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SUBJECT: Semi-monthly Progress Report

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DATE: March 1, 1968
NTO-M-21848
HNM:WDW:ch

Attached is the NTO Semi-monthly Progress Report for the period of February 1 through February 15, 1968. The inputs received here have, in some cases, been edited to eliminate redundant material.

W. D. Wayne, Manager
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Enclosure

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NTO SEMI-MONTHLY PROGRESS REPORT

For the Period of February 1 through 15, 1968

I. NTO PRODUCT ASSURANCE

A. ETS-1 Operations

1. The hydro tests for V-3901 through 3905 were satisfactorily completed.
2. As previously reported, a dye penetrant inspection revealed cracks in the S-1 top trough. Product Assurance is monitoring the work currently in progress to correct this condition.
3. Discrepancies discovered in the Steam Generator Pressure Switches were documented and dispositioned. It was decided to remove the switches from the Steam Generator and send them to the Pan Am Valve Shop for disassembly, cleaning, reassembly and test. Some delay has been encountered due to use of a lubricant during reassembly that is not compatible with aluminum bodied valves in a LO₂ system.
4. Radiographs of the 18 and 24 inch water lines have been reviewed by Product Assurance. Some apparent discontinuities in the radiographs were revealed during the examination.
5. Product Assurance reviewed and signed off ECR 1113-000 requiring removal of the 4 inch expansion joints located above the intermediate shield.
6. Product Assurance witnessed the leak and proof tests of shrouds that have been added to the main propellant line.

B. MAD Operations

1. Measurements on UTSM per XE-1-P2, Change 9, and Lower Module, XE-1-P5, Change 20, have been completed. Measurements required on the UTSM per XE-1-P2, Change 11 are in process.
2. E-MAD Machine Shop gages are in the process of being calibrated per the requirements of QRI 9.2A. This requirement should be completed in approximately two weeks.

3. The Overhead Positioning System (OPS), Wall Mounted Handling System (WMHS) and the rectilinear manipulators were load tested per applicable Engineering Change or Work Request.
4. Approximately 20 of the 50 pieces of Handling Equipment tagged "out of service" have been proof tested, documented and returned to service.
5. XE-1 cable routing is in process. Also, instrumentation is being prepared and layed out in preparation for installation and checkout per XE-1-P4 and data log sheet requirements under the surveillance of NTO Product Assurance.
6. Received the XE-2 Nozzle, P/N 1114263-99, S/N 880028. The nozzle was placed in "HOLD" status due to the fact that the item was shipped without the Narrative End Item Report (NEIR) or proper shipper. NRO was notified of the deviation and NTO was assured that the NEIR would be shipped as soon as it was available.

C. Procedures and Audits

1. Two QRIs were initiated and are currently out for coordination with NTO, WANL, NRO and SNPO-C.
2. Three QRIs were finalized and will be distributed during the week of 26 February 1968.

D. Reliability

Review of the ETS-1 facility Failure Mode Analysis is currently in progress and should be completed during the next report period.

II. NTO HEALTH AND SAFETY

A. General

1. The annual summary of radiation exposures (AEC-190) to Aerojet and Westinghouse personnel were sent to Sacramento and to Large.
2. Health and Safety personnel participated in an incident investigation relating to inappropriate handling of beryllium.

B. Criticality

1. NTO-SOP-0017, "NTO Standard Operating Procedure for Neutron Multiplication Detection," was revised and transmitted for review.
2. Inspections of E-MAD and R-MAD have revealed no infractions of the NTO Criticality Control Manual.
3. E-MAD water lines to the hot bay and hot cells were inspected for compliance with criticality requirements prior to receipt of the first shipment of fuel from R-MAD.
4. The results of a WANL nuclear safety analysis for the E-MAD Post Ops metallurgical specimen storage rack were received and transmitted to the Manager, Post Ops Examinations.

C. E-MAD

1. The initial shipment of irradiated fuel elements was received at the E-MAD.
2. Made recommendations to E-MAD engineering for safeguards on the high voltage power supply for the F.E.P.S. photo flash unit.
3. Aided E-MAD personnel in the resolution of several discrepant items noted on the January NTO Health and Safety inspection.
4. Prepared a statement of NTO Health and Safety criteria for use of the E-MAD hot hold tank and drain field.
5. Assisted E-MAD management in the modification to improve the criticality alarm.

D. R-MAD

1. Arranged for a shipment of NRX irradiated fuel to LASL.
2. Periodic informal inspections for industrial safety practices reveal no serious discrepancies.

E. ETS-1

1. Reviewed and concurred with procedures to proof pressure test the water lines from the 2.5 million gallon water tank.

2. Assisted NRO and SNPO-C in follow-up assessment of ETS-1 readiness for XECF testing.
3. Have reviewed and commented upon procedures to:
 - a. Check out SGS
 - b. Run NEP-He-1
 - c. XECF EP-1 and EP-2

III. TECHNICAL SUPPORT OPERATIONS

A. Engineering and Analysis

1. ETS-1
 - a. ETS-1 Supplementary Lighting - Continue to give technical support by following the Contractor's installation.
 - b. Electrical Power Distribution System - Preparation of ECR is completed and installation of KVAR meters on Diesel Generator Control Panel is continuing.

The NRO Short Circuit Study is being reviewed.
 - c. UTSM Heater (ECR-1082-616) - Work continues on the installation of the 25 KW Heater's Electrical Power and Controls.
 - d. PCV-449 Hydraulic Pump (ECR-1107) - The completed ECR has been issued and work continues on the permanent installation of the electrical power source.
 - e. FEP-V Temporary Piping - Drawings and specifications have been completed and issued and fabrication has been started.
 - f. ETS-1 Duct Vault & Pipe Chase Catwalks & Ladders - Drawings are being revised to incorporate additional ladders and catwalks as requested by ETS-1.
 - g. ETS-1 Deluge System Nozzle Relocation - Drawings have been completed for re-installation of 32 deluge system nozzles which were removed for installation of the Test Stand Heat Shield.

- h. 24" Water Line - ETS-1 requested Engineering and Analysis to design a culvert over the 24" water line at the railroad crossing. Analysis does not justify this requirement. Recommendations are to be made accordingly.

2. ETS-1 Modification 75K Thrust Engine

- a. Side Shield Evaluation - Initiated investigation of the capability of the existing side shield to handle the 75K Thrust Engine. Requested additional information from NRO.
- b. ETS-1 Scrubber Estimate - Prepared a preliminary cost estimate for the addition of an Exhaust Scrubber required for 75K Thrust Engine at ETS-1.

3. Test Cell "C" Scrubber

Initiated checkout of scrubber hardware and control system.

4. E-MAD Cryotrap/Heater Vessel

Engineering and Analysis was required to analyze the existing cryotrap/heater vessel in the Actuator Checker System. The analytical results indicate that the vessel does not satisfy the safety considerations. Recommendations have been made to operate the existing vessel with a light blast shield and at limited temperatures and pressures. A new design conforming to ASME Code has been completed.

5. Counting Laboratory

- a. Continue to prepare final report on NRX-A6
- b. Preparation of XE-1 Dosimetry continues.
- c. Re-calibration of TLD's and TLD Reader is being performed to assure that the reader was properly repaired.

B. Engineering Services

1. Completed

- a. ETS-1 Facilities Manual Illustrations
- b. ETS-1 Test Stand Control Valve Hydraulic Flow Diagram

- c. TCC Emergency Shutdown System Print
- d. NRX-A6 Certificate of Participation

2. In Process

- a. ETS-1 Process Gasses and Cryogenic Flow Diagram, 80%
- b. ETS-1 Facility Actuation and Purge System (Sht. 2), 60%
- c. ETS-1 Pipe Chase and Duct Vault Ladders and Catwalks, 25%
- d. TCC Reactor Control System Print, 25%
- e. E-MAD Optical Micrometer Wiring Diagram, 50%
- f. E-MAD Post Mortem Cell Spiral Groove, 75%
- g. ETS-1 General Civil Improvements, 35%
- h. ETS-1 V-3801 LH₂ Dewar Modification, 35%
- i. TCC Specific Speed Control Spring, 25%
- j. E-MAD Inter cell Car-to-Car Tow Bar, 10%
- k. ETS-1 Proposed Test Stand Modifications (75K), 10%

C. Documentation and Reporting

1. NRX-A6

- a. Work was initiated on the NRX-A6 Post Test Report.
- b. A recorder was provided to the NRX-A6 TS&PRB.

2. XECF

- a. XECF-P18, "NTO Operating Procedure for Post-Test Inspection of XECF," was submitted for internal review.
- b. The XECF TRB meeting minutes and Measurement Change Request originals approved during this period were published and transmitted off site.

3. XE-1

- a. XE-1-P8, "Transport and Installation of the XE-1 Test Assembly to ETS-1," was submitted for internal review.
- b. A recorder was provided for the XE-1 TS&PRB.

4. ETS-1

- a. The ETS-1 101 Point Data Listings Manual was compiled and distributed.
- b. NTO-SOP-0091, "Hydrogen Converter Operation at ETS-1," was approved and distributed.
- c. NTO-A-0030, Section 029, "ETS-1 Exclusion Area Guide," was published.

5. E-MAD

- a. NTO-I-0214, "NTO Operating Procedure for Remote Controlled Overhead Cranes at E-MAD was approved and reproduced.
- b. NTO-I-0449, "NTO Operating Procedure for Rectilinear Manipulators," was approved.
- c. NTO-SOP-0105, "Transport of Radioactive Materials between NRDS Facilities," was prepared and submitted for internal review.

6. General

- a. NTO-A-0047, "NTO Mail Service-Pan Am," was completed and published.
- b. NTO-S-0030, "NTO Standard for Levels of Cleanliness and Packaging," was submitted for internal review.
- c. The "NTO Standard Operating Procedure for Neutron Multiplication Detection," NTO-SOP-0017, was revised and transmitted off site for review.

IV. TEST CELL "C"

- A. The facility modifications and testing in preparation for EP-II were completed. EP-II is scheduled as a two-day operation for February 14 and 15. The first day will involve turbine operation with nitrogen and

helium gases from the tank farm to evaluate turbine blade vibration phenomena observed on previous tests. February 15 will be devoted to Phoebus-2 shutdown studies with dual mode pump operation. New facility additions and modifications included in EP-II operations will be the new diesel generator emergency power system, the new water boiler installation for process water heating, and the generation of run profiles using the DDP-116 computer. EP-II checklists were completed, and operator simulation drills were conducted as part of the training program for the Phoebus-2 operating team. The DDP-116, which had been damaged by a power supply short, was repaired and will be operable for EP-II.

- B. Two representatives from Marshall Space Flight Center visited Test Cell "C" on February 8 to discuss facility problems which may be involved during the full power testing of the Phoebus-2A reactor. Data from previous reactor runs and facility information were discussed and transmitted.

The modified control systems for the gas scrubber were received on February 9, and their installation and testing were begun on February 10.

Considerable analytical effort in the Test Planning section was expended in the preparation of the Summary Test Plan.

V. MAD OPERATIONS

A. Test Article

1. XECF

The XECF Assembly was transported to ETS-1 on 20 November 1967 and MAD Operations personnel are participating in the pre-test cold flow testing.

2. XE-1

- a. A proof and leak check of the actuator drive gas manifold was completed.
- b. A checkout of the actuator checker, using a valve to simulate an actuator was completed.
- c. The facility heater, downstream of the actuator checker drive gas cryotrap was recalibrated.
- d. Alignment and leveling of the four (4) UTSM On-Marks at the eighteen (18) inch interface was completed.

- e. The LEA electrical module individual pins were inspected by "GO" - "NO-GO" techniques.
- f. The safety wiring of the bolts on the UTSM door, the UTSM flanges at the lower interface and on the Marmon coupling was completed (FCO 422 and 425).
- g. The pump discharge line and the turbine inlet line installation was completed on the lower engine assembly.
- h. The UTSM valve covers were installed.
- i. The heater for the actuator drive gas manifold in the facility was hydrostatically proof tested to twelve hundred (1200) psig. The relief valve was set at seven hundred seventy-five (775) psig. The heater temperature controller relocation was initiated.
- j. The UTSM modification was completed and the eighteen (18) inch interface modification for the control drum actuator overhead vent was initiated.
- k. The actuator checker re-assembly and acceptance was completed.
- l. The installation of the diluent line on the lower engine assembly was completed and purging of the core through the nozzle torus was continued.
- m. The procedure NTO-I-0903, "XE-1 Continuous Purge," was updated and approved by the TS&PRB.

3. NRX-A6

- a. Disassembly operations of NRX-A6 at R-MAD were continued and included the following:
 - 1) Beryllium samples from the upper center portion of the reflector were obtained per test specifications.
 - 2) The disassembly and examination of the upper, forward and aft portions of the reflector were continued.
 - 3) The core disassembly operation was continued. It is anticipated that the fuel removal will be completed by 20 February 1968.

- 4) The nozzle examination was continued. Discoloration at the core support interface was evident and was readily removed by wiping.
- 5) Fuel element data processing was continued.
- 6) Corrosion depth measurements were continued. One hundred two elements were completed.
- 7) One hundred nineteen WIPES were completed.
- 8) Three hundred eighty-nine of the fourteen hundred (1400) five (5) inch I.W. elements were completed.
- 9) Four of sixteen axial elements were completed.
- 10) The gross gamma counting is seventy-six percent complete and the two point gamma counting is eighty-three percent complete.
- 11) Eighteen pieces of X-coat analysis have have been completed for twelve percent.
- 12) A uranium analysis of four of ninety-six elements was completed.
- 13) The peripheral fission distribution check was completed.
- 14) Twenty of one hundred forty-nine (149) fuel elements were transferred to E-MAD for post operative inspection and examination.
- 15) Radiography of twenty-nine central elements was completed.
- 16) Post operative examinations were continued on the NRX-A6 hardware as follows:

Support blocks, forty-five percent complete.

Cluster Cold End, seventy-six percent complete.

Reactor structural parts, eighty percent complete.

Outer reflector, forty-eight percent complete.

Nozzle and pressure vessel, ninety percent complete.

B. Radiochemistry

1. Radiochemistry work efforts were continued concerning the NRX-A6 fuel elements as follows:
 - a. Gross ion measurements were taken.
 - b. Axial gamma scanning was conducted.
 - c. Core disassembly data reduction was performed.
 - d. Fuel element sectioning and dissolution for chemical analysis was conducted.
 - e. Comparison of two (2) point gamma and gross ion data was conducted.

C. Facility Equipment and Systems

1. General

- a. The installation of radioactive drain filters in the Core Disassembly and Examination (CDAE) Cell was continued.
- b. The preparation for the construction of an access road to the Engine Transport System Maintenance Building (ETSMB) was continued.
- c. The sampling of air for containment of particulate matter in the controlled assembly area was continued during the assembly of XE-1.

2. Cranes/Hoists/Manipulators

A design was initiated for an adjustable load test fixture to proof load test all cranes to one hundred twenty-five percent of rated capacities.

3. HVAC/PA/CCTV/Rad Safe

- a. Closed circuit television camera mounts and the electrical conduit and cable were installed in the core disassembly and examination cell.

- b. The installation and check out of acid tanks for the heating, ventilating and air conditioning (HVAC) system was continued.
 - c. The HVAC system preheat and chill coils were repaired and a hydrostatic test was successfully completed.
 - d. In an effort to upgrade the performance of the HVAC system, ninety-eight percent of the system controllers were cleaned and re-calibrated. All of the remotely operated dampers and valves were checked and/or reworked where required to restore proper operation.
 - e. The design and fabrication of a new panel for the criticality alarm system was completed. This panel provides for the use of the regular Klaxon for broadcast over the PA system rather than taped Klaxon now installed.
4. Postmortem/GSE/CDAE
- a. An evaluation study of the corrosion on surfaces of the fuel elements removed from NRX-A6 is being conducted to determine possible improvement of the fixture.
 - b. The design, drawings and fabrication of a twenty-four (24) cavity RTV metallography mount mold was completed.
 - c. Design and drafting support was continued and included the completion of a drawing for simulated lens alignment FEPS camera; the continuation of the optical micrometer wiring diagram drawings; the layout of and design of the "car to car" tow bar for HOCMTS; and the continuation of spiral groove drawings.

IV. ENGINE TEST OPERATIONS

A. NEP-HE-I

Activities which are to be completed prior to the initiation of NEP-He-I were in progress, and included the following items.

- 1. Completion of the helium leak test on the facility and TSA piping was accomplished during the XECF engine leak test in accordance with procedure P-16.

2. Reactivation of the Steam Generator System was continued and included replacement of the LO₂ filter and refurbishment of pressure switches.
3. Instrumentation activities included the continuation of data system calibration and checkout in accordance with NTO-I-0340.
4. Installation of various ETC transducers and strain gauges (mounted on XECF) was continued. The remaining installation of ETC transducers will be accomplished when the shields are moved to the fill position. The microphone installation is expected to be completed 21 February 1968.
5. Facility Modifications

No. 38 - Post-ETC Checkout Punch List Mods.

No. 38.8 - H₂/O₂ Analyzer

A final system leak check will be performed when the ETC is again mated.

No. 114 - ETC Side Shield Latches

Repair of several leaking ETC side shield latch actuation cylinders was completed 5 February 1968. A final checkout will be conducted following repair of the ETC top trough which leaked liquid eutectic alloy on 18 January 1968. See Modification No. 157 for details on the ETC top trough repair.

No. 157 - ETC Top Trough Repair

The coolant line plug leaks were corrected on the S-1 and S-2 top troughs. Leaking weld areas in the S-2 top trough were coated with RTV type compound and the leaking weld areas in the S-1 trough are to be coated. After leak repairs are completed, the coolant tubes, heaters and thermocouples are to be re-installed in the top troughs.

No. 158 - ETC Intermediate Shield Bellows Replacement

Removal of the leaking aluminum bellows in the return line of the intermediate shield coolant water system was initiated. The bellows will be replaced with aluminum pipe. Although this modification is required for

XECF tests, it must be completed prior to closing of the ETC shields for NEP-He-I.

No. 160 - UTS GN₂ Purge Heater

The 25 KW electric heater was mounted and installation of piping, electrical power and control circuits was in progress. The Purpose of this modification is to maintain transducer temperatures within the UTS above 40 degrees F. to prevent erratic data recording.

6. Documentation for NEP-He-I

All documentation for NEP-He-I was prepared and issued. This included the Test Prediction Report (by NRO), Test Operating Procedure NTO-I-0416 and the Dry Run Check List.

B. XECF Cold Flow

Included in the activities, which are to be completed prior to the initiation of XECF cold flow tests, were the following items.

1. A second leak test on the installed XECF assembly in accordance with procedure P-16 to verify system integrity following completion of the vibration tests was accomplished.
2. The setup and checkout of the data acquisition system in accordance with procedure NTO-I-340B was continued. The grounding problems and other discrepancies were being resolved.
3. Upon completion of the data acquisition system setup, a final system calibration will be performed and analyzed for channel integrity by the 3200 computer and the system will be ready for XECF tests.
4. Work was continued preparatory to pre-test checkout of the Test Stand and Engine Control System. Various discrepancies resulting from TSCS/ECS checkout tests were under investigation. This included the zero suppression amplifiers, the patch for control room recorders, Pc and Tc average and reject, core temperature average and reject and cooldown controls.

5. Facility Modifications

No. 29 - Engine Shield Fill & Drain System

The modification was completed 2 February 1968.

No. 30 and No. 31 - Data Link System and Test Diagnostic Center (TDC)

Checkout tests were continued on the Test Diagnostic Center/Data Link System. Problems were still being experienced with the Data Link/Computer interface.

No. 109 - Data Acquisition System

Another channelization digital tape is to be produced due to soft ware changes in the CDC 3200 computer channelization program. This modification will notnot constrain XECF testing since the system channelization was completed manually.

No. 133 - V-5001 Area H₂ Flanges Manifold

The modification was completed 15 February 1968.

No. 139 - ETS-1 Fire Protection System Repair

Weld repairs to the 14-inch, 18-inch, 20-inch and 24-inch diameter underground lines supplying water to the fire protection valve pits No. 1 & 2 were completed and the lines were proof tested at 300 psig on 13 February 1968. The remaining work consists of painting the lines and replacing the excavated soil.

No. 150 - Duct Vault and Pipe Chase Inerting System

As a result of the full inert system checkout with GN₂ on 11 January 1968, additional system refinements were in progress to reduce leakage of inerting gas from the duct vault and pipe chase. Hydrostatic proof tests of the GN₂ storage vessels (V-3901 through V-3904) obtained from Test Cell "A" were completed 14 February 1968. Dehydration of the vessels was initiated.

6. Documentation for XECF Cold Flow

The final issue of the XECF Test Operating Procedure for EP-I is to be submitted to the

TRB. The TOP for EP-II and EP-III is being reviewed externally. A proposed Modification No. 3 to the Test Specification was approved by the TRB and released. Procedure P-18 was being prepared for post-test checkout of XECF at ETS-1 and was submitted for external and internal review.

7. Operator Training

Operator training conducted during this report period was directed primarily towards meeting XECF requirements. The majority of these requirements are completed except for simulator training.

C. FEP-V

1. Facility Modifications

No. 62 - Actuator Supply Cryo-Trap

A work order for installation of the cryo-trap was prepared and submitted to PAN AM by SNPO-N for work action.

No. 103 - Line 207-He-12 Supports

The work order package was submitted to PAN AM by SNPO-N for relocation of line 207-He-12 supports to permit the installation of the cryo-trap (Mod. No. 62).

No. 154 - XE-1 Cooldown Simulator System

Piping spool fabrication was continued by PAN AM preparatory to system installation.

2. Documentation for FEP-V

The FEP-V Test Description was issued for external review. The RDR and Controls Requirements were submitted for internal review.

D. XE-1 Installation and Checkout

1. Facility Modifications

No. 27 - Relief Valves (Fluid Systems)

A relief valve from Test Cell "A" is being reworked to meet the required pressure

relief setting for RV-2952 in the He cooldown system. Relief valves for the GN₂ engine disconnect and for the He purge are installed.

No. 35 - Valve and Power Failure Mods.

This modification provides backup actuation for critical components in the cooldown system. The mechanical and electrical portion of the pneumatic system are completed. Hardware fabrication was in progress for mechanically blocking the valves "open" in accordance with ECR 683-000.

No. 38 - Post-ETC Checkout Punch List Mods.

a. 38.6 - EIV Wand

I&C system design was in progress in conjunction with Modification No. 144.

b. 38.10 - S-1/S-2 Limit Switch Pit Drains

The drain holes have been drilled through the concrete. Installation of the drain pipes is pending manpower availability.

c. 38.11 - Replace Damaged Expansion Joint

No activity for replacing expansion joints in the ETC water lines.

d. 38.12 - Repair S-2 Pylon Sheave Support

Drawings are being revised by NTO Site Engineering.

e. 38.14 - Setup and Checkout Duct and Shield Monitor

No activity.

No. 52 - Facility Supplementary Lighting (Craft)

Installation of tunnel emergency lights and trenching for the "39" area lighting was continued to provide adequate night lighting. A shortage of lighting fixtures will delay completion approximately two weeks.

No. 67 - BFV-666 Motorization

Circuitry design for control of the drive unit to permit remote operation of the 42 inch main water supply valve, BFV-666, is

to be completed 19 March 1968. Installation of the drive unit will be after completion of XECF tests.

No. 112 - Facility Kitchen and Rest Room

This modification was completed 5 February 1968.

No. 144 - ETC Shield Park Limit/Torque

I&C system design per Functional Requirement NTO-FR-401 was continued to provide an inch mode of operation as the shields approach their parking stops. Limit switch operation is also to be improved. Installation will be after completion of XECF tests.

No. 149 - S-3 Shield Test Position Stop Control

I&C system design per Functional Requirement NTO-FR-401 was continued to provide an inch mode of operation as the shield approaches the test position stops. Limit switch operation is also to be improved. Installation will be after completion of XECF tests.

No. 151 - ETC Trough Steam Heater (Melt Eutectic)

The steam generator is available at ETS-1 and is mounted on a portable cart. No special effort is being expended for providing this auxiliary heating system as a backup for melting the eutectic alloy trough seals until after XECF cold flow tests are completed.

No. 159 - V-3801 and Area 32 Structural Supports

This is a facility requirement for AEC tests and does not constrain XE-1 tests. Contract award is expected in February 1968.

No. 161 - Heat Shield Reinforcement

Reinforcement of the test stand heat shield to increase the structural rigidity under wind and/or thermal load condition is approximately 20% complete.

No. 162 - NES Duct Demineralizer Flushing System

No scheduled activity.

Data System Accuracy Test No. 3

The detailed scope and schedule for this test have not been established. Previous Data System Accuracy Tests did not include the LVTD and Zero Suppression Systems.

2. Documentation

The XECF installation and checkout procedure P-16 is being upgraded to incorporate the nuclear aspects associated with XE-1 installation and checkout.

E. XE-1 Test Program

1. Facility Modifications for EP-1

No. 39.4 TSCS Experimental Controls (Chassis #1)

The wiring is installed and the chassis is to be installed following completion of XECF cold flow.

No. 39.5 - TSCS - AC Power Rearrangement

The portion covering the signal conditioning racks is completed. Wiring of affected racks is to be resumed following completion of XECF cold flow tests.

No. 39.6 - TSCS Backup Power Supplies

Checkout tests were conducted which completed this modification on 1 February 1968.

No. 88 - ATD Console

The design work is completed and material is on-board. Installation of equipment will be initiated following completion of FEP-V.

No. 115 - LN₂ Vaporizer (Remote Control)

The mechanical and instrumentation installation is essentially completed. The remaining work consists of installing the control circuits for remote operation of the LN₂ vaporizer from the GFS console and conducting checkout tests.

No. 156 - Control Room TV Camera

Installation and checkout of the control room TV system for display of control room activities at the A&E Building is essentially completed except for relocation of the control room camera to obtain a wider angle coverage.

2. Facility Modifications for EP-IV

No. 80 - Additional Gas Storage (GN₂ Trailers)

Completion of this modification is pending receipt and hookup of the remaining GN₂ tank trailers. Four trailers have been received, connected into the facility and are to be proof tested.

No. 90 - Deluge/Decontamination Water Control (Craft Labor)

The modification is completed except for the installation of some asphalt curbing. The contractor is no longer able to perform and the remaining work is being re-negotiated.

No. 91 - Surface Preparation

The treatment of various surfaces in the test stand area for ease of surface decontamination is completed except for painting of the duct vault door. The door will be painted by PAN AM at the earliest opportunity.

No. 93 - Decontamination and Facility Cooling Water (Craft Labor)

The piping installation was continued and is nearing completion. Another portion of the piping was hydrostatic tested. Delivery of the 12-inch and 14-inch valves is still expected by 29 March 1968.

No. 146 - PCV-472 Mechanical Block

No scheduled activity until after completion of FEP-V.

3. Facility Modifications for EP-V

No. 39.7 - TSCS - Experimental Controls (Chassis #2)

No scheduled activity until after the completion of XECF tests.

4. Documentation for XE-1 Test Program

Preparation of the Support Operations Requirement Document (SORD) for the scheduled EP's was temporarily halted due to other priority work. Preparation of the RDR control requirements was in progress.

F. Data Control

1. Computer Programs

Work was continued on programming of the CDC 3200 for Real Time data processing for display in the ETS-1 Test Diagnostic Center and A&E Building visitor's room. This program is identified as NTO-10500 and is approximately 99% complete.

Work was continued on the new calibration program. For each digital data system channel, this program will provide the following data:

"Average" at 0, 25, 50, 75 and 100% steps.

"Slope" at 75% step.

"Noise" at 0% step.

"Non-Linearity" at 25, 50, 75 and 100% steps.

"Drift" based on difference between 0% step averages at two calibration files.

2. Data Handling

Preparation of computer operator instructions was continued.

Preparations were continued for XECF and NEP-He-I data processing. Processing of data obtained during XECF Pre-Test Inspection (Procedure P-16) was in progress.

Analysis on the channel engineering end item table computer update program was continued.

G. Channel Engineering

The following items were published:

Issues No. 37 and 38 of the Transducer Inventory.

Issue No. 2 of the Master Channel List.

Complete Unit List employing new computer program and listing format.

Issue No. 2 of XECF Patch List.

Issue No. 1 of GEP-X Datalog

The events patch audit was continued.

The RDR for GEP-X was prepared.

Testing of the computer directed patching system was continued and the patching system drawing was updated.

H. Other Activities

1. Operation Analysis

Preparation of the NEP-He-I System Performance Evaluation Analysis Review (SPEAR) included a listing for parameter grouping of digital listings and the preparation of special equations for computer calculations for purposes of data evaluation.

Evaluation of data obtained during the TSER Inerting test and the Duct Vault and Pipe Chase Inerting test revealed greater than expected usage of GN_2 .

A report related to the checkout of the engine binary valves, TPCV and the TPA bearing purge system checkouts conducted as a part of the XECF pretest inspection (procedure P-16) is being prepared.

An evaluation of the relief valve settings for FEP-V and XE-1 was in progress and the results of this evaluation should be released early in March 1968.

Coordination was provided for the FEP-V analog studies and for the functional

requirements (FR-132) of the FEP-V
Permanent control system.

2. Test Schedules

A preliminary revised Engine Test
Operations schedule dated 16 February
1968 was prepared covering the major
activities through XE-1 EP-IV. This
schedule will be presented to SNPO-W
on 19 February 1968.

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