97-0003189

The Secretary of Energy
Washington, DC 20585

October 8, 1997

The Honorable John T. Conway
Chairman
Defense Nuclear Facilities Safety Board
625 Indiana Avenue, N.W., Suite 700
Washington, D.C. 20004

Dear Mr. Chairman:

We have enclosed for your review a revised implementation plan for Recommendation 92-4. Under the previous plan, the Department developed systems engineering procedures and institutionalized them at a site-wide level. In revising the implementation plan, the Department has described a set of actions that will demonstrate the application of a systems engineering approach at the project level in the Tank Waste Remediation System Program.

As the Department implements this revised plan, we look forward to the involvement of your staff as a means of keeping you informed of our progress.

Sincerely,

Federico Peña

Enclosure

U. S. DEPARTMENT OF ENERGY
PLAN FOR IMPROVING THE
SYSTEMS ENGINEERING APPROACH AND
MANAGEMENT PRACTICES OF
THE HANFORD SITE
TANK WASTE REMEDIATION SYSTEM (TWRS)

August 1997

DNFSB RECOMMENDATION 92-4
IMPLEMENTATION PLAN
REVISION 2N

U.S. DEPARTMENT OF ENERGY
RICHLAND OPERATIONS OFFICE

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DNFSB RECOMMENDATION 92-4 IMPLEMENTATION PLAN
Revision 2

EXECUTIVE SUMMARY

Revision 2 of the Defense Nuclear Facilities Safety Board (DNFSB) Recommendation 92-4 Implementation Plan provides twelve commitments that demonstrate how systems engineering and management improvements are being implemented and institutionalized in the Tank Waste Remediation System (TWRS) Project. The U.S. Department of Energy (DOE) has addressed many of the specific concerns raised in DNFSB Recommendation 92-4. This revision of the Implementation Plan focuses on the following TWRS safety concerns identified by DOE:

1. Design bases need additional definition;

2. Integrated, systematic design basis development needs to be institutionalized;

3. TWRS Privatization projects need more integration with other activities; and

4. Technical qualifications for U.S. Department of Energy, Richland Operations Office (DOE-RL) TWRS technical positions need to be adequately defined, documented, and demonstrated.

Causes identified for the preceding safety concerns include:

1. Insufficient systems engineering skills at the Hanford Site;

2. Inadequate use of systems engineering techniques and data in the TWRS projects;

3. Implementation of systems engineering techniques in the TWRS Project took longer than originally anticipated; and

4. Systems analysis of TWRS plans produced alternative preferred actions, which took additional time to structure and implement.

During Fiscal Year (FY) 1998, TWRS will develop additional guidance documents to address the stated safety concerns. TWRS has selected activities to demonstrate that the systems are institutionalized within TWRS and that the stated safety concerns are resolved.

The DOE-RL Assistant Manager for TWRS, and staff, have the responsibility for completing the commitments in Revision 2 of the Plan. Change control, quality assurance, and semi-annual reporting requirements will keep DNFSB apprised of work progress, forecasts, issues, problems, and corrective actions. This revision of the Plan is based on Revision 2 of the TWRS FY97 Multi-Year Work Plan and assumes the commitments described in the Implementation Plan for DNFSB Recommendation 93-3 will be completed as scheduled in that Work Plan.

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DNFSB RECOMMENDATION 92-4 IMPLEMENTATION PLAN
Revision 2

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1.0 BACKGROUND

Radioactive waste from defense production is stored in 177 large underground tanks at the Hanford Site. Many of these tanks are more than 50 years old and are deteriorating. Consequently, the condition of the tanks raised potentially serious public health and safety issues. In December 1991, the U.S. Department of Energy (DOE) established the Tank Waste Remediation System (TWRS) Project to resolve the waste tank safety issues and remediate the tank waste.

1.1 RECOMMENDATION OF THE BOARD

During 1992, the Defense Nuclear Facilities Safety Board (DNFSB), hereafter referred to as "the Board," reviewed one of the TWRS lower-level projects, the Multi-Function Waste Tank Facility (MWTF). This project was to construct four new tanks to be used to dilute and store waste removed from existing tanks that had priority safety issues. DNFSB Recommendation 92-4 (Attachment A) resulted from the MWTF review and was submitted to the Secretary of Energy on July 6, 1992.

1.2 PAST DOE RESPONSES TO DNFSB RECOMMENDATION 92-4

A summary of DOE's interpretation of the safety concerns identified in DNFSB Recommendation 92-4, includes the following:

1. The design bases are not adequately specified;
2. A project management structure is lacking; and
3. There is a lack of technically qualified personnel within TWRS.

DOE initiated corrective action to address these concerns with the development of the DNFSB Recommendation 92-4 Implementation Plan, Revision 1 (also referred to as "the Plan"). The Plan established an integrated approach to defining, planning, controlling and executing the Hanford Site and TWRS missions. The Plan established both a Site-wide and TWRS systems engineering approach to projects, improvements in program management, and a process for TWRS staff qualification and training.

During the course of fulfilling the Plan's commitments, DOE has made progress in implementing systems engineering at the Hanford Site, and specifically in the TWRS Project. Processes, procedures, and policy have been developed for both the Hanford Site and TWRS systems engineering approaches. Additional efforts are necessary to demonstrate the institutionalization of systems engineering in TWRS and to satisfy the objectives of DNFSB Recommendation 92-4.

The systematic approach initiated by the Plan has created project changes at the Hanford Site. Therefore, it is now appropriate to revise the Plan to more accurately reflect the progress that has occurred at the Hanford Site and in TWRS. Revision 2 of the Plan reinterprets the key safety concerns originally identified by the Board and the actions that will be taken by TWRS over the near-term to resolve the remaining concerns. The overall goals and resolution methods noted in the Plan continue to be applicable.

1.3 SIGNIFICANT CHANGES SINCE PLAN ACCEPTANCE

The U.S. Department of Energy, Richland Operations Office (DOE-RL) acts as the Master Integrator of TWRS activities by planning, requiring and monitoring an integrated, verifiable and risk-reducing use of TWRS resources by TWRS Contractors. As of this date, all of the Hanford Site-specific commitments and 85% of the TWRS Project commitments have been completed. Since the Hanford Site commitments are complete, this revision of the Plan will focus on the efforts to complete the TWRS commitments.

TWRS has now completed:

- Systems Engineering Management Policy, Systems Engineering Management Plan (SEMP), and 13 SEMP Implementing Procedures;
- Ongoing training sessions for technical personnel on systems engineering elements;
- Development of an upper-level TWRS Project logic; and
- Utilization of some systems engineering tools in decision-making.

DOE TWRS has identified several vulnerabilities with institutionalization of systems engineering across TWRS, which include:

- Implementation is limited within and between projects;
- Dissemination of systems engineering techniques needs improvement;
- The TWRS initial Technical Baseline is incomplete; and
- Additional data is needed on some required system engineering tools.

As a result of the development and implementation of the systems engineering approach in the TWRS Project, DOE has modified their interpretation of the safety concerns identified in DNFSB Recommendation 92-4. Therefore, the commitments presented in this revision address the following relevant TWRS safety concerns:

1. Design bases need additional definition;
2. Integrated, systematic design basis development needs to be institutionalized;
3. TWRS Privatization projects need more integration with other activities; and
4. Technical qualifications for TWRS DOE-RL technical positions need to be adequately defined, documented, and demonstrated.

2.0 UNDERLYING CAUSES

The underlying causes leading to the Board's safety concerns and the reasons for the planned actions in this revision of the Plan include the following:

1. Systems analysis and systems engineering skills at the Hanford Site have not reached the level of maturity that furnishes timely and acceptably documented safety analysis and design basis information where needed.

2. Additional effort is still required to ensure adequate use of the properly selected data; technology; safety, health, and design standards and requirements; testing programs; alternatives; cost, schedule and performance development and assurance procedures; and technical baseline information in design basis and management decisions and documents. Acceptable development of these items took much longer than anticipated in the Plan.

3. Organizational realignment, empowerment, and greatly enhanced public involvement processes have increased managerial responsibilities, authority, accountability, and continuity for most TWRS personnel. Improved technical staffing and training have increased the skills, plans, and methodologies used by many TWRS personnel. However, these changes took more time to initiate than originally planned.

4. Training programs for DOE personnel are now being accomplished through the DNFSB Recommendation 93-3 Implementation Plan and in accordance with DOE Order 360.1, as opposed to the schedule delineated in the Plan. TWRS projectization reassignments provided impetus for this integration.

5. Changes in Government policy initiated contract reform initiatives that significantly increased the types of government-contractor project management structures, review relationships, and implementation methodologies used in DOE.

3.0 BASELINE ASSUMPTIONS

Key programmatic assumptions have changed since issuance of the Plan. Assumptions which apply to this revision of the Plan include the following:

1. Revision 2 of the Plan is based on the cost, schedule, technical and performance planning bases described in Revision 2 of the TWRS Fiscal Year (FY) 1997 Multi-Year Work Plan (MYWP), published in October 1996.

2. Due to the MWTF and Aging Waste Transfer Line Projects being canceled, the associated deliverables in the Plan are deleted based on a February 8, 1996, letter from the Secretary of Energy to the Chairman of the DNFSB.

3. TWRS integrated safety management activities will be coordinated by DOE-RL as described in the Project Hanford Management Contract (PHMC) Integrated Safety Management System Plan currently being prepared.

4. DOE will complete its commitments in DNFSB Recommendation 93-3 Implementation Plan as scheduled in the TWRS FY97 MYWP. Data formed and delivered through these plans support completion of the goals and some of the deliverables presented in this revision of the Plan.

5. Delivery dates include up to one month of required DOE review and concurrence for transmittal of each deliverable. DOE will begin to supply deliverables identified in Revision 2 of the Plan upon submittal of the Plan to the Board.

4.0 SUMMARY OF COMPLETED ACTIONS

Attachment B identifies completion of 38 commitments and deletion of three commitments listed in the Plan. The results of the actions taken by DOE and the Contractors at the Hanford Site are also contained in Attachment B. The results demonstrate the substantial measures DOE has taken to institutionalize system engineering approaches and address the safety concerns identified by the Board.

As of this date all Hanford Site-specific and 85% of the TWRS Project commitments have been completed. The process to complete the remaining commitments continues.

5.0 RESOLUTION OF REMAINING CONCERNS

Section 5.0 is organized by the four safety concerns noted in Section 1.3 of this revision to the Plan. This Section identifies the methods Revision 2 of the Plan uses to answer the commitments and safety concerns that are not yet complete or fully addressed. For each safety concern, the concern is described, DOE's intended course of action is noted, the specific safety improvement(s) expected is addressed, and specific commitments with milestones, responsibilities, and deliverables are listed.

5.1 RESTATEMENT OF DNFSB RECOMMENDATION 92-4

Refer to Attachment A for a verbatim restatement of DNFSB Recommendation 92-4.

5.2 KEY SAFETY CONCERNS

DOE will use selected TWRS activities and projects to show that DOE's commitments and goals identified in the Plan regarding the key safety concerns are being met. These activities and projects will demonstrate that applicable systems engineering processes are being practiced throughout TWRS. Documentation defining alternatives TWRS considered, TWRS design bases and adequate consideration of safety standards, safety related items, and safety analyses, as well as other key basis and integration data, will be available for review when the demonstrations are complete.

5.2.1 SAFETY CONCERN #1 — Design bases need additional definition

In 1994, a top-level independent TWRS Systems Requirements Review (SRR) was conducted to validate the TWRS Functions and Requirements Baseline. This review essentially rejected the TWRS High-Level Technical Baseline. An SRR Action Plan was subsequently developed, approved in July 1996, and provided to the Board staff. The SRR Action Plan addressed the disposition of each SRR finding and recommendation, and identified the specific deliverables required to support the satisfactory definition of TWRS system requirements. Systems engineering tools, developed in 1995 by DOE, are now being applied to supply those Baseline deliverables. Tools such as project logic flowsheets and Operations and Maintenance scenarios help highlight and integrate the key functions, requirements, activities, decisions, and milestones needed to complete the TWRS mission. Most of the tools utilized are described in the Hanford Site and TWRS policy and implementing documents, and the TWRS SEMP delivered to DNFSB in 1996 and listed in Attachment B.

All current Hanford Site-specific and TWRS system engineering policies and procedures were prepared in alignment with DOE Order 430.1, "Life Cycle Asset Management (LCAM)." These policies and procedures require a graded approach allowing the systems engineering process to be tailored for each particular effort. The PHMC Management and Integration (M&I) Contractor is currently implementing the policies and procedures developed by DOE-RL and the previous Hanford Contractor. The M&I Contractor and its subcontractors (the PHMC Team) are evaluating these tools, and may develop and use other systems engineering methods that meet the requirements of DOE Order 430.1, as long as they document their changes.

Using these tools, selected, lower-level TWRS Project specifications will be identified and documented down to the end-project level from the TWRS High-Level Technical Baseline data. Traceability from the Technical Baseline through these project specifications will be maintained in a configuration management system. Technologies needed, data used, and alternatives considered will be documented in the system. Memoranda of understanding will document agreements with other projects, and Interface Control Documents (ICDs) will define physical and functional interfaces with other projects. A technical requirements specification applicable to the Double-Shell Tank (DST) Initial Tank Retrieval System project will be developed from a previous TWRS Functions and Requirements Baseline and the noted flowsheets. A Baseline Comparison Report, comparing the technical requirements specification and supporting studies to the Functional Design Criteria for the first tank retrieval system in the Initial Tank Retrieval System Project will be prepared. These two documents will be supplied as selected examples of the lower-level systematic design development activities occurring in TWRS projects. These documents will use a previous, unapproved TWRS Functions and Requirements Baseline and TWRS Systems Engineering Management Plan as their basis at increased risk.

Commitment (a):	*Develop a technical requirements specification for the second and future tank retrieval systems in the TWRS Initial Tank Retrieval System project (Project W-211)*
Responsibility:	*Project Director, TWRS Initial Tank Retrieval System project*
Applicability:	*TWRS*
Deliverable:	*DST system technical requirements specification document applicable to the second and future tank retrieval systems in the Initial Tank Retrieval System project (Project W-211).*
Due Date:	*December 31, 1997*

Commitment (b):	*Provide a Baseline Comparison Report for the first tank retrieval system in the TWRS Initial Tank Retrieval System project (Project W-211)*
Responsibility:	*Project Director, TWRS Initial Tank Retrieval System project*
Applicability:	*TWRS*
Deliverable:	*A Baseline Comparison Report comparing the Functional Design Criteria for the first tank retrieval system in the Initial Tank Retrieval System project (Project W-211) against the DST system technical requirements specification and supporting studies.*
Due date:	*February 28, 1998*

5.2.2 SAFETY CONCERN #2 — Integrated, systematic design basis development needs to be institutionalized

The TWRS SRR described in Section 5.2.1 found that systems engineering is not driving the TWRS Project. TWRS projects now often use systematic approaches, but do this in relative isolation from other TWRS activities. TWRS will implement corrective action to address insufficient integration by developing additional guidelines for TWRS projects.

The following commitment will develop a procedure for translating available TWRS Technical Baseline data into required project design specifications, utilizing the guidelines, procedures, and tools available in the Tank Waste Remediation System. The delivered document will be tried and adjusted as needed.

Commitment (a):	*Provide a procedure for translating TWRS Technical Baseline data into project design specifications*
Responsibility:	*Systems Engineering Lead, TWRS Management Systems Division*
Applicability:	*TWRS*
Deliverable:	*A procedure on how various design specifications are produced for graded project applications using diverse TWRS data environments.*
Due Date:	*December 31, 1997*

Another commitment will develop a measurement scheme (model) for periodically assessing progress in applying specified, graded systems engineering processes on TWRS projects. Included in the scheme will be criteria that enable measurement of improvement of systems engineering processes in TWRS projects.

Commitment (b):	*Create a method for measuring systems engineering implementation in TWRS projects.*
Responsibility:	*Systems Engineering Lead, TWRS Management Systems Division*
Applicability:	*TWRS*
Deliverable:	*A letter report describing the scheme and criteria for measuring progress in implementing defined system engineering activities on TWRS projects.*
Due Date:	*January 31, 1998*

As one demonstration of the institutionalization of systems engineering processes in TWRS, DOE-RL TWRS will apply the criteria used for measuring progress in implementing systems engineering processes (Commitment 5.2.2(b)) to a new TWRS project, the Immobilized Low-Activity Waste Interim Storage Project (Project W-465) at the end of calendar year 1997, and document the basis for significant items found.

Commitment (c):	*Evaluate 1997 systems engineering processes existing on the TWRS Immobilized Low-Activity Waste Interim Storage project (Project W-465) as of December 31, 1997, using the method developed in Commitment 5.2.2(b)*
Responsibility:	*Project Manager, TWRS Immobilized Low-Activity Waste Interim Storage project (Project W-465)*
Applicability:	*TWRS*
Deliverable:	*A letter report providing a comparison of Project W-465 systems engineering processes, existing in calendar year 1997, to the stated criteria, citing reasons for significant findings.*
Due Date:	*April 30, 1998*

DOE-RL TWRS will create a schedule that identifies when initial systems engineering documents for one new project will be formed and made available for initial review. Continuing systems analysis performed primarily during the initial design phases of this project and at all levels of programmatic authority is expected to optimize the tasks to be completed by the project. Thus, changes to this schedule are anticipated, and will be configuration controlled and submitted to DNFSB during planned semi-annual presentations (see Commitment 6.3). The schedule will reflect a graded systems engineering process established by the project from applicable TWRS systems engineering process guidelines, such as, the TWRS SEMP. The schedule will contain dates for producing the first drafts of systems engineering documents applicable to the TWRS Immobilized Low-Activity Waste Interim Storage project (Project W-465) and plan to be developed before detailed project designs are first reviewed. This single project will be a representative example of the institutionalization of systems engineering practices in new projects in TWRS.

Commitment (d):	*Provide a schedule for key initial systems engineering products on the TWRS Immobilized Low-Activity Waste Interim Storage project (Project W-465)*
Responsibility:	*Project Manager, TWRS Immobilized Low-Activity Waste Interim Storage project*
Applicability:	*TWRS*
Deliverable:	*A time-table listing documents to be produced for the TWRS Immobilized Low-Activity Waste Interim Storage project (Project W-465) after initial project authorization but before the first reviews of detailed designs, and scheduled to be initially reviewed within this time frame, which respond to applicable TWRS Systems Engineering Management Policy, TWRS Systems Engineering Management Plan, and TWRS Systems Engineering Implementing Procedures.*
Due Date:	*October 31, 1997*

The Plan supplied an Integrated Technology Development Plan that defined TWRS technology needs. However, a systematic analysis of DOE technology needs indicated that project needs could be more effectively satisfied through a DOE complex-wide technology needs evaluation and deployment system. Documentation explaining the complex-wide approach has been supplied to the DNFSB. The following commitment provides the technology needs integration occurring for TWRS projects in FY98.

The DOE-RL TWRS FY98 MYWP will contain a listing of technology development activities applicable to TWRS, regardless of funding source.

Commitment (e):	*Provide applicable sections of the TWRS FY98 Multi-Year Work Plan that reflect technology development activities for TWRS*
Responsibility:	*Division Director, TWRS Management Systems Division*
Applicability:	*TWRS*
Deliverable:	*TWRS FY98 MYWP (relevant sections)*
Due Date:	*December 31, 1997*

5.2.3 - SAFETY CONCERN #3 — TWRS Privatization Projects need more integration with other activities

On September 25, 1996, contracts were awarded to two Contractors for an initial effort to process the high-level tank waste, involving the separation of the high-level waste fraction and the production of a low-activity waste form suitable for disposal. The Privatization Contractors will be responsible for creating a portion of the physical system that constitutes TWRS and for performing a portion of the TWRS scope of work. Privately owned facilities and privately owned technologies and processes will be the basis of the physical system. The Contractors are responsible under the terms and conditions of the contract for: (1) achieving adequate safety; (2) complying with applicable laws and legal requirements; and (3) conforming with top-level safety standards and principles stipulated by DOE in DOE/RL-96-0006, *Top-Level Radiological, Nuclear, and Process Safety Standards and Principles for TWRS Privatization Contractors.*

Responsibility for technical and business management of the TWRS Privatization Contractors is separated from the organizations responsible for protecting the safety and health of the workers and public. DOE-RL TWRS Waste Disposal Division coordinates all technical, logistics, and systems interfaces necessary to support plant operations, and assists with integration of business and management interactions. The TWRS Waste Disposal Division will not directly manage any of the operations of the privately-owned facilities.

The full responsibility for regulating the radiological, nuclear, and process safety of the TWRS Privatization Contractors is assigned to the Office of Radiological, Nuclear, and Process Safety Regulation (known as the "Regulatory Unit"), which is completely independent of the technical, production, procurement and business aspects of the contracts. The Regulatory Unit reports directly to the Manager, DOE-RL, and will institute a safety and health protection approach that is well structured, staffed by fully qualified and experienced personnel, and is disciplined in its operation. The single focus of the Regulatory Unit is the safety and health protection of the workers and public.

DOE-RL, through the PHMC Team, is responsible for the storage, retrieval, transfer, delivery, and receipt of radioactive waste, and the disposal of Low Activity Waste. A description of the present DOE project management structure for TWRS and the Regulatory Unit is included in Attachment D.

Although DOE found the risks in this privatization initiative to be lower than those using the DOE waste processing method described in the Plan, DOE-RL lowered risks further by instituting risk mitigation activities. Alternate contracting, financing, integration, and staffing paths were planned and criteria developed for implementation. These alternatives were provided to DNFSB staff in Spring 1997.

The TWRS Waste Disposal Division forms interfaces between the PHMC Team and Privatization Contractors through contract elements known as Interface Descriptions. Twenty-two Interface Descriptions are included in the contracts, which define primary inputs and outputs required by both DOE -- through the PHMC Team -- and the TWRS Privatization Contractors. During Privatization Phase I, Part A performance, the Privatization Contractors, DOE, and the PHMC Team will develop ICDs detailing the responsibilities and requirements described in the Interface Descriptions. During Privatization Phase I, Part B, DOE-RL, as Master Integrator of TWRS activities, will utilize the finalized ICDs to establish the necessary technical integration between the treatment and immobilization projects (the privatized work) and the other projects within TWRS and the Hanford Site.

Commitment (a):	*DOE will provide three Interface Control Documents for TWRS Privatization*
Responsibility:	*Division Director, TWRS Waste Disposal Division*
Applicability:	*TWRS*
Deliverable:	*a -- Interface Control Document: Immobilized High-Level Waste* *b -- Interface Control Document: Low-Activity Waste Feed* *c -- Interface Control Document: High-Level Waste Feed*
Due Date:	*February 28, 1998*

DOE will conduct an evaluation of the Privatization Contractors' ability to meet technical and safety requirements. The results of this evaluation will be documented in a letter report as part of the Phase 1, Part B, Authorization to Proceed. This evaluation will be another example of an integrated, systematic approach used to establish technical and safety requirements and regulate TWRS Privatization Contractors in the TWRS Privatization initiative.

Commitment (b):	*DOE-RL will provide a letter report for the Authorization to Proceed (Phase 1, Part B) for the TWRS Privatization Contractors*
Responsibility:	*Division Director, TWRS Waste Disposal Division*
Applicability:	*TWRS*
Deliverable:	*A letter report notifying the Contracting Officer of the adequacy of the Privatization Contractors' technical and safety requirements as defined in Contract Numbers DE-AC06-96RL13308 and DE-AC06-96RL13309, dated September 1996.*
Due Date:	*June 30, 1998*

DOE-TWRS will develop criteria to assess whether the Authorization Agreements between the Privatization Contractors, the PHMC Team and DOE, are integrated sufficiently to ensure safety will be maintained during transfer of equipment and materials for Privatization (e.g., Tanks 241-AP-106 and 241-AP-108). The intent of developing the criteria is to enable evaluation of the Authorization Agreements at the interface points to the Privatization Contractors' Authorization Bases. Note: This is not an interface control document, since it deals with a management system.

Commitment (c):	*Develop criteria to assess whether Privatization Contractors' and Non-Privatized Contractors' Authorization Agreements are adequately integrated*
Responsibility:	*Division Director, Safety and Characterization Division*
Applicability:	*TWRS*
Deliverable:	*Letter report identifying the criteria of acceptability for the Authorization Agreements among DOE, the Privatization Contractors, and the non-Privatized Contractors (PHMC Team).*
Due Date:	*July 31, 1998*

5.2.4 SAFETY CONCERN #4 — Technical qualifications for DOE-RL TWRS technical positions need to be adequately defined, documented, and demonstrated

The existing qualification program for DOE-RL TWRS technical personnel is based on the DOE Technical Qualification Program implemented in response to DNFSB Recommendation 93-3. A DOE-RL TWRS final staffing analysis is still required to determine the need for specific knowledge, skills and abilities, and position-specific training and personnel adjustments for its staff. This effort has been delayed due to prior DOE and TWRS reorganizations required to support projectization.

The DOE-RL TWRS final staffing analysis is in progress and includes the derivation of position-specific knowledge, skills, and abilities requirements from the TWRS mission, functions, and responsibilities, as well as the identification of knowledge, skills, and abilities of existing personnel using job task analysis techniques. These data sets will be compared, differences noted, and the results evaluated and used to determine the position-specific training and adjustments necessary for DOE-RL TWRS personnel. A process is being designed to provide senior management a mechanism to enhance recruitment, retention, and performance management of DOE-RL TWRS technical personnel. Some details of these processes are available in the DNFSB Recommendation 93-3 Implementation Plan, and are not further discussed here.

Commitment:	*Provide a Final Staffing Analysis, including DOE-RL TWRS position specific profiles based on DNFSB Recommendation 93-3 Implementation Plan qualification standards*
Responsibility:	*Training Manager, TWRS*
Applicability:	*TWRS*
Deliverable:	*Final Staffing Analysis Report for DOE-RL TWRS technical personnel*
Due Date:	*September 30, 1997*

6.0 ORGANIZATION AND MANAGEMENT

6.1 ORGANIZATION

The DOE-RL Assistant Manager, Office of TWRS, has the responsibility for managing the completion of the commitments in this revision of the Plan. The DOE-RL Director of the TWRS Management Systems Division has been assigned by the Assistant Manager, Office of TWRS, as the TWRS working representative in this area. DOE-RL TWRS managers have the authority to develop, negotiate, and review goals, activities, and incentives for Contractors to ensure proper prioritization of commitments in Revision 2 of the Plan and to delegate these activities to members of their staff.

6.2 CHANGE CONTROL

Complex, long-range plans require sufficient flexibility to accommodate changes in commitments, actions, or completion dates that may be necessary due to additional information, improvements, or changes in baseline assumptions. DOE's policy is to:

1. Bring to the Board's attention any substantive changes to this revision of the Plan as soon as identified and prior to the passing of the milestone date;

2. Have the Secretary of Energy approve all revisions to the scope and schedule of Plan commitments; and

3. Clearly identify and describe the revisions, and bases for the revisions.

Fundamental changes to this Plan's strategy, scope, or schedule will be provided to the Board through formal revision of the Plan. Other changes to the scope or schedule of Plan commitments will be formally submitted to the Board by the Secretary of Energy in appropriate correspondence, along with the basis for the changes and appropriate corrective actions.

6.3 REPORTING

DOE's policy is to assure that the various DOE implementing elements and the Board remain informed of progress toward implementation of Revision 2 commitments, and to provide periodic progress reports. DOE will provide a semi-annual verbal progress report to the Board to document status and progress toward completing identified commitments, until the DNFSB Recommendation 92-4 is closed. Highlights of work, deliverables, forecasts, issues, and progress toward completing commitments will be discussed.

DOE will also make a one-time presentation to the Board on the technical and safety deliverables provided by the TWRS Privatization Contractors, during the second quarter of FY98.

The following commitment responds to the above requirements.

Commitment:	*Provide semi-annual verbal presentation of progress on DNFSB Recommendation 92-4 Implementation Plan, Revision 2, commitments to the Board until the Recommendation is closed. Provide a one-time presentation on the Privatization Contractor's technical and safety submittals*
Responsibility:	*Assistant Manager, TWRS*
Applicability:	*TWRS*
Deliverables:	*(1) Semi-annual briefings*
	(2) One-time presentation to the Board on DOE evaluation of Privatization Contractor submittals for technical and safety requirements.
Due Date:	*(1) November and May of each year until the Plan is closed*
	(2) March 1998

6.4 QUALITY ASSURANCE

TWRS maintains a master working file by commitment/deliverable number. The file contains all documents and correspondence detailing commitments, commitment changes, acceptance criteria, commitment verification results, independent audit results, reviews, concurrences, and approvals. An independent audit of the overall Plan process, as it relates to controlling and completing scheduled commitments, is accomplished periodically by DOE-RL organization(s) not directly involved in the commitment resolution process.

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DNFSB RECOMMENDATION 92-4 IMPLEMENTATION PLAN
Revision 2

Attachment A

Verbatim Restatement of DNFSB Recommendation 92-4
(July 6, 1992)

As required by the Atomic Energy Act, the Defense Nuclear Facilities Safety Board (DNFSB) conducts reviews and evaluations of the design of new Department of Energy defense nuclear facilities before and during their construction. Under this statute, the DNFSB is also required to recommend to the Secretary of Energy, within a reasonable time, such modifications of the design as the DNFSB considers necessary to ensure adequate protection of public health and safety.

The Board has performed reviews of the Multi-Function Waste Tank Facility (MWTF) project to be located at the Hanford Site in the State of Washington. The MWTF is an element of the Hanford Tank Waste Remedial System (TWRS) Program which eventually will provide for the ultimate treatment and disposal of the Hanford Site tank waste. We have reviewed information received in the form of briefings and presentations by DOE Headquarters personnel, DOE Richland personnel, Westinghouse Hanford Company personnel, and Kaiser Engineers Hanford personnel as well as analysis of relevant documents. The Board's reviews to date have been concerned with such matters as the application of standards, including DOE orders and directives, and commercial nuclear industry practices as well as other aspects of the project which relate to ensuring adequate protection of the health and safety of the public.

The conceptual design of the MWTF Project is now nearing completion. The Board believes that it is appropriate at this time to assure that the design of the MWTF and other new defense nuclear facilities incorporates engineering principles and approaches, detailed engineering criteria, and practices that are essential to ensure adequate protection of public health and safety. These include:

- The design needs to be appropriately conservative with respect to safety.
- The design bases (criteria) need to be clearly defined, coherent, and compatible with the facilities' perceived lifetime functions (i.e., Functional Design Criteria) and documented.
- The design bases and the resulting facility design need to reflect and incorporate the requirements of appropriate standards as that term is used in the Board's enabling statute and thus including DOE orders and directives and commercial nuclear practices, as well as any other factors that may be required for the safe and reliable operation of the facility throughout its entire life.
- The design, construction, and start-up activities need to be performed by those who will ensure the completed project is of the quality necessary to provide adequate protection of public health and safety.

- The design effort needs to be organized such that there is continuity through all phases (conceptual design, preliminary design, final design, construction, testing...) so that all aspects of the process that affect safety are clearly delineated and that line responsibility is clear.

- The DOE organization responsible for the project needs to have technically qualified personnel in numbers sufficient to provide direction and guidance to Contractors performing all phases of the effort and to assess the effectiveness of Contractor efforts.

- The project organization and operations need to reflect a clear and effective chain of command with responsibility, authority, and accountability clearly defined and assigned to individuals within the respective project organizations.

- The functions and responsibilities of all DOE and Contractor organizations involved in the project need to be delineated in writing in a single document.

The Board's view of the Hanford MWTF's conceptual design performed to date is that the design does not clearly present and delineate those aspects that ensure that the public health and safety can adequately be protected. In particular, the MWTF appears to be a project (1) without a well-defined mission or functional requirements (e.g., waste treatment or storage), (2) predetermined to consist of four one-million-gallon tanks regardless of their intended uses, and (3) managed without sufficient regard for technical issues and engineering involvement. The continuing phases of the design and construction are about to begin and the Board seeks to be assured that the design of the tanks as they are built incorporates the appropriate levels of nuclear safety. Further, the Board recognizes that many of the nuclear safety concepts and assurances would normally be provided in the series of facility Safety Analysis Reports and would include design bases, safety system analyses, analysis methods and accident analyses. However, to ensure that appropriate nuclear safety characteristics are included in the design efforts, the Board recommends the following to the Secretary of Energy:

1. Establish a plan and methodology that results in a project management organization for the MWTF Project team that assures that both DOE and the Contractor organization have personnel of the technical and managerial competence to ensure effective project execution. This should emphasize management aspects of the project necessary to ensure adequate protection of public health and safety and should include the integration of professional engineering and quality assurance as necessary into the project, the application of appropriate standards and approved Department of Energy requirements, and the establishment of clear lines of responsibility and accountability.

2. Identify the design bases and engineering principles and approaches for the MWTF Project that provide the data and rationale to show that the design for the MWTF conservatively meets the quantitative safety goals described in the Departments' Nuclear Safety Policy (SEN-35-91). The Board believes that this would include items related to standards, identification of safety related items, detailed design bases, functional design criteria, and safety analyses.

DNFSB RECOMMENDATION 92-4 IMPLEMENTATION PLAN
Revision 2

Attachment B

Summary Status of DNFSB Recommendation 92-4 Implementation Plan, Revision 1 -- Commitments and Completed Actions

The commitments identified in the Plan have been completed, superseded, or deleted as identified in Table B.1. In addition to the specific commitments in the Plan, TWRS and the Hanford Site have accomplished a significant number of other activities that demonstrate the institutionalization of systems engineering, including the following.

- The concept of DOE-RL as Master Integrator of TWRS was developed and implemented.
- DOE-RL modified existing Hanford Site and TWRS contractual relationships, further strengthening DOE-RL's role as Master Integrator.
- TWRS "projectized" all projects, assigning a hierarchy of TWRS personnel clear responsibility and authority for satisfying every aspect of the TWRS mission.
- DOE-RL implemented an ongoing recruiting program to upgrade the overall technical and managerial competence of its staff including excepted service positions.
- Analysis, selection, training, and documentation of competency of TWRS Contractor personnel occur annually in accordance with DOE Order 5480.20A, through a subprocess in the MYWP development.
- Recruitment, retention, and performance enhancement of DOE technical staff occurs per the DOE Administrative Flexibilities Guide and the Implementation Plan for DNFSB Recommendation 93-3.
- Ongoing training of TWRS personnel on systems engineering methods is occurring.
- Hanford Site MYWPs are developed using data from the Site Technical Baseline as described in the Site System Engineering Implementing Directive.
- The PHMC Team developed and utilized a TWRS Project logic to determine whether necessary and sufficient activities are being performed or planned and placed in the TWRS MYWP.
- TWRS design bases now include a documented Mission Analysis, Basis for Interim Operations, Environmental Impact Statement, and a Functions and Requirements Baseline.
- A fully integrated Safety Management Program is being implemented at the Hanford Site and in TWRS.
- TWRS projects include active risk management, alternative comparisons, and contingency planning -- all intended to reduce risks over time.
- TWRS utilizes a decision management process being standardized in TWRS.

- Over $750 Million of planned TWRS project costs have been eliminated through the projects' use of systems engineering techniques.

- Systems analysis is used to develop PHMC Team and Privatization Contractor contract terms, safety and technical deliverables, and interfaces.

- Integrated Product/Process Teams develop interfaces between the Privatization Contractors and the PHMC Team.

Table B.1 -- DNFSB Recommendation 92-4 Implementation Plan, Revision 1, -- Completed, Deleted, or Superseded Commitments

Commitment Number	*Commitment Description*	*Status*	*Revision 2 Reference*
2.2.a	(1) Draft Hanford Site Functions and Requirements (January 1, 1994) and Addenda I, 2, & 3 (2) Draft Architecture Synthesis Basis for the Hanford Cleanup System (3) Draft Systems Engineering Product Description Report for the Hanford Cleanup Mission	Complete	
2.2.b(1)	Systems Engineering Implementation Plan based on FY 1995 Multi-Year Program Plan (MYPP) logic and planning for the Hanford Site	Complete	
2.2.b(2)	Letter of direction to affected Hanford Site participants to include use of systems engineering in accordance with DOE policy to develop the technical baselines that will be used as the basis for Multi-Year Work Plan updates	Complete	
2.4.a	Initial TWRS Systems Analysis Report reflecting the systems engineering work done to October 31, 1993	Complete	
2.4.b	TWRS Preliminary Functional Analysis Report	Complete	
2.4.c	TWRS Top-Level SRR Report	Complete	
2.4.d	TWRS Project Technical Requirements Review Report	Superseded	Commitment 5.2.1(a)
2.4.e	MWTF Project Baseline Comparison Report	Deleted - Project Canceled	
2.4.f	MWTF Project Independent Critical Design Review Report	Deleted - Project Canceled	
2.4.g	Aging Waste Transfer Line Project Baseline Comparison Report	Deleted - Project Canceled	
2.4.h	Cross-Site Transfer Line Project Baseline Comparison Report	Complete	
2.4.i	Initial Retrieval Demonstration Baseline Comparison Report	Superseded	Commitment 5.2.1(b)

Commitment Number	Commitment Description	Status	Revision 2 Reference
2.4.j	Initial Pretreatment Module Baseline Comparison Report	Superseded	Commitment 5.2.3(b)
2.4.k	Project Independent Design Review Schedule Dates	Superseded	Commitment 5.2.2(b)
2.4.l	Summary Report for each Stand-down Review	Complete	
3.2.a	TWRS Integrated Technology Plan	Completed; Revised	Commitment 5.2.2(e)
3.3.a	DOE-RL and Hanford Contractor Staff Qualification and Training Process (refer to DNFSB Recommendation 93-3, commitment 4.3)	Complete	
3.3.b	Hanford Performance-Based Training and Qualification Process (Refer to DNFSB Recommendation 93-3, commitment 4.3)	Complete	
3.3.c	DOE-RL Qualification and Training Evaluation and Assessment Process	Complete	
3.3.d	Report of Independent Assessment of DOE-RL and Contractor TWRS Qualification/Training Process	Complete	
3.4.a	DOE-HQ (EM-36) Preliminary Staff Analysis Report	Complete	
3.4.b	DOE-RL TWRS Preliminary Staff Analysis Report	Complete	
3.4.c	DOE-HQ (EM-36) Individual Development Plans	Complete	
3.4.d	DOE-RL TWRS Training Requirements Matrix Plans	Complete	
3.4.e	DOE-RL TWRS Orientation Report documenting status and initiation of orientation	Complete	
3.4.f	DOE-HQ (EM-36) Orientation Report documenting status and initiation of orientation	Complete	
3.4.g	Final Staffing Analysis Report for DOE-HQ and DOE-RL TWRS personnel	Open	Commitment 5.2.4
3.4.h	Report documenting completion of required technical training identified in Individual Development Plans (DOE-HQ) and Training Requirements Matrices (DOE-RL)	Open	Covered under DNFSB Recommendation 93-3 IP
3.5.a	Contractor TWRS Staffing Analysis and Contractor Position Qualification Standards	Complete	
3.5.b	Contractor TWRS Individual Qualification and Training Plans	Complete	
3.5.c	Contractor TWRS Selection Process Report documenting status and completion	Complete	
3.6.a	Hanford Site Management System Directives	Complete	
3.6.b	TWRS Management Systems Description Document and Policy Annexes	Complete	
3.6.c	Schedule to develop and issue Contractor TWRS Management Plan and associated documents	Complete	

Commitment Number	*Commitment Description*	*Status*	*Revision 2 Reference*
3.7.a	TWRS Industry/Government Standards Review Report	Complete	
3.7.b	A letter report summarizing comparisons of DOE and Department of Defense (DOD) systems engineering approaches	Complete	
3.7.c	DOE-FM Report on DOD Systems Engineering Standard Review	Complete	
3.7.d	Draft Hanford Site Systems Engineering Management Plan	Complete	
3.7.e	Final Hanford Site Systems Engineering Management Plan	Complete	
3.7.f	Develop and issue Draft Hanford Site Systems Engineering Management Plan and Implementing Procedures	Complete	
3.7.g	Draft TWRS Systems Engineering Management Plan	Complete	
3.7.h	TWRS Systems Engineering Management Plan Implementing Procedures	Complete	
3.7.i	Revised TWRS Systems Engineering Management Plan	Complete	
3.8.a	Draft TWRS Configuration Management Plan	Complete	
3.9.a	TWRS Multi-Year Work Plan	Complete	
3.10.a	TWRS Total Quality Management Policy Annex	Complete	
3.10.b	TWRS Health and Safety Management Policy Annex	Complete	
4.a	Quarterly Status Reports	Open	Modified to semi-annual briefings in Commitment 6.3
5.a	Revised DNFSB Recommendation 92-4 Implementation Plan	Superseded	Commitment 6.3
5.b	Discussions in Quarterly Status Reports	Superseded	Commitment 6.3

DNFSB RECOMMENDATION 92-4 IMPLEMENTATION PLAN
Revision 2
Attachment C
Table C.1 -- Summary of DNFSB Recommendation 92-4 Implementation Plan, Revision 2, Commitments

Commitment Number	*Commitment Description*	*Responsibility*	*Applicability*	*Deliverable*	*Due Date*
5.2.1(a)	Develop a technical requirements specification for the second and future tank retrieval systems in the TWRS Initial Tank Retrieval System project (Project W-211)	Project Director, TWRS Initial Tank Retrieval System project	TWRS	DST system technical requirements specification document applicable to the second and future tank retrieval systems in the Initial Tank Retrieval System project (Project W-211).	December 31, 1997
5.2.1(b)	Provide a Baseline Comparison Report for the first tank retrieval system in the TWRS Initial Tank Retrieval System project (Project W-211)	Project Director, TWRS Initial Tank Retrieval System project	TWRS	A Baseline Comparison Report comparing the Functional Design Criteria for the first tank retrieval system in the Initial Tank Retrieval System project (Project W-211) against the DST system technical requirements specification and supporting studies.	February 28, 1998
5.2.2(a)	Provide a procedure for translating TWRS Technical Baseline data into project design specifications	Systems Engineering Lead, TWRS Management Systems Division	TWRS	A procedure on how various design specifications are produced for graded project applications using diverse TWRS data environments.	December 31, 1997
5.2.2(b)	Create a method for measuring systems engineering implementation in TWRS projects	Systems Engineering Lead, TWRS Management Systems Division	TWRS	A letter report describing the scheme and criteria for measuring progress in implementing defined system engineering activities on TWRS projects.	January 31, 1998

5.2.2(c)	Evaluate 1997 systems engineering processes existing on the TWRS Immobilized Low-Activity Waste Interim Storage project (Project W-465) as of December 31, 1997, using the method developed in Commitment 5.2.2(b)	Project Manager, TWRS Immobilized Low-Activity Waste Interim Storage project (Project W-465)	TWRS	A letter report providing a comparison of Project W-465 systems engineering processes, existing in calendar year 1997, to the stated criteria, citing reasons for significant findings.	April 30, 1998
5.2.2(d)	Provide a schedule for key initial systems engineering products on the TWRS Immobilized Low-Activity Waste Interim Storage project (Project W-465)	Project Manager, TWRS Immobilized Low-Activity Interim Waste Storage project	TWRS	A time-table listing documents to be produced for the TWRS Immobilized Low-Activity Waste Interim Storage project (Project W-465) after initial project authorization but before the first reviews of detailed designs, and scheduled to be initially reviewed within this time frame, which respond to applicable TWRS Systems Engineering Management Policy, TWRS Systems Engineering Management Plan, and TWRS Systems Engineering Implementing Procedures.	October 31, 1997
5.2.2(e)	Provide applicable sections of the TWRS FY98 Multi-Year Work Plan that reflect technology development activities for TWRS	Division Director, TWRS Management Systems Division	TWRS	TWRS FY98 MYWP (relevant sections)	December 31, 1997
5.2.3(a)	DOE will provide three Interface Control Documents for TWRS Privatization	Division Director, TWRS Waste Disposal Division	TWRS	a -- Interface Control Document: Immobilized High-Level Waste b -- Interface Control Document: Low-Activity Waste Feed c -- Interface Control Document: High-Level Waste Feed	February 28, 1998

5.2.3(b)	DOE-RL will provide a letter report for the Authorization to Proceed (Phase 1, Part B) for the TWRS Privatization Contractors	Division Director, TWRS Waste Disposal Division	TWRS	A letter report notifying the Contracting Officer of the adequacy of the Privatization Contractors' technical and safety requirements as defined in Contract Numbers DE-AC06-96RL13308 and DE-AC06-96RL13309, dated September 1996.	June 30, 1998
5.2.3(c)	Develop criteria to assess whether Privatization Contractors' and Non-Privatized Contractors' Authorization Agreements are adequately integrated at interface points	Division Director, TWRS Safety and Characterization	TWRS	Letter report identifying the criteria of acceptability for the Authorization Agreements at the interface points between the Privatization Contractors and the DOE-Regulatory Unit, and the non-Privatized Contractors (PHMC Team) and the DOE-Management Systems Division.	July 31, 1998
5.2.4	Provide a Final Staffing Analysis, including DOE-RL TWRS position specific profiles based on DNFSB Recommendation 93-3 Implementation Plan qualification standards	Training Manager, TWRS	TWRS	Final Staffing Analysis Report for DOE-RL TWRS technical personnel.	September 30, 1997
6.3	Provide semi-annual verbal presentation of progress on DNFSB Recommendation 92-4 Implementation Plan, Revision 2, commitments to the Board until the Recommendation is closed. Provide a one-time presentation on the Privatization Contractors' technical and safety submittals	Assistant Manager, TWRS	TWRS	(1) Semi-annual briefings (2) One-time presentation to the Board on DOE evaluation of Privatization Contractor submittals for technical and safety requirements. This presentation may substitute for one semi-annual briefing.	(1) November and May of each year until the Plan is closed (2) March 1998

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Attachment D

Hanford Site and TWRS - Current Project Management Structure

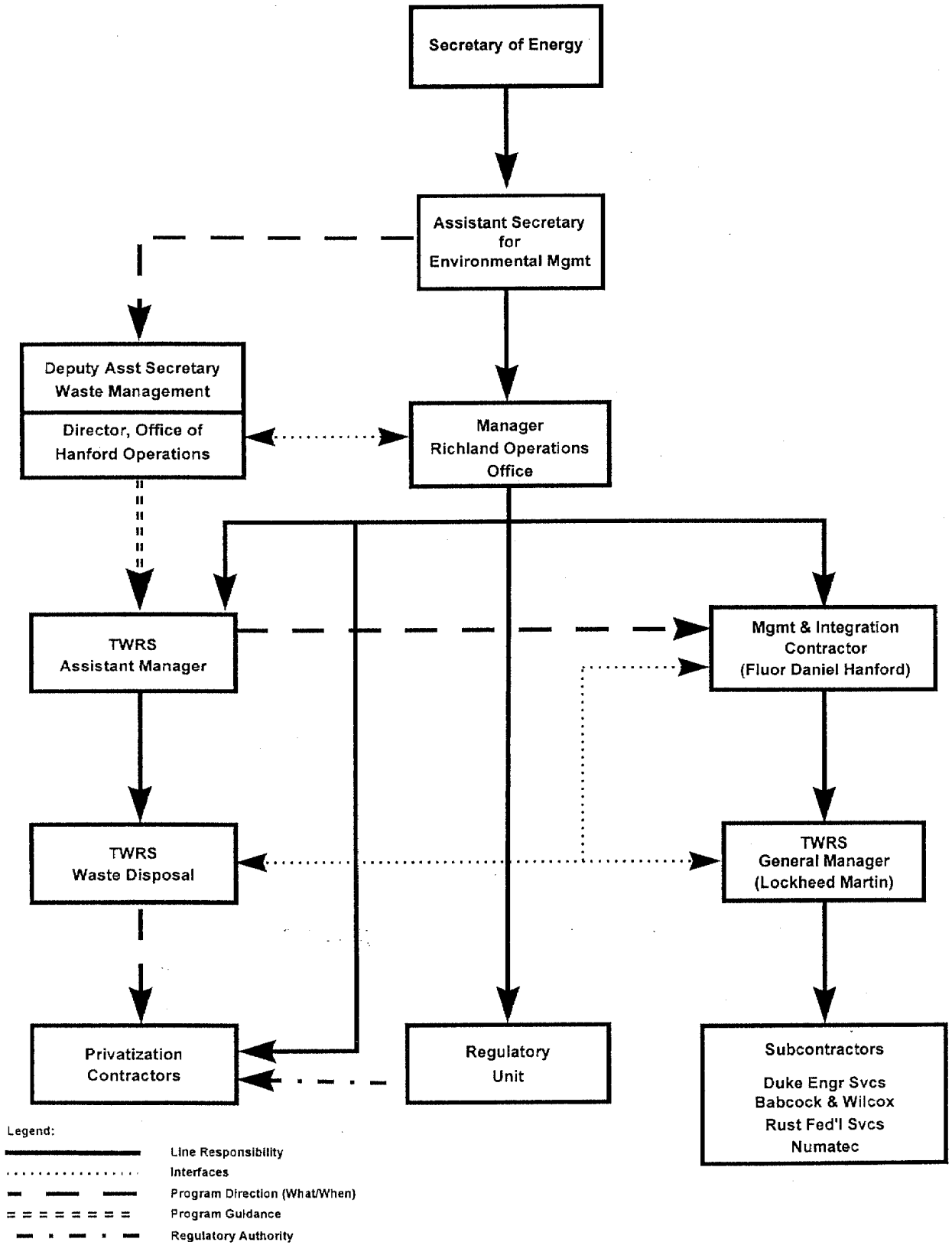
DNFSB Recommendation 92-4 identified the need for improvement in establishing clear lines of responsibility, authority, and accountability for the MWTF Project. As noted in Section 1.0 and Attachment B, actions were taken to resolve the safety concerns in these areas; therefore, no further management structure commitments are necessary.

Two events affecting the Hanford Site and TWRS management structures recently occurred and are receiving continued management attention. These events were the reorganization of the Hanford Site Contractor reporting relationships and the TWRS privatization initiative, both resulting from contract reform. As part of the privatization initiative, key facilities supporting some TWRS goals will be assigned, constructed, owned, and operated by private contractors. Of paramount importance in both cases are the management structure and oversight processes that must be in place to assure effective communication, control where appropriate, and the achievement of DOE goals.

On October 1, 1996, the Hanford Site Contractor reporting relationships were significantly changed as a result of DOE's contract reform initiative. Under the current PHMC, DOE-RL provides specific direction on program goals and objectives (the what and when) to the PHMC Team. The M&I Contractor, a leader in complex system development and integration, working with its "best-in-class" subcontractors, determines the means of accomplishing the work (the who and how) to meet DOE's goals and objectives. DOE-RL acts as the Master Integrator of all TWRS work, ensuring contractually that risks are continually being reduced in an integrated, verifiable way.

Figure D-1 identifies the TWRS lines of authority from the U.S. Department of Energy-Headquarters (DOE-HQ) to the M&I Contractor and its subcontractors responsible for TWRS Project activities. This figure shows that a clear line of responsibility and accountability exists and flows down from the Secretary of Energy through the Assistant Secretary for Environmental Management, the DOE-RL Manager and TWRS Assistant Manager, the M&I Contractor (Fluor Daniel Hanford, Inc.), the TWRS prime subcontractor (Lockheed Martin Hanford Corp.), and the major supporting subcontractors. In the case of the projects associated with the TWRS Privatization Initiative, the Contractors selected are directly responsible to DOE-RL's Waste Disposal Division under the Assistant Manager for TWRS, for performance of their technical and business work. For radiological, nuclear, and process safety, the Privatization Contractors are responsible to the Regulatory Unit.

Figure D-1. Programmatic Lines of Authority.



DNFSB RECOMMENDATION 92-4 IMPLEMENTATION PLAN
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Attachment E

Acronyms and Abbreviations

DOE	U.S. Department of Energy
DOE-EM	U.S. Department of Energy, Office of Environmental Management
DOE-HQ	U.S. Department of Energy, Headquarters
DOE-RL	U.S. Department of Energy, Richland Operations Office
DOD	Department of Defense
DNFSB	Defense Nuclear Facilities Safety Board or the "Board"
DST	Double-Shell Tank
FY	Fiscal Year
ICD	Interface Control Document
LCAM	Life Cycle Asset Management
M&I	Management and Integration
MWTF	Multi-Function Waste Tank Facility
MYPP	Multi-Year Program Plan
MYWP	Multi-Year Work Plan
PHMC	Project Hanford Management Contract
SEMP	Systems Engineering Management Plan
SEN	Secretary of Energy Notice
SRR	Systems Requirements Review
TWRS	Tank Waste Remediation System

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Attachment F

References

Administrative Flexibility Guide, "Recruiting, Hiring, and Retaining High Quality Technical Staff: A Manager's Guide to Administrative Flexibilities," U.S. Department of Energy, Office of Human Resources, November 1996.

Contract Number DE-AC06-96RL13308, *TWRS Privatization Contract: Lockheed Martin Advanced Environmental Systems,* U.S. Department of Energy, Richland Operations Office, September 25, 1996.

Contract Number DE-AC06-96RL13309, *TWRS Privatization Contract: BNFL Incorporated,* U.S. Department of Energy, Richland Operations Office, September 25, 1996.

DNFSB Recommendation 93-3, *Improving DOE Technical Capability in Defense Nuclear Facilities Programs*, Defense Nuclear Facilities Safety Board, June 8, 1993.

DOE/RL-92-61, Revision 1, *Tank Waste Remediation System Integrated Technology Plan (ITP)*, U.S. Department of Energy, Richland Operations Office, Draft, April 15, 1994.

DOE/RL-96-0006, Revision 0, *Top-Level Radiological, Nuclear, and Process Safety Standards and Principles for TWRS Privatization Contractors*, U.S. Department of Energy, Richland Operations Office, February 1996.

DOE/RLID 430.1, Revision 0, "Systems Engineering Criteria Document and Implementing Directive," U.S. Department of Energy, Richland Operations Office, January 31, 1996.

DOE Order 360.1, *Training*, U.S. Department of Energy, May 31, 1995.

DOE Order 430.1, *Life-Cycle Asset Management*, Change 1, U.S. Department of Energy, October 26, 1995.

DOE Order 5480.20A, *Personnel Selection, Qualification, and Training Requirements for DOE Nulclear Facilities*, U.S. Department of Energy, November 29, 1994.

ISMSRV8.DFT, *Integrated Safety Management System Plan: The System for Managing Environment, Safety, and Health*, Fluor Daniel Hanford Company, Draft, June 25, 199.

Letter, Hazel O'Leary, DOE to John Conway, DNFSB, *MWTF and Aging Waste Transfer Line Project Deletion*, February 8, 1996.

Letter, Jackson Kinzer, DOE-RL to H. J. Hatch, Fluor Daniel Hanford, Inc., *Re-Issuance of the U.S. Department of Energy Richland Operations Office Tank Waste Remediation System Systems Engineering Management Policy*, 97-MSD-193, April 9, 1997.

SEN-35-91, *Nuclear Safety Policy*, U.S. Department of Energy, September 9, 1991.

SRR Action Plan, *Systems Requirements Review Action Plan*, Westinghouse Hanford Company, September 1996.

SRR Report, *System Requirements Review, Hanford Tank Waste Remediation System Final Report*, Office of Hanford Waste Management Operations, U.S. Department of Energy, April 12, 1996.

TWRS Level 0 Logic, Revision 3, Draft, *TWRS Program Logic*, Fluor Daniel Hanford Company, May 6, 1997.

U.S. Department of Energy Implementation Plan for DNFSB Recommendations 93-3 and 92-7, *Improving the Technical Capability in Defense Nuclear Facilities Programs and Training and Qualifications*, U.S. Department of Energy, November 4, 1993.

WHC-IP-1231, Revision 0, *TWRS Systems Engineering Manual*, Westinghouse Hanford Company, May 15, 1996.

WHC-SD-W211-FDC-001, Revision 2, *Functional Design Criteria, Project W-211, Initial Tank Retrieval System*, Westinghouse Hanford Company, February 20, 1996.

WHC-SD-WM-SEMP-002, Revision 0, TWRS SEMP, *Tank Waste Remediation System Systems Engineering Management Plan*, Westinghouse Hanford Company, February 5, 1996.

WHC-SP-1101, *Tank Waste Remediation System Fiscal Year 1996 Multi-Year Program Plan W.B.S. 1.1*, Revision 1a, Westinghouse Hanford Company, November, 1995.

WHC-SP-1101, *Tank Waste Remediation System Fiscal Year 1997 Multi-Year Work Plan W.B.S. 1.1*, Revision 2, Westinghouse Hanford Company, August, 1996.

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Attachment G

Glossary

Hanford Site Projects. There are eight major DOE projects active at the Hanford Site of DOE near Richland, Washington. The aggregate goal of these projects is to clean up the Site, provide scientific and technological excellence to meet global needs, and partner in the economic diversification of the region. Currently, the eight projects include Facility Stabilization, Tank Waste Remediation System, Waste Management, Spent Nuclear Fuels, Landlord, Environmental Restoration, Infrastructure, and Laboratories and Other Site Services.

Organization. A unit within an entity (e.g., company, government agency, or branch of service) within which many projects are managed as a whole. All projects within an organization at the top of the report structure, share a common manager and common policies.

Program. An initiative, prescribed plan, or course of action, such as a training program or process improvement program, which is undertaken at the organizational level. A program typically specifies the objective, methods, activities, plans, and success measures for the target of the program. Many projects or subprograms at various lower organizational levels may be established to accomplish the target of a program. In DOE, programs are typically established at DOE-HQ.

Project. The aggregate of effort and other resources focused on developing and/or maintaining a specific product. The product may include hardware, software, action results, and other components. Typically a project has its own funding, cost accounting, resources, end-point, and delivery schedule.

TWRS Project. One of eight major Hanford Site projects established to manage, retrieve, process, and dispose of highly radioactive and hazardous waste stored in 177 large and 36 small underground tanks at the Hanford Site. Currently 22 subprojects are being funded in the TWRS Project.

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