

ENGINEERING CHANGE NOTICE

Page 1 of 2

1. ECN **644861**

Proj.
ECN

2. ECN Category (mark one) Supplemental <input type="checkbox"/> Direct Revision <input checked="" type="checkbox"/> Change ECN <input type="checkbox"/> Temporary <input type="checkbox"/> Standby <input type="checkbox"/> Supersedeure <input type="checkbox"/> Cancel/Void <input type="checkbox"/>	3. Originator's Name, Organization, MSIN, and Telephone No. B.D. Zimmerman/TWRS SEI/H6-35/376-7440	4. USQ Required? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	5. Date January 5, 1997
	6. Project Title/No./Work Order No. TWRS System Engineering	7. Bldg./Sys./Fac. No. N/A	8. Approval Designator N/A
	9. Document Numbers Changed by this ECN (includes sheet no. and rev.) WHC-SD-UM-PMP-018, Revision 1	10. Related ECN No(s). N/A	11. Related PO No. N/A

12a. Modification Work <input type="checkbox"/> Yes (fill out Blk. 12b) <input checked="" type="checkbox"/> No (NA Blks. 12b, 12c, 12d)	12b. Work Package No. N/A	12c. Modification Work Complete N/A Design Authority/Cog. Engineer Signature & Date	12d. Restored to Original Condition (Temp. or Standby ECN only) N/A Design Authority/Cog. Engineer Signature & Date
---	-------------------------------------	---	---

13a. Description of Change

13b. Design Baseline Document? Yes No

This change issues revision 2 of the TWRS Risk Management Plan. Revision 2 is a complete rewrite of revision 1.

The major change incorporated into revision 2 is recognition of Technical Basis Reports as a major source of risk items. Also, the suggested risk management list format has been extensively modified to include columns for recording data used for financial risk analysis.

Revision 2 is being produced as part of the TWRS Readiness-To-Proceed activities.

14a. Justification (mark one)				
Criteria Change <input checked="" type="checkbox"/>	Design Improvement <input type="checkbox"/>	Environmental <input type="checkbox"/>	Facility Deactivation <input type="checkbox"/>	
As-Found <input type="checkbox"/>	Facilitate Const <input type="checkbox"/>	Const. Error/Omission <input type="checkbox"/>	Design Error/Omission <input type="checkbox"/>	

14b. Justification Details

Revision 2 of the TWRS Risk Management Plan is being issued to incorporate major changes to the way the TWRS risk management program operates. These changes are primarily the result of the switch to Technical Basis Reports as a major source of risk items for the risk management program.

15. Distribution (include name, MSIN, and no. of copies)
See attached list.

JAN 09 1998

DATE: _____

STA: 37

RELEASE

IC: 20

Tank Waste Remediation System Risk Management Plan

B.D. Zimmerman

Lockheed Martin Hanford Company, Richland, WA 99352
U.S. Department of Energy Contract DE-AC06-96RL13200

EDT/ECN: 644861 UC: 2030
Org Code: 76000 Charge Code: D215P
B&R Code: EW3130010 Total Pages: 52

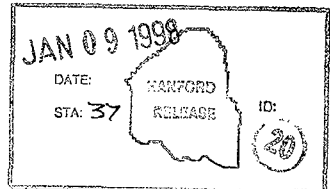
Key Words: TWRS, Risk Management

Abstract: The purpose of this plan is to describe a consistent approach to risk management such that Tank Waste Remediation System (TWRS) Project risks are identified and managed to achieve TWRS Project success.

TRADEMARK DISCLAIMER. Reference herein to any specific commercial product, process, or service by trade name, trademark, manufacturer, or otherwise, does not necessarily constitute or imply its endorsement, recommendation, or favoring by the United States Government or any agency thereof or its contractors or subcontractors.

Printed in the United States of America. To obtain copies of this document, contact: Document Control Services, P.O. Box 950, Mailstop H6-08, Richland WA 99352, Phone (509) 372-2420; Fax (509) 376-4989.

V.L. Berkland 1/9/98
Release Approval Date



Approved for Public Release

Tank Waste Remediation System Risk Management Plan

B. D. Zimmerman
Lockheed Martin Hanford Corporation

Date Published
January 1998

Prepared by Lockheed Martin Hanford Corporation
Richland, Washington

Prepared for the U.S. Department of Energy



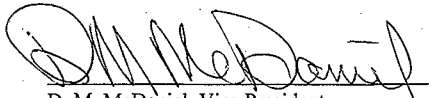
Fluor Daniel Hanford, Inc.
P.O. Box 1000
Richland, Washington

Hanford Management and Integration Contractor for the
U.S. Department of Energy under Contract DE-AC-0696-RL13200

This page intentionally left blank.

Document Title: Tank Waste Remediation System Risk Management Plan

Approved by:



D. M. McDaniel, Vice President
Information Resource Management Systems,
Engineering and Integration
Lockheed Martin Hanford Corporation

1/8/98
Date

This page intentionally left blank.

EXECUTIVE SUMMARY

The purpose of the Tank Waste Remediation System Risk Management Plan is to describe a consistent approach to risk management such that Tank Waste Remediation System (TWRS) Project risks are identified and managed to achieve TWRS Project success. The Risk Management Plan implements the requirements of the Tank Waste Remediation System Systems Engineering Management Plan¹ in the area of risk management. Figure ES-1 shows the relationship of the TWRS Risk Management Plan (lower left) to other major TWRS Project documents.

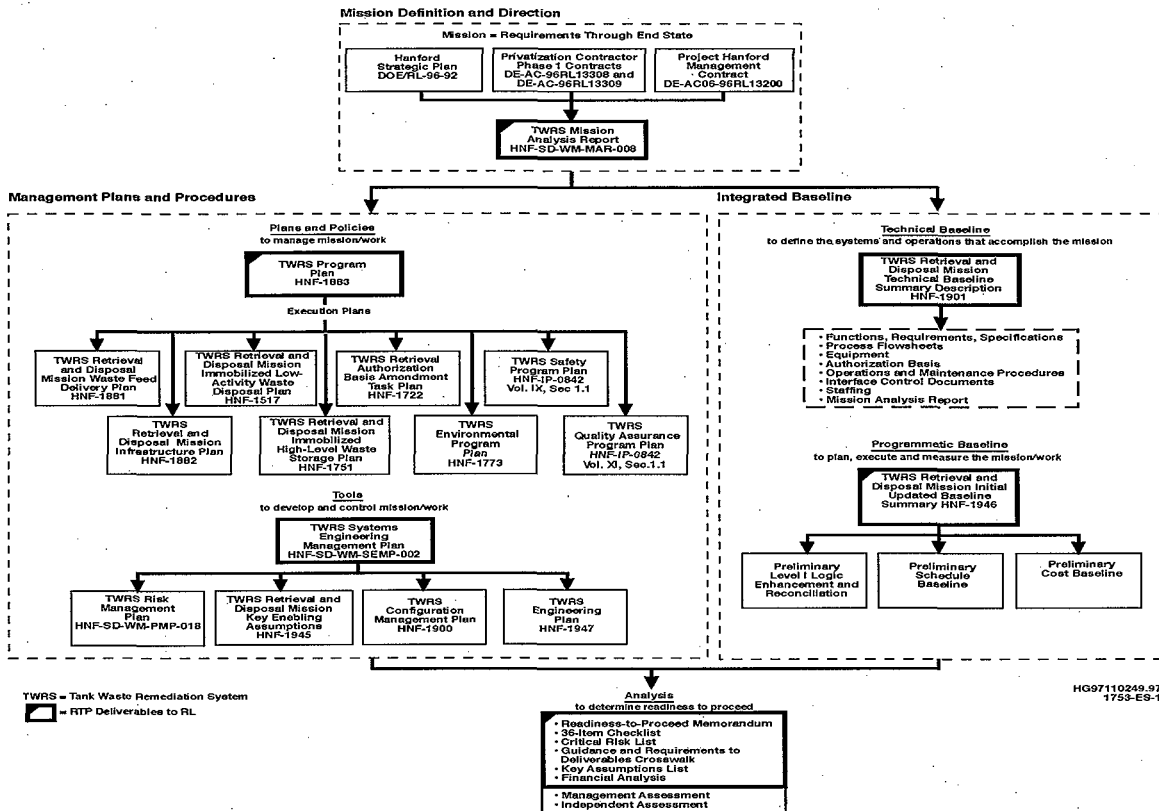
As the figure indicates, the Risk Management Plan is a tool used to develop and control TWRS Project work. It provides guidance on how TWRS Project risks will be assessed, analyzed, and handled, and it specifies format and content for the risk management lists, which are a primary product of the risk management process. In many instances, the Risk Management Plan references the TWRS Risk Management Procedure,² which provides more detailed discussion of many risk management activities.

The TWRS Risk Management Plan describes an ongoing program within the TWRS Project. The Risk Management Plan also provides guidance in support of the TWRS Readiness-To-Proceed (RTP) assessment package. The current Tank Waste Remediation System Critical

¹Peck, L.G., 1998, *Tank Waste Remediation System Systems Engineering Management Plan*, HNF-SD-WM-SEMP-002 Rev 1, prepared by Lockheed Martin Hanford Corporation for Fluor Daniel Hanford, Inc., Richland, Washington.

²LMHC, 1997, *TWRS Administration*, HNF-IP-0842, Fluor Daniel Hanford, Inc., Richland, Washington.

Figure ES-1. Readiness-to-Proceed Document Hierarchy.



HNF-SD-WM-PMP-018 Rev 2

TWRS = Tank Waste Remediation System
 = RTP Deliverables to RL

HG97110249.97
1753-ES-1

Risk Management List³ is based primarily on risks associated with the TWRS Level 1 Logics,⁴ which encompass the feed delivery activities that are the subject of the RTP assessment. Production of this list is required by the Risk Management Plan. Also, the financial risk assessment done as part of the RTP assessment is consistent with Risk Management Plan requirements. The risks associated with the TWRS Project activities that are the subject of the RTP assessment are being managed according to the requirements of the TWRS Risk Management Plan. The requirements of this plan are also applicable to, and are being implemented throughout, the remainder of the TWRS Project.

³Zimmerman, B. D., 1998, *Tank Waste Remediation System Retrieval and Disposal Mission Risk List*, prepared by Lockheed Martin Hanford Company for Fluor Daniel Hanford, Inc., Richland, Washington.

⁴FDH, 1998, Logic Diagrams, prepared by Lockheed Martin Hanford Corporation for Fluor Daniel Hanford, Inc., Richland, Washington.

- H-2-823148, *TWRS Retrieval Level 1 Logic Immobilized Waste (ILAW)*
- H-2-829149, *TWRS Retrieval Level 1 Logic Immobilized Waste (IHLW)*
- H-2-829150, *TWRS Retrieval Level 1 Logic Infrastructure Phase 1 Privatization Support*

- H-2-892151, *TWRS Retrieval Level 1 Logic Waste Feed Delivery LAW 1st Feed Batches Tank 241-AN-105*
- H-2-829152, *TWRS Retrieval Level 1 Logic Waste Feed Delivery LAW 2nd Feed Batches Tank 241-AN-104*
- H-2-829153, *TWRS Retrieval Level 1 Logic Waste Feed Delivery LAW 3rd Feed Batches Tank 241-AW-101*
- H-2-829154, *TWRS Retrieval Level 1 Logic Waste Feed Delivery LAW 4th Feed Batches Tank 241-AN-103*
- H-2-829155, *TWRS Retrieval Level 1 Logic Waste Feed Delivery LAW 5th Feed Batches Tanks 241-AP-101 & 241-AW-104*
- H-2-829156, *TWRS Retrieval Level 1 Logic Waste Feed Delivery LAW 6th Feed Batches Tank 241-AY-101*
- H-2-829157, *TWRS Retrieval Level 1 Logic Waste Feed Delivery LAW 7th & 8th Feed Batches Tank 241-AN-107*
- H-2-829158, *TWRS Retrieval Level 1 Logic Waste Feed Delivery LAW 9th Feed Batches Tank 241-AN-102*
- H-2-829159, *TWRS Retrieval Level 1 Logic Waste Feed Delivery LAW 10th Feed Batches Tank 241-AN-106*
- H-2-829160, *TWRS Retrieval Level 1 Logic Waste Feed Delivery LAW 11th Feed Batches Tank 241-SY-101*
- H-2-829161, *TWRS Retrieval Level 1 Logic Waste Feed Delivery LAW 12th Feed Batches Tank 241-SY-103*
- H-2-829162, *TWRS Retrieval Level 1 Logic Waste Feed Delivery HLW 1st & 2nd Feed Batches First Tank, 241-AZ-101*
- H-2-829163, *TWRS Retrieval Level 1 Logic Waste Feed Delivery HLW 3rd & 4th Feed Batches Second Tank, 241-AZ-102*
- H-2-829164, *TWRS Retrieval Level 1 Logic Waste Feed Delivery HLW 5th - 9th Feed Batches Third Tank, 241-AY-102*
- H-2-829165, *TWRS Retrieval Level 1 Logic Waste Feed Delivery HLW 10th - 12th Feed Batches Fourth Tank, 241-C-104*
- H-2-829166, *TWRS Level 0 Logic (2 Sheets)*

CONTENTS

1.0 INTRODUCTION 1

 1.1 PURPOSE 1

 1.2 SCOPE 1

 1.3 MANAGEMENT ORGANIZATION AND RESPONSIBILITIES 1

 1.3.1 Tank Waste Remediation System General Manager 2

 1.3.2 Tank Waste Remediation System Work Breakdown Structure Level 3
 Managers 2

 1.3.3 Managers of Work Breakdown Structure Elements Below Level 3 2

 1.3.4 Tank Waste Remediation System Systems Engineering & Integration 3

 1.3.5 Tank Waste Remediation System Business Management 3

 1.3.6 Identification of Responsible Personnel 3

2.0 TANK WASTE REMEDIATION SYSTEM RISK MANAGEMENT PROGRAM 3

 2.1 RISK MANAGEMENT AND TANK WASTE REMEDIATION SYSTEM
 PROJECT PLANNING 4

 2.2 THE RISK MANAGEMENT PROGRAM STRUCTURE 5

 2.2.1 Identification of Risk Items at the Technical Basis Review Level 5

 2.2.2 Risk Management List Hierarchical Structure; Risk Item Roll-Up
 and Roll-Down 5

 2.3 THE RISK MANAGEMENT PROCESS FOR INDIVIDUAL RISKS 9

 2.3.1 The Risk Management Process For Individual Risks 9

 2.3.2 Risk Management List Format and Content 10

 2.3.3 Risk Management List Review and Communication 12

 2.3.4 Risk Management List Medium 13

 2.4 RISK HANDLING 13

 2.4.1 Developing Risk Handling Actions 13

 2.4.2 Risk Action Status 14

 2.4.3 Risk Action Plans 15

 2.5 RISK MANAGEMENT PROGRAM PERFORMANCE EVALUATION 15

3.0 SCHEDULE 15

4.0 REFERENCES 16

APPENDIXES

A ORGANIZATIONAL POSITIONS RESPONSIBLE FOR IMPLEMENTATION OF THE TANK WASTE REMEDIATION SYSTEM RISK MANAGEMENT PROGRAM A-i

B THE INTEGRATED SAFETY MANAGEMENT SYSTEM B-i

C CRITICAL RISK LIST FORMAT C-i

D GUIDANCE AND REQUIREMENTS TO DELIVERABLES CROSSWALK-Tank Waste Remediation System Risk Management Plan D-i

LIST OF FIGURES

1. Tank Waste Remediation System Risk Management Program Structure and Flow 6

2. Technical Basis Review Risk Assessment Sheet 8

3. Risk Management Process 9

4. Tank Waste Remediation System Risk Management List 11

LIST OF TABLES

1. Typical Sources of Risk 7

2. Risk Management Program Schedule 16

LIST OF TERMS

DOE	U.S. Department of Energy
ES&H	environmental, safety, and health
FDH	Fluor Daniel Hanford, Inc.
FY	fiscal year
ISMS	Integrated Safety Management System
LMHC	Lockheed Martin Hanford Corporation
PRIMS	Programmatic Risk Information Management System
TBR	technical basis review
TWRS	Tank Waste Remediation System
WBS	work breakdown structure

TANK WASTE REMEDIATION SYSTEM RISK MANAGEMENT PLAN

1.0 INTRODUCTION

1.1 PURPOSE

The purpose of this Risk Management Plan is to describe a consistent approach to risk management such that Tank Waste Remediation System (TWRS) Project risks are identified and managed to achieve TWRS Project success. This plan provides a method for the following:

- Identifying, compiling and tracking technical, schedule, cost, programmatic, management, and environmental, safety, and health (ES&H) risks
- Understanding the risks sufficiently well to develop and successfully execute associated risk mitigation actions and plans.

The products produced by the risk management process (risk management lists) are also specified.

This Risk Management Plan implements the requirement for a risk management program as specified in HNF-SD-WM-SEMP-002, *Tank Waste Remediation System Systems Engineering Management Plan* (Peck 1998). It updates the Revision 1 of WHC-SD-WM-PMP-018, *Tank Waste Remediation System (TWRS) Programmatic Risk Management Plan* (Awadalla 1996).

1.2 SCOPE

This Risk Management Plan describes how risk management is accomplished within the TWRS Project.

1.3 MANAGEMENT ORGANIZATION AND RESPONSIBILITIES

To cover risks at all levels within the TWRS Project organization, risk management activities are being implemented from the TWRS Project level down to the level of individual tasks, typically work breakdown structure (WBS) Level 8. Risk management responsibilities of key TWRS personnel are as follows.

1.3.1 Tank Waste Remediation System General Manager

The TWRS General Manager is the lead manager for the TWRS risk management program, and is responsible for its overall management and execution including the following:

- Ensuring that the risk management program is implemented within the TWRS Project
- Reviewing the overall TWRS Critical Risk Management List and determining which risks need to be brought to the attention of Fluor Daniel Hanford, Inc. (FDH) and/or the U.S. Department of Energy, Richland Operations Office (RL).

1.3.2 Tank Waste Remediation System Work Breakdown Structure Level 3 Managers

The WBS Level 3 Managers are responsible for implementing the requirements of the TWRS Risk Management Plan within their WBS elements, including the following:

- Developing and reviewing WBS Level 3 risks
- Ensuring that the lower level risk management activities described in this plan are carried out within their WBS elements
- Selecting critical risk items for incorporation into the overall TWRS Critical Risk Management List
- Producing WBS Level 3 risk management implementation plans describing details of TWRS risk management program implementation within their WBS elements.

1.3.3 Managers of Work Breakdown Structure Elements Below Level 3

Managers of WBS elements below Level 3 are responsible for implementing the requirements of the TWRS Risk Management Plan and of the applicable Level 3 risk management implementation plans within their WBS elements, including the following:

- Identifying risk items based on technical basis review (TBR) WBS Level 7 and Level 8 information and providing this risk information for incorporation into the TBR risk assessments. (For organizations that do not yet have TBRs, risks corresponding approximately to WBS Level 7 and 8 activities are to be identified.)

- Identifying risk items that occur above WBS Levels 7 and 8 and developing risk evaluation, handling, and status information as needed.

1.3.4 Tank Waste Remediation System Systems Engineering & Integration

TWRS Systems Engineering & Integration has responsibility for performing the following:

- Providing guidance and consultation on the operation of the TWRS risk management program within the TWRS Project
- Preparing and updating this Risk Management Plan.

1.3.5 Tank Waste Remediation System Business Management

At the direction of the TWRS General Manager, TWRS Business Management has the responsibility to prepare financial risk analyses based on the information contained in the TBRs and corresponding risk assessments. Financial risk analyses are viewed as a separate activity from the risk management program described in this document. Financial risk analyses integrate input in a structured risk assessment process through data modeling to produce a view of the entire spectrum of cost or schedule outcomes, quantifying the likelihood of successfully completing the program or project within a given funding level or time frame.

1.3.6 Identification of Responsible Personnel

Appendix A contains a list of the TWRS Project organization positions responsible for implementation of the TWRS risk management program at WBS Level 3 and above.

2.0 TANK WASTE REMEDIATION SYSTEM RISK MANAGEMENT PROGRAM

The TWRS risk management program is based on the life-cycle management philosophy of U.S. Department of Energy (DOE) Order 430.1, *Life Cycle Asset Management*, and is typical of risk management practice within the U.S. Department of Defense community. It involves management and communication of risks at all levels within the TWRS Project. The TWRS risk management program focuses on TBRs as the primary source of risk information for entry into risk management lists. TBRs are documents containing the cost, schedule, and technical information, which provides the basis for individual work items. TBRs are part of the TWRS Programmatic Baseline, and are closely linked to the WBS structure. TBRs are a major source

for identification of risk issues within the TWRS Project. However, it is recognized that risks may be identified from other sources, and at any level, within the TWRS Project.

Some TWRS organizations are still transitioning to the use of TBRs. For these organizations, modifications to the risk management program applicable when TBRs are not available are noted in this plan. It is expected that TWRS organizations will complete the transition to TBRs as part of the fiscal year (FY) 1999 budget cycle.

Section 2.1 of this plan describes the TWRS work planning process as the context into which the risk management program fits. Section 2.2 explains the overall structure of TWRS risk management program implementation (including roll-up and roll-down of risk items). Section 2.3 explains how the risk management process is applied to individual risk items and specifies risk management list review requirements and options for the medium in which the lists are maintained. Section 2.4 provides additional discussion of risk handling. Section 2.5 establishes a requirement for periodic risk management program performance evaluation. These sections provide the primary description of how risk management is implemented within the TWRS Project.

Work performed within the TWRS Project must comply with the standards of the Integrated Safety Management System (ISMS). The TWRS risk management program must be conducted within these constraints, and failure to achieve ISMS standards is a possible source of risk for TWRS Project activities. A brief description of the ISMS is provided in Appendix B for reference.

2.1 RISK MANAGEMENT AND TANK WASTE REMEDIATION SYSTEM PROJECT PLANNING

The risk management discipline is imbedded into the larger TWRS Project planning process. For those TWRS WBS elements that use Level 1 Logic diagrams (FDH 1998) and TBRs as part of their planning, the individual activities on the Level 1 Logic diagrams lead to work plans which are typically at WBS Level 7. These work plans are supported by the data contained in the TBRs. Part of the TBR review process consists of identifying risk items associated with the work described by each TBR. These risk items may apply directly to each individual task or to the enabling assumptions associated with the TBR. These risk items, typically considered to be at WBS Level 7 and 8, form a major source of risk items compiled on the risk management lists. Additional risk items may also be identified as a result of risk analyses performed at higher WBS levels.

TWRS organizations that do not yet use Level 1 logics or TBRs as the basis for their work planning perform their planning by direct consideration of activities to be performed at WBS Levels 7 and 8 (as well as at other levels). For these organizations, risks are identified directly from the individual activities to be performed.

TBR risks (and enabling assumptions) may also form part of the input for risk-based financial analyses, as discussed in Section 1.3.5.

2.2 THE RISK MANAGEMENT PROGRAM STRUCTURE

2.2.1 Identification of Risk Items at the Technical Basis Review Level

Figure 1 illustrates the structure of the TWRS risk management program and the flow of risk items through it. (For organizations still transitioning to TBRs, TBRs should be thought of as being replaced by WBS Level 7 and 8 task items.)

Risk can occur in six categories: technical, cost, schedule, programmatic, management, and ES&H. Some typical sources of risks are shown in Table 1.

During the risk review process performed on the TBRs, risk items in any of these categories and from any of these sources may be identified. Risk from other sources, such as decision analyses and enabling assumptions, also may be identified. Risk items in all these categories flow through the risk management process in a similar manner.

Risk items may be identified both with reference to individual TBR task items (typically referred to as Level 8 risk items) and from consideration of enabling assumptions that are associated with the TBR work scope (typically Level 7 risk items). These risk items are captured on TBR risk assessment sheets. An example of a TBR risk assessment sheet is provided in Figure 2. Risk items associated with individual TBR tasks (typically WBS Level 8) are listed on the top part of the form, and risk items associated with TBR enabling assumptions (typically WBS Level 7) are listed on the bottom part of the form. The contents of most of the columns shown on this form are described in Section 2.3.2, because these columns are also included on the risk management list.

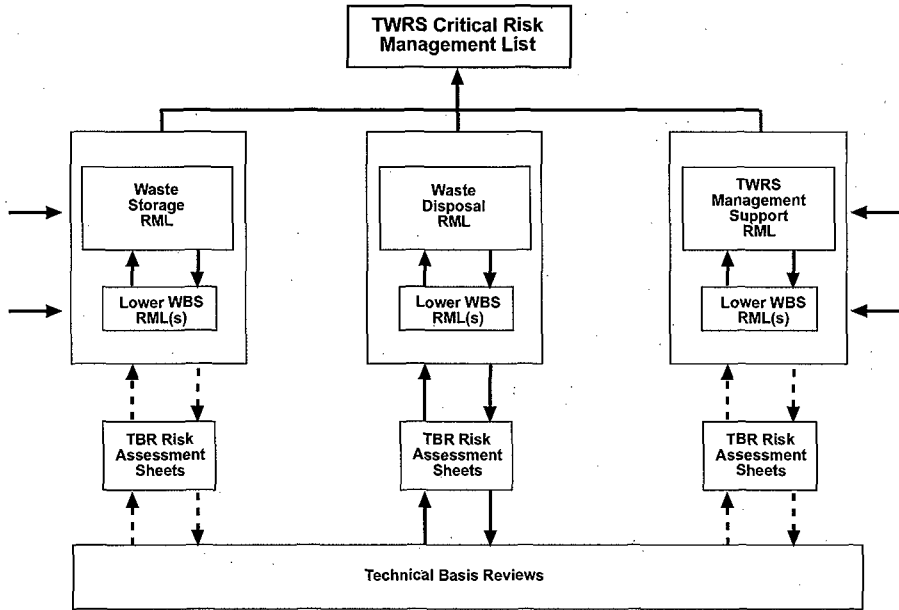
(If TBRs are not being used, risk items identified from individual tasks are recorded directly onto risk management lists, and TBR Risk Assessment Sheets are not employed.)

2.2.2 Risk Management List Hierarchical Structure; Risk Item Roll-Up and Roll-Down

Each TWRS WBS Level 3 element will have a hierarchical structure of risk management lists, illustrated in Figure 1. This structure will normally follow the WBS structure.

If TBRs are being used, risks from each TBR risk assessment sheet will be reviewed by the WBS manager(s) in charge of the activities of that TBR, and selected risk items will be entered into the risk management list associated with that WBS organization.

Figure 1. Tank Waste Remediation System Risk Management Program Structure and Flow.



RML = Risk Management List
 TBR = Technical Basis Review
 TWRS = Tank Waste Remediation System
 WBS = Work Breakdown Structure

HG97110249.52
 1753-1

↑ ↓ = Indicates flow of risk items
 ↑ ↓ = Indicates future flow of risk items
 (Organization still transitioning to TBRs)

HNF-SD-WM-PMP-018 Rev 2

Table 1. Typical Sources of Risk.

Risk item type	Description	Typical source
Technical	Risk of technical failure of processes or equipment.	Trade studies <i>Tank Waste Remediation System Mission Analysis Report (Acree 1998)</i> Design reviews Functions and requirements analyses Reliability, availability, maintainability studies
Cost	Risk that planned work cannot be completed for expected cost or that required funding will not be available.	Multi-Year Work Plan WBS budgets Data Quality Objectives TBR cost estimating sheets Monthly status reports Predictions of Economic Conditions
Schedule	Risk that planned work cannot be completed within the planned schedule or that required time will not be available.	Multi-Year Work Plan Program logic diagrams TBR schedule analyses Labor Union Contracts
Programmatic	Risk from changes in program goals or direction.	Multi-Year Work Plan Program plans <i>Tank Waste Remediation System Mission Analysis Report (Acree 1998)</i>
Management	Risk associated with inadequate management of tasks, including staffing issues.	Multi-Year Work Plan Interface Control Documents Required program decisions Special requirements for program coordination or control
Environmental, Safety, and Health	Risk associated with worker and environmental health and safety.	Design reviews Work package preparation process Safety analyses Job Hazard Analyses

Acree, C. D., Jr., 1998, *Tank Waste Remediation System Mission Analysis Report*, HNF-SD-WM-MAR-008, Rev. 0, prepared by Lockheed Martin Hanford Corporation for Fluor Daniel Hanford, Inc., Richland, Washington.

TWRS = Tank Waste Remediation System.

Figure 2. Technical Basis Review Risk Assessment Sheet.

TBR:

Subactivity (WBS 8) Risk Assessment

WBS/ CEIS #	Summary Descriptio	Activity Cost (\$000)	Base Cost	Contingency (Yes/No)	Ri	Mi	ri	P(ri)

Level I (WBS 7) Risk Assessment

Assumption	Basis	Baseline Risk	P(ri)
Total Cost (\$000)	Probability:	Low:	High:

CEIS = Cost Estimating Information Sheet
 TBR = Technical Basis Review
 WBS = Work Breakdown Structure

HG97110249.43
 1753-2

Additional risk items are compiled from sources other than the TBRs or review of individual, low-level activities. For example, some risk items may be identified as part of the TWRS decision analysis process (see HNF-IP-0842, Volume IV, Section 2.7, "Decision Management" [LMHC 1997]) and may be most applicable above WBS Levels 7 and 8. Other risk items will be associated with TWRS enabling assumptions. These risk items initially should be entered onto the risk management list at the most appropriate WBS level and then rolled up to higher level risk management lists in the same manner as other risk items. It is also necessary that these risk items be rolled down to the appropriate TBR and entered into the risk section of that TBR.

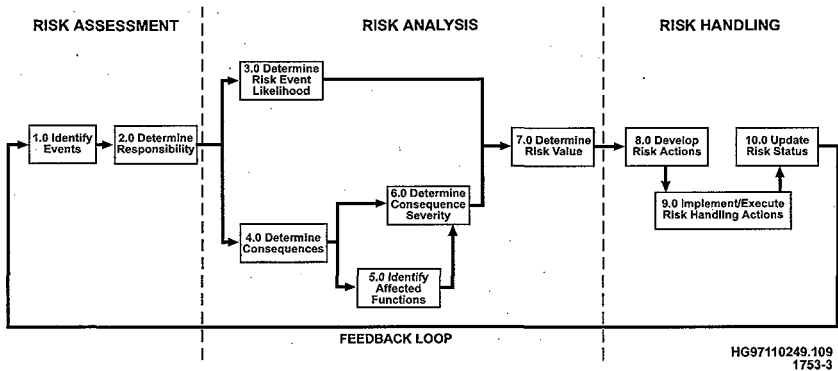
Additional discussion of the evaluation and selection of risk items for roll-up is presented in HNF-IP-0842, *TWRS Administration*, Volume IV, *Management/Administration*, Section 2.6, "Risk Management" (LMHC 1997).

2.3 THE RISK MANAGEMENT PROCESS FOR INDIVIDUAL RISKS

2.3.1 The Risk Management Process For Individual Risks

Individual risk items pass through a process of risk assessment, risk analysis, and risk handling. These steps are illustrated briefly by Figure 3.

Figure 3. Risk Management Process.



Risk assessment refers to initial identification of risk items and the assignment of responsibility for them. This includes assignment to the proper risk management list.

Risk analysis refers to estimation of the relative likelihood and severity of the consequences associated with each risk event. Likelihood and consequence severity are both ranked on a low-medium-high scale. Once the likelihood and consequence severity have been estimated, these can be input into a simple matrix to estimate the risk value (see HNF-IP-0842, Volume IV, Section 2.6 [LMHC 1997]).

Risk handling refers to development of risk mitigation actions and the periodic status of those actions. Additional guidance on risk handling is provided in section 2.4 of this plan.

Refer to HNF-IP-0842, Volume IV, Section 2.6 (LMHC 1997) for detailed consideration of these issues.

2.3.2 Risk Management List Format and Content

Identified risk items are incorporated into risk management lists, as described in Section 2.2.2. The TWRS Project will use a standard risk list format as shown in Figure 4. This format was developed specifically for use with TBR risk data but also is applicable for risk items derived from other sources or at higher WBS levels. This format may be modified by individual TWRS organizations to meet special circumstances. In particular, a simplified version of this form may be employed for discussion with senior management. However, any such modification must be documented and approved by the appropriate WBS Level 3 manager.

This form contains the following information:

- WBS number and, if applicable, TBR number and Cost Estimating Information Sheet number
- (Task) Summary Description - including logic block number if applicable
- Activity Cost - expressed in work-hours, dollars, or both; may be estimated if no formal cost estimate is available
- Base Cost (of Activity) - refers to the basis for Activity Cost
- Contingency (Cost Included In Base Cost) (Yes/No); If Yes, how much?
- (Identified risk item(s)) Ri - a listing of individual risk events
- (Risk-handling action(s)) Mi - a listing of individual risk handling (mitigation) actions or risk action plans
- (Residual Risk) Ri - assuming the handling action is successful; expressed in work-hours, dollars, or both; used primarily for financial risk analysis

Figure 4. Tank Waste Remediation System Risk Management List.

Subactivity (WBS 8) Risk Assessment

WBS/ CEIS #	Summary Description	Activity Cost (\$000)	Base Cost	Contingency (Yes/No)	Ri	Mi	ri	P(ri)	Probability (L, M, H)	Consequence (L, M, H)	Risk Value	Status

Level I (WBS 7) Risk Assessment

Assumption	Basis	Baseline Risk	Mi	P(ri)	Probability (L, M, H)	Consequence (L, M, H)	Risk Value	Status

CEIS = Cost Estimating Information Sheet
 TBR = Technical Basis Review
 WBS = Work Breakdown Structure

HG97110249.43
 1753-4

- (Probability of Residual Risk Occurring) $P(ri)$ - used primarily for financial risk analysis
- Assumption - enabling assumptions associated with a task
- Basis - basis for the enabling assumptions; source, if available
- Baseline Risk - for each assumption, describe risks that could result in the assumption being untrue
- (Probability of Assumption Being False) $P(ri)$ - quantitative estimate of the probability that the assumption will eventually be false
- Probability (L, M, H) - a subjective assessment of the likelihood that the risk event will occur (low, medium, high)
- Consequence (L, M, H) - a subjective assessment of the severity of the risk event, if it does occur (low, medium, high)
- Risk Value - calculated as (probability x consequence) using the matrix provided in HNF-IP-0842, Volume IV, Section 2.6 (LMHC 1997)
- Status refers to both the status of the overall risk, and to the status of individual handling actions.

A detailed discussion of the Low, Medium, High ranking approach is provided in HNF-IP-0842, Volume IV, Section 2.6 (LMHC 1997).

For purposes of presenting critical risks to senior management, RL, and others, a simplified format for presentation may be used (see Appendix C).

2.3.3 Risk Management List Review and Communication

The purpose of compiling risk management lists is to provide a means for communication of risks to the appropriate personnel within, and outside of, the TWRS Project. Consequently, TWRS Project risk management lists will be reviewed by the associated WBS managers at least quarterly. As part of this review, information concerning the status of handling actions will be updated as needed.

Risk management lists to be reviewed with RL and FDH personnel, and the frequency of those reviews, will be specified in the TWRS WBS Level 3 risk implementation plans.

2.3.4 Risk Management List Medium

Risk management lists will be maintained in the medium specified in the WBS Level 3 risk implementation plans. Typical choices might include WordPerfect¹, Excel², and PRIMS. The PRIMS (Programmatic Risk Information Management System) was developed at the Hanford Site specifically for use with the risk management program. Copies of the database can be supplied on disk upon request.

2.4 RISK HANDLING

The purpose of the TWRS risk management program is to allow program risk to be controlled and mitigated so as to achieve overall program success. Risk handling consists of developing risk handling actions, and managing those actions to ensure that they are successfully implemented. Additional discussion of risk handling is provided in the TWRS Risk Management Procedure (LMHC 1997).

2.4.1 Developing Risk Handling Actions

A risk handling action is the technique selected to reduce risk to an acceptable level through one or more of the following: avoidance, transfer, sharing, control, or assumption.

- **Avoidance** - Action taken to completely rule out the potential for a risk and its consequences.
- **Transfer** - Action taken to entirely give a risk to another organization through contractual agreement, or arrangement.
- **Sharing** - Action taken to allocate a portion of a risk to another organization so as to reduce risk likelihood or consequences.
- **Control** - Action taken to monitor and correct conditions so that either risk likelihood or consequence severity, or both, are reduced.
- **Assumption** - Decision made to accept a risk should it occur and to take no action beforehand.

Sources of information used during the risk assessment and analysis process should also be used to assist in development of risk handling actions. Risks are evaluated based on probability

¹WordPerfect is a trademark of Corel Corporation.

²Excel is a trademark of Microsoft Corporation.

of occurrence, severity of consequence; and impact to critical path, and mitigation actions are evaluated based on projected return for resources applied. This results in a prioritization of those risks and handling actions to be managed and statused. Those actions adopted are to be incorporated into the program execution plans as well as recorded on the appropriate risk management list.

The following are some examples of risk handling actions (DOE Order 430.1; GPG-FM-007, *Risk Analysis and Management*):

- Specific design features/redundancies to control the risk
- Prototype testing
- Alternative/value engineering studies
- Formal design reviews
- Analytical modeling
- Operating adjustments
- Life accelerating testing
- Functional testing
- Expert design review and redesign
- Financial incentives to vendors/contractors
- Strategic milestone selection
- Hold points
- Additional resources
- Selective requests for contingency funds or use of existing contingency funds
- Overtime/multiple shifts
- Selection of project controls to appropriate level.

Specific risk handling actions need to be developed for specific risks.

2.4.2 Risk Action Status

An essential aspect of risk handling is the periodic determination and review of the status of each action. As described in the TWRS Risk Management Procedure (LMHC 1997), the following key words should be used to describe risk action status.

- **Pending** - Action has not yet started, or a decision has not yet been made to adopt the action.
- **Ongoing** - Action started, but is not yet complete.
- **Complete** - Action fully implemented.

This status information will be included in the STATUS column of the risk management list, (a separate risk action status column may be created if desired), and updated as part of the overall risk management process.

2.4.3 Risk Action Plans

In most instances, inclusion of specific actions (including cost/schedule contingency) in the program plans and a listing on the risk management list provide adequate documentation of those actions. However, a separate, formal risk action plan may be developed for any risk item at the discretion of the manager(s) impacted by the risk. Risk action plans will most likely be associated with risks of high risk value, particularly critical risks, but may also be associated with other risks requiring complicated handling actions.

A risk action plan will state the steps to be taken to mitigate the risk, the persons responsible for the actions, the schedule for accomplishing the actions, and the criteria to be met for closing the action plan. Other information may be included as deemed necessary. The TWRS Risk Management Procedure (LMHC 1997) contains further discussion of risk management plans, including a sample plan outline. Status of risk action plan activities will be reported on the risk management list in a fashion similar to that of individual risk handling actions (i.e., Pending, Ongoing, Complete).

2.5 RISK MANAGEMENT PROGRAM PERFORMANCE EVALUATION

At least once per year, an evaluation of the implementation of risk management within the TWRS Project will be performed. This evaluation will be conducted under the direction of TWRS Systems Engineering, and will be formally documented.

3.0 SCHEDULE

The schedule of the risk management program is shown in Table 2.

Table 2. Risk Management Program Schedule.

Risk management item	Schedule date
Implementation of the risk management program for readiness-to-proceed activities <ul style="list-style-type: none"> • Perform TBR-based risk assessments • Implement the full risk management program 	Complete 1/30/98
Initial implementation of this risk management program in the remainder of the TWRS Project	3/15/98
Review Risk Management Program Experience and Update Documents As Needed	3/30/98
Produce TBR-based risk assessments for the remainder of the TWRS Project	12/30/98
Review Of Risk Management Lists By Management	Minimum quarterly

TBR = technical basis review.
 TWRS = Tank Waste Remediation System.

4.0 REFERENCES

U.S. Department of Energy Orders

DOE Order 430.1, *Life Cycle Asset Management*, U.S. Department of Energy, Washington, D.C.

Good Practice Guides

GPG-FM-007, *Risk Analysis and Management*, U.S. Department of Energy, Washington, D.C.

Logic Diagrams

FDH, 1998, Logic Diagrams, prepared by Lockheed Martin Hanford Corporation for Fluor Daniel Hanford, Inc., Richland, Washington.

- H-2-823148, *TWRS Retrieval Level 1 Logic Immobilized Waste (ILAW)*
- H-2-829149, *TWRS Retrieval Level 1 Logic Immobilized Waste (IHLW)*
- H-2-829150, *TWRS Retrieval Level 1 Logic Infrastructure Phase 1 Privatization Support*
- H-2-892151, *TWRS Retrieval Level 1 Logic Waste Feed Delivery LAW 1st Feed Batches Tank 241-AN-105*
- H-2-829152, *TWRS Retrieval Level 1 Logic Waste Feed Delivery LAW 2nd Feed Batches Tank 241-AN-104*
- H-2-829153, *TWRS Retrieval Level 1 Logic Waste Feed Delivery LAW 3rd Feed Batches Tank 241-AW-101*

- H-2-829154, *TWRS Retrieval Level 1 Logic Waste Feed Delivery LAW 4th Feed Batches Tank 241-AN-103*
- H-2-829155, *TWRS Retrieval Level 1 Logic Waste Feed Delivery LAW 5th Feed Batches Tanks 241-AP-101 & 241-AW-104*
- H-2-829156, *TWRS Retrieval Level 1 Logic Waste Feed Delivery LAW 6th Feed Batches Tank 241-AY-101*
- H-2-829157, *TWRS Retrieval Level 1 Logic Waste Feed Delivery LAW 7th & 8th Feed Batches Tank 241-AN-107*
- H-2-829158, *TWRS Retrieval Level 1 Logic Waste Feed Delivery LAW 9th Feed Batches Tank 241-AN-102*
- H-2-829159, *TWRS Retrieval Level 1 Logic Waste Feed Delivery LAW 10th Feed Batches Tank 241-AN-106*
- H-2-829160, *TWRS Retrieval Level 1 Logic Waste Feed Delivery LAW 11th Feed Batches Tank 241-SY-101*
- H-2-829161, *TWRS Retrieval Level 1 Logic Waste Feed Delivery LAW 12th Feed Batches Tank 241-SY-103*
- H-2-829162, *TWRS Retrieval Level 1 Logic Waste Feed Delivery HLW 1st & 2nd Feed Batches First Tank, 241-AZ-101*
- H-2-829163, *TWRS Retrieval Level 1 Logic Waste Feed Delivery HLW 3rd & 4th Feed Batches Second Tank, 241-AZ-102*
- H-2-829164, *TWRS Retrieval Level 1 Logic Waste Feed Delivery HLW 5th - 9th Feed Batches Third Tank, 241-AY-102*
- H-2-829165, *TWRS Retrieval Level 1 Logic Waste Feed Delivery HLW 10th - 12th Feed Batches Fourth Tank, 241-C-104*
- H-2-829166, *TWRS Level 0 Logic (2 Sheets)*

Documents

- Acree, C. D., Jr., 1998, *Tank Waste Remediation System Mission Analysis Report*, HNF-SD-WM-MAR-008, Rev. 0, prepared by Lockheed Martin Hanford Corporation for Fluor Daniel Hanford, Inc., Richland, Washington.
- Awadalla, N. G., 1996, *Tank Waste Remediation System (TWRS) Programmatic Risk Management Plan*, WHC-SD-WM-PMP-018, Rev. 1, Westinghouse Hanford Company, Richland, Washington.
- LMHC, 1997, *TWRS Administration*, HNF-IP-0842, Fluor Daniel Hanford, Inc., Richland, Washington.
- Peck, L. G., 1998, *Tank Waste Remediation System Systems Engineering Management Plan*, HNF-SD-WM-SEMP-002, Rev. 1, prepared by Lockheed Martin Hanford Corporation for Fluor Daniel Hanford, Inc., Richland, Washington.

APPENDIX A

**ORGANIZATIONAL POSITIONS RESPONSIBLE
FOR IMPLEMENTATION OF THE
TANK WASTE REMEDIATION SYSTEM
RISK MANAGEMENT PROGRAM**

APPENDIX A

**ORGANIZATIONAL POSITIONS RESPONSIBLE
FOR IMPLEMENTATION OF THE
TANK WASTE REMEDIATION SYSTEM
RISK MANAGEMENT PROGRAM**

Lockheed Martin Hanford Corporation President

Tank Waste Remediation System General Manager

Tank Waste Remediation System Systems Engineering & Integration

Lockheed Martin Hanford Corporation Business Management

Tank Waste Remediation System WBS Level 3 Organizations

Tank Waste Remediation System Waste Storage Manager

Tank Waste Remediation System Waste Disposal Manager

Manager, Tank Waste Remediation System
Management Support Manager

Responsible individuals within Tank Waste Remediation System (TWRS) WBS Level 3 organizations will be specified in Level 3 risk management implementation plans.

APPENDIX B

THE INTEGRATED SAFETY MANAGEMENT SYSTEM

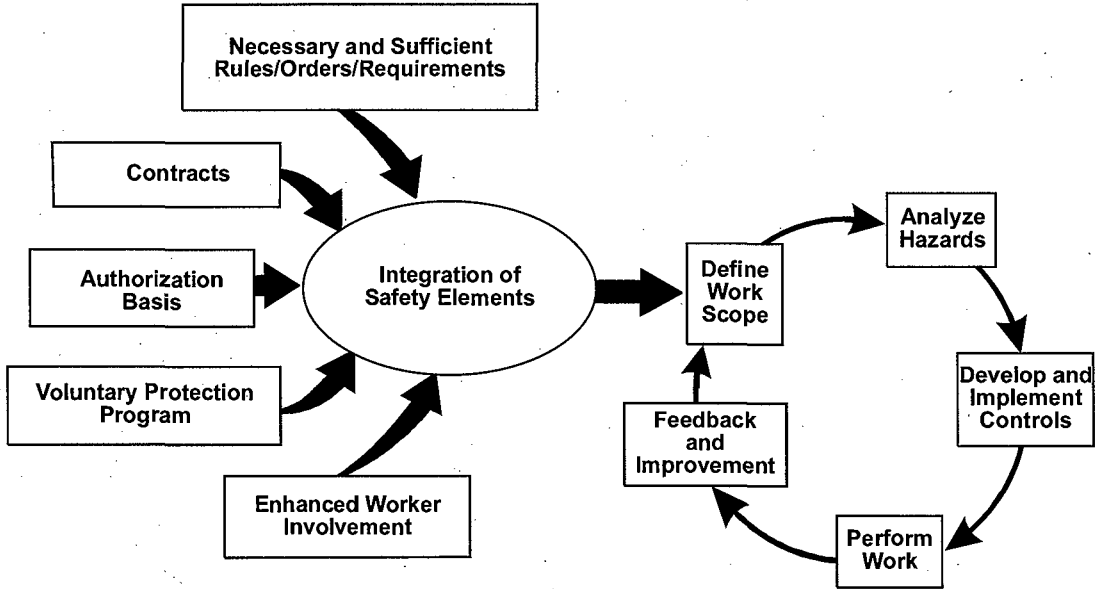
APPENDIX B**THE INTEGRATED SAFETY MANAGEMENT SYSTEM**

Work performed within the Tank Waste Remediation System (TWRS) organization must comply with the standards of the Integrated Safety Management System (ISMS), shown schematically in Figure B-1. The ISMS (HNF-MP-003, *Integrated Environment, Safety and Health Management System Plan* [FDH 1997a]) is the “umbrella” for all other TWRS health and safety systems. The figure illustrates the ISMS and the various standards and safety-related activities that affect TWRS work.

- **Necessary and Sufficient Rules/Orders/Requirements** - This is the collection of rules, orders, and requirements, including regulatory requirements, that govern tank farms operations.
- **Contracts** - These are the Hanford Site contracts and contracting regulations that govern work at the Hanford Site.
- **Authorization Basis** - These documents, such as HNF-SD-WM-BIO-001, *Tank Waste Remediation System Basis for Interim Operation* (FDH 1997b) form the “in-house” controlling documents specifying the rules and restrictions for tank farms operations.
- **The Voluntary Protection Program** - This is an employee-based program involving continual analysis of all Site activities for worker health and safety concerns.
- **Enhanced Worker Involvement** - These activities, such as the job hazards analysis and requirements engineering, are used to involve craft workers in improving the safety and effectiveness of their work efforts.

Figure B-1 also illustrates the process of defining work scope, analyzing the hazards associated with this work scope, implementing controls for those hazards, and developing feedback and improvements based on actual work experience. The ISMS provides many of the standards against which TWRS activities are to be measured. Possible failure to achieve these standards is one source of risk for the TWRS Project.

Figure B-1. The Integrated Safety Management System.



B-2

HNF-SD-WM-PMP-018 Rev 2

HG97110249.42
1753-B1

REFERENCES

Documents

FDH, 1997a, *Integrated Environment, Safety, and Health Management System Plan*,
HNF-MP-003, Rev. 0, Fluor Daniel Hanford, Inc., Richland, Washington.

FDH, 1997b, *Tank Waste Remediation System Basis for Interim Operation*,
HNF-SD-WM-BIO-001, Rev. 0, Fluor Daniel Hanford, Inc., Richland, Washington.

APPENDIX C
CRITICAL RISK LIST FORMAT

APPENDIX C

CRITICAL RISK LIST FORMAT

The following figure is an example of a simplified risk list format for use in presenting critical risks to senior management, U.S. Department of Energy, Richland Operations Office (RL), and others.

Each of the table headings is briefly explained below.

- Assumption or Issue - a statement regarding the technical or programmatic status of the Tank Waste Remediation System Project that, for purposes of planning or enabling, is accepted as being factual.
- Risk - an unwanted event that has some probability of occurring with some level of resulting consequence.
- Mitigating Activities - the interceding actions that are taken to lower the probability of an unwanted event and/or to reduce the severity of the consequences should the unwanted event occur. (Note that no mitigating activities are listed for planning assumptions. Changes to the cost and schedule baseline will be required through Change Control if planning assumptions change.)
- Recommendations - technical or programmatic (contractual) changes that the Project Hanford Management Contract team is requesting that RL consider, to reduce a risk or reduce cost associated with mitigating risk.

Example of Tank Waste Retrieval System Retrieval and Disposal Mission Critical Risk List Table

No.	Title	Assumption or Issue	Risk	Mitigating activities	Recommendations

APPENDIX D

**GUIDANCE AND REQUIREMENTS TO
DELIVERABLES CROSSWALK**

Tank Waste Remediation System Risk Management Plan

TWRS Risk Management Plan - Guidance and Requirements to Deliverables Crosswalk.

Guidance or Requirement	Status	Implementing Location
A.1 DOE Letter to H. J. Hatch, FDH, from W. J. Taylor, DOE, dated August 8, 1997, #9757162A (36 ITEM CHECKLIST)		
15. Technical risks have been identified and are being managed.	I	The Risk Management Plan calls out technical risks (see Table 1). Management is implemented through the Risk List
16. The technical baseline is complete and defensible, and represents best value to the government.	I	Entire Document
21. The ability of the PHMC team to support alternatives other than the baseline has been evaluated from a technical perspective.	I	Entire Document
27. Schedule risk has been identified and is being managed.	I	The TWRS Risk Management Plan calls out schedule risks (see Table 1); Management is implemented through the risk lists
29. The ability to support alternatives other than the baseline has been evaluated from a programmatic perspective.	I	Entire Document
35. A risk and decision management program has been implemented at all levels.	I	Entire Document, TWRS Risk Management Procedure, and decision management through the TWRS Decision Management Procedure
A.2 DOE Letter to H. J. Hatch, FDH, from W. J. Taylor, DOE, dated August 8, 1997, #9757162A (BODY OF TEXT)		
General PHMC Responsibilities from RL's 8/8/97 letter, Section 2.1		
9. A risk management program exists and includes evaluation of performance and reporting of that performance to DOE	I	Program exists per the TWRS Risk Management Procedure and the TWRS Risk Management Plan; Performance evaluation is per Section 2.7 of the TWRS Risk Management Plan.
A.3 DOE Letter H. J. Hatch, FDH, from William J. Taylor, DOE, dated December 2, 1997, #9761291		
5. Provide specific information to address the ten areas in Paragraph 4.2.4 of the August 8 DOE letter of direction		

TWRS Risk Management Plan - Guidance and Requirements to Deliverables Crosswalk.

Guidance or Requirement	Status	Implementing Location
j. Deliver to DOE or make available for DOE review, Draft Program Plans	I	The TWRS Risk Management Plan is available.
B.1 DOE Order 430.1, "Good Practice Guide," GPG-FM-002		
2.3.7 Project Risk Criteria		
1. Risk Assessment	I	Section 2.3 and the TWRS Risk Management Procedure.
2. Risk Management	I	Entire Document and the TWRS Risk Management Procedure
2.4.7 Project Risk Criteria		
1. Risk Assessment	I	Section 2.3 and the TWRS Risk Management Procedure.
2. Risk Management	I	Entire Document and in the TWRS Risk Management Procedure
D.1 Detailed Instructions for Assessment of RTP - Appendix C, November 14, 1997		
19. Describe the PHMC Team's risk management program and show it will be used to support the privatization contractor(s).	I	Entire Document and in the TWRS Risk Management Procedure; TWRS Risk Management Program will support private contractors through minimizing impacts of risks on the TWRS Program
D.2 Plan for Determining PHMC-Team's RTP for Waste Feed Delivery (Table 2).		
PHMC provide deliverables necessary to support RTP, as follows:		
14. Risk Resolution Plan	I	Individual Risk Mitigating Actions and (in some instances) risk action plans for individual risks are shown on the risk lists; see Section 2.6 of the TWRS Risk Management Plan
37. PHMC Team Risk Management Plan	I	Entire Document
D.3 Plan for Determining PHMC-Team's RTP for Waste Feed Delivery - Document Checklist (Table 3)		
42. Plans describe PHMC's M&I activities for the PHMC Tank Waste Division, incl. prog mgmt, EM-30/50 int spt, PBS prog logic/WBS, int with Hanford Mast Baseline Sched, dev. of risk dec. mgmt prog, PHMC Prog Pln, Sys Eng Int Pln, QAPP, & Part B App spt.	I	Entire Document, the TWRS Risk Management Procedure and the TWRS Decision Management Procedure

TWRS Risk Management Plan - Guidance and Requirements to Deliverables Crosswalk.

Guidance or Requirement	Status	Implementing Location
D.7 Draft Plan for Determining RTP for Infrastructure & Byproducts Delivery, Appendix B, Programmatic Baseline Checklist.		
35. Provide schedule risks and identify how schedules are managed to reduce risk. (2.5.1-2.5.7)	I	Entire Document, the TWRS Risk Management Procedure, and specific risks are identified on the risk lists.
D.8 Draft Plan for Determining RTP for Infrastructure & Byproducts Delivery, Appendix C, Infrastructure (Management Baseline) Checklist.		
49. Show that the risk and decision management program is acceptable or is not needed. (1.5.1)	I	Entire Document portrays acceptability of the TWRS risk management program.
D.10 Draft Plan for Determining RTP for Infrastructure & Byproducts Delivery, Appendix E, Infrastructure Feed Tank Transfer (Programmatic Baseline) Checklist.		
79. Provide schedule risks and identify how schedules are managed to reduce risk. (2.5.1-2.5.7)	I	Entire Document, the TWRS Risk Management Procedure, and specific risks are identified on the risk lists.
D.11 Draft Plan for Determining RTP for Infrastructure & Byproducts Delivery, Appendix E, Infrastructure Feed Tank Transfer (Management Baseline) Checklist.		
93. Show that the risk and decision management program is acceptable or is not needed. (1.5.1)	I	Entire Document portrays acceptability of the TWRS risk management program.

References:

- TWRS Risk Management Procedure, WHC-IP-0842, Section 2.6, September 30, 1996.
- TWRS Risk Management Procedure, WHC-IP-0842, Section 2.6, September 17, 1996.
- CRML = Critical Risk Management List.

DISTRIBUTION SHEET

To	From	Page 1 of 1
Document Control Services	TWRS Configuration Management	Date January 3, 1998
Project Title/Work Order		EDT No.
Tank Waste Remediation Systems (HNF-SD-WM-PMP-018)		ECN No. 644861

Name	MSIN	Text With All Attach.	Text Only	Attach./ Appendix Only	EDT/ECN Only
C.D. Acree, Jr	H6-35	X			
J.N. Alibert	S2-48	X			
P.R. Anglier	S7-82	X			
H.L. Boston	G3-21	X			
M.P. Delozier	R2-58	X			
M.D. Ebben	H7-07	X			
J.E. Ferguson	H8-71	X			
K.A. Gasper	H6-37	X			
M.L. Grygiel	H8-71	X			
J.O. Honeyman	G3-21	X			
K.N. Jordan	G3-21	X			
R.A. Kirkbride	H5-27	X			
S.C. Klimper	H6-25	X			
E.E. Mayer	R2-36	X			
D.M. McDaniel	H7-06	3 copies			
R.J. Murkowski	H6-37	X			
S.M. O'Toole	G3-21	X			
M.A. Payne	R2-58	X			
L.G. Peck	H6-35	4 copies			
M.L. Peterman	H7-06	X			
R.W. Powell	H5-03	X			
R.E. Raymond	R2-38	X			
S.H. Rifaey	R1-56	X			
B. Root	G3-21	X			
P.S. Schaus	H5-03	X			
S.E. Seeman	H6-35	X			
S.J. Simon	H7-06	X			
R.L. Treat	H5-03	X			
J.M. Vann	H6-37	X			
J.H. Wicks Jr	H7-07	X			
R.D. Wojtasek	G3-21	X			
B.D. Zimmerman	H6-35	10 copies			
Central Files	B1-07	X			