

U. S. NUCLEAR REGULATORY COMMISSION

REGION V

Report No. 50-508/85-04

Docket No. 50-508

Construction Permit No. CPPR-154

Licensee: Washington Public Power Supply System  
3000 George Washington Way  
Richland, Washington 99352

Facility Name: Washington Nuclear Project 3

Meeting at: Satsop Information Center, Elma, Washington

Date: July 2, 1985

Prepared by:

*D.F. Kirsch*  
for R. T. Dodds, Chief, Reactor Projects, Section I

*7/22/85*  
Date Signed

Approved By:

*D.F. Kirsch*  
D. F. Kirsch, Acting Director  
Division Reactor Safety and Projects

*7/22/85*  
Date Signed

Summary:

Meeting on July 2, 1985, to examine the Supply System's proposed readiness review programs for design review and plant preservation.

8508140163 850722  
PDR ADOCK 05000508  
Q PDR

## 2. General

The Supply System has previously met with NRC representatives to discuss the proposed readiness review programs for WNP-1 and WNP-3. In the Supply Systems letter of May 22, 1985, a specific request was made that the NRC agree to review the program description of Readiness Reviews at WNP-3 and WNP-1 for approval, agree to participate in the Readiness Review at WNP-3 and WNP-1 and review the Preservation Program Description for approval.

In letter G03-85-283 dated May 24, 1985, the Supply System sent a copy of the preservation program entitled "Preservation of Assets Preventative Maintenance Program" for NRC review and approval. The description of the programmatic controls for the Preservation Program were subsequently furnished with G03-85-358 dated June 28, 1985, which was also submitted for NRC review and approval.

In letter G01-85-0127/G03-85-0299 dated June 3, 1985, the Supply System requested review and approval of the Design Review Program entitled "Engineering Assurance Program (EAP)".

The purpose of the meeting on July 2, 1985 was to review the status of the WNP-3 project and the aforementioned submittals pertaining to the Preservation Program and Engineering Assurance Program. Attached are copies of the slides used by the licensee during the presentation of the proposed programs for NRC consideration.

The licensee stated that an independent group from outside the Supply System will be utilized to assess and audit the effectiveness of the Readiness Review.

The licensee responded as follows for specific issues/questions:

- ° An independent group from outside the Supply System will be utilized to assess and audit the effectiveness of the program.
- ° Procedures will be developed that detail how each design process review is to be conducted.
- ° The readiness review will verify that the documentation inventory is complete.
- ° Maintenance Work Requests are reviewed by Engineering after work has been completed.
- ° The cathodic protection system is on-line and has been balanced several times.
- ° Generally, the manufacturer's recommendations are followed for preventative maintenance for the protection of equipment, including surveillance frequency and insulation resistance tests.
- ° The control room is manned continuously by at least two persons per shift.

The Regional Administrator expressed concern as to the existence of a structured program for configuration control to assure that control over maintenance and work crews inside the plant does not diminish during the years of mothballing; emphasizing the need to make absolutely certain that if something is taken apart, it is properly reassembled and documented. He cautioned that over the years unusual circumstances can occur. The Supply System needs to make sure the inventory is complete so a new generation can pickup the project.

Supply System management responded, stating that is the heart of what they are doing and that there have not been any big surprises so far in the preservation of the plant.

The only comment from the public was from a member of EFSEC who stated that the Council supported the Readiness Review and Preservation Programs.

## PROJECT STATUS

### WNP-3 - 1250 MWE PWR

- CONSTRUCTION STARTED APRIL 11, 1977  
ENGINEERING 90% COMPLETE  
CONSTRUCTION 76% COMPLETE
  
- AE: EBASCO SERVICES, INC.
- NSSS: COMBUSTION ENGINEERING
- CM: EBASCO SERVICES, INC.
  
- MULTIPLE CONSTRUCTION CONTRACTORS
  
- EXTENDED CONSTRUCTION DELAY FROM JUNE, 1983
  
- PLANT IN PRESERVATION STATUS FOR RESUMPTION OF CONSTRUCTION
  
- ENGINEERING/DOCUMENTATION/LICENSING CONTINUITY MAINTAINED
  
- NRR PREPARATION OF DRAFT SER

## PREVENTIVE MAINTENANCE (PM) PROGRAM ADMINISTRATION

- SPECIFIC PROCEDURES AND INSTRUCTIONS DEVELOPED FOR EACH TYPE OF EQUIPMENT.
  
- REQUIREMENTS ENTERED INTO COMPUTER SYSTEMS. (THE PREVENTIVE MAINTENANCE AND CORRECTIVE MAINTENANCE COMPUTER SYSTEMS ARE INTERACTIVE.)
  
- COMPUTER SYSTEM PRODUCES HARD COPY OF REQUIREMENTS AS SCHEDULE DICTATES.
  
- WORK IS PERFORMED, DOCUMENTED AND REVIEWED BY SUPERVISOR.
  
- COMPLETION DATA AND COMMENTS ENTERED BACK INTO COMPUTER SYSTEMS.
  
- LATE REPORTS GENERATED BY COMPUTER IF COMPLETION DATA NOT ENTERED.

## PROGRAM DURING EXTENDED CONSTRUCTION DELAY

PLAN FOR EXTENDED CONSTRUCTION DELAY WAS DEVELOPED FOR EACH PLANT - REFINED EACH YEAR.

FY-85

WNP-3

ANNUAL BUDGET

\$59.1M

MANPOWER LEVEL (SITE)

402

### ACTIVITIES

- PLANT PRESERVATION AND MAINTENANCE
- CONSOLIDATION AND VERIFICATION OF RECORDS
- ENGINEERING CONSOLIDATION AND COMPLETION
- LICENSING CONTINUITY AND FOLLOW THROUGH
- CONTRACT CONSOLIDATION AND CLOSE OUT
- RESTART PLANNING AND PREPARATION
- PROJECT ENHANCEMENT STUDIES

## READINESS REVIEW PROGRAM

### WHAT IS IT:

- A SERIES OF REVIEWS TO ASSESS THE ADEQUACY OF AN ACTIVITY.
  
- FOR THE SUPPLY SYSTEM THE SERIES OF REVIEWS ENCOMPASS THE IMPLEMENTATION OF ALL ASPECTS OF DESIGN, CONSTRUCTION AND PREPARATION FOR OPERATIONS.
  
- PROGRAM HAS SUPPLY SYSTEM MANAGEMENT INVOLVEMENT, ALONG WITH NRC PARTICIPATION.

WHAT DOES THE PROGRAM ACCOMPLISH?

- GIVES MANAGEMENT ADDITIONAL ASSURANCE THAT QUALITY-RELATED PROBLEMS HAVE BEEN DETECTED.
- PROGRAM GIVES CONFIDENCE AS THE WORK PROGRESSES.
- PRECLUDES SURPRISES AT THE END OF CONSTRUCTION.



## READINESS REVIEW PROGRAM GOALS

- WHEN A REVIEW IS COMPLETED AND ACCEPTED, ALL ISSUES RELATED TO THAT SUBJECT WILL HAVE BEEN ADDRESSED AND ANSWERED.
  
- FSAR AND SER QUESTIONS FINISHED.

## CURRENT ACTIVITIES

- NO CONSTRUCTION ACTIVITY - SOME SMART WORK TO HELP PRESERVATION
- SOME DESIGN ON-GOING
- DESIGN STATUSING BEING CONDUCTED
- PRESERVATION PROGRAM IMPLEMENTED
- NO PREPARATION FOR OPERATION

SUPPLY SYSTEM READINESS REVIEW PROGRAM

SINCE OUR PROJECTS ARE NOT CURRENTLY UNDER CONSTRUCTION,

OUR REVIEW PROGRAM MUST BE DIVIDED INTO TWO PHASES.

- INITIAL PHASE - TO BE ACCOMPLISHED BEFORE  
RESUMPTION OF CONSTRUCTION.
  
- SECOND PHASE - BEGINS FOLLOWING RESUMPTION  
OF CONSTRUCTION AND IS COMPLETE BEFORE OPERATING  
LICENSE.

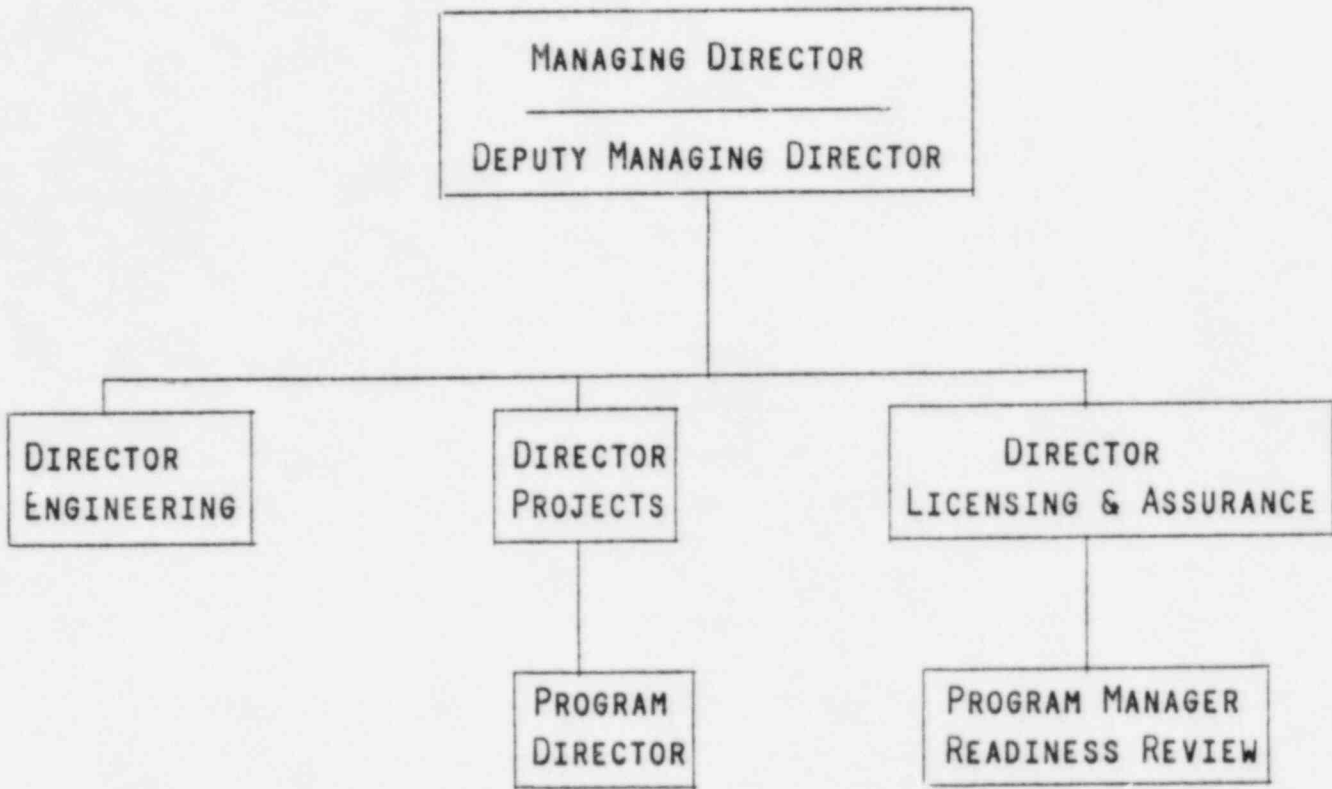
## INITIAL PHASE

- REVIEW OF WORK COMPLETED TO DATE.
  
- FOCUS ON DESIGN AND CONSTRUCTION PROCESSES AND ON THE PRESERVATION PROGRAM IMPLEMENTATION.
  
- SAMPLE PRODUCTS OF THESE PROCESSES AND DRAW CONCLUSIONS FROM THE RESULTS OF THE REVIEWS.

GOAL: REVIEW FOR ACCEPTANCE, THE DESIGN AND CONSTRUCTION THAT HAVE BEEN COMPLETED TO DATE. THE RESULTS OF THE INITIAL PHASE WILL BE THE FIRST INCREMENTAL ACCEPTANCE OF THE PROJECT.

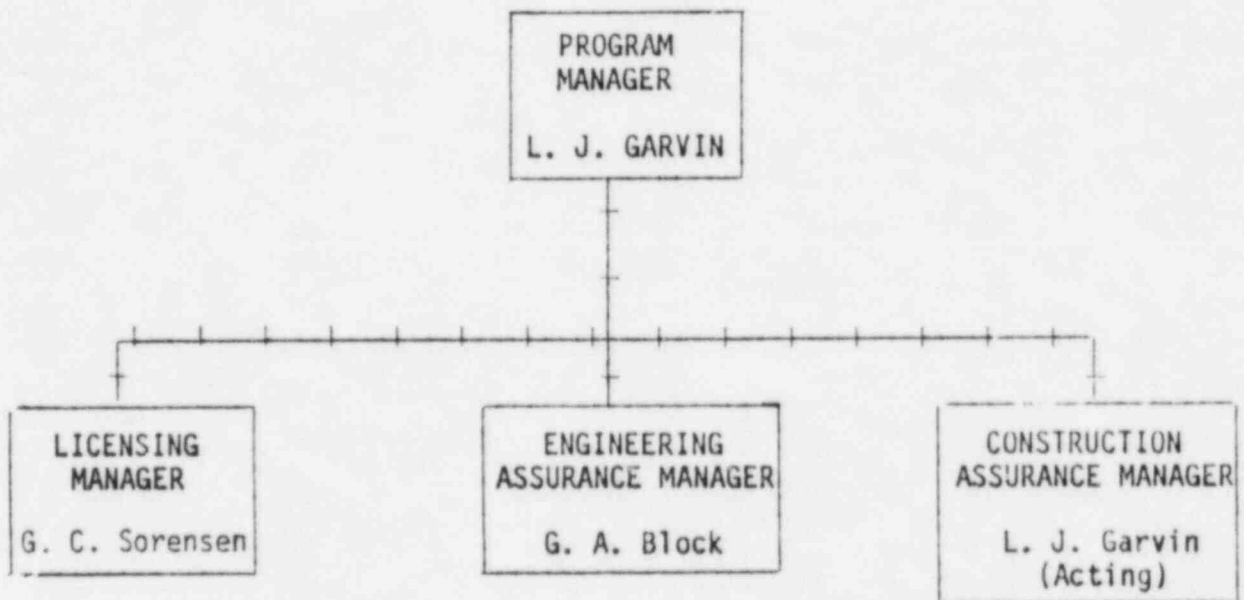
## SECOND PHASE

- REVIEW OF CONTROL SYSTEMS PUT IN PLACE TO COMPLETE CONSTRUCTION.
- REVIEWS WILL BE CONDUCTED TO INCREMENTALLY ACCEPT THE PROJECT WORK AS IT PROGRESSES TOWARD LICENSING AND FUEL LOAD.
- DETAILS OF THE SECOND PHASE WILL BE DISCUSSED BEFORE RESTART OF CONSTRUCTION.
- GOAL: COMPLETION OF THE SERIES OF REVIEWS WILL RESULT IN AN SER WITH NO OUTSTANDING QUESTIONS.



- READINESS REVIEW GROUP REPORTS TO CORPORATE MANAGEMENT, INDEPENDENT OF THE PROJECT.

READINESS REVIEW  
ORGANIZATION



o USING INDIVIDUALS MATRIXED FROM OTHER CORPORATE GROUPS.

## DESIGN ASSURANCE

- SAMPLES DESIGN
  
- DRAWS CONCLUSIONS FROM THE RESULTS OF THAT REVIEW AND FROM THE RESULTS OF ALL THE DESIGN REVIEWS.
  
- GETS FEEDBACK FROM THE RESULTS OF THE REVIEW OF CONSTRUCTION AND PRESERVATION.
  
- DETAILS TO BE DISCUSSED LATER.



## CONSTRUCTION ASSURANCE

- SAMPLE EACH CONTRACTORS WORK.
- SAMPLE SIZE DEPENDENT ON NATURE AND AMOUNT OF WORK.  
HISTORY OF CONTRACTOR AND THE RESULTS OF ANY SPECIAL PROGRAMS.
- REVIEW WILL CONSIST OF REINSPECTION/WALKDOWNS USING THE SAME CRITERIA AS USED FOR CONSTRUCTION INSPECTIONS.
  - WALKDOWNS INCLUDE DESIGN ENGINEERS - TO ASSESS EFFECT OF OTHER CONSTRUCTION.
  - ADEQUACY AND IMPLEMENTATION OF PRESERVATION, WILL ALSO BE REVIEWED).
- DEFICIENCIES WILL BE DOCUMENTED AND RESOLVED.
- THE NEED FOR INCREASED SAMPLING WILL BE BASED UPON THE NUMBER AND SIGNIFICANCE OF DEFICIENCIES.
- DETAILS OF PROGRAM TO BE PROVIDED BY AUGUST 1985.
- APPROVAL OF PROGRAM DESCRIPTION IS REQUESTED BY OCTOBER 1985.

## PRESERVATION

- PREVENTIVE MAINTENANCE OF EQUIPMENT STARTS UPON RECEIPT OF AN ITEM.
- PRESERVATION PROGRAM IMPLEMENTED AT THE TIME DELAY WAS ANNOUNCED. STILL ON-GOING.
- DETAILS TO BE DISCUSSED BY A. D. KOHLER.

SCHEDULE

LONG TERM

DESIGN REVIEW

START - JULY 1, 1985

FIRST REPORT TO NRC - JANUARY, 1986

REVIEW REPORTS SUBMITTED TO NRC EVERY 3-4 MONTHS  
THEREAFTER.

CONSTRUCTION REVIEW

START - JANUARY, 1986

FIRST REPORT TO NRC - JULY, 1986

REVIEW REPORTS SUBMITTED TO NRC EVERY 2-3 MONTHS  
THEREAFTER.

WNP-3 DESIGN READINESS REVIEW

WASHINGTON PUBLIC POWER SUPPLY SYSTEM

NUCLEAR PROJECT NO. 3

JULY 2, 1985

## WNP-3 DESIGN READINESS REVIEW

### PURPOSE:

TO INCREASE CONFIDENCE IN THE DESIGN OF THE WNP-3 PLANT AND TO PROVIDE A DOCUMENTED BASIS FOR THE ACCEPTANCE, BY BOTH SUPPLY SYSTEM MANAGEMENT AND THE NRC, OF THE COMPLETED DESIGN OF WNP-3.

- (1) NEAR TERM ACCEPTANCE OF DESIGN COMPLETED TO DATE PRIOR TO CONSTRUCTION RESTART.
  
- (2) FINAL ACCEPTANCE OF COMPLETED DESIGN BASED ON AN ONGOING DESIGN REVIEW PROCESS RATHER THAN A LAST-MINUTE MAJOR EFFORT.

2

WNP-3 DESIGN READINESS REVIEW

NUCLEAR PLANT DESIGN:

- 0 THE DESIGN FUNCTION ASSEMBLES ALL TECHNICAL AND HUMAN REQUIREMENTS FROM A VARIETY OF SOURCES INTO AN INTEGRATED DESIGN OF A FUNCTIONAL UNIT, THE POWER PLANT.
- 0 IT EMCOMPASSES THE SITE, SYSTEMS, STRUCTURES, COMPONENTS, AND THE HUMAN INTERFACE.
- 0 THE PRODUCTS OF DESIGN ARE DRAWINGS AND SPECIFICATIONS.
- 0 THE PROCESS OF DESIGN IS THAT SEQUENCE OF EVENTS LEADING TO THE PREPARATION OF DRAWINGS AND SPECIFICATIONS.
- 0 NUCLEAR PLANT DESIGN ALSO INCLUDES RECONCILIATION OF THE DESIGN WITH THE ACTUAL PHYSICAL INSTALLATION.

07/02/85

WNP-3 DESIGN READINESS REVIEW

- 0 THE DESIGN OF A NUCLEAR PLANT IS A COMPLICATED AND PRECISE ACTIVITY TYPICALLY SPANNING MANY YEARS.
- 0 THE DESIGN PROCESS IS PROCEDURALIZED AND DOCUMENTED TO ENSURE CONSISTENCY AND TO AVOID DEPENDENCE ON HUMAN MEMORY.
- 0 THE PROCESS IS CHECKED BY AN INDEPENDENT QUALITY ASSURANCE ORGANIZATION TO DETECT ANY DEVIATION FROM PROCEDURAL COMMITMENTS.
- 0 AS AN ADDED MEASURE, THE SUPPLY SYSTEM HAS CREATED AN ORGANIZATION SEPARATE FROM BOTH THE PROJECT AND QUALITY ASSURANCE GROUPS.
- 0 THE NEW ORGANIZATION IS STAFFED WITH SENIOR TECHNICAL PERSONNEL WHO CAN RECOGNIZE GOOD OR BAD DESIGNS OR PRACTICES.
- 0 THE STAFF IS INDEPENDENT OF THE PROJECT.
- 0 THE INDEPENDENT STAFF REVIEWS THE PRODUCTS OF DESIGN (DRAWINGS, SPECIFICATIONS AND HARDWARE), AND THE DESIGN PROCESS THAT CREATED THE DRAWINGS AND SPECIFICATIONS, AND REPORTS ON THE RESULTS OF THOSE REVIEWS.
- 0 ANY PROCESS OR PRODUCT DEFICIENCIES ARE CORRECTED.
- 0 AN INDEPENDENT (NON-SUPPLY SYSTEM) OVERSIGHT COMMITTEE MONITORS AND REPORTS ON THE INTEGRITY OF THE PROGRAM.

07/02/85

WNP-3 DESIGN READINESS REVIEW

DESIGN REVIEW PARTICIPANT REQUIREMENTS

- 0 DOCUMENTED EVIDENCE OF INDEPENDENCE FROM PROJECT AND/OR MAJOR CONTRACTORS.
  
- 0 NOT INVOLVED IN ORIGINAL DESIGN EFFORT FOR TOPIC BEING ADDRESSED.
  
- 0 QUALIFIED BY TRAINING/EXPERIENCE AS EXPERTS IN THE SUBJECT UNDER REVIEW.
  
- 0 EXPERIENCED/QUALIFIED IN CONDUCTING SIMILAR REVIEW EFFORTS.
  
- 0 TEAM LEADER REPORTS TO CORPORATE MANAGEMENT.



WNP-3 DESIGN READINESS REVIEW

OVERSIGHT COMMITTEE

- 0 COMPRISED OF THREE INDEPENDENT, RECOGNIZED CONSULTANTS.
- 0 WILL ASSESS PROGRAM PLANS AND PROGRAM IMPLEMENTATION.
- 0 WILL FILE WRITTEN CRITIQUES OF THEIR COLLECTIVE ASSESSMENT OF:
  - THE CAPABILITY OF PROGRAM TO MEET STATED OBJECTIVES
  - ADEQUACY OF PARTICIPANT INDEPENDENCE
  - PROGRAM INTEGRITY
  - CANDIDNESS OF REVIEWS
  - ADEQUACY OF PROJECT RESPONSIVENESS
  - OTHER OBSERVATIONS
- 0 HAVE ACCESS TO TOP MANAGEMENT.

WNP-3 DESIGN READINESS REVIEW  
PROGRAM DESCRIPTION - GENERAL APPROACH

- 0 TWO PHASES
  
- 0 PHASE I - DESIGN COMPLETED TO DATE
  - BASELINE (DESIGN COMPLETED STATUS)
  - DESIGN PROCESS REVIEW
  - DESIGN PRODUCT REVIEW
  - DESIGN/CONSTRUCTION INTERFACE REVIEW
  - INTERIM REPORT/CONCLUSION
  
- 0 PHASE II - DESIGN THROUGH COMPLETION
  - DESIGN PROCESS CHANGE REVIEW
  - ONGOING DESIGN PRODUCT REVIEW
  - CONSTRUCTION/TESTING FEEDBACK REVIEW
  - FINAL REPORT/CONCLUSION

WNP-3 DESIGN READINESS REVIEW  
PHASE I

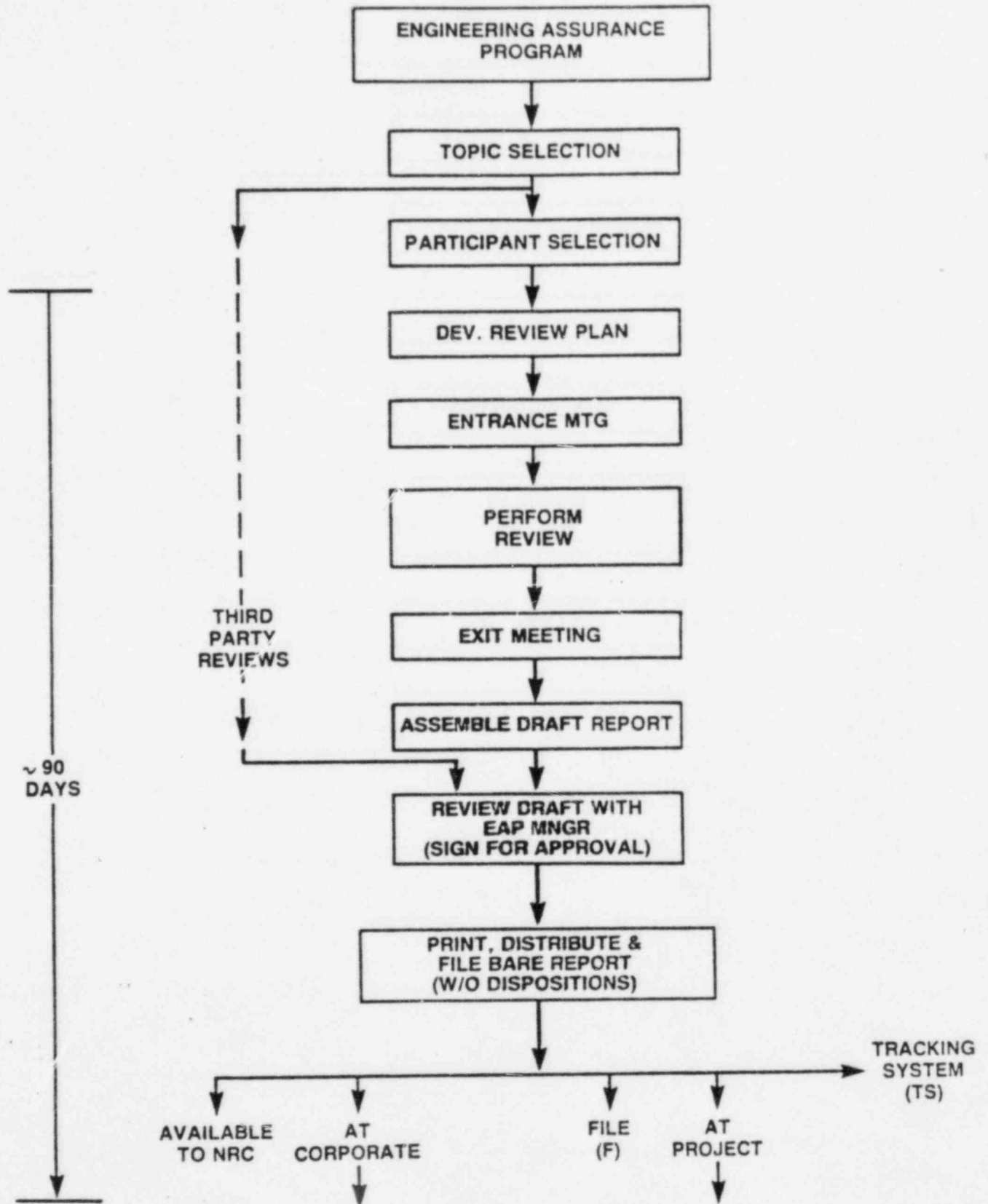
(JULY 1985. TO RESTART)

- O COMPLETE THE SYSTEM DESIGN STATUSING PROGRAM NOW UNDER-  
WAY. THIS ESTABLISHES A BENCHMARK FOR EACH SYSTEM TO  
IDENTIFY DESIGN WORK COMPLETED TO DATE.
  
- O PERFORM A SERIES OF INDEPENDENT DESIGN REVIEWS TO  
SAMPLE THE PRODUCT OF DESIGN PERFORMED TO DATE. THIS  
PROVIDES CONFIDENCE IN PRODUCT AS STATUSED.
  
- O REQUESTED NRC INVOLVEMENT
  - ENDORSEMENT OF THE PROGRAM PLAN
  - FINAL ACCEPTANCE OF COMPLETED WORK
  
- O OPTIONAL NRC INVOLVEMENT
  - ENDORSE REVIEW TOPICS
  - REVIEW SCOPE OF SELECTED REVIEWS
  - PARTICIPATE ON SELECTED REVIEWS
  - REVIEW RESULTS, FOLLOWUP ACTION
  - ATTEND "EXIT" MEETINGS
  - MONITOR TRACKING AND CLOSURE OF FINDINGS

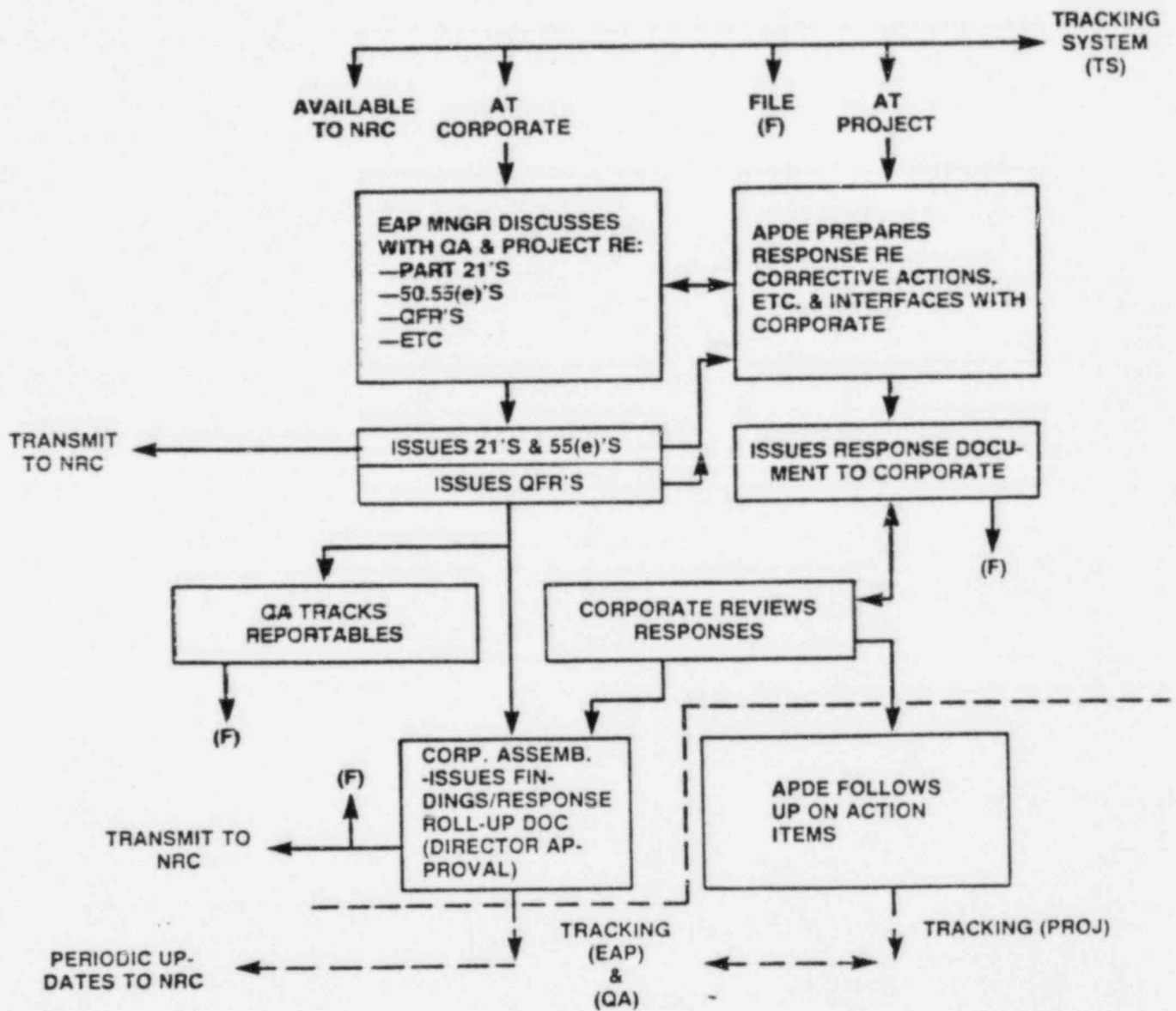
WNP-3 DESIGN READINESS REVIEW  
PHASE II

(RESTART TO FUEL LOAD)

- 0 ONGOING INDEPENDENT DESIGN REVIEW
- 0 ONGOING FEEDBACK FROM CONSTRUCTION REVIEW
- 0 PREOPERATIONAL TESTING RESULTS REVIEW
- 0 TRACKING AND CLOSEOUT OF OPEN ITEMS
- 0 ONGOING INVOLVEMENT OF NRC
- 0 FINAL REPORT PROVIDING BASIS FOR ACCEPTANCE, BY BOTH SUPPLY SYSTEM MANAGEMENT AND THE NRC, OF THE COMPLETED DESIGN



7/02/85



7/02/85

WNP-3 DESIGN READINESS REVIEW

POTENTIAL INDEPENDENT DESIGN REVIEW TOPICS

(EXAMPLES)

- 0 SYSTEM INTERACTION REVIEWS
- 0 PIPING/HANGER DESIGN REVIEW
- 0 SYSTEM DESIGN REVIEW
- 0 ELECTRICAL DESIGN REVIEW
- 0 STRUCTURAL DESIGN REVIEW
- 0 MISCELLANEOUS REVIEWS
- 0 SPECIAL REVIEWS BASED ON CONSTRUCTION REVIEW RESULTS
- 0 EQUIPMENT QUALIFICATION PROGRAM REVIEW
- 0 HUMAN FACTORS DESIGN REVIEW
- 0 4 - 5 TOPICS SELECTED WITHIN 1 - 2 MONTHS
- 0 APPROXIMATELY 13 TOPICS REVIEWED OVER A PERIOD OF ABOUT 3 YEARS

WNP-3 DESIGN READINESS REVIEW

PREVIOUS REVIEWS

- 0 WILL BE EVALUATED FOR POTENTIAL PROBLEM AREAS FOR FOLLOWUP DURING THE READINESS REVIEW.
  
- 0 WILL BE EVALUATED TO DETERMINE IF THEY CAN AUGMENT THE PRESENT PROGRAM.



WNP-3 DESIGN READINESS REVIEW

SUMMARY OBJECTIVES

- 0 TO ESTABLISH AND MAINTAIN INCREASED CONFIDENCE IN THE ADEQUACY OF OVERALL DESIGN ACTIVITIES.
- 0 TO OBTAIN NRC CONCURRENCE THAT THE PROGRAM WILL MEET ITS OBJECTIVES IF CARRIED OUT AS PROPOSED.
- 0 TO OBTAIN NRC ACCEPTANCE OF COMPLETED WORK IN INCREMENTS.
- 0 TO MAINTAIN HIGH PROGRAM INTEGRITY AND CONTINUED NRC INVOLVEMENT SO THERE WILL BE NO NEED TO REVISIT THE SAME SUBJECTS (UNLESS CHANGES OCCUR).
- 0 TO ALLOW SUPPLY SYSTEM AND NRC ACCEPTANCE OF THE TOTAL PLANT DESIGN UPON COMPLETION OF ALL DESIGN, BASED ON THE ONGOING INCREMENTAL ACCEPTANCE OF WORK DURING THE IMPLEMENTATION OF THIS PROGRAM.

## WNP-3 PRESERVATION PROGRAM

### OVERVIEW

GOAL: TO PROVIDE THE CONTROLS SUCH THAT EQUIPMENT, SYSTEMS AND COMPONENTS, AT THE WNP-3 PROJECT, ARE MAINTAINED AND PRESERVED IN AN ACCEPTABLE CONDITION DURING THE CONSTRUCTION DELAY.

THE MAINTENANCE AND PRESERVATION PROGRAMS CONTAIN SEVERAL LAYERS OF DETAIL:

- "SUPPLY SYSTEM WNP-3 PREVENTIVE MAINTENANCE AND PRESERVATION PROGRAM" SERVES AS THE OVERALL CONTROL DOCUMENT. (PROVIDED TO THE NRC ON JUNE 28, 1985.)
  
- WMC-051. "PRESERVATION OF ASSETS - PREVENTIVE MAINTENANCE PROGRAM" CONTAINS BASIC REQUIREMENTS FOR MAINTENANCE. (PROVIDED TO THE NRC ON MAY 24, 1985).
  
- SPECIFIC PROCEDURES AND INSTRUCTIONS FOR THE EQUIPMENT, COMPONENTS, AND SYSTEMS AT THE PLANT. (AVAILABLE AT THE PLANT)

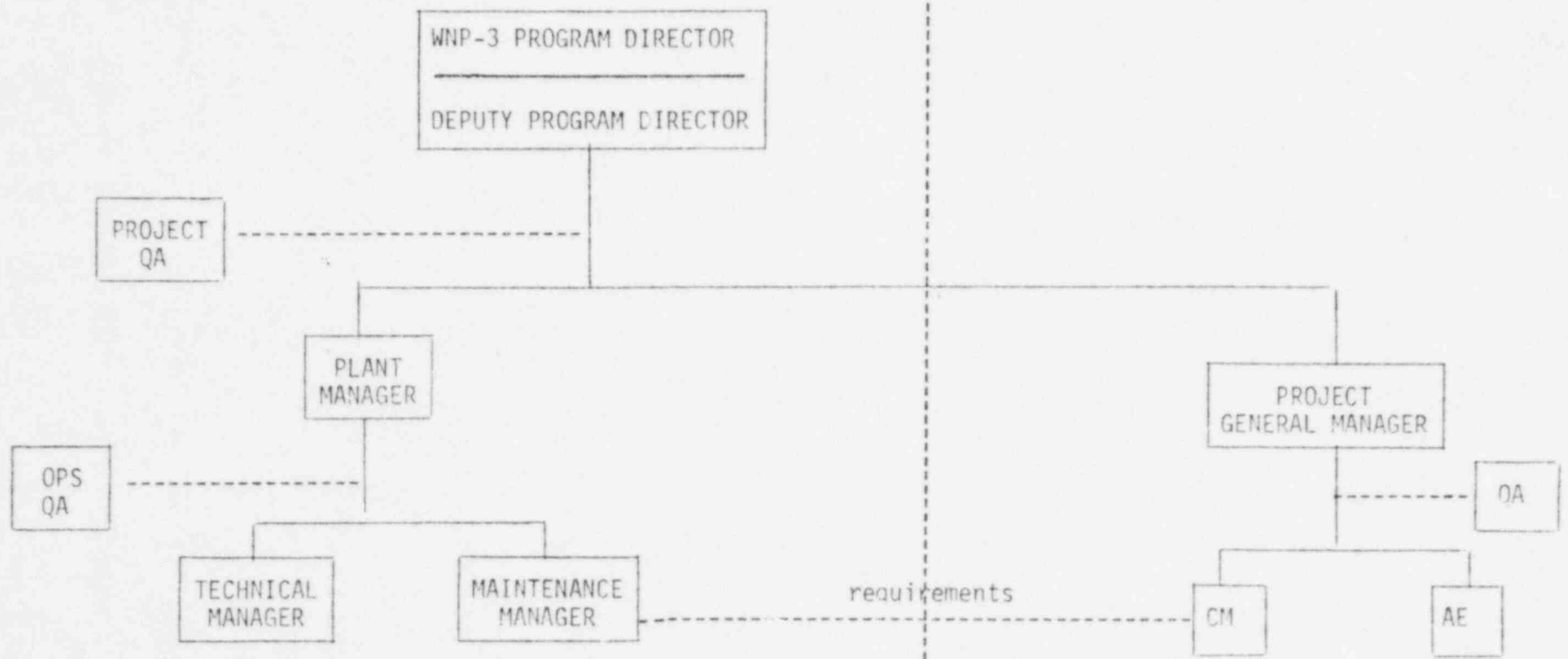
## PROGRAM CONTROLS

- PROGRAM CONTROLS DERIVED FROM QUALITY ASSURANCE PROGRAM DESCRIPTIONS IN FSAR.
  
- BOTH THE OPERATIONAL QUALITY ASSURANCE TOPICAL AND DESIGN/CONSTRUCTION QA PROGRAM APPLY.

WNP-3 PRESERVATION ORGANIZATION CHART

SUPPLY SYSTEM

EBASCO



• CHART CONTAINS ORGANIZATIONS HAVING PERFORMING RESPONSIBILITIES.

CHART 1

## REQUIREMENTS

WMC-051 - "PRESERVATION OF ASSETS - PREVENTIVE MAINTENANCE PROGRAM"

- PROGRAM DOCUMENT THAT PROVIDES BASIC REQUIREMENTS FOR GENERAL CLASSES OF EQUIPMENT.
  
- BASED UPON MANUFACTURERS RECOMMENDATIONS, EXPERIENCE, NATIONAL STANDARDS, ETC.
  
- APPROVED BY EBASCO AS AE, AND THE SUPPLY SYSTEM.
  
- CHANGES TO WMC-051 WILL BE MADE AS EXPERIENCE IS GAINED, BUT ONLY AFTER ENGINEERING APPROVAL.

## CORRECTIVE MAINTENANCE

- WHEN PROBLEMS ARE IDENTIFIED MAINTENANCE WORK REQUESTS ARE WRITTEN.
  
- WHEN - DURING PM OR AT ANY OTHER TIME.
  
- BY WHO - ANYONE CAN WRITE AN MWR.
  
- MWR - DESCRIBES THE PROBLEM AND IS ROUTED TO MAINTENANCE FOR RESOLUTION.
  
- MWR CAN BE SELF STANDING OR REQUIRE THE USE OF DETAILED PROCEDURES.
  
- REVIEWED, AND HOLD POINTS ESTABLISHED BY QA.
  
- WORK IS PERFORMED, INSPECTED, DOCUMENTED AND REVIEWED BY SUPERVISION.
  
- DATA ENTERED INTO MWR COMPUTER SYSTEM.
  
- HARD COPY FILED.

## VERIFICATION ACTIVITIES

- AUDITS AND SURVEILLANCES OF THE PM ACTIVITIES ARE CONDUCTED BY THE QA GROUPS AT THE PROJECT.
  
- QUALITY CONTROL, WHICH IS PART OF OPERATIONAL QA, CONDUCTS HOLD POINT INSPECTIONS.



THE PROJECT HAS ESTABLISHED MONITORING PROGRAMS TO PROVIDE DATA TO CONFIRM THE ADEQUACY OF THE MAINTENANCE PROGRAM OR TO PROVIDE THE BASIS FOR IMPROVEMENTS TO THE MAINTENANCE REQUIREMENTS.

### STRUCTURAL MATERIAL CORROSION MONITORING

- ATMOSPHERIC CORROSION TEST RACKS IN THE FIELD AND PLANT BUILDINGS.
  
- COUPONS ARE MONITORED FOR GALVANIC AND PITTING CORROSION.
  
- COUPONS REPRESENTATIVE OF PLANT MATERIALS.

## HYGROTHERMOGRAPH MONITORING

- TEMPERATURE-HUMIDITY MONITORING.
  
- INDICATES THE ENVIRONMENT THAT EQUIPMENT, SYSTEMS AND COMPONENTS HAVE EXPERIENCED.
  
- DATA PROVIDES:
  - EARLY WARNING OF UNACCEPTABLE CONDITIONS THAT COULD LEAD TO DEGRADATION.
  
  - INPUT TO MAINTENANCE REQUIREMENTS FOR CORRECTIVE MEASURES.
  
  - RECORDS OF ACTUAL EXPOSURE EXPERIENCED BY PLANT COMPONENTS AND SYSTEMS.

CORROSION DATA IS USED TO:

- PROVIDE EARLY NOTIFICATION OF DEGRADING CONDITIONS SUCH THAT CORRECTIVE ACTIONS CAN BE TAKEN.
  
- QUANTIFY DEGRADATION TO VERIFY THAT STRUCTURAL INTEGRITY OF CONSTRUCTION MATERIALS HAS NOT BEEN COMPROMISED.
  
- PROVIDE ASSURANCE THAT CONSTRUCTION ACTIVITIES CAN RESUME WITH EXISTING STOCK MATERIAL.
  
- PROVIDE A QUANTITATIVE BASIS FOR THE EVALUATION AS TO THE ACCEPTABILITY OF THE PLANT TO RESTART CONSTRUCTION ACTIVITIES.

RESULTS ARE FEDBACK TO PREVENTIVE MAINTENANCE REQUIREMENTS TO MINIMIZE DEGRADATION.