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18. Signature of EDT Originator <i>CC Pitkoff</i> 2/2/95	19. Authorized Representative for Receiving Organization <i>CC Pitkoff</i> 2/2/95	20. Cognizant Manager <i>J.R. Frederickson</i> 2/2/95	21. DOE APPROVAL (if required) Ctrl. No. <input type="checkbox"/> Approved <input type="checkbox"/> Approved w/comments <input type="checkbox"/> Disapproved w/comments
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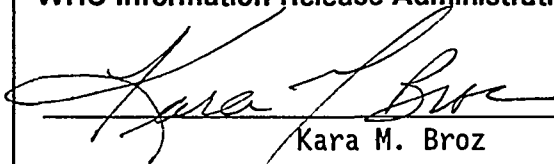
Document Title: Gas and Liquid Sampling for Closed Canisters in KW Basin - Work Plan

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This document was reviewed following the procedures described in WHC-CM-3-4 and is:

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WHC Information Release Administration Specialist:


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February 3, 1995

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7. Abstract

Work Plan for the design and fabrication of gas/liquid sampler for closed canister sampling in KW Basin.

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Gas/Liquid Sampler for
Closed Canisters in KW Basin
Work Plan

WHC-SD-SNF-WP-012 Rev. 0

May 17, 1994

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1.0 INTRODUCTION

1.1 Objective

This document defines the tasks associated with the design, fabrication, assembly, and acceptance testing equipment necessary for gas and liquid sampling of the Mark I and Mark II canisters in the K-West basin. The sampling of the gas space and the remaining liquid inside the closed canisters will be used to help understand any changes to the fuel elements and the canisters.

Specifically, this work plan will define the scope of work and required task structure, list the technical requirements, describe design configuration control and verification methodologies, detail quality assurance requirements, and present a baseline estimate and schedule.

1.2 Authority

The design of the gas/liquid sampling equipment will be conducted under the authority of the U.S. Department of Energy (DOE).

1.3 Summary Description

1.3.1 Background

Currently, 958 MTU (metric tons of Uranium) of irradiated N Reactor fuel is stored in 3821 sealed canisters in K-West basin. Encapsulation (packaged into sealed canisters) of the fuel was initiated in 1980 to prevent the release of fission products from corroding fuel rods to the basin water system. The encapsulation process involved sealing the elements inside a canister nearly full of water and a dilute potassium-nitrite solution with a nitrogen-filled vapor space. The canisters are vented through traps that allow gases (produced from corrosion) to escape while maintaining the water in the canister.

1.3.2 Systems Description

This sampling task is to provide a sampling device that will remove small amounts of gas and liquid from a closed Mark I and Mark II canister without disturbing other canisters or the basin water system. The equipment will be designed to remove either the head space gas or liquid contained in the canister through a valve in the canister lid.

The sampling device is envisioned to stand 7.01 meters tall (the developmental sampler is 5.49 meters tall) and fit over a valve on top of the lid and seal so as not to release any of the gas/liquid in the closed canister to the basin water when opened. A gas sample will be removed from the off-set

valve and the liquid sample will be taken from the center valve if the liquid in the canister is above the dip leg.

The equipment will be able to disengage from the canister with the valves resealed to the canister lid. The samples will then be packaged for shipping and transported to an analytical lab.

2.0 SCOPE

This section identifies the tasks to be completed and the deliverables required to develop, install, operate the equipment, and ship samples for the gas and liquid sampling task.

2.1 WHC Scope and Deliverables

Westinghouse Hanford Company is to lead the gas and liquid sampling program by providing appropriate management and funding support. Westinghouse Hanford Company is to develop the definitive design and documentation to build, and test the hardware. Westinghouse is also to provide adequate training to those personnel that will install the equipment, operate the equipment, and store equipment.

The WHC deliverables, as a minimum, include:

- This engineering work plan, and a Functional Design Criteria.
- Installation work plans, packages, procedures, test plan, and design documentation.
- Acceptance test procedure/report which combines report findings and all calibration-type information.

2.2 Functions and Requirements

The definitive design criteria will be developed throughout the course of the program. The initial design guidance is provided herein.

- The gas and liquid sampling equipment must be able to take a both vapor space sample and, if the liquid is above the drop leg on the center valve, a liquid sample without significantly changing the chemical and radiological constituent concentrations of either the gas or the liquid inside the canisters.
- The equipment shall be designed to sample the canisters with minimal disturbance to the basin water system.

2.3 Document approval levels and Safety Classification

Determination of safety classification and document approvals are in accordance with WHC-CM-1-3, MRP 5.46, WHC-CM-3-5, Section 12.7 and WHC-CM-4-46.

Document Approval

Selection of approval levels for all documents and changes related to design, procurement, fabrication, assembly, and installation of equipment shall be in accordance with WHC-CM-3-5, Section 12.7, Table 1 and WHC-CM-7-5 Section 13.5.

2.4 Safety Assessment

An Unreviewed Safety Question (USQ) evaluation, per WHC-CM-1-3, MRP 5.12, is required prior to sample equipment installation in the K West fuel storage Basin. K Basin Technical Safety will perform this scope of work.

3.0 ORGANIZATIONAL RESPONSIBILITIES

The task responsibilities are outlined in the following sections. Signatures on the EDT of this document indicate agreement for the task.

3.1 Operational Activity Support/ Performance Responsibilities

3.1.1 Process Systems

Lead Design Manager: J.R. Frederickson
Cognizant Engineer: C.C. Pitkoff

- Provide cost and schedule estimates.
- Design or modify existing design for the gas and liquid sampler to meet design criteria in the Functional Design Criteria.
- Follow preparation of fabrication and I&C system sketches and drawings.
- Plan fabrication and assembly operations for test apparatus, as required.
- Coordinate on-site or off-site component fabrication.
- Coordinate assembly operations for gas and liquid sampler and miscellaneous tooling.

- Identify, initiate, and complete procurement of vendor-supplied materials, detail components, and equipment.
- Prepare acceptance test procedure and perform acceptance testing as required. Provide acceptance test report.
- Generate design criteria
- Design verification
- Determine approval designator and safety classifications for all systems and/or subsystems.

Documentation included as required:

- Cost and schedule.
- Work plan, acceptance test plan/ calibration, acceptance test report, installation/operation manual, system design description, and functional design criteria.
- Design sketches and as-built drawings for sample equipment.
- Instructions for fabrication and assembly.

4.0 TECHNICAL REQUIREMENTS

Materials, components fabrication, inspection of test hardware shall conform to applicable WHC Specifications listed in Section 4.1 and as defined in the fabrication drawings. Quality assurance program requirements for the gas liquid sampling task shall be in accordance with WHC-CM-4-2.

The gas and liquid sampling equipment shall be designed, fabricated, assembled, and tested in accordance with WHC-IP-1026. Specific tasks to be performed for the gas and liquid sampling system are listed in Section 3.1.

All materials used will be called out on the drawings. The materials used will be compatible with the basin water system.

4.1 Specification

4.1.1 WHC Procedures

Procedures	WHC Procedure Number
Quality Assurance Manual	WHC-CM-4-2
Standard Engineering Practices	WHC-CM-6-1
Procurement Manual and Procedures	WHC-CM-2-1
Job Control System	WHC-CM-8-8
Environmental Compliance	WHC-CM-7-5
Management Requirements and Procedures	WHC-CM-1-3
Radiological Control Manual	WHC-CM-1-6
ALARA Program Manual	WHC-CM-4-11
Industrial Safety Manual	WHC-CM-4-3
Industrial Hygiene Manual	WHC-CM-4-40
Document Control and Records Management Manual	WHC-CM-3-5
Hazardous Material Packaging and Shipping	WHC-CM-2-14
K-Basin Administrative Procedures	

4.2 Procurement Tasks

All material and components shall be procured in accordance with WHC-CM-2-1.

Advance procurement are encouraged. It is accepted that some equipment procured may not be used (or useful) in the final assembly due to the development nature of the task.

4.3 Fabrication and Assembly of Equipment

Fabrication of components shall meet the requirements established by the drawings and this work plan. Drawings, sketches, and specifications shall be identified as "Development Control" per EP-2.4. Changes to the drawing requirements shall be markings of the drawing in "red" and/or the addition of supplementary sketches. All modifications shall be signed and dated by the cognizant fabrication engineer.

Two complete independent sets of uniquely numbered fabrication drawings shall be maintained with identical information, updated on a daily bases at a minimum. One set is to be in the cognizant engineer's possession; the other set in the fabrication package. All redline changes are to be circled signed, and dated by the cognizant engineer. A log of changes and their locations are to be maintained with both sets of drawings. The two sets are to be clearly identified as originals with the cognizant engineer's signature and date.

4.3.1 Acceptance Testing

The gas and liquid sampling system, including all ancillary systems, will be fully tested prior to installation to assure compliance with customer's (Characterization) requirements. Testing will be in accordance with an approved acceptance test plan. Quality Assurance will verify all acceptance testing.

4.3.2 Fabrication Drawings

All fabrication shall be completed per WHC drawings or sketches. All changes shall be approved by the cognizant engineer's dated signature next to each change. Approval and release of the engineering documents shall be in accordance with EP-1.7, Engineering Document Approvals and Release Requirements.

4.4 Verification

Design verification for the gas and liquid sampling equipment shall be accomplished at the minimum through use of independent technical reviews and testing in accordance with WHC-CM-6-1, EP-4.1.

No hold points have been determined at this time.

4.5 Test Performance

Equipment cognizant engineer will be designated by J.R. Frederickson. Tool operation will be performed by operations and engineering technicians under the direct supervision of the equipment cognizant engineer.

4.6 Documentation

A general data file shall be established and maintained by SNF K-Basin Engineering Projects for the gas and liquid sampling task. The gas and liquid sampling general file shall contain the complete, legible, and reproducible copies of documents such as overcheck reports, drawings, engineering analysis, inspection data (inspection/test plans and inspection data sheets), repair procedures, and progress reports, as required. The general file shall be turned over to WHC Document Control in a format ready for release as a supporting document in the IRM system. Document Control will release this document as a supporting document for permanent record availability and traceability.

5. SNF QUALITY ASSURANCE REQUIREMENTS

5.1 Design Verification and Control

Design verification shall be accomplished through independent reviews between the cognizant engineer and Quality Assurance in accordance with WHC-CM-6-1, EP-2.4, the acceptance test procedure, and the as-built data package.

5.2 Quality Assurance Program Requirements

The design documents generated for the tasks identified in this work plan shall be prepared and verified in accordance with WHC-IP-1026, Engineering Practice Guidelines, "Development Control". The tasks associated with this work plan shall meet the requirements of WHC-CM-4-2, "Quality Assurance Manual".

6.0 COST AND SCHEDULE

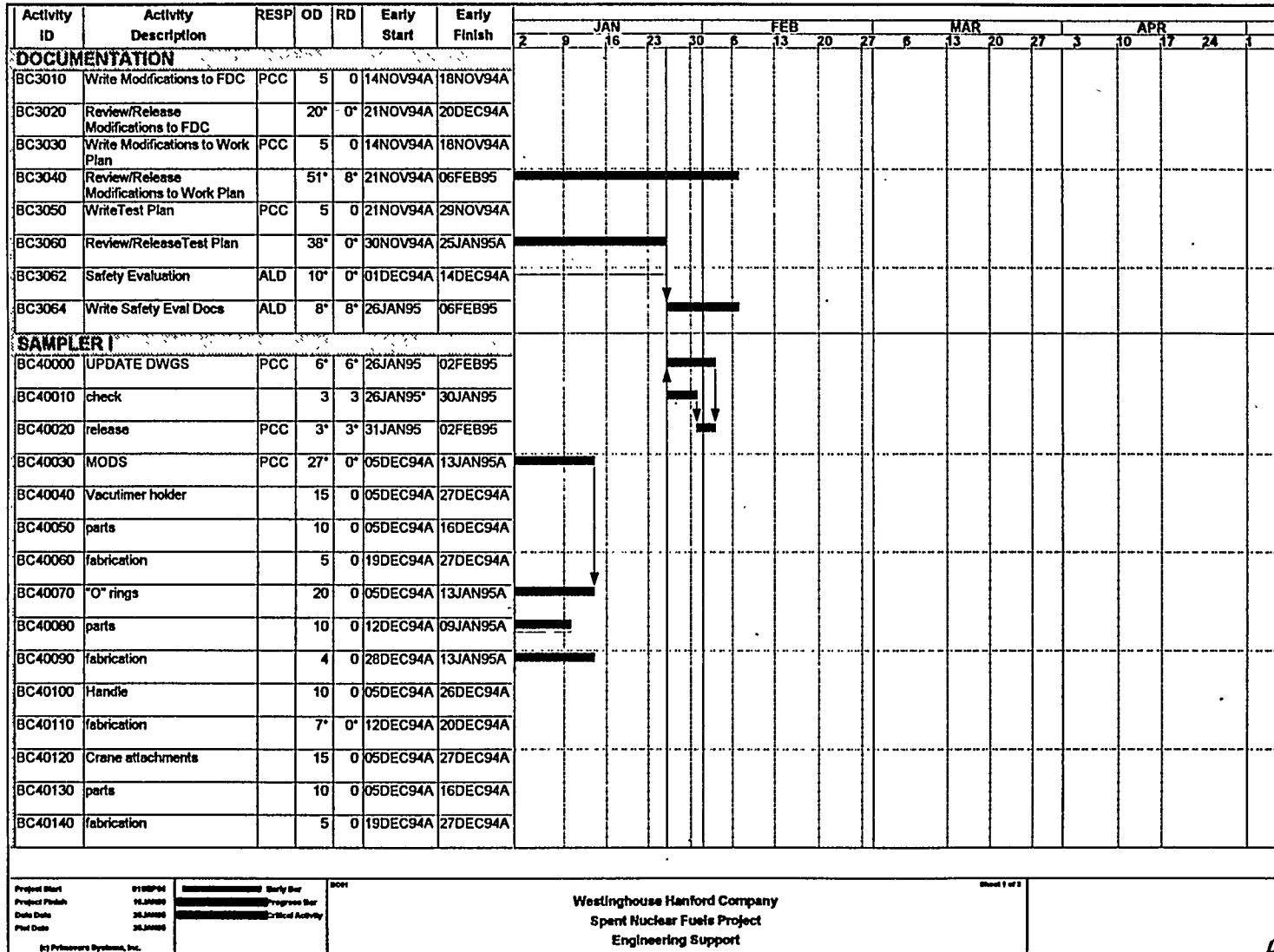
The baseline task breakdown and associated cost and schedule estimates are given in attachments A and B. The conditions and assumptions listed in Section 6.1 provide a baseline for cost and schedule estimates.

6.1 Baseline Cost and Schedule Estimate Assumptions

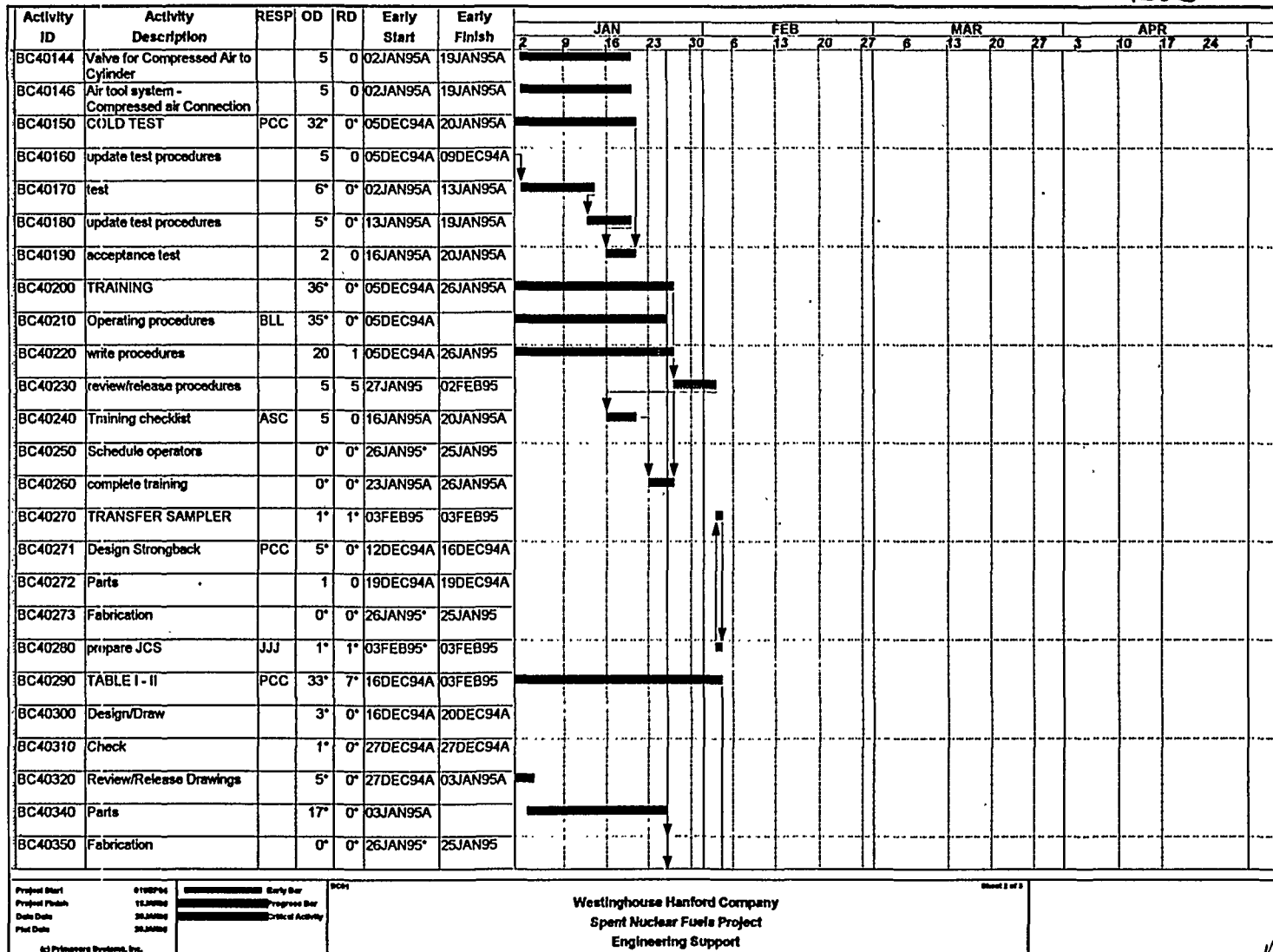
- All cost based on FY94 rates.
- Schedule based on single shifts and standard holidays.
- All cost include organizational adders.
- Personnel required to support the activities/responsibilities outlined in Section 3.0 will be available.
- Schedule is a working schedule and will be updated to reflect changes and completion of each task.

A work order has been written for drawings from KEH the number is E33600. The Charge code for the Work is L2113.

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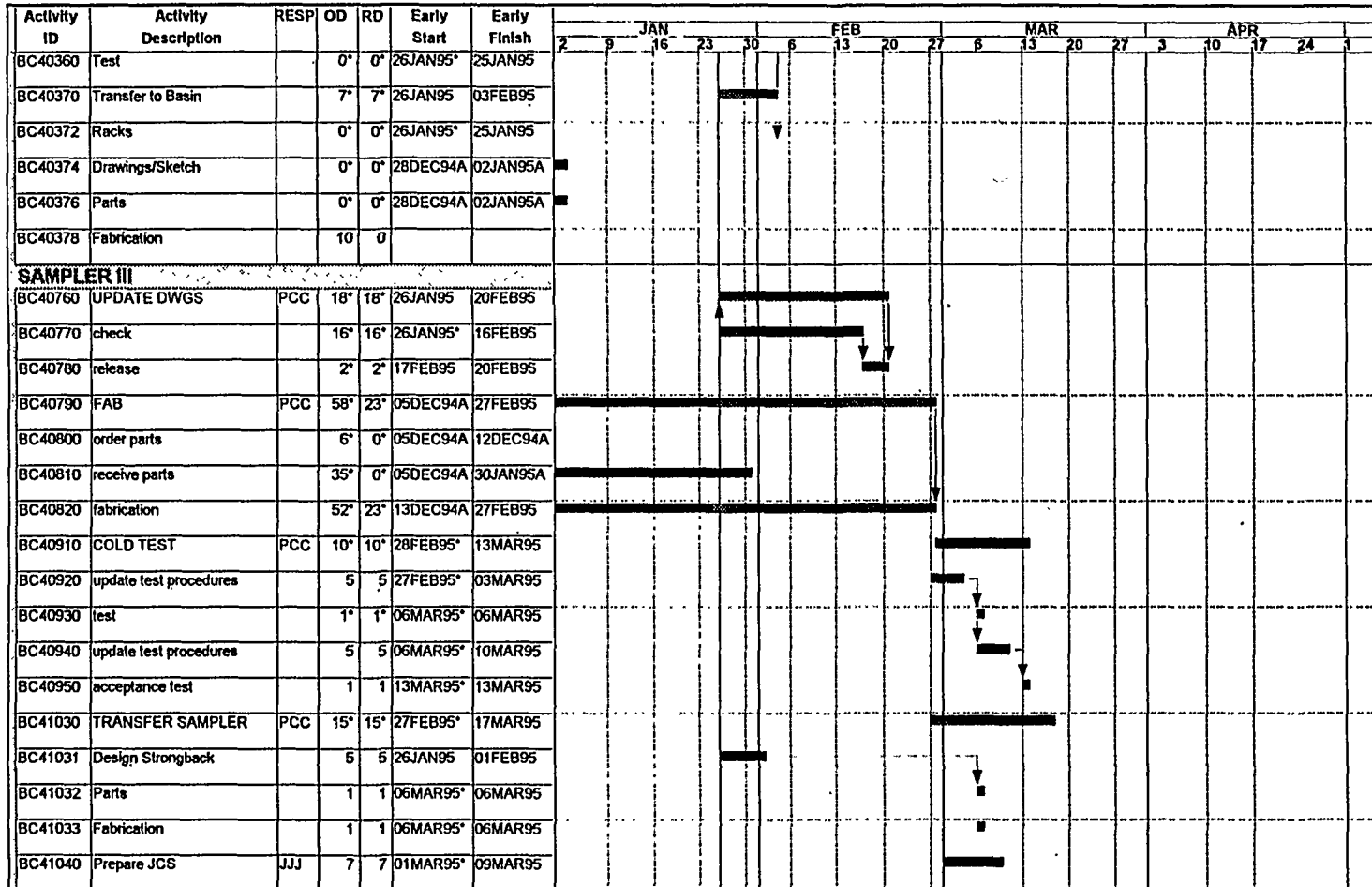
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A2

WNC-SD-SNF-WP-003

Rev 0



Project Start 01SEP94
 Project Finish 11JUN95
 Data Date 28JUN95
 Plot Date 28JUN95

Legend:
 [Solid Bar] Early Bar
 [Hatched Bar] Progress Bar
 [Dashed Bar] Critical Activity

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0001

Westinghouse Hanford Company
 Spent Nuclear Fuels Project
 Engineering Support

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