

Midland Nuclear Power Plant, Units 1 and 2

Docket No. 50-329  
Docket No. 50-330

REPORT ON DESIGN AND CONSTRUCTION PROBLEMS FOR PERIOD FROM  
START OF CONSTRUCTION THROUGH JUNE 30, 1982

Report Requested by Advisory Committee on Reactor Safeguards

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I. Introduction

The following report prepared by the NRC, through its Region III office, discusses Midland construction problems, their disposition, and the overall effectiveness of the Consumers Power Company's efforts to ensure appropriate quality. The report was prepared at the request of the Advisory Committee on Reactor Safeguards and in response to commitments made in Supplement No. 1 of the Safety Evaluation Report. The report covers the period starting with the beginning of construction up to June 30, 1982. A final report will be issued on the above subjects for the period from July 1, 1982 through the completion of construction discussing the overall quality of plant construction.

## II. Summary and Conclusions of Overall Effectiveness

Since the start of construction, Midland has experienced some significant problems resulting in enforcement action (enforcement statistics are summarized in Table 1). Following the identification of each of these problems, the licensee has taken action to correct the problems and to upgrade the QA program and QA/QC staff. The most prominent action has been an overview program which has been steadily expanded to cover safety related activities. In spite of the corrective actions taken, the licensee continues to experience problems in the implementation of quality in construction.

Significant construction problems identified to date include: (1) 1973 - cadweld splicing deficiencies (Paragraph C.2); (2) 1976 - rebar omissions (Paragraph F.5); (3) 1977 - bulge in the Unit 2 Containment Liner Plate (Paragraph G.3); (4) 1977 - tendon sheath location errors (Paragraph G.4); (5) 1978 - Diesel Generator Building settlement (Paragraph H.10); (6) 1980 - allegations pertaining to Zack Company heating, ventilating, and air conditioning (HVAC) deficiencies (Paragraph J.7); (7) 1980 - reactor pressure vessel anchor stud failures (Paragraph J.8); (8) 1981 - piping suspension system installation deficiencies (Paragraph K.4); and (9) 1982 - electrical cable misinstallations (Paragraph L.2).

Consumers Power has on repeated occasions not reviewed problems to the depth required for full and timely resolution. Examples are: (1) rebar omissions (1976); (2) tendon sheath location errors (1977); (3) Diesel Generator Building settlement (1978); and (4) Zack Company HVAC deficiencies (1980). In each of these cases the NRC, in its investigation, has determined that the problem was of greater significance than first reported or that the problem was more generic than identified by Consumers Power Company.

The Region III inspection staff believes problems have kept recurring at Midland for the following reasons: (1) Overreliance on the architect-engineer, (2) failure to recognize and correct root causes, (3) failure to recognize the significance of isolated events (4) failure to review isolated events for their generic application, and (5) lack of an aggressive quality assurance attitude.

A history of the Midland design and construction problems and their disposition, as identified and described in NRC inspection reports, is contained in the following section (III). This history is for the period from the beginning of construction through June 30, 1982.

Table 1

## ENFORCEMENT STATISTICS

YEAR	INSPECTIONS	NONCOMPLIANCES/ DEVIATIONS	HEADQUARTERS NOTICE OF VIOLATION	CIVIL PENALTIES	IALs/ CALs	ORDERS MODIFYING CP/ SHOW CAUSE ORDERS	SIGNIFICANT CONSTRUCTION PROBLEMS
1970	6	4	0	0	0	0	0
1971	2	0	0	0	0	0	0
1972	1	0	0	0	0	0	0
1973	11	6	0	0	0	1 (Cadmolds)	1 (Cadmolds)
1974	11	3	0	0	0	0	0
1975	7	0	0	0	0	0	0
1976	9	17	1 (Rebar)	0	1 (Rebar)	0	1 (Rebar)
1977	13	10	0	0	1 (Tendon Sheath)	0	(Bulge in Containment Liner and 2 Tendon Sheath Installation Errors)
1978	21	14	0	0	0	0	1 (Diesel Generator Bldg. Settlement)
1979	30	17	0	0	0	(Diesel Generator 1 Bldg. Settlement)	0
1980	37	21	0	1 (Zack)	1 (Zack)	0	2 (Zack HVAC & Reactor Anchor Studs)
1981	23	21	0	0	1 (Pipe Suspension System)	0	1 (Pipe Suspension System)
1982	14	7	0	0	0	2 (Diesel Generator Bldg. Settlement)	1 (Electric Cable Routing)

### III. Design and Construction Problems As Documented in NRC Inspection Reports

#### A. 1970

Six inspection reports were issued in 1970. In July 1970, construction activities authorized by the Midland Construction Permit Exemption commenced. A total of four items of noncompliance were identified in 1970. These items are described below:

Four items of nonconformance were identified in Inspection Report Nos. 50-329/70-06 and 50-330/70-06 concerning the installation of concrete. The nonconformances regarded: (1) concrete placement activities violated ACI Code; (2) laboratory not performing tests per PSAR; (3) sampling not per ASTM; and (4) QA/QC personnel did not act on deviations when identified. Licensee corrective actions included: (1) Bechtel to provide a report attesting to the Auxiliary Building base slab where lack of consolidation was apparent; (2) a commitment to perform tests at frequencies specified in the PSAR; and (3) a commitment to train workers and the inspection staff. This matter was discussed during the Construction Permit Hearings and is considered closed.

#### B. 1971-1972

Three inspections were conducted during this period. No items of noncompliance were identified. Midland construction activities were suspended pending the pre-construction permit hearings.

On December 15, 1972, the Midland Construction Permit was issued.

#### C. 1973

Eleven inspection reports were issued in 1973 of which two pertained to special management meetings, two to vendor inspections, one to an audit of the architect engineer, and six to onsite inspections. A total of six items of noncompliance were identified during 1973. One significant construction problem was identified involving deficiencies in cadweld splicing of rebar (see Paragraph 2). These items/problems are described below:

1. Noncompliances involving two separate Appendix B criteria with five different examples were identified during a special audit of the architect engineer's Quality Assurance Program. The noncompliances were documented in Inspection Report Nos. 50-329/73-08 and 50-330/73-08. The items of noncompliance regarded: (1) inadequate requirements for quality record retention; (2) inadequate drawing control; (3) inadequate procedures; and (4) unapproved specifications used for vendor control. Licensee corrective actions included: (1) revision of Bechtel Nuclear Quality Assurance Manual; (2) revision of Midland Internal Procedures Manual; (3) personnel instructed to audit the status of the drawing stick files weekly; (4) project administrator assigned the

responsibility for maintenance of master stick file; and (5) project engineer and staff to perform monthly surveillance of project record file. Inspection Report Nos. 50-329/74-03 and 50-330/74-03 concluded that appropriate corrective actions had been taken by the licensee relative to the identified violations.

2. One significant construction problem was identified during 1973. It involved cadweld splicing deficiencies and resulted in the issuance of a Show Cause Order. Details are as follows:

A routine inspection, conducted on November 6-8, 1973, identified eleven examples of four noncompliance items relative to rebar cadwelding operations. The noncompliances were documented in Inspection Report Nos. 50-329/73-10 and 50-330/73-10. These items were summarized as: (1) untrained cadweld inspectors; (2) rejectable cadwelds accepted by QC inspectors; (3) records inadequate to establish cadwelds meet requirements; and (4) inadequate procedures.

As a result, the licensee stopped work on cadweld operations on November 9, 1973, which in turn stopped rebar installation and concrete placement work. The licensee agreed not to resume work until the NRC reviewed and accepted their corrective action. A Show Cause Order was issued on December 3, 1973, formally suspending cadwelding operations. On December 6-7, 1973, Region III and Headquarters personnel conducted a special inspection and determined that construction activities could be resumed in a manner consistent with quality criteria. Licensee corrective actions included: (1) the revision of the Bechtel specification to reflect requalification requirements; (2) development of instructions requiring that work specifications be reviewed prior to Class 1 work; (3) the establishment of provisions for Consumers Power QA review of work procedures; and (4) the establishment of procedures for the audit of Class 1 work.

The Show Cause Order was modified on December 17, 1973 allowing resumption of cadwelding operations based on inspection results. The licensee answered the Show Cause Order on December 29, 1973 committing to revise and improve the QA manuals and procedures and make QA/QC personnel changes.

On September 25, 1974, the Hearing Board found that the licensee was implementing its QA program in compliance with regulations and that construction should not be stopped.

D. 1974

Eleven inspection reports were issued in 1974 of which one pertained to a vendor inspection, one to an inspection at the licensee's corporate offices, and nine to onsite inspections. Three items of noncompliance were identified during 1974. These items are described below:

1. One noncompliance was identified in Inspection Report No. 50-329/74-01 and 50-330/74-01 concerning the use of unapproved procedures during the preparation of containment building liner plates for erection. Licensee corrective actions included: (1) intensive review of liner plate records for accuracy; (2) issuance of nonconformance report; (3) requirement imposed that unapproved copies of procedures transmitted to the site be marked "advance copy;" and (4) identification of procedure approval status. The licensee's actions in regards to this matter were reviewed and the noncompliance closed by the NRC as documented in Inspection Report Nos. 50-329/74-01 and 50-330/74-01.
2. One noncompliance was identified in Inspection Report Nos. 50-329/74-04 and 50-330/74-04, concerning the use of a weld method which was not part of the applicable weld procedure. Licensee corrective actions included: (1) issuance of a nonconformance report; (2) repair of subject welds; (3) reinstruction of welders; and (4) increased surveillance of containment liner plate field fabrications. The licensee's actions in regards to this matter were reviewed and the noncompliance closed by the NRC as documented in Inspection Report Nos. 50-329/74-04 and 50-330/74-04.
3. One noncompliance was identified in Inspection Report Nos. 50-329/74-11 and 50-330/74-11 concerning the failure of QC inspections to identify nonconforming rebar spacing. This violation is discussed further in the 1976 section of this report, Paragraph F.5.

E. 1975

Seven inspection reports were issued in 1975 of which one pertained to a meeting in Region III, one to an inspection at the licensee's corporate offices, and five to onsite inspection.

No noncompliances were identified in 1975, however, the licensee in March and August of 1975 identified additional rebar deviations and omissions. This matter is further discussed in the 1976 section of this report, Paragraph F.5.

F. 1976

Nine inspection reports were issued in 1976 pertaining to nine onsite inspections. A total of seventeen items of noncompliance were identified during 1976. One significant construction problem was identified involving rebar omissions/placement errors and the issuance of a Headquarters Notice of violation (see Paragraph 5). These items/problems are described below:

1. Three items of noncompliance were identified in Inspection Report Nos. 50-329/76-01 and 50-330/76-01. These items regarded: (1) inadequate concrete oven temperature controls; (2) no measures to control nonconforming aggregate; and (3) failure to dispose of nonconforming aggregate as required. Licensee corrective actions included: (1) implementing a requirement for the reverification of oven temperature controls every three months; (2) removal of nonconforming aggregate from the batch plant area; (3) modification of subcontractor's QA manual; and (4) training of subcontractor's personnel to the revised QA manual. The corrective actions implemented by the licensee in regards to these noncompliances were subsequently reviewed and the items closed by the NRC as documented in Inspection Report Nos. 50-329/76-02 and 50-330/76-02.
2. Two items of noncompliance were identified in Inspection Report Nos. 50-329/76-02 and 50-330/76-02. These items regarded: (1) the Vice President of Engineering Inspection did not audit test reports as required; and (2) corrective actions required by audit findings had not been performed. Corrective actions taken by the licensee included revising the U.S. Testing QA manual. The licensee's corrective actions taken in regards to these matters were subsequently reviewed and the items closed by the NRC as documented in Inspection Report Nos. 50-329/76-08 and 50-330/76-08.
3. Three items of noncompliance were identified in Inspection Report Nos. 50-329/76-08 and 50-330/76-08. These items regarded: (1) inadequate classification, review, and approval of field engineering procedures and instructions; (2) inadequate documentation of concrete form work deficiencies; and (3) inadequate control of site storage of post tension embedments. Licensee corrective actions included: (1) revision of the Bechtel Nuclear QA manual; (2) revision of Bechtel field procedure for "Initiating and Processing Field Procedures and Instructions;" (3) initiation of Bechtel Discrepancy Report; (4) training sessions for Bechtel QC; and (5) revision of storage inspection procedures. The licensee's corrective actions in regards to these items were subsequently reviewed and the items closed by the NRC as documented in Inspection Report Nos. 50-329/77-01 and 50-330/77-01.
4. Two items of noncompliance were identified in Inspection Report Nos. 50-329/76-09 and 50-330/76-09. These items regarded: (1) noncompliance report not written to identify broken reinforcing steel; and (2) hold down studs for the reactor vessel skirt were not protected. Licensee corrective actions included: (1) inspection of all rebar dowels; (2) initiation of new field procedure; and (3) initiation of new



procedure for inspecting reactor vessel and steam generator anchor bolts. The licensee's corrective actions in regards to these items were subsequently reviewed and the items closed by the NRC as documented in Inspection Report Nos. 50-329/77-01 and 50-330/77-01.

5. One significant construction problem was identified during 1976. It involved rebar omissions/placement errors and the issuance of a Headquarters Notice of Violation. Details are as follows:

During an NRC inspection conducted in December 1974 the licensee informed the inspector that an audit had identified rebar spacing problems in the Unit 2 containment. The failure of QC inspectors to identify the nonconforming rebar spacing was identified in the 1974 NRC inspection report as an item of noncompliance. (See the 1974 section of this report, Paragraph D.3.) This matter was subsequently reported by the licensee as required by 10 CFR 50.55(e).

Additional rebar deviations and omissions were identified in March and August 1975 and in April, May and June 1976.

Five items of noncompliance regarding reinforcement steel deficiencies were identified in Inspection Report Nos. 50-329/76-04 and 50-330/76-04. These items regarded: (1) no documented instructions for the drilling and placement of reinforcement steel dowels; (2) nonconformance reports concerning reinforcement steel deficiencies were not adequately evaluated; (3) inadequate inspections of reinforcement steel; (4) inadequate evaluations of a nonconformance report problem relative to 10 CFR 50.55(e) reportability requirements; and (5) results of reviews, interim inspections, and monitoring of reinforcement steel installations were not documented.

The licensee's response, dated June 18, 1976, listed 21 separate items (commitments) for corrective actions. A June 24, 1976 letter from the licensee provided a plan of action schedule for implementing the 21 items. The licensee suspended concrete placement work until the items addressed in the licensee's June 24 letter were resolved or implemented. This commitment was documented in a Region III Immediate Action Letter (IAL) to the licensee, dated June 25, 1976.

Rebar installation and concrete placement activities were resumed in early July, 1976 following satisfactory completion of the corrective actions and verification by Region III as documented in Inspection Report Nos. 50-329/76-05 and 50-330/76-05.

A subsequent inspection to followup on reinforcing steel placement problems identified two noncompliances. These noncompliances are documented in Inspection Report Nos. 50-329/76-07 and 50-330/76-07. The noncompliances regarded: (1) failure to follow procedures; and (2) inadequate Bechtel inspections of rebar installations. The inspection report documents licensee corrective actions which included: (1) removal of cognizant field engineer and lead Civil engineer from the project; (2) removal of lead Civil Quality Control engineer from the project; (3) reprimand of cognizant inspector; (4) additional training given to cognizant foremen, field engineers, superintendants and Quality Control inspectors; and (5) assignment of additional field engineers and Quality Control engineers. The licensee's actions in regard to these items were reviewed and the items closed by the NRC as documented in Inspection Report Nos. 50-329/76-07 and 50-330/76-07.

As a result of the rebar omissions and placement errors, a Headquarters Notice of Violation was issued on August 13, 1976.

Additional actions taken by the licensee included the establishment of an overview inspection program to provide 100% reinspection of embedments by the licensee following acceptance by the contractor Quality Control personnel.

Additional actions taken by the contractor included: (1) personnel changes and retraining of personnel; (2) preparation of a technical evaluation for the acceptability of each identified construction deficiency; and (3) improvement in the QA/QC program coverage of civil work.

G. 1977

Twelve inspections pertaining to Unit 1 and fifteen inspections pertaining to Unit 2 were conducted in 1977. Ten items of non-compliance were identified during 1977. Two significant construction problems were identified involving a bulge in the Unit 2 containment liner plate (see Paragraph 3) and errors in the placement of tendon sheathings (see Paragraph 4). These items/problems are described below:

1. Five examples of noncompliance with Criterion V of 10 CFR 50, Appendix B, were identified in Inspection Report Nos. 50-329/77-05 and 50-330/77-08. The examples of noncompliance regarded: (1) inadequate clearance between concrete wall and pipe support plates; (2) assembly of pipe supports using handwritten drawing changes; (3) inadequate preparation and issue of audit reports; (4) inadequate review of nonconformance reports and audit findings for trends; and (5) inadequate tagging of defective measuring equipment. Licensee corrective actions included: (1) clarification of

design and acceptance criteria contained in pertinent specifications; (2) modification and review of Quality Control Instructions; (3) issuance of two field procedures relative to field modifications of piping hanger drawings; (4) staffing of additional QA personnel at the site; (5) closer management attention; and (6) additional training in the area of tagging. The licensee actions in regard to these items were subsequently reviewed and the items closed by the NRC as documented in Inspection Report Nos. 50-329/77-08, 50-330/77-11, 50-329/78-01, and 50-330/78-01.

2. Three items of noncompliance were identified in Inspection Report Nos. 50-329/77-09 and 50-330/77-12. The items regarded: (1) failure to follow audit procedures; (2) failure to qualify stud welding procedures; and (3) inadequate welding inspection criteria. Licensee corrective actions included: (1) administrative instruction issued to require the audit manager to obtain a semi-monthly audit findings status report from the project manager; (2) administrative instruction issued for the close out and followup of internal corrective action requests; (3) revision of Quality Control Instruction; (4) special inspections and audit; and (5) prescribing specific acceptance criteria. The licensee's actions in regard to these items were subsequently reviewed and the items closed by the NRC as documented in Inspection Report Nos. 50-329/78-01, 50-330/78-01, 50-329/78-05, and 50-330/78-05.
3. A significant construction problem involving a bulge in the Unit 2 containment liner plate was identified in 1977. Details of the liner plate bulge follow:

The initial identification by the licensee of a bulge in the Unit 2 liner plate occurred on February 26, 1977. The liner plate bulge occurred between column line azimuths 250 degrees and 270 degrees and between elevations 593 and 700. Inspection Report No. 50-330/77-02 documents a special inspection concerning the liner plate bulge. This report further identifies an item of noncompliance relative to the failure of the licensee to report the bulge deficiency pursuant to the requirements of 10 CFR 50.55(e). The licensee's corrective actions in regard to this item were reviewed and the item closed by the NRC as documented in Inspection Report No. 50-330/77-14.

The cause of the liner plate bulge was determined to be due to a leaking 2 inch water line installed in the containment concrete as a construction convenience. It was theorized that the water line froze, started to leak, allowing water to seep behind the liner. The water line was supplied by a construction water pump that was set to cycle between 100 and 130 PSI. This pressure was considered to be sufficient to cause the liner plate bulge.

A meeting was held on April 4, 1977 at the Ann Arbor, Michigan Office of Bechtel to review the original design and construction concept of the containment liner, the procedures and actions taken during the removal of bulge affected zones, the investigation activities and results, and to ascertain the concepts involved in the licensee's proposed repair program.

The containment liner bulge deficiency repair was started on August 1, 1977. Inspection Report No. 50-330/77-11 documents the observed fit up and welding of the first four foot lift of replacement liner plate installed. The completion of repair and the repair records were subsequently reviewed as documented in Inspection Report No. 50-330/79-25.

4. A second significant construction problem involved tendon sheath placement errors and resulted in an Immediate Action Letter (IAL). Details are as follows:

The licensee reported, on April 19, 1977, the discovery of an error in the Unit 1 containment building which resulted in two tendon sheathings (H32-036 and H13-036) being misplaced, and two tendon sheathings (H32-037 and H13-037) being omitted. As shown on pertinent vendor drawings, these four tendons were to be deflected downward to clear the two main steam penetrations at center line elevation 707' 0". Concrete had been placed to a construction joint at elevation 703' 7" approximately one week before these tendon deficiencies were discovered.

Corrective actions resulted in the rerouting of tendon sheathing H32-037, originally planned for below the penetration, to a new alignment above the penetration. Tendon sheathing H13-037 was installed below the penetration. Tendon sheathings H32-036 and H13-036 did not require modification.

The tendon sheath placement errors and the past history of rebar placement errors indicated the need for further NRC evaluation of the licensee's QA/QC program. As a result, an IAL was issued to the licensee on April 29, 1977. Licensee commitments addressed by this IAL included: (1) NRC notification prior to repairs or modifications involving the placement of concrete in the area of the misplaced and omitted tendon sheaths; (2) identification of the cause of the tendon sheath deficiencies and implementation of required corrective action; (3) expansion of the licensee's QC overview program; (4) NRC notification of all embedment placement errors identified after QC acceptance; (5) review and revision of QC inspection procedures; and (6) training of construction and inspection personnel.

A special QA program inspection was conducted in May 1977 as documented in Inspection Report Nos. 50-329/77-05 and 50-330/77-08. The inspection team was made up of personnel from Region I, Region III, and Headquarters. It was the consensus of opinion of the inspectors that the licensee's program was acceptable.

The licensee issued the final 50.55(e) report on this matter on August 12, 1977. Final onsite review was conducted and documented in Inspection Report Nos. 50-329/77-08 and 50-329/79-15.

H. 1978

Twenty-two inspections and one investigation were conducted during 1978. A total of fourteen items of noncompliance were identified in 1978. One significant construction problem was identified involving excessive settlement of the Diesel Generator Building foundation (see Paragraph 10). These items/problems are described below:

1. Three items of noncompliance were identified in Inspection Report Nos. 50-329/78-03 and 50-330/78-03. These items regarded: (1) inadequate inspections of welds on cable tray supports; (2) inadequate control of welding voltage and amperage as required by AWS; and (3) inadequate documentation of repairs on purchased equipment. Licensee corrective actions included: (1) additional training given Quality Control Engineers and craft welders; (2) revision of pertinent technical specifications and weld acceptance requirements; (3) revision of welding procedures; (4) revisions of vendor QA manual; and (5) reinspections and engineering evaluations. The licensee actions in regard to these items were subsequently reviewed and the items closed by the NRC as documented in Inspection Report Nos. 50-329/78-15, 50-330/78-15, 50-329/79-25, 50-330/79-25, 50-329/81-12, 50-330/81-12, 50-329/79-22, and 50-330/79-22.
2. Two items of noncompliance were identified in Inspection Report Nos. 50-329/78-05 and 50-330/78-05. These items regarded: (1) inadequate control of welding filler material; and (2) inadequate protection of spool pieces. Licensee corrective actions included: (1) additional instructions given to welding personnel; (2) generation of nonconformance report to require Bechtel to perform a thorough inspection of the facility, correct and document discrepancies noted, and instruct craft personnel. The licensee actions in regard to these items were subsequently reviewed and the items closed by the NRC as documented in Inspection Report Nos. 50-329/78-05, 50-330/78-05, 50-329/79-22, and 50-330/79-22.
3. Two examples of noncompliance with one 10 CFR 50 Appendix B criterion were identified in Inspection Report Nos. 50-329/78-07 and 50-330/78-07. These examples regarded: (1) inadequate

control of drawings; and (2) inadequate drawing control procedures. Licensee corrective actions included: (1) Zack and Bechtel revised drawing control procedures; and (2) extensive audits of drawing controls. The licensee actions in regard to these items were subsequently reviewed and the items closed by the NRC as documented in Inspection Report Nos. 50-329/79-25 and 50-330/79-25.

4. One item of noncompliance was identified in Inspection Report No. 50-330/78-09 concerning inadequate backing gas flow rate during welding operations. Licensee corrective actions included: (1) revision of Bechtel welding procedure specifications; (2) revision of Bechtel Quality Control Instruction; and (3) additional training for all welding Quality Control Engineers. The licensee's actions in regard to this item were subsequently reviewed and the item closed by the NRC as documented in Inspection Report No. 50-330/78-16.
5. Two items of noncompliance were identified in Inspection Report Nos. 50-329/78-13 and 50-330/78-13. The items regarded: (1) inadequate inspection of weld joints; and (2) inadequate storage of Class 1E equipment. Licensee corrective actions included: (1) revision of welding specifications; (2) additional instructions to QC inspectors; (3) additional overinspections; (4) upgrade of administrative procedures; and (5) actions to bring storage environment within controlled specifications. The licensee's actions in regard to these items were reviewed and the items closed by the NRC as documented in Inspection Report Nos. 50-329/78-13 and 50-330/78-13.
6. Two items of noncompliance were identified in Inspection Report Nos. 50-329/78-15 and 50-330/78-15. These items regarded: (1) nonconforming welds on Main Steam Isolation Valve support structures; and (2) inadequate corrective action taken to repair nonconforming Nelson Stud weld attachments. Licensee corrective actions included: (1) responsible welding Quality Control Engineer required to attend training course; (2) defective welds reworked; and (3) engineering evaluation. The licensee's actions in regard to these items were subsequently reviewed and the items closed by the NRC as documented in Inspection Report Nos. 50-329/79-22, 50-330/79-22, 50-329/79-25 and 50-330/79-25.
7. One deviation was identified in Inspection Report No. 50-330/78-16 concerning the failure to meet ASME code requirements for nuclear piping. Licensee corrective actions included the determination that the impact test values of the pipe material in question met the code requirements, and the UT thickness measurements made by ITT Grinnell were in error and

voided by measurements made by Bechtel. The licensee's actions in regard to this item were subsequently reviewed and the item closed by the NRC as documented in Inspection Report No. 50-330/79-24.

8. One item of noncompliance was identified in Inspection Report Nos. 50-329/78-17 and 50-330/78-17 regarding the failure to follow weld procedures pertaining to the repair welding of cracked welds on the personnel air locks. The licensee's corrective actions included steps to revise affected drawings and to update the stress analysis report for the air locks. The corrective actions taken by the licensee will be reviewed during future NRC inspections.
9. One item of noncompliance was identified in Inspection Report Nos. 50-329/78-22 and 50-330/78-22 concerning the failure to perform specified maintenance and inspection activities on Auxiliary Feed Pumps. Licensee corrective actions included: (1) training of pertinent Quality Control engineers; (2) transition of personnel in QC department relative to storage and maintenance activities; and (3) inspections and evaluations of omitted maintenance. The licensee's actions in regard to this item were subsequently reviewed and the item closed by the NRC as documented in Inspection Report Nos. 50-329/78-22 and 50-330/78-22.
10. One significant construction problem was identified during 1978. It involved excessive settlement of the Diesel Generator Building foundation. Details are as follows:

The licensee informed the Region III office on September 8, 1978, per requirements of 10 CFR 50.55(e), that settlement of the Diesel Generator foundations and structures was greater than expected.

Fill material in this area was placed between 1975 and 1977, with construction starting on the diesel generator building in mid-1977. Review of the results of the Region III investigation/inspection into the plant fill/Diesel Generator building settlement problem indicate many events occurred between late 1973 and early 1978 which should have alerted Bechtel and the licensee to the pending problem. These events included non-conformance reports, audit findings, field memos to engineering, and problems with the administration building fill which caused modification and replacement of the already poured footing and replacement of the fill material with lean concrete.

Causes of the excessive settlement included: (1) inadequate placement method - unqualified compaction equipment and excessive lift thickness; (2) inadequate testing of the soil material; (3) inadequate QC inspection procedures; (4) unqualified Quality Control inspectors and field engineers; and (5) overreliance on inadequate test results.

Lead technical responsibility and program review for this issue was transferred to NRR from IE by memo, dated November 17, 1978.

During 1978 the licensee conducted soil borings in the area of the Diesel Generator building and in other plant fill areas. In addition, a team of consultants who specialize in soils was retained by the licensee to provide an independent evaluation and provide recommendations concerning the soil conditions existing under the Diesel Generator building.

As previously stated, an investigation was initiated in December 1978 by the NRC to obtain information relating to design and construction activities affecting the Diesel Generator Building foundation and the activities involved in the identification and reporting of unusual settlement of the building. The results of the investigation and additional developments in regard to this matter are discussed in the 1979 section of this report, Paragraph I.11.

I. 1979

Thirty inspection reports were issued in 1979 of which one pertained to an onsite management meeting, two to investigations, one to a vendor inspection, one to a meeting in Region III, and twenty-five to onsite inspections. A total of seventeen items of noncompliance were identified in 1979. These items are described below:

1. One item of noncompliance was identified in Inspection Report Nos. 50-329/79-10 and 50-330/79-10 concerning inadequate measures to assure that the design basis was included in drawings and specifications. Licensee corrective actions included: (1) revision to Midland FSAR; and (2) revision to pertinent specification. The licensee's actions in regard to this item were subsequently reviewed and the item closed by the NRC as documented in Inspection Report Nos. 50-329/79-19 and 50-330/79-19.
2. Three items of noncompliance were identified in Inspection Report Nos. 50-329/79-12 and 50-330/79-12. The items were: (1) inadequate corrective action in regard to drawing controls; (2) discrepancy in Zack Welding Procedure Specification; and (3) inadequate control of purchased material. Licensee corrective actions included: (1) audit of drawing control program; (2) revision to drawing control requirements; (3) revision of Zack Welding Procedure Specification; (4) review of other Zack procedures; (5) missing data added to documentation packages; and (6) audits of other documentation packages. The actions taken by the licensee were subsequently reviewed and the items closed by the NRC as documented in Inspection Report Nos. 50-329/81-01, 50-330/81-01, 50-329/80-15, 50-330/80-16, 50-329/79-22, and 50-330/79-22.



3. One item of noncompliance was identified in Inspection Report No. 50-330/79-13 concerning the failure to inspect all joints and connections on the Incore Instrument Tank as prescribed in the hydrostatic test procedure. Licensee corrective actions included a supplemental test of the Incore Instrument Tank and the initiation of a supplemental test report. The licensee's actions in regards to this matter were subsequently reviewed and the item closed by the NRC as documented in Inspection Report No. 50-330/80-38.
4. One item of noncompliance was identified in Inspection Report No. 50-330/79-14 concerning the use of a wad of paper in making a purge dam during welding activities. Licensee corrective actions included: (1) revision of pertinent procedures; (2) revision of pertinent Quality Control inspection checklist; and (3) training sessions for welders and Quality Control inspectors. The licensee's actions in regards to this matter were subsequently reviewed and the item closed by the NRC as documented in Inspection Report No. 50-330/80-16.
5. One item of noncompliance was identified in Inspection Report Nos. 50-329/79-18 and 50-330/79-18 concerning inadequate controls to protect materials and equipment from welding activities. Licensee corrective actions included training sessions for cognizant Field Engineers, Superintendents, General Foremen and Foremen. The licensee's actions in regards to this matter were subsequently reviewed and the item closed by the NRC as documented in Inspection Report Nos. 50-329/80-15 and 50-330/80-16.
6. Two items of noncompliance were identified in Inspection Report Nos. 50-329/79-19 and 50-330/79-19. These items regarded: (1) failure to ensure that appropriate quality standards were in the specification for structural backfill; and (2) Quality Control inspection personnel performing containment prestressing activities were not being qualified as required. Licensee corrective actions included: (1) revision of pertinent specification; (2) examination given to Level I and Level II inspector; and (3) reinspection of selected tendons. The licensee's actions in regards to these items were subsequently reviewed and the items closed by the NRC as documented in Inspection Report Nos. 50-330/80-09, 50-329/80-04 and 50-330/80-04.
7. One item of noncompliance was identified in Inspection Report Nos. 50-329/79-20 and 50-330/79-20 concerning inadequate controls for welding activities pertaining to 4.16 KV switchgear. Licensee corrective actions included: (1) correction of relevant records; (2) additional training for Quality Control Engineers; and (3) additional training for the Quality Control Document Coordinator. The licensee's actions were subsequently reviewed and the item closed by the NRC as documented in Inspection Report Nos. 50-329/80-15 and 50-330/80-16.

8. One item of noncompliance was identified in Inspection Report No. 50-330/79-22 concerning inadequate weld rod controls. Licensee corrective actions included a training session for cognizant welding personnel. The actions taken by the licensee in regards to this matter were subsequently reviewed and the item closed by the NRC as documented in Inspection Report No. 50-330/80-01.
9. One item of noncompliance was identified in Inspection Report Nos. 50-329/79-26 and 50-330/79-26 concerning failure to follow procedures relative to the shipment of auxiliary feed water pumps to the site with nonconforming oil coolers. Licensee corrective actions included: (1) reinstruction given to cognizant engineer; and (2) Supplied Deviation Disposition Request (SDDR) generated by the vendor. The licensee's actions in regards to this matter were reviewed and the item closed by the NRC as documented in Inspection Report Nos. 50-329/79-26 and 50-330/79-26.
10. One item of noncompliance was identified in Inspection Report Nos. 50-329/79-27 and 50-330/79-27 concerning the violation of QC Hold Tags. Licensee corrective actions included: (1) a training session for Construction Supervisors and Field Engineers; and (2) a Field Instruction on Quality Control Hold Tags was issued. The licensee's actions in regards to this matter were subsequently reviewed and the item closed by the NRC as documented in Inspection Report Nos. 50-329/81-04 and 50-330/81-04.
11. As a followup to the significant construction problem identified in 1978 (see Paragraph H.10), an investigation was initiated in December, 1978 to obtain information relating to design and construction activities affecting the Diesel Generator Building foundations and the activities involved in the identification and reporting of unusual settlement of the building. The investigation findings were documented in Inspection Report Nos. 50-329/78-20 and 50-330/78-20, dated March 22, 1979. Information obtained during this investigation indicated: (1) a lack of control and supervision of plant fill activities contributed to the inadequate compaction of foundation material; (2) corrective action regarding nonconformances related to plant fill was insufficient or inadequate as evidenced by the repeated deviations from specification requirements; (3) certain design bases and construction specifications related to foundation type, material properties, and compaction requirements were not followed; (4) there was a lack of clear direction and support between the contractor's engineering office and construction site personnel; and (5) the FSAR contained inconsistent, incorrect and unsupported statements with respect to foundation type, soil properties, and settlement values. Nine examples of noncompliance involving four different 10 CFR 50, Appendix B Criteria were identified in the subject inspection report.

Meetings were held on February 23, 1979 and March 5, 1979 at the NRC Region III office to discuss the circumstances associated with the settlement of the Diesel Generator Building at the Midland facility. The NRC staff stated that it's concerns were not limited to the narrow scope of the settlement on the Diesel Generator Building, but extended to various buildings, utilities and other structures located in and on the plant area fill. In addition, the staff expressed concern with the Consumers Power Company Quality Assurance Program. Under the authority of Section 182 of the Atomic Energy Act of 1954, as amended, and Section 50.54(f) of 10 CFR Part 50, additional information was requested regarding the adequacy of the fill and the quality assurance program for the Midland site in order for the Commission to determine whether enforcement action such as license modification, suspension or revocation should be taken. Question 1 of the 50.54(f) letter dated March 21, 1979 requested information regarding the quality assurance program. On April 24, 1979, Consumers Power Company submitted the initial response to the 50.54(f) request, Questions 1 through 22. As a result of the NRC staff review of Question 1, the NRC concluded that the information provided was not sufficient for a complete review. Subsequently, on September 11, 1979, the NRC issued a request for additional quality assurance information (Question 23). On November 13, 1979, Consumers Power Company submitted Revision 4 to the 50.54(f) responses which included response to Question 23. As a result of the Region III investigation report and CPCo responses, the NRC issued an Order modifying construction Permits No. CPPR-81 and No. CPPR-82, dated December 6, 1979. This order prohibited further soils related activities until the submission of an amendment to the application seeking approval of the Remedial Soils work with the provision that the order would not become effective in the event that the licensee requested a hearing. Due to the licensee's decision to request a hearing this order forms the basis for the ongoing ASLB Hearings.

During 1979, the licensee continued soil boring operations in order to identify and develop the quality of material in the plant area fill and beneath safety related structures. The licensee completed a program regarding the application of a surcharge of sand material in and around the Diesel Generator Building. This surcharge was an attempt to accelerate any future settlement of the Diesel Generator Building by consolidating the foundation material.

Additional developments in this matter are discussed in the 1980 section of this report, Paragraph J.9.

J. 1980

Thirty-seven inspection reports were issued in 1980 of which two pertained to meetings at the licensee's corporate office, one to a meeting in Glen Ellyn, two to investigations, and thirty-two to onsite inspections. A total of twenty-one items of noncompliance were identified during 1980. Two significant construction problems were identified involving quality assurance problems at the Zack Company (see Paragraph 7) and deficient reactor vessel anchor studs (see Paragraph 8). These items/problems are described below:

1. Two items of noncompliance and one deviation were identified in Inspection Report Nos. 50-329/80-01 and 50-330/80-01. These items regarded: (1) a welder welding on material of thickness which exceeded his qualified range; (2) failure to date and sign the cleanliness inspection of Unit 2 Service Water System valve; and (3) failure to implement a design change or prepare a Field Change Request. Licensee corrective actions in regards to the items of noncompliance included: (1) testing and qualification of the subject welder; (2) reinstruction of QC engineer; (3) review of the inspection records for additional valves; and (4) the revision of applicable turnover procedures. The licensee's actions in regards to these items were subsequently reviewed and the items closed by the NRC as documented in Inspection Report Nos. 50-329/80-20, 50-330/80-21, 50-329/82-04 and 50-330/82-04.
2. One item of noncompliance was identified in Inspection Report No. 50-329/80-09 concerning the failure to maintain levelness requirements during core support assembly lifts. The licensee's corrective actions in response to the item of noncompliance included the issuance of a nonconformance report and the commitment to ensure compliance with Quality Control procedures. The licensee's corrective actions in regards to this matter will be reviewed during subsequent NRC inspections.
3. One item of noncompliance was identified in Inspection Report Nos. 50-329/80-20 and 50-330/80-21 concerning the failure of a Bechtel purchase order for E7018 welding rods to specify the applicable codes. Licensee commitments in regards to corrective actions included an audit of the ordering and receiving records of weld filler material. The licensee's corrective actions in regards to this matter will be reviewed during subsequent NRC inspections.
4. One item of noncompliance was identified in Inspection Report Nos. 50-329/80-21 and 50-330/80-22 concerning the failure to perform an audit of Photon Testing, Inc. for services to qualify Zack Company welders. Licensee corrective actions included an audit of Photon Testing, Inc. The licensee's actions in regards to this matter were subsequently reviewed and the item closed by the NRC as documented in Inspection Report Nos. 50-329/81-03 and 50-330/81-03.

5. One item of noncompliance was identified in Inspection Report Nos. 50-329/80-28 and 50-330/80-29 concerning the bypassing of a hold point on a Pressure Surge System weld. The inspection report further identifies that action had been taken to correct the identified noncompliance and to prevent recurrence. The item is closed.
6. One item of noncompliance was identified in Inspection Report Nos. 50-329/80-31 and 50-330/80-32 concerning substantial delays by the licensee in making 10 CFR Part 21 reportability determinations. Licensee corrective actions included training sessions for key personnel in recognizing 10 CFR 21 reporting obligations. The licensee's actions in regards to this matter were subsequently reviewed and the item closed by the NRC as documented in Inspection Report Nos. 50-329/81-07 and 50-330/81-07.
7. A significant construction problem involving quality assurance problems at the Zack Company, the heating, ventilating, and air condition contractor was identified in 1980. Details of the Zack problem follow:

During March and April, 1980 the NRC received numerous allegations pertaining to the Zack Company. The Zack Company is the heating, ventilation and air conditioning (HVAC) subcontractor at the Midland construction site. The allegations dealt with material traceability, violations of procedures, falsification of documents, and the training of quality control inspectors.

As the result of the allegations, an investigation was initiated by the NRC. During the initial phases of the investigation, the NRC determined that Consumers Power Company had issued a Management Corrective Action Request (MCAR), dated January 8, 1980, pertaining to the Zack Company. The MCAR showed that Zack had failed to initiate corrective action in a timely manner on a large number of nonconformance reports and audit findings and had failed to address other requirements and commitments of the quality program.

Consumers Power Company had issued seven nonconformance reports during the period of May 23 to October 2, 1979 all of which recommended 100% reinspection of work as a corrective action. The investigation determined that as of March 19, 1980, corrective action had not been completed on any of the nonconformance reports.

Based on preliminary findings during the investigation, which revealed some instances of continued nonconformance in the implementation of Zack's Quality Assurance Program, an Immediate Action Letter (IAL) was issued to the licensee on March 21, 1980. The IAL stated the NRC's understanding that a Stop Work Order had been issued to the Zack Corporation for all its safety related construction activities.

Seventeen examples of noncompliance involving eight different 10 CFR 50, Appendix B, criteria were identified during the investigation. The investigation findings are documented in Inspection Report Nos. 50-329/80-10 and 50-330/80-11. The licensee's actions in regards to the items of noncompliance were subsequently reviewed and the items closed by the NRC as documented in Inspection Report Nos. 50-329/82-15 and 50-330/82-15.

On June 30, 1980, the NRC received from the licensee a letter documenting a Program Plan for resumption of safety related work by the Zack Company. The licensee identified that corrective actions required prior to lifting the Stop Work included: (1) the review and approval of all Field Quality Control Procedures and specific Weld Procedure Specifications; (2) the review and approval of the revised Zack QA Manual; (3) the training and certification of the QC personnel; and (4) the training of site production personnel.

Subsequent to followup NRC inspections to determine the effectiveness of licensee corrective actions, it was determined by the NRC, on August 14, 1980 that HVAC safety related work could resume.

The Bechtel Power Corporation released the Zack Company from the Stop Work Order by letter dated August 14, 1980.

As a result of the aforementioned investigation findings, the NRC imposed a Civil Penalty, on January 7, 1981, on Consumers Power Company for the amount of \$38,000.

8. The second significant construction problem involved reactor pressure vessel anchor stud failures. Details are as follows:

On September 14, 1979, Consumers Power Company personnel notified the NRC of the discovery of a broken reactor vessel anchor stud on the Midland Unit 1 reactor vessel. On October 12, 1979, this condition was reported under the requirements of 10 CFR 50.55(e). Two other studs were subsequently found to be broken. As this condition reflected a significant deficiency, an NRC investigation was initiated in February 1980 to review the materials, manufacturer, and installation of the studs.

The investigation findings, as documented in Inspection Report Nos. 50-329/80-13 and 50-330/80-14, indicate several Quality Assurance deficiencies: (1) lack of licensee involvement; (2) failure to advise the heat treater of different heats of material; (3) inadequate document review; (4) failure to respond to indications that the studs were deficient; (5) failure to review materials previously purchased when the purchase specification was revised; and (6) miscalculation of

the stud stress area resulting in a slight over-specification stressing of the studs (this item was identified by the licensee).

Three items of noncompliance were identified in the inspection report. These items regarded: (1) failure to identify Subsection NF of the ASME Code as the applicable requirement for the reactor vessel anchor bolts; (2) failure to establish measures to assure that purchased material conforms to the procurement documents; and (3) failure to establish measures to assure that heat treating and nondestructive tests were controlled in accordance with applicable codes and specifications. Licensee commitments in regards to corrective actions included: (1) a commitment to conduct a review to confirm that safety related low alloy steel bolting and/or component support materials, which have been tempered and quenched and are 7/8" or greater in diameter, have been procured in accordance with proper codes and standards; (2) a commitment to obtain NRR approval of the acceptability of the Unit 2 reactor vessel anchor bolts and (3) a commitment that actual plant modifications to compensate for the defective bolts would not be started on Unit 1 until approval of the design concept was received from NRR.

The stud failure mechanism was identified as stress corrosion cracking which propagated to the point that the studs failed by cleavage fracture. Tests indicated that some studs utilized in Unit 2, although of different material and heat treatment, have above specification surface hardness readings.

The final report per 50.55(e) requirements was submitted by the licensee on December 1, 1981.

NRR has the lead responsibility for evaluation and approval of the licensee's proposals for resolution of this matter.

9. A special inspection was conducted in December, 1980 at the Bechtel Power Company Ann Arbor, Michigan offices to verify implementation of the specific commitments and action items reflected in Consumers Power Company response to 10 CFR 50.54(f) questions (regarding excessive settlement of the Diesel Generator Building foundations). The results of this inspection were documented in Inspection Report Nos. 50-329/80-32 and 50-330/80-33. Two items of noncompliance were identified regarding: (1) failure to provide adequate corrective actions with regard to identified audit results; and (2) inadequate design control. Licensee corrective actions included: (1) revision of procedures; (2) revision of specification; and (3) audit of FSAR sections. The licensee actions were subsequently reviewed and the items closed by the NRC as documented in Inspection Report Nos. 50-329/81-12, 50-330/81-12, 50-329/81-19 and 50-330/81-19.

Additional information regarding this matter is discussed in the 1981 section of this report, Paragraph K.6.

K. 1981

Twenty-three inspection reports were issued in 1981 of which one pertained to a management meeting and twenty-two to onsite inspections. A total of twenty-one items of noncompliance were identified during 1981. One significant construction problem was identified involving deficiencies in piping suspension system installations (see Paragraph 4). These items/problems are described below:

1. Two items of noncompliance were identified in Inspection Report Nos. 50-329/81-04 and 50-330/81-04. These items regarded: (1) failure to account for all tools and materials used in a controlled clean room area; and (2) inadequate procedure for the installation of the Unit 2 vent valves in the core support assembly. Licensee corrective actions included: (1) the upgrading of personnel and equipment logs; (2) the addition of new logs; (3) issuance of a formal Stop Work Order for further work on the installation of vent valves; (4) the revision of installation procedures; (6) training and indoctrination of personnel performing vent valve installations; and (5) the revision of the overview inspection plan. The licensee's actions in regards to these items were reviewed and it was determined that action had been taken to correct the identified non-compliances and to prevent recurrence. This determination is documented in Inspection Report Nos. 50-329/81-04 and 50-330/81-04.
2. One item of noncompliance was identified in Inspection Report Nos. 50-329/81-08 and 50-330/81-08 regarding the failure to provide adequate storage conditions for Class 1E equipment. Licensee corrective actions included: (1) additional training for Bechtel maintenance engineers; (2) an audit of maintenance activities; and (3) reinspections of affected equipment. The licensee's actions in regards to this matter were subsequently reviewed and the item closed by the NRC as documented in Inspection Report Nos. 50-329/81-23 and 50-330/81-23.
3. Four items of noncompliance were identified in Inspection Report Nos. 50-329/81-11 and 50-330/81-11. These items regarded: (1) inadequate procedures for the temporary support of cables and for the routing of cables into equipment; (2) failure of QC inspectors to identify inadequate cable separation; (3) inadequate control of nonconforming raceway installations; and (4) failure to translate the FSAR requirements into instrumentation specifications. Licensee corrective actions in regards to (1) and (2) above, included: (1) the revision of cable pulling procedures;



(2) the repair of damaged cables; (3) training given to the termination personnel and the involved QC inspector; and (4) the revision of the cable termination procedure. The licensee's actions in regards to these items were subsequently reviewed and the items closed by the NRC as documented in Inspection Report Nos. 50-329/81-20, 50-330/81-20, 50-329/82-03 and 50-330/82-03. Licensee commitments in regards to corrective actions pertaining to items (3) and (4), above, included: (1) the addition of required barriers on pertinent raceway drawings; (2) the revision of Project Quality Control Instruction; (3) and the revision of the instrumentation specification. The licensee's actions in regards to these items will be reviewed during subsequent NRC inspections.

4. Eight items of noncompliance were identified during a special indepth team inspection to examine the implementation status and effectiveness of the Quality Assurance Program. The results of the inspection are documented in Inspection Report Nos. 50-329/81-12 and 50-330/81-12. Three of the items of noncompliance regarded: (1) failure to take adequate corrective action concerning the trend analysis procedure; (2) failure of QC inspections to identify a nonconforming cable bend radius; and (3) failure to take adequate corrective action in regards to the lack of rework procedures. Licensee corrective actions in regards to items (1) and (2) above, included: (1) the issuance of a new procedure for trending; (2) the revision of cable termination procedures; and (3) additional training given to the responsible QC inspector. The licensee's actions in regards to these items were subsequently reviewed and the items closed by the NRC as documented in Inspection Report Nos. 50-329/82-02, 50-330/82-02, 50-329/82-03 and 50-330/82-03. The licensee's commitments in regards to corrective actions pertaining to item (3) above, included: (1) the development of Administrative Guidelines and Instructions for rework; and (2) the revision of field procedures. The licensee's actions in regards to this item will be reviewed during subsequent NRC inspections.

The remaining five items of noncompliance identified in Inspection Report Nos. 50-329/81-12 and 50-330/81-12 are considered to be a significant construction problem. Safety related pipe support and restraint installations and QC inspection deficiencies in regard to those installations were identified. The five items of noncompliance pertaining to this issue regarded: (1) failure to install large bore pipe restraints, supports and anchors in accordance with design drawings and specifications; (2) failure of QC inspectors to reject large bore pipe restraints, supports and anchors that were not installed in accordance with design drawings and specifications; (3) failure to prepare,

review and approve small bore pipe and piping suspension system designs performed onsite in accordance with design control procedures; (4) failure to adequately control documents used in site small bore piping design activities; and (5) failure of audits to include a detailed review of system stress analysis and to follow up on previously identified hanger calculation problems. Licensee corrective actions in regards to items (3) through (5) included: (1) the review and upgrading of small bore piping calculations (2) audits of small bore piping activities; (3) revision of Engineering Directive; (4) additional training in QA procedures; and (5) audits of document control. The licensee's actions in regards to these items were subsequently reviewed and the items closed by the NRC as documented in Inspection Report Nos. 50-329/82-07 and 50-330/82-07.

As a result of the adverse findings, an Immediate Action Letter (IAL) was issued by the NRC on May 22, 1981 acknowledging the NRC's understanding that the licensee would not issue fabrication and construction drawings for the installation of the safety related small bore pipe and piping suspension systems until requirements identified in the IAL had been completed and audited.

The IAL requirements were subsequently reviewed and determined to have been satisfactorily addressed. This is documented in Inspection Report Nos. 50-329/81-14 and 50-330/81-14.

The licensee's actions in regards to noncompliance items (1) and (2) above, are discussed in Paragraph 1 of the following report section for 1982(L).

5. One item of noncompliance was identified in Inspection Report Nos. 50-329/81-14 and 50-330/81-14 concerning inadequate design controls involving the Bechtel Resident Engineer's review of the field engineers redline drawings for small bore piping. Licensee corrective actions included: (1) a 100% review of all questionable systems; and (2) the revision of a Project Instruction. The licensee's actions in regards to this matter were subsequently reviewed and the item closed by the NRC as documented in Inspection Report Nos. 50-329/82-07 and 50-330/82-07.
6. In January, 1981 an inspection was conducted by the NRC to verify whether adequate corrective actions had been implemented as described in the Consumers Power Company response to Questions 1 and 23 of 10 CFR 50.54(f) submittals (regarding excessive settlement of the Diesel Generator Building foundation). The findings during this inspection, which include three items of noncompliance and one deviation, are documented in Inspection Report Nos. 50-329/81-01 and

50-330/81-01. The items of noncompliance and the deviation regarded: (1) failure to develop test procedures for soils work activities; (2) failure to have soils laboratory records under complete document control; (3) failure to have explicit instructions for the onsite Geotechnical Engineer's review of test results; and (4) failure to have a qualified Geotechnical Engineer onsite. Licensee corrective actions included: (1) revision of Quality Control Procedures and Specification; (2) development of new Quality Control Procedures; and (3) the addition of a qualified Geotechnical Engineer. The licensee's actions in regards to these items were subsequently reviewed and the items closed by the NRC as documented in Inspection Report Nos. 50-329/81-12 and 50-330/81-12.

7. In March 1981, an inspection was initiated by the NRC to verify the licensee's Quality Assurance Program for the ongoing soil borings. The soil borings were performed by the licensee in response to a request from the Corps of Engineers for additional soil information for their review of the licensee's 10 CFR 50.54(f) answers. The findings of this inspection, which includes one item of noncompliance, are documented in Inspection Report Nos. 50-329/81-09 and 50-330/81-09. The noncompliance regards the lack of evaluation of Woodward-Clyde technical capabilities prior to the commencement of drilling operations. Licensee commitments in regards to corrective actions included: (1) the review, for compliance, of Midland Project major procurements and contracts; and (2) the review and revision of pertinent procedures. The licensee's corrective actions in regards to these items will be reviewed during subsequent NRC inspections.

L. 1982

Fourteen inspection reports have been issued during 1982 covering the period through June 30, 1982 of which two pertain to management meetings, one to an investigation, one to the SALP meeting, and ten to onsite inspections. During this period of time seven items of noncompliance were identified. One significant construction problem was identified involving electrical cable misinstallations (see Paragraph 2). These items/problems are discussed below:

1. The licensee conducted reinspections to determine the seriousness of the safety related support and restraint installation and QC inspection deficiencies identified in Inspection Report Nos. 50-329/81-12 and 50-330/81-12. The results of the reinspections are documented in Inspection Report Nos. 50-329/82-07 and 50-330/82-07. From a sample size of 123 safety related supports and restraints installed and inspected by Quality Control, approximately 45% were identified by the licensee as rejectable.

On August 30, 1982, the licensee was informed of the NRC's position that the licensee shall reinspect all the supports and restraints installed prior to 1981 and perform sample reinspections of the components installed after 1981. The licensee has agreed to perform the reinspections.

2. One significant construction problem was identified during 1982. It involved electrical cable misinstallations. Details are as follows:

During the special team inspection conducted in May 1981, the NRC identified concerns in regards to the adequacy of inspections performed by electrical Quality Control inspectors. These concerns were the result of the NRC's review of numerous Nonconformance Reports (NCR) issued by Midland Project Quality Assurance Department (MPQAD) personnel during reinspections of items previously inspected and accepted by Bechtel QC inspectors. The NRC required the licensee to perform reinspections of the items previously inspected by the QC inspectors associated with the MPQAD NCRs. The licensee, in reports submitted to the NRC in May and June 1982, reported that of the 1084 electrical cables reinspected, 55 had been determined to be misrouted in one or more vias. This concern was upgraded to an item of non-compliance and is documented in Inspection Report Nos. 50-329/82-06 and 50-330/82-06.

On September 2, 1982, the licensee was informed by the NRC that a 100% reinspection of class 1E cables installed or partially installed before March 15, 1982 was required. In addition, the licensee was required to develop a sample reinspection program for those cables installed after March 15, 1982. The licensee has agreed to perform the reinspections.

3. Three examples of noncompliance to one 10 CFR 50 Appendix B Criterion were identified in Inspection Report Nos. 50-329/82-03 and 50-330/82-03. These examples regarded: (1) failure to follow procedures concerning drawing changes; (2) inadequate specification resulting in the undermining of BWST No. 2 valve pit; and (3) inadequate control of changes to procedures. The licensee's response to the identified item of noncompliance is presently under review. Corrective actions taken by the licensee in regards to this item will be reviewed during future inspections.
4. Four examples of noncompliance to one 10 CFR 50 Appendix B Criterion and a deviation were identified in Inspection Report Nos. 50-329/82-05 and 50-330/82-05. The examples of noncompliance and the deviation regarded: (1) failure to review and approve a Mergentine (the soils contractor) field procedure prior to initiation of work; (2) inadequate control of specification changes; (3) inadequate acceptance

criteria for dewatering specification; (4) inadequate instruction to prepare or implement reinspection plans; and (5) inadequately qualified remedial soils staff. The corrective actions taken by the licensee in regards to this item will be reviewed during future inspections.

5. One item of noncompliance was identified in Inspection Report Nos. 50-329/82-06 and 50-330/82-06 concerning the licensee's failure to establish a QA program to provide controls over the installation of remedial soils instrumentation. This item resulted in the issuance of a letter by the licensee on March 31, 1982 confirming the licensee's suspension of all underpinning instrumentation installation activities until: (1) approved, controlled drawings and procedures or instructions were developed to prescribe underpinning instrumentation installation activities; (2) plans were established to inspect and audit instrumentation installation activities; and (3) Region III had concurred that (1) and (2), above, were acceptable.

A followup inspection by Region III in April 1982 identified that the licensee had developed acceptable drawings, procedures, and instructions for underpinning instrumentation installations such that instrumentation installation activities could be resumed. An additional followup inspection on August 23, 1982 determined that the installation of underpinning instrumentation for the Auxiliary Building was complete and acceptable. This item will remain open pending the licensee's development of drawings, procedures, and instructions for the future installation of underpinning instrumentation for the Service Water Building.

6. One item of noncompliance and a deviation were identified in Inspection Report Nos. 50-329/82-11 and 50-330/82-11. The items regarded: (1) inadequate anchor bolt installation; and (2) the use of unapproved installation/coordination forms during remedial soils instrumentation installations. The licensee's responses to the identified items of noncompliance are presently under review. Corrective actions taken by the licensee in regards to these items will be reviewed during future inspections.

The ASLB issued an order modifying Construction Permits No. CPPR-81 and No. CPPR-82, dated April 30, 1982. This order suspended all remedial soils activities on "Q" soils for which the licensee did not have prior explicit approval. The ASLB issued another order, dated May 7, 1982 clarifying the April 30, 1982 order. This order only includes those activities bounded by the limits identified on Drawing C-45.

As a result of past Region III findings, the Region III Administrator created a special Midland Section staffed with individuals assigned solely to the Midland project. Since the formation of the Midland Section a work authorization procedure has been developed by Region III and the licensee to control work and ensure compliance to the ASLB Order.

Remedial Soils activities performed by the licensee thus far in 1982 involve: (1) the drilling of a number of wells which function as part of the temporary and permanent dewatering systems; (2) the installation of the freeze wall associated with the Auxiliary Building Underpinning activity; (3) the completion of the initial work on the access shaft; and (4) the completion of the Auxiliary Building instrumentation for remedial soils activities.



UNITED STATES  
NUCLEAR REGULATORY COMMISSION  
WASHINGTON, D. C. 20555

March 14, 1983

Docket Nos: 50-329  
and 50-330

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*midland 518*

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APPLICANT: Consumers Power Company  
FACILITY: Midland Plant, Units 1 and 2  
SUBJECT: DOCKETING OF MARCH 7, 1983, LETTER FROM  
GOVERNMENT ACCOUNTABILITY PROJECT

On March 7, 1983, Ms. Billie Garde of the Government Accountability Project (GAP), a citizens interest group, delivered to the NRC's Director of the Division of Licensing the enclosed letter consisting of GAP's comments on the "Construction Completion Plan" described in a January 10, 1983, letter from Consumers Power Company. Ms. Garde briefly summarized portions of the contents of the letter. NRC members present for Ms. Garde's summary were D. Eisenhut, R. Warnick, T. Novak, E. Adensam and D. Hood.

Ms. Garde's letter is enclosed for docketing and future reference purposes.

*Darl Hood*  
Darl S. Hood, Project Manager  
Licensing Branch No. 4  
Division of Licensing

Enclosure:  
As stated

cc: See next page

MAR 21 1983

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MIDLAND

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Mr. J. W. Cook

- 2 -

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# GOVERNMENT ACCOUNTABILITY PROJECT

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March 7, 1983

Mr. Darrell Eisenhut, Director  
Division of Licensing  
U. S. Nuclear Regulatory Commission  
Washington, D. C.

Dear Mr. Eisenhut:

On February 8, 1983, the Government Accountability Project (GAP) attended two public meetings in Midland, Michigan on behalf of the LONE TREE COUNCIL, concerned citizens, and several former and current employees working on the Midland Nuclear Power Plant, Units 1 and 2. As you know, the large public turnout for both the daytime meeting between Consumers Power and various Regional and Washington-based offices of the Nuclear Regulatory Commission (NRC) and the evening session between the NRC and the general public included spirited debate and lengthy presentations. These meetings, although highly beneficial to the education of the Michigan public about the nuclear facility being constructed in Midland, did not allow for the type of technical questions and detail about the Construction Completion Plan (CCP) in which GAP is particularly interested.

Therefore, I appreciate this opportunity to address a number of concerns that we have regarding issues presented at the public meeting and contained in the detailed CCP submissions. In order to complete our own continuing analysis of the Midland project, I would hope that you can provide answers to and/or comments on the enclosed questions.

Pending further public meetings and detailed review of basic elements of the Construction Completion Plan, I assume that your verbal requests to Consumers Power (Consumers) management to "hold off" on making any commitments will be translated into a firm NRC directive. As you know, Consumers has had a history of misinterpretations and miscommunications in relation to many of the aspects surrounding the Midland plant. The public understood quite clearly what your instructions were; if those have changed I suggest that you continue to express those changes to the public through the appropriate local media representatives.

## I. REQUESTS FOR FURTHER INFORMATION

### A. The relationship between the Washington NRC offices (NRR, DOL, etc.) and the Regional management, and on-site Midland Special Team and Inspector.

It is unclear where the authority lines for approval of various elements of the Midland construction project are drawn. GAP investigators, staff and attorneys are continually getting unclear signals from the various regulation divisions as to who is making what decisions and when. Since it has been noted by the NRC staff itself that "[Consumers] seems to possess the unique ability to search all factions of the NRC until they

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have found one that is sympathetic to their point of view - irregardless of the impact on plant integrity,<sup>1/</sup> it seems critical to establish once and for all the authority lines within the NRC that Consumers must respond to.

We are particularly concerned about the apparent transferring of responsibility for the on-site inspectors and the Midland Special Section Team to the Regional Administration and Washington-based NRC officials. Although I am sure that you have read the testimony of Mr. Keppler, submitted to the Atomic Safety and Licensing Board (ASLB) on October 29, 1983, and attached memorandum from the staff members that are more directly responsible for the Midland project, I have included them with this letter for your renewed attention following the results of the Diesel Generator Building inspection. (Attachment #1.)

There have been a number of incidents within the last several months where Regional personnel (RIII team or on-site) have indicated one answer pertaining to construction work, and then other action was taken after approval from NRR. Several examples of this that are fairly recent are:

1. A February 8, 1983 conference call between Consumers, Bechtel and the NRC regarding the discussion of loading sequence for pier load test and background settlement readings did not include any Region III personnel, most particularly Ross Landsman. Although I do not know the details of his exclusion, I am concerned that he was not a participant in the call, or in the decisionmaking process.
2. At the recent ASLB hearings NRR and RIII personnel were asked about the projected timeline for Consumers to approach the Feedwater Isolation Valve Pit jacking work. RIII personnel seemed confident that work would not begin on this until at least late March or early April, yet work actually was begun on the same day as the conversation, February 17, 1983.
3. The NRC has taken a position that "no major discrepancies" have been found in the soils remedial work to date. Yet: (a) two cracks, including one 10 millimeters by 7 inches long, have been discovered in the valve pit.<sup>2/</sup> (b) A February 15, 1983 memorandum from R. B. Landsman to R. F. Warnick identifies three specific concerns since the beginning of the underpinning work that -- to GAP -- indicate serious flaws in the perception of Consumers about the seriousness of the work they are engaged in. These include craftworkers not receiving the required amount of training, argument with Consumers about techniques that show a priority to deadlines instead of quality, and a major flaw in the Stone & Webster independent assessment. (Attachment #2.)

Given our experiences with the NRC inspection efforts, I am particularly anxious to have the on-site/special section team members have as much direct input into the review/licensing process as possible. Although I do not always agree with their decisions or their actions, I am more comfortable with their version of the facts on the Midland site.

<sup>1/</sup>Memorandum from R. J. Cook to R. F. Warnick, July 23, 1982.

<sup>2/</sup>According to the Midland Daily News, February 24, 1983, Construction Technology had performed an "independent" analysis of the cracks before the Midland team even had the opportunity to complete its own investigation or review.

B. The guidelines and timetable by which the independent third-party auditor will be chosen.

It is not at all clear what guidelines, if any, your office intends to employ in the review or monitoring of the selection process for the third-party auditor of the Midland facility. We are extremely distressed at the way that both Stone & Webster (S&W) and the TERA Corporation were approved by your office. We feel that the approval was more by default than by aggressive review of the proposals, contracts and criteria as presented to the NRR office. Further, it is very clear to us that the Regional personnel involved in the initial contact with the Stone & Webster organization gave the impression that S&W's on-site activities were authorized. Even if that impression was only technically incorrect, it is a serious breach of public trust by the Regional staff.

We recommend that your office adopt the prudent position that Consumers follow the nominating process used for Diablo Canyon's independent assessment. Although Midland's problems have not yet reached the stage of major public controversy such as Diablo or Zimmer, it is clearly evident that the sensationalism of the problems with the soils settlement and the cost of the Midland facility will move it more into the public eye as it reaches completion.

If there was any doubt as to the active interest of the Midland community in regards to the Midland facility, the February 8, 1983 public meeting should have dispelled that misconception. The community surrounding the plant is extremely attentive to the issues and concerns raised by the nuclear facility -- the debate will continue. To choose another, more congenial approach to identifying the firm that will be responsible for the completion of the plant would be a grave mistake in our opinion.

C. The plans that the NRC staff has made to determine the actual "as built" condition of the rest of the buildings and systems on the Midland site in the wake of the findings in the Diesel Generator Building inspection.

The aggressive efforts of the DGB inspection were a solid step forward in determining the extent of the problems at the Midland facility. However, it is unfortunate that the inspection did not expand to other buildings. The public must have confidence that all the problems have been identified, as well as basic factors about how the problems were caused and how they are going to be fixed if there is ever any hope for restoring faith in the safety of the plant.

D. The methodologies that are to be employed in the technical review of generic problems on the site, such as determining the accuracy of quality control/quality assurance documentation made suspect by the flawed process, and the training and recertification of all the welders who were trained by Photon Testing, Inc.

The two items mentioned above, as well as problems that have resulted from the ZACK corporation, unidentifiable electrical cables, untrained quality control inspectors, material traceability inaccuracies, etc., must be addressed in any workplan to identify the problems on the site. It is not clear whether the NRC staff, the NRR staff or the independent auditor is to

be responsible for identification of all of the problems prior to the start up of construction activities on the site.

E. The resolution of what is and what is not "Q" work in regards to the soils remedial work should be handled in a public forum.

The "Q" debate between NRC staff members - including Regional management and the on-site inspectors - as well as between the NRR and NRC staff has been a topic of considerable concern to us. The resolution of these issues has critical implications for the rest of the soils work project. Because it has been a major item of discussion in the hearings currently underway in Midland, as well as among the staff, we believe that it would be beneficial for you to receive the position that concerned citizens have taken. I have suggested that those residents who have been following this issue very closely prepare a position statement for your office on the "Q" soils issue.

## II. COMMENTS CONCERNING THE THIRD-PARTY REVIEWS

It is our understanding that there are currently three separate independent audits being conducted (or considered) at the Midland facility. These are:

(1) The Stone and Webster Corporation's third party independent assessment of the soils remedial work activities. A February 24, 1983 letter from Mr. Keppler to Consumers outlines the scope of the S&W assessment. It significantly broadens the original scope of S&W's review. As a result of the expansion of S&W's responsibilities, and apparently a close monitoring of their work by the RIII team, Mr. Keppler approved the release of additional underpinning work for construction. We request the following documents in reference to the S&W approval:

- a. The criteria that NRC officials used to judge the adequacy of the initial S&W work.
- b. The methodologies which the S&W personnel are utilizing to provide their QA overview and assessment of the design packages, inspector requalification and certification program, and training programs.
- c. The details of the expanded work contract which will assess the actual underpinning work on safety-related structures.

(2) The Independent Design Verification and vertical slice review being performed by the TERA Corporation. We have recently received the detailed Engineering Program Plan from TERA on the Midland Project. Although extremely impressed with some of TERA's procedures, organization and structure there are a number of areas which raise serious questions.

- a. What specific reporting procedures does TERA have to follow in regards to findings, corrective action reports, controversies among their own staff over issues of noncompliance or questionable accuracy, and internal reporting. Figure 1-1 clearly indicates that

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TERA intends to notify the NRC at the same time as Consumers, but at the February 8 meeting there was a very clear example of that not actually happening because of miscommunication between TERA and the NRC.

b. What is the difference between a Corrective Action Report as referenced in the QA Audit Procedures and a Non-Conformance Report as required by 10 CFR Part 21. (A similiar "informal" nonconformance reporting procedure at the William H. Zimmer plant caused innumerable problems for both the NRC and the licensee.) We would ask that the C.A.R.'s be forwarded to the NRC, or preferably be written up as NCR's immediately upon identification of an item of non-compliance. Any discretion between informal and formal procedures should be limited to the judgement of the NRC.

c. What is the intent and scope of the "EXCEPTIONS" referred to in Part 1.1 of the plan?

d. Who controls the Administrative decision making process between Consumers and TERA over specific points of technical controversy?

e. What documents will be forwarded to the NRC in support of the various findings - whether favorable or unfavorable - during the course of the two vertical slice reviews?

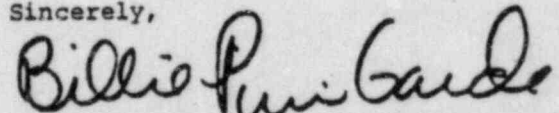
(Further comments and questions about the TERA plan will be forthcoming under separate cover when we are able to finish our review.)

(3) The overall independent third-party assessment. Instead of providing your office with our detailed ( and lengthy) analysis of the flaws and shortcomings of the CCP as introduced by Consumers in the January 10, 1983 letter and the public meeting we have decided to wait for further detail to be provided by Consumers on their plan. We are somewhat anxious about this, as we understand that there have been detailed discussions going on between the NRC and Consumers. As you know, similar events at the Zimmer plant led to increased public skepticism and an even greater loss of confidence in the NRC process.

We strongly encourage your office and the Regional Administrator to consider the process of choosing a third-party auditor as important and delicate as was the process at Zimmer. If there is to be a "closed door" approach to Midland we request that you articulate that at this time. If you do not we will assume that the NRC intends to follow a fully public process of nomination and selection.

Thank you for your time, we look forward to answers to our questions in the near future.

Sincerely,



BILLIE PIRNER GARDE  
Director, Citizens Clinic

10/29/82

UNITED STATES OF AMERICA  
NUCLEAR REGULATORY COMMISSIONBEFORE THE ATOMIC SAFETY AND LICENSING BOARD

In the Matter of

CONSUMERS POWER COMPANY

(Midland Plant, Units 1 and 2)

)  
)  
)  
)Docket Nos. 50-329 OM & OL  
50-330 OM & OLTESTIMONY OF JAMES G. KEPPLER  
WITH RESPECT TO QUALITY ASSURANCE

Q.1 Please state your name and position.

A.1 My name is James G. Keppler. I am the Regional Administrator of the NRC's Region III office. My professional qualifications have been previously submitted in this proceeding.

Q.2 Please state the purpose of your testimony.

A.2 In my testimony to the Board in July 1981, I testified on the more significant quality assurance problems that had been experienced in connection with the Midland project and the corrective actions taken by Consumers Power Company and its contractors. I stated that, while many significant quality assurance deficiencies have been identified, it was our conclusion that the problems experienced were not indicative of a breakdown in the implementation of the overall quality assurance program. I also noted that while deficiencies have occurred which should have been identified earlier, the licensee's QA program had been effective in the ultimate identification and subsequent correction of these deficiencies. Furthermore, I discussed the results of Region III's special quality

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assurance inspection of May 18-22, 1981, which reflected favorably on the effectiveness of the Midland Project Quality Assurance Department, which was implemented in August 1980. The thrust of my testimony was that I had confidence that the licensee's QA program both for the remedial soils work and for the remainder of construction would be implemented effectively.

It was not until April 1982 that I was made aware of additional problems with the effectiveness of implementation of the QA program. The problems came to my attention as a result of the April 1982 meeting between NRC and Consumers Power Company to discuss the Systematic Assessment of Licensee Performance (SALP) report for Midland and the discussions held within the Staff in preparation for that meeting. The SALP report addressed the Midland site activities for the period July 1, 1980 through June 30, 1981. During this period, the soils work activities were rated Category III, the lowest acceptable rating given by the SALP review process.

During the April 1982 public meeting on the SALP findings, Mr. Ronald J. Cook, NRC Senior Resident Inspector at Midland, stated that as of that date he would rate Consumers Power Company soils work Category III, the same rating as it received for the SALP period. He had similar comments on other work activities. Based on my July 1981 testimony, I expected Consumers Power Company would be rated a Category I or II in the soils area, as well as other areas, by April 1982, and I was certain that my July 1981 testimony had left that impression with the Board.



On the basis of the above, I decided it was appropriate to supplement my July 1981 testimony.

Q.3 What actions have been taken by Region III in response to the information contained in your previous answer?

A.3 I met with the NRC supervisors and inspectors who had been closely involved with Midland during the past year to get a better understanding of their concerns. As a result of these meetings, I concluded that the problems being experienced were ones of program implementation rather than problems with the QA program itself.

Because of my concerns, I requested the Region III Division Directors most actively involved with the Midland inspection effort to try to identify the fundamental problems and their causes and to provide me with their recommendations to resolve these problems. They provided me with an assessment of technical and communications problems experienced by the licensee and made recommendations with respect to the licensee's workload, institution of independent verification programs, and QA organization realignments. This response is included as

Attachment A. (Memorandum from Norelius and Spessard to Keppler, dated June 21, 1982)

In July 1982 I recognized that more NRC resources were going to have to be provided in overseeing activities at Midland and created the Office of Special Cases (OSC) to manage NRC field activities at Midland (and Zimmer). Mr. Robert Warnick was assigned Acting Director. A Midland Section was formed comprised of a Section Chief, two regional based

inspectors, and two resident inspectors (the second resident inspector reported onsite in August 1982).

Before meeting with representatives of the Office of Nuclear Reactor Regulation (NRR) to discuss options for NRC action in connection with Midland, Mr. Warnick requested Senior Resident Inspector Cook to provide a summary of the indicators of questionable licensee performance. Mr. Cook provided a memorandum documenting a number of problems and concerns, which is included as Attachment B. (Memorandum R. J. Cook to R. F. Warnick, dated July 23, 1982)

Mr. Warnick and I met with representatives of NRR on July 26, 1982 to discuss Consumers Power Company's performance. This meeting resulted in recommended actions concerning third party reviews of past work and ongoing work which are described in Attachment C. (Memorandum, Warnick to Files, dated August 18, 1982)

Following the meeting with NRR, Mr. Warnick discussed with members of the Midland Section positions concerning third party reviews developed at the meeting with NRR. The members of the Midland Section were not convinced the recommended actions were the best solution, since the causes of the problems had not been clearly identified. Instead, they proposed a somewhat different approach consisting of an augmented NRC inspection effort coupled with other actions to strengthen the licensee's QA/QC organization and management. This proposal is documented in Attachment D. (Memorandum, Warnick to Keppler, dated August 18, 1982)

In response to these suggestions, Mr. Darrell Eisenhut, Director, Division of Licensing, NRR, and I met with top corporate management representatives from Consumers Power Company on August 26, 1982, and

again on September 2, 1982, to discuss NRC's concerns and possible recommended solutions. Because it was not clear to the NRC staff why Consumers Power was having difficulty implementing their QA program, we requested them to develop and propose to the NRC, actions which would be implemented to improve the QA program implementation and, at the same time, provide confidence that the program was being implemented properly.

Consumers Power subsequently presented its proposal for resolution of the identified problems in two letters dated September 17, 1982, which are included as Attachments E and F. (Letters Cook to Kepler and Denton, dated September 17, 1982)

These proposals were lacking in detail, particularly with respect to the plant independent review programs. Following a meeting between NRC staff members and Consumers Power Company in Midland on September 29, 1982, Consumers Power submitted a detailed plan to NRC on October 5, 1982 concerning the planned third party activities (Attachment G). Consumers Power Company's proposals (Attachments E, F, and G) are currently under review by NRC.

Q.4 Do you believe that soils remedial work at the Midland plant should be permitted to continue?

A.4 Yes. This portion of my testimony discusses what has been accomplished and what will be accomplished in the near future to provide a basis for continued construction at the Midland plant.

We expect that Consumers Power Company will have independent third party assessments of the Midland construction project. These assessments will include reviews of safety related work in progress and of completed

work activities. The scope of, and contractors for, the third party assessments are presently under review by the NRC staff.

Along with the independent third party reviews, the Office of Special Cases, Midland Section, has expanded its inspection effort and has taken actions to assure compliance with the Licensing Board's April 30, 1982 requirement that the remedial soils work activities receive prior staff approval. Specifically, the Midland Section has (1) established a procedure for staff authorization of work activities proposed by Consumers Power Company (Attachment H, Work Authorization Procedure, dated August 12, 1982), and (2) has caused a stop of the remedial soils work on two occasions once in August 1982 and again in September 1982 (Attachments I and J, Confirmatory Action Letters dated August 12, 1982, and September 24, 1982, respectively). The Section has also started an inspection of the work activities which have been accomplished by Consumers Power Company in the last twelve months in the diesel generator building, the service water building and other safety related areas. This inspection was started during October 1982 and is continuing as of the filing date of this testimony.

Based upon (1) the third party assessments of the plant which will be performed, (2) the increased NRC inspection effort, and (3) the work authorization controls by the NRC, I believe that soils remedial work at the Midland plant may continue. As demonstrated by the previous stop-work effected in the remedial soils area, the staff will take whatever action is necessary to assure that construction is in accordance with applicable requirements and standards.



UNITED STATES  
NUCLEAR REGULATORY COMMISSION  
REGION III  
799 ROOSEVELT ROAD  
GLEN ELLYN, ILLINOIS 60137

Attachment A

(K-1)

June 21, 1982

MEMORANDUM FOR: James G. Keppler, Regional Administrator

FROM: C. E. Norelius, Director, Division of Engineering  
and Technical Programs  
R. L. Spessard, Director, Division of Project and  
Resident Programs

SUBJECT: SUGGESTED CHANGES FOR THE MIDLAND PROJECT

Historically, the Midland Project has had periods of questionable quality assurance as related to construction activities and has had commensurate regulatory attention in the form of special inspections, special meetings, and orders. These problems have been given higher public visibility than most other construction sites in Region III. As questions arise regarding the adequacy of construction or the assurance of adequate construction, we are faced with determining what regulatory action we should take. We are again faced with such a situation.

Current Problem

The current problem was caused by a major breakdown in the adequacy of soils work during the late 1970's. Because of the increased regulatory attention given the site, we expect that exceptional attention would be given to this activity and that licensee performance would be better than other sites or areas which have not had such significant problems and therefore have not attracted this level of regulatory attention. However, that does not appear to be the case and Midland seems to continually have more than its share of regulatory problems. The following are some of the specific items which are troublesome to the staff.

Technical Issues

1. In the remedial soils area, the licensee has conducted safety related activities in an inadequate manner in several instances - removal of dirt around safety related structures, pulling of electrical cable, drilling into safety related utilities.

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2. In the electrical area, in trying to resolve a problem of the adequacy of selected QC inspectors' work conducted in 1980, the licensee completed only part of the reinspection even when problems were identified, and appears inclined to accept that 5% of electrical cables may be misrouted (their characterization of "misrouting" may imply greater significance than we would attach to similar findings).
3. In the pipe support area, in trying to resolve a problem of the adequacy of QC inspections conducted in 1980, the licensee has portrayed only a small percentage of defects of "characteristics" identified and has not addressed the findings in terms of a large percentage of snubbers which may be defective because of the characteristics within each snubber that may be defective (e.g., if only one characteristic was defective out of 50 reviewed on a single hanger, the percentage is small; but if the one defective characteristic makes the hanger defective the result would have a much greater significance level). The licensee had done a detailed statistical analysis in an attempt to show that the small percentage of characteristics were found rather than broadly approaching the problem with significant reinspections to determine whether or not construction was adequate.

#### Communications

Multiple misunderstandings, meetings, discussions, and communications seem to result in dealing with the Midland Project. Some examples are:

1. NRC staff attending a meeting in Washington on March 10, 1982, heard the Consumers Power Company staff say that electrical cable pulling related to soils remedial work was completed. It was determined to be ongoing the next day at the site.
2. When Region III attempted to issue a Confirmatory Action Letter, J. Cook informed W. Little of his understanding that both J. Kappler and H. Denton had agreed that the subject of the CAL was not a safety related item subject to NRC regulatory jurisdiction. Such agreements had not in fact occurred and following a meeting, Consumers Power Company issued their commitments in a letter to Region III.
3. In reviewing a licensee May 10, 1982 letter, responding to the Board Order, the NRR staff had an unsigned letter and Region III had a signed copy both dated the same date but differing in content.
4. Recently a Region III inspector in closing out and exiting from his inspection described the exit meeting as being the most hostile he had ever participated in.

5. The responses to any Region III enforcement letters issued to Midland are more lengthy and <sup>are</sup> argumentative than are any other responses from any other licensee in Region III. This point was made in the SALP response provided by Midland, and the SALP response in itself from Midland is an example of the type of response which we commonly receive from the site. The length of the response is at least as long as the initial SALP report.
6. Multiple requests for briefing meetings and other statements by the utility to the effect that we should review procedures in developmental stages imply that Midland wants the NRC to be a part of their construction program rather than having us perform our normal regulatory function.

#### Staff Observations

1. With regard to corrective actions of identified noncompliances, the Midland response seems to lean towards doing a partial job and then writing up a detailed study to explain why what they have done is sufficient rather than doing a more complete job and assuring 100% corrective action has occurred. In the detailed writeups that are prepared, it is the staff's view that the licensee does not always represent the significance properly, and the analyses and studies often raise more questions than they solve; thus time appears to have been wasted in writing an analysis rather than in fixing the problem.
2. Midland site appears to be overly conscious with regard to whether or not something is an item of noncompliance and spends a lot of effort on defending whether or not something should be noncompliance as opposed to focussing on the issue being identified and taking corrective action. This appears in part to be due to their sensitivity of what appears in the public record as official items of noncompliance. This sensitivity may have resulted from the extended public visibility which has attended construction of the facility. The staff's view is that the Midland site would look better from the public standpoint and be more defensible from NRC's standpoint, if they concentrated on fixing identified problems rather than arguing as to the validity of citations. This type of view was expressed by the utility during a recent effort to clarify in detail that certain construction items on the soils remedial work should not be subject to NRC's regulatory action.
3. The Midland project is one of the most complex and complicated ever undertaken within Region III. The reason is that they are building two units of the site simultaneously and additionally have an underpinning construction effort which in itself is probably the equivalent of building a third reactor site. The massive construction effort and the various stages of construction activity which are involved make the site extremely complicated to manage. This activity appears to cause a lot of pressure on the licensee management.

4. Mr. J. Cook, the Vice President responsible for the Midland site is an extremely capable and dynamic individual. However, these characteristics in conjunction with the complexity and immenseness of operation as set forth in 3, above, may actually be contributing to some of the confusion which seems to exist. The staff views that (1) he is too much involved in detail of plant operations and there are times when the working level staff appears to agree and be ready to take action where Mr. Cook may argue details as to the necessity for such action or may argue as to the specific meaning of detailed work procedures, (2) this kind of push may lead to such things as letters both signed and unsigned appearing in NRR and causing confusion, (3) this push may lead to some animosity at the licensee's staff level if NRC activities are looked on as slowing progress of construction at the site.

#### Recommendations

It appears essential that some action be taken by NRC to improve the regulatory performance of the Midland facility. The following specific suggestions are made.

1. The company must be made aware and have emphasized to them again that their focus should be on correcting identified problems in a complete and timely manner.
2. We should question whether or not it is possible to adequately manage a construction program which is as complex and diverse as that which currently exists at Midland. We would suggest specifically that the following activities be considered:
  - a. That the licensee cut back work and dedicate their efforts to getting one of the units on line in conjunction with doing the soils remedial work.
  - b. That they have a separate management group all the way to a possible new Vice President level, one of which would manage the construction of the reactor to get it operational and the second to look solely after the remedial soils and underpinning activities.
3. Consumers Power Company should develop a design and construction verification program by an independent contractor. This would provide an important additional measure of credibility to the design and construction adequacy of the Midland facility.



James G. Keppler

- 5 -

6/2/1/82

We would be happy to discuss this with you.

*C. E. Norelius*

C. E. Norelius, Director  
Division of Engineering and  
Technical Programs

*R. L. Spessard*

R. L. Spessard, Director  
Division of Project and  
Resident Programs



UNITED STATES  
NUCLEAR REGULATORY COMMISSION  
REGION III  
799 ROOSEVELT ROAD  
GLEN ELLYN, ILLINOIS 60137

Attachment B

(K-2)

July 23, 1982

MEMORANDUM FOR: R. F. Warnick, Director, Enforcement and Investigations Staff  
FROM: R. J. Cook, Senior Resident Inspector, Midland Site  
SUBJECT: INDICATORS OF QUESTIONABLE LICENSEE PERFORMANCE - MIDLAND SITE

As per our conversation of July 21, 1982, the following is a list of those items that various inspectors consider to be indicative of questionable licensee performance:

1. One of the leading items is the over-inspection performed on electrical QC inspectors which was done in response to NRC concerns identified in the May 1981 team inspection. The licensee found weaknesses in the inspections performed by some electrical QC inspectors pertaining to not identifying the mis-routing of cables. This item culminated in an item of noncompliance. The licensee did not expand the overview activity to a degree necessary for an acceptable resolution to the identified weakness - even after a meeting in RIII. This item has not been resolved to the satisfaction of the NRC although our position has been clearly defined.

As a partial response to the team inspection concern, the licensee presented the NRC with an audit report which would demonstrate a response to our concern of questionable electrical QC inspections. However, the audit report stated that it (the audit report) did not address the NRC concerns.

2. During the dialogue for the underpinning and remedial soils work, a large amount of emphasis has been placed on the settling data for the structures involved. During a meeting in HQ on March 10, 1982, the need for QC requirements on remedial soils instrumentation were explicitly delineated. However, one week later, the NRC inspectors found soils work instrumentation installation was started the day after the March 10, 1982 meeting without a QC/QA umbrella; that the licensee's QA Auditor and QA Engineering personnel were not approached pertaining to the need for QA coverage for this soils settlement instrumentation; that there were strong indications that the licensee had misled the NRC in relating that the work was essentially complete when indeed it was not; and presently, the licensee management informs our inspector that items are ready for his review when in actuality they are not. Our conversations with licensee personnel - other than management - confirm that the items are not ready for review.

NOS 11/4/82

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3. Historically, one of the NRC questions has been, "Who is running the job - Bechtel or Consumers?" The following example would allow one to believe it is Bechtel: As a part of the resolution to our findings in the soils settlement instrumentation installation, the NRC insisted that the licensee generate a Coordination/Installation Form to cover interface between different evolutions of instrumentation installation. The licensee would call our inspector for his concurrence on the adequacy of the form - the inspector would approve Consumers Power Company's form, but then would find out that Bechtel did not want to work to Consumer's form - the form that was generated to resolve regulatory concerns. This event has occurred twice and was considered as a deviation during a more recent inspection. The opinion of the staff is that if Consumers generates a form that will aid them in not incurring regulatory difficulty, and which has had NRC input, the licensee should demand that the contractor comply with these policies instead of the contractor dictating the regulatory environment under which they will work.
4. Deficiencies in material storage conditions has continually been a concern to the NRC and has resulted in items of noncompliance. To the inspectors, the ability to maintain quality storage is indicative of how rigorous or slipshod the constructor's attitude is towards construction. The licensee has attempted to entice the constructor to do better in maintaining the material storage conditions, but still the licensee's auditors and the NRC have negative findings in material storage conditions and negative discussions with the contractor about the validity of the finding.
5. At periodic intervals, the support of cables, particularly in the control room area, which are awaiting further routing or termination, has met with the disapproval of the NRC inspectors. These discrepancies also include cables without covered ends being on the floor in walk areas that are in a partially installed status. This is also another indicator of slipshod workmanship which has been brought to the constructor's attention at various times, but was last noted during a recent inspection.
6. In the area of instrumentation impulse line installation and marking, the licensee has had separability violations which has required removal of all installed impulse lines. Also, the NRC, because of this and significant adverse operational conditions, insisted that the installed impulse lines be identified. Although the licensee plans to mark the impulse lines, there was an inordinate amount of resistance to marking the lines - even though there had been instances of mis-matched channels because of identification confusion.

7. An example of reluctance in placing the responsibility for quality workmanship at the foreman and/or worker level has recently been identified. The NRC inspectors noted that some drop-in anchors were improperly installed and obviously did not adhere to the installation procedures. The licensee's attitude indicated this was not a valid finding because QC had not inspected the item. The NRC inspectors treat this as indicative that slipshod workmanship is tolerated in the hopes that QC will find the mistakes.
8. Late in 1981, the licensee decided to move the QA Site Superintendent into another position and cover this site function by sharing the site time between the QA Director and the QA Manager. After a January 1982 meeting with the NRC at RIII, the licensee opted to fill the QA Superintendent spot with another person. In the spring of the year, the NRC inspectors were following up on welding allegations and approached the QA Superintendent. The QA Superintendent was familiar with the alleged poor welding and had established what the NRC inspectors determined to be a responsive plan to resolve the questionable QC welding inspections. At the Exit Interview, the QA Director did not appear to back the QA Site Superintendent's proposed plan which had tacit NRC approval. The NRC inspector classified in writing and with just cause that the Exit Interview was the most hostile exit interview he had ever encountered.
9. During a recent inspection, it was noted by the NRC-inspector that fill dirt was piled and being covered with a mud mat at a nominal 1:14 horizontal to vertical slope when the specification called for a 14:1 horizontal to vertical slope. A constructor Field Engineer witnessed the wrong slope being installed and justified and defended the slope after being informed of the specification requirement. This is another example of the constructor having an attitude which precludes quality workmanship.
10. At different times, NRC inspectors have experienced difficulty in getting information which is controlled by the contractor, such as supporting calculations and qualifying information to justify a given installation. A recent example is: the NRC inspector informed the licensee and the contractor he wanted to see resumes of persons involved in the remedial soils work. There is an obligation to the NRC to supply a precise number of "qualified" persons on the soils work. The inspector was informed he could not get these records as they were personal. The inspector ultimately did get the information after bringing it to the attention of licensee upper management. However, this indicates an implied unwillingness of the constructor to share information with the NRC and sometimes with the licensee.

11. The licensee oftentimes does not demonstrate a "heads up" approach to their activities. The following are examples of the licensee operating in an environment using tunnel vision - "blinders".

- a) During a recent NRC inspection, the inspector challenged the ability to maintain the proper mix ratio on high pressure grout. This was done after the inspector noted that the operator could never maintain the proper mix ratio without continual manual control - which was not available when the grout is applied. The licensee's apathetic attitude did not allow them to stop the grout application until the next day when this became an issue at the exit interview.
- b) At one point in time, the company doing drilling on site for the remedial soils work cut into a safety related duct bank between the diesel generator building and the service water building. The Consumers Power Site Manager's Office (the production people) stopped work because - from a quality standpoint conditions were so deplorable. However, the Site Manager's Office did not have responsibility in this area - the Midland Project QA Department had this responsibility and did not invoke their authority to prevent the drilling work from getting out of control - or to bring it back into control.
- c) The NRC inspector recently witnessed the licensee setting up to drill a well hole in safety related dirt using a technique which was not authorized. If the inspector had not brought this to the licensee's attention, the licensee would have violated an Order addressing remedial soils work and also the Construction Permit. When the licensee was queried as to the availability of the QC/QA personnel who would prevent such activity from happening, the NRC inspector was informed that this was (another) misunderstanding.

The NRC inspectors have been informed by our contacts on site that there are memoes written to the effect that "peripheral vision" should be curtailed and communication with the NRC stifled. The NRC has not read these memoes yet - but plans to in the near future, provided they really exist and infer what we have been informed.

12. The licensee seems to possess the unique ability to search all factions of the NRC until they have found one that is sympathetic to their point of view - irregardless of the impact on plant integrity. Some examples of this are:

- a) The NRC soils inspector informs the licensee that soils stabilization grout comes under the Q program. The licensee is not particularly happy with this position. Unknown to the inspector, the licensee argues his point with NRR to have the grout non-Q - using only those arguments which support his (the licensee's) position. The licensee

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what*

has the advantage of the NRC inspector's technical and regulatory basis for supporting his (the inspector's) position, and therefore avoids mention of this during the discussions with NRR. However, the licensee's QA program, which has already been approved by NRR, states that all the remedial soils work is Q unless RIII approves a relaxation on a case by case basis. It appears the licensee does not wish to acknowledge the prior agreements with the NRC.

- b) Since the failure of auxiliary feedwater headers in B&W steam generators, discussions have transpired between the NRC inspectors and the site personnel. These discussions have indicated that the licensee was maintaining a conservative approach and were entertaining the concerns expressed by the NRC which were stimulated primarily by gross mistakes in attempting the modification at operating B&W plants. The licensee's corporate personnel were annoyed that the NRC inspectors would not give approval to start the modification until all the preparatory work had been accomplished as this would tend to impact the schedule and the modification to the steam generators could become a scheduling nuisance. The licensee corporate personnel contacted the NRC inspectors involved to "reason with them". However, the corporate personnel, (including a representative from B&W) were unable to answer the concerns of the NRC inspectors but did mention that the NRR Operational Project Manager indicated that it was alright to proceed with the modification. The licensee corporate personnel could not state what the position of the NRR Construction Project Manager was on this issue - only that they had found some form of approval from someone in the NRC.
- c) At times, when Immediate Action Letters or other forms of escalated enforcement become imminent, the licensee attempts to "appeal" their case with individuals in the regional management who are removed from the particulars of the tentative enforcement action. The licensee attempts to get these persons to agree to specific portions of the issue which would indicate that the licensee is "really not all that bad". However, the "real" issues, as identified by the NRC inspectors are being masked.
- d) During inspections of the remedial soils work, the NRC inspector has been informed by the licensee that certain findings and areas of inspection were not within the purview of his (the inspector's) inspection program because they were in essence considered non-Q and that by virtue of prior agreement with the Regional Administrator were excluded from enforcement action. However, the NRC inspectors would subsequently find that there was no such agreement between the Regional Administrator and the licensee - only a philosophical discussion as to what, in general terms, constituted an item of noncompliance.

The above indicators support the reputation the licensee has for being argumentative. Their apparent inability to accept an NRC position without diligently searching to find a "softened" position results in numerous hours of frustrated conversations between all parties involved to resubstantiate (usually the original position) a position based on technical and regulatory prudence.

13. The licensee has been classified publicly by the NRC as being argumentative. The licensee continues to exhibit this trend, as evidenced by the following examples:
  - a) Essentially every item of noncompliance receives an argumentative answer which addresses only the specificity of the item of noncompliance and selectively avoids any concept which would support the essence for the item of noncompliance. For example - in the instance of the improperly installed drop-in anchor mentioned above, it was the fact that QC had not inspected the installation of the bolt which was important to the licensee. However, the real enforcement issue was that components were being improperly installed.
  - b) The Cycle II SALP made critical evaluations of the licensee's performance in several areas. The licensee's response to this SALP report was argumentative over specific details and did not seem to acknowledge that the consensus of opinion of the NRC inspection staff was that there were areas where the licensee's performance was weak. The licensee's argumentative position is in the form of "we really are not all that bad" when the records, findings and observations of the NRC inspectors support just the opposite position.
  - c) The "Q-ness" of the remedial soils work has continually been an argumentative topic of discussion which ultimately resulted in a HQ meeting on March 10, 1982. At this meeting, the "Q-ness" of the remedial soils work was specified and later documented with the meeting minutes. However, the licensee did not wish to abide by this position and a subsequent meeting was held in RIII to further clarify the NRC position. Still, the topic of "Q-ness" is being argued by the licensee, even though the ASLE has issued an Order further defining the "Q-ness" of the soils work. It might be noted that a hearing is in process over this soils issue and the NRC's position on "Q-ness" has been expressed during these testimonies.
14. During a recent episode, the licensee wanted to continue excavation of soils in proximity to the Feedwater Isolation Valve Pit (FIVP). However, the licensee wanted to perform this evolution without determining that the temporary supports of the FIVP were adequate. Making this determination would have an impact on scheduling, as stated by the licensee. The FIVP supports were installed without a Q umbrella and subsequent inspections did reveal several discrepancies in the installation of the support structure.

15. During the limited remedial soils work which has transpired, the licensee has managed to penetrate Q-electrical duct banks, a condenser header drain line, an abandoned sewer line, a non-Q electrical duct bank and a 72-inch circulating water line. All of these occurrences have happened because of a lack of control and attention to details. Whenever approached by the NRC as to the adequacy of review prior to attempting to drill, the NRC receives responses which strongly suggest that the time was not taken to perform these reviews - perhaps taking this time would impact on the schedule.
16. By virtue of an earlier ALAB Order, the licensee is required to perform trend analyses for nonconforming conditions. These trend analyses have, in the past, masked the data such that obvious trends are not obvious and has resulted in negative findings by the NRC. This was addressed in one of the earlier SALP meetings. Recently, while performing a review of hanger welding data, the NRC inspector found that the statistical data had been diluted to the point that the number of unsatisfactory hangers could not be determined from the trend analyses or the type and degree of non-conforming conditions which were being identified pertinent to the hanger fabrication.
17. The licensee continually would use the NRC staff as consultants and classifies a regulatory and enforcement position as counter productive. This is reflected by the licensee not wishing to perform Q-work without obtaining NRC prior approval and then addressing only those areas where the NRC has voiced a regulatory concern - provided it is convenient to the licensee. This attitude has particularly prevailed in the remedial soils issue and to a lesser degree in the electrical installation areas. The preferred NRC inspector mode would be for the licensee to generate his program to establish quality and then the NRC would approve or disapprove. However, the licensee requires consultation with the NRC to establish his level of quality requirements.

The above is not intended to be a complete list of all discrepancies which indicate questionable licensee performance as this would require a more extensive review of the records and inspection personnel involved than time permits. Also, there has been no attempt to systematically document the enforcement and unresolved items list as these are contained in other information sources. However, the listing is rather comprehensive of the types of situations and attitudes which prevail at the Midland Site as observed by the NRC inspector staff.

When considering the above listing of questionable licensee performance attributes, the most damning concept is the fact that the NRC inspection effort at Midland has been purely reactive in nature for approximately the last year, and that these indicators are what have been observed in approximately the last six months. If



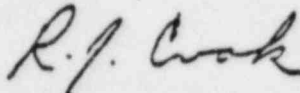
R. F. Warnick

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July 23, 1982

these are the types of items that have become an NRC nuisance under a reactive inspection program, one can only wonder at what would be disclosed under a rigorous routine inspection and audit program.

Sincerely,



R. J. Cook  
Senior Resident Inspector  
Midland Site Resident Office

cc: W. D. Shafer  
D. C. Boyd  
R. N. Gardner  
R. B. Landsman  
B. L. Burgess



UNITED STATES  
NUCLEAR REGULATORY COMMISSION  
REGION III  
799 ROOSEVELT ROAD  
GLEN ELLYN, ILLINOIS 60137

Enclosure 3

Attachment C  
(K-3)

August 18, 1982

MEMORANDUM FOR: Region III Files  
FROM: Robert F. Warnick, Acting Director, Office of Special Cases  
SUBJECT: MEETING BETWEEN NRR AND REGION III RE CONSUMERS POWER COMPANY  
PERFORMANCE AT MIDLAND (DN 50-329; 50-330)

On July 26, 1982, R. F. Warnick and James G. Kappler met with E. G. Case, D. G. Eisenhut, R. H. Vollmer, R. G. Tedesco, T. H. Novak, W. D. Paton, and J. Rutberg to discuss the performance of Consumers Power Company at the Midland site.

During the meeting reference was made to information contained in two memos from the RIII staff. The first memo dated June 21, 1982 is from C. E. Norelius and R. L. Spessard and concerns suggested changes for the Midland Project. The second memo dated July 23, 1982 is from R. J. Cook and concerns the licensee's performance at Midland. Copies of the memos are attached.

The meeting resulted in the following recommendations:

- (1) Region III should obtain the results of the recent audit by KMC.
- (2) Schedule a public meeting between NRC and CPC management in Midland, Michigan, to obtain licensee commitment to accomplish (3) and (4) below.
- (3) The licensee should obtain an independent design review. (A vertical slice from design thru completion of construction.)
- (4) The licensee should obtain an independent third party to continuously monitor the site QA implementation and provide periodic reports to the NRC. Region III is to provide a suggested outline for the continuous monitoring function.

*Robert F. Warnick*  
Robert F. Warnick, Acting Director  
Office of Special Cases

Attachments: As stated

cc w/attachments: Meeting  
participants

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August 18, 1982

Attachment D  
(K-4)

MEMORANDUM FOR: James G. Keppler, Regional Administrator

FROM: Robert F. Warnick, Acting Director, Office of Special Cases

SUBJECT: CONSUMERS POWER-MIDLAND (DN 50-329; 50-330)

When you created the Office of Special Cases and a special Midland Section staffed with individuals assigned solely to that project, you indicated your concern with the Midland Project. You did this in spite of the favorable findings of the special team inspection conducted in May, 1981, and the favorable testimony you gave before the Atomic Safety and Licensing Board on July 13, 1981. You indicated your concern was based on the Systematic Assessment of Licensee Performance (SALP) report for the period July 1, 1980 to June 30, 1981, the inspection findings since those dates, and the memo of June 21, 1982, by C. E. Norelius and R. L. Spessard suggesting certain changes be made at the Midland Project (copy attached as Enclosure 1).

At my request R. J. Cook prepared a summary of indicators of questionable license performance at Midland. A copy of Cook's memo dated July 23, 1982 is attached as Enclosure 2.

Because of your expressed concerns, you and I met with representatives from NRR on July 26, 1982 to discuss Midland and Consumers Power Company (CPCo) performance. That meeting also resulted in recommended actions. A summary of the meeting is attached as Enclosure 3.

Following the meeting with NRR, I discussed the recommendations of that meeting with our Senior Resident Inspector, other members of the new Midland Section, and former Section and Branch Chiefs who are intimately familiar with Midland.

Later that week (July 30) I spent a day at the Midland site. I attended the exit meeting following Landsman's and Gardner's inspection, met with CPCo and Bechtel management to get acquainted with them, and toured the plant site.

On July 31, 1982, I expressed my opposition to the recommendations we had come up with in the NRR meeting. My opposition was based on (1) opinions expressed by the Senior Resident Inspector, a Region III Branch Chief formerly responsible for the NRC inspection of Midland, and a Construction Section Chief who has been intimately associated with inspections of Midland regarding the proposed actions; (2) my visit to the site; and (3) the inability of Region III to articulate the problem(s) at Midland which the above referenced recommendations were supposed to solve. I indicated that we needed to better identify our concerns and the prescribe actions that would resolve these concerns.

OFFICE	RIII	RIII	RIII	RIII			
SURNAME	Gardner	Landsman	Shaffer	Warnick			
DATE	8/18/82	8/18/82	8/18/82	8/18/82			

On August 3, 1982, members of the Midland Section met with you to discuss my opposition to the recommendations coming from the meeting with NPR. The pros and cons of the recommendations together with other alternatives were discussed. The meeting concluded with you agreeing to give the Section until August 11 to determine a better proposed course of action to resolve NRC concerns about Midland.

To this end the Midland Section met together on August 4 and again on August 5 following our public meeting with CFCo on the SALP II report. Several alternatives were discussed including stopping all work on one unit, have an independent third party monitor all past and current construction work, stopping work in selected areas, performing a construction appraisal team inspection, placing all site QC work under CFCo, and establishing an augmented NRC inspection effort.

Although some members of the Midland Section thought that stronger actions should be taken, all members of the Section agreed they could support an augmented NRC inspection effort coupled with other actions to strengthen the licensee's QC/QA organization and management. These recommended actions are attached as Enclosure 4.

It is recommended the proposed actions to improve the licensee's performance be discussed with NRR and then the licensee.

Robert F. Warnick, Acting Director  
Office of Special Cases

Attachments: As stated

OFFICE ▶							
SURNAME ▶							
DATE ▶							



UNITED STATES  
 NUCLEAR REGULATORY COMMISSION  
 REGION III  
 799 ROOSEVELT ROAD  
 GLEN ELLYN, ILLINOIS 60137

FEB 24 1983

Docket No. 50-329  
 Docket No. 50-330

Consumers Power Company  
 ATTN: Mr. James W. Cook  
 Vice President  
 Midland Project  
 1945 West Parnall Road  
 Jackson, MI 49201

Gentlemen:

We have reviewed your proposal to have the Stone and Webster Corporation (S&W) perform the third party independent assessment of the soils remedial work activities.

The staff has received sworn statements from the S&W Corporation and from the key S&W personnel (Attachments A and B respectively) attesting to corporate and individual independence.

The staff has also reviewed a letter, J. E. Brunner to W. D. Paton, dated November 15, 1982 (Attachment C) which describes the contracts undertaken by S&W for the Consumers Power Company and indicates that S&W or its subsidiaries have no holdings of Consumers Power Company stocks. The attachments to this letter have been subsequently notarized.

The staff has considered the qualifications of both the S&W organization and the individuals proposed as team members to conduct the independent review of Consumers Power Company's management of the Midland soil project. Inputs to this review included the information supplied in the above submittals, the staff's existing knowledge of S&W performance at other nuclear power plants and information as to S&W personnel competence.

Our evaluation of these documents revealed that the competence and independence criteria have been met as set forth in Chairman Palladino's letter to Congressmen Ottinger and Dingell of February 1, 1982.

Based on our reviews we have determined that the S&W Corporation is an acceptable organization to perform the third party assessment of the soils remedial work; however, the scope of the S&W assessment should be broadened to include the following:

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Consumers Power Company

- 2 -

- (1) Provide a QA overview and assessment of the design work packages to ensure accuracy and adequacy.
- (2) Provide a QA overview and assessment of the QC inspector requalification and certification program.
- (3) Provide a QA overview and assessment of the training conducted for all personnel in the soils remedial work effort.
- (4) Expand the work contract to include an assessment of all underpinning work on safety-related structures on which underpinning work is done while your contract with Stone and Webster is in effect.

In addition, the Midland Section has reviewed Consumers Power Company's performance regarding the installation of Piers W12 and E12 and has concluded that no major discrepancies were identified during this work (Memorandum, R. Landsman to R. F. Warnick, dated 2/15/83, Attachment D).

Stone and Webster in their letter dated February 14, 1983 (Attachment E) also indicated that no major performance problems have been identified. They have stated that in their opinion additional underpinning work could be released for construction.

Based on the inclusion of the previously described contract changes, your performance record regarding Piers W12 and E12, and the acceptability of the Stone and Webster Corporation as the third party independent reviewer, we conclude that underpinning activities of safety-related structures may proceed. Please submit documentation of the expansion of the third party assessment to include the four areas identified above. The work activities will be authorized in accordance with the approved NRC/CPCo Work Authorization Procedure.

Should you have any questions regarding this letter please contact Mr. R. F. Warnick of my staff.

Sincerely,

Original signed by  
A. Bert Davis

James G. Keppler  
Regional Administrator

Enclosures: As stated

cc w/encl:  
See attached distribution list

OFFICE	RIII						
SURNAME	Shades	Warnick	Lewis	Davis	Keppler	Eisenhut	E. Adensam
DATE	2/22/83		2/22	2/22	2/22/83		2/23/83

*concurrent by telephone*

cc w/encl:

DMB/Document Control Desk (RIDS)

Resident Inspector, RIII

The Honorable Charles Bechhoefer, ASLB

The Honorable Jerry Harbour, ASLB

The Honorable Frederick P. Cowan, ASLB

The Honorable Ralph S. Decker, ASLB

William Paton, ELD

Michael Miller

Ronald Callen, Michigan

Public Service Commission

Myron M. Cherry

Barbara Stamiris

Mary Sinclair

Wendell Marshall

Colonel Steve J. Gadler (P. E.)

February 15, 1983

MEMORANDUM FOR: R. F. Warnick, Director, Office of Special Cases  
 THRU: W. D. Shafer, Chief, Midland Section  
 FROM: R. B. Landsman, Reactor Inspector, Midland Section  
 SUBJECT: LICENSEE PERFORMANCE ON PIERS 12E and 12W

RIII on December 9, 1982, authorized CPCo to initiate work activities pertaining to the drift, excavation and installation of Piers 12E and 12W. Subsequent to that authorization the licensee began work on December 13, 1982. Due to the Diesel Generator Building Inspection I have had only enough time to perform five inspections to determine the acceptability of the licensee's work in regards to these piers including removal of fill concrete, shaft excavation and bracing, bell excavation and bracing, and reinforcing details and proposed concreting activities.

I have identified three concerns since underpinning work began which have been subsequently corrected or are in the process of being corrected by the licensee. They are:

- a) That the craftworkers were not receiving the required amount of specialized remedial soils underpinning training. The licensee has agreed to expand the scope of craft training, but does not have the details worked out to date.
- b) That the licensee wanted to use a super plasticizer as an additive to the concrete mix in lieu of good concreting practices, i.e., consolidation by vibration. The licensee after what I consider to be excessive discussions finally agreed to vibrate all underpinning concrete in accordance with good engineering practices.
- c) That the third party independent assessment team is not reviewing the design documents for technical adequacy. They are only doing implementation review to assure that the design documents are being followed. From discussions with Stone and Webster personnel, it was determined that this important parameter was not included in their contract. The licensee is presently considering including this in the contract documents.

Besides these three concerns no other issues or deviations from regulatory requirements have been identified.

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OFFICE	RIII	R. B. Landsman			
SURNAME	Landsman	Reactor Inspector			



# STONE & WEBSTER MICHIGAN, INC.

P.O. BOX 2325, BOSTON, MASSACHUSETTS 02107



PRINCIPAL STAFF		
NO.	NAME	POSITION
1	W. J. Keppler	Administrator
2	W. J. Keppler	Administrator
3	W. J. Keppler	Administrator
4	W. J. Keppler	Administrator
5	W. J. Keppler	Administrator
6	W. J. Keppler	Administrator
7	W. J. Keppler	Administrator
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17	W. J. Keppler	Administrator
18	W. J. Keppler	Administrator
19	W. J. Keppler	Administrator
20	W. J. Keppler	Administrator

February 14, 1983  
 J.O. NO. 14358  
 MPS-8

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

**RE: DOCKET NO. 50-329/330  
 MIDLAND PLANT - UNITS 1 AND 2  
 INDEPENDENT ASSESSMENT OF AUXILIARY BUILDING UNDERPINNING  
 ASSESSMENT OF WORK ON PIERS W12 AND E12**

As of February 11, 1983 the Stone & Webster - Parsons Brinckerhoff Assessment Team has observed the excavation, placing of reinforcement, and concreting of underpinning pier W12, and the excavation, and placing of reinforcement for underpinning pier E12. In addition, the Assessment Team has reviewed the drawings, procedures and other documents pertaining to the underpinning work and has observed the performance of the Quality Assurance and Quality Control Organizations during the progress of the work.

During the period that the Assessment Team has been on site, daily meetings have been held with Construction, Quality and Engineering personnel to obtain additional information and discuss observations.

The Assessment Team has issued twenty Weekly Reports to the U.S. Nuclear Regulatory Commission. These reports have described the activities of the Assessment Team and summarized their observations and findings.

The Assessment Team has issued a total of five Nonconformance Identification Reports. Four of these Nonconformance Identification Reports have been closed out to the satisfaction of the Assessment Team. The remaining open Nonconformance Identification Report was issued on February 10, 1983 and the Assessment Team feels that it can be closed out in the near future without impacting the progress of the underpinning.

The underpinning work is being performed in accordance with the construction and quality procedures. As the work has progressed, the procedures have been modified based upon experience gained during the construction of piers W12 and E12. The Assessment Team feels that these minor changes are appropriate and will have a positive effect on the quality of the underpinning work.

FEB 15 1983

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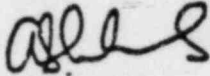
February 14, 1983

2

JGK

Based upon these observations and findings, the Assessment Team is of the opinion that additional piers could be released for construction. This will benefit the quality of the work by allowing the Contractor to maintain the experienced labor teams from piers W12 and E12.

If you have any questions, please contact me at (617) 589-2067.



A.S. Lucks  
Project Manager

# Consumers satisfies NRC with turbine building work

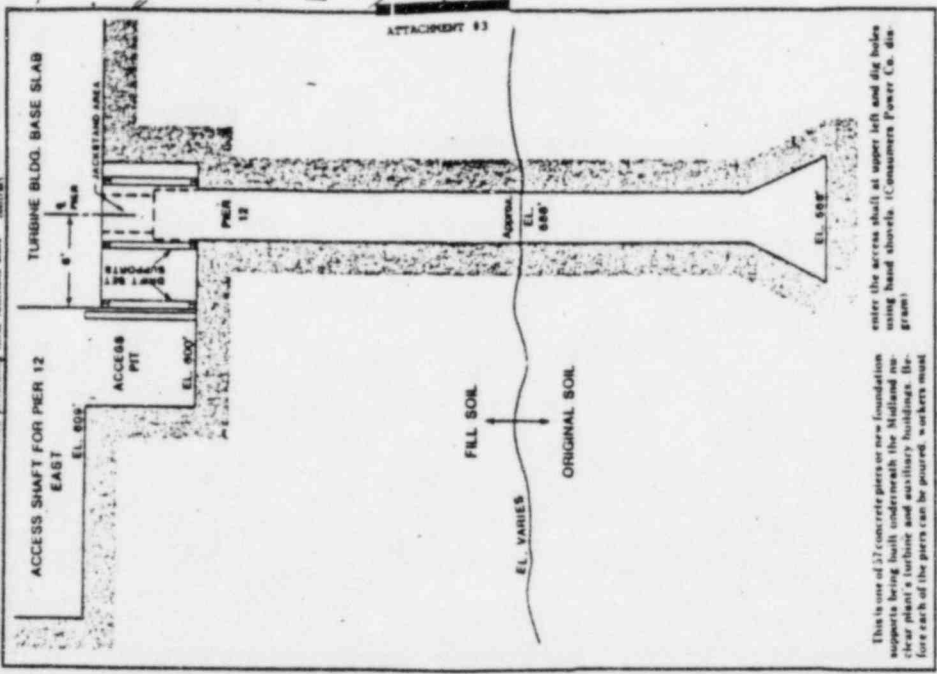
By PAUL BAU  
Daily News staff writer

The U.S. Nuclear Regulatory Commission has approved the plans for a new turbine building at the Consumers Power Co. plant in Farmington, Mich. The commission's approval is a significant step in the construction of the plant, which is being built by Consumers Power Co. and its subsidiary, Consumers Turbine Building Co. The commission's approval is based on a report by the National Reactor Construction Institute, which found that the plans for the turbine building meet the requirements of the Atomic Energy Act. The commission's approval is also based on a report by the National Reactor Construction Institute, which found that the plans for the turbine building meet the requirements of the Atomic Energy Act.

many other systems needed to shut down the plant. The NRC wanted to judge the quality of the work done on the turbine building. The commission's approval is based on a report by the National Reactor Construction Institute, which found that the plans for the turbine building meet the requirements of the Atomic Energy Act. The commission's approval is also based on a report by the National Reactor Construction Institute, which found that the plans for the turbine building meet the requirements of the Atomic Energy Act.

In a fourth requirement the NRC said the turbine building must be designed to withstand a maximum of 100 miles per hour wind. The commission's approval is based on a report by the National Reactor Construction Institute, which found that the plans for the turbine building meet the requirements of the Atomic Energy Act. The commission's approval is also based on a report by the National Reactor Construction Institute, which found that the plans for the turbine building meet the requirements of the Atomic Energy Act.

Sept. 30, 1962, but Shuler said the NRC approved the plans in the first instance. He said the need to split the turbine into two parts was a result of the NRC's requirements.



This is one of 37 concrete pieces on new foundation supports being built underneath the Middland nuclear plant's turbine and auxiliary buildings. Before each of the pieces can be poured, workers must enter the access shaft at upper left and dig holes using hand shovels. (Consumers Power Co. diagram)

# N-plant tightens examination rules

Consumers Power Co. has tightened its rules for examining the turbine building. The company's new rules require that all work be done in accordance with the plans and specifications. The company's new rules also require that all work be done in accordance with the plans and specifications. The company's new rules also require that all work be done in accordance with the plans and specifications.

Peck said he had not known who was responsible for the work. He said he had not known who was responsible for the work. He said he had not known who was responsible for the work.

SEVENTY-SIXTH CONGRESS

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 FR. FRID CORNBS, OCA

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 WASHINGTON, D.C. 20515

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 STAFF DIRECTOR  
 AND COUNSEL

ROY JONES  
 ASSOCIATE STAFF DIRECTOR

LEE MC ELVAIN  
 GENERAL COUNSEL

TRIMOTHY W. GLIDDEN  
 REPUBLICAN COUNSEL

June 2, 1983

The Honorable Nunzio Palladino,  
 Chairman,  
 United States Nuclear Regulatory Commission  
 Washington, D. C. 20555.

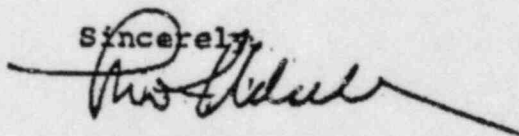
Dear Mr. Chairman:

I am writing to request the presence of Messers. James Keppler, R. M. Gardner, Ross Landsman and Ronald J. Cook at the Subcommittee on Energy and the Environment's hearing on the Midland, Michigan nuclear power plant on June 16 at 9:45 a.m.

Others who have been invited to testify at the hearing are: Governor James Blanchard, Midland Mayor Joseph Mann, representatives of Consumers Power Company and representatives of Midland intervenor groups.

We expect a most informative hearing and look forward to seeing you on the 16th.

Sincerely,



MORRIS K. UDALL  
 Chairman

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6-3-83  
 333  
 KB

MORRIS K. UDALL, ARIZ., CHAIRMAN

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COMMITTEE ON INTERIOR  
 AND INSULAR AFFAIRS

U.S. HOUSE OF REPRESENTATIVES  
 WASHINGTON, D.C. 20515

May 6, 1983

STANLEY SCOVILLE  
 STAFF DIRECTOR  
 AND COUNSEL

ROY JONES  
 ASSOCIATE STAFF DIRECTOR

LEE MC ELVAIN  
 GENERAL COUNSEL

TIMOTHY W. GLIDDEN  
 REPUBLICAN COUNSEL

Dircks  
 Roe  
 Rehm  
 Stello  
 DeYoung  
 Dento  
 Keppler  
 GCunnirgham  
 EDO R/E

PRINCIPAL STAFF	
✓ OCA	✓
✓ O/RA	✓
A/RA	✓
OP/P	✓
ORMA	✓
OR/MS/P	
DE	
ML	
OL	FILE

The Hon. Nunzio Palladino  
 Chairman  
 United States Nuclear Regulatory Commission  
 Washington, D.C. 20555

Dear Mr. Chairman:

On June 16, the House Interior Committee's Subcommittee on Energy and the Environment will conduct a hearing to address the NRC's procedures for handling construction quality issues at Midland nuclear power plant. The hearing will focus on the regulatory actions relating to the remedial soils problem and the breakdown of the quality assurance program.

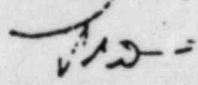
I would welcome testimony from you or your representative on June 16 for the purpose of presenting the views of the NRC in regard to these matters.

The hearing will convene at 9:45 a.m. in the Committee's hearing room which is located in Room 1324 of the Longworth House Office Building.

Should you wish to present a prepared statement, please provide 75 copies of the statement to the Clerk of the Subcommittee at least 24 hours in advance of the hearing. I am also requesting that witnesses be prepared to summarize their statements in 10 minutes or less. Additional information may be submitted for the record. In the event that you believe that you will need additional time to summarize your statement, please inform either Henry Myers or Mark Brand of the Committee staff. They can be reached at (202) 225-8331.

I appreciate your cooperation and look forward to a most productive and informative hearing.

Sincerely,



MORRIS K. UDALL  
 Chairman

5/10..To OCA for Appropriate  
 Action..Cpys to: EDO, RF..  
 83-1812

MAY 16 1983



UNITED STATES  
NUCLEAR REGULATORY COMMISSION  
WASHINGTON, D. C. 20555

June 1, 1983

Docket Nos. 50-329/330

~~Other~~  
@ Jul<sup>2</sup> Yes

PRINCIPAL STAFF	
RA	ENF
D/RA	PCS
A/RA	PAO
D/RRP	SLO
DRMA	RC
DRMISH	
DE	
ML	
OL	FILE

APPLICANT: Consumers Power Company  
 FACILITY: Midland Plant, Units 1 & 2  
 SUBJECT: SUMMARY OF APRIL 19-21, 1983 CASELOAD FORECAST  
 PANEL MEETING

On April 19 and 21, 1983, members of the NRC Caseload Forecast Panel met with Consumers Power Company (CPCo) and Bechtel to review construction completion schedules which CPCo completed February 18, 1983 and announced April 12, 1983 for Midland Plant, Units 1 & 2. On April 20, 1983 the Panel toured the plant to observe construction progress. The purpose of the meeting and tour is to provide for an assessment by the Panel of construction completion. Meeting attendees are listed in Enclosure 1. Enclosure 2 is the meeting and tour agenda. Enclosure 3 shows some of the slides used during CPCo's presentations.

CPCo's previous and revised estimates are:

	<u>7/80 Estimate</u>	<u>4/83 Estimate</u>	<u>Difference (Mos.)</u>
Unit 2	7/83	10/84	14
Unit 1	12/83	2/85	13

Overall plant completion is estimated by CPCo to be about 83% complete; engineering is about 76% complete; design 94%; and underpinning 4%.

CPCo finds there are three separate critical paths for construction completion: (1) a so called "aboveground" pathway, (2) auxiliary building underpinning, and (3) the licensing/hearing pathway.

Aboveground Pathway

This pathway is primarily based upon rework of large and small bore pipe supports. However, installation of three HVAC systems, penetration sealing, and installation of mirror type pipe insulation also presently have zero or negative schedule float.

JUN 6 1983

~~8306070425~~ 110pp

A letter of March 29, 1983, notes CPCO's intent to reinspect all installed safety related pipe supports without regard to the time of their installation or turnover. CPCo estimated the new support reinspection procedure, training and certification of inspection personnel, QA program revisions, and other support activities would be in place in time to commence reinspections during the week of April 11, 1983. CPCo plans to use three inspection teams (about 50 inspectors) and expects to complete hanger reinspections in June 1983. Only two inspectors had been certified as of April 15, 1983 and had started hanger inspections. The hanger reinspection pathway is the critical path for the "Construction Completion Plan" (CCP) described in CPCo's letters of January 10 and April 6, 1983 (and subsequently on April 22, 1983).

CPCo noted that 544 of 850 total subsystems (64%) have been turned over and accepted. Some systems were accepted with multiple "exceptions" (punchlist open items such as design changes, and corrective actions). CPCo's schedule for preoperational testing, acceptance testing, flushing and specific tests for both units provides a total duration of 14 months. Forty-five percent of the systems have been initially checked out. About 4% of the total of 683 tests have been completed as of March 31, 1983. Of these 683 tests, CPCo plans to complete 95% of the 268 preoperational tests and 128 acceptance tests prior to the Unit 2 fuel load. Currently, no preoperational tests have been completed (two are in progress); one acceptance test has been completed and none are in progress. The testing program for about 134 systems were noted to be constrained by the CCP. The present schedule assumes little rework of hanger (about 850 out of 7000) will be needed for both units.

At least seven 50.55(e) reports are considered by CPCo to have some potential for schedule impact in that reviews and tests are not complete and cannot be fully assessed at this time. These seven are:

	<u>50.55(e) Report No.</u>	<u>Management Corrective Action Report (MCAR) No.</u>	<u>Subject</u>
1.	80-04	40	High-energy line break analysis (HELBA) pipe whip restraints
2.	80-09	45B	Low alloy quenched and tempered bolting
3.	82-12	63	Design of steel embedments that use tension bars and shear lugs
4.	81-01	46	Deficiencies of Limitorque valve operators
5.	82-01	55	Deficiencies in electrical components associated with main steam isolation valve actuators, and non-safety related equipment wired as Class 1E

6.	82-07	59	Safety related equipment cooled by non-safety related HVAC system
7.	83-02	67	Clearances between electrical control cabinets and panels

Auxiliary Building Underpinning Pathway

Six of the 57 underpinning piers have been installed since December 13, 1983, and a pier load test (pier W-11) was in progress. The construction sequence will utilize an existing Utility Access Tunnel (UAT) to gain early access beneath the southern corners of the Control Tower. The revised construction scheme utilizing the UAT is reflected in CPCO's current completion forecasts.

CPCO's schedule assumes NRC will approve loading of fuel immediately after transfer of the EPA load to the permanent wall (i.e. in advance of EPA and FIVP soil consolidation beneath the wall; pier lockoff and grouting; replacing of backfill beneath EPA and FIVP; and structural stiffening at critical elevation 659 feet). CPCO estimates that these latter activities will be completed by late January 1985.


Licensing/Hearing Pathway

CPCO considers that completion of the present soils "OM" hearing and "OL" hearing is also critical to the new Unit 2 fuel load estimate. CPCO's estimated need dates for the hearing are:

Complete "OM" hearing session	August 1, 1983
Initial Decision on "OM" matters	Mid October 1983
Completion of "OL" hearing session	Mid May 1984
Initial Decision on "OL" matters	Early July 1984

Staff Conclusions

The Caseload Panel noted that the information provided during the meeting and observations made during the site tour would be further reviewed before the Panel's completion estimates are reached.

  
Darl Hood, Project Manager  
Licensing Branch No. 4  
Division of Licensing

Enclosures:  
As stated

cc: See next page



MIDLAND

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Vice President  
Consumers Power Company  
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U.S. Nuclear Regulatory Commission  
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Mr. J. W. Cook

- 2 -

cc: Mr. Ron Callen  
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Supplemental page to the Midland OM, OL Service List

Mr. J. W. Cook

- 3 -

cc: Commander, Naval Surface Weapons Center  
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Energy Technology Engineering Center  
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U.S. Nuclear Regulatory Commission  
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Jerry Harbour, Esq.  
Atomic Safety and Licensing Board  
U.S. Nuclear Regulatory Commission  
Washington, D. C. 20555

Geotechnical Engineers, Inc.  
ATTN: Dr. Steve J. Poulos  
1017 Main Street  
Winchester, Massachusetts 01890

ENCLOSURE 1

CASELOAD FORECAST PANEL VISIT

April 19, 1983

<u>NAME</u>	<u>ORGANIZATION</u>
D. Hood	LB4/DL/NRR
R. Gardner	Region III, NRC, IE
B. Harshe	CPCo - Safety & Licensing
J. Mooney	Exec. Mgr. - CPCo
R. McCue	CPCo - Technical Supt.
D. Miller, Jr.	CPCo - SHE Manager
J. DeMeest	Public
N. Saari	CPCo - Pub. Affairs
L. Shane	Midland Daily News
J. Leech	CPCo - Safety & Licensing
W. Bird	CPCo - Mgr. Quality Assurance
J. Schaub	Asst. Proj. Mgr. - Midland CPCo
J. Post	CPCo - Purchasing Dept.
D. Fredlund	BPC - Project Planning
D. Perry	CPCo - Design Production
G. Keeley	CPCo Project Manager
J. Cook	CPCo, V.P. Proj. Eng. & Const.
D. Ronk	CPCo, Section Head, Midland Project Mgr.
F. Buckman	CPCo - Exec. Mgr.
W. Lovelace	NRC/Ron
D. Sedgwick	Saginaw News
G. Slade	CPCo - SMO
A. Mollenkopf	Mgr. - Sch. & Cost - CPCo
R. Wells	Exec. Mgr. - QA

ENCLOSURE 1 (continued)

ATTENDEES

April 21, 1983

<u>NAME</u>	<u>ORGANIZATION</u>
D. Hood	LB4/DL/NRR
J. Harrison	USNRC/RIII/OSC
R. Gardner	RIII/OSC/IE
B. McCue	CPCo - Technical Dept.
A. Mercado	CPCo - Technical Dept.
D. Miller, JR	CPCo - SMD
D. Fredlund	BPC - Project Plng.
A. Mollenkopf	CPCo - Sch. & Cost
R. Wells	CPCo - MPQADF
F. Buckman	CPCo - Project Office
N. Saari	CPCo - Public Affairs
L. Shane	Midland Daily News
M. Clayton	DOW

ENCLOSURE 1 (continued)

CASELOAD FORECAST VISIT

April 20, 1983

SITE SESSION

NAME

ORGANIZATION

D. Hood  
R. Rice  
R. Orosz  
R. McCue  
D. Miller, JR.  
A. Mercado  
A. Mollenkopf  
W. Lovelace  
J. Harrison  
R. Gardener

LB4/DL/NRR  
CPCo - Tech. Dept. - Primary Mech.  
CPCo -Tech.  
CPCo - Tech. Dept. Supt.  
CPCo  
CPCo Tech. Dept. - Scheduling  
CPCo - Schedule & Cost  
NRC/RM  
USNRC/RIII  
USNRC/RIII

MIDLAND PLANT UNITS 1 & 2  
NRC CASE LOAD FORECAST PANEL  
APRIL 19 & 21, 1983

SUMMARY AGENDA

<u>Topic</u>	<u>Presenter</u>
1. Opening Remarks	Darl Hood
2. Introduction and Project Organization	Jim Cook
3. Results of Replanning Effort	Jim Cook
4. Schedule Replanning Effort	Alan Mollenkopf
5. Schedule Critical Paths (other than soils and licensing)	Alan Mollenkopf
6. Design & Engineering	Fred Buckman
7. Procurement	Jim Post
8. Construction Progress Overview	Don Miller
— Lunch Break	
9. Construction Completion Program (CCP)	
A. Status & Plan	Don Miller
B. Verification Program	Roy Wells
C. IDV & Third Party Overview Programs	Gil Keeley
10. Test Program Status and Plan	Don Miller
11. Soils Remedial Work Status & Plan	Jim Mooney & John Schaub
12. Post TMI (NUREG 0737) Changes	Bruce Harshe
13. Plant Licensing Plan	Nate Leech
14. 10 CFR 50.55(e) Impacts	Walt Bird
— Dinner Break (Approximate)	
15. Plant Operational Readiness	Gerry Slade

NOTE: If necessary some presentations may be deferred until  
Thursday 4/21/83, 8:30 am.

ENCLOSURE 2 (continued)TOUR - CASE LOAD FORECAST PANEL - APRIL 20, 1983

<u>AREA</u>	<u>ENGINEER(S)</u>	<u>DURATION</u>
T/Bs, D/G's, SW & CW, Evaporator	JSKreple	<u>0800</u> 1½ - 2 Hrs
Auxiliary Building	TASpelman/ GWRowe	1½ - 2 hrs
BREAK		
Confined Space Entry Training		½ hr
Electrical and I&C	RDOrosz	1 hr
Containments	JTWalton	1½ - 2 Hrs
Remedial Soils	RHWieland	1 Hr



ENCLOSURE 3

SELECTED VIEWGRAPH SLIDES AND HANDOUTS

April 19 & 21, 1983

Y. Clark  
4/19/85

© MIDLAND PROJECT REPLANNING  
**SCHEDULE CONCLUSIONS**

<u>MILESTONE</u>	<u>PREVIOUS</u> <sup>(1)</sup>	<u>CURRENT</u> <sup>(2)</sup>	<u>ΔMONTHS</u> <sup>(3)</sup>
● Unit 2 Fuel Load	July 83	Oct 84	14
● Unit 2 Operation	Dec 83	Feb 85	14
● Unit 1 Fuel Load	Dec 83	Feb 85	13
● Unit 1 Operation	July 84	Aug 85	12

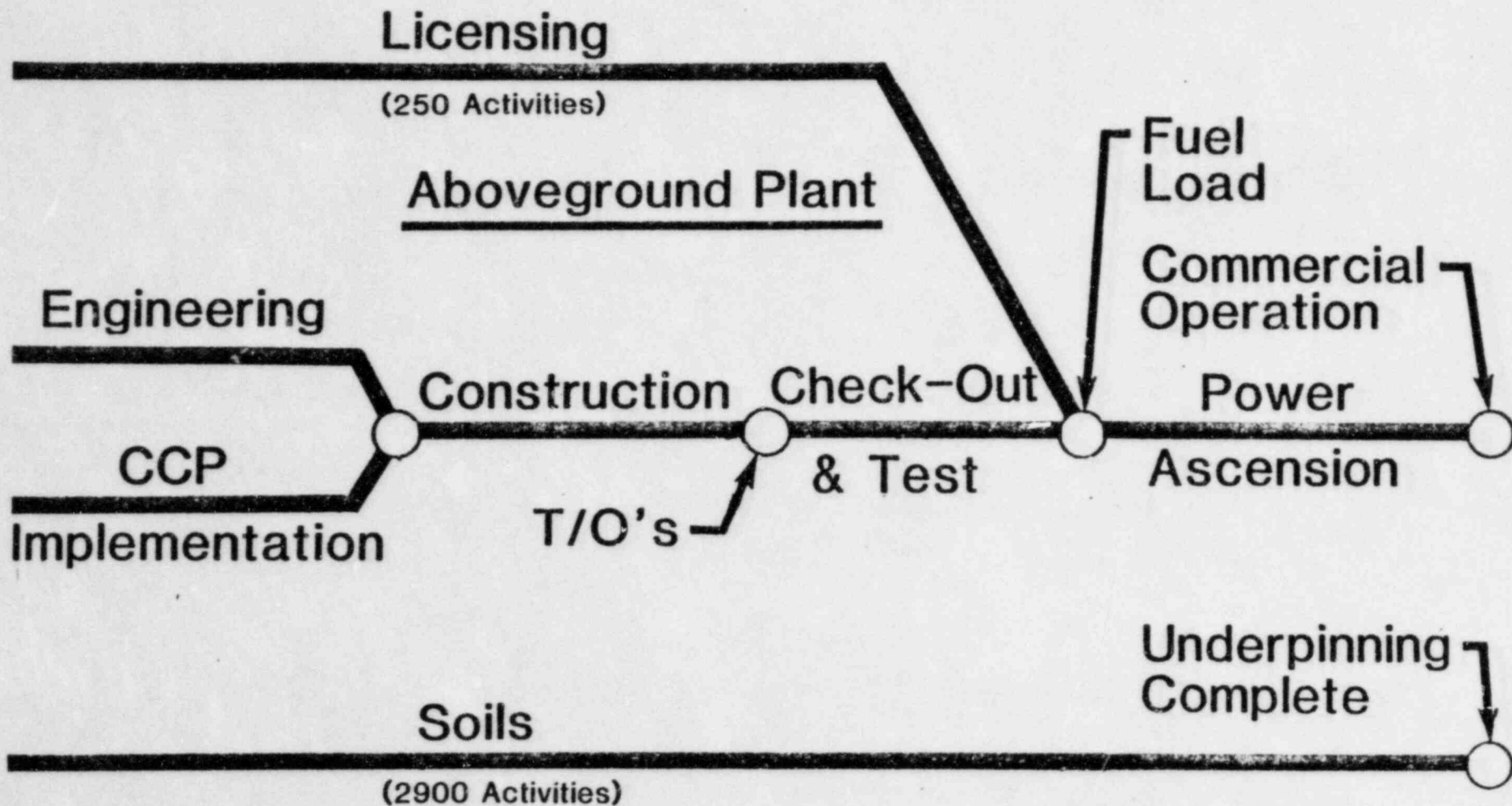
(1) Established July 1980  
(2) Recommended April 1983  
(3) Rounded To Nearest Month

*M. M. ...*  
*4/17/83*

①



# NRC CASELOAD FORECAST PANEL SIMPLIFIED MODEL - OVERALL PROJECT SCHEDULE



NRC Caseload Forecast Panel

RESULTS OF WORKING LINE SCHEDULE DEVELOPMENT  
(ABOVEGROUND PLANT)

- COMPLETED INITIAL SCHEDULE - FEBRUARY 18, 1983
  
  - WORKING LINE CRITICAL PATHS  
(0 OR NEGATIVE FLOAT TO AUGUST 1, 1984 UNIT 2 F.L.)
    - LB PIPE SUPPORTS (BASE)
    - SB PIPE SUPPORTS (BASE)
    - HVAC DUCT & HANGERS INSTALLATION
    - SB PIPING
    - MECHANICAL/INSTRUMENTATION - CONSTRUCTION
- PUNCHLIST ITEMS
- PENETRATION SEALS

*LB's  
Hangers*

## NRC Caseload Forecast Panel

ESTABLISHING THE BASELINE PROJECT SCHEDULE  
(ABOVEGROUND PLANT)

- |   |           |
|---|-----------|
| ● REEVALUATE WORKING LINE ASSUMPTIONS     |           |
| - Q WORK RESTART DELAYED                  | . 1 MONTH |
| ● ALLOWANCE FOR UNCERTAINTIES             | 1 MONTH   |
| - RESULTS OF VERIFICATION EFFORT          |           |
| - UNFORESEEN TESTING/ENGINEERING PROBLEMS | _____     |
| ● CHANGE TO WORKING LINE SCHEDULE         | 2 MONTHS  |

*Always  
critical path =  
Q change impacts*

## NRC Caseload Forecast Panel

PROJECT REPLANNING SCHEDULE SUMMARY

	<u>MAJOR TESTING MILESTONES</u>	<u>SCHEDULE REQUIREMENTS</u>	
		<u>UNIT 2</u>	<u>UNIT 1</u>
C	HYDRO REFUELING CANAL	12/10/83	2/2/84
D	RCS COLD HYDRO	1/10/84	3/14/84
J	HOT FUNCTIONAL TEST	5/5/84	7/19/84
M	FUEL LOAD	10/1/84	2/9/85
R	COMMERCIAL OPERATION	2/28/85	8/9/85

## NRC Caseload Forecast Panel

BASELINE SCHEDULE CRITICAL PATHS  
(MAJOR WORK)

<u>PATH DESCRIPTION</u>	<u>FLOAT</u> (MONTHS)
1. SOILS - AUX BLDG UNDERPINNING	0
2. INSTALLATION OF LB & SB PIPE SUPPORTS (BASE) (22 SYSTEMS - 59 LB & 163 SB SUPPORTS)	0
3. INSTALLATION OF LB & SB PIPE SUPPORTS (SEISMIC) (6 SYSTEMS - 6 LB & 129 SB SUPPORTS)	0
4. INSTALLATION OF HVAC SYSTEMS (3 SYSTEMS)	0
5. PENETRATION SEALING (FUEL LOAD)	0
6. PIPE INSULATION (SECONDARY PATH)	0
7. RELOCATION OF CLASS 1E PANELS (MCAR 67) (RCS HYDRO)	+2
8. Q-LISTED DEVICES IN NON-Q ENVIRONMENT (MCAR - 59) (1/2 GJA-1-FUEL LOAD)	+3
9. MOTOR OPERATED VALVES (MCAR - 46) (FUEL LOAD)	+4
10. HELBA PIPE WHIP RESTRAINTS (UNIT 2)	+6

*Handwritten notes:*  
 We want to ensure  
 supply related to the center  
 from - inlet from, etc. contained

*Handwritten note:*  
 15 months

*Handwritten note:*  
 additional testing needed

*Handwritten note:*  
 sc. 55(c) etc.

NRC Caseload Forecast Panel

BASELINE SCHEDULE CONFIDENCE

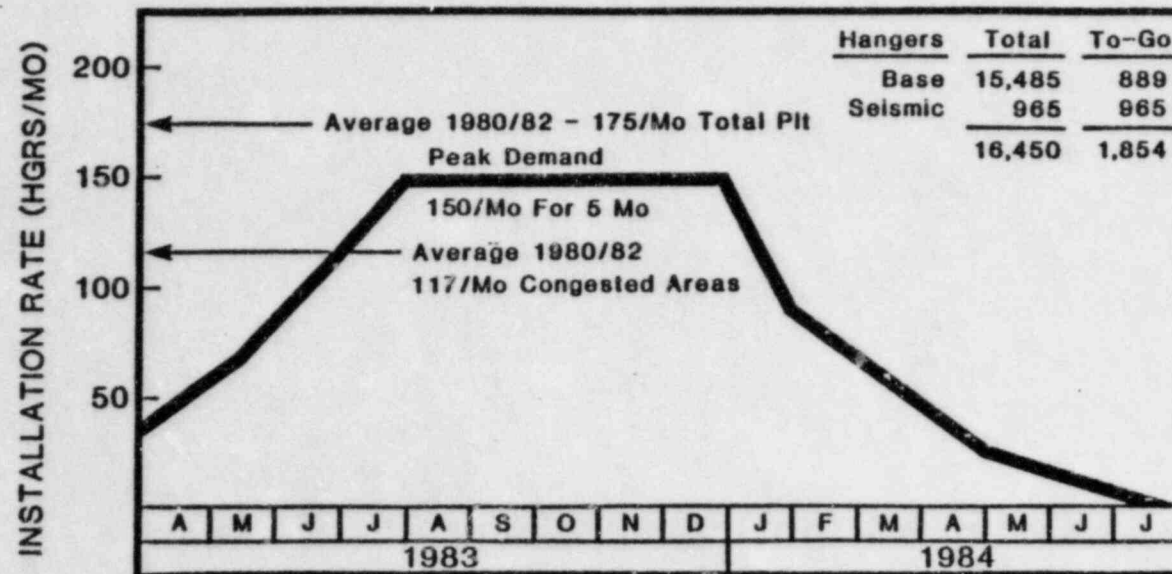
- CONSERVATIVE ESTIMATE OF NEW &  
MODIFIED SEISMIC LB & SB PIPE SUPPORTS
- CONSERVATIVE PIPE SUPPORT COMPLETION DEMAND
  - SEISMIC 45 DAYS PRIOR TO HFT
  - BASE PRIOR TO SYSTEM T/O
- HANGER TEAMS - EFFICIENT WORK PROSECUTION
- ACHIEVABLE INSTALLATION RATES





### MIDLAND PROJECT REPLANNING

# LARGE PIPE HANGER INSTALLATION (BECHTEL)



W B 1

50.55(E) REPORT STATUS

14      CLOSED BY NRC

18      AWAIT NRC REVIEW

39      ARE WORKING

-----

71      TOTAL REPORTED

SEVEN ITEMS BEING PRESENTED, ARE ONES WHICH HAVE SOME POTENTIAL FOR SCHEDULE IMPACT IN THAT ALL REVIEWS, TESTS FOR ENGINEERING ARE NOT COMPLETE, WHICH IN TURN RESULTS IN SOME SCHEDULE RISK.

WRB  
4/18/83

HIGH-ENERGY LINE BREAK ANALYSIS  
(HELBA) PIPE WHIP RESTRAINTS M CAR 40 (80-04)

DESCRIPTION OF PROBLEM

CONTRARY TO INTENT OF BN-TOP-2, THE STEADY-STATE THRUST FORCES WERE USED IN THE ENERGY BALANCE TECHNIQUES FOR THE DESIGN OF HELBA PIPE WHIP RESTRAINTS RATHER THAN THE TRANSIENT PEAK THRUST FORCES.

STATUS

83 RESTRAINTS REQUIRE MODIFICATION.

CALCULATION FINALIZATION IN PROGRESS - INTEGRATED INTO NORMAL HELBA PRODUCTION WORK. DESIGN DRAWINGS ARE BEING REVISED.

TASKS TO RESOLVE

EXPECTED COMPLETION DATE

. COMPLETE DESIGN EFFORT

JUNE, 1983

. COMPLETE PLANT MODIFICATIONS

PRIOR TO HFT

SCHEDULE IMPACT

NO KNOWN IMPACT ON SYSTEMS TURNOVER OR FUEL LOAD.

WRB  
4/18/83

LOW ALLOY QUENCHED AND TEMPERED BOLTING  
MCAR 45B (80-09)

DESCRIPTION OF PROBLEM

IDENTIFICATION SPECIFIC BOLTING FAILURES TO MEET REQUIRED SPECIFICATIONS RESULTED IN A COMMITMENT TO REVIEW ALL LAQTS BOLTING AND COMPONENT SUPPORTS 7/8 INCH IN DIAMETER OR GREATER.

STATUS

RECEIPT INSPECTION UTILIZING HARDNESS SAMPLING WAS IMPLEMENTED IN MAY, 1982.

COMMONWEALTH AND APEICH REVIEWS IDENTIFIED APPROXIMATELY 65,000 LAQTS ITEMS TO BE EVALUATED BY A SAMPLING PLAN DEVELOPED BY SAI.

THE 6000 ITEMS REQUIRING PHYSICAL TESTING IS WELL UNDERWAY WITH THREE NCRS WRITTEN TO DATE ON MATERIAL LOTS EITHER TOO HARD OR TOO SOFT.

*6000  
complete*

TASKS TO RESOLVE

EXPECTED COMPLETION DATE

- |   |                |
|---|----------------|
| . COMPLETE TESTING OF REMAINING LAQTS ITEMS AND REVIEW BY SAI   | AUGUST, 1983   |
| . FINALIZE IDENTIFICATION OF ITEMS REQUIRING ENGINEERING DISPOSITION VIA NONCONFORMANCE REPORTS AND OBTAIN SAME | DECEMBER, 1983 |

80-09 (CONT'D)

SCHEDULE IMPACT

INDETERMINATE UNTIL TEST PROGRAM IS COMPLETED. TO DATE RESULTS, OF THE APPROXIMATELY 50% BOLTS TESTED, BOLT REPLACEMENT FOR THE THREE NCRs HAS NO SCHEDULER IMPACT.

DESIGN OF STEEL EMBEDMENTS THAT USE  
TENSION BARS AND SHEAR LUGS MCAR 63 (82-12)

DESCRIPTION OF PROBLEM

THE ACI 349 CODE, APPENDIX B, ISSUED AUGUST 1979, SPECIFIES THAT SHEAR LUGS IN EMBEDMENT DESIGNS SHALL BE CONSIDERED EFFECTIVE ONLY IN COMPRESSION ZONES. MIDLAND EMBEDMENT DESIGNS WERE COMPLETED AND INSTALLED BEFORE THIS DATE AND CONSIDERED THAT SHEAR LUGS ACCOMODATE ALL SHEAR LOADS AND THAT TENSION BARS ACCOMMODATE ALL TENSION LOADS.

STATUS

ENGINEERING HAS IDENTIFIED APPROXIMATELY 2,500 EMBEDMENTS HAVING SHEAR LUGS.

EVALUATION IN PROGRESS TO DETERMINE WHICH OF THESE EMBEDMENTS IDENTIFIED HAVE SHEAR LUGS IN TENSION ZONES.

TASKS TO RESOLVE

EXPECTED COMPLETION DATE

- . TESTING PROGRAM IS BEING DEVELOPED TO DETERMINE THE EFFECTIVITY OF SHEAR LUGS LOCATED IN TENSION ZONES FOR MIDLAND DESIGN

TBD

WRB  
4/18/83

82-12 (CONT'D)

- REVISIONS TO BE MADE TO THE DESIGN CRITERIA ESTABLISHED FOR NEW DESIGNS AND MODIFICATIONS TO EXISTING EMBEDMENTS TO ENCOMPASS ALL EMBEDMENT DESIGN, MODIFICATION AND EVALUATION.

MAY, 1983

SCHEDULE IMPACT

IT IS EXPECTED THAT THE TEST PROGRAM WILL SUBSTANTIALLY AFFECT EXISTING MIDLAND DESIGN.

WRB  
4/18/83

DEFICIENCIES IN LIMITORQUE VALVE OPERATORS  
MCAR 46 (81-01)

DESCRIPTION OF PROBLEM

- A) THE USE OF UNDERRATED TERMINAL BLOCKS IN LIMITORQUE OPERATORS.
- B) THE USE OF TERMINAL BLOCKS WITHOUT PROPER ENVIRONMENTAL QUALIFICATION IN LIMITORQUE OPERATORS.
- C) ADDITIONAL CONCERNS REGARDING QUALIFICATION OF VARIOUS LIMITORQUE OPERATOR COMPONENTS.

STATUS

EVALUATION TO DETERMINE THE EXACT NUMBER OF VALVES OPERATORS TO BE REPLACED IS IN PROGRESS.

TASKS TO RESOLVE

EXPECTED COMPLETION DATE

- |   |                   |
|---|-------------------|
| . IDENTIFY AND ISSUE P.O. FOR REPLACEMENT PARTS | SEPTEMBER 9, 1983 |
| . COMPLETE INSTALLATION                         | JUNE 8, 1984      |

SCHEDULE IMPACT

NO KNOWN IMPACT ON SYSTEM TURNOVER OF FUEL LOAD.

WRB  
4/18/83



DEFICIENCIES IN ELECTRICAL COMPONENTS ASSOCIATED  
MSIV ACTUATORS, AND NON-Q EQUIPMENT WIRED AS CLASS 1E  
MCR 55 (82-01)

DESCRIPTION OF PROBLEM

MAJOR SAFETY-RELATED ELECTRICAL COMPONENTS OF THE MSIV SYSTEM WERE FOUND TO BE NONCONFORMING TO THE SEPARATION CRITERIA OF REGULATORY GUIDE 1.75, QUALITY ASSURANCE PROGRAM, AS REQUIRED BY 10 CFR 50, APPENDIX B, OR ANSI 45., 2 AND THE PROJECT SEISMIC REQUIREMENTS.

A REVIEW OF FOUR ADDITIONAL EQUIPMENT PACKAGES (M125C (Q) NUCLEAR STAINLESS STEEL VALVES 150 THROUGH 400 POUND RATINGS 2 1/2" AND LARGER, (M-149 (Q) AIR HANDLING UNITS, (M-150 (Q) AIR FILTERING UNITS, AND (M-154 (Q) HVAC ISOLATION VALVES, HAS REVEALED THAT SOME NON CLASS 1E DEVICES HAVE BEEN WIRED INTO CLASS 1E CIRCUITS (MCR 55, REVISION 1)

STATUS

REPLACEMENT COMPONENTS WERE ORDERED AND ARE EXPECTED TO BE SHIPPED OVER THE NEXT THREE MONTHS.

A REVIEW OF ALL SAFETY-RELATED MATERIAL REQUISITIONS THAT INCLUDE PROCUREMENT OF ELECTRICAL COMPONENTS AND ACCESSORIES FOR SIMILAR POTENTIAL NONCONFORMANCES AND DEFICIENCIES IS IN PROGRESS.

AN ACTION PLAN IS BEING DEVELOPED TO RESOLVE THE EXPANDED SCOPE OF MCR 55.

82-01 (CONT'D)

TASKS TO RESOLVE

EXPECTED COMPLETION DATE

- |  |                |
|--|----------------|
| . RECEIVE MSIV REPLACEMENT COMPONENTS<br>AND INSTALL           | DECEMBER, 1983 |
| . IDENTIFY AND ACCOMPLISH MODIFICATIONS<br>FROM ONGOING REVIEW | TBD            |

SCHEDULE IMPACT

INDETERMINATE UNTIL REVIEW IS COMPLETE. PROBLEMS IDENTIFIED TO  
DATE HAVE NO IMPACT ON FUEL LOAD.

Q-RELATED EQUIPMENT COOLED BY NON-Q HVAC SYSTEM  
MCAR 59 (82-07)

*12-4-84*

DESCRIPTION OF PROBLEM

SAFETY-RELATED DEVICES LOCATED IN PORTIONS OF THE AUXILIARY BUILDING ARE COOLED BY NON-Q HEATING, VENTILATING, AND AIR-CONDITIONING (HVAC) SYSTEMS. LOSS OF THESE NON-Q HVAC SYSTEMS FOLLOWING VARIOUS DESIGN BASIS ACCIDENTS COULD RESULT IN ROOM ENVIRONMENTAL TEMPERATURES THAT COULD EXCEED THE SPECIFIED DESIGN TEMPERATURE OF 104F. UNDER THESE CONDITIONS, THE SAFETY-RELATED EQUIPMENT IN THESE ROOMS MAY NOT OPERATE RELIABLY, AND BOTH TRAINS OF REDUNDANT Q-LISTED EQUIPMENT ARE AFFECTED BY LOSS OF THE NON-Q HVAC SYSTEM IN MANY INSTANCES.

STATUS

REVIEW OF THE PROJECT DESIGN DRAWINGS TO DATE HAS IDENTIFIED 57 AREAS CONTAINING APPROXIMATELY 1100 ITEMS OF CLASS 1E ELECTRICAL EQUIPMENT, DEVICES, AND INSTRUMENTS IN THE AUXILIARY BUILDING THAT ARE COOLED BY NON-Q HVAC SYSTEMS.

TASKS TO RESOLVE

EXPECTED COMPLETION DATE

. ACTIONS TO FINALIZE RESOLUTIONS  
ARE IN PROGRESS

UNIT II JULY, 1984  
UNIT I DECEMBER, 1984

A. UPGRADE SELECTED AUXILIARY BUILDING HVAC SYSTEMS TO Q STATUS TO LIMIT THE EFFECT OF THE PEAK ROOM TEMPERATURE WITHIN THE CURRENT ENVIRONMENTAL QUALIFICATION ENVELOPE OF THE EQUIPMENT

82-07 (CONT'D)

- B. RELOCATE THE CLASS 1E DEVICE TO ANOTHER AREA WHERE THE PREDICTED PEAK ENVIRONMENTAL TEMPERATURE IS WITHIN THE ENVIRONMENTAL QUALIFICATION ENVELOPE OF THE EQUIPMENT
- C. REPLACE THE CLASS 1E DEVICE, WHICH DOES NOT QUALIFY FOR THE PREDICTED PEAK ROOM TEMPERATURE, WITH ONE THAT QUALIFIES
- D. QUALIFY THE EXISTING CLASS 1E DEVICE FOR TEMPERATURES GREATER THAN OR EQUAL TO THE CALCULATED PEAK ROOM ENVIRONMENTAL TEMPERATURE

SCHEDULE IMPACT

NO KNOWN IMPACT ON FUEL LOAD.

WRB  
4/18/83

ELECTRICAL CONTROL CABINETS/PANELS CLEARANCES

MCAR 67 (80-02)

3

DESCRIPTION OF PROBLEM

CLASS 1E ELECTRICAL CONTROL CABINETS/PANELS THAT ARE NOT MEANT TO BE PHYSICALLY ATTACHED TO EACH OTHER AND ARE SEISMICALLY QUALIFIED INDEPENDANTLY MUST NOT INTERACT WITH EACH OTHER OR ADJACENT STRUCTURES DURING A SEISMIC EVENT. THE REQUIRED CLEARANCES HAVE BEEN CALCULATED FOR THE CLASS 1E CABINETS/PANELS BASED ON THE RECOMMENDATIONS OF BC-TOP-4A (TOPICAL REPORT, SEISMIC ANALYSIS OF STRUCTURES AND EQUIPMENT FOR NUCLEAR POWER PLANTS, REVISION 3, NOVEMBER 1974) AND COMPARED TO THE EXISTING CLEARANCES. THOSE CABINETS/PANELS WHOSE EXISTING CLEARANCES IS LESS THAN THAT CALCULATED ARE CONSIDERED TO POSE POSSIBLE SAFETY/QUALIFICATION PROBLEMS SUBJECT TO ADDITIONAL EVALUATION.

STATUS

NUTECH AND/OR SUPPLIERS ARE REVIEWING EXISTING INSTALLATIONS WITH PROXIMITY PROBLEMS TO DETERMINE ACCEPTABILITY.

B&W IS ANALYZING THEIR CLASS 1E CRD TRIP BREAKER CABINETS

- TO FINALIZE THE DEFLECTIONS
- DETERMINE WHETHER PROXIMITY PROBLEM EXISTS

WRB

4/18/83

<sup>3</sup>  
80-02 (CONT'D)

TASKS TO RESOLVE

EXPECTED COMPLETION DATE

- . ACTUAL MOVING OF PANELS TO PROVIDE  
REQUIRED CLEARANCES ON HOLD PENDING  
'NUTECH' REVIEW OF ALTERNATIVE  
SOLUTION AND ANALYSIS OF EXISTING  
INSTALLATION APRIL 25, 1983
  
- . UNINSTALLED CLASS 1E PANELS  
- ADD NOTES TO APPROPRIATE LOCATION  
DRAWINGS SHOWING MINIMUM CLEARANCES JUNE, 1983
  
- . B&W SEISMIC QUALIFICATION ANALYSIS MAY 31, 1983

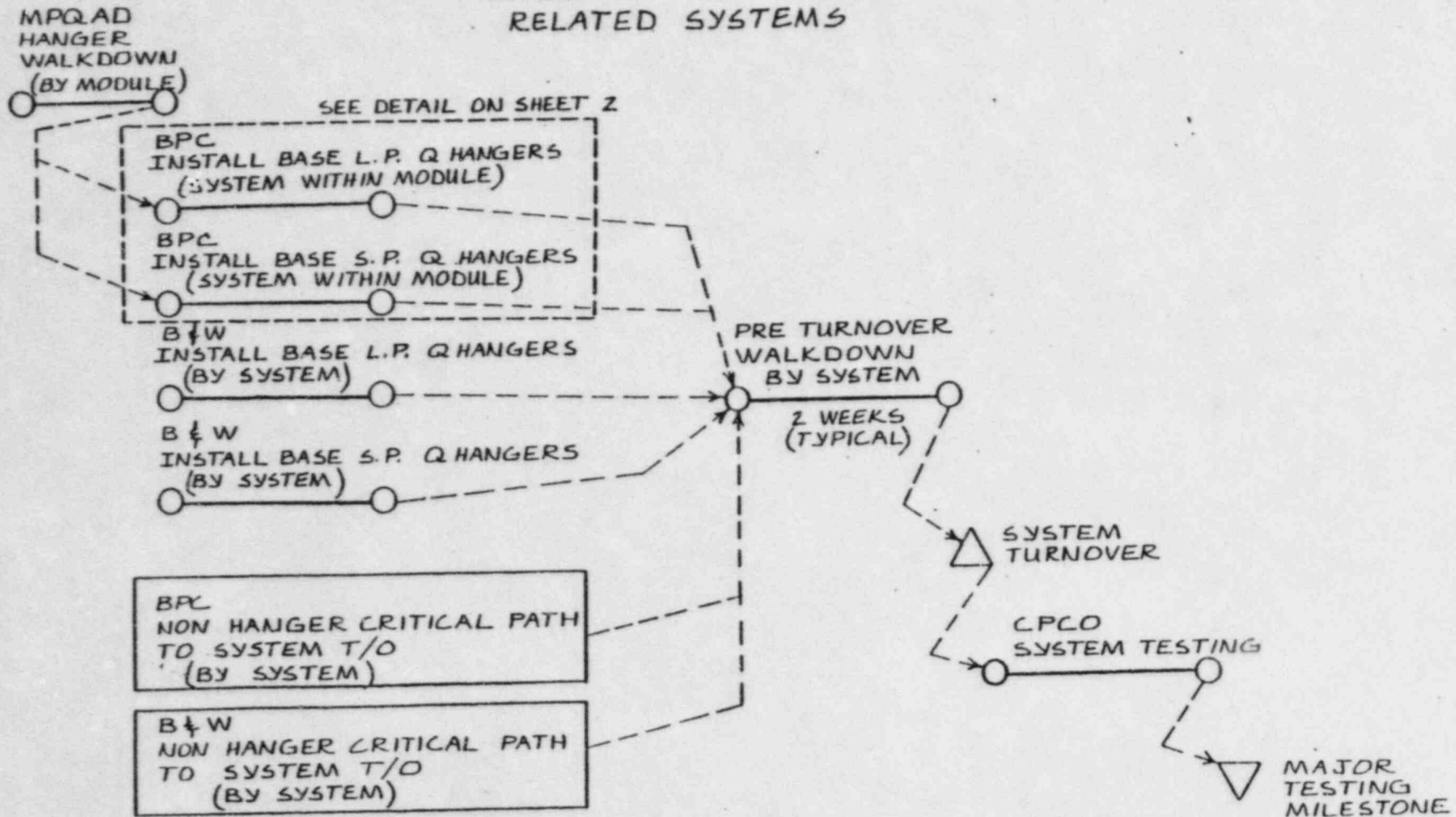
SCHEDULE IMPACT

NO SCHEDULE IMPACT EXPECTED.

WRB  
4/18/83

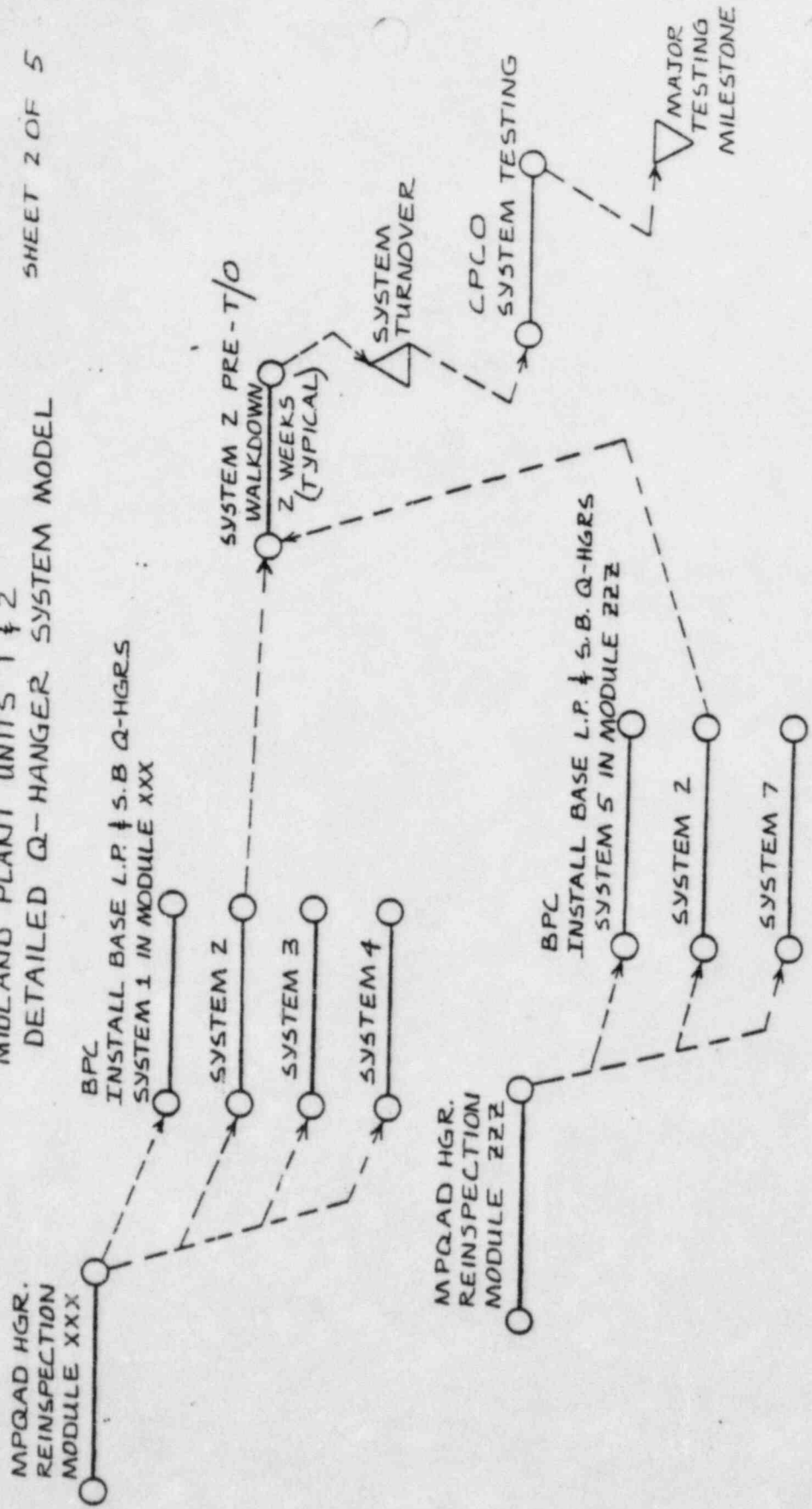
MIDLAND PLANT UNITS 1 & 2  
 MODEL FOR Q HANGER  
 RELATED SYSTEMS

SHEET 1 OF 5



4/2/83

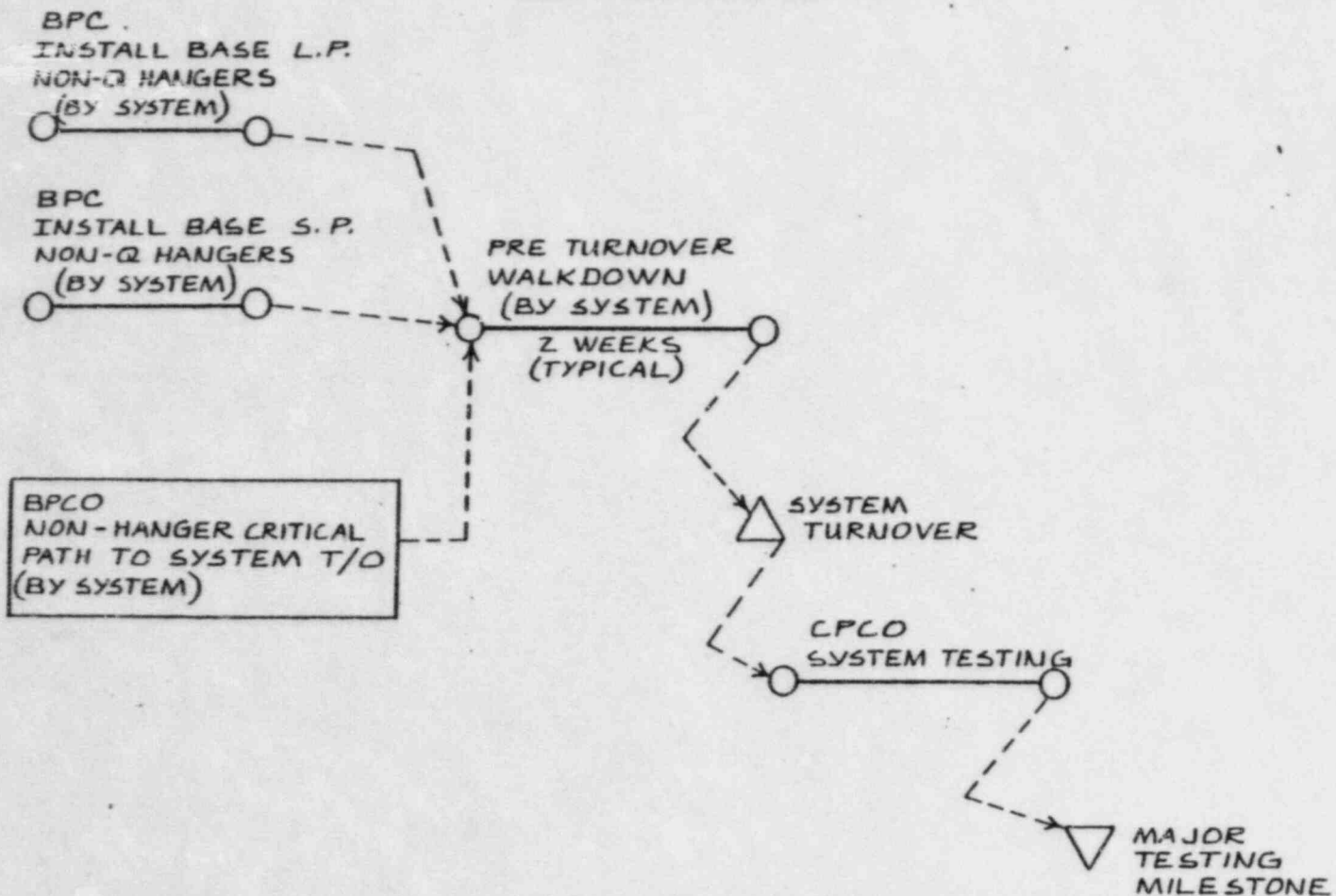
MIDLAND PLANT UNITS 1 & 2  
DETAILED Q-HANGER SYSTEM MODEL





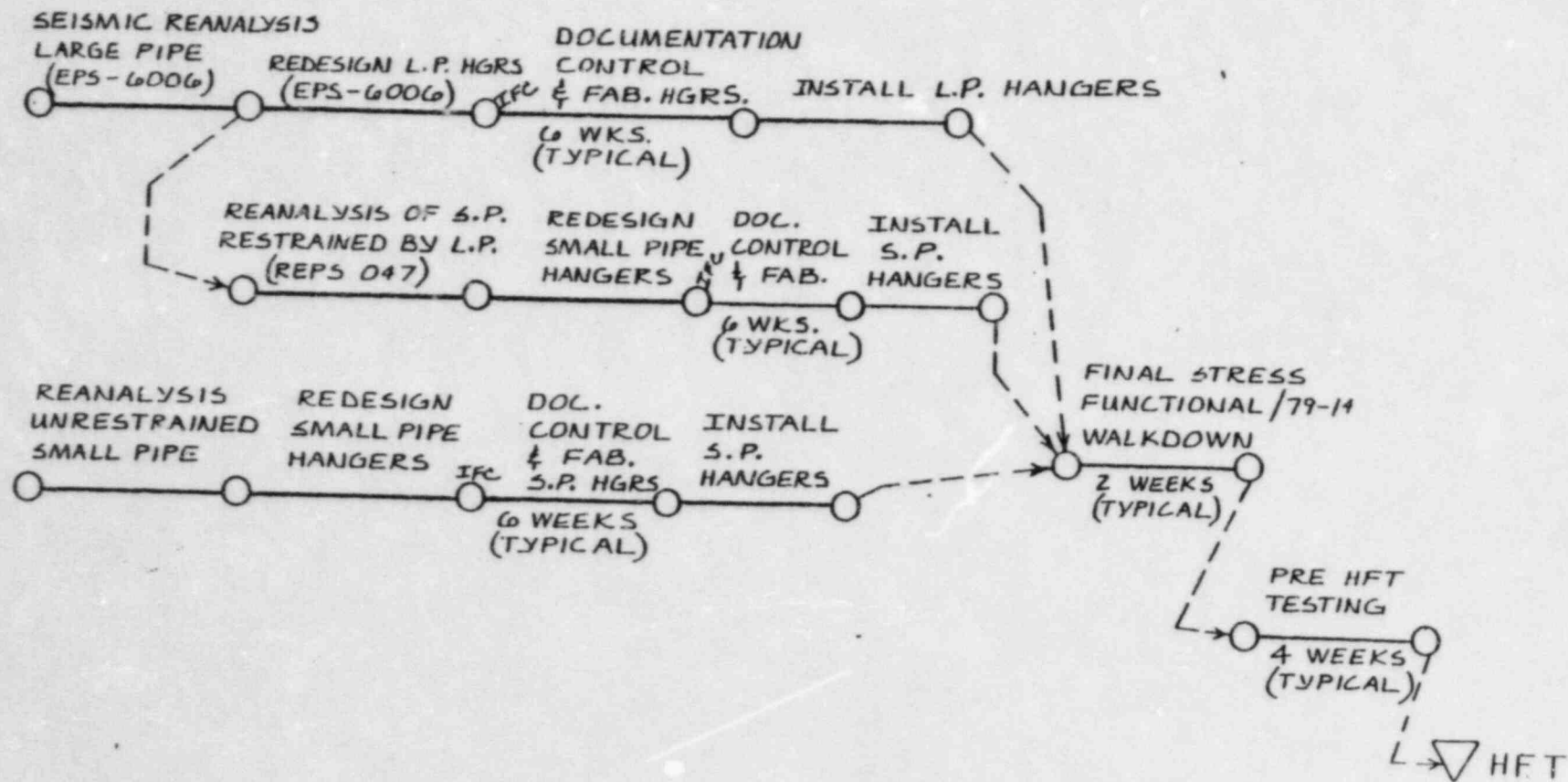
MIDLAND PLANT UNITS 1 & 2  
MODEL FOR NON-Q HANGER  
RELATED SYSTEMS

SHEET 3 OF 5



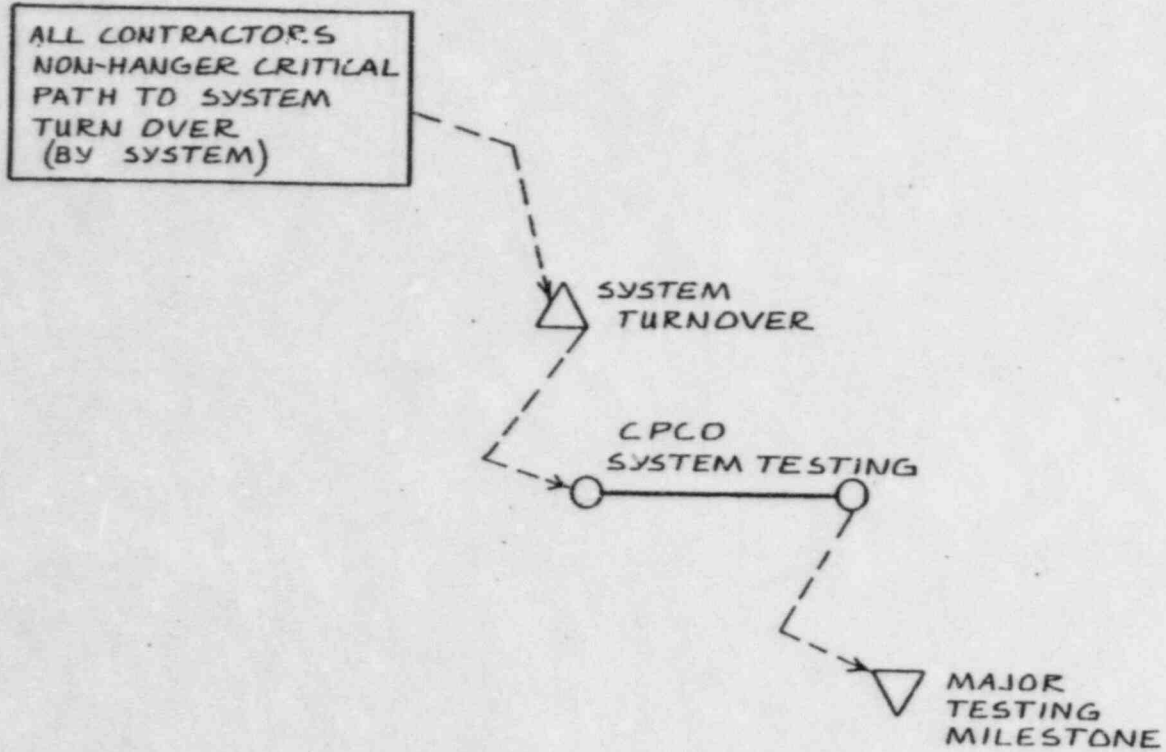
MIDLAND PLANT UNITS 1 & 2  
SEISMIC HANGER MODEL  
(ALL ACTIVITIES BY SYSTEM)

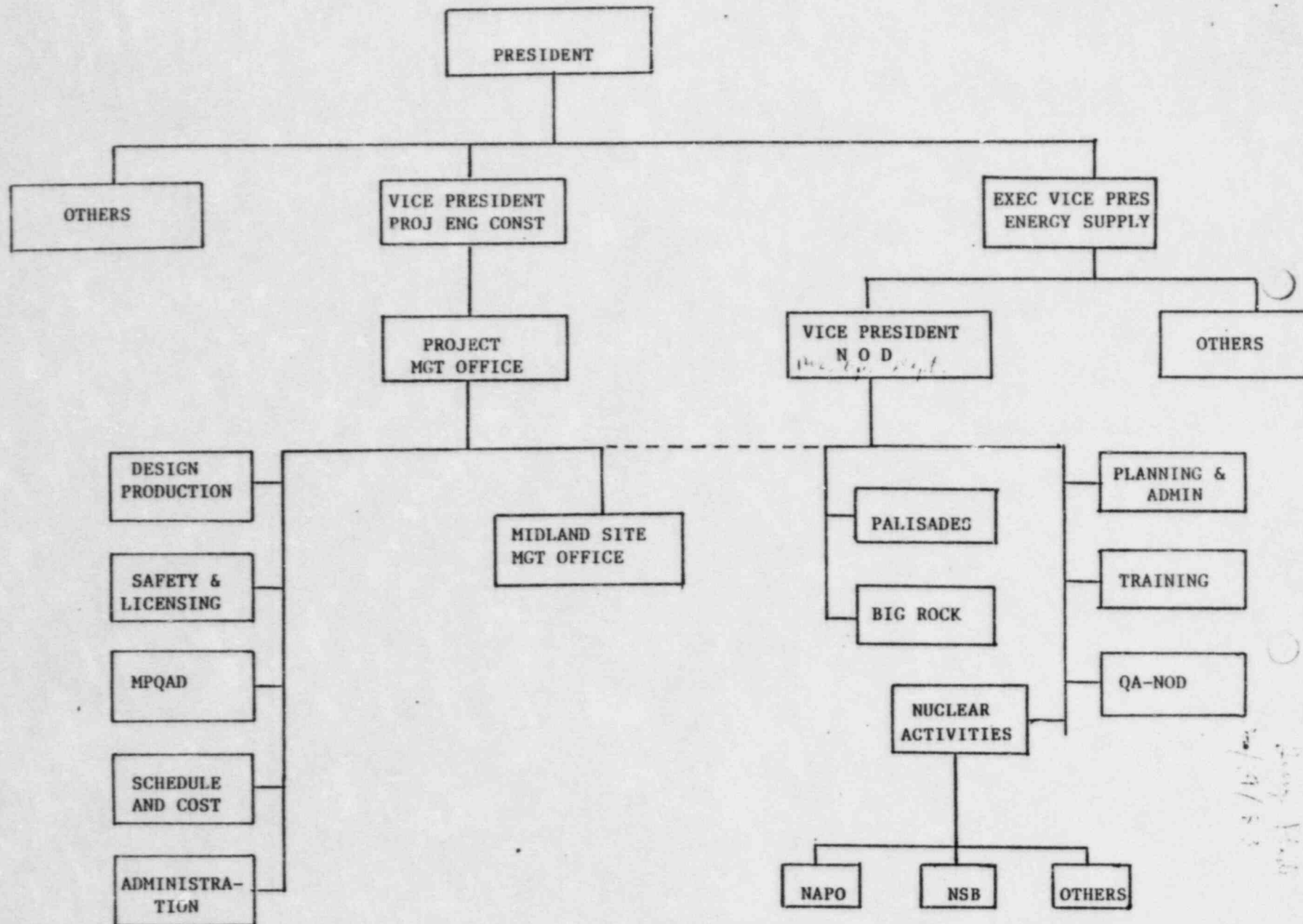
SHEET 4 OF 5



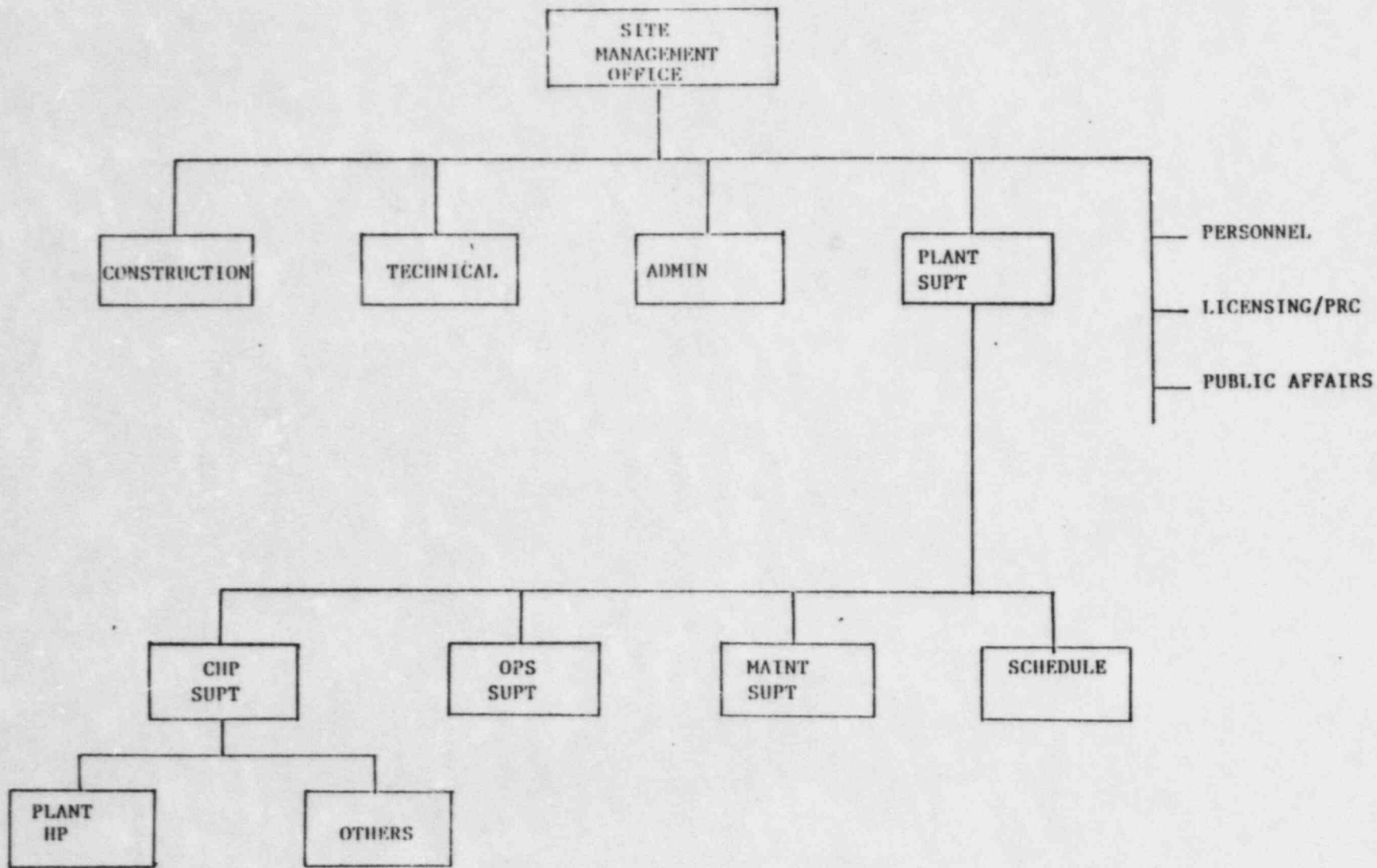
MIDLAND PLANT UNITS 1 & 2  
MODEL FOR NON-HANGER  
RELATED SYSTEM

SHEET 5 OF 5

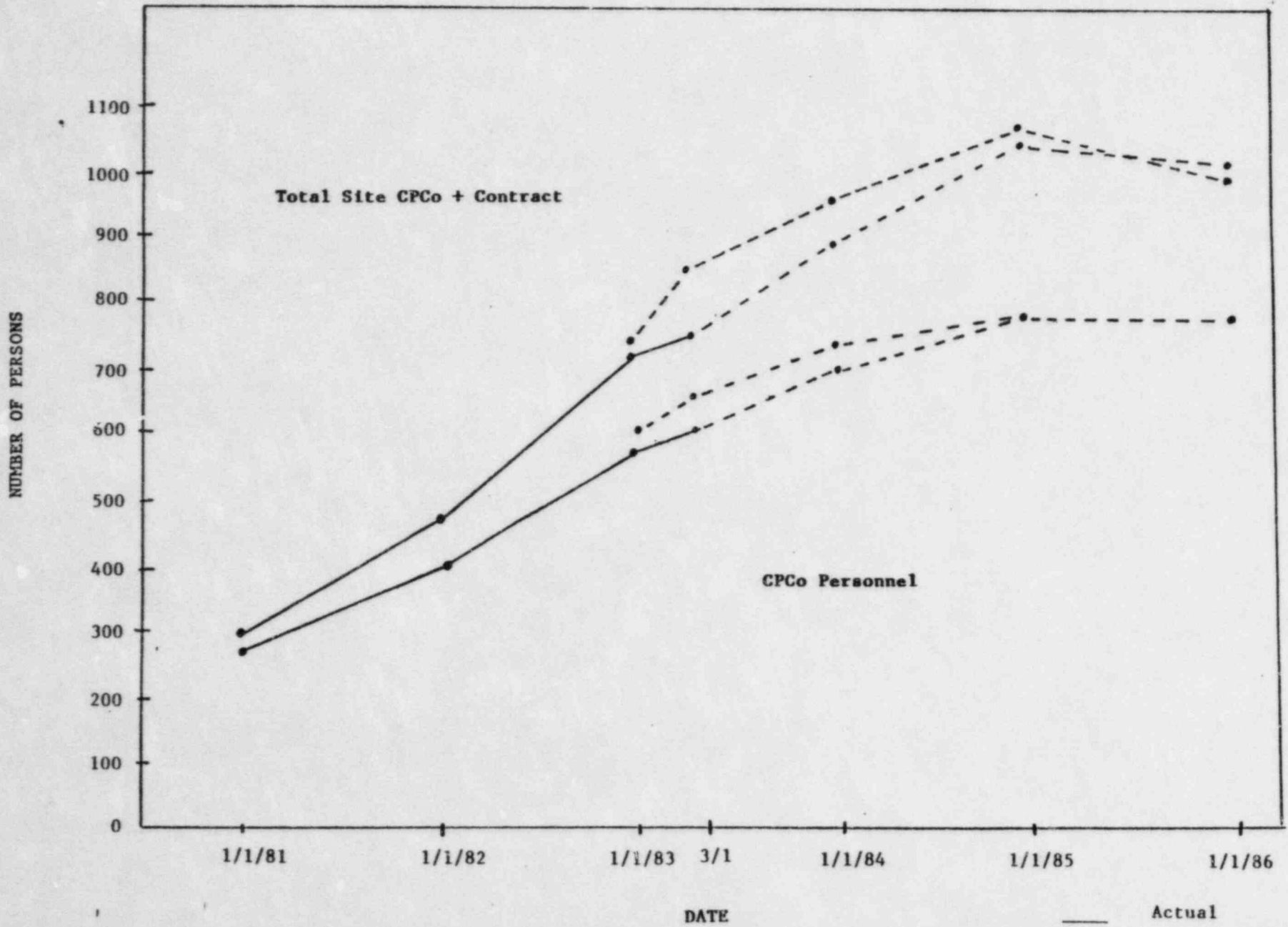




10/1/83  
 J. H. ...



ACTUAL AND ANTICIPATED CPCO AND CONTRACT EMPLOYEES THROUGH 1985



OPERATIONS DEPARTMENT TRAINING STATUS

As of March 31, 1983

	<u>TOTAL</u>	<u>COLD LICENSE</u>		<u>U of M</u>	<u>SIMULATOR</u>	<u>REQUIRED</u>	<u>OBSERVATION</u>
		<u>FUND.</u>	<u>SYSTEM</u>	<u>Rx TRAINING</u>	<u>B&amp;W</u>	<u>SRO MGMT</u>	<u>TRAINING</u>
SS	27	24 * 3	24 ** 3	24 ** 3	20 * 4 ** 3	27	24 *** 3
SE	6	6	6	6	5 ** 1	6	4 *** 2
B/U SE	5	4 * 1	4 ** 1	4 ** 1	4 * 1	4 *** 1	4 *** 1
CO 1	12	12	12	12	12		10 *** 2
CO 2	11	11	11	11	11		***11
AO	26	14 *12	14 **12	15 **11	11 * 2 **13		1 ***25

\* In training  
 \*\* Scheduled  
 \*\*\* Pending

MIDLAND PLANT

PROCEDURE STATUS  
(MARCH 1983)

	<u>NUMBER IDENTIFIED</u>	<u>DRAFT COMPLETE</u>	<u>APPROVED</u>
ADMINISTRATIVE PROGRAM PROCEDURES	305	250 (82%)	213 (70%)
TECH SPEC SURV *	396	3 (1%)	0 (0%)
WORKING LEVEL PROCEDURES			
OPS +	322	320 (99%)	195 (60%)
MAINT	336	312 (93%)	290 (86%)
CHEM	111	109 (98%)	97 (87%)
HP	130	111 (85%)	84 (65%)
TEST PROGRAM	729	610 (84%)	322 (44%)

\* WITHDREW ALL APPROVED PROCEDURES 4TH QUARTER 1982, DUE TO NOD STANDARDS REQUIREMENTS CHANGES.

+ MANY SYSTEM PROCEDURES REQUIRE SUBSTANTIAL REVISION DUE TO CHANGES SINCE ORIGINALLY APPROVED.



EMERGENCY PREPAREDNESS STATUS  
PLANS AND PROCEDURES

EMERGENCY PLAN

- SUBMITTED FEB 1982
- SER ISSUED JUNE 1982
- REVISION PLANNED (*for Emergency*) MAY 1983

IMPLEMENTING PROCEDURES

- 100% DRAFTED
- 65% FINAL

MIDLAND, BAY AND SAGINAW COUNTY EMERGENCY PLANS

- SUBMITTED TO FEMA SEPT 1982
- INITIAL FEMA FINDINGS ISSUED DEC 1982
- RESUBMITTED TO FEMA APRIL 1983

ASLB PREPARATION

- DIRECT TESTIMONY PREPARATION HAS BEGUN

EMERGENCY PREPAREDNESS STATUS

SEP TRAINING

CPCo PERSONNEL

- o 60% 1982
- o REMAINDER 1983

NON-CPCo PERSONNEL

- c HOSPITAL NOV 1982
  - c EMERGENCY ROOM
  - c AMBULANCE ATTENDANTS

REQUALIFICATION

- o SCHEDULED 1983

DRILLS

- o ACTUAL DEC 1982  
FEB 1983
- o PLANNED QUARTERLY

EXERCISES

- o TWO TRAINING TEAMS
- o ACTUAL DEC 1982
  - o INCLUDED GOCC MAR 1983
- o PLANNED QUARTERLY

EMERGENCY PREPAREDNESS STATUS

SEP SYSTEMS/FACILITIES

SYSTEM FACILITY	TESTING COMPLETE	TURNOVER COMPLETE	TURNOVER FORE- CAST DATE
POLICE RADIO LINK	✓		
BULK POWER BASE STATION	✓		
HEALTH PHYSICS BASE STATION	✓		
OPERATIONS REPEATER		✓	
CONSTRUCTION REPEATER		✓	
SECURITY SYSTEM REPEATER		✓	
EMERGENCY YARD LIGHTING		✓	
UNINTERRUPTABLE POWER SUPPLY		✓	
COMMON COMPUTER		✓	
TSC DOMESTIC WATER		✓	
TSC SEWAGE		✓	
TSC UPS		✓	
SECURITY SYSTEM CONSOLES/COMPUTERS		✓	
PLANT ACCESS/SECURITY MONITORING			Nov 1983
PUBLIC ADDRESS GROUPS 1 & 2			DEC 1983
AUX BUILDING RADIATION MONITORS			JAN 1984
PLANT DRMS COMPUTERS			JAN 1984

*Digital Radiation  
monitoring system*

EMERGENCY PREPAREDNESS STATUS

SEP SYSTEMS/FACILITIES

PUBLIC WARNING SYSTEM

- INSTALLATION COMPLETE
- PARTIAL TEST
- IN SERVICE

MAR 1983

MAY 1983

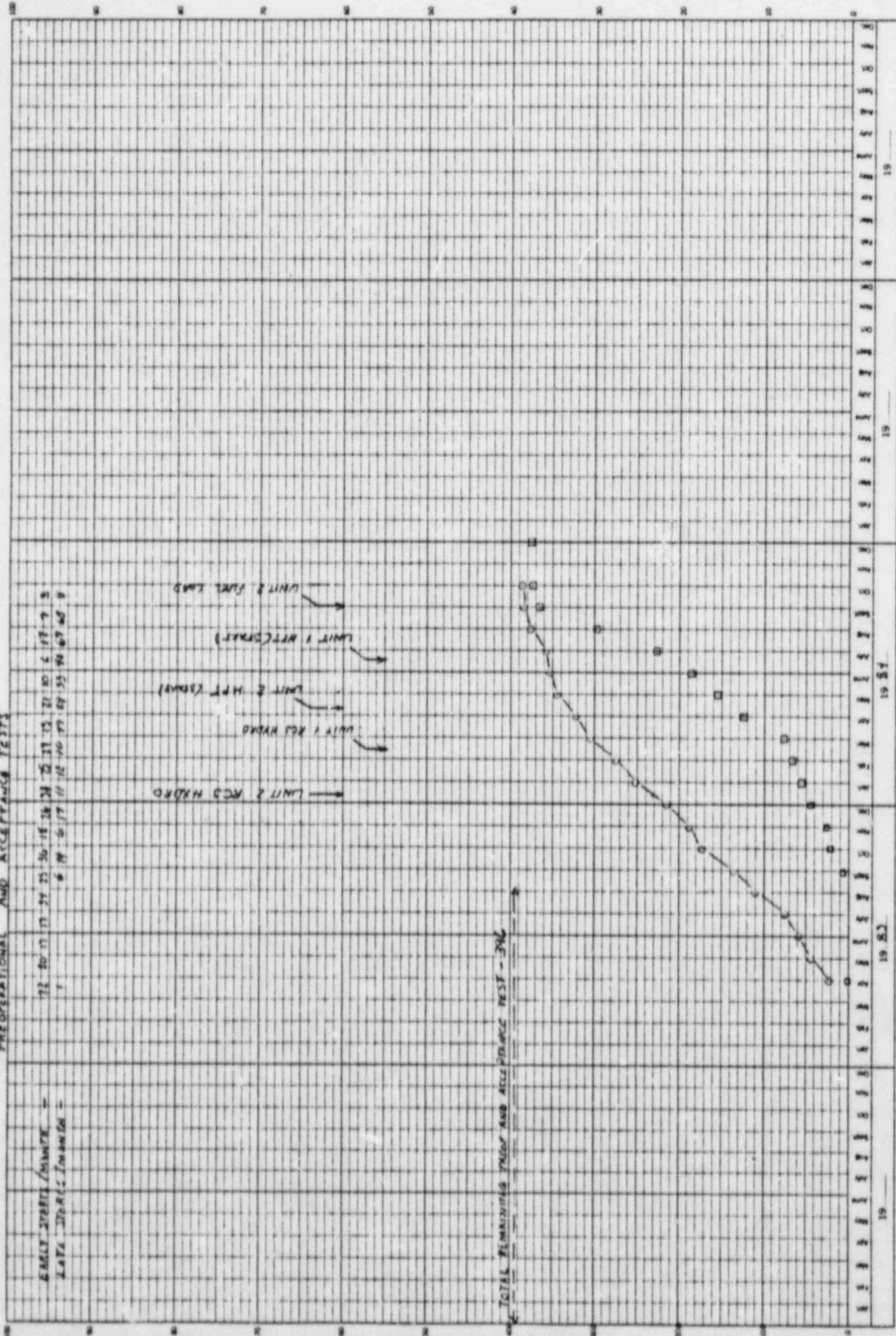
GENERAL OFFICE CONTROL CENTER

- PROCEDURES COMPLETE
- TRAINING COMPLETE
- EXERCISED FOR PALISADES AND BIG ROCK PLANT

EMERGENCY OPERATIONS FACILITY

- PROCEDURES COMPLETE
- COMMUNICATION SYSTEMS INSTALLED
- TRAINING BEGUN

MIDLAND ENERGY CENTER - CONSUMERS POWER COMPANY  
 PREOPERATIONAL AND ACCEPTANCE TESTS



R. Keeling  
4/11/73

INDEPENDENT THIRD PARTY REVIEWS

Independent Design Verification (IDV)

Construction Implementation Overview (CIO)

Soils Remedial Activities

IDV

(a) System Selection

- Aux FW
- Electric Power System (Diesel Gen)
- HVAC (Control Room Habitability)

(b) Scope (Design)

- Review of Design Criteria & Commitments
- Review of Implementation Documents
- Review of Calculations & Evaluations
- Evaluation of Drawings & Specifications

(c) Scope (Construction)

- Review of Supplier Documents
- Review of Storage & Maintenance Documents
- Review of Construction Installation Documents
- Review of Selected Verification Activities
- Verification of Physical Configuration

(d) Expansion of Scope Possible if Generic Findings

(e) Status

Started 11/82

Meetings 10/25/82, 2/8/83, 4/13/83 With NRC

PGAM Issued 11/11/82

Findings & Protocol (Region III letter 3/28/83)

CIO

(a) Purpose *Control CCP*

(b) Scope

- Development of An Assessment Program and Preparation of a Project Quality Plan
- Assessment of Adequacy & Compliance with CCP Procedures and Inspection Plans
- Monitoring of the Implementation of the CCP by Evaluating:
  - Conformance of Installed Hardware to Design Info in Specs & Drawings
  - Completeness of CP Co & Bechtel's Procedures Regarding Construction Activities Personnel Qualifications, Training Programs, and Organizational Practices
  - Compliance of CCP Teams With Prescribed Procedures
  - Compliance of QA Personnel With Applicable Procedures
  - Compliance of Construction Activities with Applicable Procedures.
  - Audits of Management Reviews of CCP & Hold Points

(c) Protocol

(d) Status

- Selection of S&W
- April 6, 1983 Letter to Keppler
- Drafting PQAM
- On Site 4/20/83



*R. 1/16/83*

CCP QUALITY ACTIVITIES

<u>ACTIVITY</u>	<u>STATUS</u>
. QC INTEGRATION WITH MPQAD	COMPLETED 1-17-83
. VERIFICATION OF QUALITY	
- PQCI REVISIONS	ONGOING <i>start</i>
- INSPECTOR TRAINING/RECERTIFICATION	ONGOING
- DEVELOPMENT OF QUALITY VERIFICATION PLAN	MGMT REVIEW 4-29-83
- PROCEDURE REVIEW AND DEVELOPMENT	ONGOING
. SUPPORT OF Q SYSTEM TEAMS	
- ORGANIZATIONAL ALIGNMENTS	IN PROGRESS
- PROCEDURE REVIEW/APPROVAL	ONGOING
- MPQAD INTERFACE PROCEDURES	IN PROGRESS
- IN PROCESS INSPECTION PLAN	IN PROGRESS
. PROGRAMMATIC REVIEWS	REPORT TO MGMT 5-18-83
. HANGER REINSPECTION	
- 100% REINSPECTION OF 7000 HANGERS	IN PROGRESS
- OVER 50 INSPECTORS DEDICATED	STAFFING IN PROGRESS

*7 5/1/inspector*

## REINSPECTION SCOPE AND ASSUMPTIONS

### SCOPE

- 139,000 CLOSED IR'S REPRESENT POPULATION
  - COMBINED PQCI'S
  - RECEIPT INSPECTION
  - DOCUMENT REVIEW
  - OVERINSPECTIONS PREVIOUSLY DONE
- 101,500 CLOSED IR'S SUBJECT TO VERIFICATION (EST)
  - 79,500 HARDWARE REINSPECTION
  - 22,000 PRIMARILY DOCUMENTATION REVIEW

### ASSUMPTIONS

- PLANNING BASED UPON 45,000 UNITS OF REINSPECTION
- 4 INSPECTION HOURS PER UNIT (AVG) REQUIRED FOR REINSPECTION
- WORK FORCE OF 250 TO 350 INSPECTORS
- SCHEDULE BASED UPON <sup>Equivalent</sup> 7 DAY WEEK AND 5 INSP-HOURS PER DAY
- NRC APPROVAL OF CCP IN MAY

CUMULATIVE REINSPECTION MAN HOURS  
FOR VERIFICATION PHASE

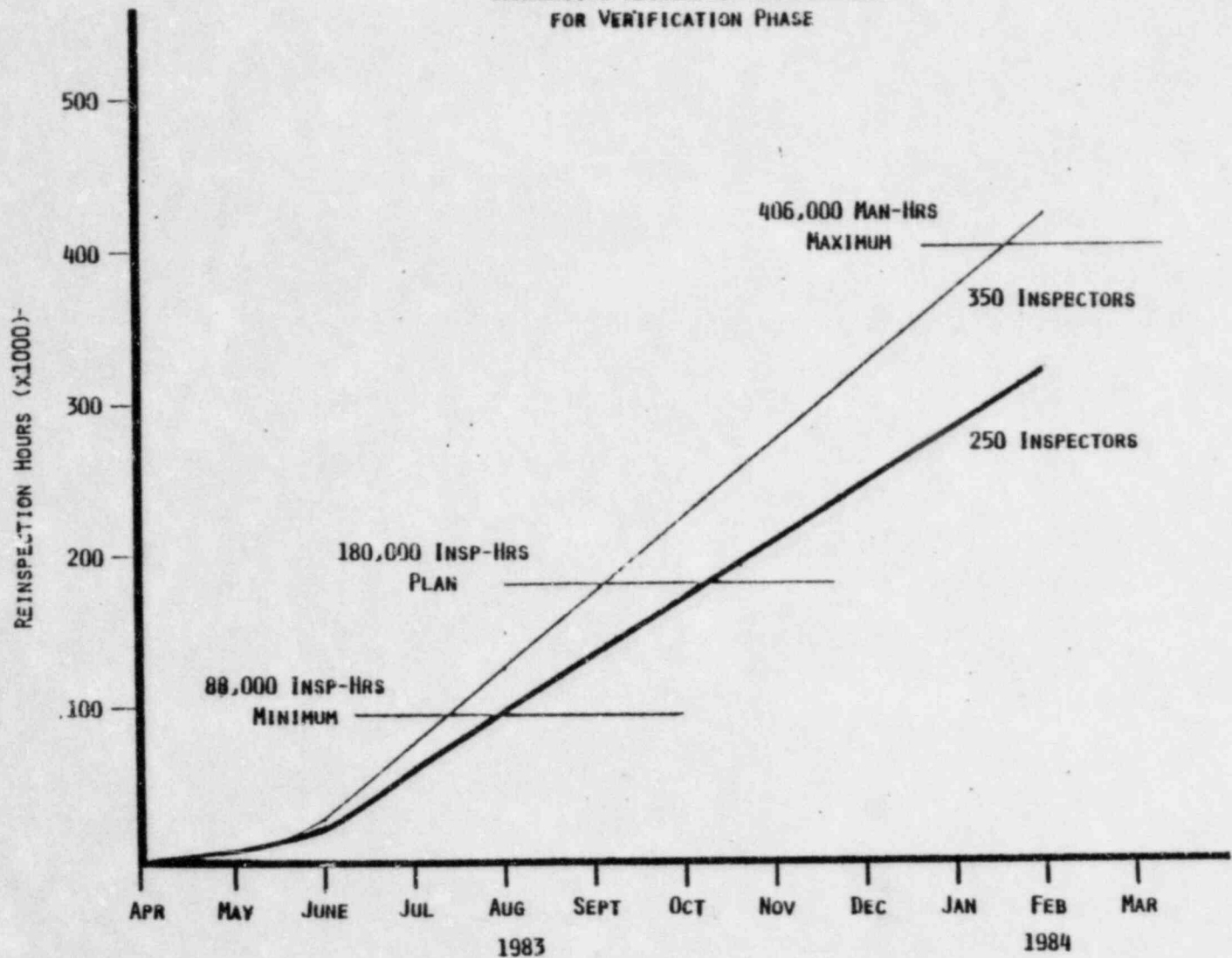
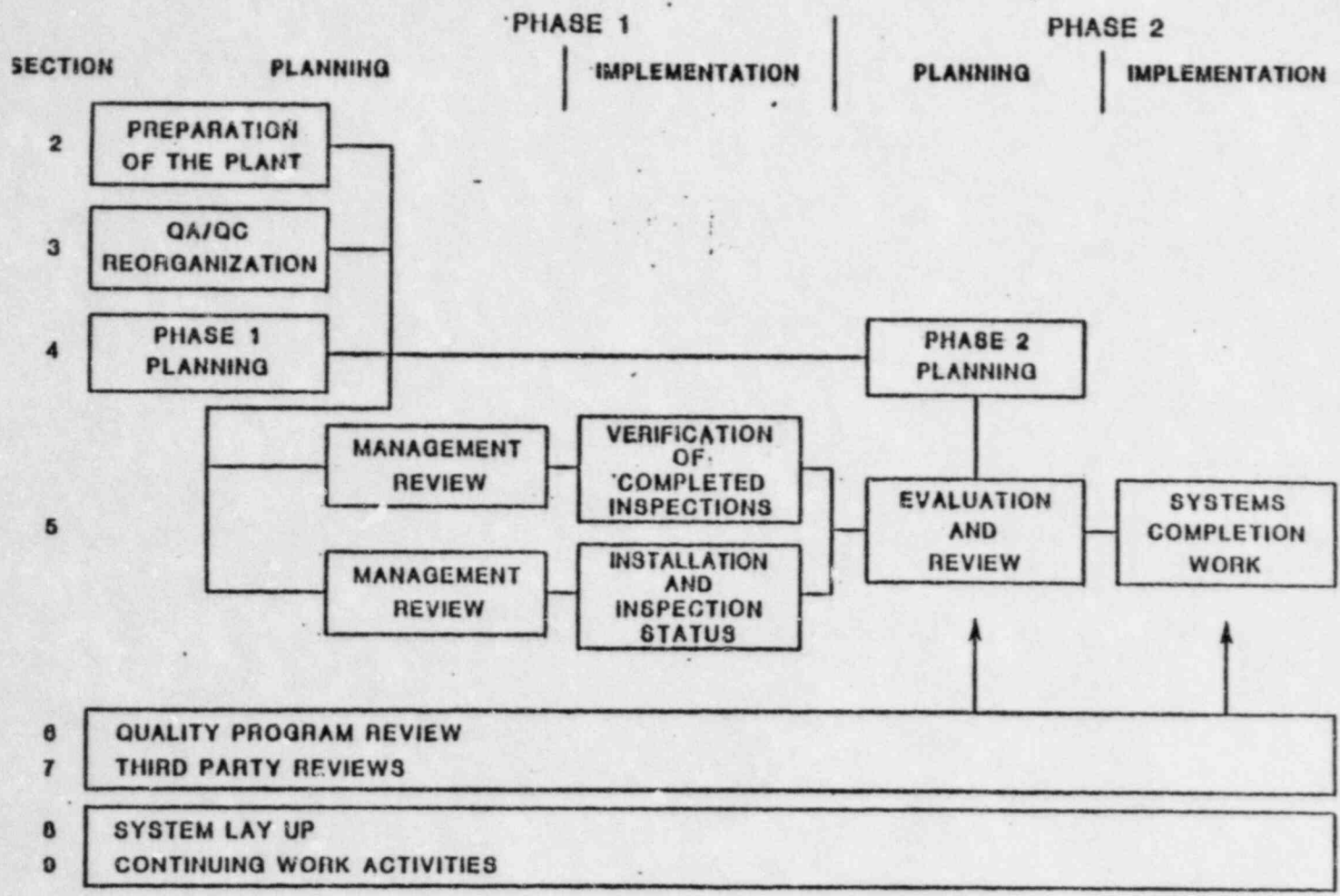


FIGURE 1-1  
CONSTRUCTION COMPLETION PROGRAM SCHEMATIC



BASIC CCP ELEMENTS

SYSTEM TURNS

1. TOTAL TO-GO . . . . . 310

Q-SYSTEMS TO-GO . . . . . 187

RECHTEL 134

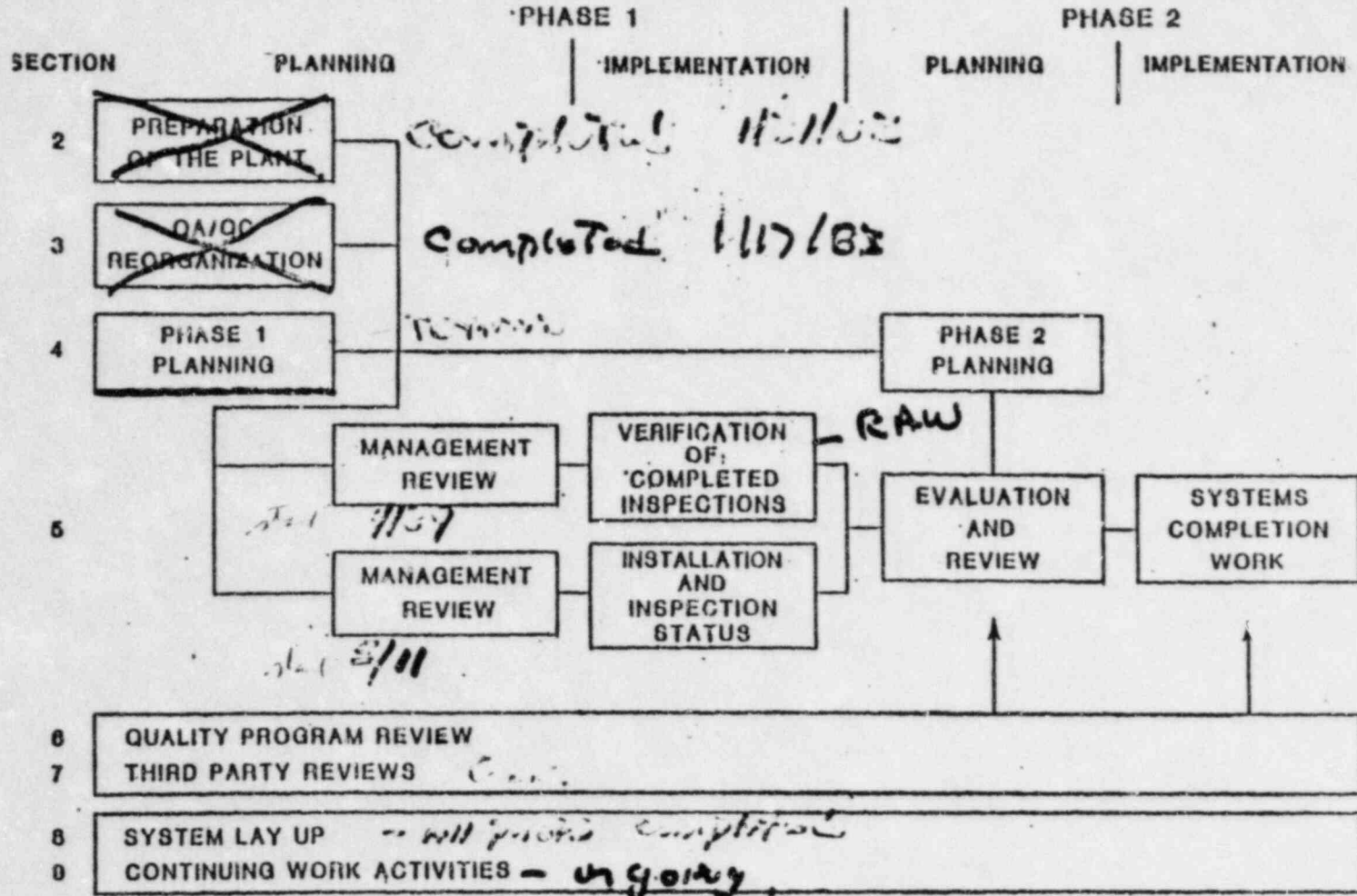
B&W CONSTRUCTION 8

ZACK 45

187

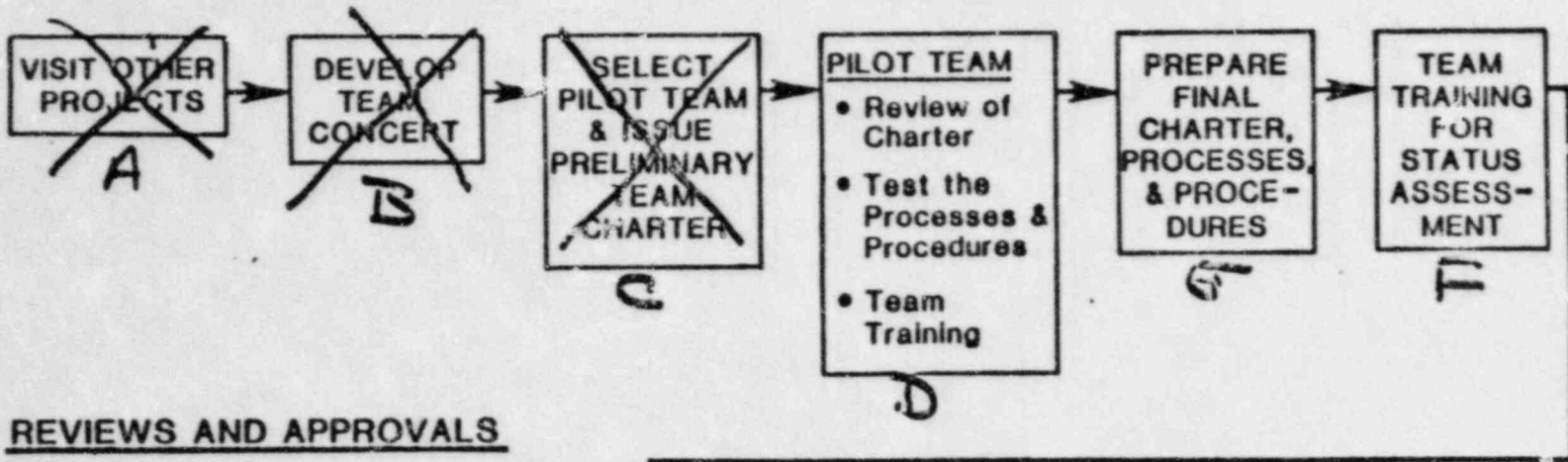
NON-Q SYSTEMS TO-GO . . . . . 123

FIGURE 1-1  
CONSTRUCTION COMPLETION PROGRAM SCHEMATIC

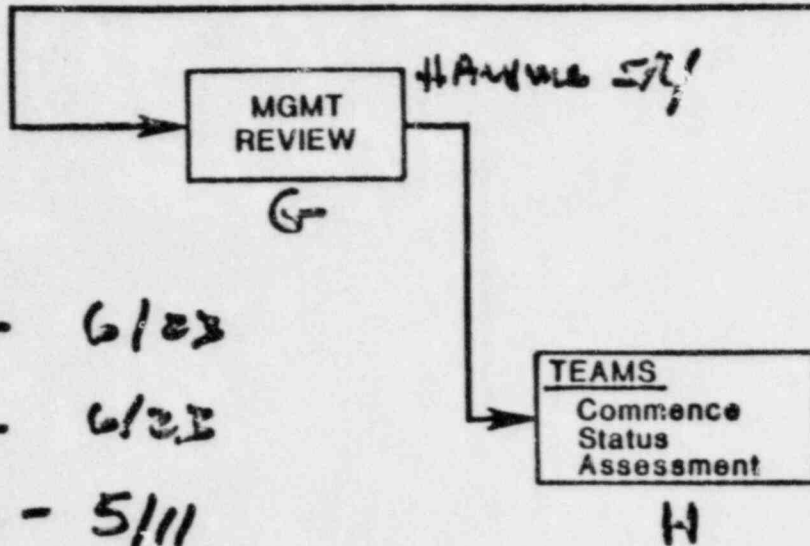


SYSTEM TEAM DEVELOPMENT

ORGANIZATIONAL PROCESS & PROCEDURE DEVELOPMENT



REVIEWS AND APPROVALS



COMMENCE WORK

Systems - 6/23  
ANWIS - 6/23  
HAWKINS - 5/11

SECTION 9.0  
CONTINUING WORK ACTIVITIES

**DESCRIPTION:** THOSE ACTIVITIES THAT HAVE DEMONSTRATED EFFECTIVENESS IN THE QUALITY PROGRAM IMPLEMENTATION WILL CONTINUE DURING IMPLEMENTATION OF THE CONSTRUCTION COMPLETION 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 THE NRC
6. DESIGN ENGINEERING WILL CONTINUE AS WILL ENGINEERING SUPPORT OF OTHER PROJECT ACTIVITIES



*J. P. [unclear]*  
*4/19/82*

## MAJOR EVENTS SINCE AUGUST, 1981

- CCP Initiated - December, 1982
- Remedial Soils Work Start - August, 1982
- Turnover First System for Cold Hydro - May 1982
- Completed 500 Turnovers - October, 1982
- Placed HP Boilers in Service - August, 1982
- Turbine - Generators on Turning Gear - Unit 2 June, 1982  
Unit 1 November, 1982
- Commenced Area Turnovers for CPGCo Control

*Completed Support Center*  
*Starting Emergency Planning*

CONSUMERS POWER COMPANY

MIDLAND UNITS 1 & 2

BULK COMMODITY COMPARISON

COMMODITY	CURRENT ESTIMATE	% COMPLETE 3/27/83	PREVIOUS ESTIMATE	% COMPLETE 7/26/81	ESTIMATE INCREASE/DECREASE
Large Pipe	280,000	99	282,000	94	(2,000)
Small Pipe	325,350	95	307,550	78	17,800
Large Pipe Hangers	15,834	92	15,350	82	484
* Small Pipe Hangers	18,260	80	17,740	43	520
Cable Tray	93,300	99	85,000	96	8,300
Exposed Metallic Conduit	610,000	90	554,000	76	56,000
Wire and Cable	10,750,000	93	10,300,000	58	450,000
* Connections	356,000	81	385,000	32	(29,000)
* Instrument Tubing	175,000	65	205,000	22	(30,000)

1-108

CONSUMERS POWER COMPANY

MIDLAND UNITS 1 & 2

BULK COMMODITY STATUS

(AS OF 3/27/83)

COMMODITY	UNIT	TOTAL QUANTITY			INSTALLED TO-DATE		
		1	2	TOTAL	1	2	TOTAL
<u>PIPING</u>							
Large Pipe	LF	85,525	194,475	280,000	84,855	192,470	277,325
Small Pipe	LF	110,277	215,073	325,350	105,306	204,960	310,266
Large Pipe Hangers	EA	5,064	10,770	15,834	4,623	9,965	14,588
Small Pipe Hangers	EA	5,930	12,330	18,260	5,042	9,648	14,690
<u>ELECTRICAL</u>							
Cable Tray	LF	N/A	N/A	93,300	N/A	N/A	92,574
Exp. Metallic Conduit	LF	141,463	468,537	610,000	131,918	419,378	551,296
Wire and Cable	LF	N/A	N/A	10,750,000	N/A	N/A	9,946,929
Connections	EA	N/A	N/A	356,000	N/A	N/A	288,690
<u>INSTRUMENTATION</u>							
Tubing	LF	N/A	N/A	175,000	N/A	N/A	113,890

CONSUMERS POWER COMPANY  
MIDLAND PLANT UNITS 1 & 2

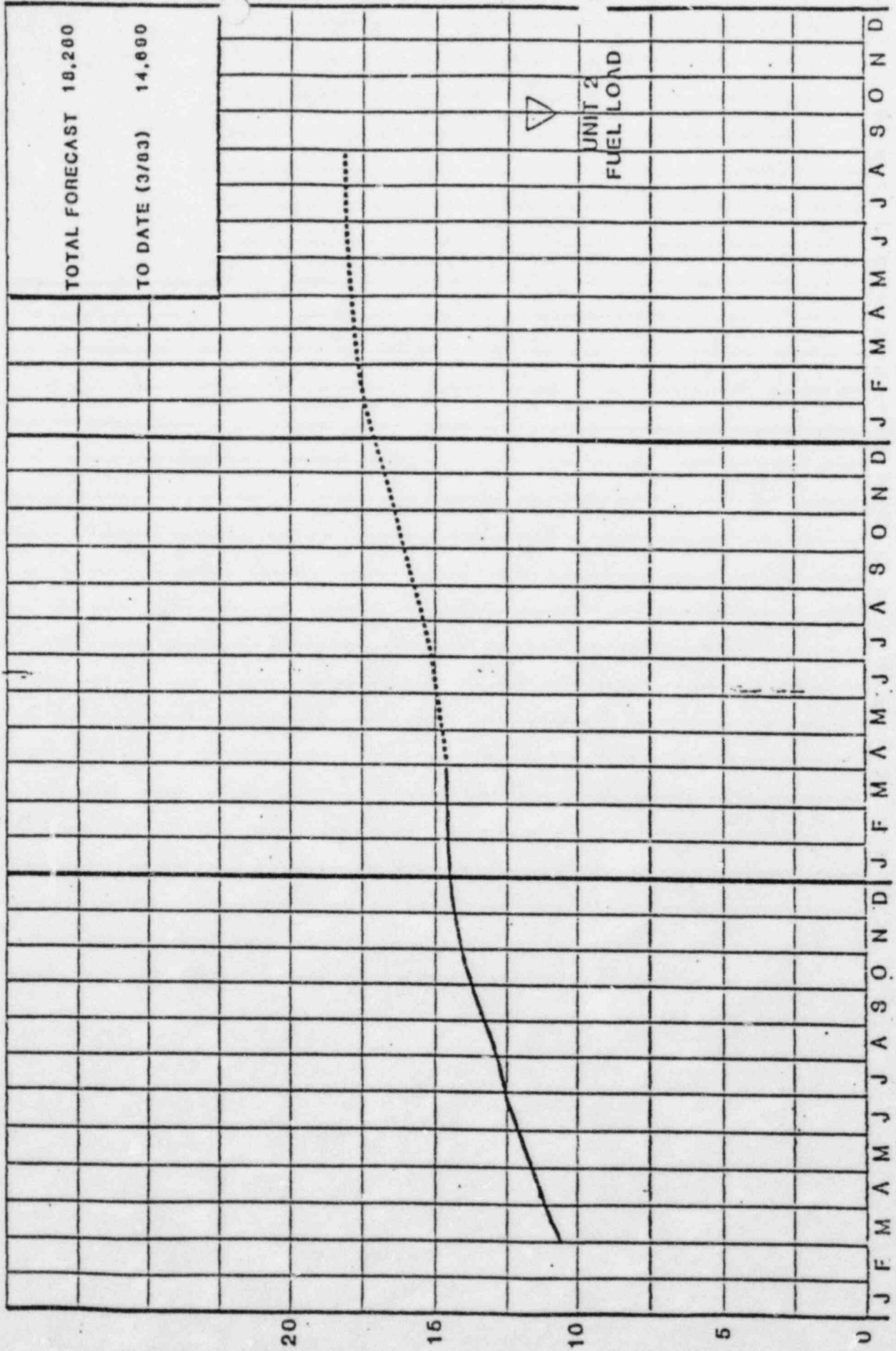
PEAK INSTALLATION RATES  
OVER FIVE MONTH PERIOD

	SMALL PIPE HANGERS	CONNECTIONS	INSTRUMENT TUBING
ACTUAL AVERAGE PEAK RATE (SEPT. 81 THROUGH JAN. 82)	515/MO	13,737	9175
ACTUAL VS. FORECAST (OLD)	54%	72%	57%
ACTUAL VS. FORECAST (NEW)	186%	181%	115%

7220 MIDLAND UNITS 1 & 2  
 CONSUMERS POWER COMPANY  
 SMALL PIPE HANGER  
 INSTALLATION



THE TO GO INSTALLATION IS BASED  
 ON REQUIREMENTS TO SUPPORT THE  
 PROJECT REPLANNING SCHEDULE



TOTAL FORECAST 18,200  
 TO DATE (3/83) 14,600

UNIT 2  
 FUEL LOAD

1984

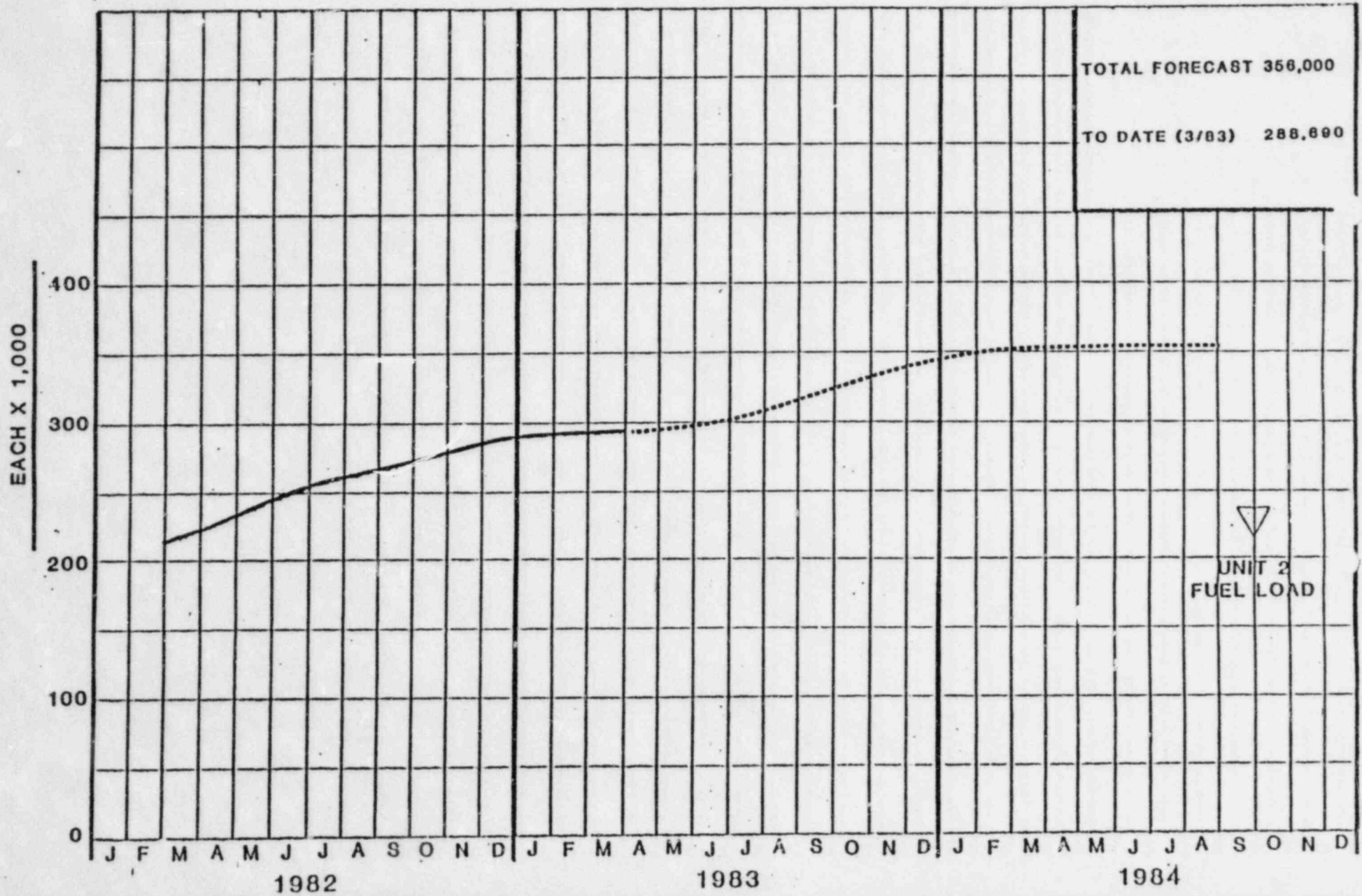
1983

1982



7220 MIDLAND UNITS 1 & 2  
CONSUMERS POWER COMPANY  
TERMINATION  
INSTALLATION

THE TO GO INSTALLATION IS  
BASED ON REQUIREMENTS TO  
SUPPORT THE PROJECT RETAINING  
SCHEDULE

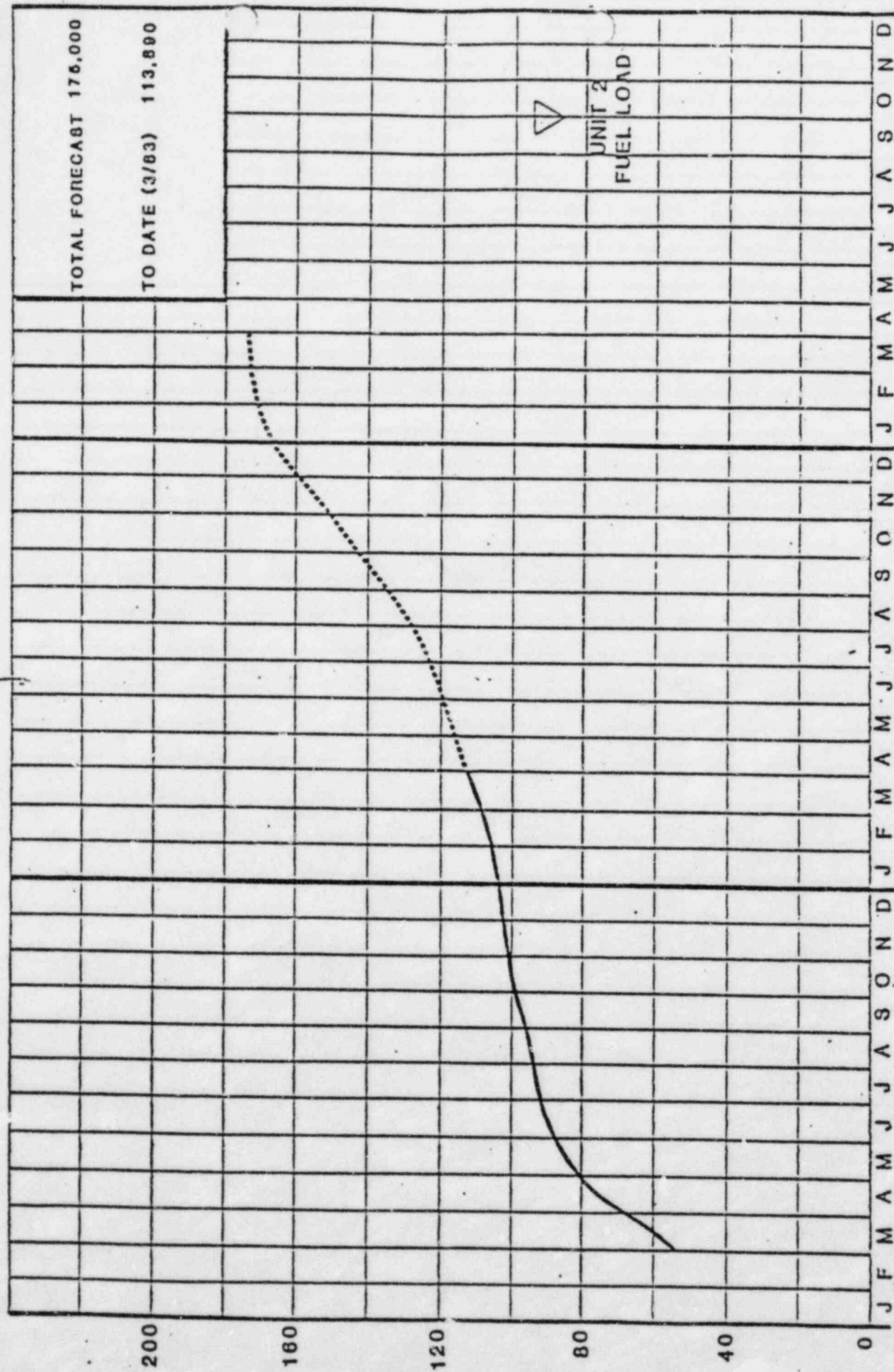


7220 MIDLAND UNITS 1&2

CONSUMERS POWER COMPANY

### TUBING INSTALLATION

THE TO GO INSTALLATION IS BASED  
ON REQUIREMENTS TO SUPPORT  
THE PROJECT REPLANNING SCHEDULE



TOTAL FORECAST 176,000

TO DATE (3/83) 113,800



UNIT 2  
FUEL LOAD

1984

1983

1982

CONSUMERS POWER COMPANY

MIDLAND UNITS 1 & 2

PRODUCTIVITY

(AS OF MARCH 27, 1983)

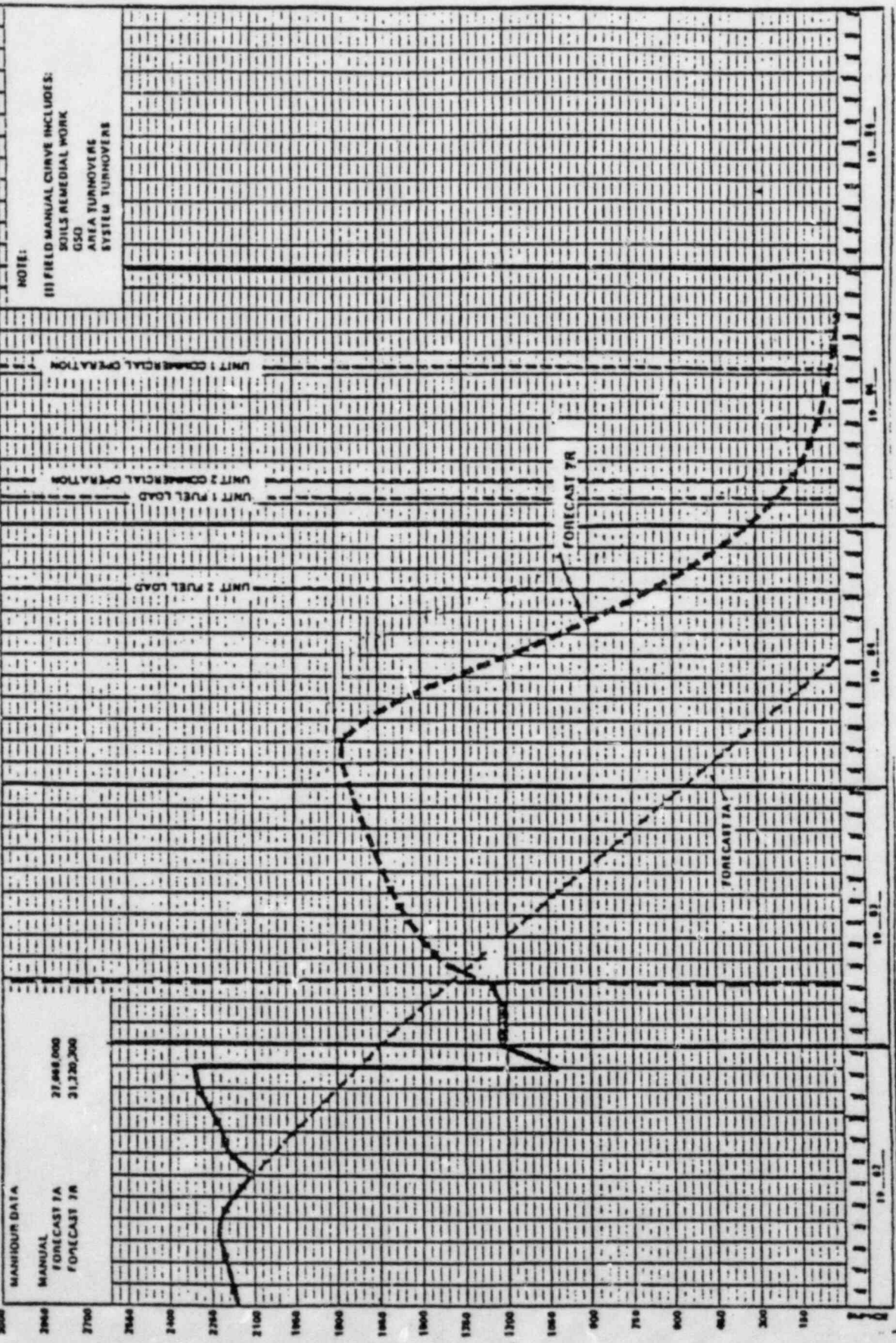
<u>COMMODITY</u>	<u>PERFORMANCE FACTOR TO-DATE</u>	<u>UNIT RATES TO-DATE</u>
Large Pipe	1.00	5.48 MH/LF
Small Pipe	0.99	4.56 MH/LF
Large Pipe Hangers	1.05	120.84 MH/EA
Small Pipe Hangers	1.04	45.23 MH/EA
Conduit	0.97	1.83 MH/LF
Wire and Cable	0.92	0.08 MH/LF
Connections	0.93	0.91 MH/EA

PERFORMANCE FACTOR =  $\frac{\text{Actual Manhours}}{\text{Calculated Manhours}}$



ACTUAL AS OF 3/1/83  
MANUAL: 26,840,317

MIDLAND UNITS 182 JOB 272C  
MANPOWER CURVE: TOTAL FIELD MANUAL  
PEOPLE ON PAYROLL



PEOPLE ON PAYROLL

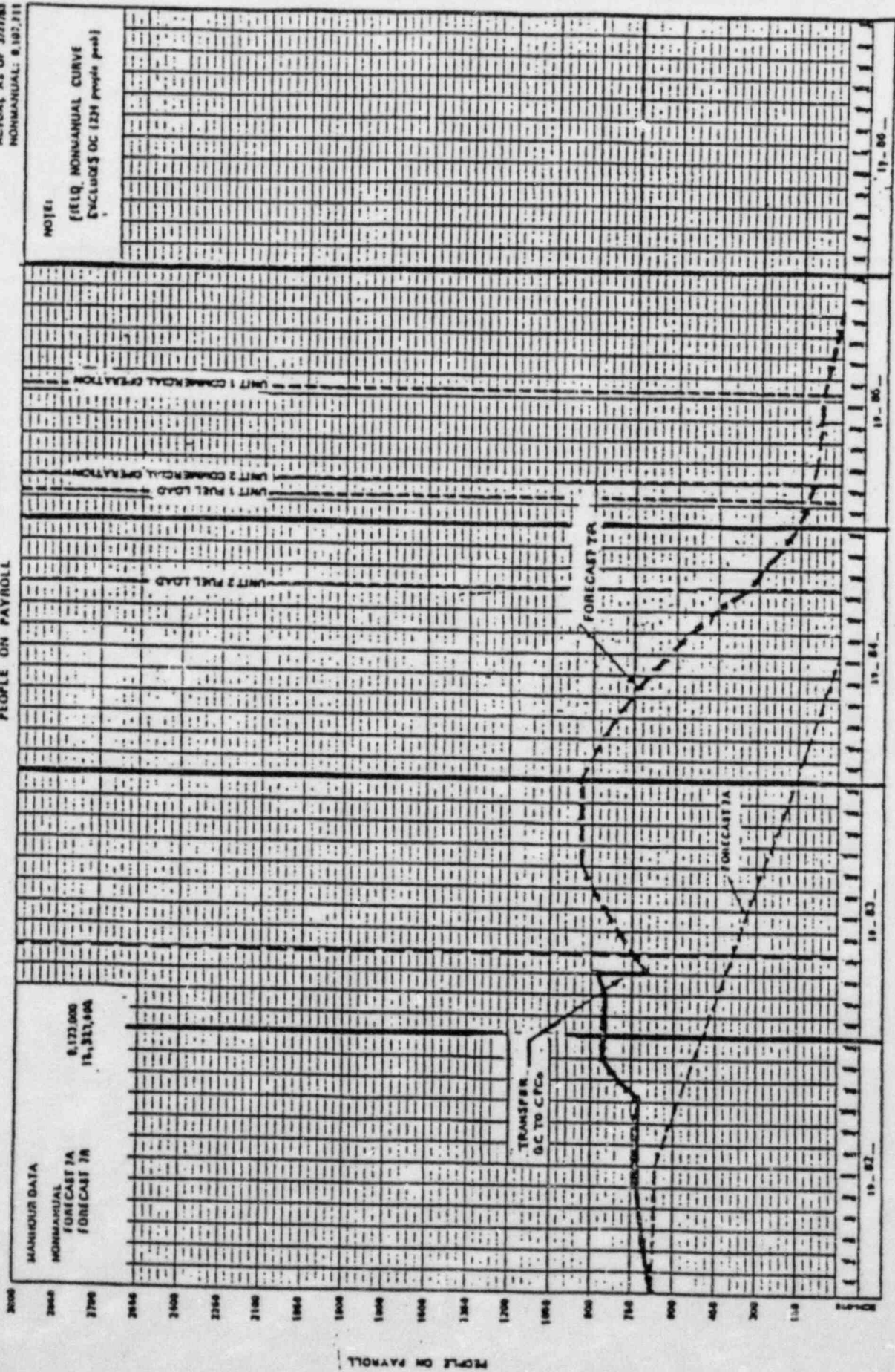
# SIGNIFICANT CRAFT

## MANPOWER STATUS

	PIPEFITTERS	ELECTRICIANS
CURRENT	357	275
PEAK FORECAST	670	500
AVAILABILITY	416	650
CONTRACT EXPIRATION	April 30, 1984	May 31, 1983

MIDLAND UNITS 162 JOB 7278  
 MANPOWER CURVE: TOTAL FIELD NONMANUAL  
 PEOPLE ON PAYROLL

ACTUAL AS OF 3/21/83  
 NONMANUAL: 8,192,211



PEOPLE ON PAYROLL

## CURRENT PROBLEMS

1. CCP - RESTART OF WORK
2. REMEDIAL SOILS WORK
3. HVAC
4. HANGER INSTALLATION
5. PENETRATION SEALING

CP - 105 - 7

MIDLAND PLAN  
PLANT TWO UNIT STARTUP  
AUG 1965

NO.	DESCRIPTION	DATE	BY
1	ASSEMBLED	10/27/64	...
2	...	...	...
3	...	...	...
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- ▲ UNIT 100

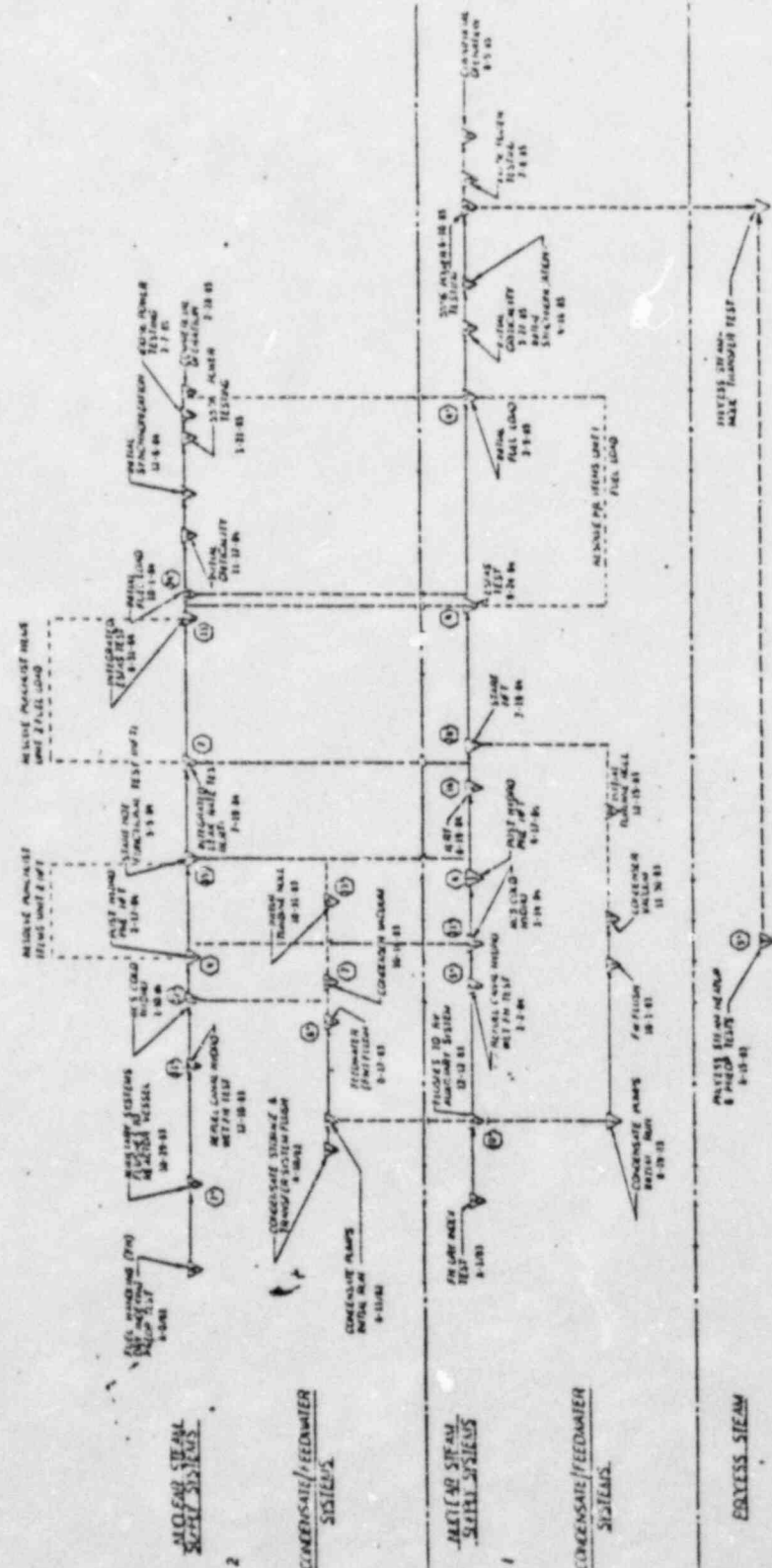
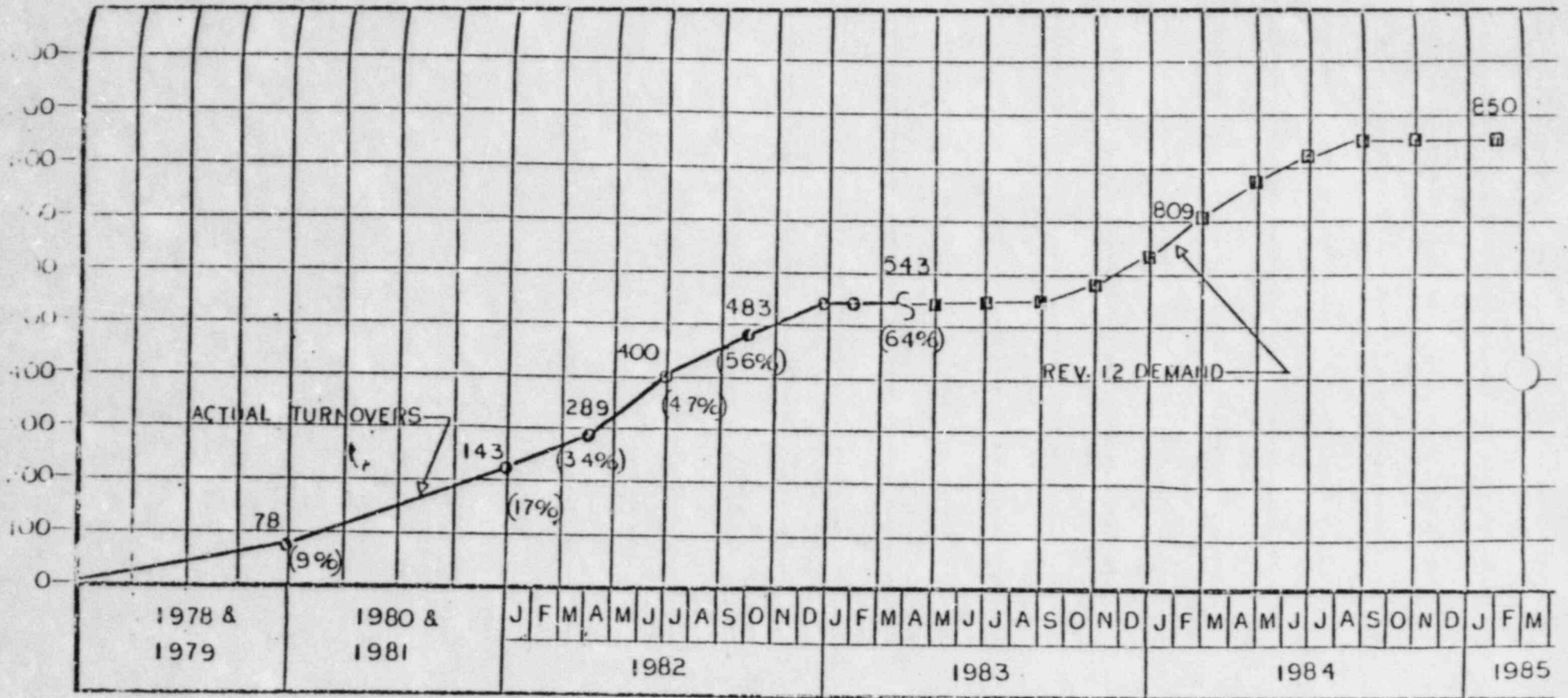


Table 2  
TEST COMPL

Table 1  
PROC. STATUS

MIDLAND STEAM SYSTEMS  
CONDENSATE/FEEDWATER SYSTEMS  
MAIN STEAM SYSTEMS  
CONDENSATE/FEEDWATER SYSTEMS  
EXCESS STEAM  
SITE EMERGENCY PLAN  
UNIT 1  
UNIT 2



ACTUAL TURNOVERS AND REV. 12 DEMAND TURNOVER CURVE

FIGURE 1

DISCIPLINE

GENERIC CHECKOUT  
PERCENT COMPLETE

ELECTRICAL 83

I & C 37

TURBINE/HVAC 24

FEEDWATER/CONDENSATE 25

NSSS 4

AUXILIARY SYSTEM 8

PROCESS STEAM 15

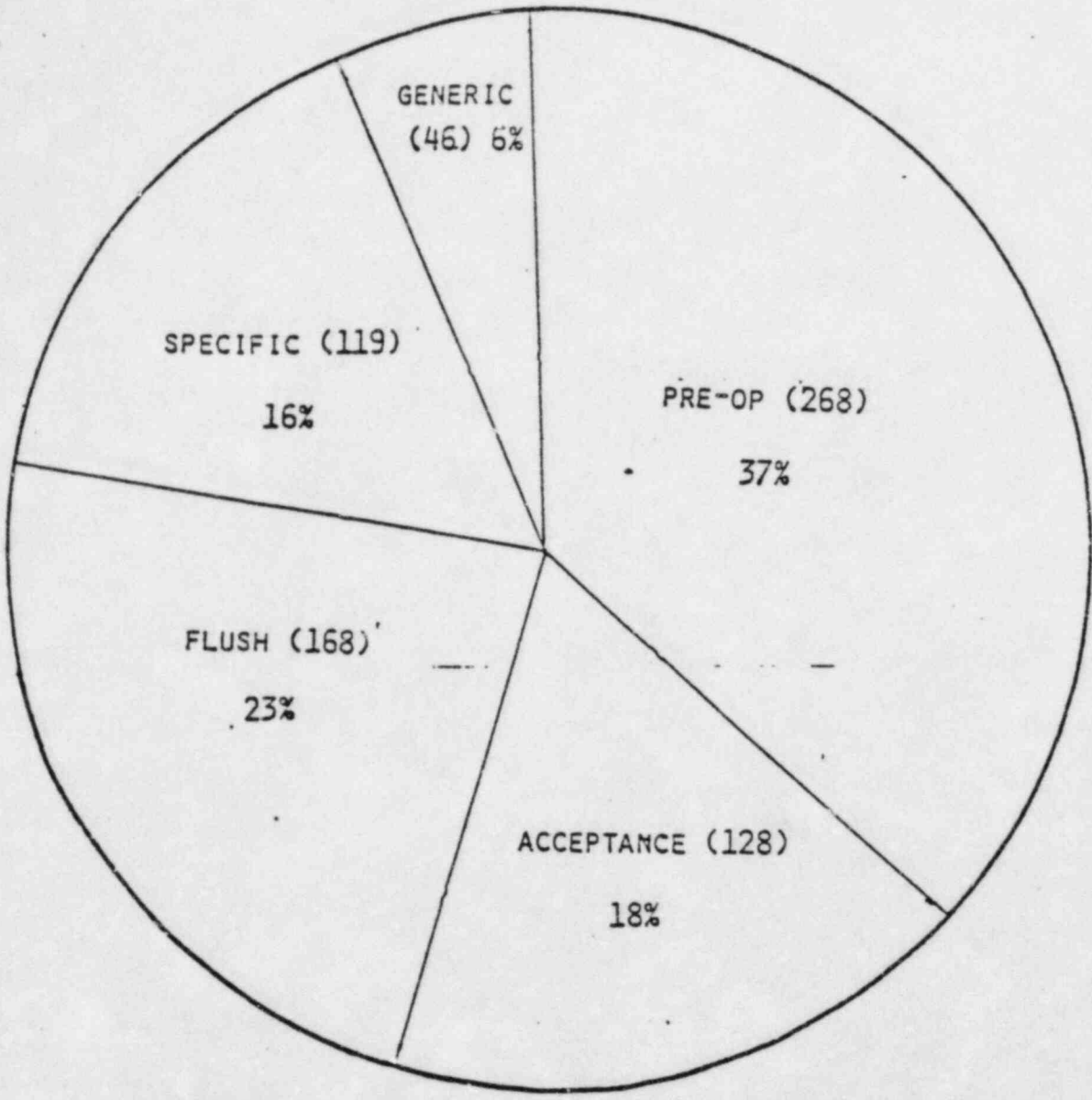
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TOTAL SYSTEM CHECKOUT COMPLETE 45%

SYSTEM CHECKOUT STATUS - (3-31-83)

ET #  
0329  
0330

--  
00329  
00330



TEST PROCEDURES - PROCEDURE TYPES  
(729) (5)



	<u>COMPLETED</u>	<u>STARTED/NOT COMPLETE</u>
RE-OPERATIONAL TESTS <sup>221</sup> 268	0	2
ACCEPTANCE TESTS 128	1	0
SYSTEM FLUSHES	16	17
SPECIFIC TESTS	9	23
	<hr/>	<hr/>
TOTAL	26	42

TOTAL TESTS REQUIRED

(EXCLUDING GENERIC TESTS) 683

% TEST COMPLETE = 4

TESTS COMPLETED - (3-31-83)

*Jim Post*  
4/14/83

## **OVERALL PROCUREMENT STATUS**

- **DELIVERED TO JOBSITE**
  - **Approximately 97% of Valves; Balance Due by 9/83**
  - **Approximately 98% of Instrumentation; Balance Due by 8/83**
  - **Approximately 92% of Hangers; Balance to Be Released During Remainder of 1983**
  - **Approximately 99% of Power and Control Cable; Balance Due by 6/83**

## INCOMPLETE MAJOR PURCHASES

P.O. NO.	DESCRIPTION (Vendor)	STATUS
J-244/ J-285	Radiation Monitoring (Victoreen)	Complete Delivery by 8/83 with Exception of New Q Modules. New Q Modules to be Delivered First Quarter of 1984
M-56	Chilled Water Pumps and Motors (Goulds/Reliance Electric)	Complete Delivery by 9/83
M-146	Chiller Upgrade (Carrier Corporation)	Complete Delivery by 8/83
M-154/ M-387	Halon and Tornado Dampers (Pacific Air Products)	Complete Delivery by 7/83
M-224	Unit Coolers (American Air Filter)	Complete Delivery by 9/83
M-238	MSIV Electrical Modifications (Bonney Forge Engineered Valve Division)	Complete Delivery by 7/83
M-106	Hanger Components (ITT Grinnell)	Deliveries to Continue Through Balance of 1983 as Released by Engineering

*Fred Rudman*

## PERCENT COMPLETE

March 1983  
Current  
Forecast

---

• ALL ENGINEERING	76%
• DESIGN	94%
• Cable Routed Complete	99%
• Exposed Metallic Conduit Issued	93%
• Small Pipe Issued	99%
• Small Pipe Supports Issued	95%
• Large Pipe Supports Issued	97%

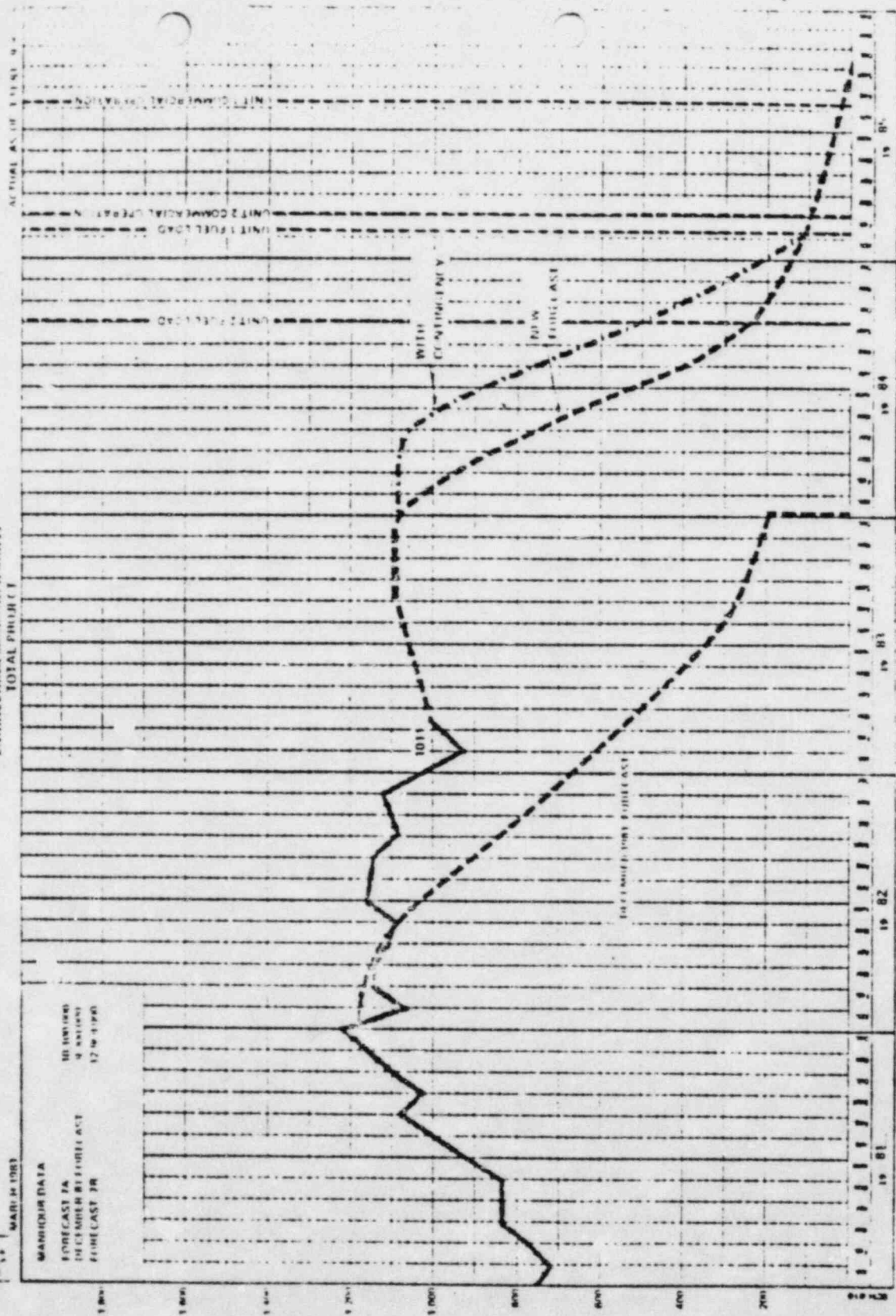
MIDLAND PLANT UNITS 1 AND 2 - JOB 7220  
**ENGINEERING MANHOUR CHANGES**  
 THROUGH DECEMBER 1982  
 (Reconciliation from December 1981 Forecast)

Item Description	Manhours (1,000s)	Total
<b>DECEMBER 1981 FORECAST</b>		2,900
1 SCHEDULE CHANGE	1,100	
2 HVAC	338	
3 SOILS	267	
4 LARGE PIPE	212	
5 SMALL PIPE	133	
6 SPACE CONTROL GROUP	109	
7 HELBA	100	
8 CONSTRUCTION COMPLETION PROGRAM	77	
9 SPATIAL SYSTEM INTERACTION	77	
10 STRUCTURAL VERIFICATION	60	
11 Q DEVICES IN NON-Q-COOLED AREAS	52	
12 EQUIPMENT ENVIRONMENTAL QUALIFICATION	49	
13 NRC BULLETIN 79-14	49	
14 INCORPORATION OF CHANGE DOCUMENTS	48	
15 SORT	41	
16 SEISMIC ANALYSIS OF CABLE TRAY SUPPORTS	36	
17 GENERAL FCRI/FCN CONSTRUCTION SUPPORT	35	
18 FILE CLOSEOUT AND JOB CLEANUP	35	
19 RELOCATION OF RESIDENTS	34	
20 EMBED ANALYSIS	25	
21 CONTROL ROOM MODIFICATIONS	25	
22 CAR DISPOSITIONS	22	
23 RESOLUTION OF MIOSHA INTERFERENCES	21	
24 INDEPENDENT DESIGN REVIEWS	18	
25 OE ACTIVITIES	15	
26 NRC HEARINGS/QUESTIONS SUPPORT	10	
27 MISCELLANEOUS NON-SCOPE CHANGES	92	
28 MISCELLANEOUS SCOPE CHANGES ROUNDING	226 (6)	
	3,300	3,300
<b>CURRENT ESTIMATED ENGINEERING MANHOUR FORECAST</b>	<b>100%</b>	<b>13,200</b>
<b>AFTER FUEL LOAD CONTINUING SERVICE AGREEMENT</b>		250
		<b>13,450</b>

MILWAUKEE PLANT UNITS 1R, 2, 3R, 7, 7R  
 ENGINEERING MAINTENANCE CHIEF  
 TOTAL PROJECT

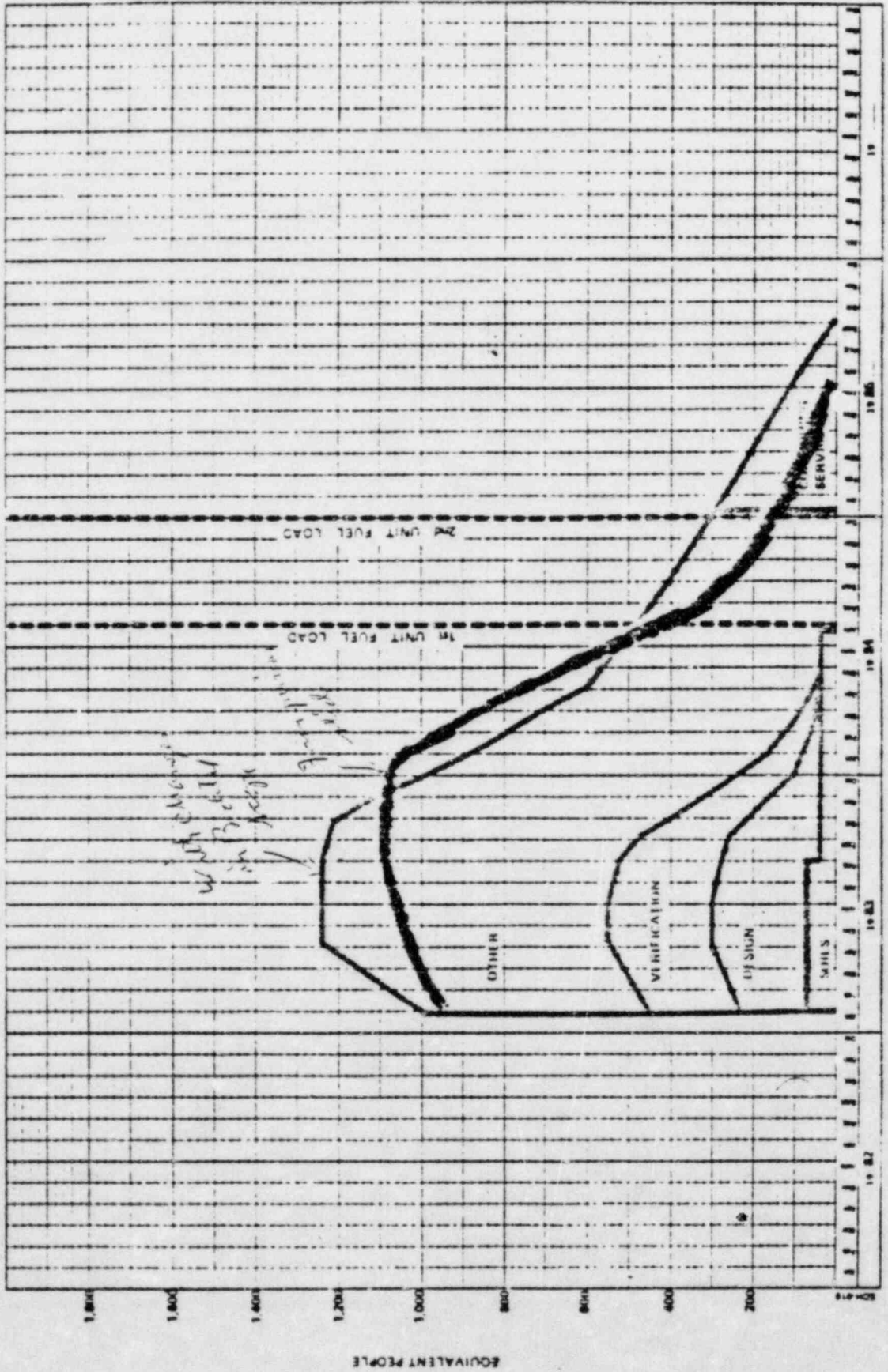
MARCH 1983

MANAGEMENT DATA  
 FORECAST PA 10 100000  
 IN CHARGE BY FORECAST 12 10 1980  
 FORECAST PR



EQUIVALENT PEOPLE

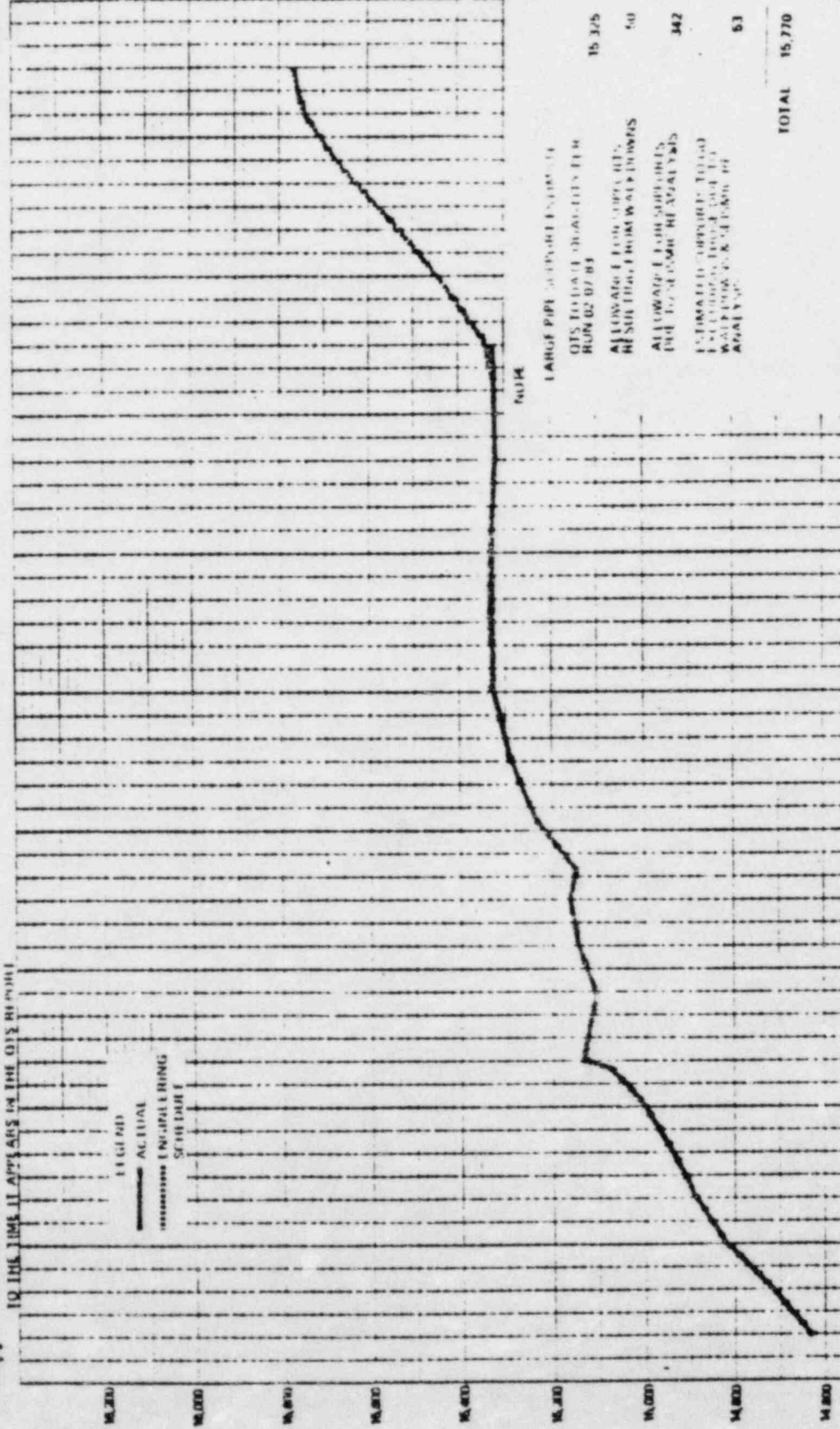
DECEMBER 1962 FORECAST  
 TOTAL PROJECT  
 TO GO ENGINEERING MANPOWER CURVE  
 MIX AND UNITS 1 AND 2 7220



NOTE: ACTUAL QUANTITY ISSUED IS BASED ON  
 QTS FIGURES. THIS IS AN APPROXIMATE 3  
 WEEK LAG IN THE REPORTING OF OFFICIALLY  
 ISSUED HANGER DESIGN FROM ENGINEERING  
 TO THE TIME IT APPEARS IN THE QTS REPORT

MIDLAND UNIT'S 1 & 2 JUN 72a  
 ENGINEERING PRODUCTION BY 19 0118 E  
 B-1A: LARGE PIPE SUPPORT DESIGN RELEASE

CUT-OFF DATE  
 A - P 4/1/81

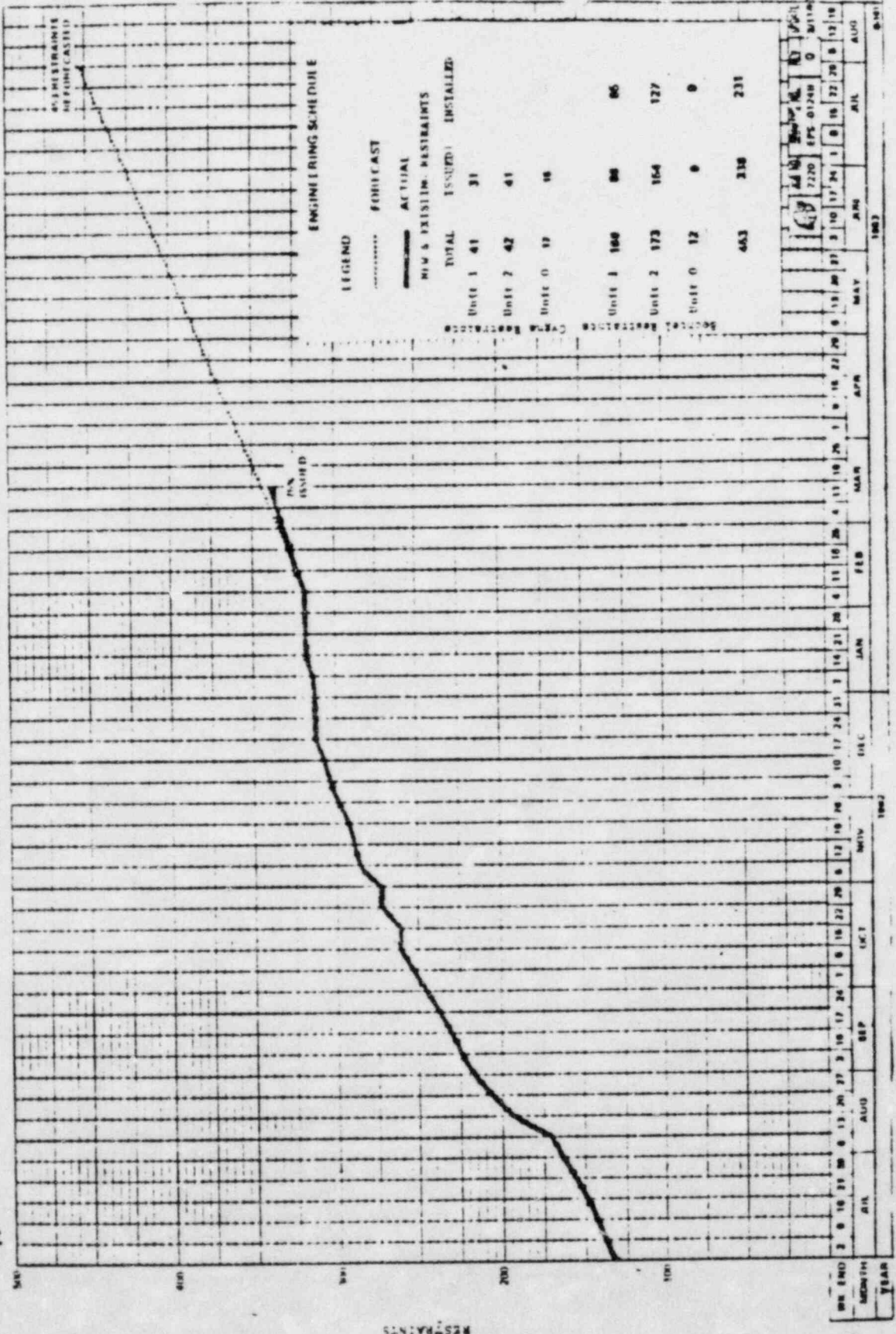


NAME  
 LARGE PIPE SUPPORT DESIGN  
 QTS TO DATE (CUMULATIVE)  
 RUN 02 07 81 15 375  
 ALLOWANCE FOR CORRECTIONS  
 RESULTING FROM WORK DOWNS 50  
 ALLOWANCE FOR SUPPORTS  
 DUE TO SCHEMATIC REANALYSIS 342  
 ESTIMATED QUANTITY TO GO  
 INCLUDING QUANTITY TO GO TO  
 WAIVER FOR CUMULATIVE  
 ANALYSIS 53  
 TOTAL 15,770

REV	DATE	DESCRIPTION	BY
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MINI AND UNITS 1 & 2 JUN 72 TO  
 ENGINEERING PRODUCTION BEGIN DATE  
 HELBA ISSUE OF DESIGN FOR NEW AND EXISTING RESTRAINTS



Ad 10	200	10	10
Ad 10	220	0	0
Ad 10	240	0	0
Ad 10	260	0	0
Ad 10	280	0	0
Ad 10	300	0	0
Ad 10	320	0	0
Ad 10	340	0	0
Ad 10	360	0	0
Ad 10	380	0	0
Ad 10	400	0	0

*J. P. ...  
of ...*

*Soils*

MIDLAND

CASE LOAD FORECAST

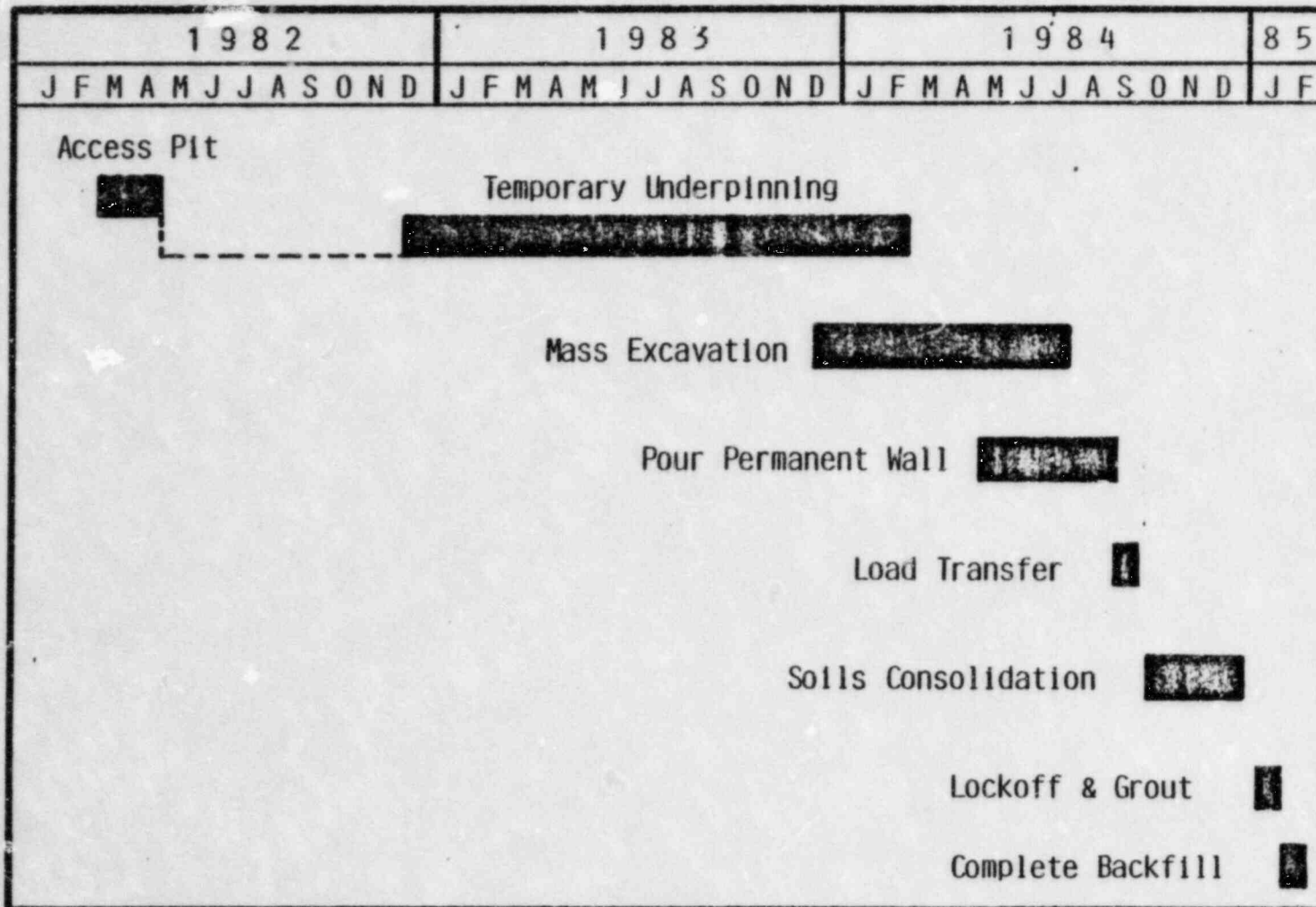
SCHEDULE REVIEW

4/19/83



# SOILS SCHEDULE

## AUXILIARY BUILDING



MIDLAND PROJECT REPLANNING

## **SOILS (UNDERPINNING)**

LINKAGE TO FUEL LOAD

EVENT: ● Start of Soils Consolidation

BASIS: ● Load Transferred To Permanent Wall  
● Demonstrate Building Has Structural Capability  
To Fulfill Safety Function Required For Fuel  
Load & Low Power Physics Test  
● Present Evaluation For NRC Approval

AUXILIARY BUILDING  
UNDERPINNING

FACT SHEET

A. Dewatering

Vertical Freeze Holes	248
Angled Freeze Holes	79
Thermal Monitor Holes	39
Fiectors	78
Piezometers	<u>13</u>
Total Holes Drilled	457

Linear Feet Freeze Header	3,036
Linear Feet Dewatering Header	3,410

B. Access Shafts (East and West)

Depth Each Shaft	76 Feet
Excavated Material - Shafts	8,889 Cubic Yards

C. Temporary Underpinning

Length of Access Drifts	1,106 Horizontal Feet
Excavated Material - Drifts	1,474 Cubic Yards
Number Temporary Piers	57
Excavated Material - Piers	3,550 Cubic Yards
Reinforcing Steel - Piers	295 Tons
Structural Steel - Piers	803 Tons
Concrete - Piers	3,550 Cubic Yards

D. Permanent Underpinning

Mass Excavation	7,957 Cubic Yards
Permanent Wall:	
Length:	600 Feet
Width:	6 Feet
Height:	35 Feet
Wall Concrete	4,287 Cubic Yards
Wall Reinforcing Steel	326 Tons
Slab Concrete	257 Cubic Yards
Slab Reinforcing Steel	30 Tons

E. Summary

Total Material Excavated	21,870 Cubic Yards
Total Reinforcing Steel	651 Tons
Total Concrete	8,095 Cubic Yards

Scope:

The scope of the C-195 contract is to underpin the Control Tower and Electrical Penetration Areas (EPA) of the Auxiliary Building and a portion of the Turbine Building.

The project has been broken down into four phases of work which includes the installation of the East and West Access Shafts, 54 underpinning piers and six grillage beam support assemblies. The piers and grillage beam assemblies will temporarily support the Control Tower, EPA and Turbine Buildings until the permanent underpinning wall can be constructed and the building loads transferred to the wall.

General:

Mergentime, the prime contractor for the Auxiliary Building, will accomplish this work by excavating drifts (tunnels) from both the East and West Access Shafts. The drifts will only advance as far as the next scheduled pier location. At this point, the pier will be excavated, lagged, rebar installed, instrumentation and embedded items installed and concreted.

Once the concrete has achieved the specified strength, the pier will be jacked against the building and the load transferred to the pier. The drift will then proceed to the next pier and the same process followed. This method will continue from both sides until all the piers and grillage systems have been installed and the load temporarily transferred.

Once the Control Tower, EPA and Turbine Building have been supported temporarily, Mergentime will begin mass excavating the area in stages to the final elevation of 571'±. During the mass excavation, the Contractor will install a strut system to brace the piers as the excavation proceeds, since excavation is on only one side of most piers. Mass excavation of the Access Shafts will coincide with the mass excavation under the building.

After mass excavation is complete, the Contractor will construct a six foot wide, 35 feet high wall approximately 600 L.F. long, (4,287 cubic yards of concrete). This will serve as the new foundation for the building once the load has been transferred from the piers to the wall.

When the load has been transferred to the permanent wall, the "ballroom" will be backfilled on the way out, as well as the Access Shafts.

Pertinent Data:

Pier Concrete	3550 C.Y.
Wall Concrete	4287 C.Y.
Miscellaneous Concrete	600 C.Y.
Rebar (Total)	1,274,784 lbs.
Material Removed	21,870 C.Y.

SERVICE WATER PUMP STRUCTURE

UNDERPINNING

Phase I

Agreed Quantities  
as of 11/19/82

FACT SHEET

A. Dewatering

Ejectors (Inside)	33
Piezometers (Inside)	3
Ejectors (Outside)	47
Piezometers (Outside)	<u>9</u>
Total Holes	92
Linear Feet 8" Dewatering Header	1,375
Linear Feet 10" Dewatering Header	345

B. Access Shaft

1. Soldier Piles	27 each
2. Sheeted Pits for S.P.	3377 Sq. Ft.
3. Excavation Sheeted Pits for S.P.	109 CYS.
4. Concrete for S.P.	16.5 CYS.
5. Lean Flyash Concrete for S.P.	65.3 CYS.
6. Lagging	2700 Sq. Ft.
7. Excavation	981 CYS.
8. Structural Steel (Struts, wales, bracing)	95 Ton

C. Approach Pits, Underpinning Piers, & Tunnel

1. Excavation	680 CYS.
2. Pier Reinforcing	52 Ton
3. Lagging	10,585 Sq. Ft.
4. Concrete	670 CYS.
5. Backfill and Tunnel Concrete	46 CYS.
6. Anchor Bolts & Plates, Etc.	47 Ea.
7. Hydraulic Jacks (Estimated)	50 Ea.



## Summary of Underpinning of Service Water Pump Structure

The scope of the work involves two Phases, I and II. Phase I entails work related to the actual underpinning of the Service Water Pump Structure. Phase II involves excavation and rebedding of piping.

Phase I work begins with the location of utilities within the work area, both for excavation and installation of dewatering wells. After all utilities are located, approximately 47 dewatering wells will be installed outside of the building. Concurrently with this operation, 33 dewatering wells will be placed in the Service Water Pump Structure and the Circulating Water Intake Structure. Also, a total of 12 piezometers are to be installed.

The installation of soldier piles will be the next activity. This will consist of 27 total soldier piles being installed; 20 will be placed in drilled holes, and the remaining seven will be placed in sheeted pits. Once the soldier piles have been installed, the Access Shaft excavation can begin. Lagging and bracing will be installed as the shaft is dug. An estimated 785 cubic yards of excavated material will be removed from ground elevation down to elevation 618.

From the Access Shaft, access pits will be dug to enable the pier excavations to proceed. A total of 20 piers are to be installed in a predetermined sequence. After Pits 1, 1A, 2 and 2A are installed, a tunnel will begin being excavated under the Service Water Pump Structure, next to the Circulating Water Intake Structure. This tunnel will be approximately 6' x 6' x 30' in length upon completion. The above will entail, for all piers, 680 cubic yards of excavation, 670 cubic yards of pier concrete, and 102,425 pounds of rebar. The tunnel will have 50 cubic yards of excavation.

Once a pier is installed, jacking will take place to transfer the load to the pier. After the load is transferred, the pier will be wedged to maintain the applied load. Large anchor bolts, connecting the pier to the Service Water Pump Structure, will be tightened to maintain contact between the building and the pier. This process will be repeated for each individual pier.

After all piers have been loaded, the access tunnel will be backfilled with a lean concrete mix.

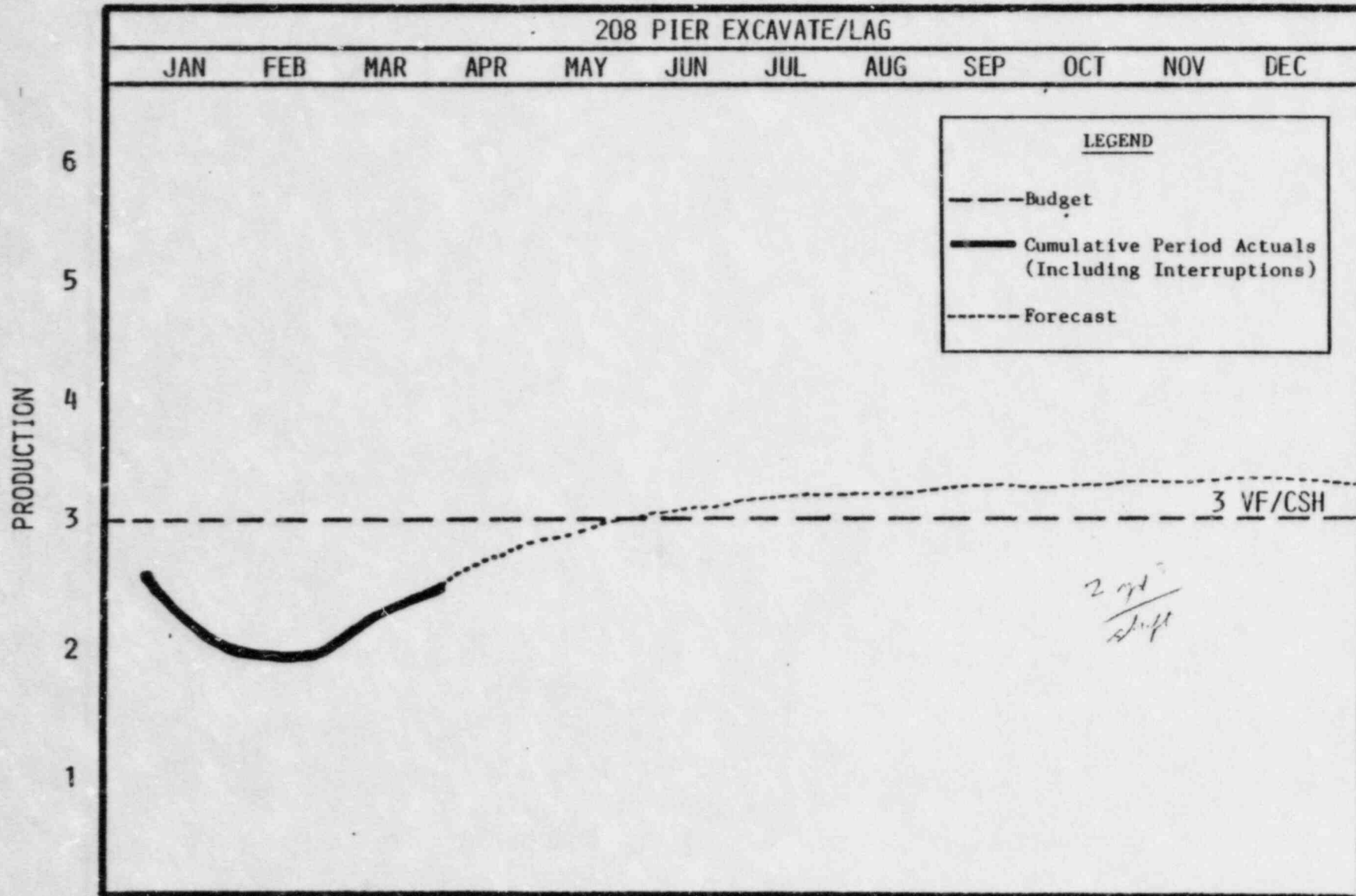
Additional work for the Phase II operation will include probing for utilities, installation of dewatering wells, installation of soldier piles, excavation, lagging and bracing. This work is being done to uncover certain utilities which must be rebedded. The actual embedment will be performed by Bechtel forces. Quantities for this work have not been calculated by the Field.

AUXILIARY BUILDING

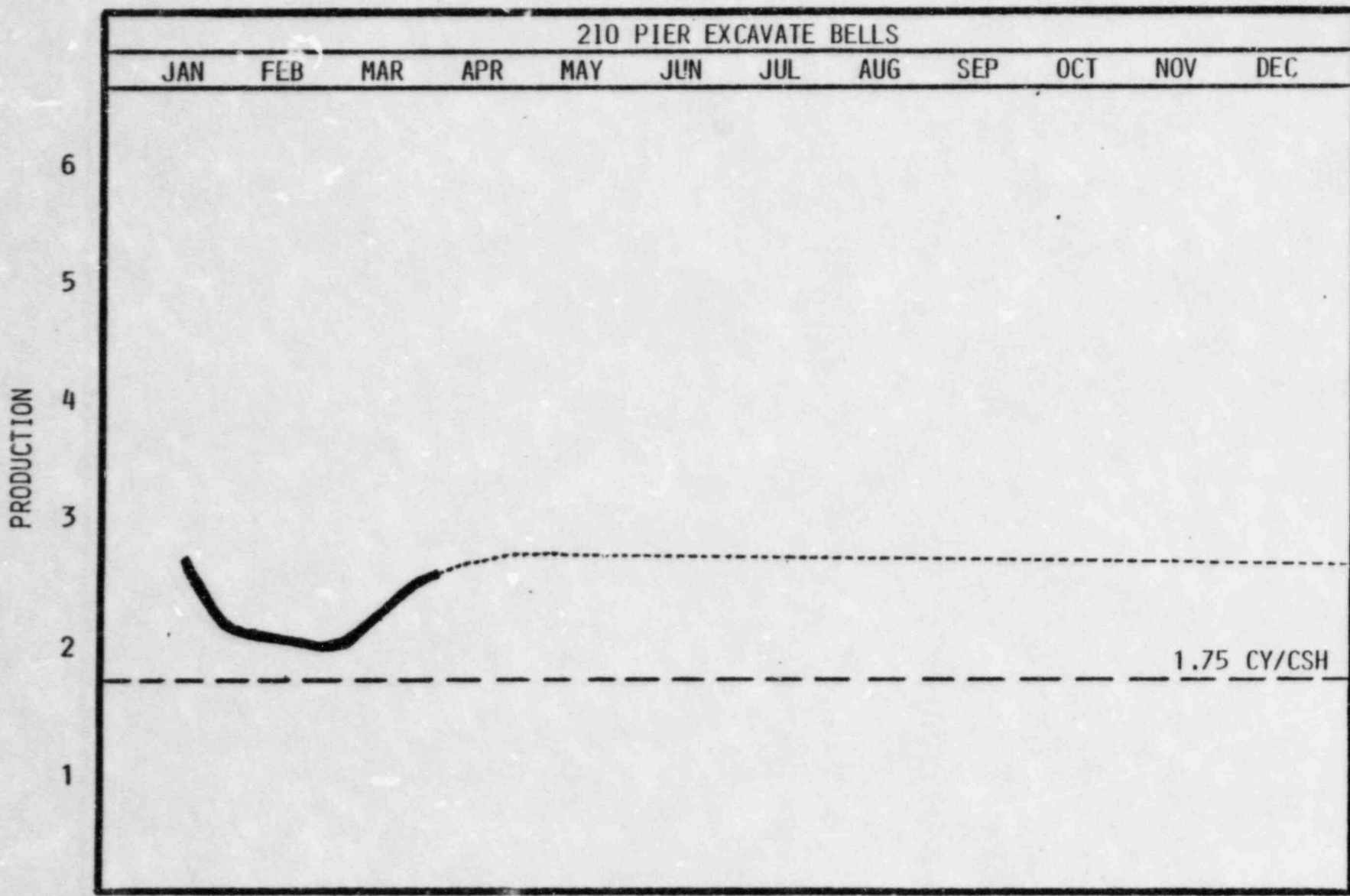
SCOPE

<u>ITEM</u>	<u>QUANTITY</u>	<u>BUDGET RATE</u>
Horizontal Drift	1,106 ft	3 lf/cs
Pier Excavating	3,550 cy	3 vf/cs
Pie. Reinforcing Steel	295 T	500 lb/cs
Pier Concrete	3,550 cy	7 cy/cs
Mass Excavation	7,957 cy	10 cy/cs
Permanent Wall Concrete	4,287 cy	29 cy/cs

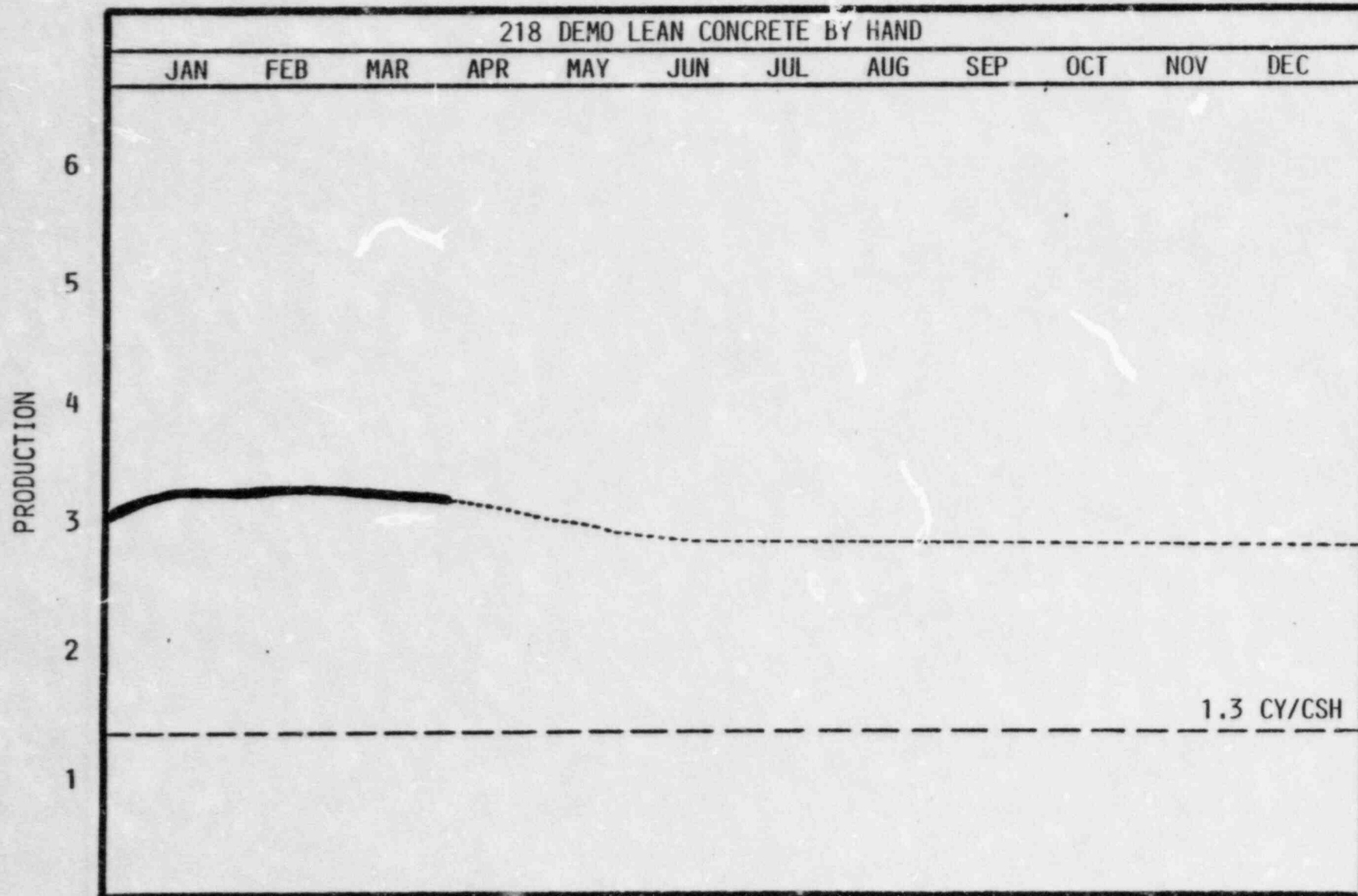
# PRODUCTIVITY CHART AUX BLDG UNDERPINNING



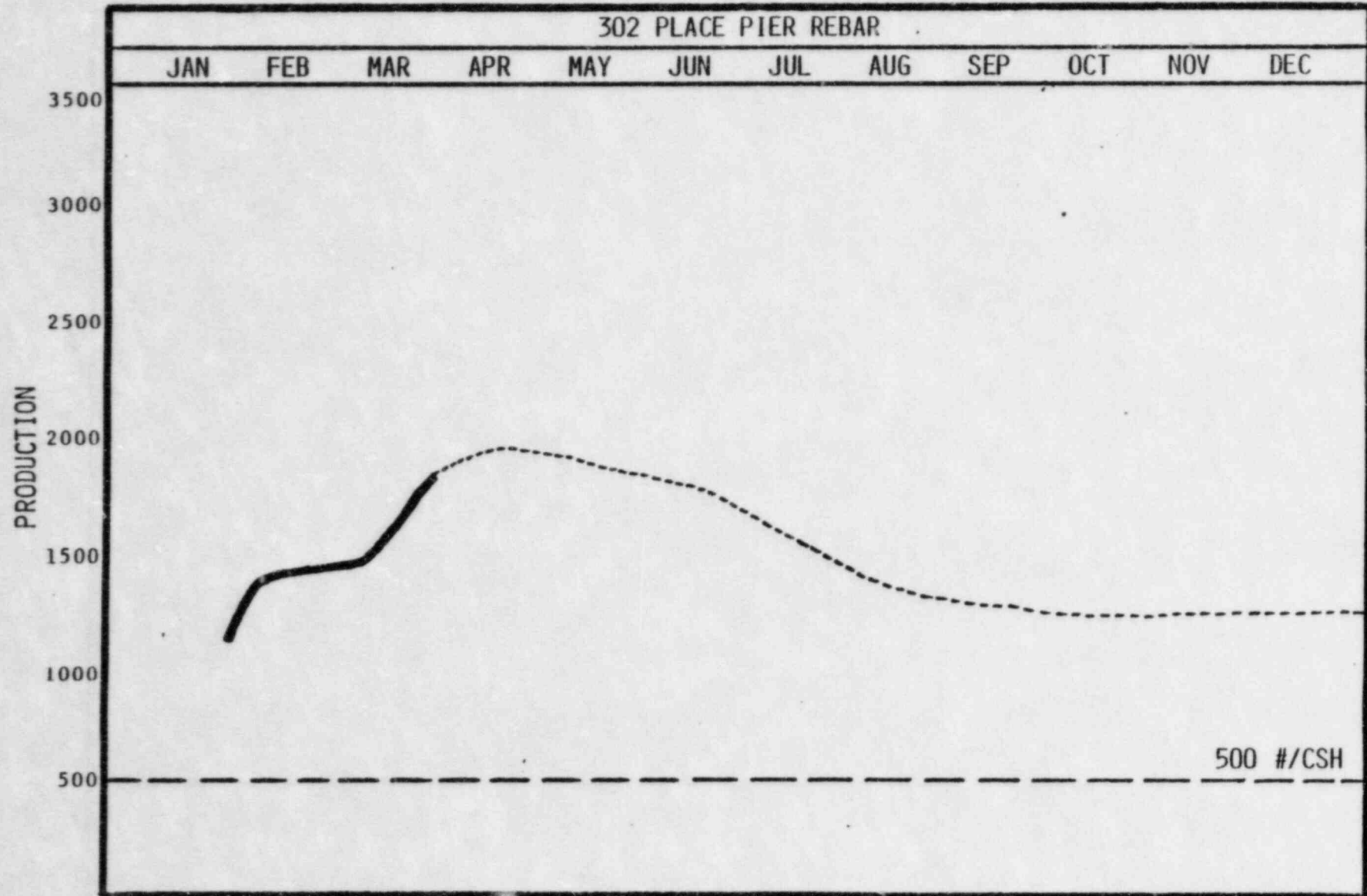
# PRODUCTIVITY CHART AUX BLDG UNDERPINNING



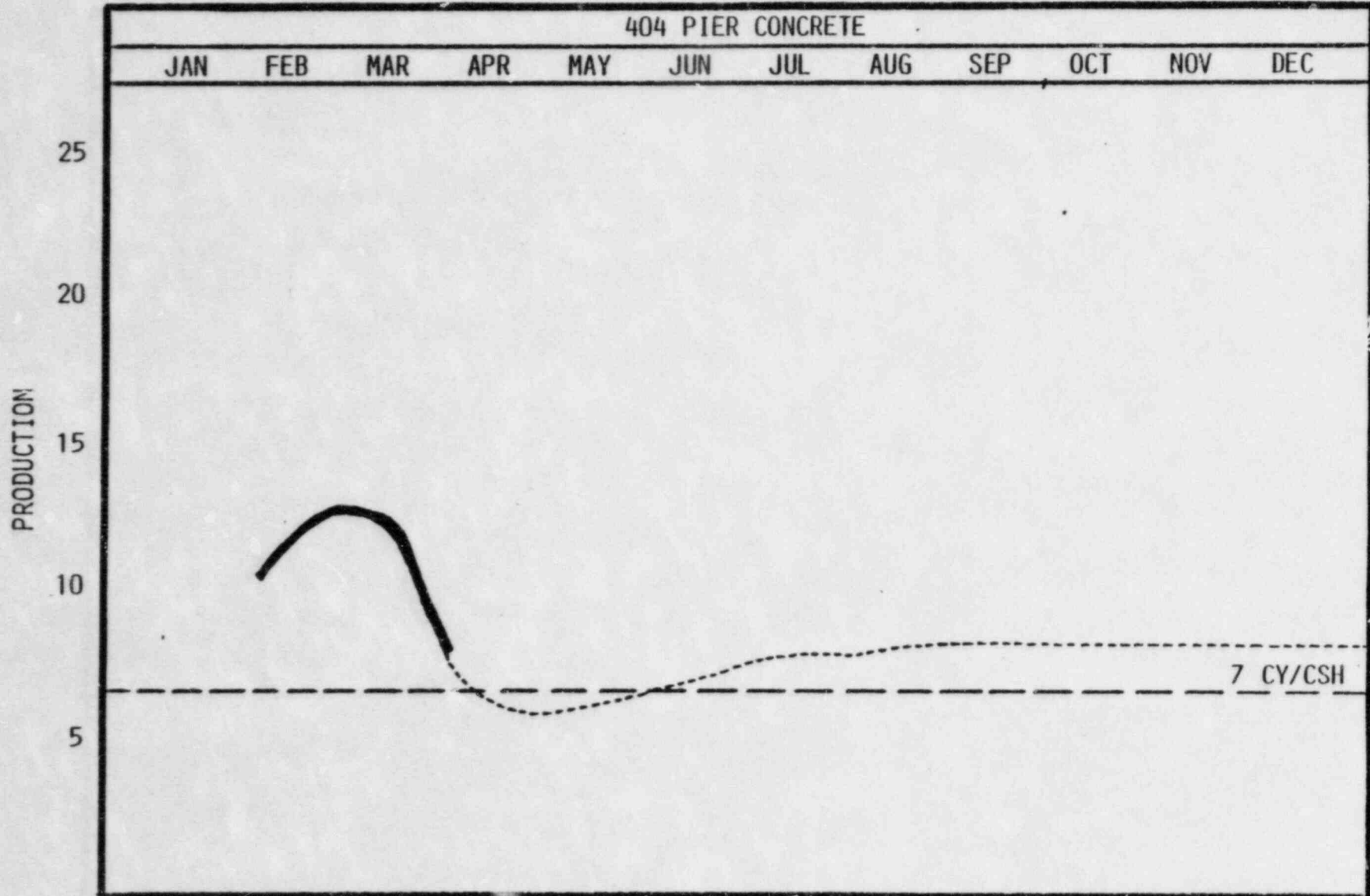
# PRODUCTIVITY CHART AUX BLDG UNDERPINNING



# PRODUCTIVITY CHART AUX BLDG UNDERPINNING

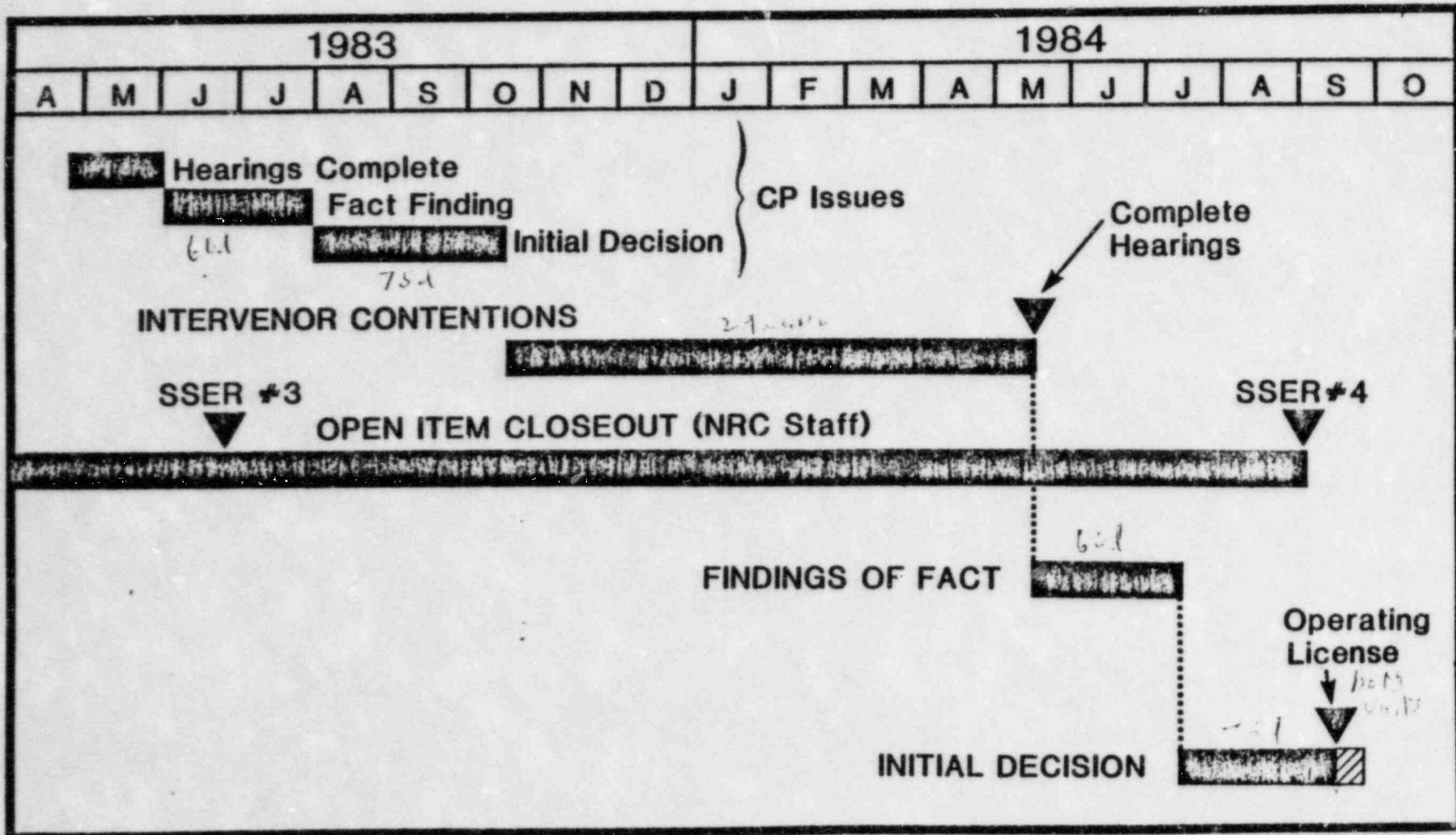


# PRODUCTIVITY CHART AUX BLDG UNDERPINNING





# MIDLAND PROJECT REPLANNING LICENSING SCHEDULE





*not used*

## SER OPEN ITEM STATUS

### CLOSED BY SSER #1 AND #2

<u>TYPE OF ITEM</u>	<u>COMPLETED/TOTAL NUMBER</u>
OUTSTANDING ITEMS	0/17
CONFIRMATORY ISSUES	9/32
LICENSING CONDITIONS	1/11

### PROJECTED COMPLETION FOLLOWING SSER #3

<u>TYPE OF ITEM</u>	<u>COMPLETED/TOTAL NUMBER</u>
OUTSTANDING ITEMS	10-1/2/17
CONFIRMATORY ISSUES	25/32
LICENSING CONDITIONS	2/11

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## SER OPEN ITEM STATUS (CONT'D)

### PROJECTED COMPLETION BY END OF 1983

<u>TYPE OF ITEM</u>	<u>COMPLETED/TOTAL NUMBER</u>
OUTSTANDING ITEMS	16/17 (2 HALVES REMAINING-EMERGENCY PLANNING & SEISMIC QUALIFICATION)
CONFIRMATORY ISSUES	31/32
LICENSING CONDITIONS	4/11

### PROJECTED COMPLETION BY FUEL LOAD

<u>TYPE OF ITEM</u>	<u>COMPLETED/TOTAL NUMBER</u>
OUTSTANDING ITEMS	17/17
CONFIRMATORY ISSUES	32/32
LICENSING CONDITIONS	8 7/11

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## SER ITEMS ALREADY CLOSED BY SSER'S

<u>OUTSTANDING ITEMS</u>	<u>DESCRIPTION OF ITEM</u>
01-5	PORTIONS OF SOILS SETTLEMENT ISSUES

<u>CONFIRMATORY ISSUES</u>	<u>DESCRIPTION OF ITEMS</u>
CI-3	PROGRAM FOR MASONRY WALL EVALUATION
CI-5	SUPPLEMENTAL ECCS CALCULATIONS
CI-8	EVALUATION OF ENVIRONMENT NEAR DHR SUCTION VALVES
CI-9	ADEQUACY OF BWST TO PROVIDE BORIC ACID TO RCS
CI-10	MFV OVERFILL PROTECTION
CI-13	LOWEST SERVICE METAL TEMPERATURE
CI-28	APPLICABILITY OF POWER TRAIN CODE
CI-29	S/G WATER INVENTORY AS A FUNCTION OF POWER LEVEL
CI-30	LOSS OF FLOW TRANSIENTS

<u>LICENSE CONDITIONS</u>	<u>DESCRIPTION OF ITEM</u>
LC-1	GROUNDWATER MONITORING

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**SER ITEMS TARGETED FOR CLOSURE IN SSER #3**  
**(TENTATIVELY SCHEDULED FOR JUNE 1983)**

<b><u>OUTSTANDING ITEMS</u></b>	<b><u>DESCRIPTION OF ITEMS</u></b>
OI-1	EXPLOSIVE HAZARDS (NATURAL GAS ISSUE)
OI-3	TORNADO MISSILE PROTECTION
OI-6	ENVIRONMENTAL QUALIFICATION REVIEW (ONLY-NOT SEISMIC PROTION)
OI-7	NATURAL CIRCULATION COOLDOWN ANALYSIS
OI-8	HPI LINE MAKEUP NOZZLE CRACKING
OI-9	REACTOR VESSEL HEAD VENTS
OI-10	CONTAINMENT VALVE TESTING-SECONDARY VALVES
OI-11	CONTAINMENT VALVE TESTING-DHR/RBCWS VALVES
OI-13	AFW RING HEADER MODIFICATION
OI-16	SHUTDOWN DECAY HEAT REMOVAL (3RD AFW PUMP)
OI-17	PUMP AND VALVE OPERABILITY

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**SER ITEMS TARGETED FOR CLOSURE IN SSER #3**  
**(TENTATIVELY SCHEDULED FOR JUNE 1983)**

**CONT'D**

<b><u>CONFIRMATORY ISSUES</u></b>	<b><u>DESCRIPTION OF ITEMS</u></b>
CI-1	PMF EFFECTS ON COOLING POND DIKE
CI-4	INDEPENDENT ANALYSIS OF PIPING SYSTEMS
CI-7	NATURAL CIRCULATION TESTING
CI-11	CHARPY DATA FOR WF-70
CI-12	S/G COMPARTMENT FAN OPENING DATA
CI-14	CONTAINMENT PENETRATION CATEGORIZATION
CI-15	SETPOINT METHODOLOGY DOCUMENTATION
CI-17	NON-CLASS 1E INPUTS TO CLASS 1E CONTROL CIRCUITS
CI-18	ECCAS AUXILIARY RELAY TESTING
CI-19	AFW PUMP SUCTION TRANSFER LOGIC TESTING
CI-20	AFW SYSTEM AUTOMATIC LEVEL CONTROL
CI-22	COMMON CAUSE CONTROL SYSTEM FAILURES
CI-23	EVALUATE LOAD SEQUENCER

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**SER ITEMS TARGETED FOR CLOSURE IN SSER #3**  
**(TENTATIVELY SCHEDULED FOR JUNE 1983)**

**CONT'D**

<b><u>CONFIRMATORY ISSUES</u></b>	<b><u>DESCRIPTION OF ITEMS</u></b>
CI-26	INTEGRATE ISEG WITH OTHER SAFETY GROUPS
CI-27	PHYSICAL SECURITY AND SAFEGUARDS PLANS
CI-31	RCP LOCKED ROTOR/SHEARED SHAFT W/TT AND LOOP
<b><u>LICENSE CONDITIONS</u></b>	<b><u>DESCRIPTION OF ITEMS</u></b>
LC-2	INADEQUATE CORE COOLING INSTRUMENTATION

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**SER ITEMS TARGETED FOR CLOSURE AFTER  
SSER #3 BUT BEFORE 12/31/83**

**OUTSTANDING  
ITEMS**

**DESCRIPTION OF ITEMS**

<b>OI-2</b>	<b>TURBINE MISSILE HAZARD EVALUATION</b>
<b>OI-4</b>	<b>RCS/CORE COMPONENT ANALYSIS</b>
<b>OI-5</b>	<b>NSSS PIPING SEISMIC ANALYSIS</b>
<b>OI-12</b>	<b>APPENDIX R FIRE PROTECTION</b>
<b>OI-14</b>	<b>EMERGENCY PREPAREDNESS (DOWNGRADE TO CONFIRMATORY)</b>
<b>OI-15</b>	<b>CONTROL ROOM DESIGN - DCRDR REPORT</b>

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**SER ITEMS TARGETED FOR CLOSURE AFTER  
SSER #3 BUT BEFORE 12/31/82 (CONT'D)**

3

<u>CONFIRMATORY ISSUES</u>	<u>DESCRIPTION OF ITEMS</u>
CI-2	LOCA AND JET IMPINGEMENT AND STRESS INTENSITIES
CI-6	CODE RELIEF REQUEST
CI-16	S/G LEVEL REFERENCE LEG HEATING
CI-24	SYSTEM VOLTAGE TEST
CI-25	TURBINE INSPECTION PROGRAM
CI-32	SELECTED SOILS SETTLEMENT ISSUES (SIESMIC MARGIN REVIEW, FOUNDATIONS, CONCRETE CONTAINMENT EVALUATION, OTHER SEISMIC CAT. 1 STRUCTURES)
<u>LICENSE CONDITIONS</u>	<u>DESCRIPTION OF ITEMS</u>
LC-7	CONTROL OF HEAVY LOADS
LC-8	SECONDARY WATER CHEMISTRY MONITORING AND CONTROL PROGRAM



## SER ITEMS TARGETED FOR CLOSURE IN 1984

<u>OUTSTANDING ITEMS</u>	<u>DESCRIPTION OF ITEMS</u>
OI-6	SEISMIC AND ENVIRONMENTAL QUALIFICATION OF EQUIPMENT (SEISMIC PORTION)
OI-14	EMERGENCY PREPAREDNESS

<u>CONFIRMATORY ISSUES</u>	<u>DESCRIPTION OF ITEMS</u>
CI-21	REMOTE SHUTDOWN OPERATION TESTING

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**SER ITEMS TARGETED FOR  
CLOSURE IN 1984 (CONT'D)**

<u>LICENSING CONDITIONS</u>	<u>DESCRIPTION OF ITEMS</u>
LC-3	RELIEF/SAFETY/VALVE TESTING (PFL)
LC-4	INSERVICE INSPECTION PROGRAM (PFL)
LC- <del>5</del> 5	AFW LEVEL CONTROL TEST (PFL)
LC-6	POST ACCIDENT SAMPLING
LC-9	B&W ON-SHIFT - STARTUP EXPERIENCE
LC-10	EMERGENCY PROCEDURES - ATOG
LC-11	SMALL BREAK LOCA MODEL (PFL)

PFL - POST FUEL LOAD

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## MAJOR NRC SITE VISITS

<u>EVENT</u>	<u>TENTATIVE TIMEFRAME</u>
CONTROL ROOM REVIEW VISIT	MAY 1983
INSTRUMENTATION & CONTROL VISIT	4TH QUARTER 1983
ELECTRICAL VISIT	4TH QUARTER 1983
FIRE PROTECTION VISIT	4TH QUARTER 1983
SEISMIC QUALIFICATION REVIEW TEAM VISIT	4TH QUARTER 1983
EMERGENCY PLANNING APPRAISAL	2ND QUARTER 1984
SECURITY VISIT	3RD QUARTER 1984
EMERGENCY PLANNING EXERCISE	3RD QUARTER 1984

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