



**Consumers
Power
Company**

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May 14, 1984

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MIDLAND ENERGY CENTER
MIDLAND DOCKET NOS 50-329, 50-330
MIDLAND PROJECT SCHEDULE
FILE 0650 SERIAL 30677

We appreciated the opportunity to discuss the Midland Project Schedule with you and the other representatives of the NRC staff on May 4, 1984. As stated during the presentation, we believe that based on the extensive planning effort undertaken over the past seven months, we now have an achievable schedule describing all known remaining activities. The schedule allows for a significant amount of rework that could result from the reinspection program, and also includes three months of schedule contingency.

The material presented at the public meeting is attached for your further study. In response to your concluding remarks at the May 4th meeting, we would be pleased to present a further briefing to the NRC staff after six months to report on our continuing experience in implementing the CCP.

JWC/ARM/bt

CC DSHood, US NRC, NRR
RJCook, Midland Resident Inspector

| PRINCIPAL STAFF | | | |
|-----------------|------|-------|----------|
| RA | last | OPRP | |
| D/RA | | DE | |
| A/RA | | DRMSP | |
| RC | | DRMA | |
| PAO | | SCS | Aug +3 ✓ |
| SGA | | M | ✓ |
| ENF | | File | last |

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MAY 21 1984

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3/14/84

MIDLAND PROJECT SCHEDULE

INTRODUCTION

JW COOK

MIDLAND PROJECT SCHEDULE PRESENTATION AGENDA

● INTRODUCTION

J. W. COOK

● INTEGRATED PROJECT SCHEDULE

A. R. MOLLENKOPF

- Planning model & data base
- Critical Activities & priorities
- Schedule contingency

● MAJOR SCHEDULE COMPONENTS

- Construction
- Quality Assurance
- Testing
- Soils
- Licensing

D. L. QUAMME

R. A. WELLS

D. L. QUAMME

J. A. MOONEY

J. N. LEECH

● CONCLUSIONS

J. W. COOK

MIDLAND PROJECT SCHEDULE

SCHEDULE CONCLUSIONS

- Unit 2 Fuel Load July 86
 - Unit 2 Operation Dec. 86
 - Unit 1 Fuel Load Indeterminate
 - Unit 1 Operation Indeterminate
-

CCP ASSUMPTIONS

- 1) QVP — Based on 100% Reinspection**
- 2) Rework From Reinspection — Estimated to Require 1.6×10^6 Hours**
- 3) Paperwork to Complete Job Estimated as 80,000 Construction Work Packages (CWPs), 33,000 NCRs and 16,500 FCRs/FCNs**

MIDLAND PROJECT SCHEDULE

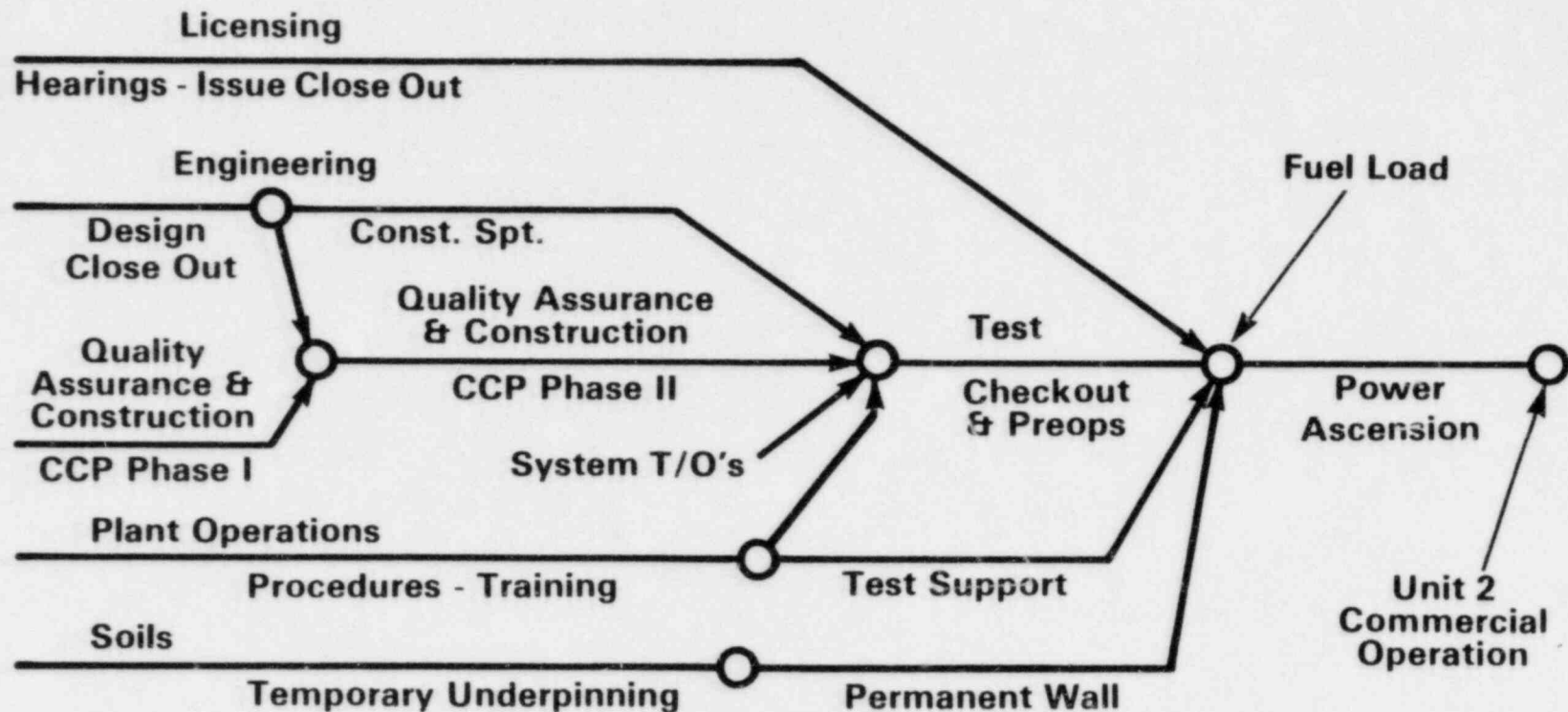
MAJOR SCHEDULE ASSUMPTIONS

- **Unit 1 Decoupling Recommendations Implemented**
- **Project Performance Merits Regulatory Support**
- **QC Inspector Rampup to Two-Shift Operation by Mid-Summer 1984**
- **Funding Available**
- **Scope Remains Stable**
- **Nonconformances and Total Rework Within Estimate**

MIDLAND PROJECT SCHEDULE

PROJECT COMPLETION PLAN

SCHEDULE LOGIC



MIDLAND PROJECT SCHEDULE

MAJOR PROJECT MILESTONES

UNIT 2

| | |
|---|---------|
| • Complete Engineering & Design (Rev. 0) | Jun. 84 |
| • Turbine Roll | Jun. 84 |
| • QC Inspector Rampup Complete | Aug. 84 |
| • Complete Status Assessment | Oct. 84 |
| • Complete Temporary Underpinning | Dec. 84 |
| • Complete System QVP | Jan. 85 |
| • Auxiliary Flushes to Reactor Vessel | Mar. 85 |
| • Complete Area QVP | July 85 |
| • Reactor Coolant System Hydrostatic Test | July 85 |
| • Hot Functional Test | Oct. 85 |
| • Major Containment Tests | Jan. 86 |
| • Integrated Safety Systems Test | Mar. 86 |
| • Fuel Load | July 86 |
| • Commercial Operation | Dec. 86 |

MIDLAND PROJECT SCHEDULE

**INTEGRATED PROJECT
SCHEDULE**

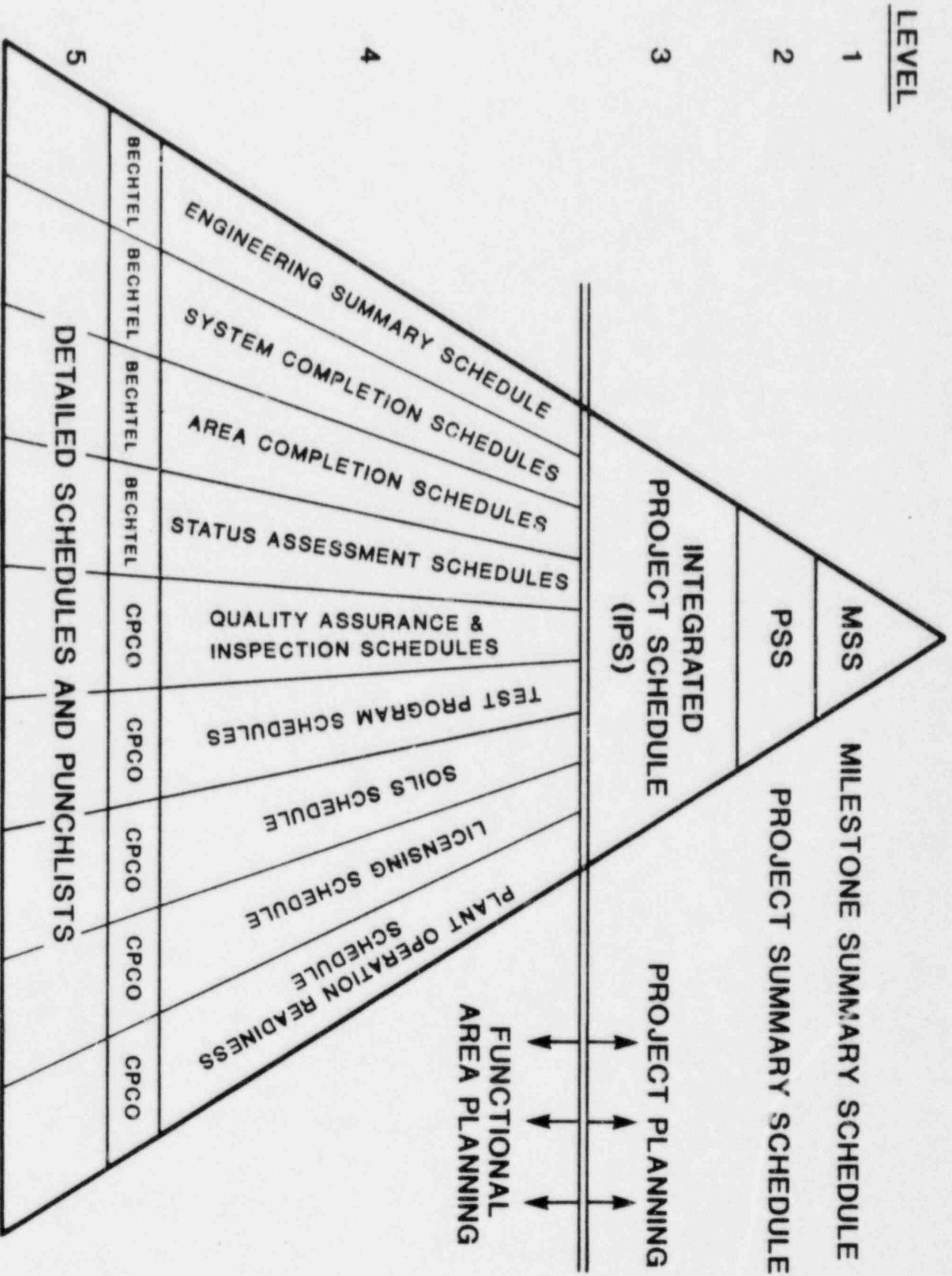
AR MOLLENKOPF

INTEGRATED PROJECT SCHEDULE

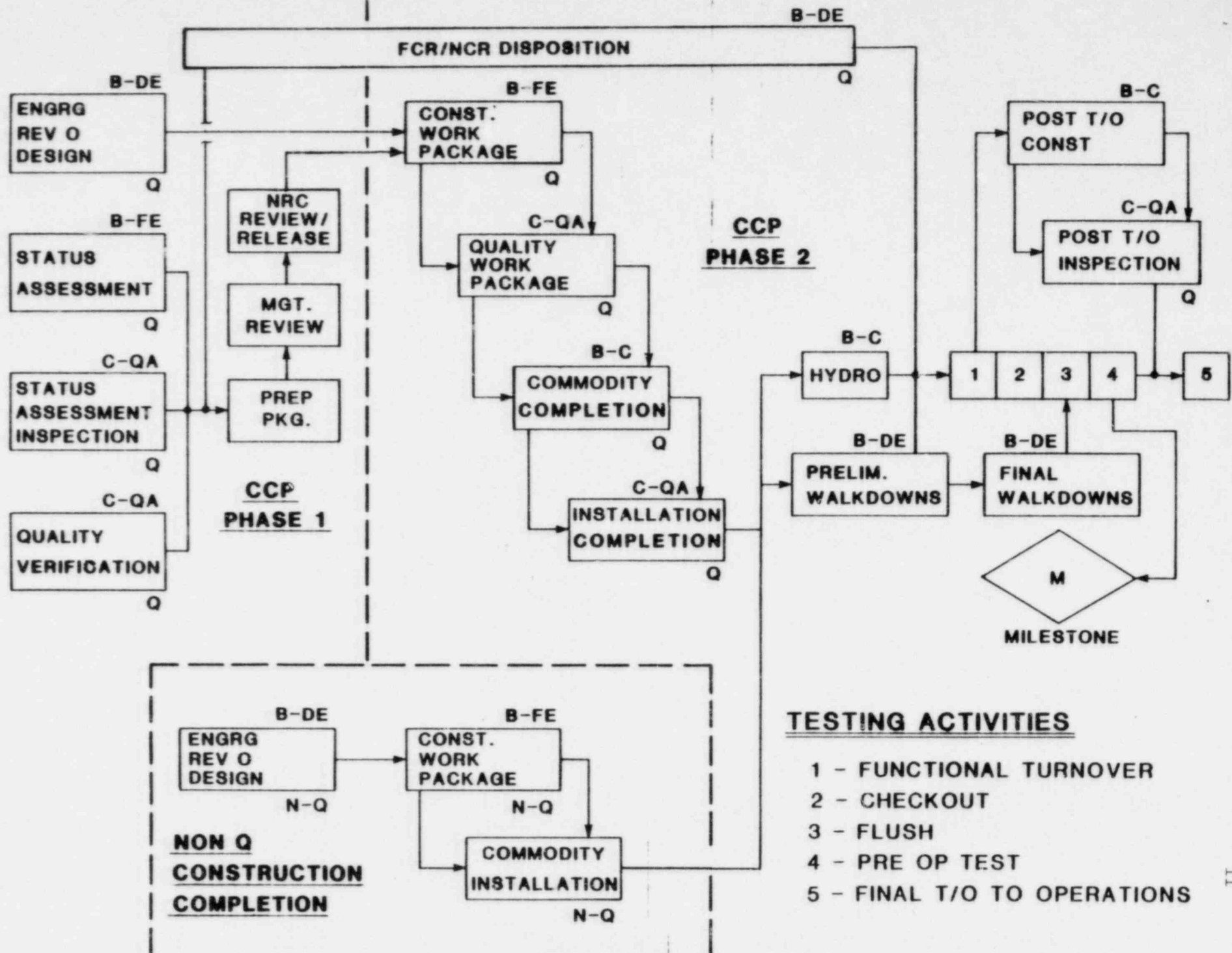
INTRODUCTION

- **PLANNING MODELS**
- **PLANNING DATA BASE**
- **PROJECT PRIORITIES**
- **SCHEDULE CRITICAL PATHS
ACTIVITIES**
- **SCHEDULE CONTINGENCY**

INTEGRATED PROJECT SCHEDULE **SCHEDULE HIERARCHY**



GENERIC IPS MODEL - PLANT SYSTEMS



INTEGRATED PROJECT SCHEDULE

PLANNING DATA BASE WORKSHEET

| DATE: <u>4/18/84</u> | | Q/NQ: <u>Q/NQ</u> | | APPROVALS: _____ | | | | | | |
|----------------------|-----------------|-----------------------|-------|------------------|-----------|----------|-------------|--------|------------|--------|
| TEAM: <u>12</u> | | SYSTEM: <u>2BGB-2</u> | | BY TEAM | | PLNR | F.E. | SUPVR | | |
| ACTIVITY CODE | COMMODITY | Q/NQ | QTY. | UNIT RATE | MAN-HOURS | TOTAL MH | NO.OF CRAFT | MH/DAY | DUR (DAYS) | SHIFTS |
| 214766206 | SMALL PIPE (LF) | Q | B 4 | 8.3 | 33 | 696 | 2 | 16 | 6 | 1 |
| | | | P 126 | 5.1 | 643 | | | | | |
| 214766257 | | NQ | B 42 | 6.7 | 281 | 870 | 4 | 32 | 27 | 1 |
| | | | P 128 | 4.6 | 589 | | | | | |
| 214766208 | SM. HGRS | | | | | | | | | |

| MPQAD - QC INSPECTION - PHASE 2 | | | | | SYSTEM: <u>2BGB-2</u> | | |
|---------------------------------|-----------------------|----------|--------|-----------|-----------------------|---------------|--------------|
| ACTIVITY CODE | TASK DESCRIPTION | DUR DAYS | QTY | UNIT RATE | QC MHRS | RESOURCE CODE | REF ACTIVITY |
| 21470208 | ERECT SMALL PIPE-Q | 6 | 130lf | 0.8 | 104 | 702.07 | 66,206 |
| 21470210 | ERECT SMALL PIPE HGRS | 15 | 48 ea. | 3.0 | 144 | 702.07 | |
| 21470212 | PIPE INSULATION | | | | | | |

INTEGRATED PROJECT SCHEDULE

RELATED DATA BASE SYSTEMS

- RWS - REMAINING WORK SCHEDULE
(ENGINEERING PUNCHLIST)
- MLCS - MATERIAL/LABOR CONTROL SYSTEM
- CPL - CONSTRUCTION PUNCHLIST
- MIRS - MIDLAND INSPECTION RECORDS SYSTEM
- QUAIL - QUALITY ACTION ITEM LIST
- MPL - MASTER PUNCHLIST

INTEGRATED PROJECT SCHEDULE

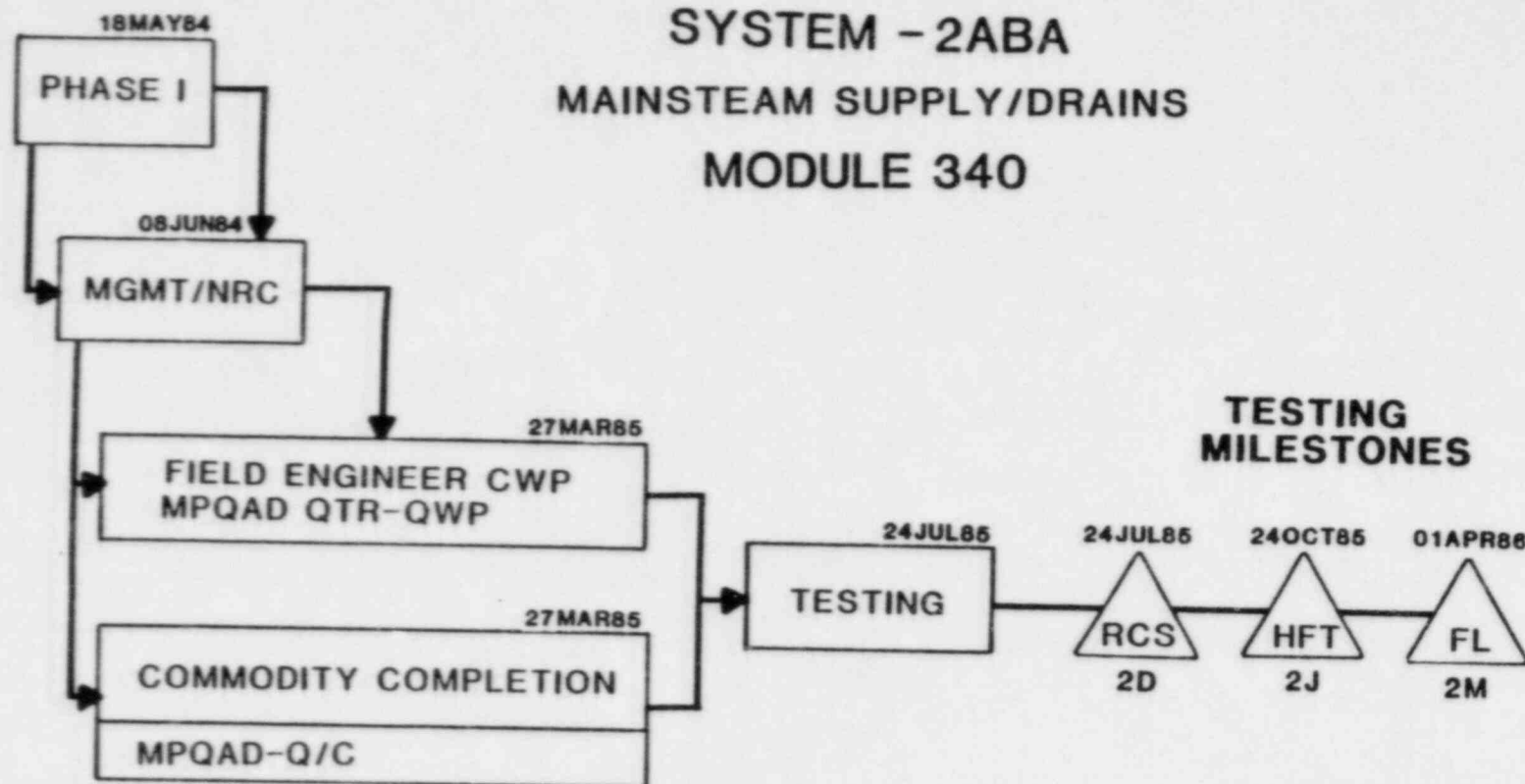
SHORT-TERM PROJECT PRIORITIES

| | <u>PRIORITY</u> | <u>SYSTEM/AREA</u> | <u>SUPPORTS</u> |
|------|--|--|---|
| 1. | TURBINE ROLL EXCEPTIONS | 2ABA-2, -3, 2ABB-3 (MAIN STM LINE/ISO VALVES) | 2TR |
| 2. | MODULE 800 SWPS | CONDENSER CIRC. WATER | 2TR |
| 3. | MODULE 120D A/B LOWER ELEV. | 2ALA-2 (AFW) | 2G (F.W. FLUSHES) MODULE RELEASE |
| 4. | NON-Q SYSTEM SPT- BY QC INSPECTION | NON-Q WORK INTERFACE W/ Q COMMODITIES | NON-Q SYSTEM COMPLETION IN 1984 |
| 5. | MODULE 240A | CONTROL ROOM CEILING | EFFICIENT CONST. SEQUENCING & CTL RM TESTING |
| 6. | FLOOD & SECURITY DOORS | TOTAL PLANT | SECURITY SYSTEM COMPLETION |
| 7. | MODULE 340 B&G (FWVIP) MODULE 102 (A/B PIPE CHASE) MODULE 120 (A/B LOWER ELEV.) | 2AEA-3 (FEEDWATER) 2ALA-2 (AFW) | 2G (F.W. FLUSHES) |
| 8-13 | MODULES 340, 150, 320, 330, 240, & 160 | 21 PARTIAL Q SYSTEMS | 2B (AUX FLUSHES) 2C (CANAL HYDRO) 2D (RCS COLD HYDRO) |

INTEGRATED PROJECT SCHEDULE
SCHEDULE CRITICAL PATHS
(TO 4/86 TARGET FUEL LOAD)

- | | | |
|---------------------------|----|--|
| • MECHANICAL SYSTEMS (99) | 3 | W/ 0 FLOAT |
| | 3 | W/ 1 MONTH FLOAT |
| | 93 | W/ 2 TO 4 MONTHS FLOAT |
| • HVAC SYSTEMS (25) | 3 | W/ + 1 MONTH |
| | 22 | W/ + 3 MONTHS |
| • ELECTRICAL SYSTEMS (33) | | NOT CRITICAL PREOPS COMPLETE EARLY 85 |
| • SOILS-AUX BLDG | | +2 MONTHS |
| • AREAS-CONTROL RM (5/85) | | +2 MONTHS |
| -ALL OTHER AREAS | | -NOT CRITICAL |

CRITICAL PATH
SYSTEM - 2ABA
MAINSTEAM SUPPLY/DRAINS
MODULE 340



**SYSTEM 2ABA MODULE 340
MILESTONE 2D**

17

| MAINSTEAM SUPPLY & DRAINS | REM N MHS | REM N DUR | FIN DATE |
|-------------------------------------|--------------|--------------|----------|
| 1. PHASE I MPQAD | 7 | 5 | 18MAY84 |
| 2. PHASE I BPCO FLD. ENGR. | 716 | 23 | 18MAY84 |
| 3. MEC MANAGEMENT REVIEW | NA | 5 | 25MAY84 |
| 4. NRC REVIEW & RELEASE | NA | 10 | 8JUN84 |
| 5. * FIELD ENGINEERING | 2477 | 209 | 27MAR85 |
| 6. * MPQAD QTR/QWP - | 1486 | 209 | 27MAR85 |
| 7. * CONSTRUCTION - | 24743 | 204 | 27MAR85 |
| 8. * MPQAD QC - | 3712 | 204 | 27MAR85 |
| 9. MECH. SYSTEM WLKDOWN P119 & P129 | NA | 5 | 3APR85 |
| 10. FUNCTIONAL TURNOVER | NA | 5 | 10APR85 |
| 11. MILESTONE (TESTING) | SEE BELOW | 75 | 24JUL85 |
| | | | |
| | | | |
| TOTAL FOR ABOVE ACTIVITIES | 35,266 | | |
| SYSTEM TOTAL FOR ENGINEERING | 2,860 | NA | NA |
| SYSTEM TOTAL FOR MPQAD | 14,845 | NA | NA |
| SYSTEM TOTAL FOR FIELD ENGR | 16,392 | NA | NA |
| SYSTEM TOTAL FOR CONSTRUCTION | 93,922 | NA | NA |
| SYSTEM TOTAL FOR GSO | 3,370 | NA | NA |
| SYSTEM TOTAL FOR TESTING | 2,125 | NA | NA |
| GRAND TOTAL | 133,514 | | |

* NOT SERIES ACTIVITIES , OCCUR WITH OVERLAP

INTEGRATED PROJECT SCHEDULE

SUMMARY

- **PROJECT PLANNING – IPS**
 - INTEGRATES & ALIGNS TOTAL TO-GO SCOPE
 - SETS SHORT TERM PROJECT PRIORITIES
 - RESOURCE REQUIREMENTS
 - PROBLEM AREA IDENTIFICATION
 - PROJECT COMPLETION FORECAST
 - SCHEDULE CONTINGENCY MANAGEMENT

- **FUNCTIONAL AREA PLANNING**
 - SYSTEM/AREA COMPLETION TEAMS
 - DETAILED WORKING SCHEDULES
 - BASED ON IPS REQUIREMENTS
 - SHORT TERM RESOURCE ALIGNMENT
 - FEEDS PROGRESS TO IPS

MIDLAND PROJECT SCHEDULE

CONSTRUCTION

DL QUAMME

MIDLAND SCHEDULE
MAJOR/KEY SCHEDULE ASSUMPTIONS
CONSTRUCTION SCHEDULE

- FUNDING AVAILABLE
- TO-GO SCOPE REMAINS STABLE
- NON CONFORMANCES AND TOTAL REWORK WITHIN ESTIMATE
- QC INSPECTOR RAMP-UP TO TWO-SHIFT OPERATION BY
MID-SUMMER 1984
- NRC/THIRD PARTY REVIEW OF PHASE 1 PACKAGES WILL
SUPPORT THE SCHEDULE

MIDLAND SCHEDULE
CONSTRUCTION MANHOUR (TO-GO) SCOPE SUMMARY
(TOTAL TO-GO AS OF 1/1/84)

| | <u>MANHOURS (MILLIONS)</u> |
|---------------------------------|-----------------------------------|
| • BECHTEL | |
| • NONMANUAL | 6.5 |
| • MANUAL | 6.3 |
| • MAJOR SUBCONTRACTS | |
| • NSSS | 0.2 |
| • HVAC | 1.1 |
| • INSULATION | 0.3 |
| • PENETRATION SEALING | 0.2 |
| • AUX. BLDG. UNDERPINNING | 1.9 |
| • SERV. WTR. BLDG. UNDERPINNING | 0.5 |

MIDLAND SCHEDULE
BECHTEL SITE MANHOURL SUMMARY
(TOTAL TO-GO AS OF 1/1/84)

| <u>NONMANUAL</u> | |
|------------------------------|---------------------------------------|
| <u>CATEGORY</u> | <u>MANHOURS (MILLIONS)</u> |
| ● CONSTRUCTION SUPERVISION | 0.5 |
| ● FIELD ENGINEERING | |
| • CONSTRUCTION WORK PACKAGES | 1.2 |
| • STATUS ASSESSMENT | 0.2 |
| • FCR/FCN/NCR RESOLUTION | 0.8 |
| • CONSTRUCTION WALKDOWNS | 0.2 |
| • STAFF | 0.2 |
| ● DOCUMENT CONTROL | 0.6 |
| ● SOILS ORGANIZATION | 1.0 |
| ● SUPPORT GROUPS | 1.8 |
| | <hr/> |
| TOTAL | 6.5 |

| <u>MANUAL</u> | |
|------------------------|---------------------------------------|
| <u>CATEGORY</u> | <u>MANHOURS (MILLIONS)</u> |
| ● NEW WORK | |
| • CONCRETE/CIVIL | 0.4 |
| • MECHANICAL/PIPING | 1.1 |
| • ELECTRICAL | 0.6 |
| ● MODIFICATIONS | |
| • CONCRETE/CIVIL | 0.4 |
| • MECHANICAL/PIPING | 0.6 |
| • ELECTRICAL | 0.4 |
| • SOILS REMEDIAL | 0.2 |
| ● DISTRIBUTABLES | 2.0 |
| ● STARTUP SUPPORT | 0.6 |
| | <hr/> |
| TOTAL | 6.3 |

MIDLAND SCHEDULE
STATUS ASSESSMENT (BECHTEL SCOPE)
PHASE 1 QUANTITIES/MANHOURS

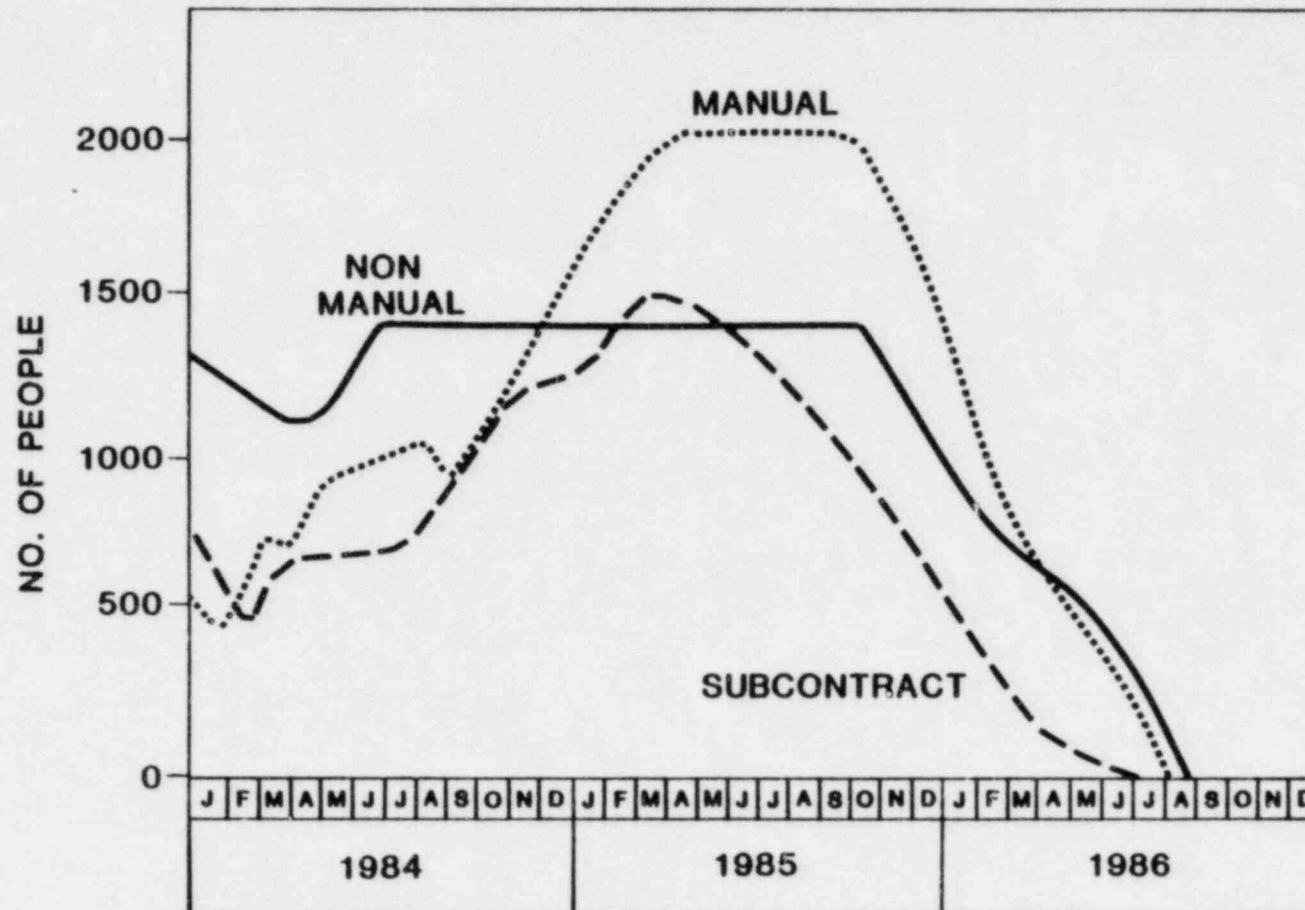
| | <u>QUANTITIES</u> | <u>HOURS</u> |
|----------------------------------|--------------------------|---------------------|
| ● MECHANICAL | | |
| • LARGE PIPE | 26,000 (LF) | 6,500 |
| • LARGE PIPE HANGERS | 3,500 (EA) | 23,000 |
| • SMALL PIPE | 39,800 (LF) | 9,500 |
| • SMALL PIPE HANGERS | 6,200 (EA) | 27,000 |
| • MISC | | <u>4,000</u> |
| | | S/T 70,000 |
| ● ELECTRICAL | | |
| • TERMINATIONS | 44,200 (EA) | 12,200 |
| • EQUIPMENT | 300 (EA) | <u>3,800</u> |
| | | S/T 16,000 |
| ● INSTRUMENTATION | | |
| • TUBING | 35,200 (LF) | 7,000 |
| ● RACEWAYS | | |
| • SUPPORTS | 6,700 (EA) | 40,000 |
| ● AREA | | |
| • STRUCTURAL STEEL | 1,340 (TONS) | 20,100 |
| • PLATFORMS | 460 (TONS) | 18,300 |
| • WHIP RESTRAINTS & JET BARRIERS | 320 (EA) | 6,500 |
| • BLOCK WALLS | 290 (EA) | 6,900 |
| • MISC | | <u>27,400</u> |
| | | S/T 79,200 |
| | TOTAL | <u>212,200</u> |

MIDLAND SCHEDULE INSTALLATIONS - SCOPE SUMMARY

| | <u>CURRENT FORECAST</u> | <u>TO-GO</u> |
|---------------------------|-----------------------------|--------------|
| • LARGE PIPE (LF) | 294,800 | 1,600 |
| • LARGE PIPE HANGERS (EA) | 16,000 | 1,460 |
| • SMALL PIPE (LF) | 339,400 | 28,090 |
| • SMALL PIPE HANGERS (EA) | 18,700 | 3,940 |
| • WIRE & CABLE (LF) | 10,694,000 | 660,640 |
| • TERMINATIONS (EA) | 356,000 | 62,220 |
| • CONDUIT (LF) | 623,300 | 47,360 |
| • CABLE TRAY (LF) | 87,300 | 500 |
| • INSTRUMENT TUBING (LF) | 160,000 | 43,640 |

MIDLAND SCHEDULE

BECHTEL SITE MANPOWER



MIDLAND PROJECT SCHEDULE

QUALITY ASSURANCE

RA WELLS

MPQAD INSPECTION REQUIREMENTS (CCP)

QUALITY VERIFICATION PLAN (QVP)

- 100% VERIFICATION OF ALL INSPECTIONS COMPLETED PRIOR TO DECEMBER 1982
 - PHYSICAL INSPECTION
 - DOCUMENT REVIEW

STATUS ASSESSMENT REINSPECTIONS

- VERIFICATION OF PARTIALLY COMPLETED INSPECTIONS PRIOR TO DECEMBER 1982
 - PHYSICAL INSPECTION
 - DOCUMENT REVIEW
- UPDATING OF INSPECTIONS TO LEVEL OF CONSTRUCTION COMPLETION

NEW INSPECTIONS

- NEW CONSTRUCTION ACTIVITIES

QVP/SA MAN HOUR ESTIMATES

- IDENTIFIED CLOSED INSPECTION RECORDS BY PQCI

- 100,000 PHYSICAL INSPECTIONS-DOCUMENT REVIEW
- 28,000 DOCUMENT REVIEW ONLY

- IDENTIFIED OPEN INSPECTION RECORDS BY PQCI

- 11,000 PHYSICAL INSPECTIONS-DOCUMENT REVIEW

- ESTIMATED NUMBER OF UPDATE INSPECTIONS

- 15% OF Q-CONSTRUCTION 3 MONTHS PRIOR TO DECEMBER 1982

- ESTIMATED UNIT RATES BY PQCI

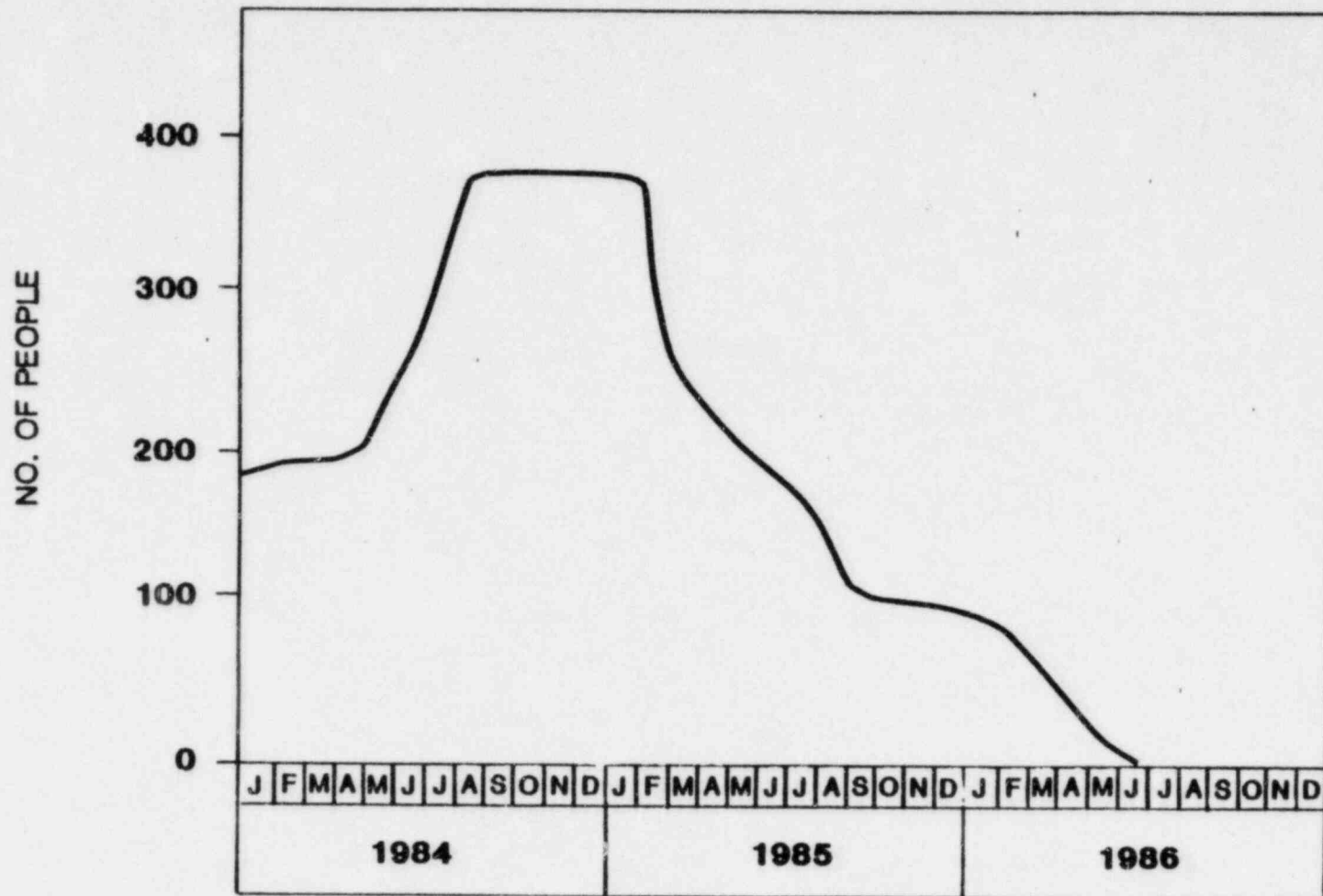
- HISTORICAL BASIS
- PILOT TEAMS FOR MAJOR PQCI

- DETERMINED MAN HOUR ESTIMATES

- 295,000 QVP - REINSPECTION/DOCUMENT REVIEW
- 20,000 QVP - DOCUMENT REVIEW ONLY
- 210,000 SA - REINSPECTION/DOCUMENT REVIEW

MIDLAND PROJECT FORECAST (84)

MPQAD INSPECTION MANPOWER



SCHEDULED SUPPORT TO DATE

- SUPPORTED TR MILESTONES
- SUPPORTING 120D MILESTONES
- SCHEDULE TO SUPPORT CRITICAL NEAR TERM MILESTONES

REINSPECTION RESULTS

- 2,500 QVP REINSPECTIONS

- NUMBER OF NCR's CONSISTENT WITH SCHEDULE ASSUMPTIONS
- WORKMANSHIP GOOD
- CONFORMANCE TO DETAIL LACKING

- PREVIOUS CABLE REINSPECTIONS

- 9,000 CABLES AND 63,500 ATTRIBUTES
- LESS THAN 2% NONCONFORMANCES
- LESS THAN 0.5% REWORK

- 1,500 HANGER REINSPECTIONS

- 30% REWORK-GENERALLY MINOR

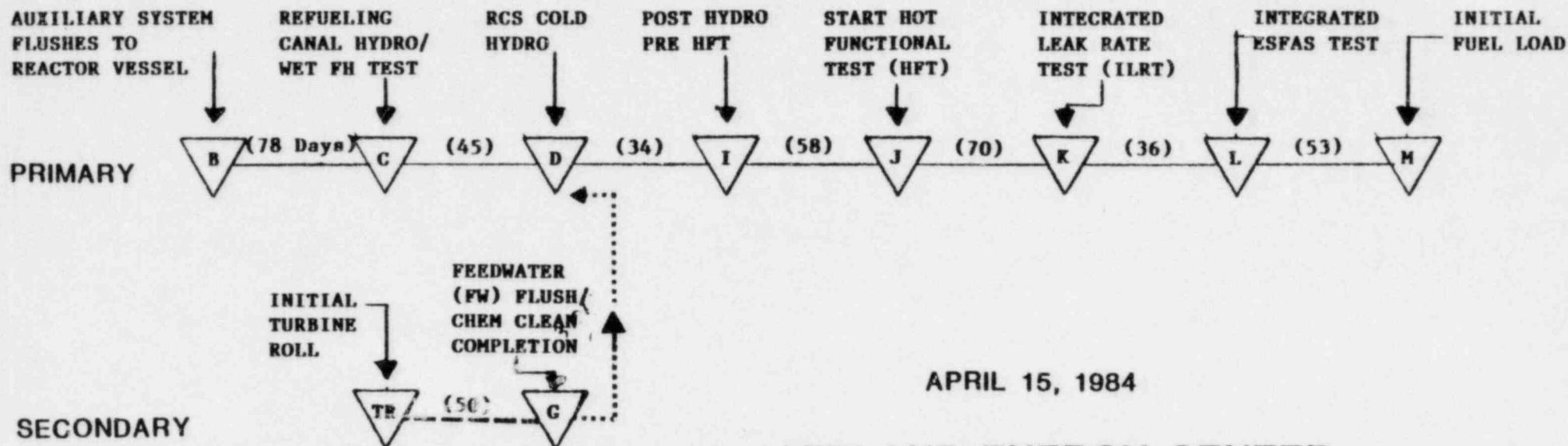
PERFORMANCE EFFICIENCIES

- SPECIAL DOCUMENT REVIEW GROUPS
- INSPECTION PLAN COMBINATION
- LEARNING CURVE IMPROVEMENTS
- PERFORMANCE MONITORING SYSTEM
- INSPECTION EVALUATION PROGRAM
- INCREASED STAFF
- TRAINING/CERTIFICATION PROCESS IMPROVEMENTS

MIDLAND PROJECT SCHEDULE

TESTING

DL QUAMME



APRIL 15, 1984

MIDLAND ENERGY CENTER TESTING DEPARTMENT

UNIT 2 MILESTONE SEQUENCE

COMPLETED MILESTONES:

- 2A - DRY FUEL HANDLING INDEX PREOP TEST (8-82)
- 2E - CONDENSATE STORAGE & TRANSFER FLUSH (10-82)
- 2F - CONDENSATE PUMP INITIAL RUN (11-82)
- 2H - INITIAL CONDENSER VACUUM (3-84)

MIDLAND ENERGY CENTER UNIT 2 TURNOVER STATUS

TOTAL TESTABLE

| | |
|----------------------|-----|
| SUB SYSTEMS REQUIRED | 693 |
|----------------------|-----|

| | |
|-------------|-----|
| TURNED-OVER | 536 |
|-------------|-----|

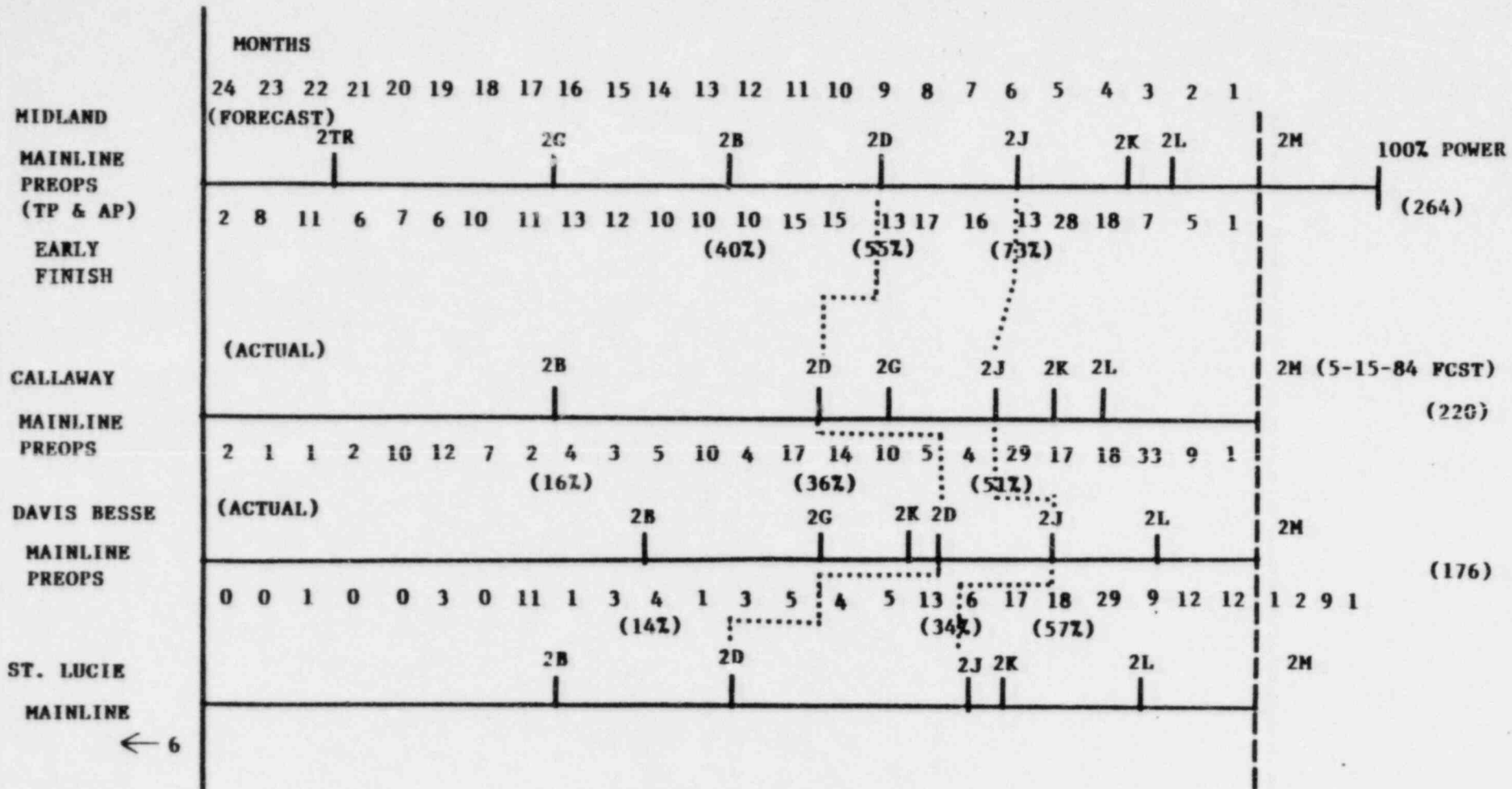
| | |
|-----------|----|
| TO-GO 'Q' | 95 |
|-----------|----|

| | |
|---------------|-----------|
| TO-GO 'NON-Q' | <u>62</u> |
|---------------|-----------|

| | |
|-------------|------------|
| TOTAL TO-GO | <u>157</u> |
|-------------|------------|

MIDLAND ENERGY CENTER UNIT 2

TEST SCHEDULE COMPARISONS



MAINLINE LEGEND

SECONDARY

2TR - TURBINE ROLL
2G - FEEDWATER FLUSH
SECONDARY SIDE TESTING
COMPLETE

PRIMARY

2B - AUXILIARY FLUSHES
2D - RCS HYDRO
2J - HOT FUNCTIONAL
2K - SIT/ILRT TESTING
2L - ESFAS TESTING
2M - FULL LOAD

MIDLAND ENERGY CENTER UNIT 2

TEST PROCEDURE STATUS

PREOPERATIONAL AND ACCEPTANCE TESTS

| | |
|----------------------------|-----|
| TOTAL NUMBER OF PROCEDURES | 264 |
| TO DEVELOP | 51 |
| IN REVIEW CYCLE | 68 |
| APPROVED PROCEDURES | 145 |

MAY 1, 1984

TESTING ACTIVITIES STATUS

PERCENT COMPLETE

| | | CURRENT TOTAL F/C | SCHED % | ACTUAL % |
|----------------------------------|----|----------------------|---------|----------|
| INITIAL SYSTEM CHECKOUT | MH | 550,000 | 19 | 49 |
| SYSTEM FLUSHES | MH | 66,000 | 15 | 28 |
| SYSTEM PREOPERATIONAL TESTING | MH | 266,000 | 9 | 15 |

EQUIPMENT RELIABILITY PROGRAMS

B & W OWNERS GROUP

NUCLEAR OPERATIONS & MAINTENANCE INFORMATION SERVICE

OTSG TASK FORCE

LAY-UP / PACS PROGRAM

- UNIT 1 SYSTEMS**
- CRITICAL UNIT 2 REVIEW**

PRE-CALIBRATION / TEMPORARY RELEASE PROGRAM

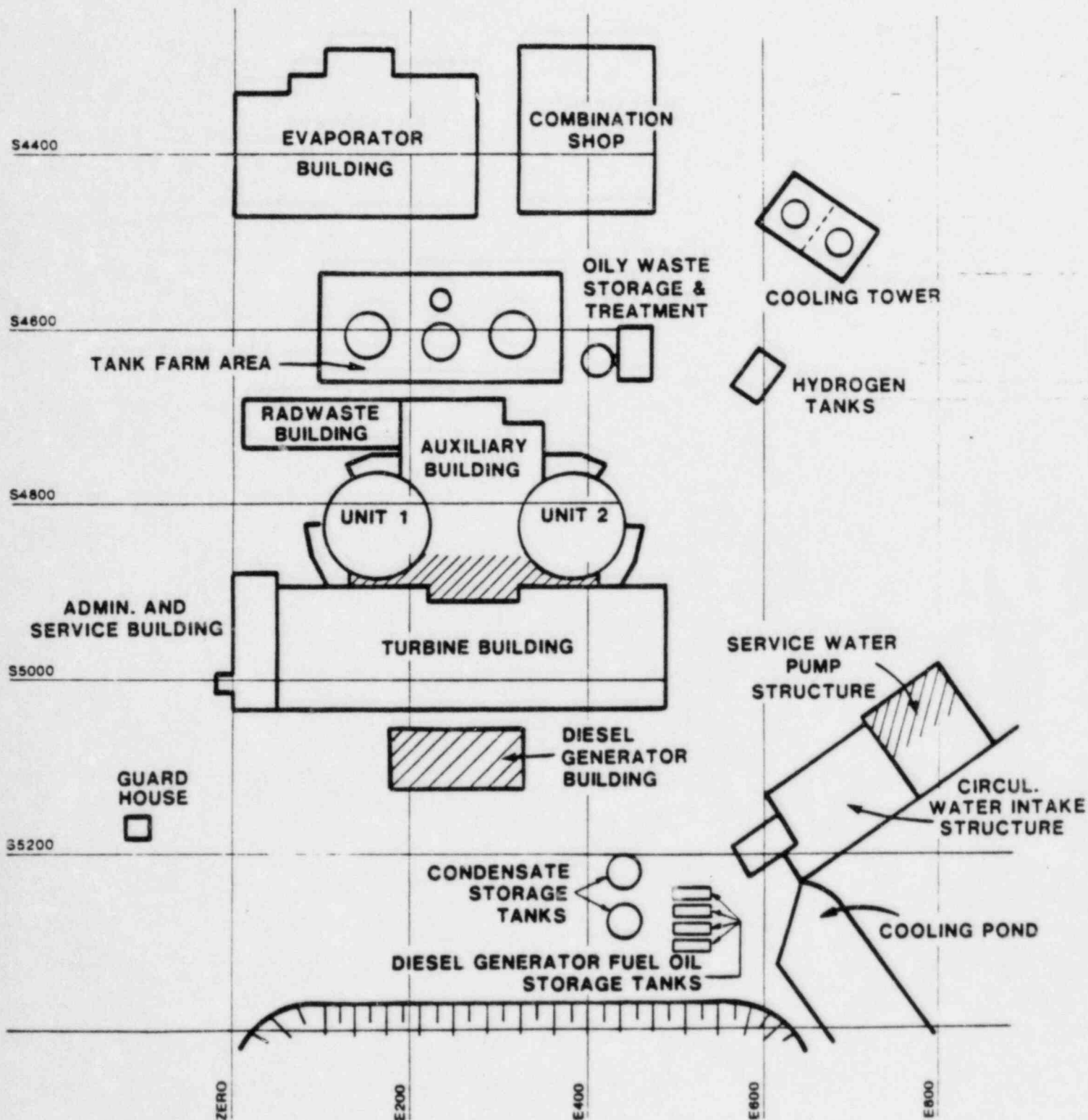
- EXECUTION OF REMAINING WORK UNDER CCP WILL RESULT IN A MORE COMPLETE SYSTEM WITH VERIFIED LEVEL OF QUALITY AT TIME OF SYSTEM TURNOVER AND INITIATION OF SYSTEM TESTING.
- DECOUPLING OF THE TWO UNITS RESULTS IN REQUIREMENT TO START-UP ONE PLANT RATHER THAN THE PARALLEL TWO UNIT START-UP PLANNED IN PREVIOUS SHCEDULES.
- TEST PROCEDURE DEVELOPMENT - ALL TEST PROCEDURES WILL BE APPROVED BY END OF THE YEAR INSURING WE MEET NRC REQ'T OF "AT LEAST 2 MONTHS PRIOR TO TEST START DATE".
- 2TR AND 2G MILESTONES PRIOR TO 2B THEREBY REDUCING SIGNIFICANTLY WORK HAS TO BE PERFORMED DURING PRIMARY MAINLINE ACTIVITIES.
- TRAINED AND EXPERIENCED TEST ENGINEER FROM BOP TESTING TO MOVE DIRECTLY INTO PRIMARY SYSTEM TESTING.
- TESTING MANPOWER BUDGETED FOR 1984 - 118
 - CPCO PERSONNEL 53
 - CONTRACT PERSONNEL 65
 - CURRENT TOTAL 119

MIDLAND PROJECT SCHEDULE

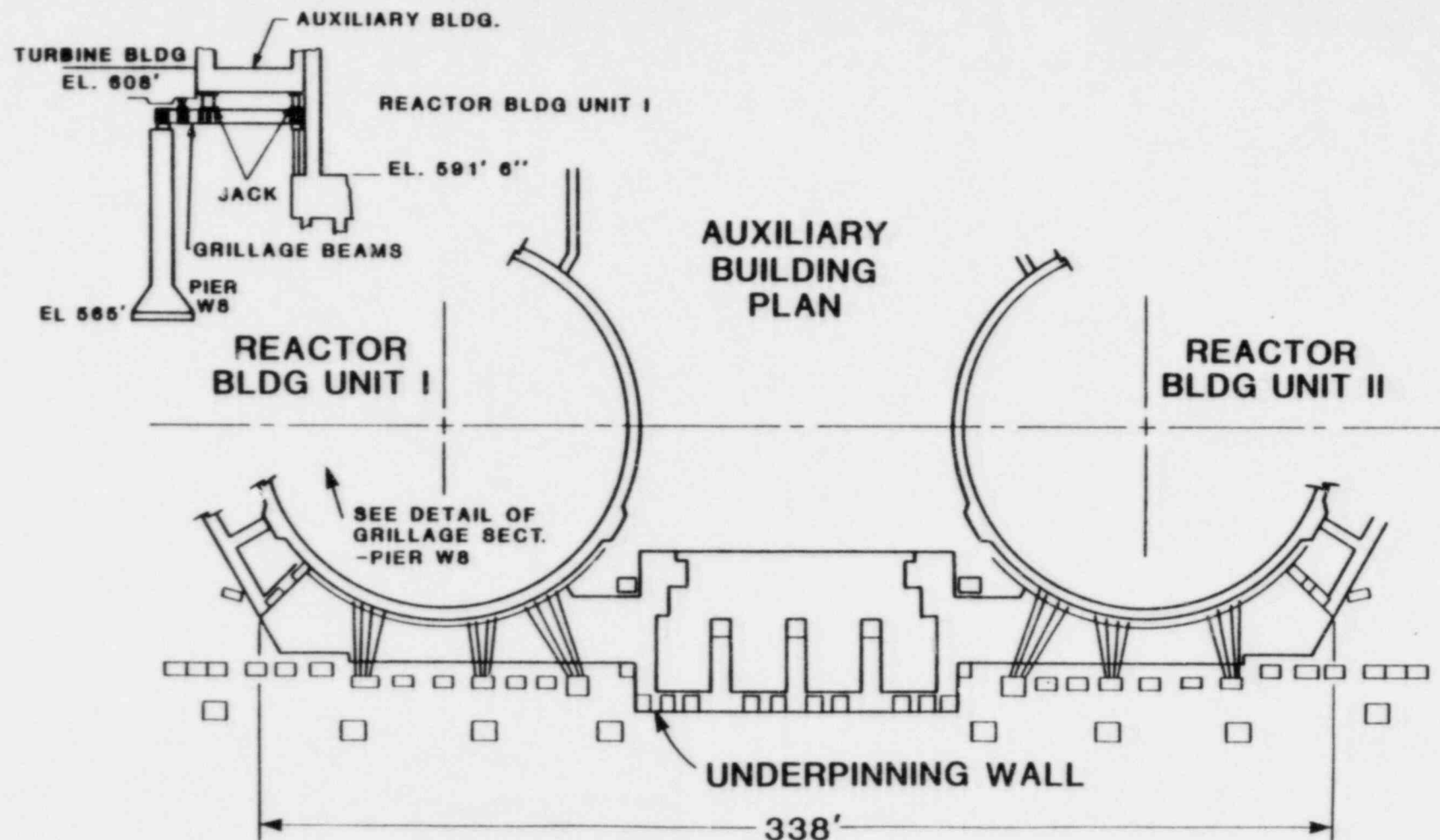
SOILS

JA MOONEY

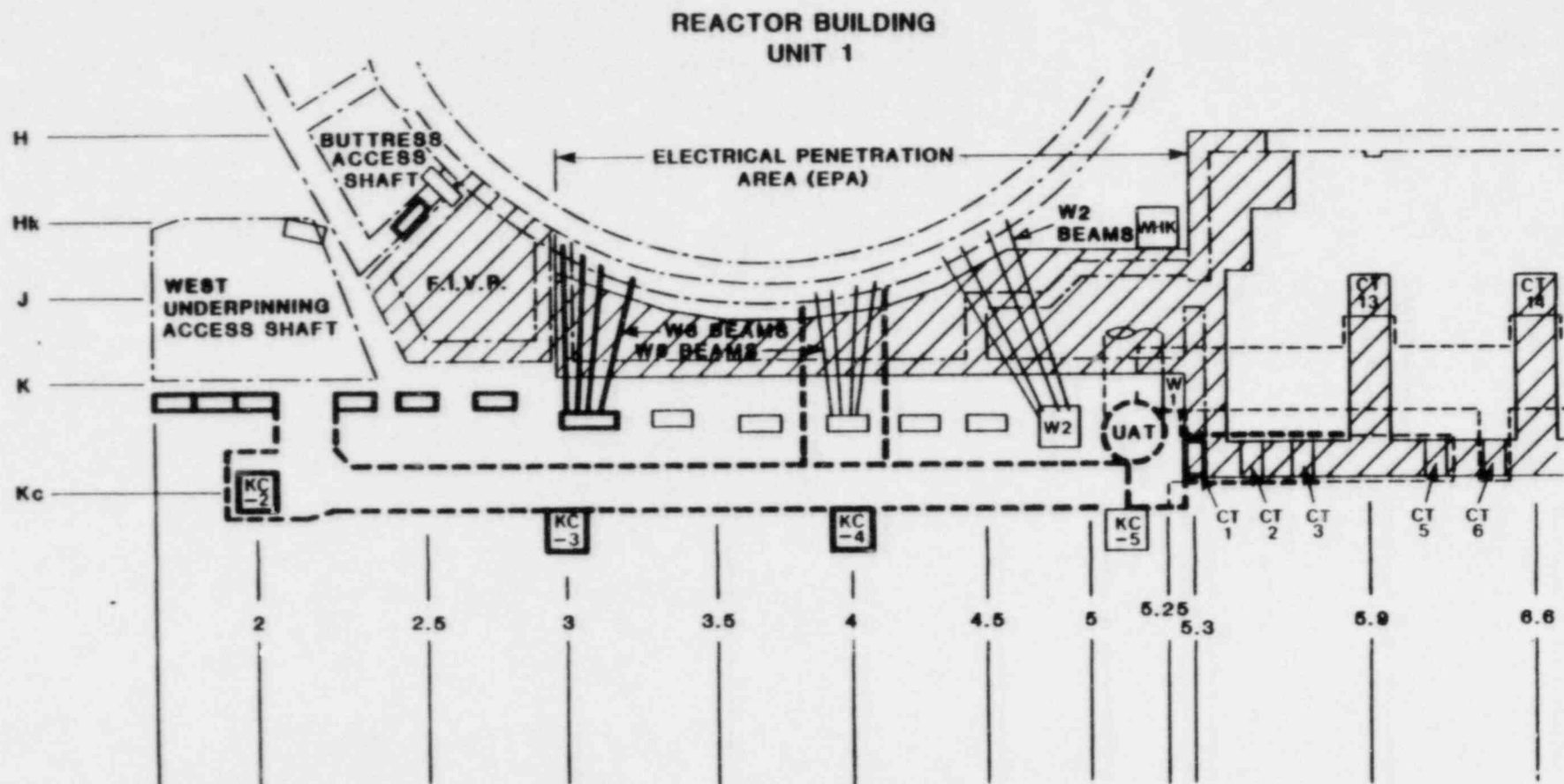
MIDLAND PROJECT SITE PLAN



MIDLAND PROJECT AUX. BUILDING SOILS REMEDIAL WORK



AUXILIARY BUILDING UNDERPINNING PLAN VIEW

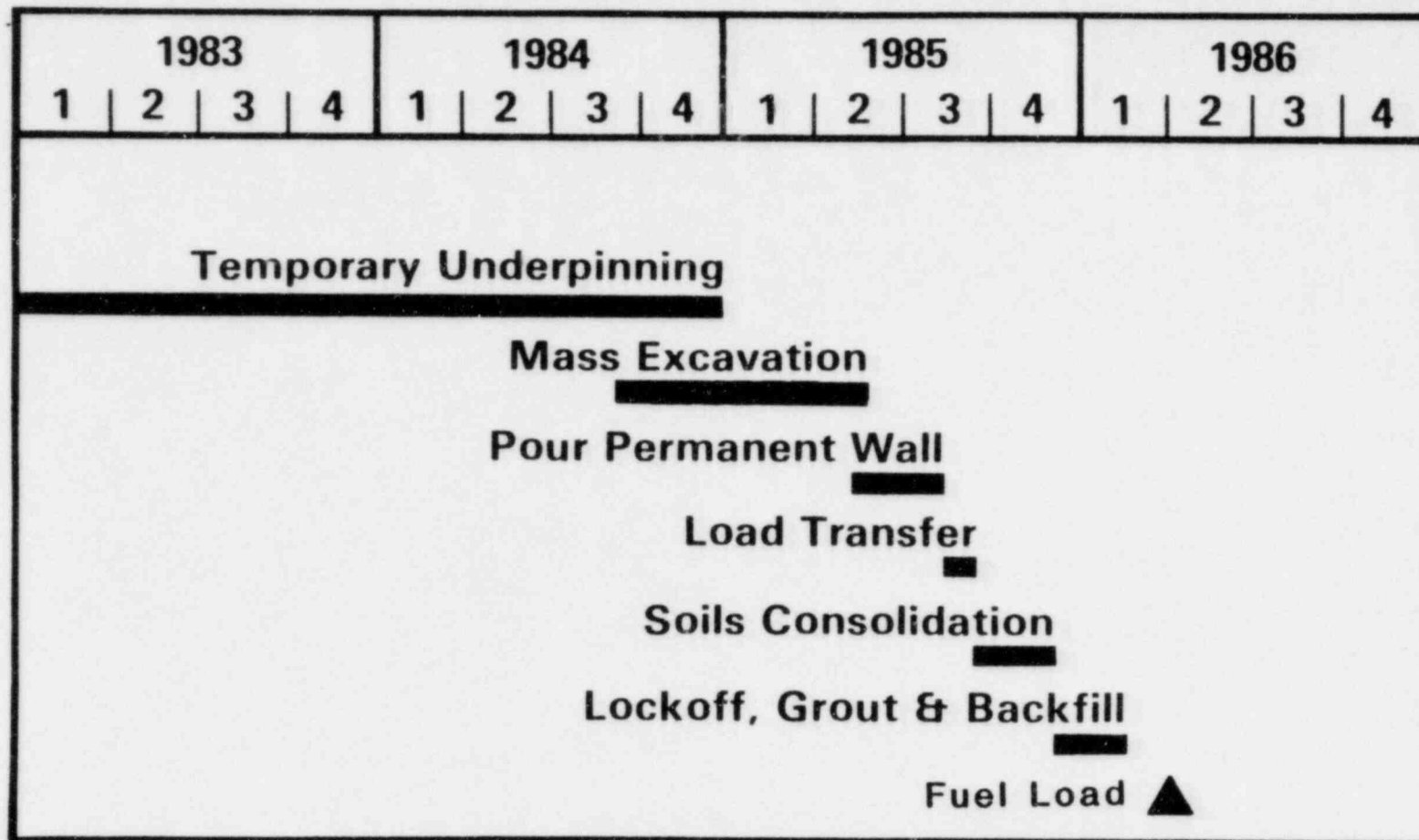


AUXILIARY BUILDING UNDERPINNING
SELECTED PRODUCTION RATES

| <u>ACTIVITY DESCRIPTION</u> | <u>UNIT</u> | <u>RATE/ CREW SHIFT</u> |
|-----------------------------|-------------|-------------------------|
| DRIFT EXCAVATION | HF | 1.2 |
| PIER EXCAVATION | VF | 2.4 |
| MASS EXCAVATION BY HAND | CY | 8.7 |
| MASS EXCAVATION BY MACH | CY | 21.0 |
| INSTALL PIER RESTEEL | LBS | 435.0 |
| INSTALL PIER CONCRETE | CY | 6.1 |
| INSTALL GRILLAGE BEAMS | LBS | 1000.0 |

MIDLAND PROJECT SCHEDULE

AUXILIARY BUILDING UNDERPINNING



MIDLAND SOILS SCHEDULE

SCHEDULE CERTAINTIES

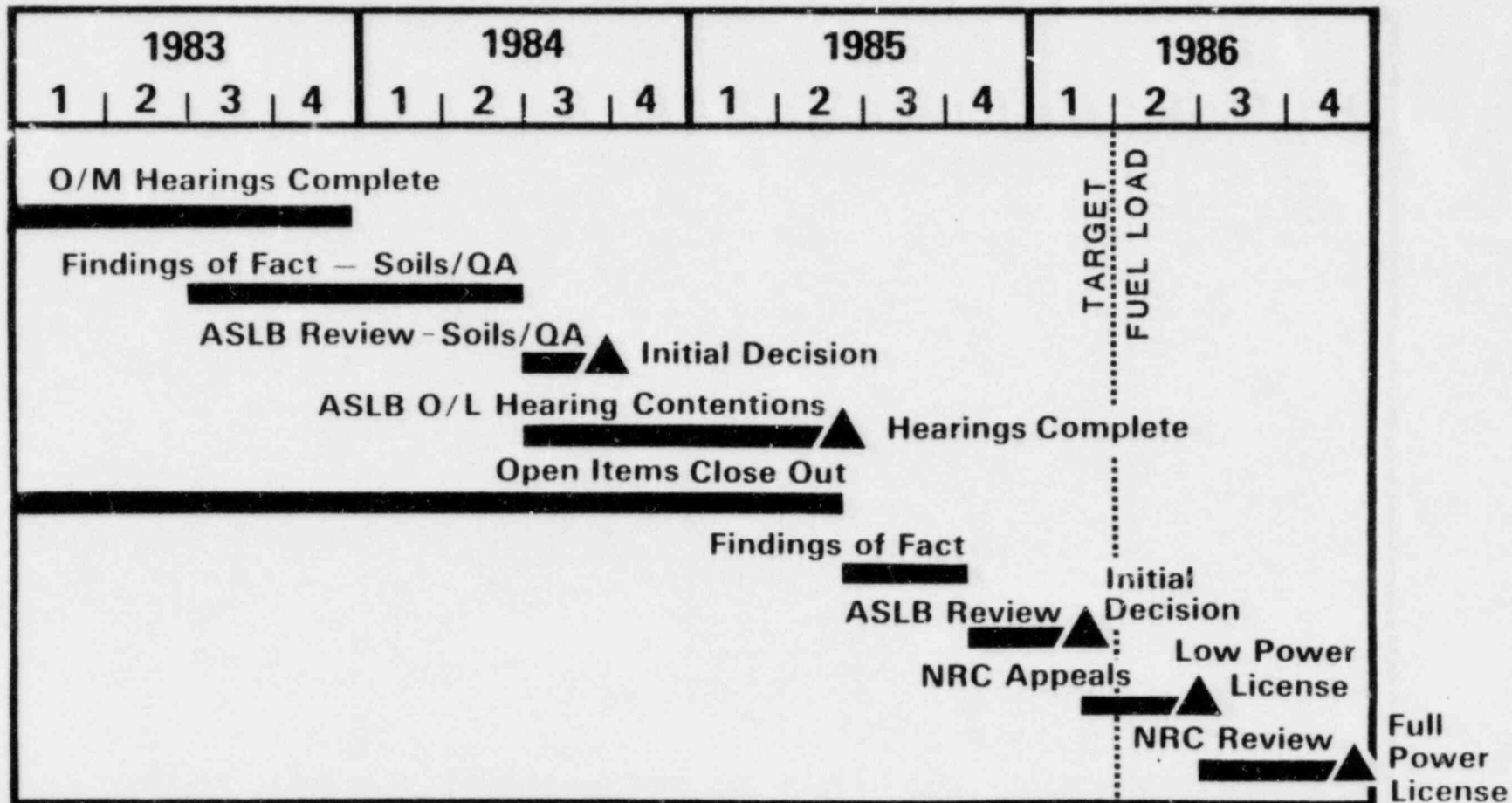
- **DESIGN COMPLETE**
- **SSER ISSUED**
- **CONSTRUCTION 35% COMPLETE**
- **DEMONSTRATED PRODUCTIVITY
RATE**
- **EXPERIENCED ORGANIZATION**

MIDLAND PROJECT SCHEDULE

LICENSING

JN LEECH

MIDLAND PROJECT SCHEDULE LICENSING SCHEDULE



MIDLAND PROJECT SCHEDULE

CONCLUSIONS

JW COOK

BASES FOR SCHEDULE CONFIDENCE

- **Soils Activities Defined and Demonstrated**
- **CCP Program Approved and Implementation Initiated**
- **Design Complete**
- **Single Plant Completion**
- **Improved Overall Project Planning**
- **Additional Senior Staff**
- **Project Milestones**
- **Target Schedule**