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# Tank Waste Remediation System Technical Baseline Summary Description

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U.S. Department of Energy Contract DE-AC06-96RL13200

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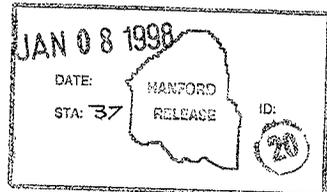
Key Words: TWRS, Technical Baseline

Abstract: This document is one of the tools used to develop and control the mission work as depicted in Figure 1. This Technical Baseline Summary Description document is the top-level tool for management of the Technical Baseline for waste storage operations.

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# Tank Waste Remediation System Technical Baseline Summary Description

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Lockheed Martin Hanford Corporation

Date Published  
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Richland, Washington

Prepared for the U.S. Department of Energy



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Description

Approved by:   
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1/8/98  
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**LIST OF TERMS**

BIO	Basis for Interim Operation
DOE	U.S. Department of Energy
ICD	Interface Control Document
LMHC	Lockheed Martin Hanford Corporation
RL	U.S. Department of Energy, Richland Operations Office
TWRS	Tank Waste Remediation System

## **TANK WASTE REMEDIATION SYSTEM TECHNICAL BASELINE SUMMARY DESCRIPTION**

### **1.0 INTRODUCTION**

This document is one of the tools used to develop and control the mission work as depicted in Figure 1. This Tank Waste Remediation System (TWRS) Technical Baseline Summary Description document is the top-level tool for management of the Technical Baseline for waste storage operations. The Technical Baseline is a subset of the Integrated Baseline addressing three phases: Requirements, Design, and Operations. The hierarchical relationship of Technical Baseline documents to other program documents and the Integrated Baseline is shown in Figure 2. This Technical Baseline summary description identifies those documents that represent the Technical Baseline for the TWRS project.

#### **1.1 TANK WASTE REMEDIATION SYSTEM MISSION**

The mission of the TWRS project is described in HNF-SD-WM-MAR-008, *Tank Waste Remediation System Mission Analysis Report* (MAR) (Acree 1998). One of the key methods used by the TWRS project to ensure safe and cost-effective waste management of the activities in support of the mission is through the establishment and continual updating (when appropriate) of the Integrated Baseline. The Technical Baseline is part of the Integrated Baseline (see Figure 2). Requirements for the TWRS Project are captured comprehensively in the Hanford Site Technical Baseline Database (HSTD) which is entered and maintained in a computer-based system called RDD-100.

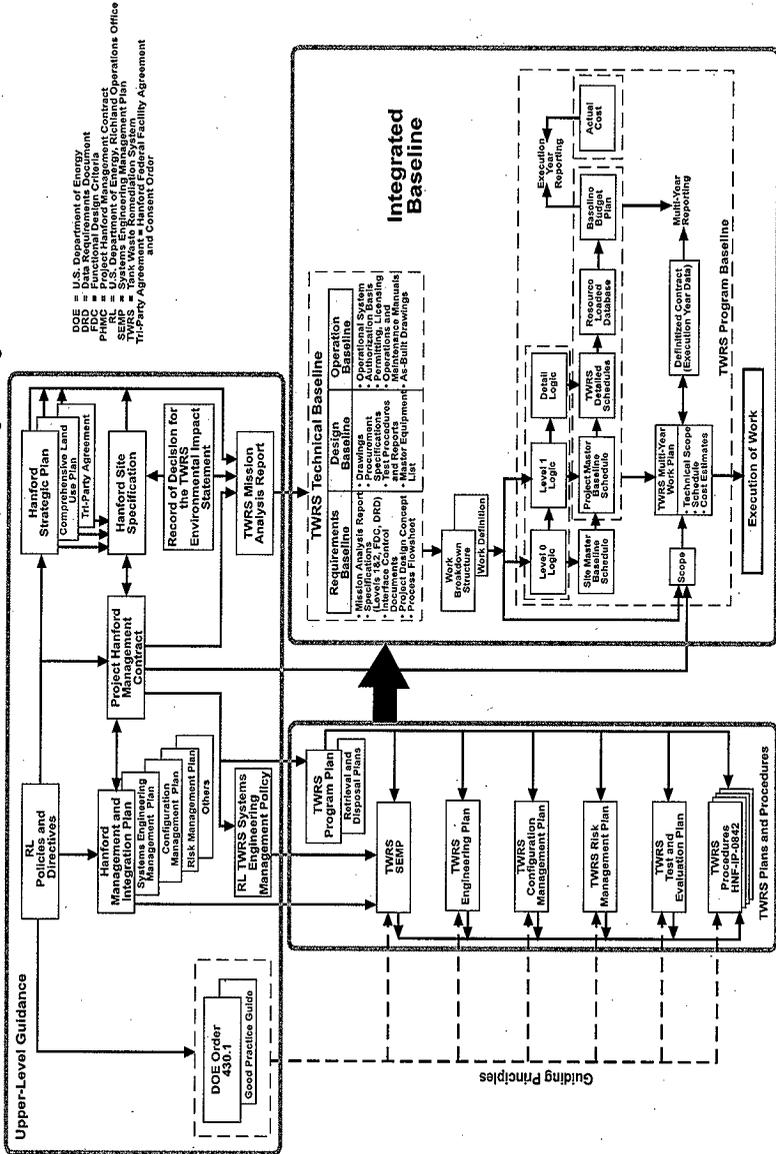
#### **1.2 TECHNICAL BASELINE DEFINITION**

The Technical Baseline is the reference set of technical data that defines the physical system in operation and in development. It contains all technical requirements, physical system architectures, and interface definitions.

The Technical Baseline is represented by various types of key documents including approved drawings, calculations and other analyses, lists of spare parts and other materials, technical plans and procedures, certifications, and other technical information. The Technical Baseline contains three parts: the Requirements Baseline, the Design Baseline, and the Operational Baseline. The HNF-SD-WM-SEMP-002, *Tank Waste Remediation System Systems Engineering Management Plan* (Peck 1997), provides additional detail on the content and development of these three aspects of the Technical Baseline.



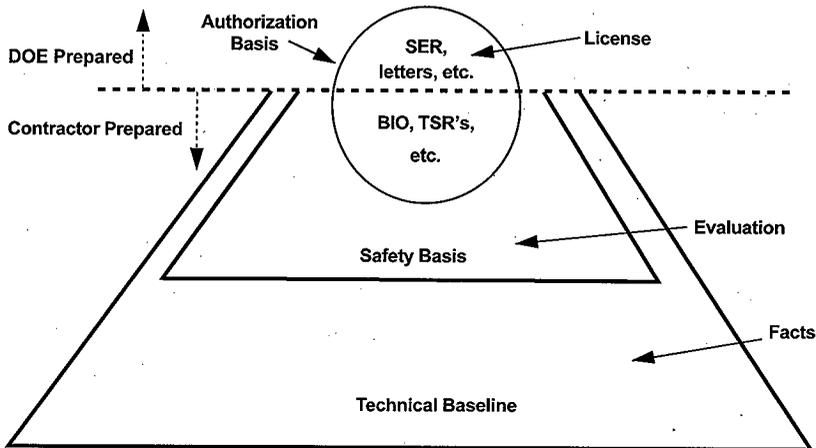
Figure 2. Tank Waste Remediation System Program Logic.



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Interface of the Technical Baseline with other configured aspects of the TWRS integrated safety baseline documents is shown in Figure 3. This figure details how the Technical Baseline encompasses all safety basis information developed by the contractor.

Figure 3. Tank Waste Remediation System Baseline Relationships.



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## 2.0 SUMMARY OF KEY TANK WASTE REMEDIATION SYSTEM TECHNICAL BASELINE DOCUMENTS

This section includes a summary description of the key documents that constitute the TWRS Technical Baseline. This list is an extension of the more detailed list included in HNF-1901, *Tank Waste Remediation System Retrieval and Disposal Mission Technical Baseline Summary Description* (Treat et al. 1998).

### 2.1 REQUIREMENTS BASELINE

This baseline supports the configuration management of DOE, contractor specific, regulatory, and mission defined requirements.

### **2.1.1 Mission Analysis and Requirements**

This Mission Analysis Report documents the Tank Waste Remediation System (TWRS) mission analysis. Acree (1998) explains the mission, identifies requirements, and describes the steps necessary to achieve the desired end state. Acree (1998) has been reviewed against DOE/RL 96-92, *Hanford Strategic Plan* (RL 1996a); current private contractor Phase 1A contracts; and DE-AC06-96RL13200, *Project Hanford Management Contract (PHMC)* (RL 1996b), to assure consistency and integration.

A preliminary analysis of the entire (Phase 1B and Phase 2) feed staging and processing mission to accelerate the removal of waste from the single-shell tanks was conducted and is included in Acree (1998).

### **2.1.2 Requirements Databases (S/RIDS, etc.)**

There are a variety of requirements databases used by TWRS. These include S/RIDS (which is included in the Environmental Requirements Management Interface [ERMI] database), ARMI (which is part of the Safety Basis), and HSTD.

### **2.1.3 Permits and Licenses**

The various permits and licenses provide regulatory approval for specific activities and provides requirements and commitments for design and operation of the associated facilities and structures, systems, and components.

### **2.1.4 Authorization Bases**

The TWRS Authorization Basis (AB) includes the Basis for Interim Operation (BIO), HNF-SD-WM-BIO-001, *Tank Waste Remediation System Basis for Interim Operation*, (FDH 1997); its associated Technical Safety Requirements; along with those additional U.S. Department of Energy, Richland Operations Office (RL) approved documents and controls (Wagoner 1997) defined at the time the BIO was implemented. The approval of BIO (FDH 1997), the Technical Safety Requirements, and other TWRS AB documents and their subsequent implementation (September 29, 1997) represents the establishment of the current TWRS AB baseline. The current listing of the documents that make up the TWRS AB list are documented and maintained in HNF-IP-0842, *TWRS Administration*, Volume IV, "Engineering," Section 5.4, "Unreviewed Safety Question," Attachment A (LMHC 1997).

## **2.2 DESIGN BASELINE**

This baseline supports the configuration management of all technical data involved with the upgrade, modification, and enhancement of facility structures, systems, and components.

### **2.2.1 Drawings and Drawing Change Documents**

There are currently over 1770 essential and support drawings in the TWRS Technical Baseline. Change documents (ECNs and EDTs) are a compliment to the drawings.

### **2.2.2 Specifications**

Design specifications are used in design input documents. Component procurement, construction, and installation specifications are design output documents.

### **2.2.3 Safety Analyses**

Some safety analyses are not incorporated into the Authorization Basis, but are part of the supporting documents for the Authorization Basis.

### **2.2.4 Calculation Notes**

Calculation notes are, as necessary, included into the Technical Baseline.

### **2.2.5 Alternative Studies/Engineering Analyses/Trade off Studies**

Alternative studies and engineering analyses document the baseline decisions.

### **2.2.6 Design Review Packages**

The design review packages include documentation of how the Technical Baseline requirements have been applied to the design.

### **2.2.7 Test Reports**

Test reports provide a record of testing performed to verify system and component performance. These reports document testing which ensures satisfaction of functional requirements: (including Code requirements) providing a record of how Technical Baseline requirements have been satisfied.

### **2.2.8 Certified Vendor Information**

Certified vendor information (CVI) provides design output documentation for process flow diagrams.

### **2.2.9 Process Flow Diagrams**

Process flow diagrams provide process design output documentation.

## **2.3 OPERATIONAL BASELINE**

This baseline supports configuration management of all technical data involved with operation of existing facility structures, systems, and components.

### **2.3.1 Authorization Basis and Implementing Documents**

See item 2.1.4 above. The Authorization Basis is used directly (e.g., Technical Safety Requirements) as operation baseline documents with operational controls.

### **2.3.2 Permits and Licenses**

See item 2.1.3 above. Similar to Authorization documents, permits and licenses and provide operational controls in addition to design requirements.

### **2.3.3 Waste/Tank Surveillance Data Sheets**

Surveillance data sheets provide documentation for operative compliance with TSR's and mission specific requirements.

### **2.3.4 Process Limit Control Documents**

Process limit documents are used operationally to control key process parameters to achieve mission goals.

### **2.3.5 System Design Descriptions**

System design descriptions are used to ease and simplify design modification and review processes.

### **2.3.6 Operations/Maintenance Procedures and Records**

Operation procedures, maintenance procedures, and associated completed records ensure and verify that systems and components are operated appropriately and are functioning within safety and mission requirements.

### **2.3.7 Environmental, Safety, and Health Plans**

These plans provide specific operational safety basis requirements and procedures.

### **2.3.8 Drawings and Drawing Change Documentation**

Some drawings are both design and operational basis documents - these are kept current on a closer to real time basis as essential drawings.

### **2.3.9 Training Certification Documents**

Training provides a key Technical Basis for operations.

### **2.3.10 Safety and Master Equipment List**

The safety equipment list is a subset of a larger database - the Master Equipment List - and both are essential for operations.

### **2.3.11 Spare Parts Documentation**

Spare and replacement parts are essential for safe and efficient operations.

### **2.3.12 Commercial Grade Dedication Documentation**

In accordance with quality and safety requirements, the commercial grade dedication documentation is necessary to support operations.

### **2.3.13 Operational Specifications**

Similar to process limits, operational specifications provide necessary data to support mission completion.

### **2.3.14 Characterization Database**

The characterization data is used for a variety of mission needs.

### **2.3.15 Process Memos**

Process memos, while current, provide specific technical details for specific processes, usually transfers, within TWRS.

### **2.3.16 Reliability, Availability, and Maintainability Analyses**

These analyses are occasionally used to assist operations in meeting the mission.

## **3.0 CONFIGURATION MANAGEMENT**

Documentation, databases, and information of the Technical Baseline is under configuration management. This entails a documented process for the controlled establishment, monitoring, changes, approval, verification, and distribution of the Technical Baseline, in

accordance with HNF-1900, *Tank Waste Remediation System Configuration Management Plan* (Vann et al. 1998).

#### 4.0 FACILITY CLOSURE

Facility closure plans and D&D plans are part of the Technical Baseline.

#### 5.0 REFERENCES

##### Databases

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ERMI, n.d., *Environmental Requirements Management Interface Database*, database maintained by Lockheed Martin Hanford Corporation for Fluor Daniel Hanford, Inc., Richland, Washington.

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