DOE/JIO--006

DE92 000931

FISCAL YEAR 1986
PROGRAM PLAN
FOR THE
DEFENSE TRANSURANIC WASTE
PROGRAM
(DTWP)

November 1985

MASTER

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SUMMARY TABLE

WORK BREAKDOWN
FY 86 SUMMARY
(\$000)

<u>WBS No.</u>	<u>TASK TITLE</u>	<u>OPERATING DOLLARS</u>		<u>CAPITAL EQUIPMENT</u>
		<u>BA</u>	<u>B0</u>	<u>BA</u>
2.1	Program Management	1410	1410	0
2.2	Program Analysis	1600	1600	0
2.3	Technology Development			
2.3.1	Reduced Waste Gen.	510	510	0
2.3.2	Stored Waste Retrieval	350	350	150
2.3.3	Burial Ground Technol.	1752	1752	0
2.3.4	Instrumentation	1000	1000	800
2.3.5	Decontamination	0	0	0
2.3.6	Incineration/Digestion	0	0	0
2.3.7	Immobilization	0	0	0
2.3.8	Containment	2506	2506	324
2.3.9	Certification	230	230	0
2.4	Facility Development	6407	6407	700
2.5	Information Services	90	90	0
	TRU PROGRAM TOTAL =	15,855	15,855	1974

CONTENTS

	PAGE
PREFACE	iii
INTRODUCTION	1
ADMINISTRATION	2
PROGRAM MANAGEMENT	6
Program Management	7
NEPA Documentation	9
TLO/WPO IWG	11
PROGRAM ANALYSIS	14
Program Analysis	16
System Simulation Modeling	20
RH Waste System Study	23
Final Inventory Workoff Plan (LANL).....	25
Final Inventory Workoff Plan (INEL).....	27
Final Inventory Workoff Plan (NTS).....	29
Final Inventory Workoff Plan (RHO).....	31
Final Inventory Workoff Plan (ORNL).....	33
Final Inventory Workoff Plan (SRP).....	35
TECHNOLOGY DEVELOPMENT	37
Reduced Waste Generation	39
RWG Equipment/Materials Replacement	41
RWG HEPA Filter Characterization	45
RWG HEPA Life Optimization	48
RWG National Working Group	51
RWG PREPP Volume Reduction	55
RWG TRUEX Technology	57
Stored Waste Retrieval	59
Stored Waste Technology Development.....	59
Equipment/Facilities Preparation for RH Demonstration.....	62
Buried Ground Technology	65
In-Situ Vitrification	67
Buried Waste Studies at a Humid Site.....	72
INEL Buried TRU Waste Studies.....	77

Instrumentation	80
NDA Technology Transfer	82
Special Case NDA/NDE.....	84
Containment	86
TRUPACT Maintenance	88
Transportation System Implementation	90
TRUPACT Prototype Fleet	93
DHLW Cask SARP	95
Certification	97
Guide for WAC Compliance	98
Stored Waste Certification Technology Development (SRP).....	100
Stored Waste Certification Technology Development (ORNL).....	102
FACILITY DEVELOPMENT	104
Process Experimental Pilot Plant (PREPP) Support	106
SWEPP II/PREPP II	108
Stored Waste Examination Pilot Plant (SWEPP) Support	110
SWEPP/PREPP Technology Transfer	112
Stored Waste Examination Pilot Plant (SWEPP) Facility	115
Process Experimental Pilot Plant (PREPP) Facility.....	116
Waste Receiving and Packaging (WRAP) Facility	118
Transuranic Waste Facility	120
INFORMATION SERVICES	122
Independent Review	123
SUMMARY TABLE	126

FIGURES

Figure 1.	3
Figure 2.	4
Figure 3.	5

PREFACE

The Defense TRU Waste Program goals are to achieve permanent disposal and end interim storage. This document presents the FY 86 Program Plan for the Defense Transuranic Waste Program (DTWP) and is prepared under TRU budget (B&RC #AR0515200) and guidance as of November 1985. Changes in the TRU Program budget and guidance may affect the task elements described within this plan. This document also includes outyear budget projections beyond the current year.

More specifically the TLO strategy for FY 86 is to accomplish the necessary technology development and resolve the systems issues in order that newly-generated and stored TRU waste can be certified to the Waste Isolation Pilot Plant - Waste Acceptance Criteria (WIPP-WAC). This effort also will be supported by technology development in transportation and reduced waste generation.

FY 86 program priorities include a concerted effort towards program coordination and systems integration. The Transuranic Waste Lead Organization (TLO) will continue to coordinate and integrate the six separate program elements of the DTWP i.e. waste generation site activities, storage site activities, burial site activities, technology development, transportation development, and permanent disposal. An overall goal of this coordination is to support a successful demonstration of the Waste Isolation Pilot Plant (WIPP).

Providing for consistent coordination, the DTWP Strategy Document will continue to be updated as required, and the Long-Range Master Plan will be revised to reflect the latest program policies, goals, and objectives. A draft quality assurance plan has been prepared to meet the quality requirements of DOE Order 5700.6A completely. Program activity networks are being revised to reflect the latest planning. In addition, program participant communication, including the development of interface working groups assembled to resolve specific issues, and the scheduling of contractor update meetings will continue.

INTRODUCTION

The Defense TRU Waste Program (DTWP) is the focal point for the Department of Energy in national planning, integration, and technical development for TRU waste management. The scope of this program extends from the point of TRU waste generation through delivery to a permanent repository. The TRU program maintains a close interface with repository development to ensure program compatibility and coordination. The defense TRU program does not directly address commercial activities that generate TRU waste. Instead, it is concerned with providing alternatives to manage existing and future defense TRU wastes.

The FY 86 Program Plan is consistent with the Defense TRU Waste Program goals and objectives stated in the Defense Transuranic Waste Program Strategy Document, January 1984. The roles of participants, the responsibilities and authorities for Research & Development (R&D), the organizational interfaces and communication channels for R&D and the establishment of procedures for planning, reporting, and budgeting of all R&D activities meet requirements stated in the Technical Management Plan for the Transuranic Waste Management Program. The Program Plan is revised as needed. The work breakdown structure is reflected in Figures 2 and 3 immediately following the Administration section and is described in the subsequent narrative. Detailed budget planning (i.e., programmatic funding and capital equipment) is presented for FY 86; outyear budget projections are presented for future years.

ADMINISTRATION

The Defense TRU Waste Program is one of several DOE programs which have been "decentralized," assigning primary program responsibility to the DOE Albuquerque field office. To implement a long-term strategy, the DOE has established a Defense TRU Waste Lead Organization (TLO) consisting of the Albuquerque Operations Office (DOE/AL), which manages the program, and the Joint Integration Office (JIO) comprised of Rockwell International personnel (RI) and Westinghouse Corp. (W) personnel. The ALO is responsible for overall management of the program, while the JIO is responsible for development and maintenance of planning information and monitoring of Program activities against long-range plans.

The TRU Program is managed by an ALO resident program manager. The DOE/HQ contact point is another program manager resident in the Defense Waste and Byproducts Division. DOE organization is shown in Figure 1.

Much of the technical research and related activities in the Program are performed by DOE integrated contractors operating major DOE facilities. Other tasks are assigned to contractors with qualifications to perform this work.

Primary responsibility for implementing individual tasks within the Program lies with the contractor performing the task and with the DOE field office which administers that contract. The JIO/RI will monitor progress of each task and, if and when any corrective actions are necessary, will negotiate issues with specific field contractors and/or make specific recommendations to the DOE/AL.

Field offices and contractors are responsible for providing a description of their Quality Assurance plans to TLO. These plans will identify the elements of Quality Assurance (QA) Plans for each task, and any controls which may be required to conform with guidance from lead sites. The TLO then reviews the QA plans and proposes QA levels that will be approved by DOE/HQ for the DWTP guidance. The JIO has two managers, one for RI and one from W. Each is supported by an internal staff.

FIGURE 1

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Figure 3.

2.1 PROGRAM MANAGEMENT

I. INTRODUCTION

Program Management includes of technical and financial planning, program planning, document preparation, task guidance development, task monitoring, information gathering and reporting to DOE. This also includes interfacing with other lead site programs, agencies and activities for overall guidance for the development of advanced TRU waste management capabilities.

II. GOALS AND OBJECTIVES

Goals and objectives of Program Management are:

- Short- and long-range planning based on well-defined scope of work, goals, and plans to guide technology development activities
- Planning and integration of waste management technology development and operations with considerations for technical reliability, safety, quality, cost, and timely achievement
- Organization of goals, objectives, and procedures for common use by those involved
- Progress review and assessment of achievement
Support reciprocal international exchange agreements for disposal of nuclear wastes.

III. STATUS

Project definitions and goals have been analyzed, and guidance has been provided for meeting objectives of a single work element. New projects have been defined to address areas where additional work is required. Contractors for this work have been identified for FY 86. A contractor reporting system has been implemented.

2.1.1 Program Management (JIO/RI)

This program element includes program planning, task guidance and monitoring, program documentation, program integration, program review, and foreign exchange. Tasks in these areas include:

- Identification of program requirements
- Long-range technical planning
Respond to Program-related urgencies and short-term information requests.
- Budget preparation
- Preparation of program planning documents
- Task guidance
- Interface control activities
- Task monitoring
- Interfacing with related programs, agencies, and activities
- Reporting program status
- Prepare and distribute the status documentation for the U.K., F.R.G, and PNC-Japan agreements
- NEPA documentation.
- Institutional activities

2.1.1

PROGRAM MANAGEMENT MILESTONES AND FUNDING

FY 86

TASK TITLE	O	N	D	J	F	M	A	M	J	J	A	S
Program Mgmt. JIO/RI	1	2 3	4			5	6				7	8 9

FUNDING REQ (\$000)

FY 86

BA	620
LO	620
CE	0

MILESTONE IDENTIFICATION

<u>No.</u>	<u>Accomplishment</u>	<u>Date</u>
1	Issue the JIO/RI Current Year Work Plan (CYWP)	10/85
2	Deliver Annual End of Year Technical Report	11/85
3	Complete Current Fiscal Year Program Plan	11/85
4	Complete FY 88 Budget Call	12/85
5	Update TRU Long Range Defense Waste Master Plan	03/86
7	Issue TRU Waste Program Budget and Task Guidance for FY 36	08/86
8	Complete Draft Responsibilities Management Plan Update	09/86
9	Issue Final Report on RWG National Working Group	09/86

2.1.2 NEPA DOCUMENTATION

I. GOALS AND OBJECTIVES

This task is a multisite task to prepare the NEPA documentation required for ORNL, LANL, SRP, LLNL, NTS, MOUND, AND ANL-E to ship their stored and newly-generated TRU waste to WIPP. In FY 86, ORNL, LANL, and SRP will prepare and issue Environmental Assessments (EA) to DOE-HQ (4th Q FY 86).

II. STATUS

The remaining small generators will prepare Action Description Memorandas (ADMs) for their sites. The present strategy is for the JIO to prepare in cooperation with another site a "generic" ADM that will serve as model for the other small generators. The "generic" ADM will be issued 4th Q FY 86 and the small sites will prepare their ADMs in FY 87.

2.1.2

NEPA DOCUMENTATION

FY 86

TASK TITLE	O	N	D	J	F	M	A	M	J	J	A	S
------------	---	---	---	---	---	---	---	---	---	---	---	---

NEPA												1
Documentation												2
												3
												4

FUNDING REQ (\$000)

FY 86

BA	590
BO	590
CE	0

MILESTONE IDENTIFICATION

<u>No.</u>	<u>Accomplishment</u>	<u>Date</u>
1.	Submit Generic ADM to DOE/HQ	09/86
2.	Submit ORNL EA to DOE/HQ	09/86
3.	Submit LANL EA to DOE/HQ	09/86
4.	Submit SRP EA to DOE/HQ	09/86

2.1.3 TLO/WPO IWG

I. Goals and Objectives

At present, the Interface Management Charter, directing the coordination of activities between the Joint Integration Office and the WIPP Project Office, divides interface responsibilities into two general areas. The responsibilities for policy review and decisions falls to the Interface Control Board, made up of DOE program managers. The responsibility to provide technical review and analyses of interface issues and to make recommendations to the ICB falls to individual interface working groups (IWGs). The Charter establishes four standing IWGs to address program areas of importance. Additionally, the ICB may create other IWGs focused on specific issues and with specific direction to report recommendations to the ICB.

II. Status

Formal Interface Management was first established in FY1984 and during FY1985 has become increasingly active, contributing to identifying and resolving numerous interface issues. These issues have included wasted characterization, barcoding, TRU waste packaging requirements, RH canister design, and other similar concerns. The expectation is that interface coordination must continue to play an important role in JIO and WPO activities as the period of WIPP operation draws nearer. This task will contribute to the support for interface coordination.

III. Description of the Task

The objective of this task is to support the staff requirements and the activities of interface working groups (IWGs) in carrying out directions assigned by the Interface Control Board. This support could include travel, clerical, report production, and related costs. In addition, the task could include additional technical consultation costs as required. The task also provides support for interface

management provided by the JIO, including preparation of semi-annual reports, preparation of ICB meetings, workshops, and related activities.

2.1.3

TLO/WPO IWG

FY 86

TASK TITLE	O	N	D	J	F	M	A	M	J	J	A	S
TLO/WPO IWG						1						2

FUNDING REQ (\$000)

FY 86

BA	200
BO	200
CE	0

MILESTONE IDENTIFICATION

<u>No.</u>	<u>Accomplishment</u>	<u>Date</u>
1.	Semi-Annual ICB Report	03/86
2.	Semi-Annual ICB Report	09/86

2.2 PROGRAM ANALYSIS

I. INTRODUCTION

Program analysis consists of the formal studies and planning activities that provide a foundation for long-range program goals, direction, content, and decisions. It includes system engineering activities which integrate and coordinate planning for decisions, research, facilities, and policies. In addition to long-range planning, program analysis includes studies to answer specific requirements, trade-off, impact, and optimization questions.

II. GOALS AND OBJECTIVES

Broad goals and objectives of program analysis are:

- To assemble the information needed for rational and supportable program decisions
- To identify long-range Defense TRU Waste Program goals and options
- To identify program requirements associated with the long-term management of Defense TRU Waste
- To conduct analyses of TRU waste management alternatives
- To provide rational and supportable bases for program decisions to assess impacts, provide trade-offs, and recommend optimization for Program costs and schedules
- To seek compliance with Legislative and Regulatory requirements.

III. STATUS

Program analysis continues to be ongoing in support of program goals. Specific analyses have been identified, defined, and completed; and findings are available to decision-makers. Some analyses are comprehensive enough to be identified separately in the work breakdown structure and funded as separate tasks, while others are combined for program task elements. During FY 86, significant emphasis will be placed on planning a comprehensive framework of objectives:

- System planning; Requirement analysis
- Criteria and Procedures Development
- Legislative and Regulatory Analyses
- Impact and Tradeoff Analyses
- Data Base.

This will continue to provide for the smooth transition of contact and remote handled stored waste removal to final WIPP emplacement.

2.2.1 Program Analysis

There is a continuing need for updated planning to anticipate and to reflect results of developments in the technical, political, and institutional areas of TRU waste management. Implementation of an overall plan involves a series of decision points based on environmental reviews, regulations, and criteria/standards. Development of the planning basis consists of identifying (1) requirements of the reviews, (2) information and analyses needed for the decisions, (3) operational requirements, and (4) technology and system requirements, and then developing plans for meeting those requirements.

The Program Modeling for Systems Planning has been expanded in concept with an integrated code called TRUSYSTEM. Integrated program scheduling modeling has been incorporated into a user-interactive computer system. In the scheduling critical paths will be identified for special management attention. RH waste system modeling will be added to the ongoing modeling activities for CH waste. The TRUCOST system cost model will be further validated in order to estimate and analyze the costs associated with long-term management of TRU waste. Certified Waste projections will continue to be developed annually for the Integrated Data Base and JIO/RI planning.

Identification of technology, facility and system requirements will be performed for Requirements Analysis/Studies to evaluate alternative and costs for handling, processing, and packaging RH-TRU waste. Facility development to support these activities will be investigated. A plan will also be developed for support of the WIPP RH waste demonstration. Special-case (SC) waste management activities will also identify facility requirements for handling, processing, packaging and WIPP certification. Guidance will be issued for making decisions on whether wastes are impractical to certify. Development of a transportation system for transport of remote-handled (RH) waste will continue and an RH waste transport system program plan will be issued.

A document will be prepared identifying waste forms requiring immobilization to meet WIPP waste acceptance criteria.

Legislative and Regulatory Analyses will be ongoing to provide early warning as to how program strategy for NEPA compliance, EPA standards and Federal Radiation Protection Guidance for Management and Disposal of Transuranic Wastes, Transportation issues, CERCLA, and RCRA would be affected by proposed and pending Congressional actions, including legislation, appropriations, and hearings.

Impact and Tradeoff Analyses -- Numerous impact, tradeoff, and optimization studies are necessary to organize the analysis of a large volume of relevant information and constraints defining both the operational system and the development program. A comprehensive review of RH program schedules and cost impact of changes will be made to identify major cost saving opportunities. System cost and project scheduling models will be used to optimize transportation system plans. Risk analyses will be performed in support of the development of waste acceptance criteria and in support of recommendations on transportation system development. Evolving program plans and the identification of alternative approaches in the program make it necessary to perform short-term analyses. In addition to identifying

program needs, JIO/RI will respond to requests for decisionmaking information from DOE/HQ and DOE/AL.

Data Base -- A TRU Waste Data Base has been developed to speed up data acquisition for program trade-off studies and analyses. The Integrated Data Base at ORNL continues to be updated and incorporated into the annual report DOE/NE-0017. Waste characterization analyses are performed to further understanding of waste management requirements.

2.2.1

PROGRAM ANALYSIS

FY 86

TASK TITLE	O	N	D	J	F	M	A	M	J	J	A	S
Program Analysis JIO/RI						1						2 3 4 5

<u>FUNDING REQ (\$000)</u>	<u>FY 86</u>
BA	740
BO	740
CE	0

MILESTONE IDENTIFICATION

<u>No.</u>	<u>Accomplishment</u>	<u>Date</u>
1.	Issue Final Transportation Plan for Transportation Implementation	03/86
2.	Update the TRU Program (JIO) Data Base	09/86
3.	Complete RH Cost and Optimization Studies	09/86
4.	Complete All Inventory Work-off Plans	09/86
5.	Issue WAC Guidance for Immobilization	09/86

2.2.2 SYSTEM SIMULATION MODELING

I. OBJECTIVES

The objective in developing TRUSIM is to provide the nucleus of TRUSYSTEM which will be an integrated system of computer models and data files for the analyses of DOE's TRU logistic system. TRUSIM will be used to simulate the interaction between the various components of the logistic system (i.e., storage sites, generation sites, processing facilities, transport and disposal facilities). The results of TRUSYSTEM will be used for making realistic projections of TRU waste logistics under a large variety of scenarios, testing the sensitivity to variance in parameters (e.g., the temporary, unexpected shutdown of a waste processing plant) of proposed logistic systems, and providing projections of WIPP receipts. The ultimate goal is to provide analyses which will lead to the most reliable and cost-effective TRU logistics system for DOE.

II. STATUS

This is the continuation of the JIO simulation modeling effort. The first generation modeling has been completed. The second generation modeling, which will be based on the previous effort, but will be both more complete and more flexible, has begun. The effort is scheduled for completion during the third quarter of FY1986.

III. DESCRIPTION OF TASK

Los Alamos National Laboratory (LANL) will design, develop, and test TRUSIM which is the simulation portion of TRUSYSTEM and its interfaces. Once TRUSIM has been proven, the JIO will be responsible for integrating it with the rest of TRUSYSTEM and for its use.

To ensure portability and maintainability, the bulk of TRUSIM will be written in FORTRAN 77 for use on IBM PC-AT compatible computers. The

code will be data driven, handle all TRU waste types, variable number and types of generation, storage and processing sites, and multiple transporter types. The code will use external definitions of all system attributes (e.g., storage capacities and generation rates) and will execute with sufficient speed to allow repetitive analyses (e.g., sensitivity analyses and "what if" questions).

2.2.2

SYSTEM SIMULATION MODELING

FY 86

TASK TITLE	O	N	D	J	F	M	A	M	J	J	A	S
System Sim. Modeling			1			2		2				

<u>FUNDING REQ (\$000)</u>	<u>FY 86</u>
BA	80
BO	80
CE	80

MILESTONE IDENTIFICATION

<u>No.</u>	<u>Accomplishment</u>	<u>Date</u>
1.	Model and Data Structures Design Completed.	12/85
2.	Modeled Verified as Correct.	03/86
3.	Documentation and Peer Review Completed.	05/86

2.2.3 RH WASTE SYSTEM STUDY

I. GOALS AND OBJECTIVES

The goal is to develop the most cost effective and efficient methods to end interim storage and achieve permanent disposal of remote-handled (RH) TRU waste.

II. STATUS

JIO is providing overall project direction and management. Generator and WIPP involvement with JIO is achieved through a series of RH workshops.

III. DESCRIPTION OF TASK

A comprehensive review of program schedules and cost/schedules tradeoffs will be made to identify major cost saving opportunities (if any) that could be realized by modification of current plans for any of the following:

1. Retrieval/certification schedules, durations, or rates
2. Processing schedules, priorities, durations, or throughputs
3. Shipping schedules, priorities, durations, or rates
4. Centralized vs. decentralized processing and/or certification
5. Volume reduction through sorting and/or processing
6. Facility and/or fleet downsizing.

A strategy for cost measurement and comparison will be developed and circulated for review and comment early in the task. The Plan will include revised schedules and cost estimates, together with a comparison with the baseline schedules and costs. It will identify the impact on total program costs and on site-specific and lead program costs through realization of program goals.

2.2.3

RH WASTE SYSTEM STUDY

FY 86

TASK TITLE	O	N	D	J	F	M	A	M	J	J	A	S
RH Waste System Study			1			2			3			4

FUNDING REQ (\$000)

FY 86

BA	300
BO	300
CE	0

MILESTONE IDENTIFICATION

<u>No.</u>	<u>Accomplishment</u>	<u>Date</u>
1.	Issue Base Case List of Alts. for Anals.	12/85
2.	Complete Cost and Optimization Studies.	03/86
3.	Issue Draft C/S Opt. Study for Review.	06/86
4.	Complete RH C/S Opt. Study and Issue Report	09/86

2.2.4 FINAL INVENTORY WORKOFF PLAN (LANL)

I. INTRODUCTION

The preliminary inventory workoff plan produced by the major storage sites, (SRP, RHO, ORNL, NTS, LANL, INEL) and collated by the TWSO in 1983 has been a fundamental working document for waste inventory characteristics and storage site waste certification strategies. As we approach the opening of WIPP, an updated version of the IWOP is needed for final planning stages. The document will also serve to prepare the means for performing remote handled cost schedule optimization and any second generation transportation studies being considered.

II. GOALS AND OBJECTIVES

The primary goal is to produce a real world working document to supplement the long range master plan, the Integrated Data Base, and to provide the user with consistent, site-by-site strategy comparisons. This document will be used to support the remote handled cost schedule optimization study which will be proceeding concurrently. The objective in data collection will be to detail waste sufficiently to be used for upcoming analyses, such as second-generation transuranic strategies.

III. STATUS

The preliminary inventory, workoff plan of 1983 is outdated. The new document will incorporate data on contact handled, remote handled, and special case consistent with the most recent IDB submissions ending on December 31, 1985. This will be accomplished concurrently with the IDB submission to be available for Remote-Handled Cost/Schedule Optimization Analyses.

2.2.4

FINAL INVENTORY WORKOFF PLAN (LANL)

FY 86

TASK TITLE	O	N	D	J	F	M	A	M	J	J	A	S
Final IWOP LANL						1			2			3

FUNDING REQ (\$000)

FY 86

BA	100
BO	100
CE	0

MILESTONE IDENTIFICATION

<u>No.</u>	<u>Accomplishment</u>	<u>Date</u>
1.	Complete Final Draft of IWOP	03/86
2.	Complete Internal Review and JIO/RI Review.	06/86
3.	Issue Final IWOP and Verify Cons. With DWMP.	09/86

2.2.5 FINAL INVENTORY WORKOFF PLAN (INEL)

I. INTRODUCTION

The preliminary inventory workoff plan produced by the major storage sites, (SRP, RHO, ORNL, NTS, LANL, INEL) and collated by the TWSO in 1983 has been a fundamental working document for waste inventory characteristics and storage site waste certification strategies. As we approach the opening of WIPP an updated version of the IWOP is needed for final planning stages. The document will also serve to prepare the means for performing Remote-Handled Cost/Schedule Optimization and any second generation transportation studies being considered.

II. GOALS AND OBJECTIVES

The primary goal is to produce a real world working document to supplement the long-range master plan, the Integrated Data Base, and to provide the user with consistent, site-by-site strategy comparisons. This document will be used to support the remote handled cost schedule optimization study which will be proceeding concurrently. The objective in data collection will be to detail waste sufficiently to be used for upcoming analyses, such as second generation transuranic strategies.

III. STATUS

The preliminary inventory, workoff plan of 1983 is outdated. The new document will incorporate data on contact handled, remote handled, and special case consistent with the most recent IDB submissions ending on December 31, 1985. This will be accomplished concurrently with the IDB submission to be available for Remote-Handled Cost/Schedule Optimization Analyses.

2.2.5

FINAL INVENTORY WORKOFF PLAN (INEL)

FY 86

TASK TITLE	O	N	D	J	F	M	A	M	J	J	A	S
Final IWOP INEL						1			2			3

<u>FUNDING REQ (\$000)</u>	<u>FY 86</u>
BA	50
BO	50
CE	0

MILESTONE IDENTIFICATION

<u>No.</u>	<u>Accomplishment</u>	<u>Date</u>
1.	Complete final Draft of IWOP	03/86
2.	Complete Internal Review and JIO/RI Review.	06/86
3.	Issue Final IWOP and Verify Cons. with DWMP.	09/86

2.2.6 FINAL INVENTORY WORKOFF PLAN (NTS)

I. INTRODUCTION

The preliminary inventory workoff plan produced by the major storage sites, (SRP, RHO, ORNL, NTS, LANL, INEL) and collated by the TWSO in 1983 has been a fundamental working document for waste inventory characteristics and storage site waste certification strategies. As we approach the opening of WIPP an updated version of the IWOP is needed for final planning stages. The document will also serve to prepare the means for performing Remote-Handled Cost/Schedule Optimization and any second generation transportation studies being considered.

II. GOALS AND OBJECTIVES

The primary goal is to produce a real world working document to supplement the long-range master plan, the Integrated Data Base, and to provide the user with consistent, site-by-site strategy comparisons. This document will be used to support the remote handled cost schedule optimization study which will be proceeding concurrently. The objective in data collection will be to detail waste sufficiently to be used for upcoming analyses, such as second generation transuranic strategies.

III. STATUS

The preliminary inventory, workoff plan of 1983 is outdated. The new document will incorporate data on contact handled, remote handled, and special case consistent with the most recent IDB submissions ending on December 31, 1985. This will be accomplished concurrently with the IDB submission to be available for Remote-Handled Cost/Schedule Optimization Analyses.

2.2.6

FINAL INVENTORY WORKOFF PLAN (NTS)

FY 86

TASK TITLE	O	N	D	J	F	M	A	M	J	J	A	S
Final IWOP NTS						1			2			3

FUNDING REQ (\$000)

FY 86

BA	30
BO	30
CE	0

MILESTONE IDENTIFICATION

<u>No.</u>	<u>Accomplishment</u>	<u>Date</u>
1.	Complete Final Draft of IWOP	03/86
2.	Complete Internal Review and JIO/RI Review.	06/86
3.	Issue Final IWOP and Verify Cons. with DWMP.	09/86

2.2.7 FINAL INVENTORY WORKOFF PLAN (RHO)

I. INTRODUCTION

The preliminary inventory workoff plan produced by the major storage sites, (SRP, RHO, ORNL, NTS, LANL, INEL) and collated by the TWSO in 1983 has been a fundamental working document for waste inventory characteristics and storage site waste certification strategies. As we approach the opening of WIPP an updated version of the IWOP is needed for final planning stages. The document will also serve to prepare the means for performing Remote-Handled Cost/Schedule Optimization and any second generation transportation studies being considered.

II. GOALS AND OBJECTIVES

The primary goal is to produce a real world working document to supplement the long-range master plan, the Integrated Data Base, and to provide the user with consistent, site-by-site strategy comparisons. This document will be used to support the remote handled cost schedule optimization study which will be proceeding concurrently. The objective in data collection will be to detail waste sufficiently to be used for upcoming analyses, such as second generation transuranic strategies.

III. STATUS

The preliminary inventory, workoff plan of 1983 is outdated. The new document will incorporate data on contact handled, remote handled, and special case consistent with the most recent IDB submissions ending on December 31, 1985. This will be accomplished concurrently with the IDB submission to be available for Remote-Handled Cost/Schedule Optimization Analyses.

2.2.7

FINAL INVENTORY WORKOFF PLAN (RHO)

FY 86

TASK TITLE	O	N	D	J	F	M	A	M	J	J	A	S
Final IWOP RHO						1			2			3

FUNDING REQ (\$000)

FY 86

BA	100
BO	100
CE	0

MILESTONE IDENTIFICATION

<u>No.</u>	<u>Accomplishment</u>	<u>Date</u>
1.	Complete Final Draft of IWOP	03/86
2.	Complete Internal Review and JIO/RI Review.	06/86
3.	Issue Final IWOP and Verify Cons. with DWMP.	09/86

2.2.8 FINAL INVENTORY WORKOFF PLAN (ORNL)

I. INTRODUCTION

The preliminary inventory workoff plan produced by the major storage sites, (SRP, RHO, ORNL, NTS, LANL, INEL) and collated by the TWSO in 1983 has been a fundamental working document for waste inventory characteristics and storage site waste certification strategies. As we approach the opening of WIPP an updated version of the IWOP is needed for final planning stages. The document will also serve to prepare the means for performing Remote-Handled Cost/Schedule Optimization and any second generation transportation studies being considered.

II. GOALS AND OBJECTIVES

The primary goal is to produce a real world working document to supplement the long-range master plan, the Integrated Data Base, and to provide the user with consistent, site-by-site strategy comparisons. This document will be used to support the remote handled cost schedule optimization study which will be proceeding concurrently. The objective in data collection will be to detail waste sufficiently to be used for upcoming analyses, such as second generation transuranic strategies.

III. STATUS

The preliminary inventory, workoff plan of 1983 is outdated. The new document will incorporate data on contact handled, remote handled, and special case consistent with the most recent IDB submissions ending on December 31, 1985. This will be accomplished concurrently with the IDB submission to be available for Remote-Handled Cost/Schedule Optimization Analyses.

2.2.8

FINAL INVENTORY WORKOFF PLAN (ORNL)

FY 86

TASK TITLE	O	N	D	J	F	M	A	M	J	J	A	S
Final IWOP ORNL						1			2			3

FUNDING REQ (\$000)

FY 86

BA	100
BO	100
CE	0

MILESTONE IDENTIFICATION

<u>No.</u>	<u>Accomplishment</u>	<u>Date</u>
1.	Complete Final Draft of IWOP	03/86
2.	Complete Internal Review and JIO/RI Review.	06/86
3.	Issue Final IWOP and Verify Cons. with DWMP.	09/86

2.2.9 FINAL INVENTORY WORKOFF PLAN (SRP)

I. INTRODUCTION

The preliminary inventory workoff plan produced by the major storage sites, (SRP, RHO, ORNL, NTS, LANL, INEL) and collated by the TWSO in 1983 has been a fundamental working document for waste inventory characteristics and storage site waste certification strategies. As we approach the opening of WIPP an updated version of the IWOP is needed for final planning stages. The document will also serve to prepare the means for performing Remote-Handled Cost/Schedule Optimization and any second generation transportation studies being considered.

II. GOALS AND OBJECTIVES

The primary goal is to produce a real world working document to supplement the long-range master plan, the Integrated Data Base, and to provide the user with consistent, site-by-site strategy comparisons. This document will be used to support the remote handled cost schedule optimization study which will be proceeding concurrently. The objective in data collection will be to detail waste sufficiently to be used for upcoming analyses, such as second generation transuranic strategies.

III. STATUS

The preliminary inventory, workoff plan of 1983 is outdated. The new document will incorporate data on contact handled, remote handled, and special case consistent with the most recent IDB submissions ending on December 31, 1985. This will be accomplished concurrently with the IDB submission to be available for Remote-Handled Cost/Schedule Optimization Analyses.

2.2.9

FINAL INVENTORY WORKOFF PLAN (SRP)

FY 86

TASK TITLE	O	N	D	J	F	M	A	M	J	J	A	S
Final IWOP SRP						1			2			3

<u>FUNDING REQ (\$000)</u>	<u>FY 86</u>
BA	100
BO	100
CE	0

MILESTONE IDENTIFICATION

<u>No.</u>	<u>Accomplishment</u>	<u>Date</u>
1.	Complete Final Draft of IWOP	03/86
2.	Complete Internal Review and JIO/RI Review.	06/86
3.	Issue Final IWOP and Verify Cons. with DWMP.	09/86

2.3 TECHNOLOGY DEVELOPMENT

I. INTRODUCTION

The TRU Program must assure that technology is provided to prepare DOE TRU wastes for long-term management. This requires research and development studies to ensure that all technology necessary to implement selected long-term management options is available when needed and that these technologies can be practically operated on a production basis.

II. GOALS AND OBJECTIVES

Goals and objectives of Technology Development include the research and development to investigate and advance TRU waste management technologies. The Technology Development program is focused on generating an inventory of certified waste and on providing transportation capability to support WIPP operations.

III. STATUS

Several research and development projects are being investigated to meet projected operational requirements and repository acceptance criteria for TRU waste.

Assay instrumentation continues at LANL. LANL will continue to review data from the prototype drum counter. In addition, operation of a mobile NDA/NDE system to be deployed at DOE sites to certify waste will be accomplished along with the technology being disseminated throughout the DOE TRU waste complex.

The Remote Handled Waste technologies being investigated are, RH Transportation Study at JIO, Stored Waste Technology Development at Mound, and also the RH Waste System Study at the JIO.

Fabrication of the TRUPAC-I is underway with revision to TRUPACT-I design to incorporate the Value Analysis recommendations and to continue TRUPACT prototype fleet activities.

Among the volume reduction technologies continuing to be developed for TRU waste streams, are ferrite processing, longer lifetime materials, and improved equipment replacement, bagless posting systems, and other engineering designs for waste reduction.

Continued technology development from buried waste studies will be conducted, with work continuing at ORNL, RHO, and INEL.

In-Situ Vitrification testing will be conducted on a large scale at the Hanford Site by PNL.

2.3.1 REDUCED WASTE GENERATION

I. INTRODUCTION

The Department of Energy (DOE) strategy for newly-generated TRU waste includes a program to reduce the amount and transuranic content of the waste. The Rocky Flats Plant in Golden, Colorado, is the largest generator of TRU waste in this country. A Reduced Waste Generation program has been established there to look for ways of reducing TRU waste at the source. This program pursues the strategy of the DOE by: 1) reducing waste generation at the plant, and 2) by encouraging other sites to share and implement the methods developed within the program and elsewhere to reduce waste generation.

II. STATUS

During the past 5 years, the program has focused on projects that attack four major types of waste forms. They include combustibles, metals, sludges, and filters. New process development and administrative controls have been developed and implemented resulting in a reduction of several hundred cubic meters of waste per year. The technology transfer program has also been successful, as a number of the suggestions and projects have been adopted by other DOE sites.

In FY 86, the Reduced Waste Generation program at Rocky Flats will continue to address the problem of HEPA filter waste. Work began in FY 85 on this waste. Throughout the DOE complex, large banks of High Efficiency Particulate Air (HEPA) filters are used to rid the air of plutonium contamination prior to release to the environment. Because of the plutonium contamination, the filters are added to the TRU waste inventory. For the primary bank of filters, it is reasonable to assume that the filters all fall in the TRU category. The secondary banks of filters, however, are put into the TRU inventory through administrative decree, when in fact they are probably low-level waste. By using improved radiation detection devices to segregate

these filters, a considerable savings in the generation of TRU filter waste will be effected. In addition, new filter technology or the use of pre-filters could prevent the filters from accruing large amounts of plutonium, thus savings do result when waste can be disposed of as low-level rather than TRU.

III. DESCRIPTION OF TASKS

A systems analysis of filter handling at the Rocky Flats Plant has provided direction for the FY 86 work. This year, the program will continue to look at ways to cut down on the use of HEPA filters. Possible locations in gloveboxes and plenums will be explored for pre-filter emplacement. If a positive cost benefit can be shown, initial engineering designs will be completed. In addition to the HEPA Filter Optimization task, HEPA filters will also be examined and characterized to determine the need to immobilize. Finally, the Equipment and Materials Replacement task will be used to develop a new ceramic coating that can be applied to foundry equipment in the Rocky Flats Plant. Use of the coating is expected to increase equipment lifetime by a factor of 150.

2.3.1.1 RWG EQUIPMENT/MATERIALS REPLACEMENT

I. GOALS AND OBJECTIVES

The goals of this task is to identify and exchange process equipment with longer life and more durable replacement.

II. STATUS

This work is a continuation of work that began in FY 84 in which equipment was evaluated for longevity in harsh process environments. The results provided that components such as pumps, valves, and miscellaneous other items would have increased lifetimes if replaced with equipment constructed of materials such as stainless steel, Teflon, or coated with impervious materials.

During FY 85, the metal waste categories were reviewed to determine if specific areas of waste could be identified that are contributing to the overall waste generation. The results of this investigation show three major waste streams that make up the metal category at RFP. The first is the metal from strip out activities; the second from equipment discard; and the third from drum disposal. Continued efforts investigating the third category of waste revealed that by changing the handling practices, a large quantity of the drums, currently being crushed with the waste, could be recycled. A test was devised to demonstrate that new equipment could be used to dump waste from 55 gallon drums without contaminating the drum itself. The practice at RFP has been to package waste in stainless steel drums and ship them to the size reduction area for repackaging, and during the repackaging step, the shipping drum became a part of the TRU waste stream. If the new equipment is accepted as part of the standard waste handling procedure, a significant reduction in the overall metal waste volumes is expected.

III. DESCRIPTION OF TASK

For FY 86 the task will focus on reducing waste through rare earth crucible and mold coating within the plutonium foundry areas. The general method of operation is that plutonium metal is received into the foundry area from several sources, i.e., off site, metal from electrowinning and direct oxide reduction, and from hydrofluorination/reduction. The metal is then melted in Ta crucibles and poured through a Ta funnel into a mold.

At the Rocky Flats Plant, four of the melting furnaces have been modified to operate using stainless steel (416) molds coated with the rare earth oxide. This technique appears to be a viable option to using graphite molds; however, at this time it is only considered partially proven and is anticipated to be extended to other areas within the foundry.

The results to date show that considerably less plutonium is converted to the oxide when coated molds reused in lieu of graphite molds, and less waste is generated. Production currently generates approximately 23 drums of graphite molds/month which would be eliminated if coated molds could be used throughout the production area. Ta crucibles cost about \$800 each, and graphite molds cost \$75. The Ta crucibles now last approximately 500 runs and would be extended through coating. Graphite molds last for only three runs; therefore, the economics show crucible costs for perhaps 750 runs at \$800; whereas if graphite were used, the cost would be \$56,250. In addition, the volume of waste would be considerable.

Work efforts this fiscal year will (1) Prepare a work plan of activities, 10/85, (2) Prepare test matrix of development activities for coating crucibles and molds, 2/86, (3) Determine processing parameters through experimental testing from the test matrix, 8/86, (4) A report will be prepared that will identify a process for implementation that will include methodologies for crucible, funnel,

and mold coatings. Also included will be an overview of the potential value and benefits that may be derived from the implementation of the technology, 9/86.

2.3.1.1

RWG EQUIPMENT/MATERIALS REPLACEMENT

FY 86

TASK TITLE	O	N	D	J	F	M	A	M	J	J	A	S
RWG Eq/Mat Replacement	1				2						3	4

FUNDING REQ (\$000)FY 86

BA	50
BO	50
CE	0

MILESTONE IDENTIFICATION

<u>No.</u>	<u>Accomplishment</u>	<u>Date</u>
1.	Prepare a Work Plan of Activities	10/85
2.	Prepare Test Matrix of Dev. Activities.	02/86
3.	Determine Processing Parameter From Test Matrix	08/86
4.	Complete Final Report Identifying Proc. for Implementation.	09/86

2.3.1.2 RWG HEPA FILTER CHARACTERIZATION

I. GOALS AND OBJECTIVES

The goal of this task is to determine if HEPA filters removed from the various plant air filtration systems, and as prepared for shipment through crushing, meet the WIPP Waste Acceptance Criteria for disposal. A recommendation may be made to segregate air filters not meeting the WIPP criteria from those that do. If disposal requirements are not met, then alternative methods for improved immobilization will be identified.

II. STATUS

Simulated, non-radioactive, tests conducted by RFP in FY 84 show approximately 20 wt% of the filter waste contains particles less than 200 microns, which suggests the filters would not meet the WAC. however, because of differences between simulated conditions and actual plant conditions, additional information needs to be obtained on filters from the various process air filtration systems. It is anticipated these tests will be indicative of particle size and characteristics due to process environment, and impingement as a function of distance, density, and flow rates. In addition, information is needed on physiochemical characteristics to ensure safety in handling and disposal.

III. DESCRIPTION OF TASK

Work elements for FY 86 will be (1) Prepare an overall work plan of activities based on the guidance, 10/85, and (2) Prepare an experimental test plan giving justification, background, schedules, resource requirements, final performance specifications and completion criteria, 11/85. The experimental test plan will then be given to the Waste Certification Committee for review and concurrence. The committee is to respond with comments within 30 working days of

receipt. If a positive recommendation is given by the committee to proceed with the task, then the task will proceed as follows:

- a. Complete experimental test as outlined in the plan for filters as removed from the plenum, 8/86.
- b. Complete experimental test as outlined in the plan for filters as crushed for shipment, 8/86.
- c. Complete a final report on task activities, 9/86, that will give guidelines for either certifying the waste filters as is, or for subsequent processing in order to meet the WIPP-WAC requirements.

2.3.1.2

RWG HEPA FILTER CHARACTERIZATION

FY 86

TASK TITLE	O	N	D	J	F	M	A	M	J	J	A	S
RWG HEPA Filter Char.	1	2									3 4	5

FUNDING REQ (\$000)

FY 86

BA	100
BO	100
CE	0

MILESTONE IDENTIFICATION

<u>No.</u>	<u>Accomplishment</u>	<u>Date</u>
1.	Prepare Work Plan of Activities.	10/85
2.	Prepare Experimental Test Plan.	11/85
3.	Complete Experimental Test as Outlined in the Plan.	08/86
4.	Complete Experimental Test for Filters as Crushed for Shipment.	08/86
5.	Complete Final Report.	09/86

2.3.1.3 RWG HEPA LIFE OPTIMIZATION

I. GOALS AND OBJECTIVES

The goal of this task is to make a thorough examination of the handling, installation, and disposition of HEPA filters, and look for ways to divert or eliminate this type of waste from the TRU classification.

II. STATUS

Fiscal year 85 studies identified (1) the air-filtration systems where most of the TRU filter waste originates, and (2) the type HEPA filters being employed within these systems. Gloveboxes were also identified where the use of prefilters could be implemented which would then result in extending the useful lifetime of the filters within the main air-filtration systems.

III. DESCRIPTION OF TASK

This task will (1) examine the administrative control of HEPA filters used in production facilities to ensure optimal usage and disposal, and (2) evaluate the potential for changes in air filtration techniques or materials that would improve the efficiency or longevity. Administrative analysis will include filter handling, installation, change out schedules, volumes, and an understanding of the impetus for change out. In addition, an analysis will be made of the current method for disposal, and if applicable, recommendations for disposal improvement. Recommendations, however, will be reviewed internally through Plant Operations for comment and concurrence to ensure certifiability. Changes in air filtration techniques or materials for improvement will include the investigation of possible pre-filter emplacement as may be applicable to specific problem areas. This may include intermediate air cleaning devices for both disposable and recleanable purposes.

Work in FY 86 will be to (1) Prepare a work plan of activities, 10/85, (2) Provide for an interfacing working group meeting including representatives from the DTWP, R&D Program Manager, Utilities, Filter Systems, and Plant Waste Operations, 10/86, (3) Complete laboratory evaluation of pre-filter choices and specific application, 3/86, (4) Complete design and testing of the pre-filters to provide for emplacement of pre-filters, 7/86, (5) Final report on filter implementation which will include projected waste volumes impacted, anticipated cost/benefit analysis, and overall improvement in filter waste management, 9/86.

2.3.1.3

RWG HEPA LIFE OPTIMIZATION

FY 86

TASK TITLE	O	N	D	J	F	M	A	M	J	J	A	S
RWG HEPA LIFE OPT	1	2				3						4

FUNDING REQ (\$000)FY 86

BA	150
BO	150
CE	0

MILESTONE IDENTIFICATION

<u>No.</u>	<u>Accomplishment</u>	<u>Date</u>
1.	Prepare Work Plan of Activities.	10/85
2.	Provide for an Interfacing Working Group Meeting.	12/85
3.	Complete Lab Evaluation of Pre-Filter Choices.	03/86
4.	Complete Design and Testing of Pre-Filters.	09/86
5.	Final Report on Filter Implementation, etc.	09/86

2.3.1.4 RWG - NATIONAL WORKING GROUP

I. GOALS AND OBJECTIVES

The objectives of the National Working Group for Reduction in Transuranic Arisings (NWGRTWA) are to (1) exchange ideas on ways in which waste generation can be minimized, (2) act as an informal peer review group for planning and funding of new DTWP tasks, and (3) establish cooperative work tasks that can be undertaken in developing and implementig reduced waste generation technology.

II. STATUS

The NWGRTWA was formed in FY 84 under the DTWP Technical Lead Organization which coordinates the activities of the group. Meetign are held periodically, and are hosted by the various USDOE sites; however, additional sub-group meetings are also held on specified topics as needed. In addition to the regular meetings, or in concert with these meetings, international workshops for waste minimization are implemented with other countries under the bilateral technical exchange agreements.

In planning meetings, a primary subject of technology is identified and speakers are asked to attend who have technical expertiese within the area. On a general basis, these areas of technology generally fall under the categories of: (1) Administrative Control, (2) Materials Substitution, (3) Process Development or Optimization, (4) New Equipment Utilization.

Following formation in FY 84, the following meetings have been held:

1. The NWGRTWA held its first meeting in Northglenn, CO, October 14, 1983. Organizational objectives were outlined, and future tasks were defined.

2. The second meeting was held at LANL, February 23, 1984, and the principal subjects of discussion were (1) Clarification of Operational Definitions, (2) Investigation of Bagless Posting Systems, (3) Review of Proposed DTWP-RWG FY1985 Tasks, and (4) Investigation of Glovebox HEPA Filters.
3. The third meeting was held at the Hanford House in Richland, Washington, July 19, 1984. The theme of this meeting was Reduction in Waste through Equipment Selection and Preventative Maintenance. In addition, presentations were made on proposed waste reduction desing features for the new Special Isotope Separation (SIS) facility, status of the bagless posting systems being installed at SRP and LANL, systems study for remote handled waste, size reduction using high pressure water cutting and the RHP/LANL arc saw, and an update of the FY 85/86 proposed tasks for Reduced Waste Generation.
4. The fourth meeting was a US/UK Workshop on Reduction in Waste Arisings which was held at ORNL, 13-15 May 1985. The objective of the meeting, which was held under the US/UK bilateral agreement for waste management, was to exchange ideas on ways in which waste generation can be minimized through administrative control, materials substitution, equipment utilization, and process optimization.

III. DESCRIPTION OF TASK

This task will be for the continuation of the National Working Group for Reduction in TRU Waste Arisings with organizational objectives of (1) exchanging ideas on ways in which waste arisings can be minimized, (2) providing analytical input for task development and implementation, and (3) establishing cooperative work efforts for technical development.

FY 86 goals will be to (1) host three meetings at different sites and exchange information relevant to waste reduction, (2) submit a topical

report entitled "FY 1986 Summary Report -- National Working Group for Reduction in TRU Waste Arisings.

The first meeting has been scheduled and is as follows:

1. National Working Group for Waste Reduction will be held October 23-24, 1985, at INEL. Discussions on Wednesday, 10/23/85, will focus on reduction in waste through (1) Optimizing Waste Immobilization, (2) Disposal of Spent Resins, (3) Assay Instrumentation for Waste Sorting at the Source of Generation, (4) Reduction in Pyrochemical Waste Salts Through Recycle, (5) Laser Cutting Technologies, (6) PREPP Volume Reduction, and (7) Super Compactors.

On Thursday, 10/24/85, there will be a tour of the INEL site in which the following facilities will be visited:

Stored Waste Examination Pilot Plant - SWEPP
Process Experimental Pilot Plant - PREPP
Radioactive Waste Management Complex - RWMC
Waste Experimental Reduction Facility - WERF

2.3.1.4

RWG - NATIONAL WORKING GROUP

FY 86

TASK TITLE	O	N	D	J	F	M	A	M	J	J	A	S
RWG Nat'l Working Group	1						2					3 4

<u>FUNDING REQ (\$000)</u>	<u>FY 86</u>
BA	40
BO	40
CE	0

MILESTONE IDENTIFICATION

<u>No.</u>	<u>Accomplishment</u>	<u>Date</u>
1.	Host First NWGRWA Workshop.	11/85
2.	Host Second NWGRWA Workshop.	04/86
3.	Host Third NWGRWA Workshop.	09/86
4.	Issue Final Summary Report.	09/86

2.3.1.5 RWG - PREPP VOLUME REDUCTION

I. GOALS AND OBJECTIVES

The goal of this task is to determine if the waste exiting the sizing step of the PREPP facility, that is not classified as fines (greater than 1/4 inches in diameter), can be diverted from the the TRU category into the LLW category.

II. STATUS

The Process Experimental Pilot Plant (PREPP) is a facility to demonstrate methods for processing TRU waste into a form that is acceptable for WIPP disposal. During this processing, wastes will be shredded, incinerated, sized for particle size by passing through a rotating trommel screen, and then the finese will be immobilized with cement. This task is to determine if thet wastes exiting the sizing step that are not classified as fines (greater than 1/4 inches in diameter) can be diverted from the TRU category into the LLW category.

III. DESCRIPTION OF TASK

Work in FY 86 will be (1) prepare a work plan of activities, 11/85; (2) determine if the waste has LLW values that can be segregated prior to grouting, 9/85; (3) propose instrumentation modifications/additions, 9/86; (4) issue an interim year-end summary report which will delineate project costs/benefits and, if favorable, project future actions for implementation, 9/86.

2.3.1.5

RWG - PREPP VOLUME REDUCTION

FY 86

TASK TITLE	O	N	D	J	F	M	A	M	J	J	A	S
RWG PREPP		1										2
Vol. Reduction												3

<u>FUNDING REQ (\$000)</u>	<u>FY 86</u>
BA	50
BO	50
CE	0

MILESTONE IDENTIFICATION

<u>No.</u>	<u>Accomplishment</u>	<u>Date</u>
1.	Prepare a Work Plan of Activities	11/85
2.	Peform a Feasibility Study, Waste Seg. and Propose Mods.	09/86
3.	Issue an Interim Report of Results and Suggest Implementation Action.	09/86

2.3.1.6 RWG TRUEX TECHNOLOGY

I. GOALS AND OBJECTIVES

The goal of this task for FY 86 is for the technology transfer and subsequent implementation of the TRUEX process into the Hanford facilities.

II. STATUS

Developmental work on the process has been ongoing by ANL for the past several years, and thus far, on a laboratory scale has shown to be applicable for removing actinides from process waste streams. Objectives of implementation of the process at RHO will be to demonstrate the TRUEX process for recovering transuranics that would normally be lost to the waste stream and to terminate the transfer of transuranic waste streams to underground holding tanks.

III. DESCRIPTION OF TASK

Elements of the FY 86 task will provide technology transfer and identify pilot scale testing to support implementation. Deliverables will be (1) Prepare a Work Plan for the FY 86 task, 10/1/85; (2) Prepare a preliminary experimental test plan including elements of scale, design, statistically valid conclusions, cost and schedule, 12/15/85; (3) Prepare a preliminary Production-Scale Implementation and Plan which will include scaleup factors equipment, specification, costs and schedule, 5/31/86; (4) A summary document will be prepared finalizing an extensive experimental test plan and production scale implementation plan, 9/15/86. This will include a cost/benefit analysis which will give the value of the process in terms of volumes of waste reduced and cost saving effected.

2.3.1.6

RWG TRUEX TECHNOLOGY

FY 86

TASK TITLE	O	N	D	J	F	M	A	M	J	J	A	S
RWG TRUEX				1				2				3

FUNDING REQ (\$000)

FY 86

BA	120
BO	120
CE	0

MILESTONE IDENTIFICATION

<u>No.</u>	<u>Accomplishment</u>	<u>Date</u>
1.	Prepare a Preliminary Exp. Test Plan.	01/86
2.	Prepare a Preliminary Production Scale Implementation and Plan	05/86
3.	Issue Document Finalizing Test and Implementation Plan	09/86

2.3.2 STORED WASTE RETRIEVAL

2.3.2.1 STORED WASTE TECHNOLOGY DEVELOPMENT

I. GOALS AND OBJECTIVES

The objective of this task is to develop strategies for handling potential gas generation in newly-generated (NG) and stored contact-handled (CH) and remote handled (RH) TRU waste during storage, shipping, and emplacement in the WIPP. During FY 85, strategies for NG-CH TRU waste storage, shipping, and emplacement were developed and verification of the key strategy elements were initiated.

In FY 86 the primary focus will be the completion of the verification of key strategy elements for CH-NG TRU waste, the resolution of strategies with TRUPACT shipping scenarios, and the development and verification of strategies for CH-stored and RH TRU waste.

II. ISSUES TO BE REVIEWED ARE:

1. The effect of inner containers, sealed and unsealed on buildings of flammable mixtures inside of vented out containers.
2. The effectivity of using multiple vent devices.
3. Measurement of vent performance of redesigned and new design vents.
4. Development of void volume, curie level, and waste for related strategy definition and guidelines.
5. Survey, resolve, and define issues related to all significant gas generation mechanisms in CH and RH TRU waste.

III. QUALITY ASSURANCE

The Quality level for this task is C. The key elements for task quality are record keeping, verification of test results, and peer review of results and conclusions. Also in this task, since experimental work will be subcontracted and vent hardware for test purposes will be purchased, QA procedures in place at Mound in MD-10169 Subcontractor Evaluation and Manual System 701, Vol 1, Procurement Policies and Procedures will be applied as required.

2.3.2.1

STORED WASTE TECHNOLOGY DEVELOPMENT

FY 86

TASK TITLE	O	N	D	J	F	M	A	M	J	J	A	S
Stored Waste Tech. Dev	1				2	3	4			5	6	7

FUNDING REQ (\$000)

FY 86

BA	150
BO	150
CE	0

MILESTONE IDENTIFICATION

<u>No.</u>	<u>Accomplishment</u>	<u>Date Due</u>
1.	Acquire and Evaluate Available Documents on RH Gas Generation	11/85
2.	Contact DOE Contract Personnel for Results of Past Studies	02/86
3.	Prepare Draft Report Discussing Proposals, Principles and Issues	03/86
4.	Conduct Workshop to Provide Updates on RH Gas Gen. Task	04/86
5.	Prepare Draft Criteria and Report on Activity Limits and Waste Forms as a Func.	07/86
6.	Obtain Peer/DOE Approval on Issues Needing Resolution	08/86
7.	Issue Final Report for NG and Stored RH Waste	09/86

2.3.2.2 EQUIPMENT/FACILITIES PREPARATION FOR RH DEMONSTRATION

I. GOALS AND OBJECTIVES

The goals of this project are: a) to provide at least one canister of RH waste for demonstration emplacement in WIPP, beginning in January 1989; and b) begin certification of newly-generated RH in retrievable primary containers. The objective of the project for FY 86 is to prepare equipment and facilities for packaging and certifying the RH waste.

II. STATUS

A site will be designated to prepare, package, certify, and ship the demonstration RH waste.

III. DESCRIPTION OF TASK

The overall task is composed of four subtasks, described as follows:

Subtask 1: A detailed work plan for the three FTP/As will be prepared to describe the work to be completed in each of the subtasks in the entire program. The facilities and equipment required, the procedures to be used, and the data to be collected will be presented. The schedule for the completion and the budget allocated for each subtask will be generated.

Subtask 2: The areas within the facilities where the gas generation studies and the welding of the canisters will take place will have to be modified before the accumulation of data and the production of canisters can take place. Most of this work will be done in FY 86.

Subtask 3: This subtask entails the preparation and weighing of enough waste to fill up at least three drums. Accurately measured quantities of radioactivity will be added to the drums and the drums closed with a specially prepared lid. The lid will allow the gas

generated inside of the drum to be monitored as to pressure and content during the ensuing months of storage. Thermocouples, placed inside of a sealed tube connecting to the inside of the drum, will allow centerline measurements of the waste temperature during the gas generation studies.

Subtask 4: This subtask requires preparation of detailed plans for achieving earliest possible RH certification of newly-generated RH waste by each RH generator.

2.3.2.2

EQUIPMENT/FACILITIES PREPARATION FOR RH DEMONSTRATION

FY 86

TASK TITLE	O	N	D	J	F	M	A	M	J	J	A	S
Equip/Fac Prep for RH Demo				1		2						3 4

FUNDING REQ (\$000)

FY 86

BA	200
BO	200
CE	150

MILESTONE IDENTIFICATION

<u>No.</u>	<u>Accomplishment</u>	<u>Date Due</u>
1.	Completion of Detailed Plan for RH Demonstration at selected site(s)	01/86
2.	Prepare RH Demo. Plan	03/86
3.	Completion of Fac. Mods. for RH Gas Gen. and Cert. Storage Subtasks	09/86
4.	Prepare Plans for Accelerated Certification of NG RH	09/86
5.	Prepare Demo Waste	12/86

2.3.3 BURIAL GROUND TECHNOLOGY

I. INTRODUCTION

Defense waste management practices prior to 1970 included the shallow land burial of solid and liquid wastes contaminated with transuramics. Configurations included cribs, trenches, ponds, ditches, French drains, and reverse wells. These practices and, at times, spills and leaks, have resulted in soil contamination.

II. GOALS AND OBJECTIVES

If exhumation or stabilization are found to be necessary for remedial action, specific technologies will have to be developed to accomplish these operations. These would include excavation and handling equipment development, waste processing capabilities, and stabilization methods.

The goal of this task is to provide the technology necessary for implementing the potential alternatives for the management of buried wastes at the several TRU sites.

Major objectives are to (1) identify the nature of the buried wastes and determine burial area boundaries and locations, (2) conduct studies and tests to determine the feasibility of optional methods for containment and long-term management of the buried wastes, (3) identify and develop methods for exhumation of buried wastes, and (4) identify and develop technology for implementing the long-term option(s) chosen.

III. STATUS

Several studies have been completed characterizing wastes buried at Hanford, INEL, SR, and LANL. The extent of further studies required in this area could be large or small depending on the detail of

information deemed necessary to make decisions on long-term management. Studies on waste exhumation methods, stabilization methods, and processing methods have identified some potentially feasible processes.

2.3.3.1 IN-SITU VITRIFICATION

I. GOALS AND OBJECTIVES

The near term objective of the program is to develop and test the large-scale in situ vitrification system for application to TRU-contaminated soils at the Hanford Site. A secondary objective is to determine the system capabilities for treating pre-1970 transuranic waste burial sites and mixed hazardous waste sites. The technology is to be transferred at an appropriate time to Rockwell Hanford Operations (Rockwell) for utilization in immobilizing applicable Hanford waste sites, pending completion of the NEPA processes.

DOE-RL recognizes the potential for selective utilization of ISV at other DOE sites and is willing to work with the lead-site offices to develop an out year program that supports this national need. The initial large-scale radioactive test is required to support a timely and favorable ROD at Hanford.

II. STATUS

The major accomplishments in FY 85 were completion of installation of the Large-Scale System, completion of the joint PNL-Rockwell Operational Readiness Review (with independent overview by DOE-RL), and completion of the three phase (setting) Operational Acceptance Test (OAT).

Operational Support Activities, such as hood movement, electrode placement, depth monitoring and failed electrode placement, depth monitoring and failed electrode replacement were demonstrated. These activities are key operational support sequences that must be satisfactorily demonstrated under Field conditions prior to a Large-Scale Radioactive Test.

Significant unplanned effort was required to remediate the problem of a rising cold cap. A rising rather than a subsiding cold cap was

observed during the first two phases of the OAT. This phenomenon is only observed with molybdenum electrodes. The mechanism which leads to the rising cold cap and upwelling was identified and verified by pilot-scale testing. Engineered remedial action techniques were evaluated with pilot-scale testing and successfully demonstrated in the third phase of the Large-Scale OAT.

Two candidate sites for the Large-Scale test were characterized. The TRU levels in the 216 T-5 trench and the 216 Z-8 French drain were below the 200 nCi/g level established in the site-selection criteria document. The 216 Z-12 crib has been identified as the alternate candidate site. Previous characterization studies indicate there are several areas within the site in excess of the 200 nCi/g criteria.

ISV was established as the reference immobilization method for high concentrations of TRU in the Hanford Waste Management Plan (HWMP) and the Hanford Waste Management Technology Plan (HWMTP). ISV is also the leading candidate for in situ destruction and/or immobilization of persistent toxic chemicals. The appropriate inclusion of ISV in the HWMP and HWMTP establish the strategic basis of deployment of ISV at Hanford.

III. TASK DESCRIPTION

The applicability of the large-scale system for immobilization of TRU-contaminated soil sites will be completed with a second nonradioactive (cold) test.

The second Cold Test, the Verification Test, will be conducted in FY 86. The first Large-Scale Radioactive Test will be conducted at the 216 Z-12 site in FY 87. Following the radioactive tests, a post-test verification and assessment program will be conducted to validate process performance.

A technology support task will be conducted in parallel with large-scale development and testing to define the following technical

areas for adaptation to the large-scale process:

- Verification of ZrB_2 coatings as electrode oxidation inhibitors
- Validation of depth monitoring capabilities
- Predictive melting rate and shape capabilities
- Demonstration of fixing hood contamination
- Caisson pretreatment techniques (after FY 87)
- Electrode failure recovery procedures
- Processing procedures for sealed containers housing combustible liquids (after FY 86)
- Treating/destroying/encapsulating chemical and mixed hazard waste.

The technology support activities will be structured and implemented by engineering- and pilot-scale testing based upon available funding and programmatic guidance.

The Large-Scale System will be placed in a safe standby condition for the last six months of FY 86. Recent program budget adjustments necessitate reassignment of staff after completion of the Verification Test. The off-gas system will be drained and flushed and the entire system will be left in safe configuration via appropriate lock and tag procedures. Allowances are made for monthly inspection and routine preventative maintenance.

Laboratory and pilot-scale testing of ZrB_2 coating on molybdenum electrodes with graphite sleeves will be provided. Remedial techniques to assure cold cap subsidence have resulted in increased temperatures in the vicinity of the electrodes. This can lead to premature failure of the molybdenum electrodes, as evidenced in LSOAT #3. A team of corrosion experts convened after LSOAT #3 have identified the failure mechanism and coatings that could prevent premature electrode failure. The leading candidate is 90% ZrB_2 , 10% $MoSi_2$. Laboratory tests will provide confirmatory screening data, and the superior coating will be tested under pilot-scale conditions, prior to the Verification Test.

Electrode replacement procedures will be updated to reflect the new electrode configurations.

Hood contamination fixation is a continuation of activities initiated in FY 85. A candidate coating (clear coat) was identified during LSOAT in FY 85. Experiments will be continued to determine temperature effects to demonstrate post Verification Test application techniques. This is a critical item for maintaining contamination control after the LSRT.

The remaining work on depth monitoring is to complete the signal receiver/signal conditioner/process control computer interface. Validation of performance will be obtained during the Verification Test.

New depth monitors must be fabricated for the pilot-scale electrode test and the Verification Test. Manuals and procurement specifications for the various components of the depth monitoring system will also be completed.

Preparation and technical review of environmental and safety related documents associated with large-scale radioactive testing will be provided.

Preliminary calculations of public and occupational exposure for the LSRT will be performed. These calculations will be based on the actual TRU and fission product inventories found in the 216 Z-12 site during characterization operations.

Characterization of the 216 Z-12 site to define the setting for the LSRT will be completed. A Rockwell lead ORR Team with participation by PNL will be selected and review the scope of the LSRT, preparations to date, and future plans. Process Engineering will continue to participate in pilot- and large-scale testing as required to maintain continuity.

2.3.3.1

IN-SITU VITRIFICATION

FY 86

TASK TITLE	O	N	D	J	F	M	A	M	J	J	A	S
ISV				1	2	3	4		5	6		7

FUNDING REQ (\$000)

FY 86

BA	1,152
BO	1,152
CE	0

MILESTONE IDENTIFICATION

<u>No.</u>	<u>Accomplishment</u>	<u>Date Due</u>
1.	Select ORR Team	01/86
2.	Complete 216 Z-12 Charac.	02/86
3.	Issue LSOAT Report	03/86
4.	Issue Informal Electrode Performance Report	04/86
5.	Issue Informal Hood Cont. Fixation Report	06/86
6.	Issue Depth Monitor Optns. Manual	07/86
7.	Issue Program Summary Report	09/86

2.3.3.2 BURIED WASTE STUDIES AT A HUMID SITE

I. GOALS AND OBJECTIVES

The objective of this task is to provide the field-scale development and demonstration of in situ grouting of buried TRU waste for its hydrologic stabilization in humid regions. It will provide documentation of the degree of stabilization achieved from which the applicability of the technique to other environmental situations can be assessed. This information will enable grouting to be compared with other long-term management options in a detailed plan for disposal alternatives of buried TRU waste.

II. STATUS

Grouting is the process of forcing a fluid into the void space of a soil, rock, or waste formation which, after group set, results in a cohesive mass which is considerably less permeable to water. The heterogeneous and permeable mixture of waste and backfill in burial trenches of TRU solid waste would make it an ideal candidate for grouting. If the permeability of the waste-backfill can be reduced significantly, then leaching of contamination from buried waste can be reduced. In addition, by the filling of trench void space, grouting could also alleviate the longer term problem of trench subsidence by obviating backfill consolidation and movement in response to collapsing waste voids.

An ideal grout for the hydrologic isolation of the buried waste would have the following properties: a low pre-set viscosity, preferably similar to that of water; none, few, or extremely small suspended solids; a controllable set time from minutes to days; an inherently low permeability after set; durability to resist the physiochemical and microbial stresses in its applied environment; low toxic hazard; and low cost. Actual grout formulations, of course, will represent some compromise among these properties.

Seven grout formulations were tested at ORNL laboratory for their ability to penetrate and to reduce the hydraulic conductivities of soils used as backfills for shallow land burial trenches. Three soluble grout formulations (sodium silicate, polyacrylamide, and resorcinol-formaldehyde) were able to both penetrate soil and sand columns and reduce the hydraulic conductivities from initial values of about 10^{-4} m/sec to less than 10^{-8} m/sec. Three particulate-containing grouts (lime-fly ash, fly ash-cement-bentonite, and bentonite slurry) could not penetrate columns; such formulations, therefore, would be difficult to distribute within a trench for assured hydrologic isolation.

The above tests were performed on "pilot-scale" trenches whose dimensions, waste characteristics, void space, and hydrologic regime were either controlled or well defined. Although this demonstration provided much information concerning the technique of in situ grouting, it was somewhat unrealistic in the sense that the knowledge about both the site and the waste was so detailed. In a real disposal trench, dimensions and location are usually uncertain, waste characteristics are, at best, poorly defined, and the hydrologic regime, both of the trench and its host soil formation, poorly understood. Application and evaluation of grouting to a more realistic situation, as proposed herein, will require considerably more pre- and post-grouting characterization to establish effectiveness.

III. DESCRIPTION OF THE TASK

Through the continued groundwater monitoring of low-level waste storage areas at ORNL, several trenches containing TRU waste, perhaps mixed with low-level waste but preferably not, can be identified. Two candidate trenches will be identified which have both TRU waste constituents and, preferably, a significant groundwater intrusion problem. The first grouting demonstration trench will be selected by the end of the first quarter of FY 86 and the second trench selected

in FY 87. These trenches will be characterized for their pedological and hydrological regimes. Each trench will be surrounded by monitoring wells to establish the water table elevation in the area. Water pump-in tests of these wells will also be performed to establish the hydraulic conductivity of the soil formation. A line of intra-trench monitoring wells will also be established on at least 5-meter intervals; these will be augered or drilled to the trench bottom and cased with slotted well screen to within 1 meter of the surface. Permeability tests will also be performed on these wells to determine the hydraulic conductivity of the trench's waste-backfill.

Trench void space will then be measured by metering water into the trench through the above wells (Spalding 1984). Following filling of trench void space, water levels during the subsequent seepage will be followed to calculate the hydraulic conductivity of the trench's walls and floor. Additionally, the hydraulic connection among wells within the trench will be established from time-lags (if any) between water level responses of the pump-in and monitoring wells. The total water holding capacity of the trench will be calculated and used to estimate the volume of grout needed.

The initial trench grouting will be completed by the end of the third quarter of FY 86 using an and polyacrylamide formulation.

Tracers simulating radionuclide behavior developed at INEL will be added to the trench.

Tritiated water and possibly other TRU tracers will be used in the grout mixture to enable subsequent (FY 87) leaching studies with grout specimens retrieved from the trench. The volume of grout injected will be compared to the water-holding capacity of the trench as a measure of grout void-filling effectiveness. The grouted trench will be allowed to cure for several days and the permeability of the waste-backfill redetermined via water pump-in tests of the intra-trench monitoring wells. These tests will be repeated at

logarithmically increasing intervals for a period of three years after grouting. Any permeation of grout into the surrounding soil formation will also be determined by sampling the array of monitoring wells around the trench. The trench and surrounding soil will be cored by the end of the fiscal year to obtain samples for next year's leaching studies.

The chemical and/or microbiological stability of the polyacrylamide grout formulation will be tested in the laboratory using soil grouted with ^{14}C -labelled acrylamide grout. Long-term (up to one year) first-order rate constants for the evolution of $^{14}\text{CO}_2$ from grouted soils will be determined in the laboratory. Additional monitoring of the evolution of $^{14}\text{CO}_2$ will be continued in the following year if rates are still changing. Effects of variation in moisture and temperature regimes will also be determined, as will any cometabolic effects of facilely-biodegradable waste constituents (e.g., cellulose) contained within the grouted waste/soil. It is anticipated that the degradation rates of the polyacrylamide grout will be extremely slow but it is required that these be demonstrated so that the long-term stability of the grout can be established empirically. Evolution of small amounts of $^{14}\text{CO}_2$ from high-specific-activity polyacrylamide in soil is perhaps the only facile method to measure the anticipated low degradation rate constants.

2.3.3.2

BURIED WASTE STUDIES AT A HUMID SITE

FY 86

TASK TITLE	O	N	D	J	F	M	A	M	J	J	A	S
Humid Site Buried Waste Studies			1						2 3			4

FUNDING REQ (\$000)

FY 86

BA	300
BO	300
CE	0

MILESTONE IDENTIFICATION

<u>No.</u>	<u>Accomplishment</u>	<u>Date Due</u>
1.	Select a Trench for Analyses	12/85
2.	Hydrologic Characterization of the Trench	06/86
3.	All Analyses for Void Space, Grout Filled Void Space Performed	06/86
4.	Issue Draft Report on Grouting Implementation	09/86

2.3.3.3 INEL BURIED TRU WASTE STUDIES

I. GOALS AND OBJECTIVES

The overall objectives and plans for the INEL Buried TRU Waste Studies are delineated in the Long-Range Plan for Buried Transuranic Waste Studies at the Idaho national Engineering Laboratory, EGG-2350.

Results obtained from the buried waste studies will support selection of a long-term management alternative for INEL buried TRU waste in FY95. Engineering tests will be conducted in: (1) improved confinement (on-going), (2) retrieval, (3) processing and certification.

II. STATUS

In FY 85 three sites for excavation near the Radioactive Waste Management Complex at INEL were selected. The site selected received an environmental evaluation approved by DOE/ID, and three test pits, one for control, were excavated. Fabrications of simulated TRU wastes were placed into 55-gallon drums and plywood boxes and staged near the pits. A group formulation for INEL soils was developed by ORNL to inject into two of the test pits in 3Q FY 86.

III. TASK DESCRIPTION

In FY 86, the test pits constructed for use in the Buried Waste Studies will be grouted. Suitable nonradioactive TRU tracers and hydrological tracers will be placed in the test pits prior to grouting.

Instrumentation will also be installed to monitor for the tracer materials. Based on work completed by ORNL in FY 85, the best grout(s) will be selected for INEL arid conditions and used for in situ grouting of the test pits. An Addendum to the environmental evaluation will be prepared to include selected tracer materials.

One test pit will be exhumed in early FY 87 to determine the effectiveness of the grouting process. Monitoring of the long-term

grouted test pit and the control pit (ungrouted) will continue for an additional 6 years.

The Long-Range Plan for buried TRU waste will be updated. An annual assessment report, documenting FY 85 progress and noting any significant technology improvements, will be prepared.

2.3.3.3

INEL BURIED TRU WASTE STUDIES

FY 86

TASK TITLE	O	N	D	J	F	M	A	M	J	J	A	S
INEL Buried Waste Studies			1			2			3			4

FUNDING REQ (\$000)

FY 86

BA	300
BO	300
CE	0

MILESTONE IDENTIFICATION

<u>No.</u>	<u>Accomplishment</u>	<u>Date Due</u>
1.	Issue Annual Technology Assessment and Progress Report	12/85
2.	Development of Chemical Tracer Simulating Radionuclide Behavior	03/86
3.	Emplacement of Heterogeneous Waste Forms	06/86
4.	Long-Range Plan Update	09/86

2.3.4 INSTRUMENTATION

I. INTRODUCTION

Instrumentation requirements for some TRU waste applications are not accurate, and measurements must only indicate that surface radiation or package contents are below set limits. Other requirements are restrictive and require identification of individual isotopic concentrations with state-of-the-art accuracy at low radiation levels. The measurements must often be made on large volume containers with the TRU materials dispersed in host matrices, which make accurate determinations very difficult.

Needs for instrumentation include measurement of TRU elements in waste containers of many sizes. Processing facilities require measurements for inventory and criticality control. Surface contamination requires measurements in the field and in decontamination facilities.

II. GOALS AND OBJECTIVES

The goal of this program is to further develop nondestructive prototype assay instrumentation to be applied to TRU wastes generated by DOE facilities. Instrumentation systems should assay both high- and low-density wastes, with and without additional beta-gamma fission product contamination, and should not depend on prior knowledge of matrix or isotopic content. The prototype systems, installed at actual waste generators, will undergo a period of field trials.

The instrumentation needs are quite varied and broad since knowledge of the transuranic content is required in all phases of waste management. Immediate objectives fall into the following three areas: (1) assay of waste containers prior to shipment or storage, (2) assay for waste processing applications, such as presorting, product monitoring, or criticality control, (3) verification of site data for DOE and WIPP policy decisions, and (4) detection of

transuranic content in the ground to determine contamination associated with burial grounds and storage areas.

III. STATUS

Active and passive neutron interrogation systems were developed and built for assay of low and high density TRU wastes at 100 nCi/gm. In some cases the active/passive assay systems are in use with segmented gamma scanners.

During FY84 the need and requirements for a mobile nondestructive assay NDA and nondestructive evaluation NDE system was identified. The needs include sorting and certification support for special case waste, off sized waste, RH waste, and waste at sites without the state-of-the-art fixed systems. An engineering prototype mobile system was demonstrated at Nevada Test Site in FY84 and performed to its design criteria.

In FY 85 verification of the performance characteristics of the passive/active neutron interrogation assay system was initiated. Many variables exist in TRU waste and waste forms. The verification of instrument performance with actual waste forms will lay the basis for WIPP and DOE to use NDA results for policy decisions.

In FY 86 the technology of assay systems will be transferred to all sites.

2.3.4.1 NDA TECHNOLOGY TRANSFER

I. GOALS AND OBJECTIVES

The goal is to accomplish effective technology transfer of the LANL second generation assay systems developed over the past seven years so that timely and cost effective benefit of this technology may be achieved by the Department of Energy and other institutions, public and private.

II. STATUS

The combined passive-active neutron assay instrumentation developed at LANL continues to play a key role in the overall WIPP TRU waste program. At the end of FY 85, approximately 6500 containers had been assayed using these new, second generation systems. Collectively the systems have certified 10 - 25% of the waste packages assayed as being non-TRU providing an enormous cost savings for disposal.

III. DESCRIPTION OF TASK

This task has as it's goal the achievement of a comprehensive written report detailing operating experience with the seven prototype assay units produced directly or indirectly as a result of the LANL/JIO sponsored development program during the past seven years. The documentation goals include a sophisticated evaluation of the complete assay algorithm with compiled analyses of several thousand assays of drums as well as an evaluation of the overall system design with a specific technology transfer design package.

2.3.4.1

NDA TECHNOLOGY TRANSFER

FY 86

TASK TITLE	O	N	D	J	F	M	A	M	J	J	A	S
NDA Tech. Transfer	1		2	3 4			5 6 7			8		9 10

FUNDING REQ (\$000)

FY 86

BA	200
BO	200
CE	0

MILESTONE IDENTIFICATION

<u>No.</u>	<u>Accomplishment</u>	<u>Date Due</u>
1.	Initiate Comp. of Operational Exp. at Sites w/LANL NDA Equipment	10/85
2.	Report Outline	12/85
3.	NDA Technology Transfer Workshop	01/86
4.	Initiate Overall Analytic Evaluation of Assay Algs. at Each Site	01/86
5.	Initiate Evaluation of Special Case Assay Experience	04/86
6.	NDA Technology Transfer Workshop	04/86
7.	First Draft of Technology Transfer Document	04/86
8.	Draft Review Complete	07/86
9.	Issue Final Report	09/86
10.	Final NDA Workshop	09/86

2.3.4.2 SPECIAL CASE NDA/NDE

I. GOALS AND OBJECTIVES

The goal is to develop and demonstrate appropriate high sensitivity and reliability NDA and NDE instrumentation useful for certification of bulk wastes such as are generated by Department of Energy facilities.

II. STATUS

The mobile NDA/NDE system project was begun in FY 84 and continued in FY 85 with complete system specification and initial equipment fabrication. To date, prototypes of both the mobile drum NDA and NDE systems have been constructed and are undergoing testing at the Nevada Test Site (NTS), and a proof of concept test has been conducted for the mobile crate NDA system. Prototype testing and final unit fabrication continues, and will be completed during FY 86.

III. DESCRIPTION OF TASK

This task covers the design and construction of a set of five stand alone mobile NDA and NDE units; specifically: 1) Mobile drum NDA unit, 2) Mobile drum NDE unit, 3) Mobile large crate NDA unit, 4) Mobile large crate NDE unit, and 5) Mobile remote-handled waste canister NDA unit.

Specifically in FY 86, LANL will complete the prototype demonstration/testing program for the mobile drum NDA and NDE units at NTS and complete fabrication and assembly of all five field units.

2.3.4.2

SPECIAL CASE NDA/NDE

FY 86

TASK TITLE	O	N	D	J	F	M	A	M	J	J	A	S
Spec. Case NDA/NDE			1				2		3			4 5

FUNDING REQ (\$000)

FY 86

BA	800
BO	800
CE	800

MILESTONE IDENTIFICATION

<u>No.</u>	<u>Accomplishment</u>	<u>Date Due</u>
1.	Complete Prototype Testing of Drum NDA/NDE at NTS	12/85
2.	Report on NTS Testing Results	04/86
3.	Complete Assembly and Checkout of Mobile Drum NDA Subsystem	06/86
4.	Complete Assembly and Checkout of Mobile Drum NDE Subsystem	09/86
5.	Complete Crate Module NDA/NDE Fabrication and Checkout	09/86

2.3.8 CONTAINMENT

I. INTRODUCTION

A new transportation system, the TRUPACT, for CH-TRU has been under development by the Transportation Technology Center (TCC) at SNL since 1978. This system is being designed to transport the majority of currently stored and newly generated CH-TRU waste packages in an efficient and cost effective transportation system to be used in the management of all defense wastes. Besides CH waste, a canister for use in packaging, shipping, and storing RH waste at the WIPP is required and will be transported in a Defense High Level Waste (DHLW) cask.

II. GOALS AND OBJECTIVES

The goals and objectives of this program are to develop licensable transportation systems for the shipment of transuranic defense wastes. TRUPACT Unit 1 will be fabricated under the existing design and will be used for nonradioactive waste transportation handling studies. TRUPACT Units 2 and 3 will be bimodal to allow shipment by the most desirable mode and to assure flexibility independent of a single transport mode. The redesign of these units limits inner door seal temperatures to meet acceptable leak rate levels. The need for follow-on systems to handle CH-TRU more efficiently and for RH-TRU and SH (special-handled) TRU will be evaluated.

III. STATUS

Fabrication of TRUPACT I - UNIT 0 for full-scale testing was completed in June, 1984, waste handling demonstrations were conducted in July, and normal and hypothetical accident condition tests were conducted in July, August, and September. Results from the dynamic tests were as anticipated, deformations were as predicted, and measured seal leak rates were within the range allowed in the SARP. (Post-test examination did reveal a leak in the seal track bond that may have

been caused by the dynamic tests.) In the thermal test, excessive seal temperatures were experienced as a result of more foam burning than predicted, and seal leak rate exceeded allowable limits.

During FY 85, TRUPACT was redesigned to eliminate burning problems and hot spots from the design. The structural foam in the outer door was eliminated in favor of using a non-combustible aluminum honeycomb. Fire retardant chemicals were added to the remaining structural foam in the sides, and an insulating board was added to design locations that were capable of transferring too much heat into the payload.

Materials tests were performed during FY 85 confirming that these measures will effectively prevent burning in TRUPACT materials and unwanted high temperatures at the seals. A full scale test article modeling the front 1/3 of TRUPACT will be subjected to the fire accident conditions during January, 1986, to confirm that all of the design modifications undertaken effectively prevent failures.

A Value Analysis Task Force met during FY 85 to review TRUPACT design. A "cleaner" design resulted which increased TRUPACT's payload and decreased TRUPACT's handling costs.

In order to effectively explore options available for transportation of Remote-Handled (RH) TRU waste, a Request For Proposals (RFP) for procurement of an RH TRU cask was drafted during FY 85. The RFP will be sent to potential bidders during November, 1985, and proposals will be evaluated by February, 1986. It is intended to either fund the procurement of the RH TRU cask beginning in March, 1986, or to initiate fabrication of the Defense High Level Waste (DHLW) cask at that time, depending on which alternative provides the smaller life cycle cost for the government. The RH-TRU cask can carry DHLW, if necessary.

2.3.8.1 TRUPACT MAINTENANCE

I. DESCRIPTION OF TASK

This task has been created to facilitate funding for TRUPACTs during prototype fleet activities. There will definitely be funding needed to correct problems that develop and deficiencies that potentially exist or are discovered.

The funds will be transferred to any site on an as-needed basis to cover the above mentioned costs.

2.3.8.1

TRUPACT MAINTENANCE

FY 86

TASK TITLE	O	N	D	J	F	M	A	M	J	J	A	S
TRUPACT Maint.												1

<u>FUNDING REQ (\$000)</u>	<u>FY86</u>
BA	100
B0	100
CE	0

MILESTONE IDENTIFICATION

<u>No.</u>	<u>Accomplishment</u>	<u>Date Due</u>
1.	TRUPACT Still Operating & Func.	09/86

2.3.8.2 TRANSPORTATION IMPLEMENTATION SYSTEM

I. OBJECTIVE

Transportation packaging for the transport of transuranic waste has been under development since FY 78. Since that time, conceptual, preliminary, final design, and fabrication of two prototype units have been completed for contact-handled transuranic waste and design engineering work has been conducted on a waste transportation system for remote-handled transuranic waste. Since FY 81, these transportation development tasks have been monitored by a DOE subcontractor, currently the Joint Integration Office. Funding provided under this scope of work will be used to continue program planning, monitoring, and implementation activities for these transportation systems.

II. DESCRIPTION OF WORK

Contact-Handled Waste Transportation - TRUPACT

Operation of the TRUPACT-I prototype fleet began in FY 85 with the delivery of Prototype Unit-1 and completion of the TRUPACT-I Implementation Plan. Activities to be accomplished in FY 86 include incorporation of TRUPACT units 2 and 3 into the prototype fleet, continued operation of the prototype fleet, compilation and reporting of data collected during the prototype fleet activities, and co-chairmanship of the TRUPACT Technical Team.

Information collected will be used to support the WIPP in preparation for the fabrication of the production fleet of TRUPACTs. Site interface support will be provided by keeping user informed of TRUPACT design and handling changes that have the potential for affecting site operations. Activities of the TRUPACT design contractor will be monitored and interim guidance will be provided as required. Under this task, support to interface working groups will be provided upon request.

Remote-Handled Transuranic Waste Transportation

Analyses were performed in fiscal year 1985 to determine whether the DHLW cask could be used for the transport of RH-TRU waste. During fiscal year 1986, writing of the SARP will be initiated by Sandia Laboratories. The work performed by Sandia will be monitored in order to stay abreast with transportation issues related to the transport of RH-TRU. Information obtained from this monitoring task will be used to assist the WIPP with preparation for receipt of RH-TRU. The project monitor will serve as the WIPP-JIO interface for activities related to RH-TRU transportation and will be available to participate in designated interface working groups as needed.

2.3.8.2

TRANSPORTATION IMPLEMENTATION SYSTEM

FY 86

TASK TITLE	O	N	D	J	F	M	A	M	J	J	A	S
Trans. System Implementation			1			2			3			4

FUNDING REQ (\$000)

FY86

BA	150
BO	150
CE	0

MILESTONE IDENTIFICATION

<u>No.</u>	<u>Accomplishment</u>	<u>Date Due</u>
1.	User Review of Value Analysis TRUPACT Waste Handling Concept	12/85
2.	User Demonstration of Value Analysis Waste Handling Prototype Equipment	03/86
3.	Receive and Incorporate TRUPACT-I Prototype Units 2 and 3 Into Prototype Fleet	06/86
4.	Deliver Final Transportation Plan	09/86

2.3.8.3 TRUPACT PROTOTYPE FLEET

I. OBJECTIVE

Finalized detailed drawings, a finalized SARP, two completed prototype units (TRUPACT-1 Units 2 and 3) and completion of all required testing is the objective of this work.

II. STATUS

SNLA has completed a draft SARP and is in the process of review and modification of the SARP. Regulatory testing completed during FY84 supported redesign during FY 85, and completion of the revised Safety Analysis Report for Packaging (SARP), completion of confirmatory testing of the redesign package, and submission of the finalized documentation for the certifying process remains to be completed, along with completion of fabrication of units 2 and 3.

III. ACTIVITIES

SNLA will perform a test burn of the redesigned TRUPACT, confirming that the new design is capable of withstanding the thermal environment of the hypothetical accident conditions of 10CFR71.

The TRUPACT-I fabrication contractors, Brooks and Perkins, will complete the fabrication of the Units 2 and 3 during FY 86. Finally, SNLA will complete revision of the TRUPACT SARP and submit the document for DOE approval.

2.8.3.3

TRUPACT PROTOTYPE FLEET

FY 86

TASK TITLE	O	N	D	J	F	M	A	M	J	J	A	S
TRUPACT Proto Flt.						1				2		3 4

FUNDING REQ (\$000)

FY 86

BA	1,978
BO	1,978
CE	324

MILESTONE IDENTIFICATION

<u>No.</u>	<u>Accomplishment</u>	<u>Date Due</u>
1.	SARP Submission Completed	03/86
2.	Delivery of Units -2 and -3	07/86
3.	Implement Full-scale Prototype Unit Life Cycle Test Plan	09/86
4.	Provide a Documented TRUPACT Life Cycle Test Report	09/86

2.3.8.4 DHLW CASK SARP

I. OBJECTIVE

The objective of this work is to certify the Defense High Level Waste (DHLW) cask for the shipment of 24" O.D. x 118" L. canisters of Remote Handled Transuranic (RH-TRU) wastes to WIPP.

II. STATUS

SNAL and GA technologies have completed design of the DHLW cask during the period from 1978 to the present. Regulatory testing of a half scale model of the cask is in process. Shielding, criticality, containment, structural and thermal analysis of the cask for DHLW are complete, and must be adapted for the RH-TRU waste form. Also, a design for vent relief of gas generated by RH-TRU waste must be provided.

III. ACTIVITIES

During FY 86 SNLA will complete SARP mods and design additions for the DHLW cask to carry RH-TRU waste. Shielding, criticality, containment, structural, and thermal analysis supporting inclusion of RH-TRU in the DHLW cask Certificate of Compliance will be completed. Design and procedure changes comprising inclusion of a filter and rupture disks in the cask and procedures for inerting the cask cavity to avoid obtaining a combustible mixture of gases in the cask will be completed.

2.3.8.4

DHLW CASK SARP

FY 86

TASK TITLE	O	N	D	J	F	M	A	M	J	J	A	S
DHLW Cask SARP									1			2

FUNDING REQ (\$000)

FY86

BA	298
BO	298
CE	0

MILESTONE IDENTIFICATION

<u>No.</u>	<u>Accomplishment</u>	<u>Date Due</u>
1.	Issue Revised Draft SARP for DHLW Cask	06/86
2.	Complete DHLW Cask SARP Modifications	09/86

2.3.9 CERTIFICATION

I. INTRODUCTION

As well as contact-handled (CH) TRU waste, remote-handled (RH) TRU waste requires certification so that it eventually can be transferred to the WIPP. This task involves the preparation and implementation of plans and procedures for WIPP certification of this waste. Technical information regarding RH-TRU waste and waste handling systems will, as a result, become available for input to other RH waste related tasks. Gas generation and container venting data will continue to be analyzed from stored contact-handled (CH) waste. This CH waste task will also provide data on how well assigned content codes agree with container contents.

II. GOALS AND OBJECTIVES

The overall goal is to initiate WIPP/WAC certification of TRU wastes and to generate a precertified inventory of waste to support WIPP operational requirements.

III. STATUS

In addition to the RH newly generated TRU waste, a large inventory of existing stored RH-TRU waste already exists. Wastes currently being generated are being placed into temporary storage pending development of both WIPP certification procedures and WIPP approved packagings. Also physical inspection of CH-TRU waste in storage must continue to be performed to acquire data on gas generation, venting, and waste container contents.

2.3.9.1 GUIDE FOR WAC COMPLIANCE

I. GOALS AND OBJECTIVES

The objective of the Guidance for Compliance with the WIPP-WAC Waste Form Immobilization Criteria is to identify waste forms which meet the WIPP-WAC immobilization criteria and those waste forms which do not. Where applicable, Waste Acceptance Criteria Certification Committee (WACCC) approved processing methods to achieve immobilization of the waste forms will be provided.

II. STATUS

This task is a new initiative for FY 1986. The current status of the task is the preparation of an outline for development of the document.

III. DESCRIPTION OF TASK

The Guidance for Compliance with the WIPP-WAC Waste Form Immobilization Criteria is a necessary task in the TRU Program that will provide a general reference listing waste forms which meet the WIPP-WAC waste form immobilization criteria and those waste forms which do not. Although the WACCC has tried to maintain a "flexibility of methods" approach in its guidance to sites, it is believed that certain methods of WAC immobilization compliance can and should be transferred for similar waste forms and compliance activities at other sites. WACCC approved processing methods to achieve compliance with the immobilization criteria will be provided where applicable.

2.3.9.1

GUIDE FOR WAC COMPLIANCE

FY 86

TASK TITLE	O	N	D	J	F	M	A	M	J	J	A	S
Guide for WAC Compliance	1							2				3

<u>FUNDING REQ (\$000)</u>	<u>FY86</u>
BA	80
BO	80
CE	0

MILESTONE IDENTIFICATION

<u>No.</u>	<u>Accomplishment</u>	<u>Date Due</u>
1.	Initiate Procedure Development; Outline Developed for Document	10/85
2.	Issue Draft Report for Site Review/Comment	05/86
3.	Issue Final Report	09/86

2.3.9.2 STORED WASTE CERTIFICATION TECHNOLOGY DEVELOPMENT (SRP)

I. GOALS AND OBJECTIVES

The goal of this task is to provide technology to certify TRU waste currently in retrievable storage at SRP. The results of this task will provide design basis information for construction and operation of the TWF which will retrieve TRU waste currently stored at SRP and prepare it for shipment to WIPP disposal as low level waste or storage for future processing. Culvert explosion testing results will provide a design basis for the explosion hardened areas of the TWF. A gas generation computer model will estimate the potential radiolytic gas content in TRU waste drums. The model will be applied to evaluate and select an appropriate pressure relief device for TRU waste drums and drum liners.

II. STATUS

In FY 85, explosion tests were performed on new 55-gallon drums containing simulated TRU waste and a computer model for radiolytic gas generation in TRU waste drums was prepared. In FY 86, testing will continue on concrete culverts.

III. DESCRIPTION OF TASK

Culvert explosion testing will be conducted to determine the physical parameters during a worst case radiolytic gas explosion inside the concrete container, which can contain up to fourteen 55-gallon drums. The effects of the drum deflagration on the culvert structure will determine the safeguards required to protect personnel during retrieval, transportation, and processing of concrete culverts containing stored TRU waste.

The gas generation computer program is being modified to estimate gas composition in SRP TRU waste drums based on curie content. The model will be modified to achieve a good fit to the experimental data.

2.3.9.2

STORED WASTE CERTIFICATION TECHNOLOGY DEVELOPMENT (SRP)

FY 86

TASK TITLE	O	N	D	J	F	M	A	M	J	J	A	S
------------	---	---	---	---	---	---	---	---	---	---	---	---

Stored Waste								1				
Cert. Tech.								2				
Dev.												

FUNDING REQ (\$000)

FY86

BA	50
BO	50
CE	0

MILESTONE IDENTIFICATION

<u>No.</u>	<u>Accomplishment</u>	<u>Date Due</u>
1.	Complete Gas Gen. Computer Program	04/86
2.	Issue Final Report on Drum/Culvert Explosion Testing	04/86

2.3.9.3 STORED WASTE CERTIFICATION TECHNOLOGY DEVELOPMENT (ORNL)

I. GOALS AND OBJECTIVES

The objective of the Stored TRU Waste Certification Program is to produce a certification document that, when accepted by the Waste Acceptance Criteria Certification Committee (WACCC), will allow Oak Ridge National Laboratory (ORNL) to ship the 2000 plus stored drums of transuranic waste currently at ORNL to the WIPP. This document will provide guidance to the personnel in the Assay/Examination Facility to determine if the waste packages meet the requirements of WIPP-DOE-137, (latest revision).

II. STATUS

This task is a new initiative for FY 86. ORNL has submitted a draft document to the WACCC for review and comment.

III. DESCRIPTION OF TASK

The certification program for stored TRU waste is now included in the overall Certification Document for Transuranic Waste (ORNL-5985/R3) that is presently in draft form. This document is an expanded version of the Certification Document for Newly Generated Contact-Handled Transuranic Waste (ORNL-5985/R2).

The work plan for stored waste encompasses three subtasks:

1. Review of the comments from the WACCC and inclusion of these comments into a second draft.
2. Submission of a second draft to the WACCC for review and comment.
3. Preparation of the final draft and official submission to the WACCC for formal approval.

2.3.9.3

STORED WASTE CERTIFICATION TECHNOLOGY DEVELOPMENT (ORNL)

FY 86

TASK TITLE	O	N	D	J	F	M	A	M	J	J	A	S
Stored Waste Cert. Tech. Dev.								1				2

FUNDING REQ (\$000)

FY86

BA	50
BO	50
CE	0

MILESTONE IDENTIFICATION

<u>No.</u>	<u>Accomplishment</u>	<u>Date Due</u>
1.	Issue Draft ORNL TRU-CH Stored Waste Certification Plan	05/86
2.	Issue Final ORNL TRU-CH Stored Waste Certification Plan	09/86

2.4 FACILITY DEVELOPMENT

I. INTRODUCTION

Facilities to support the WIPP project are under construction at INEL/EG&G and are being designed and considered at RHO and SRP. These facilities will either deal with the certification of stored waste or with the processing of noncertifiable stored waste to a certifiable waste form.

II. GOALS AND OBJECTIVES

The goal of the facilities development project is to provide the major TRU waste storage sites with the means to either certify stored TRU waste to the WIPP criteria or to process uncertifiable waste into a certifiable form. To meet the WIPP certification requirements the objective was to develop technology and build the facility that would provide the necessary information in a safe efficient and accurate manner without requiring the opening or reprocessing of the waste. SWEPP (Stored Waste Examination Pilot Plant) was designed and constructed at INEL to meet this criteria.

For stored contact handled TRU waste that was not found to be certifiable, technology was developed to provide a safe and efficient means to process the uncertifiable waste into a WIPP certified form.

PREPP (Process Experimental Pilot Plant) was designed and is being tested at INEL to provide the necessary process support. Additional systems similar in nature to SWEPP and PREPP are under consideration for the RHO and SRP sites.

III. STATUS

SWEPP was designed to examine retrieved stored waste. The examination includes real time radiography used to determine if the waste contains any waste forms excluded by the WIPP criteria. An ultrasonic device

surveys the container to determine if the integrity meets the WIPP requirement and segmented gamma scanner along with passive/active neutron interrogation is used to determine if the isotopes present and the quantity meet WIPP criteria.

Other SWEPP technology development supported venting containers to eliminate hazards from radiolytic generated gases, stored waste retrieval and handling equipment.

PREPP Facility is under construction technology developed and implemented to provide the processing of uncertifiable waste included in part waste shredding, incineration, cementing, packaging to provide WIPP certified waste. The PREPP facility is scheduled for experimental operations in FY 87.

RHO-WRAP (Waste Receiving and Processing facility) is similar to the SWEPP/PREPP operation but will support RHO needs and different waste forms than those found at INEL. Presently WRAP project is completing proof of principle engineering studies and will issue the conceptual design in FY 86.

The SRP facility will deal with the TRU waste processing needs of that facility.

2.4.1 PROCESS EXPERIMENTAL PILOT PLANT (PREPP) SUPPORT

I. GOALS AND OBJECTIVES

The overall objective of this project is to provide the technology and engineering support for the experimental TRU waste processing operations at PREPP.

II. STATUS

With facility construction essentially completed during FY 85, PREPP support activities will be concentrated on providing startup support and technology enhancement for PREPP as the facility goes through checkout, startup, and "cold" testing in FY 86.

III. DESCRIPTION OF TASK

The PREPP Technology Support task consists of five major work packages: Test Documentation; Technical Safety Documentation; Engineering Support; Plant/Experiment Modification; and Technology Development. Test documentation will provide for the continuing development of the Acceptance Test Procedures (ATP) and test planning documentation up to the start of contaminated waste processing. Technical safety documentation will provide for the updating of the PREPP safety analysis and radiological control plans, the Technical Specifications, the PREPP WAC and the Criticality Control Plan. Engineering support will provide support during development and planning of the startup and testing program. Plant/Experiment modification will provide support for modifications deemed necessary as a result of the ATP's. Technology development activities will focus on engineering studies to determine the feasibility and plant modifications necessary to process SC waste in PREPP.

2.4.1

PROCESS EXPERIMENTAL PILOT PLANT (PREPP) SUPPORT

FY 86

TASK TITLE	O	N	D	J	F	M	A	M	J	J	A	S
PREPP Support									1 2			3

FUNDING REQ (\$000)

FY86

BA	1100
BO	1100
CE	0

MILESTONE IDENTIFICATION

<u>No.</u>	<u>Accomplishment</u>	<u>Date Due</u>
1.	Complete Plans and Procedures for Checkout and Cold Startup	06/86
2.	Submit Revised INEL Certification Plan to WACCC	06/86

2.4.2 SWEPP-II/PREPP-II

I. GOALS AND OBJECTIVES

The goal is to construct a facility or facilities at INEL to process and certify special case (SC) and remote-handled (RH) TRU waste.

- II. The draft report obtained from the FY 85 detailed characterization of INEL SC/RH TRU waste will be finalized in early FY 86. The final report will be used to provide baseline data to support the alternatives evaluation for processing and certifying SC/RH waste. The alternative to modify the existing SWEPP and PREPP facilities, or to construct a new facility, is referred to as SWEPP-II/PREPP-II.
- III. This task is to complete an evaluation of alternatives to retrieve, process, and certify the SC/RH TRU waste stored at INEL. Based on evaluation, technical needs, cost and schedule data will be developed. A recommendation will be made to DOE selecting one of the alternatives.

2.4.2

SWEPP-II/PREPP-II

FY 86

TASK TITLE	O	N	D	J	F	M	A	M	J	J	A	S
SWEPP-II		1								2	3	
PREPP-II												

<u>FUNDING REQ (\$000)</u>	<u>FY86</u>
BA	300
BO	300
CE	0

MILESTONE IDENTIFICATION

<u>No.</u>	<u>Accomplishment</u>	<u>Date Due</u>
1.	Complete Final SC/RH Report	11/85
2.	Identify & Evaluate Alternatives and Develop Cost and Schedule Data	07/86
3.	Prepare Final Report	08/86

2.4.3 STORED WASTE EXAMINATION PILOT PLANT (SWEPP) SUPPORT

I. GOALS AND OBJECTIVES

The overall goal of this task is to provide technical and administrative support to the Stored Waste Examination Pilot Plant. The goals for FY 86 are to provide for capital equipment purchases and support related to the purchase and startup of that equipment.

II. STATUS

The SWEPP Facility began preliminary operation in FY 85, performing assay and RTR ON TRU waste packaged in 55-gallon drums. In parallel with FY 86, facility operation capital equipment will be purchased to support facility operation.

III. DESCRIPTION OF TASK

This task will provide the capital equipment dollars and the administrative support necessary to purchase equipment to support the operation of SWEPP. Capital equipment to be purchased are: cargo containers to transport waste containers between SWEPP and PREPP, and a bulldozer to remove dirt and rock from the waste storage modules.

2.4.3

STORED WASTE EXAMINATION PILOT PLANT (SWEPP) SUPPORT

FY 86

TASK TITLE	O	N	D	J	F	M	A	M	J	J	A	S
SWEPP Support												1

<u>FUNDING REQ (\$000)</u>	<u>FY86</u>
BA	300
BO	300
CE	700

MILESTONE IDENTIFICATION

<u>No.</u>	<u>Accomplishment</u>	<u>Date Due</u>
1.	Complete Procurement of SWEPP Capital Equipment	09/86

2.4.4 SWEPP/PREPP TECHNOLOGY TRANSFER

I. GOALS AND OBJECTIVES

The goal is to accomplish effective transfer of technology and experience gained from the INEL SWEPP and PREPP programs to other DOE sites involved in TRU WASTE MANAGEMENT.

II. STATUS

During FY 85 representatives from Hanford Reservation, Savannah River Plant, Oak Ridge National Laboratory, Rocky Flats Plant and the WIPP all participated in the transfer of SWEPP and PREPP technology from INEL.

During FY 86, knowledge gained from the operation of SWEPP and PREPP will be available. The SWEPP technologies include: 1) stored waste retrieval, 2) waste container venting design information, 3) waste handling systems, 4) real-time radiography, 5) container integrity, 6) waste assay, 7) container overpacking, 8) cleaning and painting of waste containers, 9) data acquisition systems, 10) certified waste storage, 11) TRUPACT interface equipment, 12) certification procedures for stored waste, and 13) experience gained from startup and initial operation of SWEPP.

The PREPP technologies include: 1) waste shredding, 2) incineration, 3) waste and ash handling, 4) concreting, 5) process flow control, 6) criticality control, 7) off-gas systems, 8) container opening and certification quality control, 9) data acquisition systems, 10) retrofitting existing facilities for waste processing, and 11) PREPP operation.

III. DESCRIPTION OF TASK

This task will provide technical reports, plans, specifications, trade-off studies, drawings, engineering files, safety and environmental analyses, vendor data, tours of SWEPP and PREPP, and consulting services. In addition, this task will provide project engineering support for development of the SWEPP Box/Bin assay system.

2.4.4

SWEPP/PREPP TECHNOLOGY TRANSFER

FY 86

TASK TITLE	O	N	D	J	F	M	A	M	J	J	A	S
SWEPP/PREPP	1											3
Technology	2											
Transfer												

<u>FUNDING REQ (\$000)</u>	<u>FY86</u>
BA	100
BO	100
CE	0

MILESTONE IDENTIFICATION

<u>No.</u>	<u>Accomplishment</u>	<u>Date Due</u>
1.	Det. and Rec. Mods. to SWEPP/PREPP for Applications to Other Sites	10/85
2.	Complete Evaluation of DOE Sites for Application of SWEPP/PREPP Tech.	10/85
3.	Final Summary Report of Tech. Transfer Activities for FY 85, 86	09/86

2.4.5.1 STORED WASTE EXAMINATION PILOT PLANT (SWEPP) FACILITY

I. GOALS AND OBJECTIVES

The overall goal of this task is to provide a facility to examine and certify INEL TRU waste for shipment to the WIPP. The goal for FY 86 is to provide an assay system for boxes and bins to determine if the TRU activity is less than 100 nCi/g.

II. STATUS

The SWEPP Facility began preliminary operation in FY 85, performing assay and RTR on TRU waste packaged in 55-gallon drums. In parallel with FY 86 facility operation, a box/bin assay system will be constructed at LANL and installed at SWEPP. The final checkout and calibration of the box/bin counter will be accomplished during FY 87.

III. DESCRIPTION OF TASK

The box/bin counter will be assembled at LANL during FY 86. All funds will be transferred to LANL with INEL program support provided by the SWEPP/PREPP Technology Transfer program. In addition, preliminary calibration of the counter will be completed by LANL. After preliminary calibration, the counter will be delivered and installed at SWEPP.

2.4.5.2 PROCESS EXPERIMENTAL PILOT PLANT (PREPP) FACILITY

I. GOALS AND OBJECTIVES

The primary objective of the Process Experimental Pilot Plant (PREPP) is to experimentally demonstrate full-scale methods for processing the uncertifiable INEL stored TRU waste into a form that conforms with the Waste Acceptance Criteria for disposal at the WIPP. Goals for FY 86 are for the installation and startup of the opening and verification (O&V) equipment and for the startup of the incineration equipment.

II. STATUS

PREPP facility overall construction was essentially completed in FY 85. During FY 86, activities will continue with the final processing equipment installation, testing, and cold startup.

III. DESCRIPTION OF TASK

The PREPP objective for FY 86 is to have all activities required in preparation of cold startup operations completed. This includes having the plant physically ready, having the personnel trained, and having all procedures ready. The task consists of two major work packages: Technology and Administration, and Design and Construction. Technology and Administration will provide support in following the PREPP development activities, acquiring process and technology data, addressing safety and environmental issues, supporting design and construction administration, and controlling costs and schedules. Design and construction will provide for the engineering, design, procurement, fabrication, construction, installation, and inspection of the PREPP equipment and facility.

2.4.5

SWEPP/PREPP FACILITIES

FY 86

TASK TITLE	O	N	D	J	F	M	A	M	J	J	A	S
SWEPP/ PREPP									1		2	3 4 5

FUNDING REQ (\$000)

FY86

BA	3097
BO	3097
CE	0

MILESTONE IDENTIFICATION

<u>No.</u>	<u>Accomplishment</u>	<u>Date Due</u>
1.	Complete Dev. and Assay of Box/Bin Counter At LANL	06/86
2.	Complete Modification to Support Facilities	08/86
3.	Install O&V Equipment	09/86
4.	Complete Checkout and Cold Startup at PREPP	09/86
5.	Complete Delivery of Box/Bin Counter to INEL	09/86

2.4.6 WASTE RECEIVING AND PACKAGING (WRAP) FACILITY

I. GOALS AND OBJECTIVES

The goal of this task is to provide a facility to certify TRU waste currently in retrievable storage at Hanford and prepare it for shipment to WIPP, or disposal as low level waste.

II. STATUS

Technology development necessary for the design and construction of the WRAP facility was essentially completed during FY 85. Combining the information gained during testing at Hanford with the information gained from the transfer of SWEPP and PREPP technologies from INEL, a conceptual design effort can be undertaken during FY 86.

- III. The task for FY 86 is to complete a conceptual design of the WRAP using shredding and grouting technology transferred from PREPP. A Conceptual Design Report will be prepared.

2.4.6

WASTE RECEIVING AND PACKAGING (WRAP) FACILITY

FY 86

TASK TITLE	O	N	D	J	F	M	A	M	J	J	A	S
WRAP					1						2 3	

<u>FUNDING REQ (\$000)</u>	<u>FY86</u>
BA	1310
BO	1310
CE	0

MILESTONE IDENTIFICATION

<u>No.</u>	<u>Accomplishment</u>	<u>Date Due</u>
1.	Submit Initial Schedule 44	02/86
2.	Issue Conceptual Design Report	08/86
3.	Complete Schedule 44 for Line-Item Funding	08/86

2.4.7 TRANSURANIC WASTE FACILITY (TWF)

I. GOALS AND OBJECTIVES

The goal of this task is to design and construct the Transuranic Waste Facility (TWF). The TWF will be designed to retrieve and prepare TRU waste currently stored at SRP for shipment to WIPP, low level waste disposal on site, or future processing. Facilities will be provided to:

- o Retrieve Pu-239 containers
- o Purge 55-gallon waste drums
- o X-ray and assay waste containers
- o Size reduce or overpack waste containers

The TWF will also have the facilities to demonstrate PU-238 retrieval.

II. STATUS

In FY 85, both the TWF Basic Data Report and the TWF Scope-of-Work were completed. In FY 86, the TWF conceptual design package will be prepared.

III. DESCRIPTION OF TASK

This task will provide a complete TWF Conceptual Design Package which will include the Basic Data Report, the Scope-of-Work and a Current Appraisal for Budget (CAB) estimate. The TWF design will incorporate technology transfer from the SWEPP and PREPP facilities at INEL. The TWF CAB estimate will be prepared by SRP Estimating using the Scope-of-Work. The completed Conceptual Design Package will be used for DOE validation of the TWF project.

This will also provide an evaluation of processing Pu-238 waste at SRP or shipping waste to INEL for processing. This evaluation will be completed in November.

2.4.7

TRANSURANIC WASTE FACILITY (TWF)

FY 86

TASK TITLE	O	N	D	J	F	M	A	M	J	J	A	S
TWF							1				2 3	

<u>FUNDING REQ (\$000)</u>	<u>FY86</u>
BA	200
BO	200
CE	0

MILESTONE IDENTIFICATION

<u>No.</u>	<u>Accomplishment</u>	<u>Date Due</u>
1.	Submit Initial Schedule 44	04/86
2.	Complete Conceptual Design Report	08/86
3.	Complete Schedule 44 for Line-Item Funding	08/86

2.5 INFORMATION SERVICES

I. INTRODUCTION

An Independent Review Committee (IRC) has been established for reviewing the overall program as well as specific tasks. With members drawn from the academic and environmental communities, various Federal agencies, and the nuclear industry, this committee reviews the comprehensiveness and effectiveness of the program.

II. GOALS AND OBJECTIVES

Goals and objectives of the Information Services task are the organization and implementation of an information collection management and dissemination effort so that all relevant ideas and data can be considered. This is needed so that the TRU Lead Organization can fulfill its responsibility to 1) be able to respond quickly to questions about TRU waste management, 2) be able to provide information about TRU waste management to the public, and 3) evaluate the relevance of foreign technology to the DTWP. A major component of the effort is technical information management and dissemination.

III. STATUS

The Independent Review Committee meets approximately once each quarter. During FY 86, the Independent Review Committee will continue to provide the independent and objective review of activities of the DTWP as assigned by J10.

2.5.1 INDEPENDENT REVIEW COMMITTEE

I. GOALS AND OBJECTIVES

Comprised of seven members with technical experience and expertise in disciplines associated with nuclear waste management, the Independent Review Committee provides independent and objective review of the activities of the Defense Transuranic Waste Program (DTWP). The nature of the comments of the IRC is limited largely to reviewing and commenting on the content of planned program tasks and activities and providing these reviews and comments internally to the Joint Integration Office/Rockwell International.

The membership of the IRC includes representatives with experience in nuclear engineering, nuclear waste transportation, industrial quality control, systems and environmental engineering and state and local government interface issues.

II. STATUS

IRC activities continue to include objective overall review of DTWP projects and activities, including, where assigned, a technical review of particular research and development tasks and projects. The IRC makes specific suggestions and recommendations, to the J10, based upon expertise in the field of TRU waste management. The Committee operates as an outside consulting group governed by an independent charter identifying its responsibilities and ensuring its objective status.

III. DESCRIPTION OF TASK

The IRC will meet approximately once a quarter in committee to review assigned program activities. As appropriate, the Committee will assign individual members to act as review leaders in specific technical areas and areas of specific member expertise, e.g transportation,

waste certification, and quality control. As necessary, individual members will be requested to review documents or participate in review activities specific to their individual expertise.

The IRC will also provide a self-evaluation of the effectiveness of the committee, recommending revisions to the IRC charter if appropriate. Other task reviews may be assigned to the committee as these activities occur during the course of the year.

2.5.1

INDEPENDENT REVIEW COMMITTEE

FY 86

TASK TITLE	O	N	D	J	F	M	A	M	J	J	A	S
Independent Review Com.			1	2		3			4			5

<u>FUNDING REQ (\$000)</u>	<u>FY86</u>
BA	90
BO	90
CE	0

MILESTONE IDENTIFICATION

<u>No.</u>	<u>Accomplishment</u>	<u>Date Due</u>
1.	Provide a Letter Report	12/85
2.	Complete Annual Report for FY 85	01/86
3.	Provide a Letter Report	03/86
4.	Provide a Letter Report	06/86
5.	Provide a Letter Report	09/86

SUMMARY TABLE

WORK BREAKDOWN
FY 86 SUMMARY
(\$000)

<u>WBS No.</u>	<u>TASK TITLE</u>	<u>OPERATING DOLLARS</u>		<u>CAPITAL EQUIPMENT</u>
		<u>BA</u>	<u>BO</u>	<u>BA</u>
2.1	Program Management	1410	1410	0
2.2	Program Analysis	1600	1600	0
2.3	Technology Development			
2.3.1	Reduced Waste Gen.	510	510	0
2.3.2	Stored Waste Retrieval	350	350	150
2.3.3	Burial Ground Technol.	1752	1752	0
2.3.4	Instrumentation	1000	1000	800
2.3.5	Decontamination	0	0	0
2.3.6	Incineration/Digestion	0	0	0
2.3.7	Immobilization	0	0	0
2.3.8	Containment	2506	2506	324
2.3.9	Certification	230	230	0
2.4	Facility Development	6407	6407	700
2.5	Information Services	90	90	0
	TRU PROGRAM TOTAL =	15,855	15,855	1974

END

**DATE
FILMED**

11/12/91

11