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PBF
SYSTEM OPERATION TEST
OPERATIONS PHASE PLAN

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Aerojet Nuclear Company

NATIONAL REACTOR TESTING STATION

Idaho Falls, Idaho — 83401

Date Published — July 1972

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PREPARED FOR THE

U. S. ATOMIC ENERGY COMMISSION

IDAHO OPERATIONS OFFICE UNDER CONTRACT AT(10-1)-1375

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PBF
SYSTEM OPERATION TEST
OPERATIONS PHASE PLAN
APPROVAL PAGE

Approved By
Manager, Planning and Documentation

Approved By
Manager, Operations Support

Approved By
Manager, PBF Program

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PBF SYSTEMS OPERATION TEST PLAN

A. PURPOSE AND SCOPE

The purpose of SO (Systems Operation) testing is for ANC to verify that any particular system will function in accordance with operational performance requirements and design.

The SO Test Plan describes the general objectives of the tests, interdependency and sequencing of the SO tests with the Construction Component (CC) tests, and the test management procedures including the interfacing between various companies involved. This plan will be updated and revisions, approved by the original approval signatures, will be issued as required.

B. SYSTEMS DEFINITION

A system is defined as that combination of various pieces of equipment and instrumentation that will accomplish one of the unit operations required for the successful operation of the total PBF plant.

Each system is classified by its QA essentiality level, ie; I, II, III as defined in Quality Assurance Policy Manual QAP 1-3.

The classification will be used as guide for writing SO Test Specifications, and for processing deficiencies. Generally, the higher the classification, the greater amount of detail and data required for an SO Test.

C. OBJECTIVES

The SO Tests are conducted to demonstrate that the systems will operate to functional requirements and to the design criteria. Since the tests do not include reactor operations, the acceptance envelope excludes the nuclear criteria.

D. TEST SEQUENCING

The CC test for all the related components of a system must be completed and approved before a system is released for SO testing.

E. ORGANIZATIONAL RESPONSIBILITIES AND SO TEST MANAGEMENT

ANC is responsible for the SO tests and will coordinate all aspects of the program.

The tests will be conducted by the Test Engineer (TE) and audited by the Nuclear & Operational Safety Representative. Any construction deficiency in the system will be corrected by the appropriate installation agency. Test results will be reviewed by the Test Engineer, certified by the Nuclear & Operational Safety Representative, approved by the Manager of Planning and Documentation, the Quality Assurance Representative, and the Manager of Operations' Support.

A detailed breakdown of the Company responsibilities is shown in Section F, below.

F. SO TEST FLOW SHEET

The flow sheet of Figure 1 shows the interfaces and defines the responsibilities of each. Explanations of each step in the flow sheet are given with reference to exhibits in Appendix I, which expedite the flow.

SO TEST FLOW SHEET

FIGURE 1

1. PBF Planning & Documentation (P&D) Prepares Draft of Test Specification

A review draft of the SO test specification will be prepared by PBF P&D with assistance from cognizant project engineers.

2. ANC Reviews Draft

The review draft is submitted for review to NOS, R&QA, PBF Shift Operations, PBF Operations Support and the Cognizant Project Engineer.

3. ANC Approves Test Specification

Following resolution of internal comments, final changes are made by P&D. The document is reviewed by the Cognizant Project Engineer and P&D Supervisor; then approved by the Manager of P&D and the Operations Support Manager. All signatures will be affixed on the approval page of the test specification.

4. P&D Issues Test Specification

The SO test specification is formally issued by P&D (See Exhibit A, Appendix I). Test engineers are appointed by the test coordinator. One copy of the test specification will be marked "Master" and all test data will be recorded in this copy. The "Master" copy will remain in the custody of P&D until the date of the readiness review meeting - at which time the copy will be transferred to the Test Engineer. It will be the Test Engineer's responsibility to maintain the "Master" copy current by incorporating all changes which may result from the actions of the Test Review Committee or the PBF Change Board.

5. PBF Accepts System

As soon as the CC tests of the component parts have been completed and approved, the system will be transferred from the installer (if not ANC) to ANC (see Exhibit B Appendix I for CPFF contracts or Exhibit F for Lump Sum contracts). If absolutely necessary, temporary utility hookups for electricity, water, air, etc., may be used. The Test Engineer will coordinate the hookup of temporary utilities. An orange "temporary Utility Tag" will be affixed to the connection point.

6. Test Coordinator Schedules Test

The PBF Test Coordinator, appointed by the Manager of P&D, schedules SO tests and calls the Readiness Review Meeting. The Test Coordinator will be selected from the appropriate supervisors of Operations Support Branch.

7. Test Coordinator Conducts Readiness Review Meeting (See Exhibit C, Appendix I)

A readiness review meeting will be conducted prior to the SO test. If all test preparations have been made to the satisfaction of the Test Coordinator, the readiness review meeting may be waived.

8. TE Conducts Test

The tests will be conducted under the direction of the Test Engineer. The Shift Supervisor will be responsible for the facilities operation and data acquisition. The Test Coordinator will be responsible for the overall coordination.

A Nuclear and Operational Safety Representative will audit all test operations and sign-off on the procedures and data sheets as the tests are conducted.

Field changes may be made to the test procedures for essentiality level III only. These changes must be approved by the Chairman of the Test Review Committee (see Exhibit D, Appendix I) or his designee. If a change must be made when the approving authority is not present at the test site, a telephone approval may be obtained. In any case, the Test Engineer, with assistance from the P&D Supervisor, shall be responsible for incorporating the changes into the "Master" copy of the SO test specification.

8a. Test Engineer Submits All Deficiencies To Test Review Committee

If deficiencies occur during the test, these shall be documented and submitted by the Test Engineer to the Test Review Committee for resolution. Red "SO Test Failure Tags" will be attached to each item referenced in the punch list.

8b. Test Review Committee Resolves Deficiencies (See Exhibit D, Appendix I)

The deficiencies will be evaluated by the Test Review Committee. These will generally fall into two categories.

(a) Construction Deficiencies

Items or equipment that does not perform to requirements because of error in installation, therefore correctable by the installation contractor, shall be treated as "construction Deficiencies". These will be directed to the Test Engineer to initiate action.

(b) Design Deficiencies

Items or equipment that do not perform to requirements because of design deficiencies, e.g., excessive vibration, shall be referred to the PBF Change Board through the Test Engineer.

8c. ANC Specifies Corrections To Installation Deficiencies

Upon notification from the Test Review Committee Chairman, the Test Engineer will prepare a request in detail to the ANC Resident Engineer to correct the deficiencies. If no Resident Engineer is assigned, the Cognizant Project Engineer will coordinate the correction of deficiencies.

8d. Interim Transfer Of System To Installation Agency

The ANC Resident Engineer (or Project Engineer, see 8c) will prepare an interim transfer form for the system (Exhibit E, Appendix I), if the installation agency is a non-PBF construction contractor on a CPFF contract. On Lump-sum contracts, interim transfers will not be used.

8e. Corrections made as Directed

The appropriate agency selected by the ANC Resident Engineer.

8f. TE Specifies Retest Requirements

If required, the TE will specify retest requirements which will be incorporated into the "Master" copy of the test specification with assistance from the P&D Supervisor.

9. ANC Approves Test Results

When the test is satisfactorily completed the results will be reviewed by the Test Engineer, certified by the Nuclear & Operational Safety Representative, and approved by the Manager of P&D, the Quality Control Representative, and the Manager of Operation Support. The signoff shall be executed on the "Master" copy of the test specification. Distribution of the test results will be made to SO Test Standard Distribution.

9a. Final Facility Transfer To ANC (for CPFF Contracts)

Final transfer of each system of the PBF (installed by non-ANC Construction Contractor) to ANC will be made by means of Final Facility Transfer, Exhibit F of Appendix I. Signatures from the following offices will be required:

Resident Construction Engineer - ANC (Project Engineer if no Resident Engineer assigned)
Quality Assurance Representative - ANC
Special Projects Manager - PBF
Construction Contractor Representative

10. PBF Change Board Acts On Design Deficiencies

Design deficiencies rising from the test will be presented to the PBF Change Board by the TE. If the design deficiency is approved by the Change Board, the TE will be notified so that ANC acceptance of the system can be processed.

11. TE Refers Variance To Appropriate Agency

If the variance is disapproved, the case will be submitted by the TE to an appropriate agency for action.

12. Suggested Improvements

The Test Engineer will make a formal list of suggested improvements that may become apparent during the SO Test and submit them to the PBF Manager of Operations Support on an internal memorandum with a copy to the Manager of Shift Operations.

13. Manager of Operations Support for Future Action

The Manager of PBF Shift Operations will file the suggested improvements submitted by the SO Test Engineer for possible future action.

APPENDIX I

Exhibits A through G are the typical documents presented to expedite the SO tests.

Aerojet Nuclear Company

P. O. BOX 1845
IDAHO FALLS, IDAHO 83401

W. D. Ennis, Director
PBF Division
Idaho Operations Office
U. S. Atomic Energy Commission
Idaho Falls, Idaho 83401

SO TEST NO. 4, MAKEUP AND DEMINERALIZED WATER SYSTEM - WED- -72

Enclosed for your information are three (3) copies of the approved
SO Test Specification No. 4, Makeup and Demineralized Water System.

W. E. Durkee, Manager
PBF Program

REH:mb

Enclosures - 3

cc: w/Enclosures
SO Test Standard Distribution
File: 01A12

INTERIM TRANSFER OF FACILITIES

No. _____

Date _____

The _____ System is hereby transferred
by _____, to Aerojet Nuclear Company to begin Systems Operation
(SO) Testing.

Construction Component (CC) Tests applicable for this system have been
conducted with the following:

Deficiencies:

Comments:

Upon completion of the SO testing custody of the system for operation shall
be retained by Aerojet Nuclear Company unless CC or SO Test deficiencies
remain to be corrected. For correction of deficiencies custody of the
system shall be transferred to _____ using the Interim Transfer
Form (Exhibit E). In either instance permanent transfer to Aerojet Nuclear
Company shall be made (or confirmed) by execution of a Final Transfer
Form (Exhibit F).

APPROVED: for _____
Construction Contractor Date

APPROVED: for R&QA Insp. _____
Date

APPROVED: for ANC _____
Resident Engineer Date

DISTRIBUTION: Signatories plus:

Director, PBF Program, ID
Director, Contracts & Support Div., ID
R. E. Heffner

W. E. Durkee
C. K. Leeper
R & QA
Project Engineer
A. G. McGuire
File: A6C13

SYSTEMS OPERATION TEST
READINESS REVIEW MEETING

1. Purpose

The purpose of the readiness review meeting is to assure that:
(a) equipment, materials, and services are available and adequately prepared for the SO test and (b) proper personnel arrangements have been made and each individual understands his duties. Problems will be identified and the responsibilities for correction will be specified.

2. Discussion

Attendance will be expected from the following personnel:

Chairman - Test Coordinator	N&OS Representative
Test Engineer	
Test Supervisor	
Technician	

An ID observer from the PBF program office will be invited to attend.

Areas of discussion during the review meeting will include, but not necessarily limited to, the following:

- (a) Review of test specification and related documents.
- (b) Review of prerequisites.
- (c) Discussion of interfacing systems.
- (d) Calibration of gauges and instruments.
- (e) Availability of special test equipment.
- (f) Temporary utilities requirements.
- (g) Test personnel assignments.

Minutes of the meeting will be kept and distributed as follows:

Attendees

SO Test Standard Distribution

SYSTEM OPERATION

Test Review Committee

1. Purpose

The function of the committee is to control all corrective actions needed to correct deficiencies to the test procedures during test operations and to resolve the deficiencies that may arise from the tests.

2. Membership

- a. Members and alternates to the committee shall be appointed by the head of each organization. The membership of the committee will consist of:

Chairman:	Manager of P&D (Alt. P&D Supervisor)
Member:	Test Coordinator
Member:	Test Engineer
Member:	Nuclear & Operational Safety Representative

- b. The chairman shall be responsible for implementing the administrative requirements of the Committee.

3. Responsibilities

- a. Review and approve changes to the test procedure during test operations.
- b. Review and evaluate all deficiencies arising from the test. Categorize as to construction contractor correctable item or design responsibility item. In either case the committee forwards recommendations for correction or action through appropriate channels.

4. Mode of Operation

- a. A committee member from each organization will be available at all times during the SO tests and the Chairman shall be advised of the current cognizant representative.
- b. If a formal meeting is called, observers may be invited to attend.
- c. All actions of the committee shall be documented and signed by the Chairman. Distribution shall be made to SO test standard distribution.

AEROJET NUCLEAR COMPANY
INTERIM TRANSFER OF SYSTEM

Date _____

Transfer of the system described below to _____
is hereby effected for the purpose of accomplishing the work listed.
When the deficiencies have been corrected the system will be trans-
ferred back to the Aerojet Nuclear Company for SO test completion.

Description of system or component: _____

Deficiencies: _____

Recommended Corrections: _____

Approved: _____ Date _____

ANC PBF Special Projects Manager

We certify that the above deficiencies have been corrected
as specified.

Construction Contractor Date _____

R&QA Date _____

ANC PBF Special Projects Date _____

DISTRIBUTION: SO Test Standard Distribution

FINAL. FACILITY TRANSFER NO. _____

Date _____

Project or Item: Power Burst Facility (Partial as set out below).

On this date an inspection was made of the _____
_____ System, _____, at the Reactor Building (#620)
as constructed by _____ under the technical specifications
and terms of Contract.

This work was found by the inspection group (signature as shown below)
to be complete in accordance with the plans and technical specifications
except for such exceptions as are specifically noted below. The parti-
cipating contractors are also certifying as to the completeness of the
work with reference to the plans and technical specifications.

"These facilities are accepted for the Government. From this date
on ANC, under the applicable terms of its Contract No. _____
with the Government acting through the Atomic Energy Commission,
accepts total responsibility for maintenance and custody of this
facility."

EXCEPTIONS: _____

COMMENTS: _____

INSPECTION PARTY - APPROVED:

ANC Resident Construction Eng.

Construction Contractor

ANC Representative - QA Branch

Certification of Participating Contractors: _____

Construction Contractors

I certify on behalf of _____ that our personnel have
constructed the above named work and to the best of my knowledge the
work has been completed in accordance with the plans and technical spec-
ifications including approved changes.

Construction Contractor

Date _____

FINAL. FACILITY TRANSFER (CONT.)

Aerojet Nuclear Company

I certify on behalf of Aerojet Nuclear Company that our personnel have monitored the design, fabrication and construction of the above-named work and to the best of my knowledge the work has been completed in accordance with the plans and technical specifications including approved changes.

ANC-PBF Special Projects
Manager

Date _____

DISTRIBUTION: Signatories plus:

Director, PBF Program, ID
Director, Contracts & Support Division, ID
R. E. Heffner

W. E. Durkee
C. K. Leeper
File: A6C13

S O T E S T W A I V E R

System or Items: _____

The system (or items) identified above, is (are) considered to have adequately met System Operation Tests under CC-_____.

Therefore, the SO test is waived.

PBF Special Projects Manager

PBF Program Manager

File: 01A12

APPENDIX II

SO TEST STANDARD DISTRIBUTION

Director, PBF Program, ID - 3
Chief, Water Systems Branch, RDT
R. E. Heffner
R & QA
W. E. Durkee
A. G. McGuire (2)
R. A. McGuire
R. L. Pierce
B. K. Pope
C. K. Leeper
C. R. Toole
File: 01A12