2. To: (Receiving Organization)  
Distribution

3. From: (Originating Organization)  
Project W-464

4. Related EDT No.:  
N/A

5. Proj./Prog./Dept./Div.:  
W-464/IHLW Storage and Disposal

6. Design Authority/Design Agent/Cog. Engr.:  
G.L. Parsons

7. Purchase Order No.:  
N/A

8. Originator Remarks:  
For approval and release

9. Equip./Component No.:  
IHLW Canister Storage

10. System/Bldg./Facility:  
212-H / 200E

11. Receiver Remarks:  
11A. Design Baseline Document? □ Yes □ No

12. Major Assm. Dwg. No.:  
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13. Permit/Permit Application No.:  
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14. Required Response Date:  

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16. KEY

17. SIGNATURE/DISTRIBUTION

18. Signature of EDT Originator  
F. Janin  9/29/00

19. Authorized Representative for Receiving Organization  
N/A

20. Design Authority/Cognizant Manager  
G.L. Parsons  8/29/00

21. DOE APPROVAL (If required)

Control No.

□ Approved  
□ Approved w/comments  
□ Disapproved w/comments
Operations and Maintenance Concept Plan for the Immobilized High-Level Waste Interim Storage Facility

CH2M HILL Hanford Group, Inc.

Richland, WA 99352
U.S. Department of Energy Contract DE-AC06-99RL14047

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Abstract: This O&M Concept looks at the future operations and maintenance of the IHLW/CSB interim storage facility. It defines the overall strategy, objectives, and functional requirements for the portion of the building to be utilized by Project W-464. The concept supports the tasks of safety basis planning, risk mitigation, alternative analysis, decision making, etc. and will be updated as required to support the evolving design.

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Prepared for the U.S. Department of Energy
Assistant Secretary for Environmental Management

CH2M HILL
Hanford Group, Inc.
Richland, Washington
Contractor for the U.S. Department of Energy
Office of River Protection under Contract DE-AC06-99RL14047

Approved for Public Release; Further Dissemination Unlimited
Operations and Maintenance Concept Plan for the Immobilized High-Level Waste Interim Storage Facility

L. F. Janin
COGEMA Engineering Corporation

Date Published
August 2000

CH2M HILL
Hanford Group, Inc.
P. O. Box 1500
Richland, Washington
Contractor for the U.S. Department of Energy
Office of River Protection under Contract DE-AC06-99RL14047

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Title: OPERATIONS AND MAINTENANCE CONCEPT FOR IMMOBILIZED HIGH-LEVEL WASTE INTERIM STORAGE FACILITY, PROJECT W-464

Date: August 2000

Prepared by: L. F. Janin, Principal Technical Specialist
Engineering and Technology Division
COGEMA Engineering Corporation
Richland, Washington

Reviewed By: G. L. Parsons, Project Manager
Immobilized High-Level Waste
Disposal System Project
CH2M HILL Hanford Group, Inc.
Richland, Washington

Approved By: O. M. Serrano, Operations Manager
Canister Storage Building Operations
SNF Operations
Fluor Hanford
Richland, Washington

Approved By: K. C. Burgard, Program Manager
Storage and Disposal Project
CH2M HILL Hanford Group, Inc.
Richland, Washington
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EXECUTIVE SUMMARY

This Operations and Maintenance (O&M) concept document defines the overall strategy, objectives, and contractor management requirements for the operation and maintenance of the part of the Canister Storage Building (CSB) to be utilized by Project W-464, immobilized high-level waste (IHLW), whose mission is to effect certain required Hanford infrastructure changes to accommodate the interim storage of the initial phase of Waste Treatment Contractor output. This O&M concept document was developed using guidance contained in HNF-IP-0842, Volume IV, Engineering and employs hands-on maintenance and the use of the casks and the building structure for shielding during operation.

Project W-464 will modify the CSB for interim storage of IHLW canisters. The project will provide transport systems, equipment, and facilities for accomplishing transportation, interim storage, and retrieval of IHLW.

During initial production of the IHLW canisters, the facility will operate during day shift, five days per week, eight hours per day, with overtime as required. As the Waste Treatment Plant (WTP) reaches production capacity, shift work will be phased in. One operator would be on each of ABCDE shifts from the beginning for surveillance purposes (the fifth shift is for training).

This O&M concept document will contribute to the establishment of requirements improving the program life-cycle costs by analyzing the overhaul, maintenance, and repair of components that could serve as major contributors to operational costs and achieving performance objectives. The O&M concept implementation process is a tool to assist in controlling the life-cycle costs.
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<td>administrative downtime</td>
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<tr>
<td>ALARA</td>
<td>as low as reasonably achievable</td>
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<td>BEI</td>
<td>Biological Exposure Indices</td>
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<td>BNFL</td>
<td>BNFL, Inc.</td>
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<td>continuous air monitor</td>
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<td>CCTV</td>
<td>closed circuit television</td>
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<tr>
<td>CDR</td>
<td>Conceptual Design Review</td>
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<td>CH2M HILL Hanford Group, Inc.</td>
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<td>cm</td>
<td>centimeter</td>
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<td>CONOPS</td>
<td>Conduct of Operations</td>
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<td>cpm</td>
<td>counts per minute</td>
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<td>Canister Storage Building</td>
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<td>CTS</td>
<td>Canister Transport System</td>
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<td>dpm</td>
<td>disintegrations per minute</td>
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<td>Lockheed Martin Advanced Environmental Systems</td>
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<td>m</td>
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<td>MAR</td>
<td>Mission Analysis Report</td>
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<tr>
<td>MCO</td>
<td>multi-canister overpack</td>
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<tr>
<td>MDT</td>
<td>mean downtime</td>
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<td>MMH/OH</td>
<td>maintenance man-hour per system operating hour</td>
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<td>MTBF</td>
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O&M  Operations and Maintenance
OWS  Overpack Weld Station
ORP  Office of River Protection
OTP  operational test procedure
PHMC  Project Hanford Management Contract
PLC  programmable logic controller
PM  preventive maintenance
PPE  personal protective equipment
QA  Quality Assurance
QC  Quality Control
R&D  research and development
R&M  reliability and maintainability
RAM  reliability, availability, and maintainability
RCT  Radiological Control Technician
RMA  Radioactive Material Area
RPP  River Protection Project
Management
S&D  storage and disposal
SAR  Safety Analysis Report
SCT  Shielded Canister Transporter
SEL  Safety Equipment List
SNF  spent nuclear fuel
SRID  Standards/Requirements Identification Document
SRS  Savannah River Site
SSC  structures, systems, and components
SWP  Special work permit (or procedure)
TBD  to be determined
TCM  corrective maintenance time
TFC  Tank Farm Contractor
TLV  threshold limit value
TMT  total maintenance time
TMX  Training Matrix
TMXS  Training Matrix Subsystem
TOE  Total Operating Efficiency
TPA  *Hanford Federal Facility Agreement and Consent Order*, also known as
the Tri-Party Agreement
TPM  total preventive maintenance
TSC  Telecommunications Services Contractor
TWRS  Tank Waste Remediation System (now known as the River Protection
Project, or RPP)
W-379  Spent Nuclear Fuel Project
W-464  Immobilized High-Level Waste Project
WAC  Washington Administrative Code
WTC  Waste Treatment Contractor
WTF  Waste Treatment Facility
As Low As Reasonably Achievable (ALARA): the approach to radiation protection to manage and control exposures (both individual and collective) to the work force and to the general public to as low as is reasonable, taking into account social, technical, economic, practical, and public policy considerations. As used in this Manual, ALARA is not a dose limit but a process which has the objective of attaining doses as far below the applicable limits of this part as is reasonably achievable.

availability: the probability that a system/equipment when used under stated conditions, without consideration for any scheduled or preventive maintenance will operate satisfactorily at any given time. It excludes Ready Time, Preventive Maintenance Downtime, Supply Downtime, and Waiting or Administrative Downtime.

continuous air monitor (CAM): Instrument that continuously samples and measures the levels of airborne radioactive materials on a “real-time” basis and has alarm capabilities at preset levels.

decontamination: Process of removing radioactive contamination and materials from personnel, equipment or areas.

disintegration per minute (dpm): The rate of emission by radioactive material as determined by correcting the counts per minute observed by an appropriate detector for background, efficiency, and geometric factors associated with the instrumentation.

high-efficiency particulate air (HEPA) filter: Throwaway extended pleated medium dry-type filter with 1) a rigid casing enclosing the full depth of the pleats, 2) a minimum particle removal efficiency of 99.97 percent for thermally generated monodisperse dioctyl phthalate smoke particles with a diameter of 0.3 micrometer, and 3) a maximum pressure drop of 1.0 inch w.g. when clean and operated at its rated airflow capacity.

monitoring: means the measurement of radiation levels, airborne radioactivity concentrations, radioactive contamination levels, quantities of radioactive material, or individual doses and the use of the results of these measurements to evaluate radiological hazards or potential and actual doses resulting from exposures to ionizing radiation.

maintainability: A characteristic of design which is expressed as the probability that a system/equipment will be restored to a specified condition within a given period of time, when the maintenance is performed in accordance with prescribed procedures and resources.

redundancy: The existence of more than one means for accomplishing a given function. Each means of accomplishing the function need not be identical.
reliability: A characteristic of design which is expressed as the probability that a system/equipment will perform its intended function, for a specified interval, under stated conditions.

shipping: Indicates movement of radioactive material offsite, such as to the federal repository.

survey: An evaluation of the radiological conditions and potential hazards incident to the production, use, transfer, release, disposal, or presence of radioactive material or other sources of radiation. When appropriate, such an evaluation includes a physical survey of the location of radioactive material and measurements or calculations of levels of radiation, or concentrations or quantities of radioactive material present.

Tank Farm Contractor (TFC): The tank farm contractor is a primary contractor for the River Protection Project and performs the planning and operations necessary for tank waste storage, retrieval, treatment, and final waste storage and disposal (HNF-IP-0842, Volume X, Business, Section 1.2, Rev. 3a).

transport: Indicates movement of radioactive material or an empty cask within the Hanford Site boundaries.

Waste Treatment Contractor (WTC): The waste treatment contractor is a primary contractor for the River Protection Project and is responsible for design, construction, and operation of the waste immobilization facility (HNF-IP-0842, Volume X, Business, Section 1.2, Rev. 3a).
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1.0 INTRODUCTION

The U.S. Department of Energy (DOE), through the Office of River Protection (ORP), has planned a course of action to acquire high-level waste (HLW) treatment and immobilization services from the Waste Treatment Contractor (WTC), followed by on-site interim storage. The ORP will accept the treated/immobilized waste for interim storage and disposal from the WTC, for the product that meets ORP's specifications.

The Tank Farm Contractor (TFC) is responsible for initial receipt of immobilized high-level waste (IHLW) from the WTC, safe interim storage, retrieval, and eventual transport of the IHLW to a shipping facility.

The River Protection Project (RPP) has established the IHLW Interim Storage Project (W-464). This project will provide facilities for on-site transportation and interim storage of up to 880 canisters of Phase 1 generated IHLW product. The Project W-464 scope entails modifying and retrofitting the Hanford Site Canister Storage Building (CSB) to accommodate the Phase 1 IHLW product and providing ancillary equipment and systems to safely move the IHLW from the WTP to the CSB for interim storage.

The main structure of the CSB was constructed as part of the Spent Nuclear Fuel (SNF) Project (Project W-379). Two of the three vaults are not being completed as part of Project W-379 because Project W-379 will require only Vault One for interim storage of SNF multi-canister overpacks (MCOs). Project W-464 will install the storage tubes and bellows for Vaults Two and Three (see Appendix E), and procure the shielded canister transporter [SCT (see Appendix D)], cranes (60/10-ton, 10-ton, 7.5-ton, and 2-ton), ventilation equipment, annex building, and transport system to move the IHLW from the WTP to the CSB.

HNF-2579, Rev. 0, Systems Engineering Management and Implementation Plan for Project W-464, Immobilized High-Level Waste Storage, requires, in Section 3.1.9, that an Operations and Maintenance (O&M) concept be developed for the project to summarize how the entire system is to be operated and maintained. HNF-2298, Rev. 1, Conceptual Design Report, Immobilized High-Level Waste Interim Storage Facility, Section VI, states that an O&M concept will be "established to provide a baseline for future reliability, availability, and maintainability (RAM) analysis for a basis for definitive design criteria." HNF-SD-WM-SEMP-002, Rev. 2, Systems Engineering Management Plan for the Tank Farm Contractor cites HNF-IP-0842, Volume IV, Engineering, Section 2.15 as the guidance for developing this document.

The use of the words "shall", "should", "may", and "will" within this document express the following meaning:

"Shall" indicates a provision that is binding. "Should" and "may" indicate non-mandatory, but conceptually desirable, provisions. Design development could render the "should" and "may" provisions infeasible, impractical, excessively costly, or otherwise unimplementable from the designer's perspective. "Will" is a simple declaration of purpose or futurity.
1.1 DOCUMENT PURPOSE

The initial issuance of this concept is intended to address the general mission, as well as define general operations, functions and system requirements, constraints on the system and maintenance requirements at a higher level commensurate with the conceptual design. The O&M concept document provides a starting point for subsequent planning efforts to expand the format and integrate human factors and reliability analysis to optimize the facility design specific to the new capability, as documented in the System Specification for Immobilized High-Level Waste Interim Storage (RPP-6222). This planning is required to define the envelope within which operations and maintenance activities will be planned and conducted. The concept document also supports safety basis planning, risk mitigation, alternatives analysis, decision making, and life cycle cost calculations.

Staff levels, activity durations, shifts, project equipment, etc., are expected to change as the project proceeds through design and construction. Formal Operations and Maintenance procedures will be prepared prior to operation.

1.2 DOCUMENT SCOPE

The scope of this document is the development and documentation of an O&M concept for the portion of the CSB covered by Project W-464, and includes CSB retrofit, the SCT, the Canister Transport System (CTS), the cranes, the welder, and related ancillary equipment. Additionally, it is expected that IHLW CSB personnel will assume responsibility for vault 1 surveillance and associated operation and maintenance activities when all SNF materials have been placed in storage.

The O&M concept is based on the Life-Cycle Asset Management Good Practice Guides, GPG-FM-004, Reliability, Maintainability, and Availability Planning; and GPG-FM-031, Maintenance, and developed per HNF-IP-0842, Volume IV, Engineering, Section 2.15, "Operations and Maintenance Planning Process Procedure". The O&M strategy development is iterative in nature and becomes more fully developed as the facility planning proceeds through the life-cycle phases and before new operations begin. This document will be updated throughout the life of the project as needed.
2.0 HANFORD SITE MISSION

As part of the Hanford Site mission, the DOE established the ORP to manage the tank waste activities. The Office of River Protection Integration Management Plan for the Hanford Tank Waste Remediation System (DOE/RL-99-06) (RL 1999a) states:

"The ORP mission is to store, treat, immobilize, and dispose of the highly radioactive Hanford Site waste (including current and future tank waste and cesium and strontium capsules) in an environmentally sound, safe, and cost-effective manner. The long-term goal is to protect the Columbia River from future tank waste leaks."

The DOE has identified the need to store, treat, immobilize, and dispose of the highly radioactive Hanford Site tank waste in an environmentally sound, safe, and cost-effective manner.

2.1 RIVER PROTECTION PROJECT MISSION

To support the environmental remediation and restoration effort at the Hanford Site, the DOE ORP established a two-phase approach of using a WTC to treat and immobilize the radioactive waste currently stored in underground tanks at the site. Treatment will produce a small volume of HLW and a much larger volume of low-activity waste (LAW). After immobilization, the HLW will be held in interim storage for eventual shipment to a HLW repository and the LAW will be disposed of on-site.

2.2 IHLW INTERIM STORAGE MISSION AND OBJECTIVES

The mission of the IHLW Interim Storage Subproject is as follows.

- Receive IHLW canisters produced by the WTC and accepted by DOE.
- Transport canisters to the interim storage facility on the Hanford Site.
- Store the canisters safely and economically until they can be loaded out for shipment to a federal geologic repository.

The primary objective of the IHLW Storage Subproject is to provide on-site transportation systems and interim storage facilities for Phase 1 and 2 IHLW production in accordance with the subproject mission. This includes establishing line-item projects. One will provide an onsite IHLW transportation system and retrofit the CSB to accommodate Privatization Phase 1 IHLW (W-464 – 880 canisters). A line-item project will be established for each of the Phase 2 storage modules (number and size to be determined). A line-item project will be established to design and construct an offsite shipping facility.

The IHLW Storage Modules Subproject includes design and construction of storage modules (facilities) for Phase 2 IHLW product storage and construction of the off-site shipping facility.
Specific objectives common to the Privatization Phase 1 and 2 line-item projects are as follows.

- Provide transportation systems and retrofit or design and construct IHLW interim storage facilities in accordance with the system specification document and the DOE budgeting process, and federal, state, and local laws and regulations. For Phase 1, the system specification document is RPP-6222, Rev. 0A, *System Specification For Immobilized High-Level Waste Interim Storage*.

- Design and construct a facility to support shipping of IHLW canisters to the Federal Geological Repository.

- Obtain all necessary construction and operations permits and safety authorization basis and have IHLW interim storage capability operational on a schedule consistent with WTC production schedules and Tri-Party Agreement (Ecology et al. 1996) provisions.

- Petition and obtain final approvals for delisting and removal of RCRA hazardous characteristic codes on IHLW product before shipment of IHLW canisters to the Federal Geological Repository.

- Develop operational and equipment/facility decontamination and decommissioning plans (if required) during detailed design for interim storage facilities and supporting systems.

- Support environmental, safety, and health (ESH) requirements through the *National Environmental Policy Act of 1969* (NEPA) compliance and safety analyses.

- Integrate with applicable site projects and other agencies to the extent necessary to maintain project goals and objectives and established project baseline planning and cost targets.

### 2.3 W-464 MISSION REQUIREMENTS

The Mission Analysis Report (MAR) describes and analyzes the technical requirements that the RPP must satisfy for the overall mission. It also describes, at a high level, the technical strategy, mission goals and objectives, and mission analysis specifically for Phase 1 of the privatization contract.

The following functions form the basis for IHLW interim storage requirements and design.

- Accept the IHLW product from the producer
- Transport the IHLW product to interim storage
- Interim store the IHLW product
- Support interim storage of the IHLW product
- Retrieve the IHLW product from interim storage
- Deliver the IHLW product to the shipping facility for shipment to the repository.
- Manage the disposal of incidental waste during interim storage of the IHLW product.
Further functional decomposition and design requirements specific to the IHLW product are provided in the draft Level 1 Specification document, RPP-6222.

2.4 FIGURES OF MERIT

A Figure Of Merit (FOM) is a specific measure selected to evaluate and understand the effectiveness of a system for accomplishing a mission. The following are potential FOMs to measure the effectiveness of the system.

- Overall Canister Placements/Time
- Canister Placement vs. Canister Backlog, released by the WTC
- Individual Canister Placement Time, from receipt at the CSB
- Maintenance Backlog
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3.0 OPERATIONS CONCEPT DISCUSSION

The safety of the public and the worker, and the protection of the environment will be the primary considerations in the startup and operation of the Phase 1 IHLW interim storage system. Startup and operations will maintain the facilities within their safety authorization basis and will be conducted in full compliance with applicable federal, state, and local laws and regulations. Operations are to be conducted efficiently to meet the projected production rates of the IHLW canisters. No lost-time accidents will be a primary goal of the operations group. Exposures to radiation and toxic materials will be as low as reasonably achievable (ALARA) and consistent with good industry practice and DOE orders and regulations.

In an effort to identify operational risks and failure impacts of SNF activities on IHLW operations, a joint IHLW/SNF operational assessment will be performed to identify the various facility system failures that could impact the loading and storage of IHLW canisters. This assessment will be performed as more detailed and mature information becomes available regarding the joint operation considerations and operational modes.

This assessment will address the various facility systems that could be used during joint operations, what the failure conditions would be, the impacts against IHLW and/or SNF operations, and identification of contingency planning to mitigate associated risks.

3.1 GENERAL OPERATIONS CONCEPTS/POLICIES/PHILOSOPHY

The operations strategy is based on requirements for the safe handling, interim storage, and monitoring of IHLW. Operations ensures the availability of structures, systems, and components (SSC) for planned operations within the boundary of the Authorization Basis and the Integrated Environment, Safety, and Health Management System Description for the Tank Farm Contractor (ISMS)(RPP-MP-003). Operations obtains, evaluates, and retains surveillance data to ensure up-to-date records status of the interim stored waste, facilities, and equipment.

All above-deck equipment at the CSB used for any part of the IHLW interim storage process, including the HVAC system, must be designed, fabricated, and utilized such that it is capable of being contact maintained.

Since the project represents the interim storage phase, it is dependent on the critical production requirements of the waste treatment facility (WTF). As these are defined in the design phase of the project, Design Reference Mission (DRM) and operational time lines will be developed to support a WTF ramp up in production.

3.1.1 Procedure Compliance
Procedures form the basis for correct and safe operation of all processes and facilities. Procedures provide direction for performing activities within an authorization basis, assist in communicating hazards, and maintain performance consistency. Workers and their supervisors
are held accountable for working in compliance with their procedures, whether they are administrative or technical.

Guidance and RPP policy on procedure compliance is contained in the *RPP Administrative Manual*, HNF-IP-0842, Volume I, Section 2.1, which states that procedure compliance is mandatory and in DOE Order 5480.19, *Conduct of Operations*, Chapter XVI, Section C.7, which states, "The requirements for use of procedures should be clearly defined and understood by all operators. If procedures are deficient, a procedure change should be initiated." CSB plant and support personnel are required to operate all systems in compliance with established procedures.

Procedure compliance is mandatory. When instructions/procedures are inadequate or incorrect for the task assigned, all work must be safely stopped. Supervision will be notified and an appropriate review will be conducted to correct the inadequacy.

3.1.2 **Conduct of Operations (CONOPS)**

Hanford facilities and equipment will be utilized and activities will be performed in a safe and effective manner to ensure the protection of the public, workers, and the environment. To accomplish this end, operations will be conducted in a graded, cost-effective manner to achieve enhanced safety, improved quality, and uniformity in application.

CONOPS is a philosophical approach to performing tasks to achieve given results with a minimum of error where, in the work environment, small errors can sometimes have large consequences for the public, the environment, and the worker.

The CONOPS program has developed policies and procedures for implementation based on DOE orders, federal regulations, and national standards; and will monitor, track and trend accomplishment to these defined policies and procedures. The RPP CONOPS requirements are contained in HNF-IP-0842, Volume II, Section 4, *Conduct of Operations* and in DOE Order 5480.19, *Conduct of Operations Requirements for DOE Facilities*. CONOPS will also provide interpretations and mentoring to ensure consistent understanding and implementation.

Applicable requirements and exemptions for operations, maintenance, and support activities will be addressed in the Operations and Maintenance manuals and procedures. Conduct of operations programs ensure proper identification and application of requirements, and provide for continuous evaluation, measurement, and improvement. Facility specific matrices will be developed that define the graded approach each facility uses to comply with CONOPS.

3.1.2.1 **Shift Routine and Operating Practices.** CSB administrative procedures will define standards for professional conduct to ensure operator performance meets DOE and contractor management expectations. The operators and shift manager or delegate will be notified promptly of all changes in facility status, operational abnormalities, or of any difficulties operations personnel encounter while performing tasks.

As part of the CONOPS program, operators must follow the requirements of the Industrial Safety Program in accordance with the Integrated Safety Management System (ISMS) requirements. Appropriate hearing, eye, head, foot, and respiratory protection is to be worn as required as part
of this compliance. Similarly, operators working in or around the CSB will exercise appropriate precautions when working with or around potentially hazardous objects or hazardous materials to reduce the potential for personal injury.

3.1.2.2 Inspection Tours. Operators will be required to conduct periodic inspection tours of their areas of responsibility to ensure that the status of equipment is known. These tours will normally be conducted at designated times. The tour activities will include, but will not be limited to, inspection, troubleshooting, response to alarms, housekeeping, log keeping, and reporting deficiencies.

3.1.2.3 Personnel Protection. Personnel protection practices ensure that radiological, chemical, toxicological, and other exposure hazards are maintained ALARA. Strict adherence to procedures and posted personnel protection requirements is required and will ensure:

- Appropriate use of monitoring instruments
- Cognizance of permissible exposure levels
- Proper use of and adherence to radiation work permits
- Effective and accurate deficiency reporting practices.

3.1.2.4 Response to Indications. Instrument readings are to be considered accurate and responded to accordingly until inaccuracy is proven. Prompt corrective action taken after observing abnormal or unexpected indications will usually reduce the effects of the abnormality.

3.1.2.5 Resetting Protective Devices. When protective devices (e.g., circuit breakers, fuses) trip, the cause of the trip will be investigated before resetting. Before action is taken, Operations will ensure that no unsafe or abnormal conditions exist that would preclude reset.

3.1.2.6 Process Changes. The shift manager or delegate is accountable for ensuring safe operations and should, therefore, approve all process changes. An operator may, however, stop a process without manager or supervisor approval to respond to a facility emergency or unsafe condition.

3.1.2.7 Authority to Operate Equipment. Operations shift managers will ensure that operators of facility equipment possess the necessary training, procedures, skills, and qualifications. Operation of equipment by other than authorized and qualified operators is expressly forbidden (exception: trainees under the immediate direction of a qualified operator can operate equipment).

3.1.2.8 Potentially Distractive Devices and Written Material. Use of entertainment devices (e.g., radios, televisions, audio cassette or compact disc players, electronic games, etc.) by on-duty operations personnel will be prohibited (except in approved areas) to prevent distractions from their responsibilities. Unauthorized reading materials (e.g., magazines, books, newspapers, etc.) are not allowed, except in approved areas. Inappropriate material is not permitted or allowed to be brought into or posted in the CSB.
3.1.2.9 Emergency Communications. All areas of the CSB will be provided with systems (e.g., horns, bells, and sirens) for communicating facility emergencies. Areas where emergency systems cannot be heard will have alternate methods for alerting personnel. Emergency communication systems will be tested periodically to ensure functionality.

3.1.2.10 Control of On-Shift Training. CSB personnel being trained will be carefully supervised and controlled to use the time of the trainee effectively, to avoid mistakes during training operations, and to ensure the trainee receives training within the job environment with as much hands-on experience as possible. This training will be conducted under the direct supervision of a qualified person and will be based on well-defined prejob knowledge, requirements, and objectives. Training will be immediately suspended during abnormal events or emergencies.

3.1.2.11 Control of Equipment and System Status. Equipment and facility configuration will be maintained within the design requirements through disciplined operation. Operators will be required to know the status of the equipment and operate the systems per approved procedures. The shift manager will be responsible for maintaining proper configuration and for authorizing status changes to major equipment and systems.

3.1.2.12 Lock and Tag. Locks and tags will be used on components that require special administrative control for safety or other reasons. Locks and tags are used for personnel and equipment protection. The lock and tag program protects workers against the unexpected release of hazardous energy or materials. Locks and tags will be installed on isolating devices to ensure that work can be performed safely.

3.1.2.13 Independent Verification. Independent verification is the act of checking equipment component position independently of activities related to establishing the component's position. CSB operators will be trained to perform independent verification of component position. Requirements for independent verification of facility components will be included in operating procedures.

3.1.2.14 Log Keeping. Narrative logbooks will be established and maintained to provide an accurate history of CSB activities and to provide tools for reconstructing off-normal events. These logbooks will provide accessible information and data associated with normal operation, testing, and off-normal activities for review by facility personnel.

3.1.2.15 Operations Turnover. CSB operations personnel turnover guidelines will be established and proceduralized to ensure that information required to adequately perform shift operations is documented by the off-going shift and reviewed by the oncoming shift. Hence, operators will have an accurate picture of overall facility status. Oncoming personnel will review documentation such as daily operating data sheets, logbooks, and checklists before assuming responsibility for their shift position. Off-going shift managers and operators will be responsible for documenting equipment status, making entries on the data sheets and in the logs, and apprising oncoming personnel of equipment status.
3.1.2.16 Required Reading. The CSB required reading program will direct the communication of written items pertaining to the safety of personnel, equipment, and the environment. The types of documents in the required reading program should include procedure changes, TSR changes, lessons-learned, and other similar items. Required reading status will be verified periodically by management and an auditable file containing this information will be maintained.

3.1.2.17 Operator Aid Postings. An operator aid is a posting, diagram, sample schematic, or similar instruction intended to assist operators in performing their duties. Facility managers and supervisors will approve all operator aids. The operator aids are periodically reviewed to ensure they are correct and necessary. Outdated operator aids will be removed as soon as possible after expiration.

3.1.2.18 Equipment and Piping Labeling. The CSB labeling program provides unique identification of components that require labeling (e.g., valves, dampers, instruments, piping, major equipment, motor control centers, room doors, emergency equipment, and fire protection systems). The labels are designed and oriented to be visible and easily read. They will be posted adjacent to the applicable component or piece of equipment. The labels are to be permanent labels that conform to DOE guidelines and other accepted standards for equipment and piping labels.

3.1.3 Formality of Operations

Formality of operations provides the basic framework for companies in the RPP to conduct business in a safe, professional, and compliant manner. This effort supports the goal to deliver high quality products through an environment of discipline, formality, professionalism, and teamwork.

Formality of operations applies to everyone, not just to operations personnel and organizations or to nuclear facilities. Fundamentally, this means effective implementation and control of activities by establishing high, written standards, providing sufficient resources, periodically monitoring and assessing performance, providing feedback to the workforce and holding personnel accountable for performance. The degree of application will vary among specific activities, i.e., a graded approach.


3.1.3.1 Responsibilities. Formality of operations will be achieved when employees understand and adapt the essential attributes of good performance. Accordingly, a set of general responsibilities is provided below:

- Employees are responsible for performing assigned activities, for which they are trained and authorized, to the requirements of formal procedures.

- Management is responsible for providing appropriate training, procedures, adequate resources, clear authorization to enable employees to successfully perform their tasks, and feedback to the employees.
• Management is responsible for assuring their employees are properly trained, and have adequate procedures, tools and resources, and clear authorization for successful performance of their tasks. Management is also responsible for providing objective feedback to their employees to reinforce expectations and improve overall performance.

3.1.3.2 Crane Operations Concepts. Operation of any of the CSB cranes or hoists will be in compliance with DOE/RL 92-36, Hanford Site Hoisting and Rigging Manual.

3.2 OPERATIONS CONCEPT

The operations concept will address the transport of the IHLW canisters from the WTF to the interim storage facility by transporter, the crane transfer of the canister into the facility and the placement of the canister and the interim storage period. It will also discuss the concept of overpacking and the retrieval of the canisters for shipment to permanent storage at the repository.

It is expected that by the time the IHLW portion of the CSB is ready to begin the operational test procedures (OTPs), the transfer of SNF MCOs to the CSB (vault 1) will have been completed. The associated programmatic responsibility will be consolidated under CSB Operations. Due to the similar nature of the CSB operations work for SNF and IHLW, staffing requirements will be developed based on the operational experience from SNF/CSB Operations, which is scheduled to begin in FY01. The production rate projections from the Waste Treatment Contractor will also be used. Preliminary personnel needs for the IHLW/CSB are briefly discussed in Section 5 of this document.

For approximately the first year, during startup and initial operation, it is expected that the CSB will operate on a straight day shift, five days per week, eight hours per day schedule with an additional operator on each shift for surveillance. During startup and testing, personnel may be placed on rotating shifts or overtime worked as needed. After this initial period of operation, additional crews may be formed and placed on other standard Hanford shifts, as deemed necessary to support WTF production. The operations concept updates will reflect changes in the operational activities and/or personnel and support requirements subsequent to the initial startup period.

It is anticipated that operations and maintenance personnel operating the CSB facility for the SNF/CSB project will be available for operation of the CSB for IHLW Interim Storage. This will help to minimize training time and provide continuity for the CSB facility operations. Planned, SNF-provided, CSB support facilities (change rooms, lockers, showers, a lunchroom, offices, etc.) will be available for these personnel at the CSB. Change facilities for both male and female personnel will be available at the CSB and will be furnished with lockers, showers, restroom facilities, benches, and laundry storage (clean and dirty, SWP and non-SWP) facilities. While the facility is planned to be a radiologically clean area, it is only prudent to make provisions for possible radioactive contamination. Facilities will be designed to eliminate co-mingling of radiological and non-radiological workers.
The facility operating environment within the CSB operating deck area is a chemically clean, indoor radiological area. The environment is controlled by a dedicated heating, ventilation, and air conditioning system that is operated at a slight negative pressure. The room operating temperature range is maintained between 60 and 85 degrees Fahrenheit with a relative humidity ranging from 5 percent to 95 percent. External temperatures range from 115 degrees to –27 degrees Fahrenheit. There are no external climatic conditions that normally will restrict vault operations, other than those specified by the Hanford Emergency Director. Conditions such as high winds, heavy snow, or icy roads could temporarily restrict canister transport operations.

3.2.1 Transport IHLW Canisters

The IHLW canisters will be transported from the WTP to the CSB. There will be two tractors and two trailers, each equipped with a shielded transport cask. Shielding and other requirements for the transport cask are given in RPP-6222, Rev. 0A, Section 3.7.1, Onsite Transportation System.

Initially, the transportation of canisters to the CSB will occur during day shifts, Monday through Friday, as canisters are produced and the WTP has notified the CSB that a canister is ready for shipment. Eventually, as production increases, it is anticipated that transport of canisters may occur around-the-clock and on weekends. Phase 1 production rate is expected to normally be 1 canister every 2 days and the surge rate is expected to be no more than 1 canister per day.

Transportation operations at the CSB and WTP will be performed in an normally uncontaminated radiologically controlled area. The operational process for transporting and receiving the canisters at the CSB is described in Sections 3.2.1.1 through 3.2.1.7.

Radiological surveys of the CTS (tractor, trailer, and shielded cask) will be performed by the transport initiating contractor to assess the contamination levels and ensure compliance to applicable requirements before release for use. The CTS will be inspected before each use to assess the condition and determine maintenance needs. In addition, periodic maintenance will be performed on the tractor/trailer by the transportation group.

3.2.1.1 Transport to Interim Storage Operations. Transport of the loaded transport cask to the CSB will occur along a pre-determined route. The total transport distance is estimated to be less than five miles. The operation concept for this activity is:

- The truck driver drives the tractor-trailer and loaded clean transport cask from the WTP to the CSB using the highway on the north and west sides of 200 East Area. The proposed primary route is north from the WTP to Canton Ave., north on Canton to Route 11A, west on 11A to Route 4S, and south on 4S to the entrance to the CSB. Transfers will normally not occur during times of heavy traffic. An acceptance radiological survey of the outside of the cask will be performed by the RCT prior to cask unloading.

- The time to transport a loaded cask from the WTP to the CSB was estimated by the A/E during the Conceptual Design to be approximately 30 minutes. This operation is shown on the "Mechanical Operating Sequence, CSB Block Diagram" (Appendix A) as an "in" arrow.
rather than a block because this operation will take place in parallel with other parts of the operation.

3.2.1.2 Transportation from Interim Storage Operations. The transportation from interim storage operational activities includes the transportation of an empty transport cask from the CSB to the WTP. The operation concept for this activity is:

- The truck driver drives the tractor, trailer, and released empty transport cask from the CSB to the WTP and parks the empty trailer in the designated parking area. The trailer will normally remain attached unless the tractor needs to go to the vehicle shops for repair or maintenance.

- The driving time to deliver an empty cask from the CSB to the WTP is estimated to be approximately 30 minutes. This operation is shown on the "Mechanical Operating Sequence, CSB Block Diagram" (Appendix A) as an "out" arrow because this operation will take place simultaneously with other parts of the operation.

3.2.1.3 Transport Cask Receiving Operations. The transport cask receiving operational activities include the receipt of the tractor, trailer, and transport cask delivered to the CSB. A radiological control technician (RCT) will provide coverage for radiological surveys. The operational concept for this activity includes:

- The CSB operator opens the receiving door.
- The driver backs the tractor/trailer into the delivery bay at the CSB (Radioactive Material Area [RMA]).
- The driver uncouples the tractor from the trailer and drives the tractor out of the CSB.
- The CSB operator closes the delivery door.
- The RCT surveys and releases the tractor.

The transport cask receiving operation is illustrated on the "Mechanical Operating Sequence, CSB Block Diagram" (Appendix A) as Block 1 and was estimated in the CDR to take approximately 30 minutes.

3.2.1.4 Trailer Retrieval Operations. The trailer retrieval operation activities include re-coupling the tractor to the trailer, with an empty transport cask, for transportation to the WTP. The operational concept for the activity is:

- The RCT surveys the trailer and transport cask, and releases for the return trip to the WTP.
- The CSB operator opens the receiving door.
- The driver with assistance from the CSB operator backs the tractor into the delivery bay and couples the trailer to the tractor.
- The driver drives the tractor/trailer outside the CSB.
- The CSB operator closes the delivery bay door.
- The driver returns the tractor, trailer, and empty transport cask to the WTP.
The trailer retrieval operations are illustrated on the “Mechanical Operating Sequence, CSB Block Diagram” (Appendix A) as blocks 19 and 20, with an estimated total duration of 40 minutes.

3.2.1.5 Waste Package Loading Operations. The WTC’s methods for loading the IHLW canisters into the transport casks have not yet been established. This activity is not illustrated on the “Mechanical Operating Sequence, CSB Block Diagram” (Appendix A); however, it is anticipated that a process similar to the loading process described below will be used. The WTC will provide IHLW canisters that have been sealed, surveyed, released, and verified to meet all acceptance requirements. The WTC will be responsible for providing staff to load the transport casks. The only site forces personnel will be the truck drivers. During all operations at the WTP, the WTC will supply RCT support as required. The WTC will provide a radiation survey of the cask, truck, and trailer, prior to turnover to CHG for transport.

3.2.1.6 Transport Waste Package Operational Availability—Summary. The limiting factor determining the operational availability for the CTS is the tractor. The round-trip duration for a tractor, traveling to and from the WTP is estimated to be 160 minutes (the summation of Blocks 1, 2, 3, 4, as specified on the CDR flow diagram in Appendix A and the 60 minutes drive time to and from the WTP for a total of 220 minutes or 3 hours 40 min.). Based on the anticipated nominal receipt rate of 1 canister every 2 days and surge rate of 1 canister per day, the CTS is adequate to meet these needs.

3.2.1.7 General Operational Requirements. The truck driver will be trained and qualified for transporting radioactive materials on the Hanford Site. The CTS will be operated year round in all normally expected climatic conditions.

3.2.2 Transfer Pit Operations
The transfer pit operational activities include the preparation activities for canister emplacement into the CSB. These activities include the transfer of the transport cask from the receiving area to the transfer pit; preparation activities for removal of the canister from the transport cask and loading into the SCT; and activities to return the transport cask to the receiving area following removal of the IHLW canister. The operational process for preparing the canister for emplacement is described in Sections 3.2.2.1 through 3.2.2.4.

3.2.2.1 Transport Cask Transfer Preparation Operations. The transport cask receiving operational activities include the transfer of the transport cask from the receiving area to the transfer pit. The RCT will be in the area and will provide coverage for radiological surveys. The operational concept for this activity includes:

- The crane operator removes the transfer pit shield plug if installed, using the 10-ton hoist on the gantry crane, and stores the plug in the designated storage area.

- The crane operator and an operator will retrieve the cask lifting yoke from its storage location in the receiving area and attach it to the transport cask. The 10-ton hoist on the gantry crane will be used to lift the yoke onto the cask.
- Two millwrights will remove the tie-downs from the transport cask using an impact wrench to remove the bolted fasteners. The crane operator assisted by an operator will operate the 10-ton hoist to lift the transport cask work platforms (see Appendix B, Sketch ES-W464-M01, Sheet 6).

- The crane operator and an operator will use the 60-ton bridge crane (see Appendix B, sketch ES-W464-M01, sheet 5) to lift the transport cask off the trailer and place it into the transfer pit. The vertical door between the transport trailer and the transfer pit is closed.

- Using the bridge crane, the operator and the crane operator disengage the lifting yoke from the transport cask and place it in a pre-designated storage location.

- After the transport cask is placed in the transfer pit, the transfer pit shield plug is installed using the 10-ton hoist.

The transport cask receiving operations are shown on the “Mechanical Operating Sequence, CSB Block Diagram” (Appendix A) as blocks 2, 3, 4, 5, and 6 with a total estimated duration of 110 minutes.

3.2.2.2 Transport Cask Lid Removal Operations. The transfer pit operational activities include the preparation activities for removal of the IHLW canister from the cask to the SCT. The RCT will provide coverage. The operational concept for this activity includes:

- Using an impact wrench, two millwrights remove the transport cask lid bolts. They physically enter the transfer pit through a personnel entrance;

- All personnel exit the transfer pit; and

- The crane operator remotely operates the transfer pit bridge crane and removes the transport cask lid. The lid is stored in the transfer pit in a designated location.

The transfer pit operations are illustrated on the “Mechanical Operating Sequence, CSB Block Diagram” (Appendix A) as block 7, with a total estimated duration of 30 minutes.

3.2.2.3 Transport Cask Retrieval Operations. The transport cask retrieval operations activities include retrieving the transport cask from the transfer pit and installing the transport cask onto the trailer, following removal of the IHLW canister from the transport cask and survey for contamination. The operational concept for these activities is as follows:

- The crane operator remotely operates the transfer pit bridge crane and retrieves the transport cask cover from its designated storage location and places it on the cask.

- Using an impact wrench, two millwrights install the bolts holding the transport cask lid in place. The millwrights physically enter through a personnel entrance.
• The crane operator removes the transfer pit shield plug, using the 10-ton hoist, and stores the plug in the designated storage area.

• Using the 10-ton hoist on the 60-ton bridge crane, an operator and the crane operator retrieve the yoke from its designated storage location and connect it to the transport cask.

• A crane operator and an operator remove the transport cask from the transfer pit, using the 60-ton gantry crane, and move the transport cask to the receiving area where it is placed on the transport trailer.

• The crane operator retrieves the transfer pit shield plug, using the 10-ton hoist, and reinstall the plug in the transfer pit for safety purposes.

• Two millwrights install the tie-downs and work platforms onto the transport cask using an impact wrench to install the bolted fasteners. The crane operator, assisted by an operator, will use the 10-ton hoist on the gantry crane to lift the work platforms into position.

• Using the gantry crane, the operator and the crane operator disengage the lifting yoke from the transport cask and place it in a pre-arranged storage location.

• The vertical door between the transport trailer and the transfer pit will be closed prior to opening the external doors for removal of the trailer.

The transport cask retrieval operations are illustrated on the "Mechanical Operating Sequence, CSB Block Diagram" (Appendix A) as blocks 12 through 18, with a total estimated duration of 155 minutes.

3.2.2.4 Transfer Pit Operational Capacity - Summary. The round-trip duration for this operation is estimated at 385 minutes (the summation of durations for blocks 2 through 18). Based on the anticipated nominal receipt rate of 1 canister every 2 days and surge rate of 1 canister per day, the operational capacity of the transfer pit is adequate to meet these needs.

3.2.3 Emplacement of IHLW Canisters
The IHLW canisters will be transferred from the cask in the transfer pit into the SCT. The SCT is a self-powered vehicle used to safely move IHLW canisters within the CSB and is only operated by a qualified SCT operator. The stainless steel lined SCT cask and the transport cask provide radiation shielding (meeting requirements given in the Hanford Site Radiological Control Manual) to protect personnel. The SCT is equipped with closed circuit television (CCTV) looking at the inside of the cask and the floor, to aid in operations. The SCT operator will complete a checklist for the SCT each day prior to operating the SCT. The operational process for preparing the waste package for emplacement is described in Sections 3.2.3.1 through 3.2.3.3.

3.2.3.1 Transfer Pit Canister Retrieval Operations. The transfer pit canister retrieval operational activities include the retrieval of the canister from the transfer pit using the SCT and transfer the canister to the designated storage tube location. The SCT includes a shield door,
hoist with grapple equipment, and a control system that includes CCTV, monitors and controls, programmable controllers, interlock functions, and redundant backup controls. An RCT will provide coverage throughout this operation as required. The operational concept for this activity includes:

- The operator assists the SCT operator in positioning the SCT over the transfer pit such that the shield cask is directly over the transfer pit opening. (Because of the large size of the SCT, and the precision with which it must be positioned, an operator is currently required to help guide the SCT operator - this will be looked at during detailed design.)

- Using the SCT, the operator and the SCT operator remotely removes the shield plug and stores it in a designated location within the SCT. A CCTV system is used to guide the operator during this operation.

- The operator and SCT operator remotely operate the SCT hoist to lift the canister into the SCT shielded cask. After the canister is contained within the SCT, a motor-driven shield door at the bottom of the SCT directly below the canister is closed. A CCTV system is used to guide the operator during this operation.

- Using the SCT, the operator and SCT operator remotely retrieves the shield plug from its storage location in the SCT and places the shield plug back into its original position over the transfer pit.

The transfer pit canister retrieval operational activities are illustrated on the "Mechanical Operating Sequence, CSB Block Diagram" (Appendix A) as blocks 8 through 11, with a total estimated duration of 90 minutes.

3.2.3.2 Canister Emplacement Operations. The canister emplacement activities include the positioning of a loaded SCT over the designated storage tube, emplacement of the IHLW canister, installation of upper impact absorbers (lower impact absorbers are added to each interim storage tube before startup of the CSB facility), and replacement of the tube shield plug and tube cover assembly. The operational concept for this activity includes:

- The operator and the SCT operator position the loaded SCT over the tube.

- Using the SCT, the operator and the SCT operator remotely remove the shield plug and store it in the appropriate location in the SCT. A CCTV system is used to help guide the operator during this operation.

- The SCT operator aligns the shield cask over the storage tube, and opens the motor-driven shield door at the bottom of the SCT. The hoist holding the canister lowers it into position in the tube. After the canister rests on the top of the impact absorber, the hoist grapple releases the canister and withdraws the cable and grapple.

- The SCT retrieves the shield plug from its storage location in the SCT and places the shield plug back in position in the tube.
If the canister is placed in the lower position of the tube, an upper impact absorber is required to be placed on the ridge built into the storage tubes above the level of the lower canister. These additional steps will be required:

- Using the SCT, an operator and the SCT operator will position the SCT over the impact absorber well. Using the shielded canister tube, the shield door is opened and the hoist is lowered to retrieve an upper impact absorber, which is lifted into the SCT and the shield door closed.

- Using the SCT, the SCT operator and an operator remotely remove the shield plug and store it in the appropriate location in the SCT. A CCTV system is used to help guide the operator during this operation.
- Using the shielded canister tube, the shield door is opened and the impact absorber is lowered into position on the shield ledge.

- Using the SCT, the SCT operator retrieves the shield plug from its storage location in the SCT and places it into position in the tube.

- The SCT is returned to its storage location near the receiving area doors.

The transfer pit canister retrieval operational activities are illustrated on the "Mechanical Operating Sequence, CSB Block Diagram" (Appendix A) as blocks 21 through 28, with an estimated duration of 165 minutes.

3.2.3.3 Emplacement of IHLW Canister Operational Capacity - Summary. The round trip duration for the SCT to emplace a canister is 255 minutes (the summation of durations for blocks 8 through 11 and 21 through 28). Based on the anticipated nominal receipt rate of 1 canister every 2 days and surge rate of 1 canister per day, the SCT is adequate to meet these needs.

The total operational capacity of transporting IHLW canisters, transferring pit operations, and emplacement of IHLW canisters is 7 hrs 35 minutes with an additional 2 hrs 45 minutes work performed in parallel. Based on the anticipated nominal receipt rate of 1 canister every 2 days and surge rate of 1 canister per day, the total operational capacity is adequate to meet these needs.

3.2.4 Interim Store and Monitor IHLW Canisters
The interim storage of IHLW will be monitored by a 24-hour-per-day staff verifying the canisters do not experience unexpected conditions. The cooling of canisters is provided by airflow around the outside of storage tubes. The ventilation system will be monitored to ensure adequate cooling is maintained. The operational process for storing and monitoring the interim stored canisters is described in Sections 3.2.4.1 through 3.2.4.3, in the following paragraphs.

3.2.4.1 Vault Ventilation Operations. The vault ventilation air system will be a natural convection system requiring no fans. Vault intake air temperature, intake air velocity, and exhaust air temperature will be continuously measured and recorded to ensure adequate cooling,
used to maintain the air temperature in the vault, is achieved. The air measurements signals will be transmitted to a monitoring station.

3.2.4.2 Balance of Plant Operations. Operations of balance of plant systems, such as electrical power; potable water; waste water; heating, ventilating, and air conditioning (HVAC); lighting; fire protection, are to be in accordance with standard Hanford Site operating practices. Union contracts and agreements will be honored.

3.2.4.3 Store/Monitor Canister Operational Availability - Summary. Remote operations of the vault lighting, vault ventilation, operating area HVAC, and other balance-of-plant operations will be performed locally. Change and restroom facilities (both male and female) will be available locally. An operator, a power operator, and an RCT will monitor the facility during off-shifts and weekends.

3.2.5 Canister Overpack Operations
In the current concept, the overpack canisters will be used for overpacking an IHLW canister in the event that the canister is breached during an off normal event. The overpack canister will be designed to allow for the IHLW to fit into the overpack and allow for design tolerances of both the HLW canister and the over pack canister.

The SCT will be used to move an IHLW canister from the transfer pit or storage tube and place it into an overpack canister, located in the HLW overpack station, referred to as the Overpack Weld Station. After loading the IHLW canister into an overpack, a lid is welded to the canister. Following inspection of the weld, the SCT is used to transfer the overpack canister from the weld station to a designated overpacked canister storage tube. The canister overpack operational activities are not illustrated on the "Mechanical Operating Sequence, CSB Block Diagram" (Appendix A); however, the operational process for storing and monitoring the canister is described in Sections 3.2.5.1 through 3.2.5.3.

3.2.5.1 Off Normal Canister Retrieval Operations. The retrieval of an off normal event IHLW canister can be accomplished from the transfer pit or from a storage tube. Retrieval from the transfer pit would be necessary if a canister was damaged during the transportation or receiving operation, and was detected prior to addition of the IHLW canister to the storage tube. Retrieval of a off normal MLW canister from a storage tube would be necessary if the canister was dropped from the SCT into the storage tube or loose contamination was detected around the top of the storage tube and/or inside the SCT. In either case, the SCT will be used to retrieve the canister (an operational concept similar to that described in Section 3.2.3).

If a loss of canister integrity is suspected during interim storage, the suspected damaged canister could be the lower canister (two canisters per tube, stacked one atop the other and separated by an impact absorber). If this is the case, the upper canister and impact absorber must be removed and transferred to another available storage tube, or to a temporary location (i.e. transfer pit) so that operations to retrieve the damaged canister can commence.

3.2.5.2 Overpack Canister Welding Preparations. The SCT overpack welding station emplacement operational activities include the positioning of a loaded SCT over the overpack
welding station; emplacement of the canister into an overpack canister; and installing the overpack canister lid. The operational concept assumes that an empty overpack canister has been placed in the welding station using a truck-mounted crane and lifting tongs (or similar device). The operational concept for the welding preparation activity include the following:

- The 7.5-ton gantry crane is stored in a designated spot located to make room for the SCT.
- The SCT operator and an operator remotely position the SCT over the empty overpack canister in the Overpack Weld Station (OWS).
- Using the SCT, an operator and the SCT operator remotely remove the OWS pit shield plug and store it in the designated location within the SCT.
- The operator and SCT operator remotely operate the SCT hoist to lower the canister into the canister overpack. A CCTV system is used to guide the operator during this operation.
- Using the SCT, the SCT operator remotely retrieve the shield plug from the storage location in the SCT and place the shield plug into position in the OWS.
- Using the SCT, the SCT operator and an operator position the SCT over the Impact Absorber Well, and align the shielded canister tube with the well. The shield door is opened and an impact absorber canister lid is retrieved from the well using the canister hoist. The shield door is closed.
- The SCT is positioned over the OWS pit by an operator and the SCT operator for the remote removal of the shield plug which is stored on board the SCT.
- Using the SCT, the SCT operator remotely retrieves the canister overpack lid from the shielded canister tube on the SCT and lowers it into position atop the overpack canister.
- The OWS pit shield plug is retrieved from its storage location on the SCT and replaced in the OWS.
- The SCT is returned to its storage location near the receiving area doors.

3.2.5.3 Overpack Canister Welding Operations. The overpack canister welding operational activities include welding the overpack lid to the canister; performance of an inspection of the weld; and obtaining contamination smears from the weld area. These operational activities are performed remotely from a local control panel near the overpack welding station. The operational concept for this activity includes the following:

- The operator, using the local control panel, remotely lowers the welder assembly ventilation/shielding enclosure into position and welds the lid onto the overpack canister using the gas-tungsten arc welder (GTAW). A CCTV system is used to guide the operator during this operation.
- The operator remotely raises the welder assembly and ventilation/shielding enclosure and stores it in its designated storage location.

- The operator positions the weld inspection assembly over the overpack canister lid, lowers the assembly, and performs an inspection of the weld (The exact type of weld inspection equipment will be determined during detail design). These operations are performed remotely, using a CCTV system to guide the operator during this operation. A certified QC (Level II or III) inspector will witness the weld inspection and certify the inspection results. Should the weld fail the inspection, the canister will be dispositioned according to an as yet to be developed operating procedure. Tentatively, at least one re-weld attempt should be feasible.

- A remote smear of the overpack weld area is taken. The method and equipment used for taking the remote smear and any decontamination capability will be developed in detail design. The smear is read and the canister released for storage by the RCT.

- The operator remotely raises the weld inspection assembly and stores it in its designated location.

3.2.5.4 Welding Station Overpack Canister Retrieval Operations. The welding station overpack canister retrieval operational activities include the retrieval of the overpacked canister from the welding station using the SCT and transfer of the overpacked canister to a pre-designated overpacked canister storage tube. The operational concept for this activity is similar to the activities described in Section 3.2.3.1. When the overpacked canister has been removed, the operating area will be surveyed and released to normal status by the RCT.

3.2.5.5 Overpacked Canister SCT Emplacement Operations. The SCT emplacement operational activities includes the positioning of a loaded SCT over the designated overpacked canister storage tube, removing the shield plug, emplacing the overpacked canister, and replacing the tube shield plug. If the overpack canister is placed in the lower position of the overpack storage tube, An impact absorber would be retrieved from the impact absorber well and placed in the overpack tube. The operational concept for this activity is similar to the activities described in Section 3.2.3.2.

3.2.6 Retrieve IHLW Canisters
The retrieval of canisters from interim storage will occur when the DOE designates a permanent repository. The process for retrieval is the reverse of the process described in Sections 3.2.1.2 and 3.2.1.3. It is anticipated that the 40-year SCT design life as required in the draft specification RPP-6222, System Specification for Immobilized High-Level Waste Interim Storage Rev. 0A is adequate to provide for both placement and retrieval. The actual vehicle configuration for transport to a repository has not yet been established. It is anticipated that the load-in/load-out annex will be adequate to load the transport casks for truck travel to a new load-out facility. Retrieval of the canisters and transport to the shipping facility is expected to be accomplished using the same equipment as that used during the receipt and storage operations and would have capacity to meet the maximum rate for retrieval of the canisters. The operation would basically be reversed from the original operations.
3.3 OPERATIONAL CONSTRAINTS

Section 3.3 summarizes the sources of constraints that must be met while performing the O&M activities. The RPP operates within the structure of ISMS (RPP-MP-003). The O&M concept presented in this document accounts for use of ISMS tools, such as the Automated Job Hazards Analysis (AJHA) and the Enhanced Work Planning process. ISMS facilitates performing the IHLW mission work efficiently while ensuring the protection of workers, the public, and the environment. In addition, it is designed to encourage monitoring and assessing both the development process, and ultimately actual performance during IHLW transfer and storage, and to assist in continual improvement.

3.3.1 Authorization Envelope
The DOE and the Project Hanford Management Contract (PHMC) signed an Authorization Agreement that contains essential terms and conditions specific to the RPP under which the TFC is authorized to perform work. The Authorization Agreement identifies the Authorization Envelope that establishes the limits of safe operation for the TFC. This section presents the four major categories of the Authorization Envelope that impact O&M activities.

3.3.1.1 River Protection Project Authorization Basis. The authorization basis of a facility is defined in DOE Order 5480.21 to be: "Those aspects of facility design basis and operational requirements considered to be important to safety and relied on by DOE to authorize operation constitute the 'authorization basis' for that facility." The authorization basis includes both the hazards/safety analyses associated with the storage and handling of hazardous materials and a fire hazards analysis as defined by DOE O 420.1.

The safety evaluations supporting the authorizations basis focus on the risks associated with the handling, control, and storage of hazardous materials, which for the RPP are the nuclear and mixed waste materials stored in the CSB as IHLW. The "controlled copy" list of authorization basis documents for operation of the RPP facilities to satisfy the safe storage mission is contained in HNF-IP-0842, Volume IV, Engineering, Sections 5.2, 5.4, 5.6, and 5.10.

The documents that constitute the authorization basis are the Safety Analysis Report (SAR), technical safety requirements (TSRs), and authorization letters from DOE stating the conditions under which it accepts these documents. The authorization basis will be updated as needed to support IHLW activities.

3.3.1.2 RPP Environmental, Safety, and Health Requirements Basis. The RPP requirement basis is defined in HNF-SD-MP-SRID-001, Rev. 2. This document identifies the standards/requirements that provide an adequate level of protection of workers, the public, and the environment for RPP activities. The SRID will be updated as needed to support IHLW activities.

3.3.1.3 RPP Environmental Permits, NEPA Documents, and Regulatory Agencies Agreements and Approvals. Environmental permits and NEPA documents regulate the design and operation of facilities to minimize the release of controlled radiological and non-radiological
substances to the environment. Requirements will be detailed in the appropriate permits, which will be listed in the project permitting plan.

TFC Environmental is responsible for maintaining compliance of TFC facilities to applicable regulations and obtaining the necessary facility permits. TFC Environmental reviews proposed changes to the facility design and operations for compliance with environmental release requirements and manages the activity required to ensure the facility will be permitted to operate. Any resulting restrictions on the operation of the facility during its active life flow down to the O&M operations via S/RIDS requirements, permits, environmental agency agreements and approvals, and appropriate CHG procedures.

3.3.1.4 RPP Health and Safety Plan. The RPP Health and Safety Plan implements S/RIDS for Occupational Safety and Health Administration (OSHA), Environmental Protection Agency (EPA), Washington Administrative Code (WAC), and other government agencies regarding worker and public safety and health. The safety requirements for a given O&M activity are identified and accounted for during planning and conveyed to the personnel accomplishing the work packages during pre-operational briefings. The estimates of time and personnel for specific activities account for any additional personnel, time, and effort needed to accomplish the identified tasks safely. Limitations placed on specific tasks due to the unique conditions of that task are identified by the planners and reviewed by RPP safety when work packages are approved.

The RPP ISMS (RPP-MP-003) establishes and identifies safety and environmental management system that integrates environment, safety and health requirements into the work planning and execution processes to effectively protect the workers, public and the environment. ISMS supports DOE's Hanford Strategic Plan (DOE/RL-96-92) to safely clean up and manage the site's legacy waste and deploy science and technology while incorporating the ISMS fundamental goal to "Do work safely and protect human health and the environment.".

The SNF Integrated Environment Safety and Health Management System Configuration Control (AP-MS-1-039) is a similar system that integrates environmental safety and health requirements into work planning and execution at all levels so that SNF missions are accomplished while protecting the worker, the public and the environment. The SNF ISMS requirements will be observed and adopted during the interim storage of IHLW canisters at the CSB.

3.3.2 Design Constraints
To support W-464 objectives, a number of important design constraints were established during W-464 conceptual design. These constraints were developed to direct retrofit of the CSB and are defined in the system specification (HNF-6222).

3.3.3 Additional Constraints
Requirements beyond the authorization envelope constrain the O&M activities that are to be performed. These important constraints are described below.

3.3.3.1 CSB Joint Operations with SNF. CSB IHLW operation will include accommodating unit operations required for SNF MCO. The Project W-379 operating parameters are still
evolving and could influence the Project W-464 baseline operational requirements. For example, the type and extent of monitoring for the SNF MCO in storage has yet to be determined. If the MHM is being used to handle a SNF MCO, the SCT will not be allowed on the operating deck to retain CSB structural integrity. SNF MCO handling operations could occur during seal welding or during selected monitoring of MCOs. As part of the risk identification/mitigation, Immobilized Waste Storage Project (IWSP) operations planning will coordinate with SNF CSB operations to develop a joint Immobilized High-Level Waste Interim Storage Plan (HNF-1751).

3.3.3.2 Hardware Requirements and Restrictions. The physical system must be operated within the constraints established by the design configuration and the limitations of its components. A variety of sources (e.g., regulations, standards, manufacturer warranties, and equipment limitations) impose requirements and voluntary guidelines on the operation and maintenance of equipment. The O&M concept provides input on topics, such as the preliminary RAM, maintenance concepts, and logistics support that can be used to develop requirements that components must satisfy. Necessary operational restrictions and maintenance activities will be captured in operating and maintenance procedures to enable the hardware to function reliably throughout its design lifetime.

3.3.3.3 Bargaining Unit Contracts. A variety of skill sets and differing levels of effort are needed to accomplish a given activity. The necessary skill set is established by job qualification and certification policies and contracts with the labor bargaining units. The provisions of the current labor contracts that impact the scheduling and resource allocations are considered in the activity activation process by utilizing operations managers and estimators with current experience at Hanford.

3.4 OPERATIONS PERFORMANCE REQUIREMENTS

3.4.1 Downtime
CSB Operations will receive and interim store the total DOE-accepted Phase 1 IHLW output of the WTP (up to the capacity of CSB vaults 2 and 3) without causing a production capacity impact to the system. BNFL-5193-ID-14, Interface Control Document ICD-14 Between DOE and BNFL Inc. for Immobilized High-Level Waste, Table 1, “Interface Responsibilities for HLW,” (BNFL Number 8), states that BNFL is to “provide lag storage with a minimum capacity to accommodate 90 days production.” Therefore, the maximum allowable down time for the CSB is 90 days minus the quantity (days production) already in storage, so as to not cause a shutdown of the WTP. A portion of the lag storage capacity is expected to provide for the cooling of the canisters prior to transport. Downtime requirements and definitions will be addressed further as WTF production rates and storage capacities are defined.
Repair/Replacement parts inventory will be established to support WTF production rates and recovery time requirements.

3.4.2 Radiological Contamination
BNFL-5193-ID-14, Interface Control Document ICD-14 Between DOE and BNFL Inc. for Immobilized High-Level Waste, Table 1, “Interface Responsibilities for IHLW,” sets the smearable contamination criteria requirements for the shipping casks and the IHLW canisters.
3.4.3 Transportation of Canisters
The CSB truck driver will pick up the loaded cask at the WTP upon notification that it is ready for shipment, and transport it to the CSB. After the cask has been unloaded at the CSB and the radiological survey completed, the truck driver will return the cask to the WTP.

An acceptance radiological survey will be performed on the exterior of the cask and truck prior to unloading. After completion of the unloading and transfer of the canister into interim storage, the floor and equipment used during the operation will be surveyed. The truck, trailer, and cask (interior and exterior) will be surveyed and released prior to being returned to the WTP (ICD-14). Smearable contamination found during the survey will be removed to meet radiological contamination requirements of ICD-14 prior to movement of the CTS.

If the final survey shows smearable contamination inside of the transport cask that exceeds the requirements imposed by ICD-14, the canister will be replaced in the cask for return to the WTC for decontamination. Canisters exceeding the contamination requirements will not be accepted for interim storage at the CSB. The contaminated cask will be decontaminated, surveyed, and released. The clean cask may then receive the decontaminated canister (or another clean canister) for transport to the CSB.

3.4.4 Shielded Canister Transporter Description and Operation
The SCT concept is a two-wheel or four-wheel drive vehicle, equipped with a center module, frame, and operations cab. The center module will comprise a hoisting system, including primary and backup hoists, and shielding cask for moving canisters as well as a plug hoisting system for moving shield plugs during loading and unloading operations. The center module will consist of a shield cask, shield plug housing, shield door, canister hoist, cask lifting jacks, CCTV camera, bridge, trolley, and all drives. The shield cask and shield plug housing will be constructed of carbon steel with lead filling and a 304L stainless steel liner on the inside. A segmented radiation shielding ring and cushioning pads made of fabric elastomeric compound will be provided at the bottom of the shield cask. The center module will be supported by a bridge and trolley system that is used to move it forward and backward or side to side without repositioning the SCT vehicle. The center module will be raised and lowered by an electric or a hydraulic drive lifting system.

Canister handling operations will be controlled entirely from the operator's cab, normally in the automatic mode, by a programmable logic controller (PLC) with monitoring by the SCT operator utilizing the SCT's internal CCTV system. In the automatic mode, the PLC software will ensure proper equipment position and load indication prior to execution of a step. In addition, the automatic sequence will be designed to continuously monitor the status of the SCT field equipment, and stop the sequence at any time if there is an improper equipment control or improper field indication. If necessary, all operations must be able to be performed by the SCT operator using the backup manual controls.

It is anticipated that the SCT will be equipped with four sets of dual rubber tire wheels. The tires should be filled with a low durometer resilient polyurethane rubber (or acceptable substitute) to prevent accidental deflation. The SCT will be equipped with service brakes to slow or stop the vehicle and an emergency brake, independent from the service brakes, capable of locking all four
wheels while the SCT is in the loading/unloading mode. This will be interlocked with the hoist controls to prevent any differential movement between the SCT and the floor during loading or unloading of the canister. These concepts will be further developed as the design progresses.

The cask will be mounted on two machine screw jacks for raising the shield cask for travel and for lowering the shield cask to rest on the floor for the canister transfer operation. The jacks will operate at a synchronized pace. The system must be capable of manual back-up operation in case of motor or gearbox failure.

The shield cask will be equipped with a link chain hoist that will operate the canister grapple inside the cask. The chain drive will be operated by a hydraulic (or electric) motor and a gear reducer to drive a special drive sprocket. The idler sprocket, which will guide the chain into the center of the cask cavity, will be mounted on a pivoted support with a load cell located underneath the opposite end to the pivot. The load cell will provide load measurement on the canister grapple.

A conceptual sketch of the SCT is presented in Appendix D.

3.5 OPERATIONS FAILURE MODES AND RECOVERY CONCEPTS

Failure modes and recovery concepts as well as Human Factors requirements will be developed during preliminary design. The CSB SAR (HNF-3553) markup activity is scheduled for July 2001 through June 2002 which essentially generates the PSAR. The SARP development activity is scheduled to begin in July 2001 and end in June 2002.

3.5.1 Traffic Accident Involving Loaded Cask
This scenario will be evaluated as part of SAR or SARP development.

3.5.2 Canister Drop Scenario
This scenario will be evaluated as part of SAR development. Lessons learned generated as a result of a canister drop at DWPF will be part of the evaluation.

3.5.3 SCT Failure with Canister Partially Lowered
This scenario will be evaluated as part of SAR development. The SCT design activity is currently scheduled to run from February 2003 through June 2006.

3.5.4 Operating Area HVAC Failure
This scenario will be evaluated as part of SAR development.

3.5.5 Non-Spared Equipment Failure
This scenario will be evaluated as part of RAM analysis and SAR development.

3.5.6 Contamination Spread
This scenario will be evaluated as part of SAR development.
3.5.7 Natural Phenomena

3.5.7.1 High Wind Speed. This scenario will be evaluated as part of SAR development.

3.5.7.2 Volcanic Ash Fall. This scenario will be evaluated as part of SAR development.

3.5.7.3 Flood (Rapid Snow Melt). This scenario will be evaluated as part of SAR development.

3.5.7.4 Seismic. This scenario will be evaluated as part of SAR development.

3.6 OPERATIONS LOGISTICS SUPPORT CONCEPTS

The RPP SEMP requirements for integrated logistics support planning will be met by baseline documents including this O&M Concept, O&M Procedures, Packaging and Transport Design Criteria, Design Reports, RAM Analysis, and Training Needs Analysis. The Project architecture is relatively simple and does not warrant development of stand-alone logistics support plans (HNF-2579).

3.6.1 Logistics Support Evaluation
This evaluation will be performed for each SSC and will determine what is needed to support system operations. The logistics support evaluation will consider the entire system, not just for those SSC being developed. Support concepts will be generated for new and modified SSC during the project advanced conceptual design phase.

3.7 RELIABILITY, AVAILABILITY AND MAINTAINABILITY

Reliability planning must be an integral part of the overall design process. Generally, increasing reliability reduces maintenance costs and down time. Therefore, it is prudent to evaluate design characteristics related to reliability and maintainability to optimize the availability of the system relative to prioritized technical performance requirements, schedules, and costs. Reliability is a statistical measure of probability, usually stated as a fraction or percent representing the number of times that one can expect an event to occur in a total number of trials. The key elements of this probability are satisfactory performance, time, and specified operating conditions. Good resource material for further study is readily available.

In Preliminary Design a more detailed RAM will be prepared and the O&M Concept will be updated to the Preliminary Design RAM.

3.7.1 Preliminary RAM Analysis
A general and very preliminary Reliability, Availability, and Maintainability (RAM) conceptual analysis was based on the present conceptual design methods and modes of moving IHLW waste from the WTP to and into the assigned storage locations in the present CSB, vaults Two and Three. (Ref. Operational Concept Preliminary RAM Evaluation, Memo dated December 17,
It should be noted that a more specific RAM type analysis will be performed as design develops to optimize the facility operability and maintainability. This analysis will include the high-risk facility/system interfaces in order to assist in the design and mitigate the recovery actions. The critical objective of the facility is to support the operation of the WTF and its ability to operate within its lag storage capacity. This will be achieved by maintaining a storage placement rate that keeps the backlog of released canisters at the WTF at a minimum.

Subject to a more detailed design of the system components and the actual handling equipment, this RAM analysis summary will only be generalized, using operating history of similar equipment and operations. The process steps and preliminary engineering estimates are generalized (high, medium, or low) for system availability and reliability levels and addressed below. Although the estimates of availability and reliability levels can be generally quantified at this time only conceptual information is currently available. Note the assumption is made throughout this evaluation that training and maintenance practices are high level and routinely accomplished tasks. Maintainability is an inherent design characteristic of the system as it pertains to the ease, safety, and economy in the performance of the maintenance activities. Maintainability will be addressed along with performance, reliability, human factors, supportability, life-cycle costs, and other factors in the pending RAM analysis.

This evaluation is based on or involves in a broad sense an analysis of other similar operational processes for similar activities such as the Spent Nuclear Fuel (SNF) movement of MCOs from K-Basins to their CSB storage locations. For example, in the above interim storage process for vitrified waste, the conceptualized SCT is similar in function to the MHM (Multi-Canister Overpack Handling Machine) which is already designed, built, installed and tested in the CSB. Further, since much of the other conceptual handling equipment involves non-remote controlled cranes, those evaluations are straightforward. Also the conventional motorized transporter availability and reliability to transport the shielded cask is more predictable. As a complication, the WTC’s methods for loading the waste canisters into the transport cask and closure of the transport cask have not yet been established.

This operating evolution process evaluation starts with the transferring of an empty and contamination free transport cask from the CSB to the WTP by tractor and trailer. The transfer is likely a high availability and high reliable evolution. Next, the as yet to be determined method of WTC loading of canisters into the transport cask and closing the cask is completed. Due to the likelihood that canister loading and cask closure will be a remote and complex operation, the WTC should make high reliability and availability of this system a requirement for the design of the vitrification facility.

After loading the IHLW canister into the transport cask, the next task is a simple tractor-trailer transfer of the transport cask to the CSB receiving area. This step of the process is highly reliable and highly available. However, at the CSB receiving area, the cask must have a lifting yoke installed while on the truck. This is conceptually done with a 10-ton hoist and is generally considered a high reliable and high available operational step. After attachment of the lifting yoke, the cask is untied from the transport trailer. With the use of the 10-ton hoist, sections of the cask transport work platforms (see Appendix B, Sketch ES-W464-M01, sheet 6) used during transport are removed. This step of the basic operational process appears to be a highly
The next process step is simple removal of the Transfer Pit shield plug with the above 10-ton crane. This step is anticipated to be a highly reliable operation, and thus provide a high availability, based on similar crane operations.

The next fundamental operating step is accomplished by using the 60-ton bridge crane. The bridge crane is then attached to the lifting yoke previously installed on the cask. Then the crane lifts the transport cask from the trailer and places the closed transport cask in the transfer pit. This appears to be a simple crane operation and is likely to be highly reliable and therefore highly available.

The following step is removal of the lifting yoke from the cask in the transfer pit. This appears to be a high reliable and high available operation.

The next step following the replacement of the transfer pit shield plug using the 10 ton crane, is most likely a remote operation for removing the transport cask lid from the cask in the transfer pit. Due to the apparent nature of remote operation, this task is rated medium reliability/availability. The complexity of the equipment and process affects the reliability and availability of this step. Loading the canister into the SCT, is considered a high reliable and medium to high available operation due to the operational experience with the Savannah River Site SCT, and expected very high level of operator training and preventive maintenance provided.

What can be considered the final operational step is moving the SCT to the appropriate CSB storage tube location, removing the shield/plug, lowering the waste canister into the storage tube and replacing the storage tube shield/plug. This is considered a medium to high available and high reliable operation considering the interlocks provided by the expected design requirements, the training required of the operators and the quality of maintenance of the SCT machine expected to be provided. However, the reliability of this operation alone is somewhat dependent upon the design and the postulated hazards used for the design, such as an earthquake simultaneous with the lowering of a canister.

The IHLW movement process, based on the CDR, falls within the medium to high range of system availability and reliability. The detailed design (for operability and maintainability); the quality requirements imposed to assure reliability of these components in the design, fabrication, delivery and testing process; and the maintenance required will determine where the overall reliability and availability will be within this range of evaluated and generalized projections.

3.8 REDUNDANCY DESIGN

The mission reliability of a system containing independent subsystems can usually be increased by using subsystems in a redundant fashion; that is, providing more subsystems than are absolutely necessary for satisfactory performance. The incorporation of redundancy into a system design and the subsequent analysis and assessment of that design is a complex task and should be addressed in the analysis of alternatives. While redundant design does improve mission reliability, its use must be weighed against the inherent disadvantages.
These disadvantages include higher initial cost, increased system size, and associated logistic adders. Redundancy generally improves mission reliability at the cost of increased burden on the facility logistics system.

Certain redundancy, such as HVAC fans and filters, are already in place in the SNF side of the CSB. Others, such as two trailers for transporting the IHLW, will be added as part of Project W-464. Others, which may be determined to be necessary at the completion of the RAM analysis, will be covered in a future update of this document.
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4.0 MAINTENANCE CONCEPT DISCUSSION

4.1 GENERAL MAINTENANCE CONCEPTS/POLICIES/PHILOSOPHY

Maintenance programs perform the cost-effective activities that preserve and restore the availability, operability, safety, and reliability of site assets so that they support the facility mission, and fulfill their intended life cycles and purposes. Preventive, predictive, and corrective maintenance will be used to accomplish these objectives. A proper balance of preventive, predictive, and corrective maintenance should be used to provide the required availability of the facility and a high degree of confidence that asset degradation is identified and corrected, equipment life is optimized, the maintenance program is cost-effective, and life-cycle costs are minimized. The following descriptions of the preventive and corrective maintenance, along with the predictive monitoring analysis program, will be referenced and are based on definitions provided in Good Practice Guide, GPG-FM-031, Maintenance.

- **Preventive Maintenance** - Preventative maintenance (PM) is defined as including periodic and planned maintenance, is utilized to maintain a piece of equipment within design operating conditions and to realize its maximum reasonable useful life. PM ensures that the equipment necessary for safe and reliable facility operation performs within required limits.

- **Predictive Maintenance** - A predictive maintenance program should be established and utilized to monitor; determine trends; analyze parameters, properties, and performance characteristics or signatures of equipment in order to forecast equipment degradation so that "as-needed" planned maintenance can be performed prior to equipment failure. The predictive maintenance program provides data to the preventive maintenance program and provides for retrieval of equipment history data.

- **Corrective Maintenance** - The repair of failed or malfunctioning equipment, system, or facilities to restore the intended function or design condition. This maintenance does not result in a significant extension of the expected useful life. Corrective maintenance should be performed such that equipment is restored to safe and reliable service in a timely manner following ALARA principles.

Maintenance activities, typically referred to as downtime, impact the availability of the IHLW interim storage facilities. The time to perform maintenance, as well as time arising from waiting for replacement parts for any that might have failed or for maintenance personnel to become available, is included into the downtime calculation. The downtime specified in this document is caused by maintenance activities that are based largely on a historical foundation. As the design process continues from conceptual to detailed design, the downtime caused by maintenance activities will be described in further detail.

Maintenance operations should be contact-handled without the requirement for prior decontamination. Prudent design of the facility and equipment should, however, provide for appropriate decontamination capabilities in the event of a contamination spread.

4-1
4.1.1 Maintenance Effects on Operations
All maintenance activities on equipment that are important to safety, that affect operation, or that change control indications or alarms must be authorized by Operations. This authorization should be in writing on the document controlling the work. Maintenance is responsible for ensuring that documentation on the status of work in progress is available in the control area for review by Operations personnel.

4.1.2 Post-Maintenance Testing
Operations interface with Maintenance on post-maintenance and post-modification testing is also an important link to safe operation of the facility. Testing by maintenance personnel should include performance of all functions that may have been affected by the work. The testing should also verify the maintenance or modification performed served to correct the original problem and that no new problems were introduced. Any testing following maintenance should be specified on the maintenance work order or other work-authorizing document. The Operations supervisor ensures that testing appropriately proves equipment operability.

4.2 MAINTENANCE LEVEL CONCEPTS
In this initial concept, the maintenance levels are estimated from similar operating facilities. As design progresses and the SNF/CSB and IHLW/CSB efforts are defined and integrated, maintenance organizations will be defined, maintenance periods established, and recovery actions evaluated. Parts inventories and maintenance protocols will be established.

4.2.1 Transport Immobilized High-Level Waste Packages
This system consists of three primary subsystems: the tractors, trailers, and transport casks. The tractors are off-the-shelf, commercially available equipment. Preventive and corrective maintenance has been used historically for Hanford Site tractors and trailers. Preventive maintenance will be used for the transport casks.

4.2.1.1 Tractors. The tractors will be unavailable for operations once every three months for up to one day for preventive maintenance. The short and frequent duty cycle, as compared to standard commercial operation, may dictate a greater frequency of failure or damage than would be expected normally for brakes, couplings, and bumpers. Preventive maintenance primarily will consist of lubrication, oil and filter changes, tune-ups, cooling system maintenance, and routine inspections. Maintenance on the tractors will be performed by qualified site diesel truck mechanics and will not require additional specialized training. A substitute tractor can be brought in as a replacement as and when needed. Spare parts (primarily consumables) will be maintained by the transportation maintenance organization. Special tools will not be required for preventive maintenance or most repair (corrective) maintenance on this equipment.

4.2.1.2 Trailers. Periodic inspections of trailers and some preventive maintenance, such as wheel bearing lubrication, tire inspection, and inflation, will be performed. The periodic inspections will include weld inspections. The trailers are expected to be modified commercial trailers for the specific application of transporting the IHLW transport casks. The Hanford Site workforce will perform the preventive and corrective maintenance. Spare parts (primarily
consumables) will be maintained by the transportation maintenance organization. Special tools will not be required for preventive maintenance or most repair (corrective) maintenance on this equipment.

4.2.1.3 Transport Casks. Maintenance on transport casks will be preventive in nature and therefore periodic inspection of transport casks will be performed to verify integrity and meet requirements in the SARP.

4.2.2 Transfer Pit Operations
The transfer pit hoist cannot be allowed to fail such that safe and rapid recovery is not possible. The transfer pit system must be engineered and designed as safety significant and important-to-safety equipment. The equipment shall be designed rated for twice the load required for a safety significant hoist and the load remains suspended during and after a design basis earthquake. An impact pedestal will be added to the transfer pit because of potential or high-risk drop condition.

The major SSC in the transfer pit operation systems are the 60-ton gantry crane, 10-ton bridge crane, Gantry crane 10-ton hoist, yoke(s), grapple(s), and their control systems. Unplanned downtime of this equipment has the potential of creating delays in the receipt of IHLW canisters. As such, design of the bridge crane yoke(s), control systems, and their ancillary equipment must have the reliability and maintainability to provide flexibility in meeting performance requirements.

4.2.2.1 Gantry and Bridge Cranes, Yoke(s), Grapple. Inspection, maintenance, and repair requirements for the gantry crane and grapple will be performed in accordance with the Hanford Site Hoisting and Rigging Manual, DOE-RL-92-36. Maintenance personnel qualifications will be in accordance with the Hanford Site Hoisting and Rigging Manual. Spare parts inventory will be maintained to a level commensurate to the required RAM of the crane, yokes and grapple.

The Hanford Site workforce will perform preventive maintenance. Maintenance operations will be planned as contact-handled without the requirement for decontamination. Maintenance contingency planning will be developed in advance to address the approach to handle the potential for contamination. A third-party inspection of all cranes and hoists will be conducted annually.

4.2.2.2 Crane CCTV Equipment. A CCTV camera, installed on the gantry crane, will be operated remotely from the remote control stations and will be used to monitor the remote operations. Upon failure of the CCTV, a spare CCTV will replace the failed unit. The design will be such that the replacement of a failed CCTV unit will be possible even under the worst case scenario as determined by the SAR.

4.2.2.3 Radiation Monitoring Equipment. Maintenance requirements for the continuous air monitors (CAMs), area radiation monitors (ARMS), record air samplers, and any other radiological monitoring equipment identified during design will be in accordance with the Hanford Site Radiological Control Manual, DOE/RL-96-109 and SNF-CSB operating procedures.
4.2.3 Emplacement of Immobilized High-Level Waste Canisters

The SCT is the major SSC in the emplacement function. Scheduled downtime should not have a degrading impact on the system capacity; however, unscheduled downtime has the potential of creating a degrading impact to the system capacity. Potential additional costs to the DOE for not being able to accept IHLW canisters according to schedule must be considered in the design of the SCT.

4.2.3.1 SCT. A full-scale, working model (based on 3m canisters) of this equipment, similar to the SCT, is being used at the DOE Savannah River Site (SRS) DWPF for transporting DWPF canisters between the WTP and the SRS CSB and emplacing the canisters in the storage tubes. The primary differences between the SRS SCT and the Hanford SCT are expected to be the size and the drive mechanism. The SRS SCT is designed to handle 3 m canisters while the Hanford SCT will be designed to handle 4.5 m canisters. The SRS SCT is diesel powered and it is expected that the Hanford SCT will be electrically driven. Based on the operating experience at the SRS, a high level of confidence is expected for reliable operation of the Hanford SCT. The SCT will include a manual (hand wind) method to raise and lower the canister as backup to the electrical motor system.

Because of the nature of SCT service, safety SSC will be identified in a safety equipment list (SEL). Maintenance on SEL equipment will have QA verification upon completion, as necessary.

The SCT will be designed, fabricated and acceptance-tested off-site and will be delivered with operating and maintenance manuals and procedures. Training and qualification will be required of both operating and maintenance personnel.

4.2.3.1.1 SCT Canister Hoist and Grapple. Inspection, maintenance, and repair requirements for the SCT canister hoist and grapple will be performed in accordance with DOE-RL-92-36, the Hanford Site Hoisting and Rigging Manual. Maintenance personnel qualifications will also be in accordance with the Hanford Site Hoisting and Rigging Manual. Spare parts inventory will be maintained to a level commensurate to the required RAM of the SCT canister hoist and grapple. The Hanford Site workforce will perform preventive maintenance. Maintenance operations will be planned as contact-handled without the requirement for decontamination. Maintenance contingency planning will be developed in advance to address the approach to handle the potential for contamination. Training and qualification will be required of maintenance personnel working on the SCT canister hoist.

4.2.3.1.2 SCT Plug Hoist and Grapple. Inspection, maintenance, and repair requirements for the SCT storage tube plug hoist and grapple will be performed in accordance with the Hanford Site Hoisting and Rigging Manual. Maintenance personnel qualifications will also be in accordance with the Hanford Site Hoisting and Rigging Manual. Spare parts inventory will be maintained to a level commensurate to the required RAM of the SCT hoist and grapple. The Hanford Site workforce will perform preventive maintenance. Maintenance operations will be planned as contact-handled without the requirement for decontamination. Maintenance contingency planning will be developed in advance to address the approach to handle the potential for contamination.
potential for contamination. Training and qualification will be required of maintenance personnel working on the SCT plug hoist.

4.2.3.1.3 SCT Control System. Periodic maintenance will be performed on the control systems as specified in the manufacturer's maintenance manuals that accompany the SCT. Additional maintenance will be performed by the Hanford Site workforce as needed.

4.2.3.1.4 SCT Shielding Doors. The SCT shielding door bearings, drive mechanism, and controls will be subject to periodic maintenance as specified in the manufacturers maintenance manuals. Additional maintenance will be performed by the Hanford Site workforce as needed.

4.2.3.1.5 SCT CCTV Equipment. A CCTV system, installed in the SCT, will be operated remotely from the SCT control station (cab) and will be used to monitor the handling of the shield plug and canister. Upon failure of the CCTV, a spare CCTV will replace the failed unit. The exact method of replacement will be determined during detailed design.

4.2.3.1.6 SCT Drive Mechanism. It is expected that electric motors will be utilized to power the SCT. Speed, interlock and other control devices along with back up manual control will be used to operate the SCT. These control methods will prevent run away of the SCT equipment systems. These controls will be determined during detail design.

4.2.3.2 Gantry Crane, Yoke, and Grapple. Inspection, maintenance, and repair requirements for hoisting and rigging equipment will be performed in accordance with the Hanford Site Hoisting and Rigging Manual. Maintenance personnel qualifications will be in accordance with the Hanford Site Hoisting and Rigging Manual. Spare parts inventory will be maintained to a level commensurate to the required RAM of the crane, yokes and grapple. The Hanford Site workforce will perform preventive maintenance. Maintenance operations will be planned as contact-handled without the requirement for decontamination. Maintenance contingency planning will be developed in advance to address the approach to handle the potential for contamination.

4.2.3.3 CCTV. A CCTV color camera, installed on the gantry crane, will be operated remotely from the remote control stations and will be used to monitor the remote operations. The system shall be designed such that if the CCTV color camera fails, a spare CCTV color camera can be installed to replace the failed unit, even under abnormal conditions.

4.2.3.4 Radiation Monitoring Equipment. Maintenance requirements for the CAM, radiation area monitor, record air samplers, and other radiation monitoring equipment will be in accordance with HNF-5183, Tank Farms Radiological Control Manual.

4.2.3.5 Operating Area - Balance-of-Plant. The preventive maintenance program for the operating area balance-of-plant will be maintained to a level commensurate to the required RAM of the operating area. The Hanford Site workforce will perform preventive maintenance. Maintenance operations will be planned as contact-handled without the requirement for decontamination. Maintenance contingency planning will be developed in advance to address the approach to handle the potential for contamination.
4.2.4 Canister Overpack Operations
The overpack canister welding assembly and ultrasonic weld inspection assembly are the major SSC in the canister overpack operations function. Twelve overpack storage tubes are provided in the CSB for IHLW product.

Because of the potential infrequent use of the welding assembly and ultrasonic weld inspection assembly, the equipment should have an OTP performed on a routine basis. The OTP should include actual welding of dummy caps onto dummy overpack canisters to verify proper operation of the welding assembly. Verification would then be performed by use of the ultrasonic weld inspection assembly. A number of dummy caps and dummy canisters should be available as spares and should be kept at the CSB. Spare parts (primarily consumables) will be maintained by the CSB maintenance organization. Repairs will be made as identified during the OTP. Special tools will not be required for preventive maintenance or most repair maintenance operations on this equipment.

4.2.4.1 Weld Pit Crane. The weld pit 7.5-ton gantry crane cannot be allowed to fail such that safe and rapid recovery is not possible. An engineered failsafe must be incorporated into the hoist design.

4.2.5 Retrieve Solidified IHLW Canister from Interim Storage
The equipment used for retrieval operations is the same equipment used in the emplacement operation. As such, the maintenance concept described in Sections 4.2.1 and 4.2.3 will apply to the retrieval function.

4.3 REPAIR CONCEPTS

4.3.1 Spare Parts
The critical interface controlling the repair concept is the maintaining of the WTF lag storage facility below it’s capacity. In any case where repair of a system component would require time and/or resources that are not acceptable to support the critical interface with the WTC, a replacement spare (part or component) will be obtained from inventory and installed. These components will be identified using the final RAM analysis. When a spare part is removed from inventory, a new spare will be ordered to replace it (multiple spares of long-lead items will be kept on hand). System Cognizant Engineers will determine which parts and/or equipment will be spared.

Spares will be maintained on-site (either at the CSB or a central spare parts warehouse, such as 2101-M) whenever procurement of such spare parts would cause an unacceptable delay (i.e., shutdown of any of the WTC processes; the WTP has a 90-day lag storage capability but it will be assumed that only approximately half of this lag storage is available.)

4.3.2 Radioactive Contamination
It is expected that maintenance operations will be contact-handled without the requirement for prior decontamination. Prudent design of the facility and equipment should, however, provide for appropriate operation and decontamination capabilities in case of a contamination spread.
Solid waste will be collected and controlled, characterized to determine if radioactive and hazardous constituent quantities, and packaged for disposal by others.

4.3.3 Personnel Availability
The maintenance personnel listed in Section 3.2 will perform minor maintenance, calibrations, and inspections. Larger maintenance jobs will be performed with support from RPP maintenance and outside suppliers.

4.3.4 Repair Shops, Tools, and Supplies
Repair will be available at the CSB, and elsewhere on-site, for maintenance that cannot be performed at the CSB. Maintenance personnel will be furnished with tools appropriate to their trade. Small power tools, etc. will be maintained in the shop.

Maintenance performed on the SCT or the cranes will be performed inside the CSB.

4.4 MAINTENANCE PERFORMANCE REQUIREMENTS

4.4.1 Downtime
The CSB will receive and store the DOE-accepted Phase 1 IHLW output of the WTP (up to the capacity of CSB vaults 2 and 3) without causing a production capacity impact on the system. BNFL-5193-ID-14, Interface Control Document ICD-14 Between DOE and BNFL Inc. for Immobilized High-Level Waste, Table 1, “Interface Responsibilities for HLW” (BNFL Number 8), states that BNFL is to "provide lag storage with a minimum capacity to accommodate 90 days production." Therefore, the maximum down time for the CSB is 90 days minus the quantity (days production) already in storage, so as to not cause a shutdown of the WTP.

CSB maintenance will not contribute to or be a cause of WTP production failure. All long lead-time parts and components that have an expected failure mode over the life of the facility will be spared and kept on-site. The determination of which items are "long lead-time" will be based on the projected WTP lag storage available.

4.4.2 Radiological Contamination
All equipment and facilities at the CSB will be contact-maintained. Technical requirements for the conduct of work, including construction, modifications, and maintenance, will incorporate radiological criteria to ensure safety and maintain radiation exposures ALARA. The primary methods used to maintain exposures ALARA will be facility and equipment design features. These features may be augmented by administrative and/or procedural requirements. To accomplish this, the design and planning processes should incorporate radiological considerations early in the planning stages.

Maintenance plans and procedures will be reviewed to identify and incorporate radiological requirements, such as engineering controls and dose and contamination reduction considerations. Performance of this review is the responsibility of line management, with support and concurrence from the Radiological Control Organization.
4.5 MAINTENANCE LOGISTICS SUPPORT CONCEPTS

The RPP SEMP requirements for integrated logistics support planning will be met by baseline documents including this O&M Concept, O&M Procedures, Packaging and Transport Design Criteria, Design Reports, RAM Analysis, and Training Needs Analysis. The conceptual Project architecture is relatively straightforward and will identify as a part of the O & M Concept development, the supply/support requirements for facility operations.

4.5.1 Logistics Support Evaluation
This evaluation will be performed for each SSC and will determine what is needed to support system operations. The logistics support evaluation will consider the entire system, not just for those SSC being developed. Support concepts will be generated for new and modified SSC during the project advanced conceptual design phase.

4.5.2
5.0 PERSONNEL

This section presents the personnel requirements to implement the O&M Concept for the IHLW project for the portion of the CSB (vaults 2 and 3) utilized by project W-464. The concept makes the assumption that the initiation of construction of the IHLW portion of the facility is August 2, 2004 and the SNF portion of the CSB has been completed per that schedule.

The personnel concept reflects the current output projections from the WTP. Although the CSB will be structured with the capability to operate, and transfer canisters, on a three-shift, 24 hour-per-day, 7 day-per-week basis, the facility will initially operate on a single (day) shift of 8 hours-per day, 5 days-per-week, using overtime as required. As production of the WTP increases to the nominal Phase 1 capacity of 1 canister per two days or surge rate of 1.0 canister per day, the second and third shift may be added to keep pace or increase capability to slightly exceed the vitrification production rate. The shift(s) worked is(are) subject to change as determined by CSB operations.

5.1 PERSONNEL CONCEPT (OPERATIONS)

Section 3.0 and Appendix A define the operations requirements of the IHLW portion of the CSB facility. Since the facility production requirements are established by the output rate of the WTP, the staffing will be structured to: 1) staff the facility, and 2) handle the output production of the WTP. Table 5-1 defines the conceptual personnel to accomplish the initial phase of these requirements.

5.1.1 Operations Support Personnel
The concept staffing to support the operations of the facility are defined in Table 5-2. Since the operations of the CSB requires the same type of support as other operating Hanford facilities, many of the required support personnel can be shared from the support organizations.

5.2 PERSONNEL CONCEPT (MAINTENANCE)

Section 4.0 defines the maintenance requirements of the IHLW portion of the CSB facility. Maintenance in support of the operation of the facility will be categorized as preventive maintenance, predictive maintenance, and corrective maintenance. Maintenance concept requirements are detailed by equipment and are handled by pool staff for equipment that is common to the Hanford Site, such as tractors and trailers, and by facility staff for equipment that is unique and applicable to the CSB facility, such as the SCT. Table 5-3 defines the conceptual personnel to accomplish the maintenance requirements. The basis of these estimates is the operation of a similar facility. Personnel requirements will be refined as the resources are mapped to specific activities during the evolution of the O &M concept in the design phase of the project.
5.3 OPERATIONS PERSONNEL TRAINING AND QUALIFICATION

The guidelines for the training requirements for operations personnel are addressed in the RPP Administration Manual HNF-IP-0842, Volume III, with the requirements for the operational staff defined in Volume III, Section 10. Unique qualification programs and facility specific programs will be developed for various personnel including operations, engineers, shift operations managers, and operators. Specialized training for operations personnel will also be developed for downtime operations and specific critical recovery actions.

5.3.1 Operations Support Personnel Training and Qualification

The guidelines for the training requirements for support personnel are addressed in the RPP Administration Manual HNF-0842, Volume III. Unique qualification programs and facility specific programs will be developed for various personnel including engineers, RCT, and craft personnel.

5.4 MAINTENANCE TRAINING AND QUALIFICATION

In a like manner to operations training, general training requirements for maintenance personnel are addressed in the RPP Administration Manual HNF-IP-0842, Volume III. Maintenance training should be directed towards insuring that personnel are qualified to maintain, setup (as appropriate), and recover the equipment used for the operation of the CSB facility. Specialized training for maintenance personnel will also be developed for downtime operations and specific critical recovery actions. Maintenance requirements will be mapped to assist in determining the facility staffing requirements.

Table 5-1. Estimated Resource Requirements for Operations of the CSB with the W-379 Completed and WTP at up to 5 canisters per week with surge capacity to 8 canisters per week.

<table>
<thead>
<tr>
<th>Resource Type</th>
<th>Facility Staff</th>
<th>Pool Personnel</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operations Manager</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Secretary</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Clerical/Typist</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Maintenance Manager</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Planner/Scheduler</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Records Management Specialist</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Plant Engineer</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Ops Supervisor / Shift Manager</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Nuclear Process Operators</td>
<td>10*</td>
<td></td>
</tr>
<tr>
<td>Power Operator</td>
<td>5**</td>
<td></td>
</tr>
<tr>
<td>QC Inspector</td>
<td>1***</td>
<td></td>
</tr>
<tr>
<td>Industrial Hygiene Technician</td>
<td>1</td>
<td></td>
</tr>
</tbody>
</table>

* Includes five NPOs who will work a rotating shift (one on each A, B, C, D, and E shifts) to perform surveillance.
** Power Operators will be assigned one per shift. The fifth shift is the training shift.
*** as required

5-2
Table 5-2. Estimated Operations Support Staff for the Operation of the CSB on day shift, and 5-day-per week.

<table>
<thead>
<tr>
<th>Resource Type</th>
<th>Facility Staff</th>
<th>Pool Personnel</th>
</tr>
</thead>
<tbody>
<tr>
<td>Process Crane Operators</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>SCT Operators</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>Heavy Duty Truck Driver</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>RCTs</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>ESH, QA, QC,</td>
<td></td>
<td>2*</td>
</tr>
<tr>
<td>Millwrights</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>Electrical Engineer</td>
<td></td>
<td>1</td>
</tr>
<tr>
<td>Mechanical Engineer</td>
<td></td>
<td>1</td>
</tr>
<tr>
<td>I&amp;C Engineer</td>
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* as required

Table 5-3. Estimated Resource Requirements for Maintenance of the CSB on day shift, 5-days-per-week.

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<td>Industrial Hygiene Technician</td>
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6.0 OPERATIONS AND MAINTENANCE INTERFACES

Section 6.0 discusses the interfaces that have been identified during the preparation of the O&M concept. They are grouped into (1) the interfaces at which operational responsibility of the IHLW changes and (2) the interface activities that must be accomplished to support the IHLW activities addressed by the O&M concept.

Successful interim storage of the IHLW depends on the eventual use of the W-379-designed (and W-464-upgraded) CSB facility. A Memorandum of Agreement (MOA) (Appendix E) between the RPP and W-464 reserves CSB vaults 2 and 3 for storing Privatization Phase 1 IHLW. W-464 continually interacts with the SNF Project to assess impacts to the Multi-Year Work Plan (MYWP).

6.1 PHYSICAL PLANT INTERFACES

Section 6.1 identifies the physical interfaces at which organizational responsibility O&M of the IHLW canisters transfers from the WTC to the CSB organization. The interface requirements with the WTC are contained in the Privatization contract and its associated Interface Control Documents (ICDs).

W-464's primary external interfaces will be the Waste Treatment Contractor, the SNF Project (in development), the ORP, the federal and state agencies responsible for regulatory oversight and permitting (e.g., EPA, Ecology), the U.S. Department of Energy Office of Civilian Radioactive Waste Management (RW), and the Yucca Mountain Project (Repository Program).

6.1.1 IHLW Custody Interface
The IHLW interface point is defined in ICD-14, Section 3.0, "Physical Interface Location."

6.1.2 Physical Site Infrastructure Interfaces
The physical site infrastructure interfaces generally apply to all O&M activities associated with the CSB. The physical site infrastructure and their providers are as follows:

- **Infrastructure Services Contractor (ISC).** The majority of physical site infrastructure services are provided to the RPP by the ISC. The ISC provides utilities and transportation services.
  1. Utilities - Electrical transmission, water, sanitary sewer, and fire protection systems.
  2. Transportation - Roads and other transportation infrastructure will be provided by the ISC.

- **Pacific Northwest National Laboratories (PNNL).** Pacific Northwest National Laboratories certifies radiation sources used for calibrating CAMs and radiation area monitors.
• **Security Services Contractor.** The Security Services Contractor provides security services as required.

### 6.2 ACTIVITY INTERFACES IN DIRECT SUPPORT OF O&M ACTIVITIES BY ORGANIZATIONS OTHER THAN THE RPP

This section identifies other supporting organizations and their interfaces in support of IHLW.

#### 6.2.1 Scheduling, Certification, and Documentation of IHLW Transfers

Section 4.1 of ICD-14 provides for an exchange of information prior to transfer of an IHLW canister to the CSB.

The WTC will submit to the DOE documentation and certification that the IHLW meets contract specifications. DOE will notify the WTC of acceptance of the canister. WTC will notify CSB Operations when the canister has been loaded into the transport cask, has been surveyed and released, and is ready for shipment. CSB Operations will then schedule the truck driver to pick up and deliver the loaded cask to the CSB.

#### 6.2.2 Site Infrastructure Services

The site infrastructure services generally apply to all O&M activities associated with IHLW. The site infrastructure services and their providers include the following:

• **Infrastructure Services Contractor.** The majority of the site infrastructure services are provided by the ISC. As such, they provide key support services for the RPP organization in many areas:

1. Site transportation services, courier service, government owned/leased vehicles/equipment management and maintenance
2. Janitorial services, fabrication shops, pesticide, and herbicide programs
3. Municipal solid waste disposal service
4. Personal protective clothing and equipment; e.g., respirators and related parts/supplies
5. Inventory, warehousing, and material management

The workscope for the ISC is based on the Project Hanford Management and Integration Contract.
- **Information Resources Contractor (IRC).** Lockheed Martin Services, Inc. (LMSI) provides information resources support. This work scope for LMSI is based on the Project Hanford Management and Integration Contract.

  1. Information Resource Management (IRM) support
  2. Computer, local area network (LAN) and data network operations
  3. End-user computer support
  4. Information systems and multimedia services.

- **Telecommunications Services Contractor (TSC).** U.S. West provides site telecommunication services. This includes initial installations, service changes, and site upgrades.

6.2.3 Specialized Equipment
No specialized equipment is anticipated at this time.

6.2.4 Waste Disposal
Hazardous, radioactive, and mixed waste disposal services are provided by Waste Management Hanford (WMH). WMH requires an updated waste generation forecast each year in order to determine the required disposal space and fee-for-service disposal and storage rates. This process is not expected to change and is currently managed by the RPP solid waste management and environmental organization.

No radioactive liquid wastes are anticipated to be produced by the CSB. A small volume of solid radioactive waste may be generated, the amount of which will be determined after SNF has had some experience operating the CSB. Condensate from the compressed air system and HVAC cooling unit is expected. The condensate will be collected in sumps, pumped into drums, checked for contamination, and disposed in accordance with best practice methods (SNF Standard 409). Contaminated condensate will be transported to the LERF for disposal. Non contaminated condensate will be discharged to the ground in accordance with Process Standard 409 for maintenance type discharges.

6.2.5 Third-Party Suppliers
Third-party suppliers will be used to provide equipment for normal maintenance and recovery from off-normal events, perform specialized setup, or maintenance operations when determined to be both timely and cost-effective for the project. Potential and specified third-party suppliers will be identified during maintenance planning.

6.2.6 Emergency Management
Existing emergency management interfaces are illustrated in the Emergency Response Procedures (Ref: RLEP 1.1). Further information on the response to emergency conditions are contained in the RPP Emergency Response Procedures. RPP Emergency Management conducts drills to provide assurance that the required interfaces will function. These drills will be coordinated and scheduled so that they do not interfere with scheduled critical work.
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7.0 REFERENCES

Acts

Americans with Disabilities Act of 1991

National Environmental Policy Act of 1969 (NEPA)

Code of Federal Regulations

29 CFR 1910.147, Control of Hazardous Energy (Lockout/Tagout), Washington, D.C.

10 CFR 830.120, Quality Assurance Requirements, Washington, D.C.

Correspondence


Letter Number 99-AMPD-006 (9952261A), April 1, 1999, W. J. Taylor (RL) to R. D. Hanson (President, FDH), Contract No. DE-AC06-96RL13200-Planning Guidance Revision for Development of Contract Deliverables Required by Performance Agreement TWR1.3.5

Memo dated December 17, 1999, from Columbia Energy & Environmental Services, Inc., on subject of Operational Concept Preliminary RAM Evaluation

DOE and DOE-RL Orders, Guides, and Procedures


RPP-5462 REV 0


PHMC/TFC Documents


HNF-2298, Rev. 1, Conceptual Design Report Immobilized High-Level Waste Interim Storage Facility (Phase I), Section VI "Requirements and Assessments", Numatec Hanford Corporation, Richland, Washington.


**Other Documents, Standards, and Guidelines**


PHMC and TFC Implementing Procedures


Hanford Site Policies

RPP-MP-003, Rev. 1, April 2000, Integrated Environment, Safety and Health Management System Description for the Tank Farm Contractor, CH2M HILL Hanford Group, Inc., Richland, Washington.


RPP-POL-PROCEDURE, Rev. 0, Procedure Compliance Expectations, CH2M HILL Hanford Group, Inc., Richland, Washington.

Hanford Site Procedures

AP-MS-1-039, Spent Nuclear Fuel Project Integrated Environment, Safety and Health Management System, Fluor Hanford, Richland, Washington


Privatization Documents

Sketches


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APPENDIX A

Sketch ES-W464-M02
"Mechanical Operating Sequence CSB Block Diagram"
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APPENDIX B

Sketches

ES-W464-M01, Sheet 1
"Mechanical Facility Layout Operations Floor Plan"

ES-W464-M01, Sheet 3
"Mechanical Facility Layout Cross Section"

ES-W464-M01, Sheet 4
"Mechanical Facility Layout Longitudinal Section"

ES-W464-M01, Sheet 5
"Mechanical Facility Loadin/Loadout Annex Sections"

ES-W464-M01, Sheet 6
"Mechanical Facility Layout Transport Trailer"

ES-W464-M05, Sheet 1
"Mechanical Standard/Overpack Canister Storage Arrangement"

ES-W464-M06, Sheet 1
"Mechanical Impact Absorbers & Overpack Canister Guides"

ES-W464-M07, Sheet 1
"Mechanical Overpack Station Plan & Section"

ES-W464-M08, Sheet 1
"Mechanical Overpack Weld Station Gantry Crane Section"

ES-W464-M08, Sheet 2
"Mechanical Overpack Weld Station Gantry Crane Installation"

ES-W464-M08, Sheet 3
"Mechanical Overpack Weld Station Cap Welder Assembly"

ES-W464-M09, Sheet 1
"Mechanical 4.5 M Canister & 4.5 M Overpack"
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CANISTER ASSEMBLY NOTES:
TOTAL NOMINAL WEIGHT AS SHOWN = 3751 kg (8,290 lbs)
TOTAL MAXIMUM WEIGHT = 4200 kg (9,282 lbs)

CANISTER OVERPACK NOTES:
ALL WELDED CONSTRUCTION
NEW COVER DESIGN
MATERIAL THICKNESS .95 CM (ASTM A240 304L)

CANISTER OVERPACK
SEE NOTE 2.

NOTES:
1. CANISTER PROVIDED BY OTHERS.
2. PROJECT W-464 TO PROVIDE 2 CANISTER OVERPACKS
APPENDIX C

Correspondence Number LMHC-9955973
"Agreement between the River Protection Project and the Spent Nuclear Fuel Project for Canister Storage Building Interfaces"
H. L. Boston (LMHC) to T. B. Veneziano (FDH)
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## CORRESPONDENCE DISTRIBUTION COVERSHEET

**Author:** R. B. Calmus, 376-5017  
**Address:** T. B. Veneziano, FDH  
**Correspondence No.:** LMHC-9955973

**Subject:**  
CONTRACT NUMBER DE-AC06-96RL13200/SUBCONTRACT NUMBER 80232764-9-K001; AGREEMENT BETWEEN THE RIVER PROTECTION PROJECT AND THE SPENT NUCLEAR FUEL PROJECT FOR CANISTER STORAGE BUILDING INTERFACES

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*Received  SEP 08 1999*  
LMHC CORRESPONDENCE CONTROL

**C-3**
September 9, 1999

Mr. T. B. Veneziano, Project Director
Fluor Daniel Hanford, Inc.
River Protection Project
Post Office Box 1000
Richland, Washington 99352

Dear Mr. Veneziano:

CONTRACT NUMBER DE-AC06-96RL13200/SUBCONTRACT NUMBER 80232764-9-K001: AGREEMENT BETWEEN THE RIVER PROTECTION PROJECT AND THE SPENT NUCLEAR FUEL PROJECT FOR CANISTER STORAGE BUILDING INTERFACES


Please find attached the “Agreement between the River Protection Project and the Spent Nuclear Fuel Project for Canister Storage Building Interfaces.” This Agreement has been revised from the original Agreement that is referenced above, and addresses storage of immobilized high-level waste (HLW) produced by BNFL, the privatized HLW producer, in vaults two and three of the Canister Storage Building (CSB). This has been an essential document for both projects during the past year, identifying the critical assumptions and key responsibilities necessary for planning the interfaced Spent Nuclear Fuels (SNF) Project and HLW CSB operations.

The Agreement has been revised to reflect the status of the SNF CSB (project W-379) and HLW Interim Storage Projects (project W-464) to incorporate current assumptions and responsibilities for the interface between the newly established the River Protection Project (RPP) and the SNF Project. The attached revised Agreement has been reviewed by Mr. Oly Serrano of Fluor Daniel Hanford, Inc., (FDH), CSB Facility Manager, and Mr. Sid Daughtridge, DE&S Hanford Inc., Project Manager of project W-379, CSB, and includes comment dispositions. The revised agreement is being transmitted to FDH to obtain concurrence and sign-off by the SNF Project organization(s).
We are requesting that the SNF/CSB Interface Agreement signature page be completed and dated by September 24, 1999. If you should require further assistance, please contact Mr. R. W. Root at 373-1328.

Very truly yours,

H. L. Boston, Vice President and Director
Tank Waste Retrieval and Disposal
LMHC River Protection Project

bgb

Attachment
RPP-5462 REV 0

LMHC-9955973

ATTACHMENT

"AGREEMENT BETWEEN THE RIVER PROTECTION PROJECT AND THE SPENT NUCLEAR FUEL PROJECT FOR CANISTER STORAGE BUILDING INTERFACES"

Consisting of 11 pages including cover page
Agreement Between
The River Protection Project
And
The Spent Nuclear Fuel Project for
Canister Storage Building Interfaces

The Canister Storage Building (CSB) in the 200 East Area of the Hanford Site is being constructed by the Spent Nuclear Fuels (SNF) Project for receipt and storage of SNF currently located at the K Basins. SNF Project is the overall project, which provides pretreatment of SNF packaging into the Multi Canister Overpacks (MCO), transport of MCO's from K Basin to the CSB, and construction of the CSB to accommodate SNF (project W-379). The SNF Project also plans to utilize the CSB in conjunction with a contiguously located 200 East Area Interim Storage Area to support storage of other SNF inventories at the Hanford Site. The SNF Project materials will be stored in Vault #1 of the three CSB vaults.

The River Protection Project (RPP) has established project W-464, Immobilized High-Level Waste (IHLW) Interim Storage Facility to receive and store IHLW produced as a result of a Phase 1 privatization activities to immobilize the Hanford tank waste. The scope of project W-464 is to modify the CSB to accommodate storage of the RPP materials. The RPP materials will be stored in Vaults #2 and #3 of the CSB.

The SNF Project will establish CSB operations functions when project W-379 has completed construction and is ready for operations by 05/31/00. CSB operations relative to the SNF Project are scheduled to be complete by 01/01/04. Project W-464 will interface with the CSB Operations organization and comply with established operations procedures. These include safety, security, established permits, etc. Subsequent to completion of project W-379 activities (after 05/31/00), project W-464 will interface with the CSB Operations organization established by the SNF Project.

The RPP, project W-464 and project W-379 and/or the CSB Operations organization agree that the following organizational, programmatic, schedule, technical, and procedural interfaces exist between the respective organization relating to the CSB. These organizations will hereinafter be referred to as project W-464, project W-379 and CSB Operations organizations respectively within this document.

System Requirements

Project W-464 will make use of vaults two and three (the two southern most vaults) of the CSB for storage of IHLW. Modifications of the CSB and vaults are required to accommodate the IHLW. These modifications include construction of an annex on the south end of the CSB for access and handling of IHLW, hereafter referred to as the IHLW annex, installation of the storage tubes into vaults two and three, installation of vault inlet and exhaust stacks, and ancillary utility and surveillance interconnections. In addition, a CSB independent electrically powered, rubber-tired IHLW canister transport system will be procured for the handling of
IHLW from the new IHLW annex to the storage locations. The SNF MCO Handling Machine (MHM) will not be used for emplacement of the IHLW canisters. This Memorandum of Agreement describes the interfaces, however this is not an Interface Control Document (ICD). This information is not for design, but rather to provide a scope of the activities for planning purposes:

Duration of Agreement

This agreement addresses only the period of time from initial signing, includes completion of project W-464 facility modifications to the CSB to accommodate IHLW, and continues through the startup period for the IHLW System OAC-3 for project W-464. This agreement specifically does not address the period of time for emplacement of IHLW into the CSB vaults.

Either party to this agreement can request a modification to this agreement. The modification must be mutually concurred to by the SNF Project Director and the RPP Immobilized Tank Waste Storage and Disposal Program Manager or their designee. Modification will be reflected in a documented, approved revision to this agreement.

Agreement Foundation Assumptions

The following assumptions establish the basis for the details of this agreement:

For Project W-379/CSB Operations

a. CSB Operations requires pits two and seven as welding/sampling locations and pits three and six for services and equipment to support pits #2 and #7 through 12/31/03.

b. Receipt and downloading of SNF MCOs will be through the north end access, proceeding southward to welding pits and then to tubes in vault one.

c. CSB Operations will complete welding, sampling and loading operations by 12/31/03.

d. Current CSB Operations planning is to operate the CSB three shifts per day, seven days per week. If operations are not completed by 12/31/03, at least one shift per day will be available for project W-464 construction activities or operations/construction activities will be negotiated between CSB Operations and project W-464.

e. Security requirements for the CSB site will be the responsibility of CSB Operations. Project W-464 will abide by the requirements established by CSB Operations.

f. Project W-379 will add insulating concrete to vaults #2 and #3.
For Project W-464:

a. Project W-464 will provide required seismic structural and thermal analysis and other design considerations relative to the IHLW annex to avoid significant modification to the CSB design, design media or technical basis.

b. Facility construction to begin on 01/21/03 will be external to the CSB Building.

c. Construction activities inside the CSB will start 01/06/04.

d. Modification to the facility shall be in accordance with the CSB authorization basis requirements, and the authorization basis shall be updated by project W-464 to reflect such modifications.

e. Construction, startup and readiness review activities are planned for completion by 02/28/06.

f. Use of the SNF CSB receiving crane may be required during the project W-464 construction phase.

g. Project W-464 will use an electric powered shielded rubber-tired IHLW canister handling system.

h. Project W-464 will use either existing access doors or the IHLW annex for access to the facility.

i. Project W-464 will interrupt electrical utilities, heating ventilation and air conditioning above operating deck and I & C (eg. security systems) at some point in the building construction.

j. Project W-464 will be required to cut out the concrete barrier where the annex access is added.

k. Project W-464 will be required to interconnect with CSB surveillance systems.

l. Anticipated delivery of IHLW canisters is 3 per week (nominal).

m. Daily coordination meetings should occur between CSB Operations and project W-464.

n. Project W-464 will provide training on existing or new CSB equipment required for project W-464.

o. Project W-464 requires one interior pit with adjacent pits covered and clear of deck equipment to allow access to the interior pit by the rubber-tired IHLW canister handling system.
p. A roof access hatch may be required at the south end of the CSB for emplacement of storage tubes into vaults #2 and #3.

q. Project W-464 will complete the Vulnerability Assessment for both the project W-464 construction period and the IHLW storage period.

Participating Organization(s)

The following organizations and companies are involved or directed by the memorandum:

RPP Project W-464
SNFP Project CSB Operations
SNFP Subproject W-379

Point(s) of Contact:

SNFP

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<td>Robert B. Wilkinson (FDH)</td>
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<tr>
<td>CSB Project Manager W-379</td>
<td>Sid Daughtridge (DESH)</td>
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<td>Oly Serrano (FDH)</td>
<td>372-0598</td>
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<td>Gerald Eaton (FDH)</td>
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<td>Jerry Bazinet (NHC)</td>
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<td>Liz Koster (FDH)</td>
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<td>Ron P. Ruth (DESH)</td>
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RPP

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Documentation

Project W-379/CSB Operation Will Provide:

- Complete, current approved facility design documentation to project W-464 throughout the memorandum period. This documentation is required by project W-464 for development of
facility design specification and documents. Complete and current detailed schedules from CSB Operations are also required by project W-464 in development of facility modifications and emplacement schedules.

- Project W-464 will have access to all project W-379/CSB Operations technical documents (drawings, reports, calculations, etc.). These documents will be available through the project W-379 Project Files Office, Fluor Daniel Hanford Corporation (FDH).

- CSB Operations will incorporate project W-464 construction activities into their planning and scheduling.

- CSB Operations schedules and work control requirements during project W-464 construction will be provided to support project W-464 revalidation and planning activities.

Project W-464 Will Provide:

- Complete facility and equipment design documentation, along with detailed schedules to CSB operations, to allow accommodation planning.

- Detailed ICDs, which will describe the architectural interfaces and the physical aspects of project W-464 as relates to the CSB and the configuration management (CM) plan that correlates with the FDH CM plan and as-built drawings.

- Technical documentation for use and maintenance of the equipment that is procured by project W-464 for use in the follow-on activities related to the transport, unloading, handling, processing, emplacement, and monitoring of HLW relative to the CSB.

- Training procedure development and funding for training and certification of staff.

- Final approved design documentation will be provided by project W-464 prior to start of construction (01/21/03). Primary design documentation includes; drawings, specifications, calculations, etc.

Data

Engineering and scheduling documentation provided pursuant to this agreement will be configuration controlled so that both parties to this agreement are, at all times throughout the agreement period, in possession of the same versions of all applicable documents. Development and configuration control will be the responsibility of the owner of the respective data. All data shall at all times throughout this agreement, reflect the actual configuration of the systems, structures, and components being described. This data will be under strict configuration control at all times.
Turnover/Custody

CSB Operations will make available portions of the CSB to project W-464 for modification beginning on or about 01/21/03. Completion of construction and project turnover from project W-464 to CSB Operations will occur on or about 02/28/06.

If there is an overlap of work schedules between SNF welding, testing, and emplacement, and the project W-464 facility modification, serious consideration will be given to alternative work schedules or partitioning work areas. The types of items to be considered are as follows:

a. Setup and teardown requirements and times.
b. Vehicle traffic through facility egress points and the need to maintain negative air pressure in the facility.
c. Cross-flow of CSB Operation's activities at the welding pits for welding and sampling, versus tube emplacement ad other facility modification actions by project W-464. CSB Operations welding activities are scheduled through 03/2003.
d. Health physics technician workload.
e. CSB Operations preparation time and temporary storage prior to delivery of equipment to CSB.
f. Project W-464 completion schedule requirements to accommodate IHLW production by private contractor.

CSB Operations will be responsible for security of the stored and in-process SNF materials. If a physical barrier is required by the SNF Project for security, project W-464 will be responsible for installation as specified by CSB Operations. Project W-464 will be responsible for installing a debris containment barrier (if required by CSB Operations) to prevent debris from reaching the SNF portions of the facility. An additional Vulnerability Assessment (VA) will be required to address the project W-464 modification activities, as well as the subsequent IHLW emplacement activities within the CSB. The responsibility for this VA is project W-464 details for turnover of CSB will be identified in the Acceptance for Beneficial use document prepared during project W-464 detailed design.
Funding/Financial

Project W-464 Will Provide Funding For:

- Added security to accommodate facility modification activities relative to receipt of IHLW.
- All required facility modifications and transport, handling, and processing equipment acquired as part of that project.
- Project W-464 related training.
- Procedure development
- Training certification of key operations staff.
- Documentation modifications including vulnerability assessment, authorization basis configuration management plan etc.

Personnel

Project W-464 Will Provide:

- All facility modification personnel for changes required to the CSB, including quality assurance and contract monitoring.
- Training of CSB Operations staff will be provided by project W-464 for all new vehicles and equipment acquired by that project for use with the transport, unloading, handling, processing, emplacement, and monitoring of IHLW.
- Project W-464 will provide funding for security and Health Physics Technician support specific to the needs of project W-464 construction. RPP will fund operational costs associated with storing IHLW.

Equipment

Project W-464 will be using general construction equipment during construction of the CSB IHLW annex and a crane during emplacement of the storage tubes into vaults #2 and #3. Project W-464 will not require use of the existing CSB internal crane systems (MHM). A new, electric powered handler will be provided by project W-464 for emplacement of IHLW into the storage tubes by project W-464.
Facilities

RPP will require dedicated use of vaults #2 and #3 of the CSB through the year 2048 for storage of HLW. Project W-464 also requires use of one of the welding pits for use as overpack weld stations. Some modification will be performed to the building by project W-464. These include an addition to the south end of the building to accommodate transportation and handling equipment, additions to the east and west sides for ventilation, modification of the electrical power, and some storage requirements. The project W-464 related facility modification effort will begin on or about 01/21/03 and continue until approximately 03/31/03 (end of construction). And to accommodate the CSB modification period for project W-464, both CSB Operations and project W-464 will negotiate agreeable procedures for operations of the SNF Project functions, and modification of the RPP vaults and facility.

Security

As stated earlier in this agreement, CSB Operations will be responsible for all security required within the CSB. A physical security barrier for the project W-464 annex will be designed and constructed as part of the W-464 project as required.

Work outside of the CSB (stacks, annex and site construction) will be allowed during CSB Operations. The details will be included in the project W-464 safeguard and security plan.

Surveillance

Surveillance of stored and in-process spent fuel will be performed by CSB Operations. As part of the project W-464 facility modification, interconnects with the surveillance system will be provided by project W-464 for use in monitoring stored HLW. Additional funding will be provided by project W-464 to support the additional surveillance while systems are out of service.

Quality Assurance

Quality Assurance will be provided by project W-464 for all activities relating to modification of the CSB to accommodate HLW. The CSB Operations will provide Quality Assurance (QA) as required for transport, acceptance, unload, handling, processing, and emplacing all spent nuclear fuel into the CSB. The HLW Program will provide QA as required for transport, acceptance, unload, handling, processing, and emplacing all HLW into the CSB.

Other Interface Requirements

Details of architectural and physical interfaces between the activities of project W-464 and the CSB Operations will be defined in ICDs, prepared by project W-464 for joint approval by both parties.
Change/Update/Revision

Update, and/or revision to this memorandum is expected throughout the project W-464 life. Greg Parsons is the Lockheed Martin Hanford Corporation (LMHC) Point of Contact (POC) and the FDH POC is Oly Serrano. Ken Burgard, LMHC will maintain configuration of this document.

Configuration Control

A copy of CSB Operations Configuration Management (CM) Plan will be provided for project W-464 by 10/01/99. Project W-464 will prepare a project CM plan that will meet the requirements of the HNF-PRO's. A copy of the proposed project W-464 CM plan will be provided for SNF for review and concurrence. The project W-464 CM plan will be completed by 09/30/00.

ICD's will be mutually prepared to identify those features for Configuration Control to meet the requirements of both projects.

Dispute Resolution

In the event that an agreement can't be reached between the SNF Project and RPP, Immobilized Waste Program issues will be evaluated within LMHC and FDH for dispute resolution.
RPP SNF CSB INTERFACE AGREEMENT

Signature Sheet

SNFP

Robert Wilkinson, Acting SNF Project Director

Date

Sid Daughridge, W-379 Project Manager

Date

Oly Serrano, CSB Facility Manager

Date

RPP

RW (Bill) Root, Program Manager,
ORP Immobilized Waste Programs

9/9/99

Date

Greg Parsons, W-464 Project Manager,
RPP Immobilized Waste Projects

9/8/99

Date
APPENDIX D

Conceptual Sketch of Shielded Canister Transporter
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SHIELDED CANISTER TRANSPORTER
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APPENDIX E

Correspondence Number WDD:DB 96-WDD-015
"Memorandum of Agreement (MOA) Utilization of Canister Storage Building (CSB)
Vaults 2 and 3 for Immobilized High-Level Tank Waste"
Jackson Kinzer to Charles A. Hansen
April 9, 1996

and

Correspondence Number SFD:KMS 96-WDD:DB 96-SFD-104
"Memorandum of Agreement (MOA) Utilization of Canister Storage Building (CSB)
Vaults 2 and 3 for Immobilized High-Level Tank Waste"
Charles A. Hansen to Jackson E. Kinzer
April 16, 1996
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United States Government

memorandum

DATE: APR 09 1996

REPLY TO: WDD:DB 96-WDO-015

SUBJECT: MEMORANDUM OF AGREEMENT (MOA) - UTILIZATION OF CANISTER STORAGE BUILDING (CSB) VAULTS 2 AND 3 FOR IMMOBILIZED HIGH-LEVEL TANK WASTE

TO: Charles A. Hansen, Assistant Manager for Waste Management


The Office of Tank Waste Remediation System (TWRS) at Hanford has adopted a time-phased approach for the privatized treatment of tank waste. Phase I includes an option for the immobilization of high-level waste (HLW) starting in July 2002. The HLW treatment could extend up to nine years and yield approximately 1,000 ten-foot long canisters. DOE will provide storage of the canisters at Hanford until they are shipped to a HLW repository.

A recent study by TWRS has identified Vaults 2 and 3 in the CSB as the preferred option for storage of Phase I canisters (Reference 1). However, the responsibility for the CSB was turned over to the Spent Nuclear Fuel (SNF) project with the Reference 2 MOA. Based on TWRS understanding that SNF does not forecast a need for Vaults 2 and 3 and that there is no other conflicting need, TWRS would like to formally reserve Vaults 2 and 3 for storage of Phase I HLW canisters. Therefore, TWRS has prepared the attached subject new MOA - "Utilization of Canister Storage Building Vaults 2 and 3 for Immobilized High-Level Tank Waste," for your signature.

This MOA has been reviewed informally by Kerry Schierman and others of your staff, and comments have been incorporated. Consequently, TWRS is now requesting that SNF please sign the MOA and transmit it back to TWRS for incorporation as a formal record in the Records Management Information Center. It is anticipated that TWRS and SNF will each notify their respective contractor organizations after the MOA is signed.
At this time, the TWRS baseline plan, as described in the activity data sheet, is to implement the necessary modification/additions to the CSB for canister storage in the out-years. However, several modification or additions could result in substantial cost savings if these could be implemented by Fiscal Year 1996 and 1997. TWRS is evaluating options for implementing these modification/additions and will keep SNF advised. TWRS recognizes that implementing any near-term changes must not result in unacceptable delays to the SNF project.

If you have any questions, please call me on 376-7591, or Dan Button of my staff on 376-2645.

Jackson Kinzer, Assistant Manager
Office of Tank Waste Remediation System

Attachment

cc: R. Budzich, BUD
    D. Evans, SFD
    E. Sellers, SFD
    K. Schierman, SFD
    B. Sullivan, SFD
    D. Willis, BUD
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If you have any questions, please call me on 376-7591, or Dan Button of my staff on 376-2645.

Jackson Kinzer, Assistant Manager
Office of Tank Waste Remediation System

Attachment

cc: R. Budzich, BUD
    D. Evans, SFB
    E. Sellers, SFD
    K. Schierman, SFD
    B. Sullivan, SFD
    D. Willis, MSD

96-WDO-015

bcc: Privatization RDG FILE
     WDD OFF FILE
     CC RDG FILE

(Please Return To Peggy Nazarali, 3-0068, SIGNA IV/423/RCH)

DOCUMENT No. 6661
MEMORANDUM OF AGREEMENT

UTILIZATION OF CANISTER STORAGE BUILDING VAULTS 2 AND 3 FOR IMMOBILIZED HIGH-LEVEL TANK WASTE

REFERENCES:


1.0 SUBJECT

Utilization of available vaults in the Canister Storage Building (CSB) by the Tank Waste Remediation System (TWRS) for interim storage of immobilized high-level waste products and other potential products from Phase I privatized treatment of tank wastes.

2.0 BACKGROUND

The CSB was originally designed by the Hanford Waste Vitrification Plant (HWVP) Project for storage of approximately 2,000 ten-foot-long canisters of vitrified HLW. The CSB construction was stopped in the early stage as a result of the HWVP Project cancellation. Subsequently, responsibility for the CSB was transferred to the Hanford Spent Nuclear Fuel (SNF) Project on August 8, 1995 as indicated in the Reference 1 agreement.

The SNF Project has restarted construction of the CSB after a partial redesign to accommodate SNF, including the partitioning of the storage area into three vaults by the addition of walls below the deck. The overall superstructure will include services such as overhead cranes for all vaults. The north vault (Vault 1) will provide sufficient storage space for anticipated Hanford SNF.

The SNF Project scope does not include outfitting Vaults 2 and 3 with certain features (i.e., tubes, plugs, insulating concrete, and ventilation) needed for storage of canisters.

Subsequent to the Reference 1 memorandum of agreement (MOA), TWRS established a new baseline approach for tank waste remediation based on privatization of tank waste treatment in two phases. Phase I includes an option for immobilization of High-Level Waste (HLW) over a period of five to nine years with production starting in July 2002. At the projected rate of one metric ton of product per day, the two available vaults in the CSB would have sufficient space for the HLW products, including secondary products (separated radionuclides) and other miscellaneous HLW forms (e.g., waste materials from failed melters) to be generated in Phase I.

The Reference 2 engineering study evaluated various alternatives for interim storage of Phase I canisters and...
concluded that the completion and utilization of Vaults 2 and 3 in the CSB was viable and the most cost-effective alternative.

Responsibility for HLW interim storage with the TWRS organization has been assigned to the HLW Interim Storage Sub-project under the Storage and Disposal Project, within the TWRS Waste Disposal Division.

3.0 NEED

The TWRS has a need to reserve and equip Vaults 2 and 3 and incorporate other features/design modifications in the CSB to support interim storage of HLW products from Phase I treatment of tank waste beginning in July 2002. This is approximately two years after conditioning of the SNF rods is scheduled for completion.

4.0 AGREEMENT

SNF agrees to reserve Vaults 2 and 3 of the CSB for use by TWRS to store products from Phase I treatment of tank waste. The TWRS baseline plan is to initiate facility modifications after Vault 1 is filled with K-Basin SNF. However, if TWRS desires to implement modifications in FY 1996 and FY 1997, it is the responsibility of TWRS to provide design requirements, specifications and funding as appropriate for modifications and equipment to be incorporated into the CSB during the construction phase. TWRS further agrees that incorporation of any modifications/additions to the CSB project scope for TWRS is subject to approval by SNF and will not cause an unacceptable schedule or other impacts to use of the CSB by SNF. Any requests by TWRS affecting the CSB construction and SNF operations, will be routed through SNF.

TWRS will be responsible for securing necessary permits and completing supplemental safety analyses needed to address storage of canistered products from TWRS. Allocation of operating costs for the facility after emplacement of SNF will be negotiated and resolved prior to use of the facility by TWRS.

SNF agrees to keep TWRS apprised of progress on the CSB, including invitations to participate in project reviews, design reviews, and review of engineering study reports, as appropriate. TWRS will keep SNF apprised in a timely manner of details and/or changes, if any, in Phase I plans, and current or future funding commitments for modifications and/or additions to the CSB.

It is understood that there may be a need for more detailed protocols, procedures, etc., between SNF and TWRS contractor organizations in order to efficiently achieve the overall goal of combined use of the CSB. SNF and TWRS jointly agree in principal to the establishment of such arrangements, provided they are consistent with this MOA, as approved.
APPROVALS:

C. A. Hansen, AMW  Date  J. E. Kinzer, AMT  Date

CONCURRENCES:

E. D. Sellers, SFD  Date  W. J. Taylor, WDD  Date

K. M. Schierman, SFD  Date  P. E. LaMont, WDD  Date

J. B. Sullivan, PhD  Date  D. D. Button, WDD  Date

CSBMOA.RI
DATE: APR 15 96

ATTN: SFO:KMS/96-SFO-104

SUBJECT: MEMORANDUM OF AGREEMENT (MOA) - UTILIZATION OF CANISTER STORAGE BUILDING (CSB) VAULTS 2 AND 3 FOR IMMOBILIZED HIGH-LEVEL WASTE

To: Jackson E. Kinzer, Assistant Manager
Office of Tank Waste Remediation System

In response to your memorandum (96-WOD-015) dated April 9, 1996, same title as above, the Assistant Manager for Waste Management (AMW) accepts the terms of your attached MOA as evidenced by the completion of the signature matrix. AMW looks forward to working with TWRS on the CSB Project.

Should you have any questions, please call me at 376-7434, or Kerry Schierman, of my staff, on 373-7673.

C. A. Hansen, Assistant Manager for Waste Management

Attachment

cc w/attach:
D. D. Button, WDD
P. E. LaMont, WDD
W. J. Taylor, WDD
A. D. Willis, BUD

RECEIVED
APR 16 1996
DOE RL/CCC
96F79178
MEMORANDUM OF AGREEMENT

UTILIZATION OF CANISTER STORAGE BUILDING VAULTS 2 AND 3
FOR IMMOBILIZED HIGH-LEVEL TANK WASTE

REFERENCES:


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Responsibility for HLW interim storage with the TWRS organization has been assigned to the HLW Interim Storage Sub-project under the Storage and Disposal Project, within the TWRS Waste Disposal Division.

3.0 NEED

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APPROVALS:

C. A. Hansen, AMW  4/14/96

CONCURRENCES:

E. D. Sellers, SFD  4/3/96

K. M. Schierman, SFD  4/12/96

D. B. Sullivan, PMD  4/15/96

J. E. Kinzer, AMT  4/9/96

W. J. Layot, WDO  4/3/96

P. E. LaMont, WDO  4/3/96

D. D. Button, WDO  4/3/96

CSBMOA.RI
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