

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

CONSTRUCTION COMPLETION PROGRAM

Consumers Power Company
June 3, 1983

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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 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 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 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 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 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.
- 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 is developing the procedures and training requirements. It is expected that the Phase 1 will begin shortly.

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.

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.

1.0 INTRODUCTION

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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.

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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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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 or areas 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 performing additional inspections on partially completed or completed work to bring them up to date. A closely coordinated effort involving the Engineer/Constructor and Consumers Power Company (QA/QC, testing and construction) personnel will improve quality performance.
- The quality verification of completed work initiated on a 100% basis using re-certified inspectors.

The second phase includes:

- Work completion, following quality verification, installation and inspection status assessment under responsibility of the team organization.
- 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. 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 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 second phase Program implementation, the assigned team will plan and carry out the remaining work needed for completion including 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.

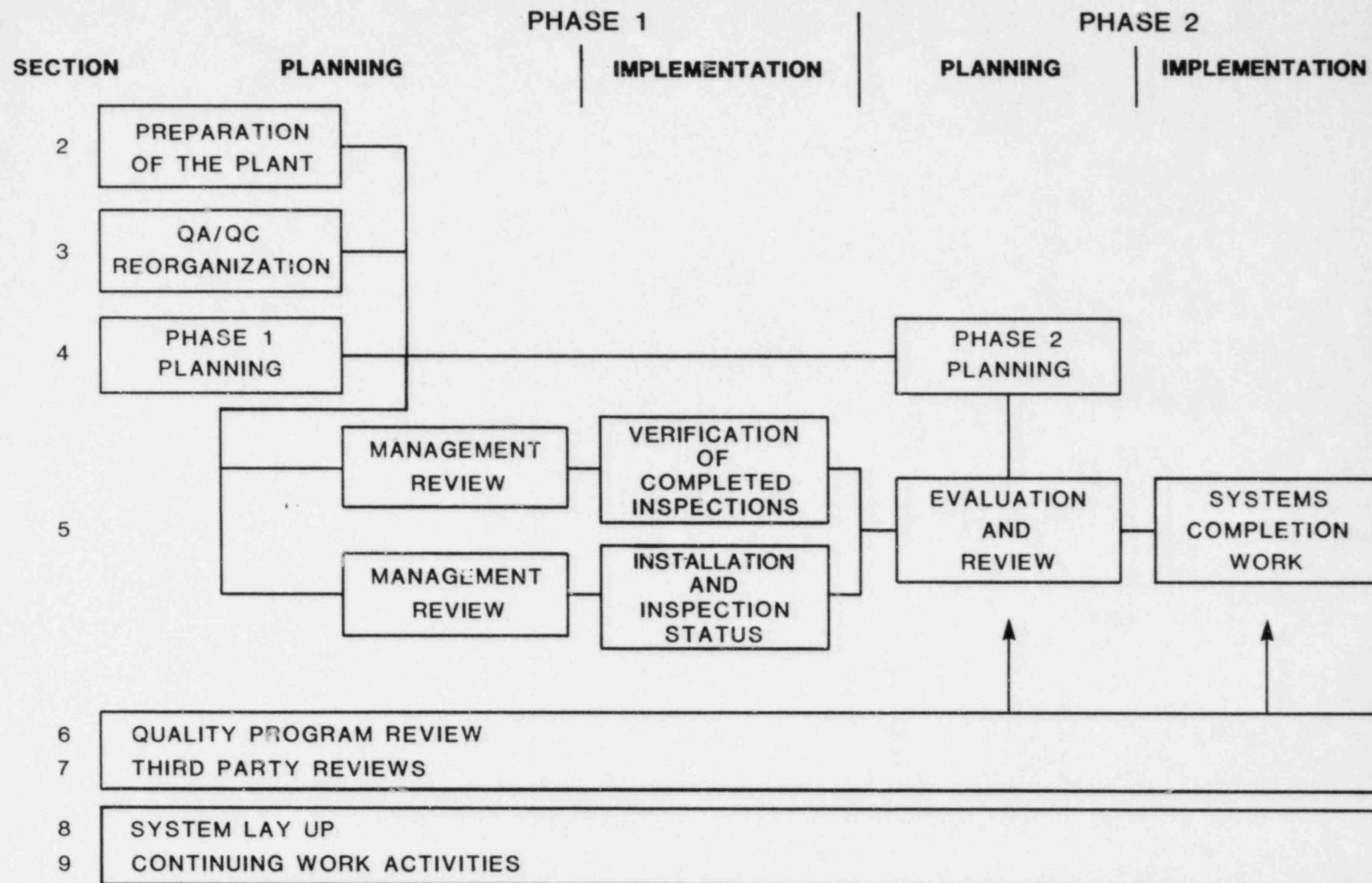
The on-going work to protect plant equipment and systems will be augmented as necessary to provide adequate protection during implementation of this Plan.

Work on Q-Systems has been limited to specific activities. This limitation permits important 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.

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 efficient 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 except ASME. 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 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 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 to the new PQCIs.

MPQAD current plans are to re-train and re-certify 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, 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 was issued April 11, 1983 and 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, the revision is evaluated 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.
3. Once the PQCI is ready for issue, an effectiveness 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 as to the need for retraining or recertification. When a revised PQCI is issued, it is evaluated in accordance with established procedures to determine if retraining and recertification is required. Based on this evaluation, appropriate action is taken.
4. During the training process, student questions (see below) are solicited and monitored. Based on this, further revision to a PQCI may be initiated.

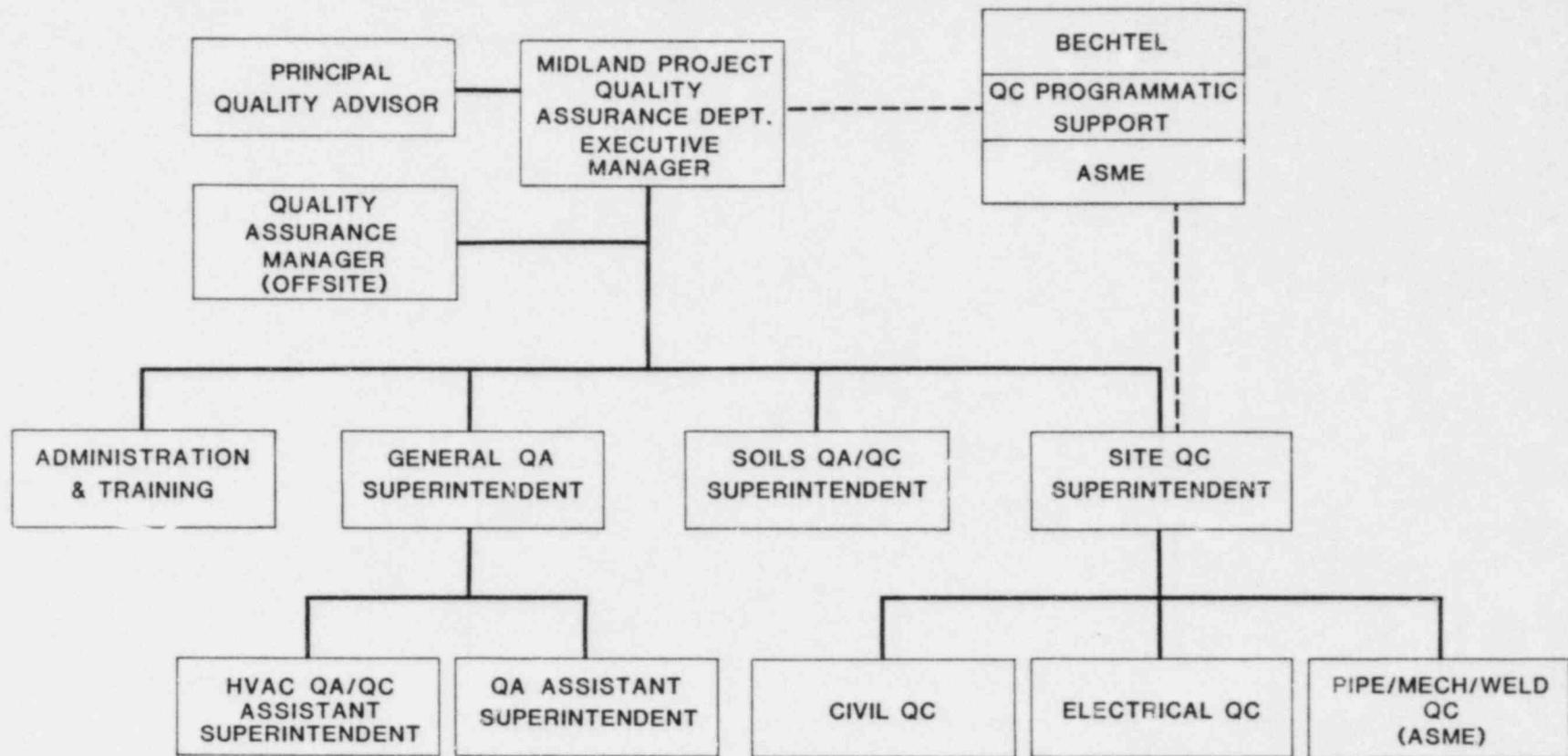
Steps taken to ensure all questions raised during PQCI training sessions are resolved prior to certification include:

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.

MPQA DEPARTMENT STATEMENT OF TRAINING POLICY

FIGURE 3-2

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

G.A. Wells 4/20/83

CFEwert

J.F. Ewert 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. These 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 to achieve recertification, a determination will be made, based on the cause of the failure, as to whether reinspection of that individuals past work is required.

3.4 MilestonesEstablish 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 Orgainzation

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, 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 and insure early identification and resolution of problem areas. Project processes and procedures are being 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 validation of NCR's. He maintains cognizance of the quality status of the verification activities.

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 (1) through (3) and selected parts of (4) will be conducted in a formal setting and will be given to all personnel including the craftpersons.

In addition, a "tool box" training session will be conducted periodically for the craftpersons by the foreman. The subject matter will be developed by the training coordinator, and will include information regarding quality issues across the job.

2. Training in the procedures used to govern the performance of work will be conducted for designated field engineering, support personnel and craft foreman as appropriate.

Formal training 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.

3. Training in procedures for selected processes will be conducted for the craftpersons. This will consist of discussion and/or field demonstrations for the selected process. A list of the selected processes will be maintained by the Training Coordinator.

Documentation of Nonconformances

Non-conformances on the finished portion of partially completed work identified during the status assessment will be documented on Non-conformance Reports (NCR's).

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 is based on a 100% reinspection of accessible attributes and review of documentation for inaccessible attributes. 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.

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 system completion teams to insure that QC inspections are adequately scheduled into the process. 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. 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 (CWP's) for new work will be prepared based on the lists 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 Plan (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 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

<u>Procedure</u>	<u>Organization</u>	<u>Purpose</u>
Area Release for Construction (FIG 7.500)	Construction	
Construction Work Plans (FPG 7.300)	Construction	
Control, Release and Handling of Construction Work Plans and Quality Work Packages (T-3)	MPQAD	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

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.

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 commitments are properly defined and carried out.

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 completion.

The Phase 1 management review and the initial Phase 2 management review will be audited by the Construction Implementation Overview Third Party as described in Section 7.3.

Management Release

Subsequent status assessment results will be released by site management prior to initiation of additional completion segments. Reports will be made to Project management at regularly scheduled meetings.

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.

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.

5.4 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.

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 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 12 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 have been 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 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 will also overview site construction activities while in residence, 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.

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.

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 three 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), The Control Room Habitability System and the Emergency Power Supply, will be reviewed to fulfill the requirements of the IDV.

7.4 Milestones

1. INPO Construction Project Evaluation

Select consultant and conduct evaluation	Complete
Submit report to INPO	Complete

2. Independent Construction Overview

Define scope	Complete
Select consultant	Complete
Mobilize CIO Team	Complete

3. IDV

Select Systems	Complete
Complete Evaluation	

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 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 walkthroughs 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 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 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 CCP 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.

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.

A separate organization of design engineers (presently existing) will carry out spatial systems interaction (SSI) review and examination. 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. This program is being overviewed by the CIO as described in Section 7.3. The SSI represents the Project response to the generic licensing issue of "important to safety" and is being handled outside of the CCP with NRC NRR.

Additional activities related to the 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, system or partial system for completion work will be reviewed with the NRC Region III before initiation.

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 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. The NRC Region III management will be informed prior to implementation.