected Tera Corporation based on our evaluation of their technical capabilities and experience. Tera has many years of varied experience in the nuclear industry including independent design reviews, FSAR preparation, initial design of certain systems, and engineering, construction, operation and administration planning. Tera personnel are experienced in system design in the areas of mechanical, electrical, structural, and thermal hydraulic evaluations. Mr John W Beck, Vice President of Tera will be Project Manager for the Tera team. Mr Beck previously worked for Vermont Yankee Nuclear Power Corp as Executive Vice President serving as Chief Operating Officer. Prior to that he was Director of Engineering for Yankee Atomic Electric Co responsible for supervision and management of the plant, reactor, and environmental engineering departments. Prior to employment with Yankee, he was a Scientist at Bettis involved in Shippingport core design.

Individuals taking part in any of the three specific evaluations which make up the overall Independent Review Program will meet the "Independency Criteria" of Chairman Palladino's February 1, 1982 letter to Representative John Dingell and which are described as follows:

1. No individuals on the Project team will have been previously utilized by Consumers Power Company to perform design or construction work.

2. No individual involved will have been previously employed by Consumers Power Company.

3. No individual owns or controls significant amounts of Consumers Power Company stock.

4. No members of the present household of individuals involved are employed by Consumers Power Company.

5. No relatives of individuals involved are employed by Consumers Power Company in a management capacity.

MAC will be responsible for integrating an overall evaluation report made up of the three inputs.

The major objective of the overall evaluation report is to provide the NRC, ACRS, and the Consumers Power Company Chief Executive Officer with an assessment of the overall quality of the Midland Project. We believe that this assessment will adequately address the NRC, ACRS, and public's questions regarding the adequacy and construction quality of the plant.

The final report will be submitted to the NRC and an auditable record will be maintained of all comments on any draft or final reports, any changes made as a result of such comments, and the reasons for such changes.

2. BIENNIAL QUALITY AUDITS

Background Of Biennial Quality Audit Requirements

The Consumers Power Company Quality Assurance Program Manual For The Midland Nuclear Plant, Topical Report CPC-1-A, requires the review of the Consumers Power Corporate Nuclear Quality Assurance Program to be performed at least once every 24 months or once every second calendar year by a Quality Assurance Program Audit (referred to as the Biennial Quality Audit).

This audit may be accomplished by a team consisting of Environmental & Quality Assurance personnel, selected employees from other Consumers Power Company departments or by an audit team of Quality Assurance personnel under contract to Consumers Power Company.

Plans For The 1982 Biennial Quality Audit

The scope of the 1982 Biennial Quality Audit will be similar to the audits conducted in 1976, 1978 and 1980. The audit will evaluate the Quality Assurance Program being utilized by Consumers Power Company and by Bechtel and will evaluate on a sampling basis, the degree of compliance with the Program by Consumers Power Company and by Bechtel. Specifically, the 1982 Biennial Quality Audit will be conducted by Management Analysis Company (MAC) and will comply with the requirements of NRC Regulatory Guides 1.144 (9/80, Rev 1) and 1.146 (8/80, Rev 0).

→ We need to review past audits & see if they are comprehensive enough.

3. INPO CONSTRUCTION EVALUATION

The magnitude of this effort is not clear.

General

In early 1982, utility nuclear power plant construction problems stimulated industry initiative and action to ensure that programs in effect nationwide meet performance goals as intended. Accordingly, the Institute of Nuclear Power Operations (INPO) was tasked by the Utility Industry to develop and manage a construction project evaluation program. The first effort was to define Performance Objectives and Criteria for project evaluations. Use of these criteria for an overall evaluation is intended to provide considerably more depth than an audit, for an audit generally does not go beyond conformance to program requirements. The evaluations include some assessment of administrative and quality records, but more important, focus on evaluating the success and efficiency of the project organization, systems and procedures in achieving the desired end results.

Following the drafting of the Performance Objectives, three pilot evaluations were conducted by INPO on plants under construction ie, Vogtle, Shearon Harris, and Hope Creek. During the last pilot a representative from NRC was present during data collection, evaluation and exit interview with utility personnel.

Following the pilot evaluations, the Performance Objectives and associated Criteria were modified to reflect experiences gained. A copy of the criteria to be used for the INPO evaluation is attached.

The performance objectives are broad in scope; each generally covers a single, well-defined area. The supporting criteria are more narrowly focused statements of activities that support or help meet the performance objectives. Several criteria are listed under each performance objective.

There are five Performance Objectives and associated Criteria which specifically address design effort. These are:

DC.1 Design Input

Process for defining and controlling design input

DC.2 Design Interfaces

The identification and coordination of interfaces to ensure input requirements are satisfied

DC.3 Design Process

Process followed to ensure safe, reliable and verifiable designs in compliance with requirements

DC.4 Design Output

Development of designs which are complete, accurate, understandable and constructable

DC.5 Design Changes

What about engineering approval of dispositions of NR's, etc.?

Control of changes to ensure compliance with design requirements

In addition there are numerous Performance Objectives which support evaluating design control. These include: Construction Engineering, Project Planning, Training, Independent Assessments, etc.

The above INPO Performance Objectives and associated Criteria will be utilized for planning the Independent Design Verification.

The INPO type self evaluation is aimed at achieving a level of performance above that required to meet Regulatory Requirements. Members of 35 Utilities (including Consumers Power) met, drafted and reviewed performance objectives and criteria to support the performance objectives of seven areas including design. A complete list of the areas whose objectives are intended to define optimum performance is:

Organization and Administration

Design Control

Construction Control

Process Support

Training

Quality Programs

Test Control

The thrust of this type of evaluation is that if utilities attempt to meet standards above those normally required to achieve quality, there will be greater assurance that Regulatory Requirements are met. The program was then applied during three pilot evaluations and modified based on the experience gained during the pilot evaluations. It essentially looks at all aspects of work in progress. This program has been developed during the calendar year 1982 and industry has made a commitment to the NRC to initiate INPO type evaluation on nuclear plants under construction by the end of 1982. The only exceptions will include those plants very close to fuel load.

Consumers Power Company selected MAC to perform the INPO Construction Evaluation primarily because of MAC's involvement in the development of the Performance Objectives and participation in all three pilot evaluations. The team supplied by MAC will be individuals experienced in multi-discipline activities associated with nuclear power plant engineering and construction. In addition, team members will be experienced in interviewing and evaluating ie, the type of activity MAC has been performing for the nuclear industry over the past seven years.

PREPARATION FOR INPO TYPE EVALUATION

We need to have an idea of how extensive this will be.

The evaluation team leader will review the job status, select work areas to be evaluated and select team members based on the above. A request will then be made to CP Co for background documents. The team will then review the documents and prepare a schedule. Individual assignments will also be made.

HOW MANY?

Is this sufficient?

Three Tera members of the team organization representing Civil, Mechanical, and Electrical disciplines will be part of the MAC INPO type evaluation team.

OK

Prior to actually performing the evaluation, all team members will receive training in plant orientation, procedures and INPO evaluation techniques.

PERFORMING THE EVALUATION

The entire evaluation team will initially meet at the Site to review the work in progress. Sections of the team will then move to the Designer's and Owner's Offices. Team members will then begin the task of collecting pertinant facts relative to various aspects of the job via observations, inspections, discussions and review of documents. These facts will be assigned to the appropriate performance objective and reviewed against that

interviews?

objective. As findings develop, additional investigations may take place. During this time, the team will communicate with the project personnel to assure validity of findings and draft evaluation summaries will be prepared.

I'm not sure what this means

REPORTING

At the conclusion of the evaluation, the team will verbally communicate their findings to the project (NRC to be present). A formal report will then be prepared and presented simultaneously to CP Co management and the NRC. CP Co will acknowledge the findings and transmit the findings with their plans for corrective action ~~concurrently~~ OK to the NRC and INPO. INPO will assimilate various utilities reports into a comprehensive summary document and report the overall program progress to the NRC.

4. INDEPENDENT DESIGN VERIFICATION

Goals and Objectives

The independent design review is directed at verifying the quality of design engineering for the Midland Plant. The approach selected is a review and evaluation of a detailed "vertical slice" of the project design by a technically competent, independent organization. The design and as-built configuration of a selected safety system will be reviewed to assure its adequacy to function in accordance with its safety design bases and to assure applicable licensing commitments have been properly implemented. Also we want them to look at the as-built condition to assure the adequacy of construction.

Summary and Scope of Effort

The independent design verification (IDV) will consist of an independent design review of the Unit 2 auxiliary feedwater system (AFW) as an applicable sample of the design engineering effort at Midland Plant. This system was selected based upon system selection criteria discussed below. The review will be conducted by Tera Corporation and will utilize a multidisciplinary team of senior staff personnel to assure that the design and as-built configuration of the AFW conforms to its safety design bases and Consumers Power Company's licensing commitments as a benchmark for its acceptability. The design process, from concept to installation, will be identified and interfaces between design engineers evaluated to assure sufficient controls were placed on the transfer and specification of important design information. Although the review will focus on the AFW, the interfacing systems will be reviewed to determine that appropriate design constraints were imposed to

I think they should also do a different system in Unit 2.

assure functionability of the AFW. Initially, important design elements for AFW will be outlined to assure the IDV includes an appropriate sample of the design interfaces between Consumers Power, B&W the nuclear steam supply system (NSSS) vendor, Bechtel the architect engineer, and other service related contractors. Design elements such as environmental qualification envelopes, seismic analysis, hydraulics and system control requirements will be selected to allow a diverse review of the various engineering disciplines (eg, Mechanical, Civil, Electrical). The design reviews in each area will evaluate the design approach used and, where appropriate, independent analytical techniques will be used to confirm questionable approaches or to permit assessment of the significance of any identified discrepancies.

To assure that the installed equipment reflects system design requirements, design specifications and drawings will be reviewed and in-field inspection of selected sections of the AFW conducted. The in-field inspection will confirm that the AFW is configured as specified in the design documents.

Throughout the IDV, all findings will be documented by each reviewer. Each finding will then be evaluated by the team leaders and more significant findings forwarded to a senior review team. At the conclusion of the effort, a preliminary report will be provided to Consumers Power and the original designers for review and provision of additional documentation that could have an impact on the final report findings. An auditable record of comments and additional information provided will be maintained. The final report will summarize the work accomplished, procedures used and a complete list and description of all findings from the review.

System Selection Criteria

The selection of a system to be reviewed by the independent contractor was based on the six criteria which follow.

- Importance to Safety - The system should have a relatively high level of importance to the overall safety of the Midland Plant.

- Inclusion of Design Interfaces - The system should be one which involves multiple design interfaces among engineering disciplines as well as design organizations, such as the NSSS vendor, architect engineer and sub-tier contractors. The system should also be one where design changes have occured and thus provide the ability to test the effectiveness of the design process exercised by principal internal and external organizations or disciplines in areas of design change.

- Ability to Extrapolate Results - The system should be sufficiently representative of other safety systems such that the design criteria, design control process and the design change process are similar so that extrapolation of findings to other systems can be undertaken with confidence.

- Diverse in Content - The major engineering disciplines should all have input to the design of the system.

- Sensitive to Previous Experience - The system should be one which includes design disciplines or interfaces which have previously exhibited problems and thus a test of the system should be indicative of any generic condition.

Ability to Test As-Built Installation - The system construction should be sufficiently completed that the as-built configuration can be verified against design.

The auxiliary feedwater system was selected for the independent design review after consideration of a number of other candidate systems. The auxiliary feedwater system had a sufficiently high profile for each of the criterion to justify its selection. Specifically, it involves interface with the NSSS vendor criteria, with containment design criteria, interface with design organizations, and the methodology of determining a water system's mechanical, electrical, and control component design criteria.

Technical Approach

The independent design verification (IDV) effort is comprised of three phases; Program Development, Review and Reporting.

The Program Development Phase includes the preparation of an IDV work plan and the development of a detailed review scope. The IDV work plan will include procedures and instructions for the work to be performed by Tera Corporation, the IDV contractor. An initial identification of the specific verification methods and depth of review to be utilized in addressing system design elements will also be completed as part of this phase.

The Review phase is the major activity of the IDV. This phase includes a design review of the systems as well as a field installation/as-built review to assure conformance of the design and the constructed facility. Initial efforts of the system design review will focus on the identification of the design process (chain) for the selected system. Emphasis will be placed on identifying design organizations and their subelements who contributed to the design and understanding the design practices and interactions between the design engineers. Paralleling this effort, the design and licensing criteria will be reviewed. It is anticipated that system design criteria information will include utility, B&W and Bechtel design requirements, licensing commitments, as well as other sub-tier documents.

The methods to be utilized in the review of system design elements will vary in depth. Depending upon the design area, the specific method may be a review of design criteria, a review of design calculations, a "blind" confirmatory

evaluation (eg alternative calculation or computer analysis by the IDV contractor) or a combination. Where appropriate, independent analytical techniques will be used to confirm design calculations or to permit assessment of the significance of any identified discrepencies. It is anticipated that the primary review method will be a review of calculations. Ultimately, the choice of review method will depend upon the nature of the design area and the type of verification method which is most effective in enabling the IDV reviews to reach a judgement as to the design adequacy in that design area.

This review will concentrate on each major step in the design process, for example:

- Design input information (transfer among designers, conformance with design criteria and commitments).
- Analyses and Calculations (selected review of inputs, assumptions, methodology, validation and usage of computer programs and reasonableness of certain analytical outputs).
- Drawings and Specifications (selected reviews for conformance with system design criteria, commitments, and incorporation of results of analyses and calculations).
- Field Verification (audit to assure that the as-built configuration reflects design requirements and pre-operational tests verify design analyses)

Findings from the INPO review as well as input from other sources such as, audit reports, 50.55e reports, design change reports and other documents will

This conveys the idea that the review will only be of part of the AFW. I believe it should be considerably more extensive.

also be considered to concentrate review in more depth in any areas where the design process may be suspect by historical evidence.

The IDV review scope will be broad enough in terms of design elements to include samples from each significant design organization, design interface and major engineering discipline.

The design elements to be evaluated include:

- Civil/Structural design of structures housing the AFW (eg, external or internal flooding, wind or tornado loads, seismic analysis, foundation design or missile protection).

- Mechanical/Electrical design of AFW systems and components (eg, pipe rupture protection, swismic subsystem evaluation, ASME code considerations, equipment qualification, penetration design, cable routing and separation, instrumentation and control system, system interlocks, fire protection, seismic and quality group classification or use of appropriate codes and standards).

- System performance requirements (requirements for accident mitigation, design transients and normal operation, hydraulic design, over-pressure protection, reliability, NPSH for pumps).

The installation/as-built verification review will include a walkdown of the selected system and inspection of system components. This review is intended to confirm system geometry and component nameplate data. Input from this evaluation will be assessed for its compatability with design documents such as specifications and drawings.

Assess adequacy of drawings, design changes or mods, resolution of NR's & punch list items,

The IDV will be conducted under project instructions and procedures that will require apparent discrepancies to be documented throughout the review. Initially, these findings will be categorized based upon the lead reviewer's judgement as to status as follows:

1) Open- The finding has the potential for becoming a confirmed error, but additional investigation or confirmatory analysis is necessary to make a final judgement;

2) Confirmed - The finding is judged to be an apparent error by the review team and will require corrective action, such as additional documentation not utilized by the team that documents the resolution of the findings or additional analysis, design or construction changes or procedural changes that may be necessary to resolve the finding;

3) Resolved - Sufficient additional information was available in the ongoing review to resolve the findings and to completely close out any additional concern about the findings.

Additionally, findings will be categorized as to whether or not they affect the AFWs safety function or licensing criteria. Additional design information will be solicited to allow the lead reviewers to reach disposition of each finding. As the reviews of each major design element reach a suitable stage, the individual findings will be evaluated in an integrated manner by the project team to further define or resolve the findings and to assure the classification is proper. After the team has completed its review, each finding will be submitted to a senior level review team to provide additional professional opinion regarding the classification of the finding.

Reporting will be in two stages, preliminary and final. The preliminary report, including the findings, as modified by the senior review team, will be provided to Consumers Power Company & NRC for review by the original designers. The preliminary report will provide an opportunity for additional information to be supplied which could have an impact on the findings but was not known to the IDV project team. All comments, additional information and changes to the findings will be maintained in an auditable manner. The final report will summarize the work accomplished, procedures used and include a complete description of all findings.

I think the NRC should be given a copy of the preliminary report.

APPENDIX

PREVIOUS ASSESSMENTS OF DESIGN AND CONSTRUCTION QUALITY AT MIDLAND

Historically, Consumers Power Company and its contractors have been committed to perform their work using QA programs which respond to all 10CFR50 Appendix B Quality Assurance criteria.

In addition to the Consumers Power Company audits in the areas of design and construction, the Company has utilized outside consultants to conduct Biennial Quality Audits. The Consumers Power Company Biennial Quality Audits were first instituted in 1976 and were subsequently conducted during 1978 and 1980. These audits were conducted to determine the Program's adequacy and to determine, on a sampling basis, the degree of compliance with the program. A summary of those audits are as follows:

A. 1976 Biennial Quality Audit

In 1976, the Biennial Quality Audit was conducted by the Nuclear Audit and Testing Company (NATCO) and included approximately 24 man-days of audit effort. The audit involved auditing for adequacy and implementation of the Consumers Power Company QA Program Procedures at the Consumers Power Company General Office in Jackson, Michigan and at the Midland Site. In addition, the audit involved auditing for adequacy and implementation of the Bechtel Nuclear Quality Assurance Manual at the Midland Site. Audit findings resulting from this audit have been closed out.

B. 1978 Biennial Quality Audit

In 1978, the Biennial Quality Audit was conducted by the Management Analysis Company (MAC) and included approximately 70 man-days of audit effort. The audit involved auditing for adequacy and implementation of the Consumers Power Company QA Program Procedures at the Consumers Power Company General Office in Jackson, Michigan and at the Midland Site. In addition, the audit involved auditing for adequacy and implementation of the Bechtel Nuclear Quality Assurance Manual at the Bechtel Ann Arbor, Michigan offices (engineering) and at the Midland Site. Audit findings resulting from this audit have been closed out.

C. 1980 Biennial Quality Audit

In 1980, the Biennial Quality Audit was conducted by the Management Analysis Company (MAC) and included approximately 46 man-days of audit effort. The audit involved auditing for adequacy and implementation of the Consumers Power Company QA Program Procedures at the Consumers Power Company General Office in Jackson, Michigan and at the Midland Site. In addition, the audit involved auditing for adequacy and implemenation of the Bechtel Nuclear Quality Assurance Manual at the Bechtel Ann Arbor, Michigan offices and at the Midland Site. Audit findings resulting from this audit have been closed out.

Wayne - We need to review this one.

MAC also performed a special Assessment of Midland in 1981 which covered the following areas: Corrective actions resulting from 50.55e items including adequacy of corrective action, hardware inspection and system walkdown, corrective action status closeout of 1980 biennial Corporate Audit, assessment

of adequacy of Midland QA program (based on first two items), review of documentation (supplier quality verification records, radiographic records, certificates of compliance, and Bechtel FLAGS program), and assessment of Bechtel and Consumers personnel (Bechtel QC and auditors, Consumers auditors, and Bechtel welders' qualification).

Starting in 1976 upon the discovery of missing rebar in three areas of the auxiliary building (later this was determined to not be a safety problem), Consumers instigated a surveillance of construction activities by Consumers QA personnel. Consumers Power surveillance provides formalized quality control inspections beyond those quality control inspections performed by the Bechtel Quality Control group.

In August 1980 the Quality Assurance Organizations of Consumers Power Company and Bechtel were integrated into one group with Consumers having the responsibility for direction and management. Consumers Power at this time set up a Design QA Engineering (DQAE) group at the Bechtel Ann Arbor offices to conduct day to day monitoring of engineering activities of Bechtel. The Consumers Power DQAE provides design and procurement quality/reliability services of problem prevention and early problem detection, resolution, and corrective action. DQAE personnel are degreed and have had direct design related experience in the areas of nuclear, mechanical, electrical, electronics and civil engineering. The DQAE functions consist of:

1. Technical reviews of Design and Procurement documents (engineering procedures/instruction, selected design and procurement documents, and supplier design deviation requests).

2. Monitors that requirements of controlling documents are being implemented (FSAR, engineering procedures, Appendix B, codes and standards) into specifications, drawings, material requisitions, supplier documentation and design calculations.

3. Audits of engineering, supplier QA Department, Bechtel Quality Engineering and Document Control.

Starting in January 1979, NRC Region IV Vendor Inspection Branch has conducted seven inspections of the Bechtel Ann Arbor Office. The latest inspections were in May and July 1982. In three of these inspections, there were no findings. Corrective action has been completed on all of the findings from inspections prior to 1982. There were no findings from the May 1982 inspection and the one finding from the July 1982 inspection has not been closed out as yet.

Although not requested by the NRC, Consumers Power Company decided in early 1982 that based on occurrences at Diablo Canyon and other plants, an Independent Design Audit or Review was prudent. The Company did not know what NRC staff requirements would be applied to an independent audit for plants that are in the construction and licensing stage similar to Midland. It was decided that this particular Independent Design Review would be undertaken as soon as possible in order to provide timely identification of problems so that corrective action could be taken consistent with overall project schedules. The purpose was to review Bechtel Project Engineering activities to determine if design criteria are being correctly implemented and if design assumptions, design methods and the design processes are satisfactory. It was also decided that the review could be optimized by using people who were knowledgeable

Have we seen this? We should.

about the Bechtel design process but were not working on Midland design such as Bechtel personnel located in offices other than Ann Arbor or Consumers personnel that have not been directly involved in Midland.

The review team consisted of six Bechtel and one Consumers Power Company employees with disciplines represented in the areas of mechanical, nuclear, electrical, civil/structural, plant design, control systems and technical support for plant operations. Short term assistance was provided by specialists and consultants from other Bechtel offices in specific areas such as piping design and seismic analysis. The general approach of the review was to conduct a broad review of important design methods and then to review in-depth, including field walkdowns, four features of the plant. Emphasis was on engineering and factors important to safety, calculations, and design features which will not be demonstrated by tests during construction and start-up. Interfaces within Bechtel and between Bechtel and B&W were also reviewed. The basic criteria and commitments used by the review team were the FSAR, Bechtel Topical Reports, project procedures, and industry guides and standards. Design methods selected for review included piping analysis, equipment qualification, separation hazards, instrumentation, structural and seismic analysis, and various nuclear analyses. The piping review included independent computer analysis of selected stress problems and hanger designs and a review of unique computer programs developed for the Midland Project. The four features of the plant for an in-depth review were: reactor cavity design, on-site electrical systems, decay heat removal system and piping for the high pressure safety injection system outside containment. The review has been completed with findings issued and replied to. The final report as well

as other design review information will be submitted to MAC and Tera for use in the performance of their activities.

September 1982
Criteria
Preliminary

Performance Objectives and Criteria for Construction Project Evaluations

INPO

PERFORMANCE OBJECTIVES

AND CRITERIA

FOR CONSTRUCTION

PROJECT EVALUATIONS

INSTITUTE OF NUCLEAR POWER OPERATIONS

September 1982

PRELIMINARY
For Use In
SELF-INITIATED EVALUATIONS

FOREWORD

In early 1982, utility nuclear power plant construction problems stimulated industry initiative and action to ensure that programs in effect nationwide meet performance goals as intended. Accordingly, the Institute of Nuclear Power Operations (INPO) was tasked to develop and manage a construction project evaluation program. The first effort was to define performance objectives and criteria for project evaluations. Use of the criteria is intended to provide considerably more depth than an audit, for an audit generally is regarded to be no more than a check of the paper trail. An evaluation includes some assessment of administrative records, but more important it focuses on evaluating the quality of the end result of implementing the project systems and procedures. It also includes assisting the utility by transferring technology, management systems, and procedural systems when the utility is not as strong as has been observed elsewhere in the industry. Such an evaluation can result in an uplifting, or upgrading, by specific recommendations on how to achieve a higher level of excellence.

This program is not intended to evaluate whether or not the design is adequate. Rather, the program will evaluate if the design documents are controlled and if the plant is being constructed as the design specifies; therefore, design control and quality of construction are the key objectives being evaluated.

These performance objectives and criteria are intended for use by INPO member utilities and third parties in the evaluation of the quality of engineering and construction of nuclear power plants. The scope of this document addresses the phase of the project beginning with the plant design process and extending through design, construction, and testing to issuance of the Nuclear Regulatory Commission operating license.

The performance objectives are broad in scope; each generally covers a single, well-defined area. The supporting criteria are more narrowly focused statements of activities that support or help meet the performance objectives. Several criteria are listed under each performance objective.

Corporate and project organizations among INPO member utilities vary widely. Accordingly, no specific organization has been assumed in developing this document. The areas addressed represent those relevant to achieving the highest standards in construction of a nuclear power plant. Rather than addressing a specific organizational structure, the program is designed to evaluate the systematic control of functions and approaches that are necessary to produce the desired results for project completion. The performance objectives and criteria emphasize management involvement in the design and construction of a nuclear power plant, since monitoring and control at the management level are essential to the achievement of an optimum end product.

This document is intended to provide a basis for INPO and INPO member utilities to assess the quality of utility management in select areas related to nuclear plant design and construction. Since the performance objectives and criteria are intended for use in evaluating the results, they do not necessarily prescribe or establish methods of achieving those results.

PERFORMANCE OBJECTIVES AND CRITERIA
FOR
CONSTRUCTION PROJECT EVALUATIONS

INDEX

ORGANIZATION AND ADMINISTRATION

QA.1 ORGANIZATIONAL STRUCTURE

PERFORMANCE OBJECTIVE

The owner's corporate organization and all other project organizations responsible for the design, engineering, planning, scheduling, licensing, construction, quality assurance, and testing of a nuclear plant should provide an organizational structure that ensures effective project management control.

CRITERIA

A. The project organizational structure is defined clearly and establishes an effective relationship among the owner's and contractors' responsible executives and managers for design, construction, procurement, planning, testing, quality assurance, and licensing of a nuclear power plant to support the success of the project.

B. Managers associated with the project, either owner's, nuclear steam system vendors', architect/engineering firms', or contractors', at the executive, corporate, project, design, procurement, construction, start-up, operations, and quality assurance levels, understand clearly their relationships regarding the project, including their authorities, responsibilities, and accountabilities.

C. An owner's manager is assigned responsibility for the project activities (hereafter referred to as project manager). This is his primary responsibility and preferably his sole responsibility. Also, he has the authority to direct the project.

D. The owner's project-level managers are assigned responsibility for the following listed functional areas in support of the nuclear project activities. Sufficient authority is held by each individual to carry out assigned responsibilities.

1. project control, including planning, scheduling, and cost control
2. engineering, analysis, and design control
3. procurement control
4. construction control
5. management information systems
6. training and qualifications
7. construction testing and turnover control
8. quality assurance
9. material receipt, handling, storage, and maintenance
10. record and document management
11. legal and licensing requirements
12. staffing, personnel policy, and salary administration

E. The project manager exercises control in those functional areas assigned to managers who do not report to him to ensure that the plant is engineered, designed, constructed, and licensed in a manner resulting in a safe and reliable plant.

F. The project manager's relationship to higher corporate management and ultimately to the chief executive officer is defined clearly and documented.

G. Clearly defined access to the project manager is provided to other managers having responsibility for the functional areas under Criterion D.

H. Corporate administration of contracts is delegated clearly with contractual obligations well-understood and enforced. Responsibility and appropriate authority for prompt action on contract changes, renegotiations, or violations of contracts have been assigned.

I. Staffing for all project organizations is adequate for the authorities and responsibilities assigned.

OA.2 MANAGEMENT INVOLVEMENT AND COMMITMENT TO QUALITY

PERFORMANCE OBJECTIVE

Senior and middle managers in the owner's corporate office, designer's office, and at the construction site who are assigned functional responsibility for matters relating to the nuclear project should exhibit, through personal interest, awareness, and knowledge, a direct involvement in significant decisions that could affect their responsibilities.

CRITERIA

A. Procedures or written statements of policy address subjects relating to the engineering, design, and construction of nuclear projects. They include policies related to project quality, such as workmanship, problem identification and correction, action item tracking, reporting, and procedural compliance.

B. Project personnel in the corporate office and at the construction site and designer's offices are aware of these procedures and policy statements and have them readily available for reference. They are able to explain how they are put into practice.

C. Project personnel demonstrate compliance with these policy statements and the statements have a high degree credibility

D. Both vertical and horizontal communication of significant problems and corrective actions are effective and coordinated to provide an accurate representation of conditions.

E. Meetings involving corporate and project management personnel result in the regular review of key aspects of the nuclear project.

F. Corporate managers are made aware of and utilize appropriate design and construction progress data and trends in setting goals and objectives and in management decisions involving the project.

G. Methods are established that permit data and trends to be compared with results at other utilities with similar construction projects.

H. Corporate managers responsible for the nuclear project are familiar with activities and reports that affect design and construction. They are cognizant of and sensitive to problems and external factors that might affect progress or quality. Examples of such involvement include the following:

1. review of applicable audit, evaluation, and inspection results conducted by internal and external organizations
2. personal interface with the engineering, design, and construction organizations and personal observations of their activities
3. review of industry's engineering, design, and construction experience and trends
4. review of project plans and schedules and reports of actual progress versus planned progress
5. review of worker performance indicators such as rework and reject rates

I. Management support and actions reflect appropriate attention to areas such as project management, scheduling, planning, staffing, training, personnel relations, and owner-contractor relations that affect project quality.

J. Corporate managers responsible for nuclear matters are committed to seek out and employ methods and information systems for identifying problem areas and their underlying causes and for taking coordinated, corrective action to eliminate these problems.

K. Designated managers associated with the project have responsibility and authority, by policy and practice, to stop or delay engineering, design, or construction activities when their judgement indicates that continuation will result in a failure to meet the project objectives.

L. Management accountability for the project is consistent with the project structure and extends to the contractors, architect/engineering firm, and nuclear steam supply system supplier contractor.

M. A complementary relationship is evident between management and quality assurance that supports implementation of a strong corporate commitment to quality.

N. Decisions are made known to appropriate individuals for implementation.

QA.3 THE ROLE OF FIRST-LINE SUPERVISORS AND MIDDLE MANAGERS

PERFORMANCE OBJECTIVE

The project first line supervisors and middle managers should be qualified by verified background and experience and have the necessary authority to carry out their functional area responsibilities.

CRITERIA

A. Position descriptions or the equivalent are employed for each key management and supervisory position.

B. Minimum qualification, experience, and training requirements are defined for project first-line supervisors and middle managers.

C. Authorities and responsibilities are defined clearly. Personnel clearly understand and accept their relationship in the organization and their authorities, responsibilities, and accountabilities.

D. The first-line and middle managers are actively and personally involved in the nuclear project functional activities. Functions that could be performed include the following:

   1. approval of qualification requirements for positions that report directly to them
   2. provisions for input to and understanding of project policies governing each functional area covered in this document
   3. assessment of selected programs and activities relating to project activities, including follow-up on corrective actions
   4. close involvement with safety review groups performing independent reviews of matters affecting safety and reliability
   5. assurance that effective actions are taken on reports of significant and unusual project deficiencies in the managers' areas of responsibility

6. regular review of project status and current problems
7. review of selected data and trends discussed in the functional sections of this document
8. monitoring of organization's performance against established goals and objectives
9. involvement in and understanding of trending programs and corrective actions related to developing adverse trends
10. active involvement in ensuring that construction practices and procedures are followed in a manner that enhances the quality of the end product
11. responsibility for ensuring that workers are qualified for their individual assignments and that they perform their work to project standards

E. The project middle managers are sensitive to the need to control work assignments to ensure that project-related effort is not diluted.

F. Appropriate supervisory, technical, and procedural training is conducted for first-line and middle managers having responsibilities for functional areas in support of project activities. Appropriate records of attendance, material presented, and test results (if given) are retained to document this training.

DESIGN CONTROL

DC.1 DESIGN INPUTS

PERFORMANCE OBJECTIVE

Inputs to the design process should be defined and controlled to achieve complete and quality designs.

CRITERIA

A. Design inputs such as codes, standards, regulatory commitments and requirements, criteria, and other design bases are identified, defined clearly, documented, evaluated, approved, and their scope of applicability is defined prior to their use in the design process.

B. The design inputs include consideration of all of the requirements necessary to produce a quality design including feedback from pertinent industry engineering, design, and construction experience.

C. Plant constructability, operability, inspectability and maintainability are considered in plant designs.

D. The design inputs are provided at a level of detail and clarity necessary to be useable and understandable by all persons using these inputs.

E. A systems, components, and materials experience information base, to the extent available, is a key element in the design process. Specifications for key safety-related equipment that does not have a substantial service history contain a requirement for supplier acceptance tests.

F. The issuance and use of design inputs is controlled by the use of complete and understandable procedures.

G. All changes to the approved design inputs are documented and approved prior to their use.

H. Design personnel utilize supplier expertise as applicable in the design process.

I. Design and design control information is readily available for use by all design personnel.

H. Design personnel utilize supplier expertise as applicable in the design process.

I. Design and design control information is readily available for use by all design personnel.

DC.2 DESIGN INTERFACES

PERFORMANCE OBJECTIVE

Design organization external and internal interfaces should be identified and coordinated to ensure a final design that satisfies all input requirements.

CRITERIA

A. Design organization engineering authority is documented, and limits of responsibility and authority are defined clearly.

B. The flow of design information between both external and internal organizations is controlled and timely.

C. The external and internal interfaces and responsibilities are defined and controlled by procedures.

D. Oral and other informal means of communication, including letters and memos, which provide significant design information, are confirmed and promptly made a part of the design input by a controlled document.

E. System interaction is considered in system design and analysis.

F. Systematic and effective lines of communication are established.

G. Design and design change information are coordinated effectively with all affected disciplines and operating personnel.

H. Transfer of design responsibilities and documents from one organization to another is planned and implemented in a controlled manner.

DC.3 DESIGN PROCESS

PERFORMANCE OBJECTIVE

The management of the design process should result in designs that are safe, reliable, verifiable, and in compliance with the design requirements.

CRITERIA

A. The design process is documented, planned, and scheduled to ensure an orderly, sequenced process for completing design.

B. Responsibility for controlling each function of the design process, including the preparation, review, and approval of input, in process, and output documents, is defined clearly, documented, and understood.

C. The overall design review process includes system design reviews; verifications of calculations, methods, and computer runs; and validations of computer codes and models. The reviews or verifications are performed by individuals or groups other than those who performed the original design.

D. Design documents include scope and applicability as well as the identity of the originator and checker.

E. Calculations and analyses clearly specify information such as applicability, assumptions, design inputs, references, methods, and results in a manner that allows a technically qualified person to understand the calculations or analyses.

F. When an independent check of calculations and analyses is required, it is performed by a technically qualified person, and the method of checking is noted on the documents.

G. Design process problems are identified, and decisions are made to resolve the problems in a timely and effective manner.

H. Supervisory and management involvement in the design process is evident by the quality and timeliness of the output information and resolution of design problems.

I. Design personnel provide timely technical support and follow-up on systems they have designed.

J. Design processes are monitored for compliance with design commitments.

K. Design control measures, such as procedures and checklists, are used to ensure that design inputs, such as design criteria, design bases, regulatory requirements, codes, and standards, are translated correctly into design documents, including specifications, calculations, drawings, procedures, instructions, and other documents needed to build a plant.

L. Drawings, specifications, and other design documents are prepared under a controlled process that establishes standards for pertinent items such as format, content, status, and revision.

DC.4 DESIGN OUTPUT

PERFORMANCE OBJECTIVE

Project design documents should specify constructable designs in terms of complete, accurate, and understandable design requirements.

CRITERIA

A. The purpose of each type of design document is defined clearly.

B. Design output documents reflect a constructable, operable and maintainable design that meets the design input requirements.

C. The total design package is complete and understandable without the need for extensive coordination or interpretation by construction or vendor personnel.

D. The design organization is aware of the capabilities and requirements of the supplier and the construction organization.

E. Sufficient detail, legibility, and clarity for interpretation and reproduction are provided in design output documents to facilitate correct implementation of the design.

F. The design organization is responsive to the need for clarification of design output documents where these needs are identified.

G. Design output documents are issued and kept current using a controlled process.

DC.5 DESIGN CHANGES

PERFORMANCE OBJECTIVE

Changes to released project design documents should be controlled to ensure that constructed designs comply with the most recent design requirements.

CRITERIA

A. The design organization's response is timely and effective regarding identified changes.

B. Reasons for the change are identified, evaluated, and, if necessary, actions taken to avoid future problems.

C. The responsible design organization considers inputs to the original design before a change is issued.

D. Design changes are coordinated with any affected discipline and/or organization in a timely manner.

E. Appropriate procedures and methods are revised if design changes make these revisions necessary.

F. Prior to the approval of the design change, consideration is given to quality, safety, cost, and schedule.

G. Changes are subject to control measures commensurate with those of the original design.

H. A system is utilized to determine whether or not the change being made impacts other parts of the system being changed, other areas of the plant, or other plants under construction.

I. Methods are in place to ensure that changes are implemented in a timely manner.

J. All changes, including those initiated by regulation, construction, vendor, or design, are properly reviewed by the design organization and, if approved, incorporated into the design documents.

K. Appropriate design changes are evaluated promptly by each affected discipline, and necessary corrective action is taken and documented in a timely manner.

L. Design change review considers the change impact on items such as calculations, system functional requirements, original safety analysis assumptions, inspectability, maintainability, and selection of equipment and material.

CONSTRUCTION CONTROL

CC.1 CONSTRUCTION ENGINEERING

PERFORMANCE OBJECTIVE

Engineering and design performed under the authority of the construction organization should be controlled as to consistency with the basic design criteria to ensure compliance with applicable codes, standards, and regulatory commitments.

CRITERIA

A. Construction engineering authority is documented, and limits of responsibility and authority are defined clearly.

B. Procedures are effective in controlling the engineering and design processes of the construction engineering organization.

C. Guidelines are issued to ensure that the basic design criteria used by the construction engineering organization is consistent with that used in the original plant design.

D. Interface links between architect/engineering home office and the construction engineering group are efficient, effective, and defined clearly.

E. Interface links among major vendors and subcontractors and the construction engineering group are efficient, effective, and defined clearly.

F. Construction engineering field change control is maintained effectively as required to support the construction effort and to ensure final as-built conditions are defined.

G. Construction engineering supports major construction equipment processes (e.g., special rigging studies and transportation studies) with calculations and design prior to important field construction effort.

H. State-of-the-art engineering and design verification exists for construction engineering processes.

I. Adequate engineering and design issuance procedures are in effect to support the engineering and construction process and to ensure management awareness of generic design or constructability problems.

J. Field detail sketches and drawings for fabrication and installation accurately reflect basic design drawings and documents.

K. Linkage to the document control system exists to ensure engineering and design documents are handled properly.

CC.2 CONSTRUCTION FACILITIES AND EQUIPMENT

PERFORMANCE OBJECTIVE

Construction facilities and equipment should be planned for, acquired, installed, and maintained consistent with project needs to support quality construction.

CRITERIA

A. A site plan has provided for key location of facilities such as warehouses, craft shops, equipment storage, and production facilities.

B. Construction equipment is acquired in a manner to support the construction schedule and is maintained in optimum condition to support quality work.

C. Facilities and equipment, both temporary and permanent, meet the project needs and specifications, and are maintained in accordance with established requirements.

D. Periodic inspections or surveillances of the work areas and activities are performed to ensure that facilities and equipment support construction needs.

CC.3 MATERIAL CONTROL

PERFORMANCE OBJECTIVE

Material and equipment should be inspected, controlled, and maintained to ensure the final as-built condition meets design and operational requirements.

CRITERIA

A. The receiving process ensures that receiving inspections include evaluations of incoming materials and equipment against the procurement specifications. This process results in proper and timely disposition of deviations.

B. Materials and equipment are identified properly to control installation and use.

C. Quality documentation for received material is accounted for, reviewed, accepted, filed, and retrievable.

D. Items received are processed in a timely manner to allow early identification of those items requiring special handling, storage, and preventive maintenance.

E. Nonconforming items are identified and controlled to prevent unapproved use.

F. Material and equipment storage, handling, and security are controlled effectively in accordance with specified requirements.

G. The warehousing facility has an accurate inventory control system that provides for the effective location of items.

H. The issuance process ensures that correct material is issued in accordance with engineering requirements.

I. Effective preventive maintenance, including maintenance of cleanliness standards, is initiated at the appropriate time and continues throughout the construction process.

J. Environmentally sensitive equipment is protected adequately from the degrading effects of temperature, humidity, and dirt.

CC.4 CONTROL OF CONSTRUCTION PROCESSES

PERFORMANCE OBJECTIVE

The construction organization should monitor and control all construction processes to ensure the project is completed to design requirements and that a high level of quality is achieved.

CRITERIA

A. Construction activities are identified in advance to allow for development of procedures and selection, training, and qualification of personnel.

B. Work procedures and instructions have sufficient detail to ensure that construction activities are in accordance with engineering requirements.

C. Construction activities are performed in accordance with work procedures, instructions, and current revisions of drawings approved for construction.

D. Rework activities are performed in accordance with established procedures and are subject to required inspections.

E. Work is performed by and under the supervision of qualified personnel who recognize and accept a responsibility for quality.

F. Proper tools are available and are used correctly.

CC.5 CONSTRUCTION QUALITY INSPECTIONS

PERFORMANCE OBJECTIVE

Construction inspections should verify and document that the final product meets the design and quality requirements.

CRITERIA

A. The inspection process is defined accurately prior to the start of the work and is controlled to meet the requirements of the project.

B. An effective system is in place to encourage the reporting of degraded quality.

C. Inspection procedures are clear, define the inspection process in detail, and reference appropriate acceptance criteria.

D. Inspections are integrated into the construction processes and work schedules.

E. Inspections are performed using written procedures.

F. Calibrated equipment used in inspections is of the proper type, range, and accuracy.

G. The quality control inspectors are separate from the production function.

H. The records clearly indicate the scope of the inspections, the inspector, and the results.

I. Records are reviewed for completeness and accuracy prior to their storage in accordance with project requirements.

CC.6 CONSTRUCTION CORRECTIVE ACTIONS

PERFORMANCE OBJECTIVE

The construction organization should evaluate audits, inspections, and surveillances; process replies and follow-up; and take corrective action to prevent recurrence of similar problems.

CRITERIA

A. The construction organization tracks construction audits and surveillances, prepares well-researched replies that address the deficiencies, and takes prompt and effective corrective action.

B. The construction organization evaluates audits for generic problems and trends and takes appropriate action to prevent recurrence.

C. Nonconformances are identified, tracked, and closed out in a timely manner.

D. The construction organization reviews nonconformances to ensure corrective actions have been taken, evaluates for trends, and reports problem areas to upper management.

CC.7 TEST EQUIPMENT CONTROL

PERFORMANCE OBJECTIVE

Measuring and test equipment should be controlled to support construction testing effectively.

CRITERIA

A. Measuring and test equipment utilized for testing is identified uniquely.

B. Measuring and test equipment is controlled to ensure that only properly calibrated equipment is used for testing.

C. Specific programs are implemented to provide regular calibration of instrumentation and to track status and calibration of each instrument used for testing.

D. Special procedures are implemented to identify retest requirements when instrumentation is found to be defective.

E. The construction organization tracks equipment out-of-tolerance reports and work performed to correct work previously done incorrectly.

F. The construction organization establishes regular maintenance and calibration intervals for all equipment and ensures timely calibration for each device.

G. Calibration is accomplished correctly using certified equipment traceable to recognized standards or methods. Calibration records are retained and retrievable.

PROJECT SUPPORT

PS.1 INDUSTRIAL SAFETY

PERFORMANCE OBJECTIVE

The construction site industrial safety program should achieve a high degree of personnel safety.

CRITERIA

A. An effective industrial safety program with clearly defined policies, procedures, scheduled training requirements, and individual responsibilities is implemented with the full support of managers and supervisors.

B. Selected data and trends of industrial safety activities are monitored, including the following:
   1. summary analysis of first aid treatments
   2. analysis of accidents requiring doctor's care
   3. incidence of lost-time accidents
   4. frequency of safety violations identified

C. General housekeeping practices prevent the accumulation of debris and trash.

D. A safe and orderly job site working environment exists.

E. Lifting and rigging equipment is checked regularly.

F. A fire protection program is defined, organized, and well-publicized.

G. The site controls hazardous materials effectively.

H. A safety tagging program exists and is implemented effectively to protect equipment, personnel, and material.

PS.2 PROJECT PLANNING

PERFORMANCE OBJECTIVE

Project plans should ensure completion of the project to the highest industry standards by identifying, interrelating, and sequencing the tasks of the project organizations.

CRITERIA

A. The project master plan presents the interrelationships of tasks within and among the plans for the various elements of the project.

B. The project plans are documented and approved by the appropriate level of management.

C. The project plans are updated to reflect changing conditions.

D. The project plans are communicated to the responsible project members.

E. Clear lines of authority and responsibility exist between the individual assigned responsibility for plan development and those responsible for plan implementation.

F. Individuals assigned responsibility for planning for each functional area of the project are provided the necessary data.

PS.3 PROJECT CONTROL

PERFORMANCE OBJECTIVE

Project scheduling and work planning and coordination should ensure that the objectives of the project plan are met through effective and efficient use of project resources.

CRITERIA

A. Individuals responsible for functional areas demonstrate an awareness of the need for and knowledge of project controls and utilize these controls as required.

B. Elements of work are defined into manageable segments that can be accomplished by a typical work unit on a definite schedule.

C. Elements of work are defined in a way that identifies clearly the construction unit or discipline responsible for the work.

D. Based on input and feedback from responsible project personnel, a controlling construction schedule exists that provides a plan for completion of work elements and commitments and that provides management with a clear, concise, and understandable method of tracking project milestone completion.

E. Elements of work are recorded in a tracking system that is established prior to the work being performed and that allows project construction completion to be monitored based on installed quantities.

F. Work elements are integrated into the construction schedule in a manner that facilitates construction erection sequence, mimimizes interferences and rework, and optimizes project resources.

G. Deviations from the project schedule and plan, caused by regulatory, productivity, design and other changes and interferences, are communicated to the proper level

of management and analyzed for trends. Corrective actions are taken to modify the schedule and plan.

H. Quality control hold point inspections are integrated with the work activities.

I. The work activities address support requirements for the segments of work to be accomplished.

J. Work plans provide for a smooth transition from bulk scheduling to system completion scheduling.

PS.4 PROJECT PROCUREMENT PROCESS

PERFORMANCE OBJECTIVE

The project procurement process should ensure that equipment, materials, and services furnished by suppliers or contractors meet project requirements.

CRITERIA

A. Procurement documents provide clear and adequate technical, quality assurance, commercial, and administrative requirements necessary to define the scope and requirements of the contract.

B. The preparation, review, and approval of procurement documents are controlled in accordance with established procedures.

C. A list of qualified suppliers or contractors is used to identify sources of quality products and services.

D. Only those suppliers or contractors who are listed as qualified are requested to furnish bids or proposals.

E. Proposals and bids are evaluated for compliance with the requirements and scope defined in the procurement documents. These evaluations are performed by the personnel responsible for the preparation of the procurement specifications.

F. The recommendation and contract award are conducted in accordance with established procedures.

G. Subtier suppliers or contractors are contractually bound to adhere to related portions of the contract.

H. Supplier and contractor performance histories are used to improve the procurement process.

I. Purchasing and contract documents are reviewed to ensure inclusion of requirements to achieve quality.

PS.5 CONTRACT ADMINISTRATION

PERFORMANCE OBJECTIVE

Methods for administering and controlling contractors and suppliers and for managing changes to their contracts should ensure effective control of performance.

CRITERIA

A. Changes are prepared, reviewed, and approved in a manner consistent with the original requirements.

B. Changes are justified with respect to quality, safety, cost, and schedule and are approved by an appropriate level of management.

C. All verbal or informal changes are approved and confirmed promptly in writing within the guidelines of the change procedures.

D. Performance is monitored, and corrective action is implemented as required.

PS.6 DOCUMENTATION MANAGEMENT

PERFORMANCE OBJECTIVE

The management of project documentation should support the effective control and coordination of project activities and provide a strong foundation for the documentation/ information requirements of the plant's operational phase.

CRITERIA

A. A comprehensive records mangement plan and schedule exists to do the following:
   1. identify the documents and records required by regulations, purchase specifications, corporate requirements, and standards
   2. specify the minimum content and format requirements and acceptance criteria for each record/document type
   3. clearly designate responsibility for receipt, review of acceptability, resolution of deficiencies, and control of documents during construction
   4. contain proper methods for declaring appropriate documents "as-built" during construction
   5. determine what, when, how, to whom, by whom, and in what format records will be turned over to the plant's oeprational staff

B. The records management plan is effective in identifying the current status of project documents such as the following:
   1. design drawings
   2. specifications
   3. structure/system descriptions
   4. vendor drawings and manuals
   5. design criteria and procedures

C. The records management plan effectively incorporates approved changes or revisions into the project documents within an acceptable time frame.

D. The distribution system is defined and ensures timely distribution of current project documents to engineering, construction, and project support personnel within the project organization and to appropriate contractors and vendors.

E. The project maintains master files of the latest revision of project documents that are correct and accessible.

F. Storage facilities provide secure maintenance of permanent and nonpermanent records.

TRAINING

TN.1 TRAINING MANAGEMENT SUPPORT

PERFORMANCE OBJECTIVE

Management should ensure that an effective program exists for indoctrination, training, and qualification of personnel involved in the project.

CRITERIA

A. Corporate managers in each area have an active interest and involvement in the training program.

B. Managers are trained and have adequate knowledge in areas related to their roles in the design and construction of a safe and reliable plant.

C. Training is neither interrupted, deferred, or cancelled, nor are personnel diverted routinely from training to other activities.

D. Management and supervisors are involved actively in assessing the qualifications and training needs of individuals with respect to their assigned tasks.

E. Management makes use of feedback information to improve the effectiveness of the training program.

F. Actions taken as a result of monitoring training and qualification trends are reviewed by appropriate levels of management on a periodic basis.

TN.2 TRAINING ORGANIZATION AND ADMINISTRATION

PERFORMANCE OBJECTIVE

The training organization and administration should ensure effective control and implementation of training activities.

CRITERIA

A. The training organization is defined clearly.

B. Training and qualification goals and objectives are established.

C. Training and qualification efforts are governed by procedures that outline responsibilities of the training organization.

D. Training personnel are provided training and opportunities to enhance their performance as instructors.

E. Training programs address organizational needs at appropriate levels.

F. Technical and nontechnical training requirements for individuals are defined clearly and documented.

G. An active program exists to acquire feedback for the purpose of developing, modifying, and improving the training programs.

H. Training activities are conducted regularly, and results are documented.

TN.3 GENERAL TRAINING AND QUALIFICATION

PERFORMANCE OBJECTIVE

The training program should ensure that all employees receive indoctrination and training required to perform effectively, and that employees are qualified as appropriate to their assigned responsibilities.

CRITERIA

A. Initial selection, training and indoctrination enable individuals to perform assigned responsibilities effectively.

B. The previous qualification and training of new hires and transfers are verified.

C. Individuals are qualified as appropriate for their assigned responsibilities.

D. Training on a continuing basis, both formal and on-the-job, maintains the employee's ability to perform consistently and effectively.

E. Continuing training provides an effective means of keeping employees up-to-date regarding changes to policies, procedures, processes, instructions, and commitments.

F. Individuals are requalified or recertified as required to keep their qualifications current.

G. Feedback is acquired and used to modify and improve training methods and content.

TN.4 TRAINING FACILITIES, EQUIPMENT, AND MATERIAL

PERFORMANCE OBJECTIVE

The training facilities, equipment, and material should support and enhance training activities.

CRITERIA

A. Classroom facilities are provided for group instruction.

B. Reference materials are up-to-date and readily accessible.

C. Equipment is available as needed to support training material development.

D. Training aids and material are provided to support the program.

E. Test and certification records are available and are updated regularly, and a follow-up system for required recertification of personnel is utilized.

QUALITY PROGRAMS

QP.1 QUALITY PROGRAMS

PERFORMANCE OBJECTIVE

The quality assurance program scope, content, and applicability should be appropriate, defined clearly, and understood.

CRITERIA

A. The quality assurance and quality control programs include all necessary program elements.

B. Day-to-day activities are observed and monitored under a continuing program designed to ensure the highest quality of personnel performance, workmanship and attention to detail.

C. The quality assurance program is applied to the project in an appropriately graduated way.

D. The relationship between manuals and the applicability of procedures is defined clearly and understood.

E. Audit and surveillance schedules are modified as appropriate to verify the effectiveness of program implementation and to reflect the need for increased monitoring.

F. The utility conducts evaluations of contractors' quality assurance program with sufficient regularity and in sufficient depth to ensure program effectiveness.

G. The programs provide for indoctrination and training of personnel as necessary to ensure that suitable proficiency is achieved and maintained.

H. The "stop process" and "stop work" authority is understood clearly and implemented effectively.

QP.2 PROGRAM IMPLEMENTATION

PERFORMANCE OBJECTIVE

Quality assurance and quality control functions should be performed in a manner to support and control the quality of the project activities.

CRITERIA

A. The relationship of the quality assurance and quality control organizations with other organizations and individuals is defined clearly to ensure their independence.

B. Quality assurance and quality control personnel experience a cooperative relationship with other project personnel and are free of harrassment and intimidation.

C. Quality assurance and quality control areas function in a manner that supports management.

D. The quality assurance programs of vendors and contractors include measures to achieve quality and are implemented in an effective manner.

E. Project organizations utilize technical specialists in the implementation of the quality requirements.

QP.3 INDEPENDENT ASSESSMENTS

PERFORMANCE OBJECTIVE

Management should provide an effective, independent assessment of project activities affecting the quality of the project.

CRITERIA

A. A plan is implemented to ensure that audits and surveillances effectively assess applicable project activities in a timely manner.

B. The results of the independent assessments identify substantive issues affecting performance.

D. Independent assessments are performed by individuals with no direct functional responsibilities for the area being assessed.

E. Independent assessments are performed by individuals suitably qualified to conduct the assessment.

F. The analysis of the assessments properly evaluate the activity assessed.

G. The results of the assessments and evaluations are directed to and used by the management of organizations to improve their effectiveness.

H. Periodic evaluations of the effectiveness and adequacy of the total quality program are performed. Results are reported to the senior management level, and appropriate action is implemented.

QP.4 CORRECTIVE ACTIONS

PERFORMANCE OBJECTIVE

Conditions requiring corrections or improvements should be resolved in an effective and timely manner.

CRITERIA

A. Conditions adverse to quality are reported promptly and accurately.

B. The responsible organization assumes its responsibility for and its management is involved in and supports the correction of adverse quality.

C. The senior levels of management are apprised of adverse quality conditions and hold the responsible supervisors accountable.

D. Corrective action resolves not only the reported item, but also the basic cause in a manner that ensures the quality of future activities.

E. Effective corrective action is taken in a timely manner.

F. The quality assurance, quality control, and project organizations cooperate in identifying and solving problems effectively.

G. Quality performance trends are developed and analyzed to effectively address generic problems and basic causes of degraded quality.

TEST CONTROL

TC.1 TEST PROGRAM

PERFORMANCE OBJECTIVE

The test program should verify the plant's full capability to operate as intended by testing the plant's systems functionally.

CRITERIA

A. A clear policy is developed and endorsed by top management that describes the test organization's responsibility for component, system, and preoperational testing.

B. The principal design organization is involved in formulating test objectives and acceptance criteria.

C. The test program describes the scope of system testing, provides detailed guidance for conduct of testing, and includes methods for evaluation of completed tests.

D. Nonconforming conditions and discrepancies are identified and tracked, and appropriate resolution or corrective action is achieved.

E. Adequacy of plant operating and maintenance procedures is demonstrated.

F. The test program describes the quality assurance program under which it functions.

TC.2 TEST GROUP ORGANIZATION AND STAFFING

PERFORMANCE OBJECTIVE

The test group organization and staffing should ensure effective implementation of the test program.

CRITERIA

A. The test group organizational structure and organizational relationship to interfacing organizations are defined clearly.

B. The staff build-up accommodates the early requirements for testing procedure and schedule preparation.

C. The staff size is sufficient to accomplish the assigned tasks as dictated by the test schedule.

D. Permanent plant personnel are utilized during testing to the maximum extent practical, in order to enhance their experience and training.

E. Key management, supervisory, and professional positions are described in writing.

F. Personnel who are assigned to perform testing meet the experience and qualification requirements as delineated in the written position descriptions.

G. Qualifications of test personnel are maintained.

TC.3 TEST PLAN

PERFORMANCE OBJECTIVE

The test organization should prepare a plan and a schedule that describe the sequence of system or component testing to support major schedule milestones.

CRITERIA

A. The plan and schedule are developed by personnel experienced in test and start-up operations.

B. The plan and schedule are coordinated with the engineering and construction schedules so restraints are identified for project management action.

C. The plant systems are scoped into logical, bounded, well-defined subsystems that can be tested as units.

D. The schedule for individual system or component testing describes the required elements of testing, including those systems required to support individual system testing.

E. The status of testing is monitored by a tracking system.

TC.4 SYSTEM TURNOVER FOR TEST

PERFORMANCE OBJECTIVE

The construction testing and turnover process should be controlled effectively to ensure that program objectives are met.

CRITERIA

A. Jurisdiction is delineated for organizations responsible for the conduct of tests, acceptance of results, and turnover to succeeding test programs.

B. Tests are performed and results evaluated for conformance to design requirements.

C. Retests are performed when necessary and are controlled to ensure completeness of verification.

D. System walk-downs are conducted by appropriate and qualified individuals and entities who effectively identify engineering, maintenance, and construction deficiencies.

E. System turnover procedures identify clearly participants, duties, responsibilities, and documentation necessary for the turnover process.

F. Turnover documents identify boundaries, material, equipment, deficiencies, and exceptions existing at the time of turnover.

G. Turnover exceptions are tracked effectively and are corrected in a timely manner.

H. The lead design, construction, quality control, and testing organizations integrate project needs effectively and accomplish the turnover process in a timely manner.

I. System and area cleanliness and maintenance programs are continued during the test phase.

TC.5 TEST PROCEDURES AND TEST DOCUMENTS

PERFORMANCE OBJECTIVE

Test procedures and test documents should provide appropriate direction and should be used effectively to verify operational and design features of respective systems.

CRITERIA

A. The necessary technical data are used in test procedure preparation.

B. Approved test procedures are available in advance of their intended use to allow adequate test preparation and training.

C. The test procedures describe clearly the objectives, prerequisites, system boundaries, and acceptance criteria for tests.

D. Test procedures receive the prescribed review before approval.

E. Tests are performed in accordance with approved procedures.

F. Necessary retesting is conducted when design changes occur during or after completion of the test phase.

G. The results of the test program receive an independent review and approval.

TC.6 SYSTEM STATUS CONTROLS

PERFORMANCE OBJECTIVE

A method should exist to identify the status of each system or component and the organization holding control or jurisdiction over that system or component to prevent interference and ensure equipment and personnel safety.

CRITERIA

A. Policies and procedures for plant status controls are implemented during testing.

B. A system is implemented to ensure current knowledge of the status of systems.

C. Activities affecting the status of systems and changes of status are authorized by designated personnel and are appropriately documented.

D. Tagging systems are coordinated among the various groups involved in the project to ensure control of status and of equipment and personnel safety.

E. Procedures are implemented to install, control, remove, and review periodically temporary field modifications.

F. Jurisdiction and control of construction work on systems after initial turnover are defined clearly and implemented.

G. Complete and current system documentation packages, including all changes and revisions resulting from the testing program, are provided to the plant operating staff in a timely manner.

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September 17, 1982

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MIDLAND NUCLEAR COGENERATION PLANT
MIDLAND DOCKET NOS 50-329, 50-330
QUALITY ASSURANCE PROGRAM IMPLEMENTATION
FILE: 0485.16 SERIAL: 18850

REFERENCE: CPCo Letter Serial 18845, 9/17/82, "Quality Assurance Program Implementation for Soils Remedial Work"

The referenced letter summarized Consumers Power Company's discussions with the NRC management regarding the implementation of the Quality Assurance Program for the Midland soils remedial work. In addition to the discussions specifically related to soils, the total Midland Quality Assurance Program implementation was reviewed and areas were identified where additional efforts should be directed to insure successful overall project implementation and the performance of the primary inspection function (QC) on site. In response to these concerns Consumers Power made two significant new commitments which are conceptually described in the following paragraphs. Additional documentation will be provided as the details of these commitments are worked out.

Quality Control Function

In order to improve the performance of the Quality Control function and to make it more responsive to direction from the Quality Assurance organization, the responsibility for directing the entire Quality Control function will be assumed by Consumers Power. The Quality Control group will functionally report to MPQAD. The programmatic aspects now in place will continue to be used and the combined inspection resources of both Bechtel and CPCo will be integrated. This reorganization will be fully implemented as soon as the appropriate procedural changes are finalized. The integration of the QC resources for soils into MPQAD has already been accomplished as a separate action.

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Independent Verification - Total Project

Consumers Power proposes a new and expanded approach for verifying the overall quality of the project. This approach will give a broader overview than the assessments currently being recommended by the NRC for other NTOL plants. The assessment which is suggested for Midland is to combine an INPO type construction project evaluation, which is a broad "horizontal" type review of many aspects of current project operations with the detailed "vertical slice" review of all aspects, current and historical of a critical plant system or subsystem. The entire review will be performed by one or more independent contractors who are currently being selected. With the assistance of the selected contractors, the detailed plans for this extensive independent assessment will be finalized and presented to NRC management shortly for their concurrence prior to initiating the major work activities.

The INPO portion of the program will be initiated immediately at least through the planning phase to comply with the INPO schedule and industry commitments to the NRC. The INPO construction program evaluation for Midland will differ from the majority of the industry's self-initiated evaluations in that an independent contractor rather than utility personnel will carry out the INPO evaluation. The results will then be overviewed by the INPO staff to assure adequacy and consistency with other evaluations.

Additional Assessment Programs

In addition to the above, Consumers Power has proposed to retain a qualified third party for an assessment of the underpinning activities as detailed in the referenced letter.

Consumers Power Company has also initiated other appraisals to assess the adequacy of the Quality Assurance Program. Two major recent examples of this practice that have occured are as follows.

In 1981, Management Analysis Company (MAC) conducted an assessment which focused on performance in three major areas as follows:

1. Adequacy and timeliness of both part and process corrective actions taken on a sample of the historical hardware problems that have been identified at Midland over it lifetime.

2. The degree to which the physical characteristics of selected supplied components and parts meet their respective quality requirements.

3. The overall adequacy of the Quality Assurance Program with particular emphasis in corrective actions, effectiveness of the supplier documentation review efforts and personnel qualifications.

This assessment has been completed, the results were positive and all open items have been resolved and closed. The final report has been previously submitted to the NRC.

A Bechtel Corporate Staff project evaluation was initiated in April 1982. A report on the results of this assessment is being finalized at this time. The

purpose of this evaluation was to review the Midland engineering activities to determine if design criteria have been implemented and if the design assumptions, design methods, and the design processes are satisfactory. Bechtel Corporate Management was asked to initiate this assessment in order to certify that the Midland project met all the standards expected of any Bechtel project. To carry out this assignment the assessment team was specifically chosen to be independent from the Bechtel Ann Arbor Power Division. The team consisted of senior experienced personnel with appropriate expertise having previously performed similar work on other projects. A Consumers Power representative was a direct participant on the assessment team. The final report will be sent to the NRC upon completion and whatever other documentation or discussion as may be requested will be provided.

Conclusion

Based on the discussion outlined above and in the reference letter, Consumers Power believes that steps have been taken to insure both the successful implementation of the remaining work to complete the plant and a verification program, including quality records, test program results, and third party assessments, that will certify the adequacy of the plant as constructed.

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MIDLAND NUCLEAR COGENERATION PLANT
MIDLAND DOCKET NOS 50-329, 50-330
QUALITY ASSURANCE PROGRAM IMPLEMENTATION FOR SOILS REMEDIAL WORK
FILE: 0485.16 SERIAL: 18845

This letter summarizes recent discussions with NRC management regarding implementation of soils remedial construction and presents the Company's documentation of those discussions.

BACKGROUND

The 1980/1981 SALP Report, presented to Consumers in late April of this year, indicated that activities in the soils area should receive more inspection effort on the part of both the NRC and CP Co. Follow-up discussions with the NRR staff and Region III Inspectors led to the conclusion that the Quality Assurance Program and its definition was adequate; however, there was concern that certain aspects were not being or might not be satisfactorily implemented.

Consumers Power has performed an in-depth review of the implementation plans for the Midland soils work activities. This review included the areas of design and construction requirements and plans, organization and personnel, project controls and management involvement. The results of this review and the proposed steps to assure the successful implementation of all aspects of the work were discussed with the NRC management in a meeting held in Chicago on September 2, 1982.

STEPS TO IMPROVE IMPLEMENTATION

A number of new steps have or are being taken by Consumers Power Co to enhance the implementation of the quality program with regard to the soils remedial work. These measures touch upon all aspects of the work, from design to post-construction verification and include the following:

(1) Retaining a third party to independently assess the implementation of the auxiliary building underpinning work;

(2) Integrating the soils QA and QC functions under the direction of MPQAD;

(3) Creating a "Soils" project organization with dedicated employees and single-point accountability to accomplish all work covered by the ASLB order;

(4) Establishing new and upgraded training activities, including a special quality indoctrination program, specific training in underpinning activities, and the use of a mock-up test pit for underpinning construction training;

(5) Developing a quality improvement program (QIP), specifically for soils remedial work;

(6) Increasing senior management involvement in the soils remedial project through weekly, on-site management meetings wherein both work progress and quality activities are reviewed;

(7) Improving systems for tracking of and accounting for design commitments.

What follows is a description of the soils implementation plan, as it will be carried out using the new approaches outlined above, together with other specific aspects which we believe will be criticial to the successful performance of the job. The discussion is limited to the implementation features specific to soils, is divided into areas roughly describing the progression of the job from design to completion and ends with a description of organizations, management involvement and NRC overview.

DESIGN ADEQUACY AND IMPLEMENTATION

The design for the required remedial activities is in an advanced state; design details and adequacy have been reviewed by numerous organizations. A special ACRS Subcommittee reviewed the soils activities and commented favorably on the thoroughness and conservatism of the review and remedial approaches. Numerous submittals to the NRC have been presented to clarify the design intent. It is our understanding that the Staff is completing its detailed review of all design aspects and is in the process of issuing an SSER. This advanced state of design has permitted the early development of a thorough planning effort and assisted in the organization and development of a detailed training effort. Following-up on design activities, the Project has assigned to the site a design team comprised of experienced structural and geotechnical engineers under the Resident Engineer. This team will monitor

and review the field implementation as specified in design documents, resolve on a timely basis routine construction questions requiring engineering response and administer the specific contingency plans immediately if any problem should arise during the underpinning work. Additional engineering resources for the soils work will continue to be located in Ann Arbor.

IMPLEMENTATION OF DESIGN FEATURES AND COMMITMENTS

All soils activities covered by the ASLB Order of April 30, 1982 are covered under soils-specific QA plans. These plans require that appropriate procedures are in place to accomplish the work in a quality manner and that detailed inspection plans be developed and utilized. Additionally, a Work Authorization Procedure and Work Permit System insure that the NRC and CP Co have specifically authorized and released the work. Under this system, the NRC reviews proposed work details, asks for additional information when necessary and authorizes construction activities in advance. CPCo then authorizes the work to proceed.

To further assure that commitments made to the NRC are properly accounted for in design documents, Consumers Power and Bechtel review the written records of commitments and insure that they are being incorporated into design documents. The Project is currently undertaking an additional review of past correspondence to create a computer listing of commitments. This computer list will be periodically reviewed to insure that commitments are incorporated in design or construction documents in a timely fashion.

PERFORMANCE OF PROJECT CONSTRUCTION, QUALITY ASSURANCE AND QUALITY CONTROL ACTIVITIES

To assure that project construction, quality assurance and quality control personnel correctly carry out their appointed tasks, a number of measures have been taken, including a reorganization of quality control, upgraded training programs, direct Company involvement in construction scheduling and control, and utilization of a contract format to minimize any cutting of corners by contractors. These elements of enhanced performance are described more specifically below.

First, the project has reorganized the Soils QA-QC effort, creating an integrated organization with single-point quality accountability under the MPQAD. This new organizat on is expected to improve QC performance, increase CPCo involvement in the management of the quality control function and improve QA-QC interfaces.

Second, extensive training programs for the soils underpinning work have been developed. This overall training program, which includes the major Construction and Quality organizations involved in soils work, covers both general training in quality and specific training relative to the construction procedures.

The majority of the personnel associated with Remedial Soils work have attended a special Quality Assurance Indoctrination Session. The QA indoctrination has been provided to Bechtel Remedial Soils Group, CPCo

Construction, QC, QA, Mergentime and Spencer, White and Prentis (SW&P) personnel down to the craft foreman level. This training consists of one three-hour session covering Federal Nuclear Regulations, the NRC, Quality Programs in general and the Remedial Soils Quality Plan in detail.

With regard to the work procedures, a requirement on both Mergentime and SW&P is that specific training on the procedures be provided prior to initiating any quality related construction activity. The identification of individuals to receive this training is spelled out in each procedure pertaining to a specific construction activity. Completion of the specific training requirements is a QA hold point which must be satisfied before work can proceed.

In further recognition of the importance of training to the underpinning work, the Company is utilizing a mock-up test pit as part of its training program for underpinning construction. The purpose of this test pit is to provide specific training in the construction of a pier, bell and grillage assembly from initial issuance of design drawings through completion of construction. This allows supervisory and craft personnel to perform work under the conditions, requirements and restraints which will be encountered when the actual underpinning starts. It also allows the various quality organizations to inspect the work and insure that their concerns and requirements are properly reflected in the procedures.

Third, to further enhance the performance of key project organizations, Consumers Power will maintain control over scheduling, both through the construction authorization process and by frequent meetings with the involved contractors and subcontractors. Each week, underpinning subcontractors will present proposed construction work to the Company. In addition, to assure the best quality work, the major subcontracts were entered into on a time-material basis. This should improve subcontractor attention to detail and acceptance of owner direction in the performance of specific construction activities.

Last, the Company is establishing a separate Quality Improvement Program (QIP) for the soils project. Although not part of the formal Quality Assurance program, the QIP is a management system that should be helpful in communicating and reinforcing project policies and expectations to all project participants. To launch this effort, an indoctrination program will be presented to all individuals, stressing the absolutes of Quality and the concept of "Doing it right the first time." Measurements specific to soils will be developed for those critical areas which are indicative of a "quality product". Tracking these activities will provide an indication of the effectiveness of the program. The QIP will provide mechanisms for individual "feedback" from all individuals involved, including the craft personnel.

INDEPENDENT ASSESSMENT

A third party will be retained to independently appraise the initial phases of the construction of the auxiliary building underpinning. This consultant will be mobilized as soon as possible and, after familiarizing itself with the design, will evaluate the auxiliary building underpinning construction work at

the site. If significant problems or adverse trends are observed, the third party assessment program will be extended in both scope and duration until a satisfactory conclusion can be drawn. The initial evaluation will be carried out over a three-month period.

The independent assessment will be conducted by a team of nuclear plant construction and quality assurance experts. This team will be supplemented by the additon of an underpinning consultant who will review the soils design documents, construction plans and construction itself to assure not only that the design intent is being implemented but also that the construction is consistent with industry standards. The assessment will further assure that the QA Program is being implemented satisfactorily and that the construction is being implemented in accordance with the construction documents. Arrangements are being made with Stone and Webster Engineering Corp to assume the lead role in this appraisal. They will be assisted by Parsons, Brinkerhoff, Quade and Douglas, Inc who will provide underpinning expertise. The NRC will be apprised of all findings of this independent assessment in a timely manner.

ORGANIZATION, MANAGEMENT INVOLVEMENT AND NRC OVERVIEW

The project organization formed for the performarce of the soils remedial work incorporates single-point accountability, dedicated personnel to the extent practical, minimum interfaces-particularly at the working level, and a quality organization integrating QA and QC. The soils project organization is tailored to the task at hand. The entire organization, including quality assurance and quality control are staffed with well qualified, experienced personnel, augmented by design consultants and construction subcontractors nationally recognized in the underpinning field.

The soils remedial effort will also include a high level of senior management involvement. Project senior management will conduct weekly in-depth reviews on site of all aspects of the work including quality and implementation of commitments. In addition, the reporting chains to the senior project personnel have been shortened. The Company's CEO is briefed on a regular basis and schedules bi-monthly briefings on all aspects of the project including soils. During the bi-monthly briefings, the CEO normally tours the Midland site.

Complementing the CPCo management role, NRC Region Management overview of the construction process will be enhanced by monthly meetings, agreed upon by the Region, to overview the results of the quality program and the progress of the soils project. These meetings will cover any or all aspects of the project of general or special interest to the NRC management.

CONCLUSION

Based on the discussion outlined above, CP Co believes that the soils program has been thoroughly and critically evaluated and that all prerequisites for successful implementation have been or are being accomplished. The Company's program, with the initial overview from the independent implementation assessment, and the continuing overview by the NRC staff and management should

provide adequate assurance that the remedial soils activities will be successfully completed.

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August 26, 1983

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MIDLAND NUCLEAR COGENERATION PLANT
MIDLAND DOCKET NOS 50-329, 50-330
CONSTRUCTION COMPLETION PROGRAM
FILE 0655 SERIAL 23971

Reference

1. Letter to Mr J G Keppler dated June 10, 1983, from Mr J W Cook regarding Construction Completion Program.

2. Letter to Mr J W Cook dated August 19, 1983, from Mr J G Keppler regarding Construction Completion Program.

The enclosure to this letter is a revision to the Construction Completion Program description submitted on June 10, 1983 (Reference 1). The revisions incorporate additional information and changes requested in Reference 2.

The changes were made to provide clarification and additional detail. The elements of the program presented in Reference 1 have not changed. All changes in the revision are indicated with a margin slash to facilitate identification. Attachment 1 identifies the Construction Completion Program revisions that address each question of Reference 2.

We trust that this fulfills your request for clarification.

James W. Cook

JWC/DMB/mkk

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CONSUMERS POWER COMPANY
Midland Units 1 and 2
Docket No 50-329, 50-330

Letter Serial 23971 Dated August 26, 1983

At the request of the Commission and pursuant to the Atomic Energy Act of 1954, and the Energy Reorganization Act of 1974, as amended and the Commission's Rules and Regulations thereunder, Consumers Power Company submits Revision 2 to its Construction Completion Program.

CONSUMERS POWER COMPANY

By J W Cook
J W Cook, Vice President
Projects, Engineering and Construction

Sworn and subscribed before me this 26 day of August 1983.

Barbara P Townsend
Barbara P Townsend - Notary Public
Jackson County, Michigan

My Commission Expires Sept 8, 1984

RESPONSE TO NRC QUESTIONS REGARDING THE CONSTRUCTION COMPLETION PROGRAM
(NRC Letter Dated Aug 19, 1983)

The following summary identifies the part of the Construction Completion Program (CCP), Revision 2, and Quality Verification Program (QVP), Revision 4, that contain the response the NRC question contained in Reference 2.

A. Comments on Construction Completion Program

1. Executive Summary of CCP - Paragraphs 1 and 2

2. a. Page 2 of CCP - Paragraph 2 under Description

   b. Page 2 of CCP - Paragraph 2 under Description

      Page 3 of CCP - Paragraph 1

3. Page 4 of CCP - Paragraph 1
   Page 29 of CCP - 5.1 Introduction
   Page 30 of CCP - NRC Hold Point 5.3.1 and 5.3.2

4. a. Page 36 of CCP - Item 3 of Section 9.3

   b. Page 4 of CCP - Paragraph 5 under Status

5. Page 7 of CCP - Paragraph 2
   Page 8 of CCP - Paragraph 1
   Page 24 of CCP - Paragraph 1 under Description

6. Page 8 of CCP - Paragraph 5
   Page 36 of CCP - Paragraph following 9.3 Item 8

7. Page 9 of CCP Revised Figure 1-1

8. Page 12 of CCP - Item 6

9. Page 12 of CCP - Item 5

10. a. Page 13 of CCP - Item 2

    b. Page 13 of CCP - Item 3B

11. Page 17 of CCP - Paragraph 2

12. a. Page 19 of CCP - Paragraph 2

    b. Page 19 of CCP - Paragraph 3

13. a. Page 20 of CCP - Paragraph 2 (Item 1)

    b. Page 21 - Paragraph "Process for Status Assessment"

14. Page 22 of CCP - Paragraph 2 under Section 4.3.3

15. Page 26 of CCP - Paragraph 4 under Section 4.5.4

16. Page 29 of CCP - Paragraph 1 under Section 5.3.1
Page 30 of CCP - Section 5.3.2

17. Page 34 of CCP - Paragraph 3

18. Page 35 of CCP - Section 8.3

19. Page 36 of CCP - Paragraph 2 under Section 9.2

20. a. Page 38 of CCP - Item 8

b. Page 37 of CCP - Item 7

c. Page 37 of CCP - Item 7

21. Page 39 of CCP - Last Paragraph under Section 10.3

B. Comments on Quality Verification Program (QVP)

1. a. Page 1 of QVP - Paragraph 1 under Section 2.1 (HVAC and B&W Construction have not used IPINS)

b. Page 7 of CCP - Paragraph 1

2. a. Page 9 of QVP - Paragraph 1 (statement deleted)

b. Page 9 of QVP - Paragraph 1 under Section 5.3

3. Page 10 of QVP - Paragraph 1

4. Page 13 of QVP - Paragraph 1 under Section 6.4

C. Comments on Appendix B

1. Page 1 of Appendix B (Soils PQCI's deleted)

MIDLAND NUCLEAR COGENERATION PLANT
Docket No-50-329, 50-330

CONSTRUCTION COMPLETION PROGRAM

Consumers Power Company
August 26, 1983

Revision 2
mi0683-4033a-66-165

TABLE OF CONTENTS

CONSTRUCTION COMPLETION PROGRAM

Executive Summary

The Construction Completion Program has been formulated to provide guidance in the planning and management of the construction and quality activities necessary for completion of the construction of the Midland Nuclear Cogeneration Plant. Construction completion is defined in this Plan as / carrying systems to the point they are turned over to Consumers Power Company for component checkout and preoperational testing. The Construction / Completion Program does not include NSSS construction as performed by B&W / Construction Company, HVAC work under the Zack subcontract, the Remedial Soils / Program and post-turnover punchlist work released to Bechtel Construction by / Consumers Power Company, which are treated in separate interactions between Consumers Power Company and the Nuclear Regulatory Commission.

/ The other major component of the Construction Completion Program is the / Quality Verification Program which verifies closed inspection records based on / a 100% reinspection of accessible attributes and verification of acceptability / of inaccessible attributes for previously completed work.

Background

The Construction Completion Program was developed in response to a number of management concerns that have been identified during the period preceding the initiation of the Program. The Midland Project had been proceeding at a high level of activity as it approached completion. The final transition from area construction to system completion, using punch lists, has been difficult for most nuclear projects. The Midland Project has not escaped these difficulties which have been compounded due to the congested space and the continuing numerous design changes, both generally attributable to the age of the Project. These factors lead to the need for improved definition of work status, increased emphasis on overall Project objectives as well as continued focus of construction and inspection resources on completion of systems for short-term milestones and increased effort to complete engineering ahead of field installation.

The Midland Project has been criticized by the NRC regional office as not having met their expectations for implementation of the Project's Quality Assurance Program. The result has been that the Project management has too often, during the months preceding this Program, been in a reactive rather than proactive posture with regard to quality assurance matters.

In recognition of these conditions, management has concluded that a change in approach was needed to effectively complete the Project while maintaining high quality standards.

Objectives

The development of the Program has considered the Project's current status and recent history and attempts to address the underlying or root causes of the problems currently being experienced. In order to develop the Program the following overall objectives were established under three general headings. The Program Must:

Improve Project Information Status By:

- Preparing an accurate list of to-go work against a defined baseline.
- Bringing inspections up-to-date and verifying that the quality of completed work is acceptable.
- Maintaining a current status of work and quality inspections as the Project proceeds.

Improve Implementation of the QA Program By:

- Expanding and consolidating Consumers Power Company control of the quality function.
- Improving the primary inspection process.
- Providing a uniform understanding of the quality requirements among all parties.

Assure Efficient and Orderly Conduct of the Project By:

- Establishing an organizational structure consistent with the remaining work.
- Providing sufficient numbers of qualified personnel to carry out the program.
- Maintaining flexibility to modify the Plan as experience dictates.

Description

The Construction Completion Program entails a number of major changes in the conduct of the final stages of the construction process and can be described in summary as a two-phase process.

/ First, after certain necessary preparations, the safety-related systems and
/ areas (unless specifically excluded-Section 9) identified in the Project
/ Q-List will be systematically reviewed. This first phase will be carried out on an area-by-area basis, but will be accomplished by teams organized with systems as well as area responsibility and a separate effort by MPQAD to
/ verify the completed work. All systems not previously turned over to
/ Consumers Power Company are included in the installation status assessment.
/ The work to go on turned over systems is contained in the existing punchlist

/ for these systems. Commodities that are not defined within a system scope are
/ covered by area teams. The reinspections defined in the Quality Verification
/ Program are carried out on both the systems turned over to Consumers Power
/ Company as well as the systems not yet turned over. The teams will use scoped
/ drawings to identify boundaries and ensure coverage of all systems in
/ preparation of commodity lists that will be used to initiate status assessment
/ and quality verification. The product from this phase of the program will be
a clear status of remaining installation work and a current inspection status
which provides quality verification of the existing work. The teams organized
to carry out this first phase will continue to function in the second phase as
/ the responsible organizational units to complete the work. They will use the
/ list of to-go work prepared during Phase 1, and work packages that integrate
/ construction and QC Inspection requirements to accomplish the Phase 2
/ completion work.

In order to achieve its complete set of objectives, the Program contains a number of activities and elements that support and are linked to the two major phases described above. The major components of the Plan, which are discussed in more detail in the balance of this report, can be described as follows:

- A significant reduction in the construction activity in the safety-related portion of the plant, material removal and a general cleanup has been carried out in preparation for installation and inspection status assessment and quality verification activities.

- A review has been made of equipment status to assure that the proper lay-up precautions have been implemented to protect the equipment until the installation work is completed.

- The integration of the Engineer/Constructor QC function into the Midland Project Quality Assurance Department (MPQAD) under Consumers Power Company management has been completed.

- MPQAD is carrying out a recertification program of QC inspectors, and review of the inspection procedures to be utilized.

- The completion teams are being organized, staffed and trained according to procedures developed to define the team's work process.

- The completion teams will 1) accomplish installation and inspection status assessment, 2) complete installation and ensure quality inspections are performed and 3) determine that all requirements have been met prior to functional turnover for test and operation.

- Quality verification of completed work will be carried out in parallel with installation and inspection status activities of the completion teams.

- A series of management reviews are being carried out to carefully monitor the development and conduct of the Program and to revise the plan as appropriate.

/ · NRC hold points for release of Phase 1 and Phase 2 implementation
/ activities.

· Review and resolution will proceed on outstanding issues related either to QA program or QA program implementation as raised by the NRC or third party overviews of the Project.

· Third party reviews are being undertaken to monitor Project performance and to carry out the NRC's requirements for independent design verification.

Status

The Program was initiated on December 2, 1982 by limiting certain ongoing safety-related work and starting preparations for the phase-one work of status assessment and quality verification activities. Since the Program also has incorporated a number of commitments made to the NRC during the period prior to December 2, 1982, activities in support of these commitments such as QC integration into MPQAD and the recertification of QC inspectors, had been initiated prior to December.

Milestones for each element of the Plan are enumerated in the text. In general, preparation for the Phase 1 activities are in place and the
/ management reviews are being held. A pilot team has developed the procedures
/ and training requirements. Phase 1 is ready to begin.

The Program provides for the Phase 1 results on an area, system, or partial system to be reviewed and evaluated prior to initiating Phase 2 system completion work on that system or partial system. Management will monitor both process readiness and Phase 1 evaluation results.

/ NRC release is required prior to initiation of Phase 1 status assessment and
/ quality verification and Phase 2 work activities. The major areas of continuing safety-related work outside the Construction Completion Program are NSSS construction as performed by B&W Construction Co, HVAC work under the Zack subcontract, the Remedial Soils Program and post-turnover punch list work released to Bechtel Construction by Consumers Power Company.

During the continuing implementation of the Program in 1983, the NRC Region III can use the Plan to monitor safety-related construction activities at the site. Since a substantial portion of the Plan directly relates to commitments made to NRC management, Consumers Power Company intends to
/ schedule periodic reviews of Program status and progress with the NRC. These
/ meetings will be noticed (by NRC) and will be open to members of the public
/ and interested parties as observers.

1.0 INTRODUCTION

The Construction Completion Program has been formulated to provide guidance in the planning, and implementation of the construction and quality activities necessary for completion of the construction of the Midland Nuclear Cogeneration Plant. Construction completion is defined in this Plan as / carrying systems to the point they are turned over to Consumers Power Company for component checkout and preoperational testing. The Construction / Completion Program does not include NSSS Construction as performed by B&W / Construction Company, HVAC work under the tack subcontract, the Remedial Soils / Program and post-turnover punchlist work released to Bechtel Construction by / Consumers Power Company, which are treated in separate interactions between Consumers Power Company and the Nuclear Regulatory Commission.

/ The other major component of the Construction Completion Program is the / Quality Verification Program which verifies closed inspection records based on / a 100% reinspection of accessible attributes and verification of acceptability / of inaccessible attributes for previously completed work.

The Construction Completion Program will be referred to as the Program in this document which contains the Plan for Program development and implementation.

Background

The Construction Completion Program was developed in response to a number of management concerns that were identified during the period preceding the initiation of the Program. The Midland Project had been proceeding at a high level of activity as it approached completion. The final transition from area construction to system completion, using punch lists, has been difficult for most nuclear projects. The Midland Project has not escaped these difficulties which have been compounded due to the congested space and the continuing numerous design changes, both generally attributable to the age of the Project. These factors lead to the need for improved definition of work status, increased emphasis on overall Project objectives as well as continued focus of construction and inspection resources on completion of systems for short-term milestones and increased effort to complete engineering ahead of field installation.

The Midland Project has been criticized by the Nuclear Regulatory Commission regional office as not having met their expectations for implementation of the Project's Quality Assurance Program. The result has been that the Project management has too often, during the months preceding this Program, been in a reactive rather than proactive posture with regard to quality assurance matters.

In recognition of these conditions, Consumers Power Company concluded that a change in approach is needed to effectively complete the Project while maintaining high quality standards.

Objectives

The development of the Program has considered the Project's current status and recent history and attempts to address the underlying or root causes of the problems currently being experienced. In order to develop the Program, the following overall objectives were established under three general headings. The Program must:

Improve Project Information Status By:

- Preparing an accurate list of to-go work against a defined baseline.
- Bringing inspections up-to-date and verifying that the quality of completed work is acceptable.
- Maintaining a current status of work and quality inspections as the Project proceeds.

Improve Implementation of the QA Program By:

- Expanding and consolidating Consumers Power Company control of the quality function.
- Improving the primary inspection process.
- Providing a uniform understanding of the quality requirements among all parties.

Assure Efficient and Orderly Conduct of the Project By:

- Establishing an organizational structure consistent with the remaining work.
- Providing sufficient numbers of qualified personnel to carry out the Program.
- Maintaining flexibility to modify the Plan as experience dictates.

Plan Contents

The Program was initiated on December 2, 1982 by limiting on-going work on Q-systems to pre-defined tasks and preparing the major structures housing Q-systems for an installation and inspection status assessment and verification of completed work. The relationship of the major elements of the Plan is shown in Figure 1-1. The sections of the Plan address the following major activities:

The buildings are being prepared for a status assessment of incomplete work and verification of completed work.

A new quality organization that integrates the QA and QC functions under a Consumers Power Company direct reporting relationship has been

established. As part of this transition, the Engineer/Constructor QC inspectors are being recertified to increase confidence in the quality inspection performance.

The overall Plan for the Program is being developed in two major phases.

The first phase includes:

- A team organization assigned on the basis of systems developed to determine present installation and inspection status. The installation status assessment includes a comparison of partially installed work to current design and identification of remaining work items for completion. The inspection status assessment includes the Team Quality Representative requesting MPQAD to perform additional inspections using recertified inspectors on partially completed or completed work to bring inspections up to date. The completed portions of open Inspection Reports will be 100% reinspected for accessible attributes. A closely coordinated effort involving the Engineer/Constructor and Consumers Power Company (QA/QC, testing and construction) personnel will improve quality performance. Separate teams are also being assigned to work area type commodities such as cable trays and doors. (ie, commodities not related to a particular system.)

- The quality verification of completed work identified by closed Inspection Reports will be initiated on a 100% basis using re-certified inspectors. This is performed under the Quality Verification Program.

The second phase includes:

- Work completion, following quality verification, installation and inspection status assessment under responsibility of the team organization. A construction punchlist developed during Phase 1 status assessment and quality verification will define the work requirements for completion.

- An integration of the QC inspection process for new work with the completion work to ensure adequate quality performance.

The first phase implementation of the Program will be initiated with a review of the process, procedures and team assignments that will be used. The plan for verification of completed work will be reviewed separately. Verification of completed and previously inspected work will be carried out by MPQAD in accordance with the Quality Verification Plan, in coordination with the team effort. The teams will conduct the installation and inspection status assessment; as part of this effort MPQAD will be requested to bring inspections up to date on partially completed or completed work. Following Phase 1 completion of the first verification and status assessment segment, a management review will be made of the evaluation of the initial

Phase 1 results and the process and procedures for Phase 2 activities. In Phase 2 Program implementation, the assigned team will plan and / carry out the remaining work needed for completion and MPQAD will / conduct QC inspections.

The adequacy and completeness of the quality program will be reviewed, as appropriate, on an ongoing basis, taking into consideration questions raised by NRC inspections and findings by third party reviewers.

Independent assessments of the Midland Project will provide management and NRC with evaluations of Project performance.

The on-going work to protect plant equipment and systems will be augmented as necessary to provide adequate protection during implementation of this Plan.

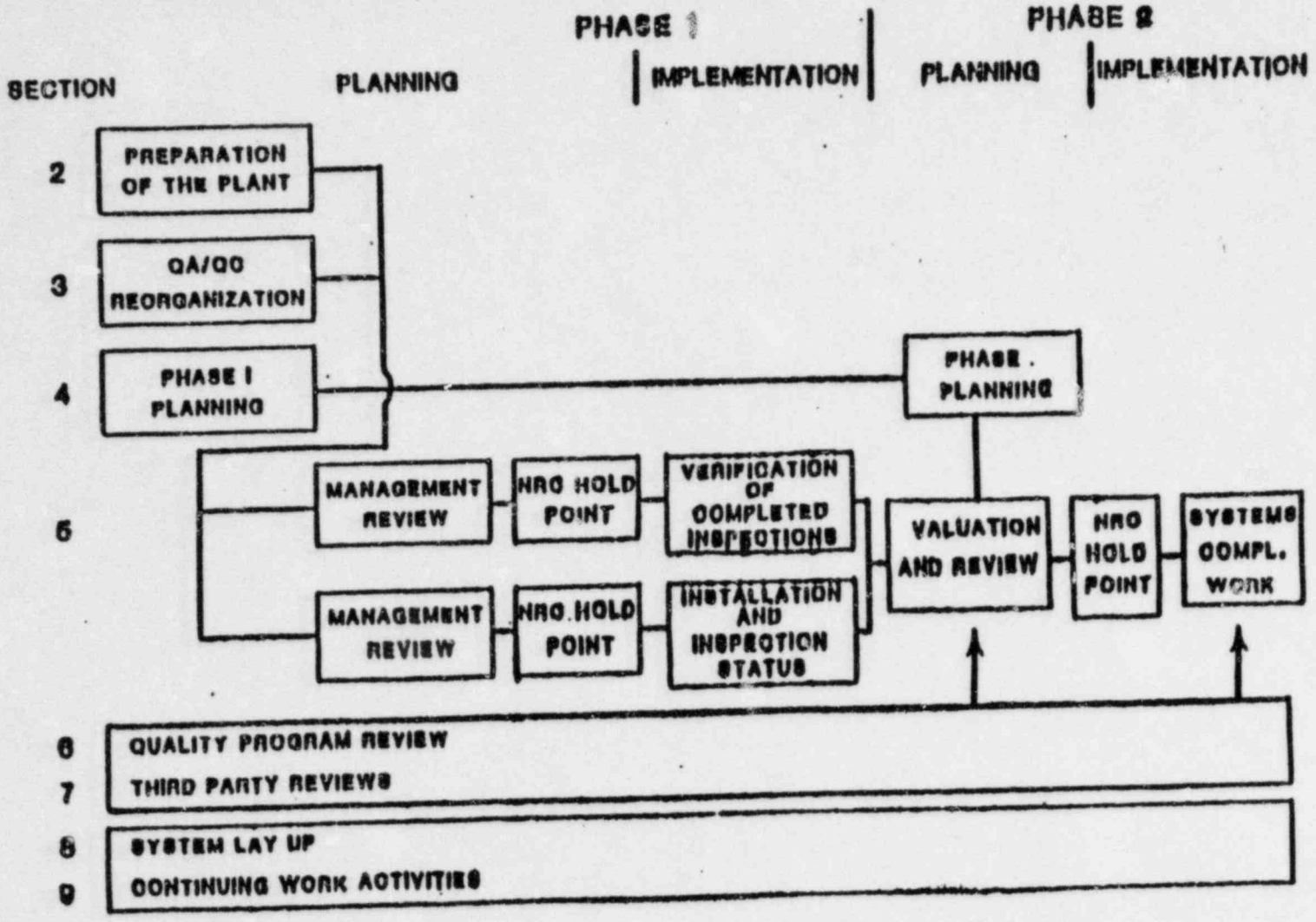
/ Work on Q-Systems has been limited to specific activities that have / demonstrated quality program effectiveness. This limitation permits / work to proceed outside of the Construction Completion Program while allowing building preparation for status assessment and verification activities on that work which is under the Construction Completion / Program. These specific ongoing activities include a review for new / work to prevent items subject to reverification, in areas covered by / the Construction Completion Program, from becoming inaccessible as a / result of on-going work.

Summary

The program is a comprehensive plan to complete the Midland Nuclear Cogeneration Plant in a manner that assures the licensibility of the plant when construction is complete. Cost and schedule for completion of the Midland Project are also a concern for Consumers Power Company. The Company believes that the most efficent way to project completion is to understand the current plant status, establish the requirements to finish the project and complete the work according to these requirements. Thus the theme of the Construction Completion Program to verify past work and proceed on future work with improved performance is consistent with this philosophy.

FIGURE 1-1

CONSTRUCTION COMPLETION PROGRAM SCHEMATIC



2.0 PREPARATION OF THE PLANT

2.1 Introduction

The preparation of the Plant cleared the auxiliary, diesel generator and containment buildings and the service water pump structure of materials, construction tools and equipment and temporary construction facilities.

2.2 Objective

To allow improved access to systems and areas for the Program activities.

2.3 Description

The preparation activities minimize obstacles and interferences for the Program activities. This is being accomplished through the following steps.

1. Limitation of Q-work to specific activities and areas defined in Section 9 resulting in substantial work force reduction.

2. Removal and storage of construction tools and equipment, and temporary construction facilities (scaffolding, etc) from the buildings identified in Section 2.1.

3. Removal, control and storage of uninstalled materials from the buildings identified in Section 2.1.

4. Appropriate housekeeping of all areas following material and equipment removal.

The preparation for each area will be complete before initiating further Program activity. The on-going work described in Section 9 will continue as scheduled during the preparation of the Plant for CCP activities.

2.4 Milestones

Complete preparation of affected areas of the plant. (Complete)

3.0 QA/QC ORGANIZATION CHANGES

3.1 Introduction

The Consumer Power Company's Midland Project Quality Assurance Department (MPQAD) was expanded to assume direct control of site project quality functions including Engineer/Constructor QC. / Bechtel retains responsibility for ASME N-stamp activities. The new organization is described below. The transferred QC Inspectors are being recertified as part of this transition.

3.2 Objectives

Establish New QA/QC Organization

Establish an integrated organization which includes the transition of Engineer/Constructor QC to MPQAD while accomplishing the following objectives:

1. Establish direct Consumers Power Company control over the QC inspection process.

2. Establish the responsibilities and roles of the QA and QC Departments in the integrated organization.

3. Use qualified personnel from existing QA and QC departments and contractors to staff key positions throughout the integrated organization.

Recertify QC Inspectors

Ensure that those Quality Control inspection personnel transferring to MPQAD will be trained and recertified in accordance with MPQAD Procedure B-3M-1.

3.3 Description

Establish New QA/QC Organization

A new organization was implemented under Consumers Power Company and has been described in the appropriate Topical Report (CPC-1A), the FSAR and quality program manuals (Volume II, BQAM and NQAM). Changes to CPC-1A were approved by NRC on March 14, 1983.

Features of the new organization include:

1. Lead QC Supervisors report to a QC Superintendent who reports to the MPQAD Executive Manager. Any required support from Bechtel Corporate QC and QA functions (except ASME N-Stamp activities) is provided at the level of the MPQAD Executive Manager.

2. The MPQAD Executive Manager will review the performance of lead personnel in his department.

3. QA will develop and issue Project Quality Control Instruction (PQCI) plans and be responsible for the technical content and requirements of such plans. QC will be responsible to implement these plans.

4. QA will continue to monitor the Quality Control inspection process to insure that program requirements are satisfactorily implemented.

5. MPQAD will implement procedures from Bechtel's Quality Control Notices Manual (QCNM) and Quality Assurance Manual (BQAM) as approved for use on the Midland Project by MPQAD in addition to the continued use of existing CPCo and MPQAD procedures. The QCNM and BQAM requirements applicable to the Midland project are approved in accordance with MPQAD Procedure M-9 Review of Subcontractors QA Manuals and Procedure N-9 MPQAD Review and approval of Bechtel Site Instructions and Guidelines. The Consumers Power Company and Bechtel Manuals are compatible. The Bechtel Manuals have been maintained to satisfy Bechtel's Commitments regarding the American Society of Mechanical Engineers, Boiler and Pressure Vessel Code (ASME III).

6. ASME requirements imposed upon a contractor as N-Stamp holder will remain with that contractor. MPQAD QA will monitor the implementation of ASME requirements. MPQAD QC personnel will conduct the inspections for ASME as described in the applicable PQCI's.

An organization chart (Fig 3-1) showing current reporting relationships is attached. The official organization chart is contained in project procedures.

Training of MPQAD Personnel

MPQAD initiated a program in late 1982 to retrain and recertify all Engineer/Constructor QCE's (Inspectors) to existing PQCIs. A significant number of QCE's have been recertified under this process. Early in 1983, MPQAD decided to terminate recertification of old PQCIs except in selected cases, focus efforts on completing the review and revision of PQCIs, and then train and recertify the QCEs to the new PQCIs. If a specific PQCI is required for support of current work activities prior to review and revision completion, inspectors are trained and re-certified to the old PQCI.

MPQAD is currently re-training and re-certifying all inspectors to the revised PQCIs. As a part of this activity, the Project Quality Control Instructions (PQCI) are undergoing a complete review to assure:

Attributes that affect the safety and reliability of specific components, systems and structures are identified for verification.

Accept/reject criteria are clearly identified.

Appropriate controls, methods, inspection and/or testing equipment are specified.

Requisite skill levels are required per ANSI N45.2.6 or SNT-TC-1A.

After the PQCIs are revised as necessary, Quality Control Engineers (Inspectors) are being trained and must pass an examination and demonstration test to assure their proficiency in utilizing the new instruction. Upon / successful completion of a performance demonstration, each inspector is being certified to perform inspections to those PQCIs in which he was trained.

The adequacy of PQCIs prior to training is assured by the following programmatic requirements:

1. The PQCI evaluation effort is being conducted under the direction of MPQAD QA personnel. MPQAD Procedure E-3M establishes the responsibilities and requirements for the preparation, revision, and control of PQCIs by QA personnel.

   As a part of the initial PQCI revision process, Project Engineering does a review of the PQCI for MPQAD to assist in ensuring that attributes that affect safety have been identified for inspection, and further to ensure that the PQCI is consistent with the specification requirements and that clarifications are made to specifications wherever necessary. The final responsibility for the content of the inspection plan remains with MPQAD-QA.

/ 2. Whenever a PQCI is revised, a documented evaluation of the revision to determine if a pilot run for testing the implementing capability of the PQCI is required. If a pilot run is required, the PQCI is tested by a team from QA, QC and Training. Based on this pilot run, / the PQCI may be further revised. The documentation is available for / review by the CIO (Construction Implementation Overview, see / Section 7.3) and the NRC.

3. Once the PQCI is ready for issue, an effectivity date is established in conjunction with the Training Department.

   A. For PQCIs on which training was not previously conducted, the training and certification process is then started.

   B. For PQCIs on which training and/or certification was previously / conducted, a determination is made in accordance with MPQAD / Procedure B-2M as to the need for retraining or recertification. / The required evaluation is documented and is available for / review by the CIO and NRC.

4. During the training process, student questions (see below) are solicited and monitored. Based on this, further revision to a PQCI may be initiated.

Steps taken to ensure all questions raised during PQCI training sessions are resolved prior to certification include:

1. The development of an MPQA Department "Statement of Training Policy." A copy of the current Policy is included as Figure 3-2.

2. The Policy Statement is handed out at the start of each class and reviewed with the trainees.

3. Statement 2 of the Policy deals with student questions. Instructors handle many questions as a routine part of a class. However, when an instructor is faced with questions he cannot answer, he makes note of them for subsequent resolution with the students.

4. When the instructor determines the need, a QA Engineer, Project/Resident Engineer or other resource person is scheduled to participate as part of the class and answer questions raised by the students.

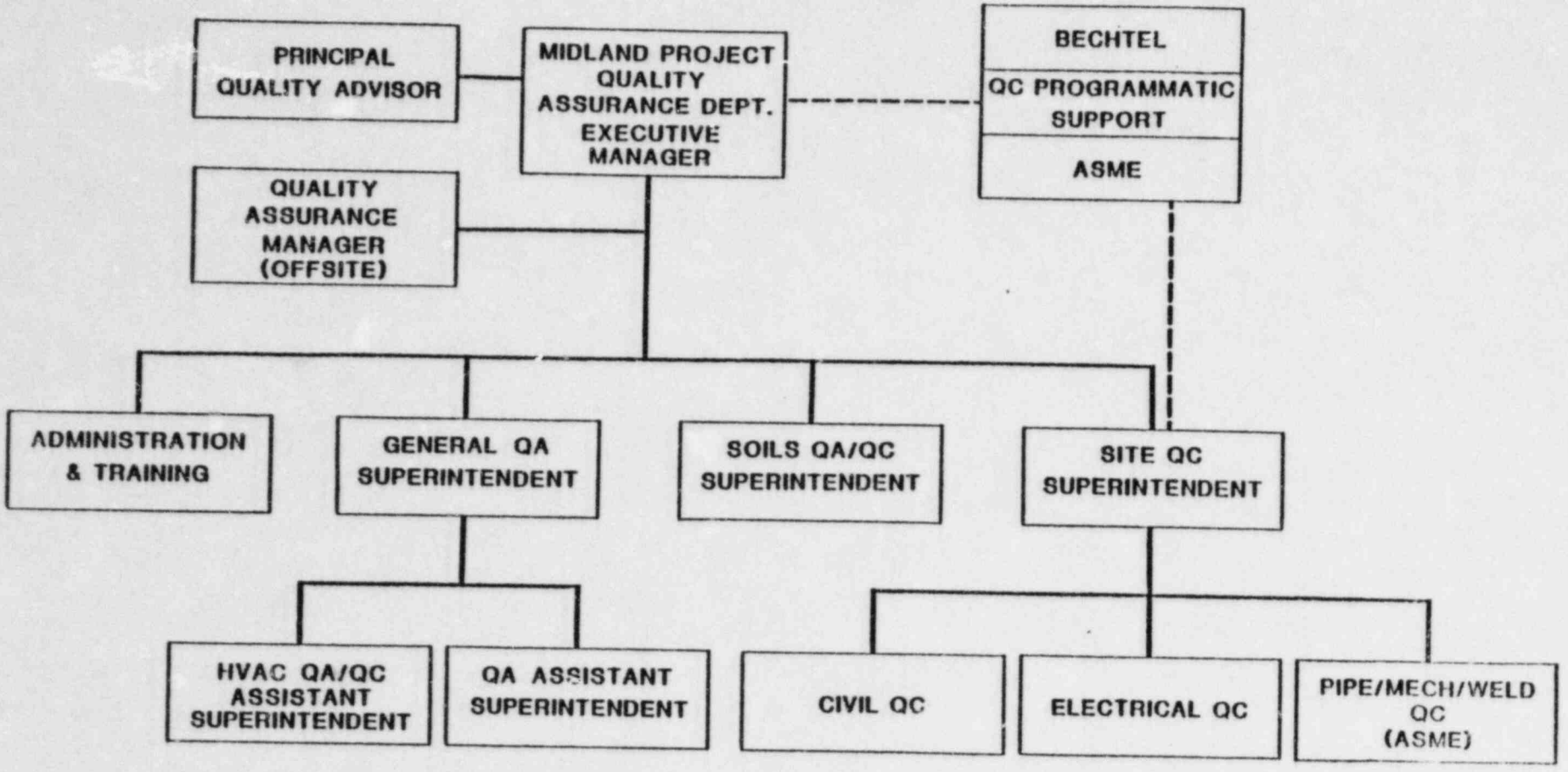
5. If there are unanswered questions at the end of the scheduled class time, an evaluation is made by the instructor as to whether training can nevertheless be considered complete and the examination given without jeopardizing the students opportunity to satisfactorily write the exam.

6. Even if the examination can be given, prior to answering questions, the questions are still tracked and answered prior to certification.

7. When a trainee indicates that he is not prepared to take an examination or a performance demonstration, he shall not be administered the examination or performance demonstration until his specific concerns are resolved.

FIGURE 3-1

MPQAD ORGANIZATION



NOTE: THIS CHART IS INTENDED TO INDICATE ONLY THE INTEGRATION OF THE BECHTEL QC FUNCTION.

FIGURE 3.2

MPQA DEPARTMENT STATEMENT OF TRAINING POLICY

It is the objective of the MPQAD Training Department to provide training that meets the needs of the trainees. To help meet these needs the following policies apply:

1. Personnel who are required to attend classroom training shall not be administered an examination without 100% classroom attendance. 100% attendance is defined as total classroom time less instructor excused absences for brief periods of time. A lesser percentage may be requested in writing by the trainees supervisor and approved by the appropriate Training Supervisor.

2. When trainees have pertinent questions that relate to the training subject matter the instructor shall take action to answer the questions or obtain the answers and provide them to the students prior to final examination or certification as appropriate.

3. The time required for self-study prior to examination shall be determined and scheduled by the appropriate Training Coordinator, based on the duration of the lesson and complexity of the subject.

4. The instructor will review the class evaluation sheets or a composite to determine the acceptability of the training prior to administering the exam to the class. If judged unacceptable, the exam will not be administered until appropriate action has been taken.

5. When a trainee indicates that he is not prepared to take an examination or a performance demonstration he shall not be administered the examination or performance demonstration until his specific concerns are resolved.

STUDENT HANDOUT

RAWells _____ 4/20/83

GFEwert _____ 4-20-83

Recertify QC Inspectors

The training and recertification process for QC Inspectors as just discussed satisfies commitments made during the September 29, 1982 public meeting with the NRC. Those inspectors transferred from the Engineer/Constructor to MPQAD are trained and examined in accordance with MPQAD Procedure B-3M-1. Upon satisfactory completion of the training and examination requirements, inspection personnel will be certified for the Project Quality Control Instruction(s) (PQCI(s)) they are to implement. Inspection personnel are certified on a schedule which supports ongoing work and system completion team activities.

/ Where individual inspectors fail any part of the recertification
/ process a documented evaluation will be made to determine the cause
/ of the failure and the need for and extent of reinspection of the
/ individual inspector's past work. The evaluation is performed by
/ the Training Instructor, the QC Discipline Supervisor and the QA/QC
/ Discipline Level III. The evaluation and recommendations require
/ concurrance of the Individual Inspector's MPQAD Superintendent. The
/ documentation is available for review by the CIO and the NRC.

3.4 Milestones

Establish New Organization

Transfer the Bechtel QC Organization to MPQAD.	Complete
Submit changes to Topical Reports and quality program manuals to NRC.	Complete

Recertify QC Inspectors

Specify the revised training and examination requirements for certification (B-3M-1)	Complete

4.0 PROGRAM PLANNING

4.1 Introduction

The detailed planning for the major portion of the Construction Completion Program is described in this section.

Planning in support of Phase 1 consists of the activities to set up a team organization, process and procedures to assess the installation and inspection status of Q-systems, Q-components and Q-structures (Section 4.2) and to verify the quality status of hardware installed and inspected prior to December 2, 1983, (Section 4.3).

The Phase 2 planning effort covers the process and procedures that will be used by the team organization for completion work (Section 4.4). The procedures to integrate the quality program requirements with completion work are covered (Section 4.5).

4.2 Team Organization (Phase 1)

4.2.1 Introduction

The planning for team organization consists of procedures preparation and team organization and training for an installation and inspection status assessment.

4.2.2 Objectives

1. Establish and implement a team organization ready to inspect and assess work for installation and inspection status.

2. Develop the organizational processes and procedures necessary to implement the team approach for status assessment.

3. Provide training to ensure required inspection and installation status assessment activities are satisfactorily performed.

4.2.3 Description

Team Organization

The team organization structure will vary depending upon the assigned scope of work. The assigned scope of work will be made on the basis of systems, specific items such as hangers and commodities that are installed and tracked on an area basis such as conduit, cable tray supports and watertight doors. (For example, see Bechtel Field Procedure FPG9800, "Bulk Hanger Organization Charts".) The organization will

consist of a team supervisor and personnel as appropriate from field engineering, planning, craft supervision, project engineering, MPQAD and Consumers Power Company Site Management Office. The team may be augmented by procurement personnel, subcontract coordinators and turnover coordinators.

Teams are assigned a specific scope of work and held accountable for status assessment and overall completion within this scope. The scope includes the requirements to develop a viable working schedule. Since the teams are assigned largely on a system basis, the work activities will overlap between teams in a given area. The working schedule for each team will have to account for the activities of the other teams. As the working schedule is developed, conflicts in coordinating these activities will be identified and resolved by the teams. Any problems related to product or work quality will be handled within the quality program. Project processes and procedures have been reviewed and modified to incorporate the team organization.

The team MPQAD representative is responsible for providing the QA/QC support for the team. He receives scheduling direction from the Team Supervisor but receives all other direction from and reports to management within MPQAD. To support the team, he analyzes the quality requirements and plans the QC activities to integrate them with the team effort. He assures the necessary PQCI's and certified inspection personnel are available for performing the inspections. He assures NCR's are validated according to established procedures. He maintains cognizance of the quality status of the verification activities.

The team organization and the reporting relationship of the team quality representative is show in Figure 4-2.

Pilot teams are being utilized to develop and test processes and procedures during the development stage to assure that Program objectives can be met. This also provides practical field input to assure that efficient and workable methods are used.

Team members are physically located together to the extent practicable to improve communication, status assessment, problem identification and problem resolution. The MPQAD representative, however, will continue to report to MPQAD management and will maintain a permanent physical assignment within the MPQAD area.

Team Training

The construction training procedure (FPG-2.000) has been revised to incorporate the training requirements of the CCP. The procedure sets down specific requirements for type of training and subject matter for each organization element. The training requirements by type and subject are defined in a matrix for each organization, management and staff level including craftpersons. The training matrix will be approved by Consumers Power Company.

The team training includes the major elements described below:

1. General training will be provided in

   A. Quality requirements for nuclear work

   B. Requirements of the CCP

   C. Safety orientation

   D. Inspection and work procedures

   Training in Items (A) through (C) and selected parts of (D) will be conducted in a formal setting and will be given to all personnel including the craftpersons.

   In addition, a "tool box" review session will be conducted at least monthly for the craftpersons by the foreman. The subject matter for this review will be contained in the recently initiated Quality Bulletin which will cover the following topics as necessary:

   A. Topic of the month, eg, a review of procedural and quality requirements in areas where problems have been identified.

   B. A review of trends that point to potential quality problems and areas that indicate good quality performance.

   C. Identification and review of important changes to work and procedural processes.

   A record will be prepared by the craft foreman indicating that the "tool box" review session was held. These records will be maintained in a central file and will be available for NRC Review. Current copies of the Quality Bulletin will be posted in appropriate locations throughout the site.

2. Training in the procedures used to govern the performance of work will be conducted for designated field engineering, support personnel and craft personnel as defined in the training matrices.

/ Formal training as defined in FPG 2.000 will be conducted for identified procedures that define the control of designated work processes, procedures for control of special processes and requirements for inspection and acceptance of completed work. Formal training includes classroom or field demonstration/discussion sessions.

/ Process for Status Assessment

/ Prior to starting the Phase 1 status assessment, the Q items
/ that are the responsibility of each team are quantified. For
/ turned over systems, the system commodities will be
/ quantified to identify items subject to the Quality
/ Verification Program. Completed items associated with closed
/ IR's are identified for verification during Phase 1. The
/ remaining items are covered by the status assessment, which
/ includes a comparison of physical configuration to current
/ design documents. The status assessment identifies work
/ required to complete each item in accordance with the design
/ documents. The identified work items are placed on a
/ construction punchlist. The completion of Phase 1 for
/ systems/areas represents a accurate list of to-go work
/ against current design requirements.

Documentation of Nonconformances

Nonconformances on the finished portion of partially
/ completed work identified during the status assessment will
/ be documented on Nonconformance Reports (NCR's). Both
/ identified nonconformances and incomplete work items will be
/ placed on the construction punchlist developed as part of
/ Phase 1 status assessment.

4.2.4 Milestones

. Complete assignment of team supervisors and members to designated systems.	Complete
. Complete organization description and procedures for team functions.	Complete
. Set up training program for teams.	

4.3 Quality Verification (Phase 1)

4.3.1 Introduction

The verification program is the activity undertaken to establish, using a variety of methods, that the hardware installations completed and inspected prior to December 2, 1982 have an acceptable quality status and that prior inspections were performed in an acceptable manner.

4.3.2 Objectives

The objectives of the verification program are to:

- Develop and implement a verification inspection plan using reviewed/revised PQCI for completed and inspected work which considers:

  a. Re-inspection of accessible items for quality verification.

  b. Verification of acceptability of inaccessible attributes by a review of documentation, over-inspection results and past corrective actions and supplementary to these reviews, if required, by NDE techniques and destructive examination.

4.3.3 Quality Verification Program Description

The Quality Verification Program is provided in Appendix 1 of this document.

/ The quality verification program addresses on a specific PQCI basis, both accessible and inaccessible attributes of work completed and inspected prior to December 1982 on a 100% basis. A complete physical reinspection will be conducted on accessible attributes regardless of past inspection activities. The quality of inaccessible attributes will be verified as follows: A review of completed inspection records and associated documentation for acceptability; a review of information and documentation associated with resolution of past problems where such information exists; a review of the results of prior MPQAD overinspection results; and a review of any other existing information pertinent to the inaccessible attributes. In addition, wherever "normally inaccessible" attributes or hardware can be located as "accessible" due to construction or rework status, reinspections will be conducted for these attributes. Further, if the proceeding process does not establish the quality of inaccessible items for any PQCI, NDE or destructive examination techniques will be utilized to the extent necessary to establish the quality level.

At some future date, once the quality level of completed work has been established, Consumers Power Company will make a determination as to whether or not further verification efforts can appropriately be based on less than a 100% reinspection program. When Consumers Power Company believes that sufficient justification exists for a reduction in the 100% commitment, it will recommend such a reduction to the NRC in accordance with the statistical sampling plan described in an appendix to the Quality Verification Program.

4.3.4 Milestone

- Issue Quality Verification Plan — Complete

4.4 Completion Planning (Phase 2)

4.4.1 Introduction

Establish completion processes, prepare procedures and expand training to cover completion work.

4.4.2 Objective

The objectives of completion planning are as follows:

- Establish processes and interfaces for work completion.
- Prepare procedures defining tasks of each completion team.
- Train team members by expanding upon training received previously for inspection and status assessment.
- Establish scheduling methods to be used during completion activities.

4.4.3 Description

The team organization (developed in Section 4.2) and the processes and procedures will be extended to accomplish the completion work.

Training will be conducted to assure that supervisors understand the team objectives and their role. Emphasis will be placed on completion of all work in accordance with the design and procedural requirements, and the change process to be used when the design or the procedures must be modified.

Completion work will be identified and released for construction using a controlled process to ensure that new work does not cover up existing nonconformances or items that

have not been inspected or re-inspected. This process is described in Section 4.5.3 and 4.5.4.

4.4.4 Milestone

Complete team procedures and training program for initiation of completion work.

4.5 QA/QC Completion Planning (Phase 2)

4.5.1 Introduction

The QA/QC completion activity covers the planning to support completion work.

4.5.2 Objectives

Establish in-process inspection program and complete review and modification of PQCIs.

4.5.3 Description

The QC in-process inspection program will be directly coordinated with construction work plans for new work to insure that inspection points are integrated with the installation schedule. The identification of applicable PQCI's and required inspection points will be used by the completion teams in conjunction with preparation of the Quality Work Package (QWP) by QC to insure that QC inspections are properly scheduled into the process during preparation of construction work plans (CWP). The completion team quality representative will be responsible for providing the interface between the completion team and MPQAD to insure that quality requirements are satisfied.

Procedure for Control and Release of New Work

The process for release of work will be controlled by procedures that ensure that the requirements of the Construction Completion Program are met prior to initiation of new work. The requirements for release of work include; checking, review and approval to ensure that verification and status assessment activities are completed and that the new work activity will not cover up (make inaccessible) items that have existing nonconformances. These procedures are identified in Figure 4-1. They define the overall process for identification and approval prior to release of work. These procedures require an identification of equipment or items that may be affected by the new work package and a check to see that there are no existing nonconformances or incomplete inspections on these items.

The interactions between project management, the completion team and the QA/QC organization are as follows. Prior to Phase 1, quantification of Q items will be performed by the completion team for assigned systems. The completed items will be identified to the QA/QC organization for the association of closed IRs and subsequent verification during Phase 1. The remaining items will be placed in an incomplete category and will be the basis for the status assessment by the completion team during Phase 1. A commodity list will be prepared as the Phase 1 verification and status assessment activities are carried out and will result in a documented status for each system/area.

This documented status will form the basis for site management review prior to release for Phase 2 completion work. Construction work plans (CWPs) for new work will be prepared based on the punchlists (See Section 4.2.3) as they are developed.

There are several major steps in the preparation and approval of the CWP. Each CWP will have a comparable Quality Work Package (QWP) that defines the quality activities. Inspection hold points will be identified and included in the CWP. Following initial preparation of the CWP, the package is taken by the team quality representative. The inspection hold points are reviewed and approved according to MPQAD procedure and a QWP is initiated for this work activity. The QWP contains the inspection records that will be required for that work activity. A review will be performed to ensure existing nonconformances or uninspected work are not covered up. The review will be based on the steps in the three procedures identified in Figure 4-1. After the CWP is returned to construction, and the QWP is prepared, work can proceed.

4.5.4 Special Procedures

As the detailed planning for CCP implementation has developed, it has become apparent that certain activities involving installation of some bulk commodities can be performed most efficiently if performed by a specialized team set up for that specific commodity.

A team organization for status assessment and subsequent installation of pipe hangers has been formed. This team will work under procedures that provide for meeting all conditions imposed on the system team organization. The same procedure for control and release of new work described in Section 4.5.3 will be in effect for this activity. Since the status assessment and verification of all items in an area will not be complete prior to initiating hanger work, the area release contains special provisions to ensure existing

non-conformances or uninspected work is not covered up. Essentially, each Construction Work Plan (CWP) will contain a specific review and check that the new work will not effect status assessment or verification for existing installation.

The installation of water tight doors can also be performed outside the system team organization but will be governed by the same procedures for control and release of new work. These procedures will ensure that there is no coverup of existing non-conformances or uninspected work.

/ It will also be desirable to allow installation of specific
/ items to support the turnover schedule prior to full release
/ of an area for Phase 2 work. Parts of a particular system
/ may be present in a number of different areas. Specific work
/ items on the particular system may be required in an area
/ that has not been fully released for Phase 2 installation.
In these cases, the procedures identified in Figure 4-1, provide for a full examination in the CWP of each item and identification of items that might be covered up. This information will be used by MPQAD and the team organizations to ensure each item that might be covered up will be status assessed and/or inspected and completed prior to release of the CWP.

In each of the cases described above, management reviews will be held and third party and NRC release points identified in Section 5.0 will be adhered to. These activities all meet the requirements identified in Section 10.0 for CCP activities.

4.5.5 Milestone

- Complete procedures for integration of inspection points with construction work process.

- Complete procedures for control and release of new work.

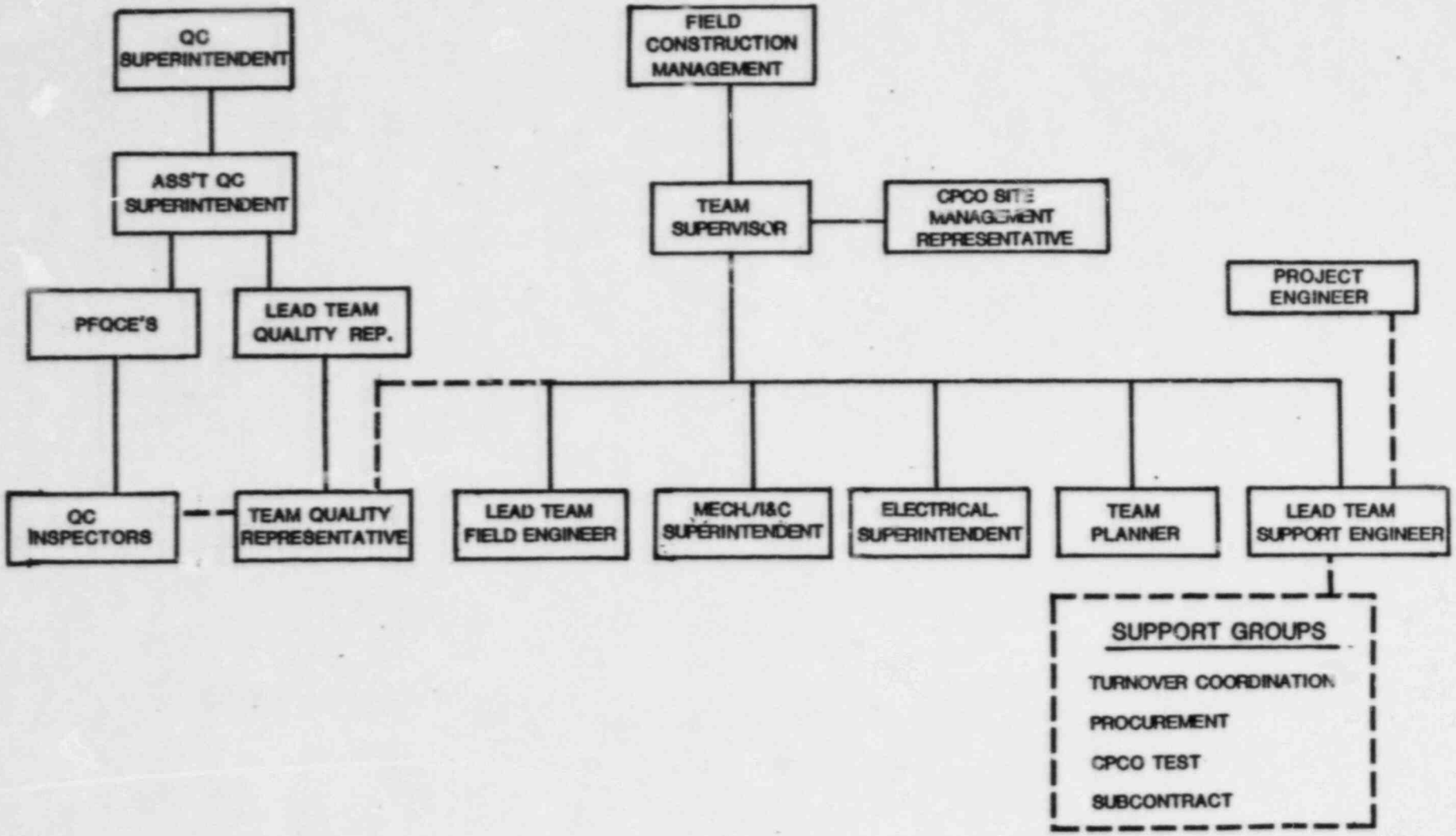
FIGURE 4-1

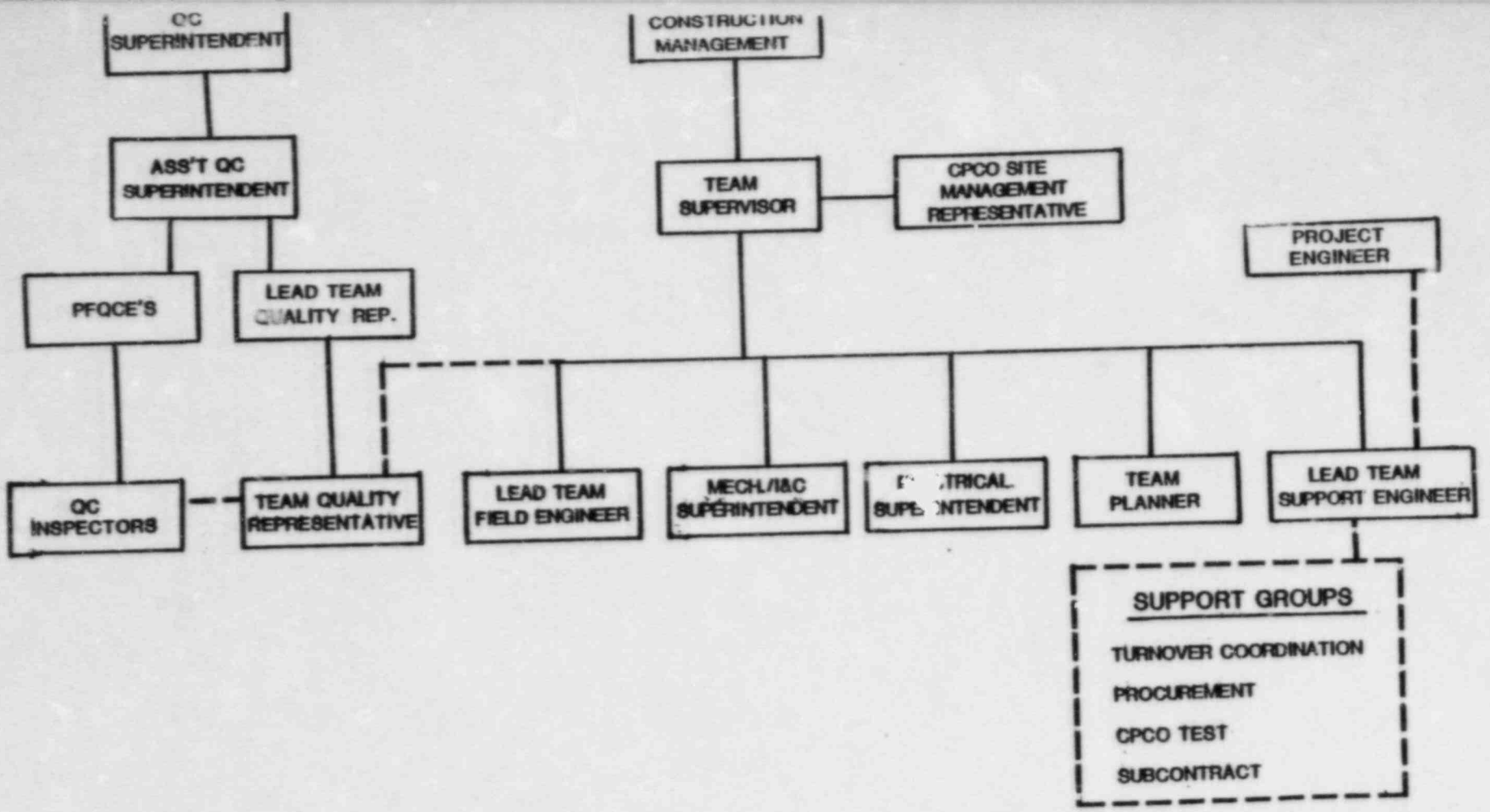
Procedures for Controlling Release for New Work

Procedure	Organization	Purpose
Area Release for Construction (FIG 7.500)	Construction	These three procedures together ensure proper completion of verification and status assessment activities prior to initiation of new work and ensure no cover-up of existing nonconformances
Construction Work Plans (FPG 7.300)	Construction	
Control, Release and Handling of Construction Work Plans and Quality Work Packages (T-3)	MPQAD	

FIGURE 4-2

CONCEPTUAL TEAM ORGANIZATION




QC SUPERINTENDENT
CONSTRUCTION MANAGEMENT
ASS'T QC SUPERINTENDENT
TEAM SUPERVISOR
CPCO SITE MANAGEMENT REPRESENTATIVE
PROJECT ENGINEER
PFQCE'S
LEAD TEAM QUALITY REP.
QC INSPECTORS
TEAM QUALITY REPRESENTATIVE
LEAD TEAM FIELD ENGINEER
MECH/I&C SUPERINTENDENT
TEAM PLANNER
LEAD TEAM SUPPORT ENGINEER
SUPPORT GROUPS
TURNOVER COORDINATION
PROCUREMENT
CPCO TEST
SUBCONTRACT

5.0 PROGRAM IMPLEMENTATION

5.1 Introduction

The implementation of the Phase 1 Construction Completion Program activities will be initiated after management reviews of the overall process insures that Project performance and quality objectives have been addressed. The Phase 1 work will then be carried out by the various teams and inspection personnel in accordance with the procedures described in the preceding sections. The verification and installation and inspection status assessment of an area, system or partial system will be followed by a review of results and a second management review before initiating the Phase 2 completion work. NRC hold points have been placed in the process. These hold points have been established to give the NRC confidence in the effectiveness of the CCP implementation. Third party (Section 7.0) hold points will be determined after the NRC has approved the contractor.

5.2 Objectives

The objectives to be met are:

- Establish the present installation completion and quality status.
- Integrate the construction and quality activities for all remaining work.
- Improve performance in demonstrated conformance to quality goals in all system completion work.
- Establish a management involvement that ensures program committments are properly defined and carried out.
- Provide NRC with confidence in the projects ability to complete the plant.

5.3 Description

The preceding sections have objectives that establish the prerequisites for the implementation of the Construction Completion Program. The Project Management reviews (identified in Figure 1-1) and NRC release are described in this section.

5.3.1 Management Review - Phase 1

/ A Management Review Committee composed of the Vice President,
/ Projects Engineering and Construction as Chairman, the
/ Executive Manager, MPQAD and the Site Manager from Consumers
/ Power Company and the Midland Project Manager from Bechtel will conduct formal reviews of the plans for implementation activities prior to initiation of team activities for the Phase 1 work. Each major activity (systems and area

completion, pipe hangers, etc) described in Section 4.0 will be reviewed. These reviews will ensure that identified project management and quality issues have been adequately addressed by specific actions and that Program objectives are met. The reviews will cover the process for both 1) the verification of completed inspection activity and 2) the installation and inspection status activity.

NRC Hold Point

Upon completion of each Phase 1 management review and resolution of open items, NRC will release the activity to proceed. This process will allow the Project to establish NRC confidence in the project's preparation and ability to proceed.

Phase 1 Implementation

The existing installation and inspection status and verification of completed work will be established in accordance with the plan presented in Section 4.

5.3.2 Evaluation and Management Reviews - Phase 2

The installation and status assessment will be performed on a system and/or area basis. Prior to the start of Phase 2 a review will be held of the results of the initial verification and status assessment activities. In addition, the plans and procedures for Phase 2 implementation will be reviewed. This evaluation assures management that the project is prepared to release new work. The first management review for work release will be done by the Management Review Committee described in Section 5.3.1.

Subsequent status assessment results will be reviewed and new work released by site management on a segment by segment basis. Reports will be made to Project management at regularly scheduled meetings. The Site Management Team is chaired by the CPCo Site Manager with the Executive Manager MPQAD and the Bechtel Site Manager as members.

NRC Hold Point

NRC will release Phase 2 activities to proceed following completion of the Phase 2 management reviews and releases described above.

Phase 2 Implementation

This activity starts completion for turnover. Work will be scheduled as installation and inspection status assessments are completed and reviewed. Correction of identified problems will be given priority over initiation of new work,

as appropriate, and the completion teams will schedule their work based on these priorities.

The plant will be divided into many distinct modules and the CCP sequence will be applied to each module. As a result, there will be situations in the plant where Phase 2 activities will be occurring immediately adjacent to an area undergoing Phase 1 activities.

/ 5.3.3 Third Party Construction Implementation Overview

The Phase 1 management reviews and the initial Phase 2 management review will be audited by the Construction Implementation / Overview Third Party as described in Section 7.3. The / continuing actions for release of work by the Site Management / Office will be monitored by the CIO.

5.4 Milestones

- Complete Management review and initiate implementation of plan for verification of completed inspections.
- Complete Management review and initiate implementation of plan for status assessment.
- Complete Management review of initial verification and installation and inspection status results and initiate systems completion work.
- Satisfy the NRC hold points.
- / Satisfy third party hold points.

6.0 QUALITY PROGRAM REVIEW

6.1 Introduction

The adequacy and completeness of the quality program is reviewed as part of the ongoing Project management attention to quality. These reviews consider questions raised by NRC inspections or findings raised by third party evaluations.

6.2 Objective

Address issues raised by internal audits, NRC inspections and third party assessments. Program changes, if needed, will be evaluated and, as findings are processed, will be factored into the Project work.

6.3 Description

Consumers Power Company believes Midland QA program is sound. From time to time, questions arise on detailed aspects of the program or program implementation. The normal process of addressing these issues ensures that all necessary information is provided to NRC and that internal confidence in the program is maintained.

The recent inspection of the diesel generator building has raised several issues of programmatic concern. These are in the areas of material traceability, design control process, Q-system related requirements, document control and receipt inspection. Project management has directed that an expeditious evaluation of these issues to be considered as part of the management review prior to initiation of Phase 2. Items identified in the NRC D/G Bldg inspection report are addressed and being resolved through the normal process of closing the inspection findings. Any corrective action or program changes will be implemented as appropriate in Project work on a schedule provided in the inspection report response.

The Project will also receive, from time to time, findings from third party assessments (Section 7). These findings or recommendations may also result in program modification or adjustments. Corrective action taken by the Project will be implemented on a schedule stated in the response to these findings.

7.0 THIRD PARTY REVIEWS

7.1 Introduction

This section describes third party evaluations and reviews that are planned to assess the effectiveness of design and construction activity implementation. Third party reviews being conducted as part of the Remedial Soils Program are not included in this activity.

7.2 Objectives

To assist in improving Project implementation and assessment of Midland design and construction adequacy, consultants will be utilized in order to:

- Provide continuous monitoring and feedback to Management of Project performance.
- Identify any activities or organizational elements needing improvement.
- Improve confidence (including the NRC's and the public's) in overall Project adequacy.

7.3 Description

The use of consultants to overview Project design and construction activities with particular emphasis on construction is part of the effort to improve the Project's implementation of the quality program. Specifically, the plan overview employs the use of consultants for three separate functions: (1) To carry out a self-initiated evaluation (SIE) of the entire Project under the INPO Phase I program, (2) to utilize a third party Construction Implementation Overview (CIO) of ongoing site construction activities to provide monitoring of the degree of implementation success achieved under the new program and (3) to conduct a third party Independent Design and Construction Verification (IDCV) Program. Only the CIO is described in this section.

/

Construction Implementation Overview

A third-party Construction Implementation Overview (CIO)is being undertaken using, as a model, the program developed specifically for the underpinning portion of the soils remedial work. The overview was initiated by retaining an independent firm, having considerable experience and depth of personnel in the nuclear construction field. The consultant's overview team is located at the Midland Plant site and observe the work activities being conducted in accordance with this Plan. The overview will continue until Consumers Power and the NRC have confidence in the adequacy of the implementation of the Consumers Quality Assurance Program for the Midland Project.

Findings identified by the installation overview team will be made available to the NRC in accordance with established procedures. The protocol for communications between the parties will be the same as used on the soils remedial activities.

In order to ensure the Project's readiness to undertake the major steps in the Construction Completion Program (CCP), the CCP includes provisions for management review at key points in the process. The review will examine plans for future implementation and ensure that programs and processes are thorough, complete and correct. To provide the NRC with additional assurance that the CCP processes have, in fact, been and will be implemented as described, the duties of the third party CIO will include responsibility for audits of Project performance of these management reviews of the CCP process. The CCP implementation will not proceed beyond these points until the third party overviewer has documented their satisfaction with our readiness to proceed, including satisfaction with our initial response to any audit findings, in their weekly reports or other memoranda.

/ The CIO, while in residence, will also overview other site
/ construction activities specifically B&W Construction-NSSS
/ installation and Zack HVAC work, although the significant focus will be on the implementation of the CCP. The exception is that the CIO will not include an overview of the other third party evaluations
/ being conducted. However, the Construction Completion Program
/ Phase 1 and Phase 2 activities on the systems that are part of the IDCV will be included in the CIO scope.

Consumers Power Company has proposed that Stone and Webster (S&W) be the organization to perform the CIO. This is based on the fact that S&W is considered technically capable to perform the activities both in terms of the individual team proposed and in the corporate depth to support this effort. They are presently conducting an independent overview of the soils remedial activities and have been found acceptable by the NRC for corporate independence.

7.4 Milestones

Construction Implementation Overview

Define scope	Complete
Select consultant	Complete
Mobilize CIO Team	Complete

8.0 SYSTEM LAYUP

8.1 Introduction

Perform system lay-up activities to protect plant equipment.

8.2 Objectives

Expand the protection of completed and partially completed plant systems and components until plant start-up, to take into account any special considerations during the status assessment.

8.3 Description

Procedures and instructions are provided in the Testing Program Manual to protect equipment during the on-going installation and test work. These normal maintenance activities (shaft rotation, lubing, etc) will continue as planned prior to and during Construction Completion Program implementation. These were extended to cover special considerations associated with the Program implementation. Both the pre- and post-turnover periods are covered. System and component integrity is ensured through existing programs and implementation of control and verification procedures.

In summary, these procedures and instructions require: Test Engineers to complete walkdowns of Q-Systems (in the auxiliary, diesel generator and containment buildings and the service water pump structure), paying particular attention to systems/components that are open to the atmosphere (eg open ended pipes, open tanks, missing spools, disconnected instrument lines, etc). Systems that have been hydrotested but are not currently in controlled layup require action to place the system in layup. Layup consists checking to ensure that system water conditions are within specification followed by moisture removal and closing the system from the atmosphere.

8.4 Milestones

Complete the layup preparation walkdown	Complete

9.0 CONTINUING WORK ACTIVITIES

9.1 Introduction

This section describes the activities that are proceeding in accordance with previously established commitments during the implementation of the Program.

9.2 Objectives

- Maintain installation and support effort that will alleviate work interference in congested portions of the plant and facilitate completion and protection of equipment on systems turned over to Consumers Power Company.

/ / - Meet previous NRC commitments on activities which are not included in the Construction Completion Program.

- Provide design support for orderly system completion work and resolution of identified issues.

9.3 Description

Those activities that have demonstrated effectiveness in the Quality Program implementation will continue during implementation of the Construction Program.

These are:

1. NSSS Installation of systems and components being carried out by B&W Construction Company.

/ 2. HVAC Installation work being performed by Zack Company.

3. Post system turnover work, which is under the direct control of Consumers Power Company, will be released as appropriate using / / / / / / established work authorization procedures. Present post-turnover activities are limited to correction of NCR conditions, turnover exception list items, items required for support of Remedial Soils work and other work of a minor nature. Work on major activities including significant design changes will not be initiated until CCP approval is received from NRC.

4. Hanger and cable re-inspections which will proceed according to separately established commitments to NRC.

5. Remedial Soils work which is proceeding as authorized by NRC.

6. Design engineering which will continue for the Midland Plant as will engineering support of other project activites.

7. The Spatial Systems Interaction (SSI) review and examination is carried out by a separate organization of design engineers. Although not part of the CCP, this will be done in coordination with the activities of the CCP. The conduct of the SSI is not a prerequisite to either Phase 1 or Phase 2 of the Construction Completion Program. The SSI program is being overviewed by the CIO in the same manner as the CCP. This overview is described in Section 7.3. The SSI represents the Project response to the generic safety issue, A-17 "System Interaction", and is being handled outside of the CCP with NRC NRR.

   The Midland Nuclear Plant has been designed and constructed with a two level philosophy of quality classification. Those structures, systems and components which are safety-related (such as those identified in Reg Guide 1.29, Section C.1, as modified by the Midland FSAR) are designated "Q". All other structures, systems and components are designated "non-Q". Important to safety is addressed using this two-level philosophy of quality classification.

   Structures, systems and components which would be considered important to safety are either (1) those non-safety related components which are capable of potential interactions with safety related equipment such that safety systems are prevented from performing their intended function or (2) those structures, systems and components which in and of themselves have been determined by industry experience to have safety significance. The Spatial Systems Interaction program is designed to identify those non-safety related components which could interact with safety-related components and then establish that the interaction is not a problem or to modify such that the interaction is removed. Those non-safety related structures, systems and components which are found to be important to safety, due to industry experience for example, are upgraded to safety grade. For the Midland Plant, examples of this would include but are not limited to the upgrade of selected pressurizer heaters, the AFW System and the PORV.

   The Spatial Systems Interaction (SSI) Program was described in a letter, J W Cook to H R Denton dated January 28, 1983. The purpose of the SSI program is to overview the design and review processes to verify that significant interactions are not being overlooked. The Midland program incorporated engineering walkdowns previously planned, modifying them to improve the documentation process to meet Appendix B requirements for assurance that equipment capable of potential interactions with safety related (Q) equipment has been evaluated to ensure that such equipment will not compromise the capability of safety systems to perform their intended functions.

/ This walkdown program, which involves an evaluation of design adequacy of the applicable attributes, is substantially different than the inspections being performed under CCP. The two efforts require personnel with different qualifications and they have different objectives. For these reasons the SSI interfaces with but has not been included in the CCP.

/ Once the plant is complete and turned over to Nuclear Operations Department, equipment important to safety is addressed by Nuclear Operations Department Standards A21 and the QA Topical Report CPC-2A. Structures, systems, components, and chemicals considered important to safety from operability/maintainability perspectives and not already on the "Q" list are added to the "Q" list and are subject to the applicable elements of the operational QA program. This occurs regardless of whether they are described as safety-related or important to safety.

/ 8. The Independent Design and Construction Verification Program being conducted by TERA Corporation which covers the Auxiliary Feedwater System, Standby Electric Power and the Control Room Habitability System. However, the Phase 1 status assessment and quality verification activites and Phase 2 system completion work performed as part of the Construction Completion Program will be overviewed by the CIO as described in Section 7.3.

/ Those activities that involve the installation of Q commodities require that an assessment be made to determine if an installation will render an item inaccessible that is subject to reverification or inspection under the Construction Completion Program. If a new installation will render another item inaccessible, the reverification will be done prior to release for installation.

Other programs that are not a part of the Construction Completion Program (CCP) will be integrated with the CCP effort as required for overall project coordination and control by Midland Project Site Management Office.

9.4 Milestones

These activities are proceeding with schedules that are independent of this Plan.

10.0 CHANGES TO THE CONSTRUCTION COMPLETION PROGRAM

10.1 Introduction

The mechanism for obtaining approval to initiate activities that do not meet the requirements of the CCP is described in this section.

10.2 Objectives

Establish a management control to ensure that any activities that do not meet the requirements of the CCP are reviewed and approved prior to initiation.

10.3 Description

A procedure (MPPM-19) is being issued to control changes to the CCP. The procedure will provide that Q work activity outside the exceptions defined in Section 9.0 will meet the requirements of the CCP. Any changes to the defined CCP process will receive management review and approval for any deviation from the CCP requirements. The requirements that must be maintained for work activities under the CCP are:

A. Management reviews are scheduled and held of (1) activity planning for verification and status assessment and (2) results of status assessment and planning prior to new work activity.

B. A process is in place to ensure that no existing nonconformances will be covered up by new work activities.

C. Procedures to control work definition and release including definition of inspection requirements and inspection hold points are in place.

D. Inspection and construction personnel involved must have received all required training.

Any work activity that does not meet these conditions will be considered a change. A change will be reviewed by the Construction Implementation Overviewer. Changes will be submitted to NRC Region III for approval prior to implementation.

Consumers Power Company

MIDLAND PROJECT QUALITY ASSURANCE DEPARTMENT PROCEDURE

Controlled Copy #_____ Name_____

Proc. No. NA		Title	Quality Verification Program Midland Nuclear Cogeneration Plant Units 1 and 2
Rev	Issue Date	Effective Date	Revision Description
0	5/13/83	5/13/83	Initial Issue
1	6/02/83	6/02/83	Redefinition of inaccessible attributes and methods of reinspection
2	6/10/83	6/10/83	Adds "Attachment 10" reinspection requirements and incorporates minor corrections
3	7/22/83	7/22/83	Clarifies Remedial Soils work scope; revises IR quantities and minor clerical corrections
4	8/25/83	8/25/83	Clarifies reporting of nonconforming conditions and material traceability requirements

Executive Manager Approval 8/26/83 Date

QUALITY VERIFICATION PROGRAM
MIDLAND NUCLEAR COGENERATION PLANT UNITS 1 AND 2

Index of Topics

QUALITY VERIFICATION PROGRAM
MIDLAND NUCLEAR COGENERATION PLANT UNITS 1 AND 2

Index of Topics

QUALITY VERIFICATION PROGRAM

Midland Nuclear Cogeneration Plant Units 1 and 2

1. Purpose: To confirm through a verification program under the direction of Consumers Power Company, the acceptable quality status of safety related procurement and construction activities completed and inspected by the Engineer-Constructor quality control personnel prior to December 2, 1982.

2. Scope: This program will cover all closed Inspection Records of inspections performed by the Engineer-Constructor quality control personnel on safety related material, systems, components and structures of the Midland Nuclear Cogeneration Plant Units 1 and 2 prior to December 2, 1982, except:

   2.1 Remedial Soils Work, which has been under the direction of Consumers Power Company Quality Assurance (QA) personnel since August, 1982. All Remedial Soils IPINs and DRs, and all Remedial Soils inspections performed by Engineer - Constructor personnel prior to August 1982, will be evaluated by the MPQAD Soils Organization.

   2.2 HVAC work, which has been under the direction of Consumers Power Company QA personnel since the major reorganization in June 1981.

   2.3 Verification of cable routing, identification and other accessible attributes which is being done on a 100% reinspection basis in accordance with PQCI E-4.0.

2.4 Verification of ASME hangers which will be done under a separate reinspection program as previously committed to the NRC on November 15, 1982 and March 29, 1983. This program requires 100% reinspection of all hangers with closed IR's as of December 1982. This program will be conducted under the direction of Consumers Power Company QA personnel.

2.5 B&W Construction Company activities which have been performed under the B&W Quality Assurance Program.

3. References:

3.1 Regulatory Guide 1.58, Rev 1, Qualification of Nuclear Power Inspection, Examination and Testing Personnel.

3.2 MPQAD Procedure E-3M, Preparation and Approval of Project Quality Control Instructions

4. Definitions:

Attachment 10 — A form previously utilized to Document Walkdown statusing on specified piping systems prior to Hydrostatic or Pneumatic Testing.

Discrepancy Report (DR): A form similar to the IPIN previously used to report inprocess nonconformances.

Inaccessible: An item or attribute of an item which, due to its physical location or configuration, cannot be physically or visually reinspected without removing and thereby invalidating installed work. Under the Quality Verification Program, this includes those items or attributes normally inspected in process and which subsequent construction processing makes inaccessible, eg, piping fit-up, root weld and subsequent layers under the cover pass, anchor bolt hole drilling, internal cleanliness, embedment in concrete, etc. Inaccessible does not include those items which can reasonably be reached by scaffold erection, limited access (remote) areas which require the physical size of the inspection personnel to be limited or those items that can be viewed by removal of access cover or panels, eg, electrical consoles, cabinets, conduit boxes, etc.

The inaccessibility of attributes covered by insulation or coatings will be handled on a case by case basis. When such coverings can be practically removed and replaced and where their particular reinspection is required to establish an acceptable level of confidence of the quality of a particu-lar attribute, the coverings will be removed. Items which fall into this category and are scheduled for verification in accordance with plan requirements will not be considered inaccessible unless so approved on a case by case basis by the Executive Manager - MPQAD.

In Process Inspection Notice (IPIN): A form previously used to record nonconforming conditions on work returned to construction forces for rework prior to completion of inspection activities for the item in question.

Inspection by Attributes: Inspection whereby the item or attribute is classified simply as conforming or nonconforming without regard for the degree of nonconformance.

Inspection Record (IR):	A report that scopes the inspection to be performed, relating it to a specific PQCI and a system, component, structure or portion thereof and which records the results of inspections.
Nonconformance:	A deficiency in characteristic, documentation or procedure which renders the quality of an item unacceptable or indeterminate.
Nonconformance Report (NCR):	A document used for reporting nonconforming conditions.
Population:	The entire quantity of closed Inspection Records (IR) as of December 2, 1982 relating to a specific PQCI.
Project Quality Control Instruction (PQCI):	The document that provides Quality Control Engineers (QCEs) with specific direction as to attributes to be verified, how they are to be verified and the acceptance criteria.

Reinspection: As used in this Verification Program, reinspection means a complete review of requisite documentation and a physical or visual recheck of accessible inspection attributes covered by a specific PQCI.

Verification: As used in this program, verification refers to the overall process of establishing the quality acceptance of the total population of completed and inspected work through combinations, as applicable, of efforts such as reinspection, documentation review, review of past efforts to investigate and resolve problems, analysis of past overinspection results and, if necessary, NDE techniques and destructive examination.

5. Program Content: As identified in Section 2, Scope, Consumers Power Company (CPCo) will conduct a Quality Verification Program of safety related procurement and construction work in which the prior 100% inspections have been performed under the direct supervision of the Engineer-Constructor. Such inspections were performed in accordance with approximately 100 PQCIs, as listed in Appendix A, that specified the inspection requirements to be achieved by Quality Control (QC) Personnel.

As noted in section 5.1, this listing includes all inspections completed by the Engineer-Constructor prior to December 2, 1982, including those excluded from this program for reasons stated herein. The Quality Verification Program has the purpose of establishing a quality baseline for the completion of construction of the Midland Project.

5.1 Detailed Scope: The program will include approximately 124,500 IRs subject to the Quality Verification Program, for which the Engineer-Constructor has a record of completed inspections as documented by closed Inspection Records (IR) and for which no other verification activity has taken place or is scheduled to take place. There are approximately 147,500 closed IRs of which approximately 14,700 were for reinspections which occurred due to design change, construction rework, etc., and approximately 8,300 which are excluded, due to previous commitments under the Remedial Soil, HVAC, and ASME Hanger Programs. Where a reinspection has occurred on a specific item or attribute the verification will relate to the latest IR. In addition, prior to the use of PQCIs, Material Receipt Inspections (MRI), Field Inspection Plans (FIP) and Welding Inspection WR-5 forms were used as quality instructions and records. These also will be used for quality verification. Where applicable, the results of the inspections will be grouped with like PQCIs. Otherwise they will be treated as separate populations.

5.2 Methodology: This program will confirm the acceptable quality status of completed work and establish the validity of prior inspections. To accomplish this, accessible attributes of items covered by completed IRs will be reinspected to the lastest design requirements with PQCI's which have been reviewed and/or revised as necessary to assure clarity of acceptance criteria and uniformity of implementation. For inaccessible attributes, the original inspection documents will be reviewed for evidence of acceptability, and justification will be developed as described in section 6.5 to establish hardware quality and support the validity of inspections associated with such PQCIs. Each IR relates to a specific PQCI. PQCIs are organized by discipline and further structured to activities within that discipline, e.g., there are separate PQCIs and corresponding IRs for preplacement, placement and post-placement inspections of concrete. Closed IRs related to each PQCI provide a population of like activities. Closed IRs are those where the Engineer-Constructors 100% inspection of construction and installed hardware has been completed.

To assess the validity of these past completed inspections, and verify the hardware quality, CPCo will initiate a 100% reinspection of the population to provide adequate confidence that safety related systems components and structures will perform satisfactorily in service.

The initial 100% reinspection effort will be based on a systems/area orientation to provide a quality baseline for subsequent construction completion activities.

At some future date, once the quality level of completed work has been established, CPCo will make a determination as to whether or not further verification efforts can appropriately be based on less than a 100% reinspection program.

When CPCo believes that sufficient justification exists for a reduction in the 100% commitment, it will recommend such a reduction to the NRC in accordance with the statistical sampling plan attached as Appendix C.

5.3 Identification of Deficiencies: Any deviation from the design drawing and PQCI observed during the implementation of this program other than those already identified on open nonconformance reports, will be identified on a nonconformance report and will be dispositioned in accordance with established procedures.

5.3.1 Deficiencies Found During Reinspection of Accessible Attributes: Reinspections will be conducted in accordance with PQCIs which have been reviewed and/or revised since implementation of the Construction Completion Program (CCP)

and in accordance with current design drawings and specifications. An acceptable reinspection will validate both the hardware quality and the prior IR. Any deficiencies, other than those already identified on open nonconformance reports as a result of prior inspections, will be identified on a nonconformance report which will be traceable to both the verification and original IR and the item or attribute in question. When a nonconformance documents a difference between the as built condition of the unit and the referenced design drawing or specification, a further check will be made to determine the design basis against which the IR was originally completed, as well as the current stage of construction, to further establish the validity of the original IR.

5.3.2 Deficiencies Found During Verification of Documentation for Inaccessible Attributes: The verification process for inaccessible attributes is discussed in Section 6.5. As noted in that section, any documentation deficiencies will be recorded on the new IR, entered on a nonconformance report and cross referenced to the original IR.

6. Special Program Elements

6.1 Cable Reinspection: As noted in Section 2, Scope, reinspection of routing and identification of installed cables is underway and is being performed 100% for all accessible attributes per PQCI E-4.0. Other electrical work, including cable tensioning and terminations, on which inspections have been completed by the Engineer Constructor will be handled in accordance with this program. This includes PQCIs E-1.0, E-1.1, E-1.60, E-2.0, E-2.1, E-3.1, E-5.0, E-6.0, E-6.2, E-6.6 and E-6.6.1. These PQCIs are further defined and affected quantities of IRs are shown in Appendix A.

6.2 IPIN and DR: In accordance with approved procedures the QC inspection process has used in the past In Process Inspection Notices (IPIN) and Discrepancy Reports (DR) rather than Nonconformance Reports (NCR) to record nonconforming conditions noted by the inspector on work returned to construction for rework. The process required that IPINs be dispositioned before the Inspection Record could be closed. Because the use of IPINs and DRs raises the possibility that a complete inspection may not have been performed on items or attributes covered by IRs with associated IPINs or DRs, all such IRs will be treated as a unique population and will be reinspected 100%. IPINs are no longer used in the inspection process. Discrepancy Reports (DR) were used prior to the use of the IPINs. They are no longer in use, but are recorded and will be treated the same as the IPIN.

6.2.1 Attachment 10 Forms: Attachment 10's were used in conjunction with Hydrostatic/Pneumatic Test Procedures as a punchlist for a defined Hydrostatic or Pneumatic Test, and included line numbers, drawing numbers and test boundaries. The Attachment 10 was not intended to be the quality document that identified documented acceptance by the QCE of subsequent action taken to correct punchlist deficiencies identified during the walkdown process. These deficiencies were intended to be tracked on other quality documents, such as Nonconformance Reports, Inspection Reports, etc. In order to verify that this use of the Attachment 10 did not compromise the quality of installed hardware, all completed hardware inspections documented on closed IRs falling within the system boundaries identified on existing Attachment 10 forms will be 100% verified during the Quality Verification Program.

6.3 Exceptions to this Program: Exceptions to this Program shall not be taken unless such exceptions can be fully justified. One such example would be a case where objective evidence is available of a CPCo overinspection of the the Engineer-Constructor's inspections and which demonstrates effective quality control and provides the basis to verify acceptability of the items or attributes covered by these past IRs.

Where such exceptions are proposed to be taken, a special report will be prepared by the MPQAD-QA General Superintendent for review and approval of the Executive Manager-MPQAD. This report will contain full justification for the exception and documentation of objective evidence to support the exception. The Executive Manager-MPQAD will inform the NRC Region III whenever he has made a decision to allow such an exception to the Program prior to implementing the exception.

6.4 Purchased Material: Purchased safety related material and components whether source inspected or inspected upon receipt are subject to this Program for verification of completed receipt inspections performed by the Engineer-Constructor prior to December 2, 1982. In many cases, purchased items have been installed and are not fully accessible for reinspection; however inaccessible interfaces will have been demonstrated and their functional acceptability proven through installation and subsequent testing. Accessible feature attributes will be reinspected in accordance with PQCI R-1.00, including material traceability when required by the Purchase Specifications. The total number of IRs associated with PQCI R-1.00, Material Receiving Inspection, is approximately 12,000. In addition, prior to the introduction of PQCI R-1.00, approximately 150 MRIs and 20 FIPs were used for receipt inspection, covering approximately 700 items. Based upon further review, receipt inspections covered by MRIs will either be grouped with like items covered by PQCI R-1.00

or be reinspected separately. FIPs were also used for construction activities and will be treated separately under this plan. Where materials such as rebar, certain structural members or features of components are inaccessible for reinspection, documentation will be reviewed in accordance with this Program.

6.5 Inaccessible Attributes: There are 37 PQCIs which cover activities that are deemed to be inaccessible for reinspection. These include rebar installed in placed concrete, containment building tendon reinspection, and PQCIs relating to surveillance of subcontractor activities. A complete listing of these is given in Appendix B to this Program. A brief statement as to why attributes of these IRs are considered inaccessible and why verification by documentation review is appropriate appears in Appendix B. Documentation relating to these PQCIs will be reviewed as indicated in this Program, in accordance with a revised PQCI or checklist specifically developed for review of documentation. These PQCIs, either individually or by groups, will be reviewed and specific detailed justification will be developed to verify the quality status of associated hardware. This will be done by a combination of methods, applied as necessary to achieve verification, including validation of prior inspections through documentation review, reinspections of attributes that may still be accessible, a review of past overinspections, a review of past activities to resolve

problems, and if required, application of NDE techniques or limited destructive examinations. This justification, or recommendations for additional verification activities, where this justification cannot be established, will be provided in writing by the MPQAD-QA General Superintendent to the Executive Manager-MPQAD for decision and approval. Deficiencies in documentation will be reported on nonconformance reports, the disposition of which will determine further actions necessary. These actions will include special testing programs as required to satisfactorily establish the quality acceptance of this category of PQCIs.

7. Documentation and Reports:

7.1 Documentation of Results: Results of reinspections and document reviews will be recorded on new IRs or checklists opened specifically for this purpose. Each such new IR or checklist will be cross-reference to the closed original IR. The new IR or checklist will provide the basis to document the quality status of the items or attributes being verified.

7.2 Documentation of Nonconformances: Nonconforming conditions observed during verification activities will be documented on a nonconformance report and appropriately analyzed for management attention. This includes instances where a design or construction modification has occurred since the Inspection Record was closed and a new IR not yet opened. (Note discussion in Section 5.3.1)

7.2.1 Trending: Deficiencies noted during the verification process will be trended as appropriate for analysis and management information.

7.3 Reports:

7.3.1 Reports to Executive Manager-MPQAD: A weekly status report will be made jointly by the CPCo BOP Quality Control (QC) Superintendent and Quality Assurance (QA) General Superintendent to the Executive Manager - Midland Project Quality Assurance Department (MPQAD) summarizing the results of the program. The report will note the completed Inspection Reports by the unique PQCI number, Nonconformance Reports issued and identification of attribute(s) causing the nonconformance(s).

7.3.2 Reports from Executive Manager-MPQAD: The Executive Manager-MPQAD will inform the CPCo Site Manager, the Engineer-Constructor Project Manager, and the Vice President, Projects, Engineering and Construction, of the status of the quality verification program on a biweekly basis and will provide them with a formal monthly report of the verification effort. As appropriate, he will also report on the acceptability of completed work as it may be impacted by nonconformances.

7.3.3 Reports to NRC and Construction Implementation Overview Team: The Executive Manager-MPQAD will provide copies of the monthly reports noted in section 7.3.2 to NRC Region III and the Construction Implementation Overview Team.

8. Implementation: This program will be implemented under the direct control of MPQAD through procedures approved and issued according to normal programmatic requirements.

8.1 Organizational Responsibilities: The Executive Manager-MPQAD has total overall responsibility and authority for the development and implementation of all quality related aspects of this verification program. He will be responsible for seeing that the implementation phase of the program is coordinated with other project departments as required to assure proper support for this plan commensurate with overall project goals.

8.1.1 MPQAD - BOP QA: is responsible for the programmatic elements of the verification program including, but not limited to, procedure development, PQCI review and approval, nonconformance review, analysis of results, justification for document review, verification of inaccessible attributes, program content modifications and certifying that the verification has been completed for a given area or system, and performing management overview of the reinspection process with appropriate documentation of results.

8.1.2 MPQAD - BOP QC: is responsible for program implementation including, but not limited to, conducting the reinspection activities with QC personnel that satisfy Regulatory Guide 1.58, Rev 1, which requires personnel certification in accordance with ANSI N45.2.6 (no person will reinspect activities for which he performed the original inspection), reporting results to the Executive Manager-MPQAD, reporting nonconformances to MPQAD-BOP QA, and coordinating with Construction Services and Consumers Site Management Office to establish schedule priorities for reinspection activities.

8.1.3 MPQAD - Site Audit Section: is responsible for formal audits of the overall verification program implementation.

8.1.4 MPQAD - QA Administration and Training: MPQAD Procedures will be developed in accordance with programmatic requirements to direct implementation of this plan.

A LIST OF ALL PQCI'S WITH QUANTITY AND REINSPECTION INFORMATION

PQCI #	PQCI TITLE	QUANTITY	DOC'T	HARDWARE	REMARKS
C-1.02	Compacted Backfill	181			Hardware & documentation under remedial soils program
C-1.09	Inspection of Crack for BWST Foundation Ring Wall	5			Hardware & documentation under remedial soils program
C-1.10	Insp of Grouting and Dry Packing	1833	±	±	Surface condition and documentation
C-1.11	Drilling & Grouting Rebar	66	±	x	
C-1.20	Concrete Preplacement Inspection	767	±	±	Inspection of remaining unplaced concrete areas plus past documentation
C-1.21	Inspection of Reinforcing Steel	259	±	±	Inspection of accessible rebar plus past documentation
C-1.22	Inspection of Reinforcing Steel at Construction Joints	19	±	±	Inspection of accessible rebar at remaining joints plus past documentation

KEY:
± Document-Review documentation for completeness
± Hardware-Reinspect accessible attributes
x Hardware-Attributes not acessible for reinspection

A LIST OF ALL PQCI'S WITH QUANTITY AND REINSPECTION INFORMATION

PQCI #	PQCI TITLE	QUANTITY	DOC'T	HARDWARE	REMARKS
C-1.30	Concrete Placement Inspection	780	±	x	
C-1.31	Inspection of Concrete Activities	246	±	x	
C-1.40	Concrete Post Placement Inspection	1002	±	±	Inspection of concrete surfaces plus documentation
C-1.50	Installation and Testing of Expansion Anchors	4982	±	±	Inspection for proper installed condition
C-1.51	Retest Verification of Drop In Expansion Anchors	54	±	x	
C-1.52	Reinspection of Seismic Category I Pipe Support Expansion Anchors	294	±	x	
C-1.53	Reinspection of Expansion Anchors for Seismic Cat I Support	0			

KEY:
± Document-Review documentation for completeness
± Hardware-Reinspect accessible attributes
x Hardware-Attributes not acessible for reinspection

A LIST OF ALL PQCI'S WITH QUANTITY AND REINSPECTION INFORMATION

PQCI #	PQCI TITLE	QUANTITY	DOC'T	HARDWARE	REMARKS
C-1.56	Reinspection of Rock Bolt Installation	20			Hardware and documentation under remedial soils program
C-1.60	Concrete Drilling and Cutting Reinforcing Steel	325	±	x	
C-1.70	Installation of Pressured Concrete Pipe	2	±	x	
C-1.80	Installation of Concrete Unit Masonry	102	±	x	
C-1.81	Installation of Concrete Unit Masonry	139	±	x	
C-1.90	Installation of SWI Sluice Gates	0			
C-2.00	Plant Area Dewatering	59			Hardware and documentation under remedial soils program

KEY:
± Document-Review documentation for completeness
± Hardware-Reinspect accessible attributes
x Hardware-Attributes not acessible for reinspection

A LIST OF ALL PQCI'S WITH QUANTITY AND REINSPECTION INFORMATION

PQCI #	PQCI TITLE	QUANTITY	DOC'T	HARDWARE	REMARKS
C-2.02	Permanent Gravel Packed Wells	17			Hardware and documentation under remedial soils program
C-2.03	Drawdown Recharge Test	1			One time test under remedial soils program
C-2.05	Drilling Q-Listed Areas for Underpinning Operations	14			Remedial Soils Program
C-2.10	Structural Steel Erection	121	±	±	Inspection of accessible attributes plus documentation
C-2.11	Installation of Watertight and Airtight Doors	0			
C-2.20	Field Fabrication of Miscellaneous Steel	1502	±	x	
C-2.21	Field and Offsite Fabrication of Reinforcing Steel	0			

KEY:
± Document-Review documentation for completeness
± Hardware-Reinspect accessible attributes
x Hardware-Attributes not acessible for reinspection

A LIST OF ALL PQCI'S WITH QUANTITY AND REINSPECTION INFORMATION

PQCI #	PQCI TITLE	QUANTITY	DOC'T	HARDWARE	REMARKS
C-2.56	Load Monitoring of the Feedwater/Isolation Valve Pit Rod & Rock Bolt	0			Remedial Soils Program
C-3.01	Installation Inspection of Spent Fuel Storage Racks	20	±	±	Inspection of accessible attributes plus documentation
C-3.02	Installation Inspection of New Fuel Storage Racks	8	±	±	Inspection of accessible attributes plus documentation
C-3.03	Inspection of Test for Acceptability of the Spent Fuel Rack Cells	0			
C-4.10	Batch Plant Inspection	929	±	x	
C-5.10	Shear Connector Installation	503	±	x	
C-6.00	Mechanical Splicing of Reinforcing Bars	787	±	x	

KEY:
± Document-Review documentation for completeness
± Hardware-Reinspect accessible attributes
x Hardware-Attributes not acessible for reinspection

A LIST OF ALL PQCI'S WITH QUANTITY AND REINSPECTION INFORMATION

PQCI #	PQCI TITLE	QUANTITY	DOC'T	HARDWARE	REMARKS
C-7.00	Erection of Reactor Building Liner Plate	10	±	x	
C-8.50	Inspection of Surface Preparation Application Touch Up & Repair of Coating	908	±	x	
C-8.51	Inspection of Decontamination Coat for Concrete	17	±	±	Inspection of surface condition plus documentation
C-8.60	Inspection of Surface Preparation Application Touchup & Repair of Coatings Reactor Bldg Liner Plate	0			
C-9.00	Installation-Post Tensioning Components	40	±	x	
C-9.10	Post Tensioning System Stressing	309	±	x	

KEY:
± Document-Review documentation for completeness
± Hardware-Reinspect accessible attributes
x Hardware-Attributes not acessible for reinspection

A LIST OF ALL PQCI'S WITH QUANTITY AND REINSPECTION INFORMATION

PQCI #	PQCI TITLE	QUANTITY	DOC'T	HARDWARE	REMARKS
C-9.20	Containment Bldg Tension Reinsp	11	±	x	
CW-1.00	Welding & NDE of "Q" Listed Non ASME Items	381	±	±	Inspection of surface condition and radiographs plus documentation
E-1.0	Installation of Conduit Boxes and Supports	4716	±	±	Inspection of accessible attributes plus documentation
E-1.1	Installation of Boxes	9	±	±	Inspection of accessible attributes plus documentation
E-1.60	In Process Inspection of Electrical Item Installation	85	±	x	
E-2.0	Installation of Cable Tray and Wireway	1368	±	±	Inspection of accessible attributes plus documentation
E-2.1	Installation of Tray Supports	799	±	±	Inspection of accessible attributes plus documentation

KEY:
± Document-Review documentation for completeness
± Hardware-Reinspect accessible attributes
x Hardware-Attributes not acessible for reinspection

A LIST OF ALL PQCI'S WITH QUANTITY AND REINSPECTION INFORMATION

PQCI #	PQCI TITLE	QUANTITY	DOC'T	HARDWARE	REMARKS
E-3.0	Final Electrical Area Completion Activity	0			
E-3.1	Electrical System Turnover Activities	108	±	x	
E-4.0	Installation of Electric Cables	7954	±	x	Inspection of accessible attributes has been accomplished under cable routing & ID program
E-5.0	Cable Terminations	12361	±	±	Inspection of accessible attributes plus documentation
E-6.0	Installation of Electric Equipment and Instrumentation	346	±	±	Inspection of accessible attributes plus documentation
E-6.1	Modification of Electric Equipment	209	±	±	Combine with RW 1.10 Inspect accessible attributes plus documentation

KEY:
± Document-Review documentation for completeness
± Hardware-Reinspect accessible attributes
x Hardware-Attributes not acessible for reinspection

A LIST OF ALL PQCI'S WITH QUANTITY AND REINSPECTION INFORMATION

PQCI #	PQCI TITLE	QUANTITY	DOC'T	HARDWARE	REMARKS
E-6.2	Installation of Terminal Boxes	108	±	±	Inspect accessible attributes plus documentation
E-6.6	Installation of Electric Penetrations	127	±	±	Inspect accessible attributes plus documentation
E-6.6.1	Installation of Feed Through Assy's for Elec Penetration	388	±	±	Inspect accessible attributes plus documentation
E-6.7.1	Installation of Batteries & Racks	9	±	±	Inspect accessible attributes plus documentation
RW-1.10	Modification to Electrical Equipment	144	±	±	Combine with E-6.1 Inspection of accessible attributes plus documentation
I-1.10	Installation of Instruments	159	±	±	Inspection of accessible attributes plus documentation
M-1.00	Installation of Mechanical Equipment	11	±	±	Inspection of accessible attributes plus documentation

KEY:
± Document-Review documentation for completeness
± Hardware-Reinspect accessible attributes
x Hardware-Attributes not acessible for reinspection

A LIST OF ALL PQCI'S WITH QUANTITY AND REINSPECTION INFORMATION

PQCI #	PQCI TITLE	QUANTITY	DOC'T	HARDWARE	REMARKS
M-2.00	Installation of Rotating Equipment	28	±	±	Inspection of accessible attributes plus documentation
M-3.10	Installation of Cranes	1	±	±	Inspection of accessible attributes plus documentation
M-4,00	Complete Installations of Mechanical Equipment	2	±	±	Inspection of accessible attributes plus documentation
MP-1.00	Disassembly Reassembly and Modification of Systems and Components	4	±	±	Inspection of accessible attributes plus documentation
MW-1.00 Rev 1	Welding and NDE of Mechanical Equipment	0			
P-1.00	Piping Completed Line Installation	80	±	±	Inspection of accessible attributes plus documentation
P-1.10	Piping Subassembly Field Installation RW	1858	±	±	Inspection of accessible attributes plus documentation

KEY:
± Document-Review documentation for completeness
± Hardware-Reinspect accessible attributes
x Hardware-Attributes not acessible for reinspection

A LIST OF ALL PQCI'S WITH QUANTITY AND REINSPECTION INFORMATION

PQCI #	PQCI TITLE	QUANTITY	DOC'T	HARDWARE	REMARKS
P-1.20	Piping Subassembly Shop Fab & Rework	994	±	±	Inspection of accessible attributes plus documentation
P-1.30	Valve and Inline Component Install	1247	±	±	Inspection of accessible attributes plus documentation
P-1.60	In Process Insp Fab/Installation Rework of Piping	167	±	x	
P-2.00	Pipe Component Supports Final Setting	5	±	±	Inspection of accessible attributes plus documentation
P-2.10	Pipe (Component) Support Installation	7057			
P-2.20	Pipe (Component) Supports Fabrication	6460	±	±	Inspection of accessible attributes plus documentation
P-2.30	Pipe (Component) Support P119/P129 Walkdown	0			Closed IR's from P-2.10 and P-2 20 will be reinspected to requirements of P-2.30 where installed

KEY:
± Document-Review documentation for completeness
± Hardware-Reinspect accessible attributes
x Hardware-Attributes not acessible for reinspection

A LIST OF ALL PQCI'S WITH QUANTITY AND REINSPECTION INFORMATION

PQCI #	PQCI TITLE	QUANTITY	DOC'T	HARDWARE	REMARKS
PF-1.10	Pipe Flange Installation and Rework	820	±	±	Inspection of accessible attributes plus documentation
PI-1.40	Field Fabrication and Installation of Piping Related Instrumentation	204	±	±	Inspection of accessible attributes plus documentation
PI-2.40	Off-Site Fabrication/ Weld of Pipe Related Instrument Supports	84	±	±	Inspection of accessible attributes plus documentation
PIW-1.00	Welding and NDE of Instrument Tubing and Fittings	642	±	±	Inspection of accessible attributes plus documentation
PW-1.00	Fab/Weld/Heat Treat and NDE of ASME III Piping	31014	±	±	Inspection of accessible attributes plus documentation
R-1.00	Material Receiving Inspection	12007	±	±	Inspection of accessible attributes plus documentation

KEY:
± Document-Review documentation for completeness
± Hardware-Reinspect accessible attributes
x Hardware-Attributes not acessible for reinspection

A LIST OF ALL PQCI'S WITH QUANTITY AND REINSPECTION INFORMATION

PQCI #	PQCI TITLE	QUANTITY	DOC'T	HARDWARE	REMARKS
R-1.60	Receiving Area and Storage Facilities Inspection	45	±	x	Walk through of existing conditions plus documentation
R-2.00	Receiving Inspection for NSSS Equipment	198	±	x	
R-2.10	Receiving Inspection for NSSS Equipment	42	±	x	
R-2.20	Receiving Inspection for NSSS Equipment Documentation	217	±	x	
S-1.00	Storage Area/ Facilities Surv	67	±	x	Walk through of existing conditions plus review of documentation
SC-1.05	Material Testing Services	306	±	x	

KEY:
± Document-Review documentation for completeness
± Hardware-Reinspect accessible attributes
x Hardware-Attributes not acessible for reinspection

A LIST OF ALL PQCI'S WITH QUANTITY AND REINSPECTION INFORMATION

PQCI #	PQCI TITLE	QUANTITY	DOC'T	HARDWARE	REMARKS
SC-1.06	Recoating Work of Cont Bldg Liner Plate, Misc Steel, and Pipe Hanger Attachment.	0			
SC-1.07	Agreement for Tech Services for Soils Laboratory Testing	0			
SC-1.10	Earthwork Subcontract Surveillance	0			
SC-1.11	Concrete and Unit Masonry Surface Sub/ Contract Surv	406	±	x	
SC-1.14	Subcontract Surveillance of Installation of Underpinning	0			
SC-1.16	Field Erected Storage Tanks/Subcontract Surveillance	108	±	x	

KEY:
± Document-Review documentation for completeness
± Hardware-Reinspect accessible attributes
x Hardware-Attributes not acessible for reinspection

A LIST OF ALL PQCI'S WITH QUANTITY AND REINSPECTION INFORMATION

PQCI #	PQCI TITLE	QUANTITY	DOC'T	HARDWARE	REMARKS
SC-8.00	Subcontractor Surv of Installation of Soil and Crack Monitoring Devices	58			Remedial Soils Program
SE-1.00	Measuring and Testing Equipment Laboratory Surveillance Inspection	31	±	x	
SM-1.03	Heat, Ventilation and Air Conditioning Subconract Surveillance	828	±	x	
SM-1.04	Field Erected Component Cooling Water Surge Tanks Subcontracts Surveillance	108	±	x	
SM-1.17	Field Fabricated Incore Installation Tanks Subcontract Surveillance	183	±	x	
SW-1.01	NDE-Subcontractor Surveillance	120	±	x	

KEY:
± Document-Review documentation for completeness
± Hardware-Reinspect accessible attributes
x Hardware-Attributes not acessible for reinspection

A LIST OF ALL PQCI'S WITH QUANTITY AND REINSPECTION INFORMATION

PQCI #	PQCI TITLE	QUANTITY	DOC'T	HARDWARE	REMARKS
T-1.00	Hydrostatic and Pneumatic Leak Testing	460	±	x	
T-1.10	Final Cleaning of Interior Surfaces of Piping, Mech Equipment and Instrumentation	0			
T-5.00	Lift Test for Cranes	0			
W-1.00	Welding, Heat Treatment and Non Destructive Examination	20251	±	±	Inspection of accessible attributes, radiography plus documentation
W-1.60	Area Inspection Of In Process Activities For Welding Q-Listed And ASME III Items	164	±	x	
C-1.01	Excavation in Q-Soil Area	NA			Remedial Soils Program

KEY:
± Document-Review documentation for completeness
± Hardware-Reinspect accessible attributes
x Hardware-Attributes not acessible for reinspection

A LIST OF ALL PQCI'S WITH QUANTITY AND REINSPECTION INFORMATION

PQCI #	PQCI TITLE	QUANTITY	DOC'T	HARDWARE	REMARKS
C-2.01	Gravel Packed Wells	224			Documentation and hardware is under remedial soils program
C-2.22	Field Fabrication Of Reinforcing Steel	0			
C-3.05	Inspection Of The Feedwater Isolation Valve Pit Jacking Operation	NA			Remedial Soils program
EU-1.0	Installation Of Conduit & Box For Under Pinning Data Aquisitions System	61			Documentation and hardware is under remedial soils program
EU-4.0	Installation Of Electrical Cables For Under Pinning Data Aquisition System	117			Documentation and Hardware is under remedial soils program
EU-5.0	Cable Termination For Under Pinning Data Aquisition System	178			Documentation and Hardware is under remedial soils program

KEY:
± Document-Review documentation for completeness
± Hardware-Reinspect accessible attributes
x Hardware-Attributes not acessible for reinspection

A LIST OF ALL PQCI'S WITH QUANTITY AND REINSPECTION INFORMATION

PQCI #	PQCI TITLE	QUANTITY	DOC'T	HARDWARE	REMARKS
EU-6.0	Installation Of Instruments For Under Pinning Data Aquisitions System	25			Documentation and Hardware is under remedial soils program
EU-6.1	Installation Of Instrument Supports For Under Pinning Data Aquisitions System	29			Documentation and Hardware is under remedial soils program
IC-1.0	Instrument Checkout	67			Documentation and Hardware is under remedial soils program
RM-1.00	Storage & Maintenance Of Material Released To Mergentine	NA			Remedial soils program
RS-1.00	Storage & Maintenance Of Material Released To Spencer, White & Prentis	NA			Remedial soils program

KEY:
± Document-Review documentation for completeness
± Hardware-Reinspect accessible attributes
x Hardware-Attributes not acessible for reinspection

A LIST OF ALL PQCI'S WITH QUANTITY AND REINSPECTION INFORMATION

PQCI #	PQCI TITLE	QUANTITY	DOC'T	HARDWARE	REMARKS
SCM-1.0	Crack Monitoring Of The Feedwater Isolation Valve Pits Sub-Contract Surveillance	36			Documentation and Hardware is under remedial soils program
SD-1.0	Monitoring, Reducing and Reporting Under Pinning Instrument Data Sub-Contracts Surveillance	189			Documentation and Hardware is under remedial soils program
UP C-1.004	Welding And NDE Of "Q" Material	8			Documentation and Hardware is under remedial soils program
UP C-1.008	Excavation And Lagging Of Access Pits Piers and Drifts For UP	1			Documentation and Hardware is under remedial soils program
UP C-1.010	Field Fabrication Of Steel Sets For Under Pinning Of Aux Bldg & FIVP	5			Documentation and Hardware is under remedial soils program

KEY:
± Document-Review documentation for completeness
± Hardware-Reinspect accessible attributes
x Hardware-Attributes not acessible for reinspection

A LIST OF ALL PQCI'S WITH QUANTITY AND REINSPECTION INFORMATION

The Remedial Soils Program has initiated the following additional PQCl's for which there are no Engineer-Constructor IR's, Inspections have all been conducted by CPCo supervision

UP-C-1.002	UP-C-1.011	UP-C-1.019	SD-2.0
UP-C-1.003	UP-C-1.012	UP-C-2.003	
UP-C-1.005	UP-C-1.013	UP-C-2.004	
UP-C-1.006	UP-C-1.014	UP-C-2.005	
UP-C-1.007	UP-C-1.015	UP-C-2.007	
UP-C-1.009	UP-C-1.016	UP-C-2.008	
UP-C-1.011	UP-C-1.017	UP-C-2.009	
UP-C-1.019	UP-C-1.018	UP-C-2.010	
UP-C-1.020		UP-C-2.019	
UP-C-1.023		UP-C-2.042	
		UP-C-2.150	
		UP-C-3.001	
		RM/RS-1.00	

APPENDIX B

PQCIs To Be Verified by Review of Documentation Only

The following PQCIs are deemed inaccessible for attribute reinspection. Hardware acceptability will be established by documentation validation where possible and by supplemental verification efforts where documentation review alone does not establish hardware acceptability:

1. Reinspection of Expansion Anchors

C-1.51 - Retest Verification of Drop In Expansion Anchors

C-1.52 - Reinspection of Seismic Category I Pipe Support Expansion Anchors.

The above PQCIs relate to reinspections which have been completed and results reported to the NRC.

2. In-Process Activities.

E-3.1 - Electrical System Turnover Activities

E-1.60 - In Process Inspection of Electric Item Installation

R-1.60 - Receiving Area and Storage Facilities Inspection

W-1.60 - Area Inspection Of In Process Activities For Welding Q-listed and ASME III Items

S-1.00 - Storage Area/Facilities Surveillance

P-1.60 - In Process Inspection of Fabrication/Installation Rework of Piping

The above PQCIs relate to in-process activities where affected work would now be completed and any reinspection would be of completed work covered by other PQCIs, e.g., PQCIs E-6.0, W-1.00 and PW-1.00. In the cases of R-1.60 and S-1.00, these are an inspection or surveillance of general facilities maintenance which can be repeated, but not on a basis which would have any meaning relative to conditions existing when the inspections were made. In short, a single inspection can attest to conditions existing today without relation to past conditions.

3. Surveillance of Subcontractor Activities.

SC-1.05 - Material Testing Services

SC-1.11 - Concrete and Unit Masonry Surface Subcontract Surveillance

SC-1.16 - Field Erected Storage Tanks Subcontractor Surveillance

SE-1.00 - Measuring and Testing Equipment Laboratory Surveillance Inspection

SM-1.03 - HVAC Subcontract Surveillance

SM-1.04 - Field Erected Component Cooling Water Tank Subcontractor Surveillance

SW-1.01 - NDE Subcontractor Surveillance

SM-1.17 - Field Fabricated Incore Installation Tank Subcontractor Surveillance.

The above PQCIs all relate to surveillance of subcontractor activities. Where work has not been completed, such surveillance activities can be

repeated when safety related work resumes. Otherwise, they can be evaluated only by a review of documentation and a single walk down of affected areas for assessment of current inplace conditions, but not of past activities. In addition, SM-1.03 - HVAC Subcontractor Surveillance, relates to activities outside the scope of this quality verification program. In depth participation by CPCo continues in this work.

4. Hydrostatic and Pneumatic Leak Testing.

T-1.00 - Hydrostatic and Pneumatic Leak Testing

CPCo has already conducted an extensive evaluation of hydrostatic and pneumatic leak testing and corrective actions relative to such evaluation are being conducted separately from this reinspection program.

5. Previously Documented Responses to the NRC.

C-6.00 - Mechanical Splicing of Reinforcing Bars

This PQCI relates to necessary inspections of the "Cadweld" process of mechanically splicing reinforcing steel. The constructor's processes were the subject of extensive investigation by the NRC in 1973 and 1974 which determined that corrective action had been identified and implemented including requalification of personnel, review of work instructions for Class I work, CPCo QA review of work procedures, and audits of Class I work. Affected mechanically spliced rebar is now inaccessible due to

concrete placement. CPCo overinspection of any continued use of this process in remaining construction will be a continuing process.

C-7.00 - Erection of Reactor Building Liner Plate

This PQCI relates to the preparation and installation of steel plates which provide the inner surface for the containment building. The liner is now inaccessible, being backed up by reinforced concrete on the outside and nuclear coated on the inside. Extensive review was made by CPCo in 1974 of the accuracy of liner plate records. Controls implemented after NRC investigation were evaluated and found satisfactory. In 1977, a deformation of liner plate occurred due to freezing of an embedded construction water line. This resulted in selected removal and replacement of steel liner plates. Quality of the liner plate installations have been verified through radiography, and extensive CPCo involvement in the installation and repair. The NRC has reviewed actions taken and closed its reports on the installation of steel liner plates.

C-1.11 - Drilling and Grouting of Rebar

This PQCI provides documented instructions for the drilling and grouting of reinforcement steel and in itself is a corrective action for previously cited deficiencies that such a procedure did not exist. Its usage is documented evidence of the implementation of corrective action.

C-5.10 - Shear Connector Installation

This PQCI is used to assure that the proper installation of shear connectors has been accomplished which tie the supporting beams, steel and concrete floor decking into a composite structure. Since the shear connector serves as concrete reinforcement, it is not visible once the concrete is placed. NRC reviewed corrective actions relative to installation problems with Nelson stud shear connectors and closed reports relative to this problem. PQCI 5.10-IRs document accomplishment of required inspections.

C-8.50 - Inspection of Surface Preparation Application Touch Up and Repair of Coating

This PQCI addresses the preparation of concrete surfaces and the application of a coating to seal the surface to prevent contamination being absorbed into the concrete. Once the coating is applied, the surface preparation cannot be examined. The final coating can be examined for presence but not for the process steps that applied the coating.

C-1.60 - Concrete Drilling and Cutting Reinforcing Steel

This PQCI describes the quality control steps necessary in drilling concrete to minimize cutting of reinforcing steel. Completion of the PQCI-IR identifies whether proper inspections were made and results encountered and documented. Since the holes will have been drilled, and

items either mounted in the holes or the holes grouted, it is not possible to physically inspect the concrete or the reinforcement. This is particularly true where expansion anchors have been used which cannot be nondestructively removed.

6. Post Tensioning Requirements.

C-9.00 - Installation-Post Tensioning Components

C-9.10 - Post Tensioning System Stressing

C-9.20 - Containment Building Tension Reinspection

These PQCIs document the re-routing of tendon sheathing, tendon installation and tensioning. CPCo identified a problem to the NRC in 1977 indicating the misplacement of two tendon sheaths and the omission of two sheaths. The misplacement of the two sheaths brought about approved re-routing of the tendons. The omitted sheaths were replaced. The NRC conducted a special investigation of the corrective measures in May 1977 and deemed them acceptable. A final 50.55(e) report was issued by CPCo in August 1977.

7. Concrete Placement Activities.

C-1.30 - Concrete Placement Inspection

C-1.31 - Inspection of Concrete Activities

The PQCIs relate to inspections during placement of concrete. Where concrete has been placed, inspections will be made in accordance with C-1.40 "Concrete Post Placement Inspection." Where concrete has not been placed, a preplacement inspection will be required before placement when construction is resumed.

C-1.80 Installation of Concrete Unit Masonry

C-1.81 Installation of Concrete Unit Masonry

These PQCIs relate to the installation of concrete block walls many of which have been removed as a result of subsequent plant modifications. The remaining walls can be inspected for presence of the wall and visual quality but not for the process controls necessary to properly erect them.

C-4.10 - Batch Plant Inspection

This PQCI was prepared for necessary controls of concrete batch plant activities. The batch plant has now been removed from the site. Concrete necessary for completion of the plant is procured from an offsite supplier. Currently concrete is procured only for the Soils program and for non-Q construction. Reinspection is limited to review of documents of past operations. Adherence to this PQCI will be enforced on procured concrete for balance of plant safety related constructions when construction is resumed.

8. Field Fabrication

C-2.20 - Field Fabrication of Miscellaneous Steel.

This PQCI addresses fabrication of steel which will have been consumed and erected into items which will be inspected if accessible, under other PQCIs.

9. NSSS Receiving Inspection Activities.

R-2.00 - Receiving Inspection for NSSS Equipment

R-2.10 - Receiving Inspection for NSSS Equipment

R-2.20 - Receiving Inspection for NSSS Equipment Documentation

These PQCIs address the constructor's receiving inspection of components and materials used by the NSSS supplier constructor. In general, the items will have been installed by that contractor. Any accessible attributes will have been confirmed by activities of the NSSS constructor.

10. Other.

C-1.70 - Installation of Pressured Concrete Pipe

This PQCI covered the installation of the main water line from the river to the cooling pond. This line is now submerged as the pond is full.

Inspection of internal surfaces could be performed through use of divers. Integrity has been demonstrated through use of the system.

E-4.0 - Installation of Electrical Cables

One hundred percent reinspection of installed cables has been completed and reported under a separate program. Documentation has not yet been reviewed.

STATISTICAL SAMPLING PLAN
INDEX OF TOPICS

SAMPLING PLAN FOR CPCo QUALITY VERIFICATION PROGRAM

1. Purpose:

To provide a statistically valid method, under the direction of Consumers Power Company, of confirming the acceptable quality status of safety related procurement and construction activities completed and inspected by the Engineer-Constructor Quality Control personnel prior to December 2, 1982.

2. Scope:

This plan applies to closed Inspection Records (IR's) related to specific Project Quality Control Instructions (PQCI's) where the quantity of closed IR's is in excess of one hundred and for which there are no other ongoing or planned programs to confirm quality.

3. References:

MIL-STD-105D Change Notice 2 (March 1964), Sampling Procedures and Tables for Inspection by Attributes.

US NRC I&E Bulletin 79-02, Reinspection of Anchor Bolts.

MIL-HDBK-53-1A 1 FEB 1982 - Guide for Attribute Lot Sampling and MIL-STD-105.

4. Definitions:

Population: The entire quantity of closed (IR's) relating to a specific PQCI.

Time Centered: The term used to describe the ordering of lots, and items within a lot, based upon the time sequence in which an IR was initiated

Homogeneity: Homogeneity implies that a series of units of product should be alike or similar in nature. Homogeneity under this plan will be achieved by utilizing specific project Quality Control Instruction (PQCI) categories covering like activities and generally within a defined time period.

Acceptance Number (AC): The number of nonconformances permitted to be found in a sample of a lot without rejecting the lot for a specific acceptable quality level.

Rejection Number (Re): The number of nonconformances found in a sample of a lot that requires rejection of the lot for a specific acceptable quality level.

Acceptable Quality Level (AQL): The AQL is the maximum percent of nonconformances that, for the purpose of sampling inspection, can be considered satisfactory as a process average.

Attribute: An attribute is a characteristic or property which is appraised in terms of whether it does or does not comply with a given requirement.

Inspection by Attributes: Inspection for which the item or attribute is classified simply as conforming or nonconforming without regard for the degree of nonconformance.

Limiting Quality (LQ): The term applies to sampling plans that provide not less than a specified percentage of quality protection. Consumers Power Company has selected an LQ of five percent which provides 95% confidence that at least 95% of inspection elements of the lot/population will be acceptable.

Lot: A quantity of items, such as completed inspection records covering the same activity, equal to or less than the total population and representing a subdivision of that population.

Nonconformance: A deficiency in characteristic, documentation or procedure which renders the quality of an item unacceptable or indeterminate.

Pa - Probability of Acceptance: The probability of accepting a lot with a predetermined percent defective, when a given sample plan is used.

Random Sample: A sample taken from a population or lot in which each of the items has an equal chance of being selected, regardless of its quality. If the units in a lot have been arranged without bias as to their quality a sample drawn anywhere in the lot will meet the requirements for randomness [1]. PQCI's are logged in accordance with the date they were opened, totally independent of the

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(1 Mil-Hdbk - 53 -1A Para 12.2)

resulting quality, thus sampling by logged date or other means meets this requirement.

Sampling Plan: A sampling plan indicates for a given lot size the number of items or components from each lot (sample size or a series of sample sizes) which are to be inspected from the lot and the criteria for determining the acceptability of the lot.

5.0 Plan Content

5.1 Detailed Scope: This sampling plan applies to closed Engineer-Constructor IR's related to specific Project Quality Control Instruction (PQCI's) for Balance of Plant safety related materials, components, systems and structures, which are not covered by other ongoing programs to confirm quality. It is applicable to closed IR's where the quantity of closed IRs for a given PQCI is in excess of 100 and where it has been demonstrated by one hundred percent inspection of a significant portion of each population that the accepted quality level of that population has been established. The specific PQCIs and quantities of closed IRs that make up this total population are identified in Appendix A. That appendix also indicates whether both hardware and documentation are planned to be verified or whether documentation alone is planned to be reviewed because of inaccessibility of hardware features.

5.2 Description of Sampling: Sampling inspection is that type of activity in which units of product are selected at random and examined for one or more quality attributes. Sampling inspection is an acceptable way of determining the conformance or nonconformance of items to specified quality requirements. The amount of inspection can be increased where the product quality is deteriorating or reduced where the level of quality is high[2].

(2 Mil-Hdbk - 53-1A)

Statistical sampling methods force one hundred percent verification of quality whenever the required quality level has not been attained. The statistical methods proposed herein are designed to provide 95 percent confidence that the inspectable elements of the entire population are acceptable based upon the acceptability of items or attributes previously 100 percent inspected to provide a satisfactory quality baseline. This is consistent with past NRC recommendations related to reinspections of safety related items[3] and will produce results at least equivalent to those expected from 100% inspection.

The statistical quality control methods proposed are in accordance with MIL-STD-105D Tables I, IIA and VIIA. MIL-STD-105D is probably the most widely used sampling standard in the United States. This Program is a rigorous application of statistical quality control methods to assess the quality of nuclear power plant construction.

(3 NCR I&E Bulletin 79-02, Appendix A)

5.3 Sampling Process: The application of statistically valid sampling plans requires lot sizes to be large enough to permit taking of a sample quantity sufficient to limit the risk of accepting nonconforming items. When quantities are not large enough, one hundred percent reinspection will be performed. Because of the Limiting Quality planned to be used, populations of PQCI items are required to be greater than 50 to be eligible for sampling further; however, CP Co has committed to performing 100 percent inspection of PQCIs having 100 or less IRs. In addition, populations to be sampled must be first qualified by having demonstrated acceptable quality levels through one hundred percent inspection of a quantity of items sufficient to provide adequate confidence the existing quality level is acceptable. When 100% inspections have established this confidence, CPCo will consider that the one hundred percent inspection of a significant portion of each PQCI has established a valid basis for statistical sampling of any remaining quantities.

The statistical sampling plan will be conducted as follows:
Two lots for each PQCI will be sampled at normal sampling levels in accordance with MIL-STD-105D, Tables I, IIA and VIIA to a limiting quality of 5 percent at a 95 percent confidence level. If these two successive lots validate that the required level of quality has been maintained, remaining lots will be sampled to the same criteria, but at reduced sampling levels per MIL-STD-105D, Table IIA.

The Executive Manager may recommend to the NRC discontinuance of further sampling where quality levels have demonstrated that past Engineer-Constructor inspections have provided acceptable control of quality.

5.3.1 Switching: The sampling plan will include switching procedures to provide Consumers Power Company the protection provided by the tightened plan, when evidence that the desired quality level is below prescribed levels and the advantage of the reduced plan, when evidence that the desired quality level has been achieved. Due to the known quantities of specific PQCI's available for sampling (non-continuous production run) the following switching rules will be implemented:

- Establish acceptable base quality level through 100% reinspection.
- Single normal plan for two lots.
- From single normal, switch to single reduced, after acceptance of two consecutive lots. Switch back to single normal after the first rejected lot.
- From single normal, switch to single tightened, after the first rejected lot for two consecutive lots, then switch back to single normal if both lots are acceptable. If either or both of the single tightened lots are rejected switch to 100% inspection of lots, until two consecutive lots are accepted.

5.4 Sampling Tables: The following tables indicate sampling information for Single Normal, Single Reduced and Single Tightened sampling plans:

SINGLE NORMAL

Population Lot Size N	Sample Size n	Accept Number Ac	Reject Number Re
2-50	ALL	0	1
*51-500	50	0	1
501-1200	80	0	1
1201-3200	125	2	3
3201-10,000	200	3	4
10,001-00	315	7	8

SINGLE REDUCED

2-50	ALL to 20	0	1
*51-500	20	0	1
501-1200	32	0	1
1201-3200	50	1	2
3201-10,000	80	1	2
10,001-00	125	3	4

SINGLE TIGHTENED

0-80	All	0	1
80-500	80	0	1
*500-1200	125	0	1
1201-3200	200	3	4
3201-10,000	315	5	6
10,001-00	500	10	11

*Mil. Std. 105D, Table VII - Limiting Quality (in percent defective) for which PA=5 percent (LQ 5.0% defective) provides the Acceptance Quality Level (AQL) numbers which specifies the acceptance/rejection numbers for a given sample size. The LQ numbers provided in the table for determining percent defective vary from the 5.0% number desired, eg: 5.8, 3.7, 5.0, 3.9 and 4.2. Since the LQ value variation from the 5% criteria is minimal and in most cases more conservative, it is reasonable and justifiable to stay within the text of the nationally recognized standard.

The specific RQCIs and total quantities of closed Inspection Records to which these lot and sample sizes apply are included in Appendix A to the Quality Verification Program.

5.5 Determination of Lot Sizes: A reinspection lot is a collection of units of product (closed inspection records of like activities) from which a sample is drawn and inspected to determine conformance with the acceptance criteria and may differ from a collection of units designated as a lot for other purposes such as production or procurement[4]. The size of the lot is one of the factors that determines the sample size to be used in sampling inspection. For this program the formation of each lot is planned to be at least equal to the normal sample size for the entire population; thus for a population of 1000, the minimum lot size would be 80; the optimal lot size would be 281 or greater.

Normally the total quantity of the population will not be a direct multiple of the lot size. After dividing the population quantity

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(4 Mil-Hdbk - 53 Para 6.4.1)

by the lot quantity, any residual quantity may be combined with the last lot, or be treated separately for sampling convenience so long as the sample size is in accordance with MIL-STD-105D. Lots will be time centered. The purpose of this is to further enhance homogeneity for each lot and to identify and isolate conditions which may have occurred in specific time periods during construction of the Midland Plant. This method of stratifying samples and lots, yields more information for corrective action than sampling the entire population. Quantities used for determining lot sizes will exclude inspection records where reinspections have occurred, since this will preclude counting the same item twice. A limited number of PQCI's cover like activities. These will be grouped, where appropriate, to provide a single population. An example of such grouping would be PQCI's E-6.1 and RW-1.00, "Modification of Electrical Equipment."

5.6 Sample Selection: Samples will be selected by dividing the lot size by the sample size indicated by MIL-STD-105D Tables I and IIA for normal sampling. For example, for a lot of 500, the sample size is 50. In this case any of the first 10 IRs and every tenth IR for a specific PQCI would be selected for reverification. This assures randomness, since the manner of filing is totally independent of the quality of the item and of the person selecting the sample, and all IRs have an equal chance of selection. It also provides a cross section as related to time, since the IRs are

logged by the date they were opened. Where there are multiple lots of the same size, the same method may be used, so that each sequential lot is time centered with the preceding lot and each item sampled is time sequenced within the lot.

5.7 Substitution: Where accessibility is found to inhibit inspection of attributes of a specific item intended for sample reinspection, the Executive Manager-MPQAD has sole authority to direct the selection of a substitute random item for reinspection from the same lot, or in the event that no item(s) is accessible for reinspection, a documentation review of the inaccessible item(s). Justification for this substitution will be documented.

5.8 Increased or Reduced Sampling: The Executive Manager-MPQAD has authority to direct 100% reinspection at any point where the ability to conduct a valid sample reinspection is determined to be impractical. Switching to reduced or tightened sampling will require prior approval by the Executive Manager-MPQAD in accordance with criteria described in this plan.

5.9 Treatment of Reinspection Deficiencies in Verification Sampling Program: Deficiencies identified by reinspections will be recorded on a nonconformance report and promptly reported to MPQAD-QA and others for processing per procedure. The party responsible for recommending the initial disposition of the nonconformance will

review the intended disposition with MPQAD-QA prior to further processing of the nonconformance. The purpose of this MPQAD-QA review is to insure proper treatment of the nonconformance in the sampling analysis. Deficiencies determined to be acceptable to "use as is" will be evaluated by Project Engineering to determine whether the design criteria requirement which the attribute failed to meet will be modified to clarify the inspection requirement. If Project Engineering modifies the requirement on a generic basis, the deficiency will be considered "acceptable" for purposes of sample analysis. The final decision as to whether the deficiency constitutes a sample defect will be made by the Executive Manager-MPQAD. This decision and its justification will be documented.

5.10 Deficiencies Found During Reinspection of Documentation for Inaccessible Attributes: The verification process for inaccessible attributes is discussed in Section 6.5 of the Quality Verification Plan. As noted in that section, any documentation deficiencies will be noted on the verification IR, entered on a nonconformance report and cross referenced to the original IR. The treatment of sampled lots containing nonconformances will be determined on a case by case basis and further verification requirements will be determined taking into account the disposition of the nonconforming condition.

6.0 Documentation and Reports

6.1 Documentation of Results: Results of sampling reinspection will be documented on IR's and statused to specifically identify the PQCI, the lot number, the quantity in the lot, the quantity inspected, the quantity found acceptable, the NCR's identifying any deficiencies and the results of the nonconformance disposition, and acceptability of the lot.

6.2 Documentation of Nonconformances: Nonconforming conditions will be reported and dispositioned in accordance with approved procedures. Disposition of the nonconformances will include necessary actions to be taken on the balance of the lot; e.g., screen balance of the lot for the rejected attributes, or 100% inspect the balance of the lot.

6.3 Reports: The results of the sampling plan for each lot related to each PQCI will be included in reports made by the CPCo BOP Quality Control Superintendent and the Quality Assurance General Superintendent QA as described in section 7.3 of the Quality Verification Program.

7.0 Implementation: This plan will be implemented as directed by the Executive Manager MPQAD. The organizational responsibilities are the same as shown in section 8 of the Quality Verification Program. In addition, MPQAD BOP Quality Control shall have the responsibility of selecting the IR's to be sampled from lot sizes predetermined by MPQAD-QA.