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Department of Energy
Washington, DC 20585

January 31, 1997

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DNF SAFETY BOARD

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

Dear Chairman Conway:

Enclosed is the Department of Energy's Second Annual Report of activities related to the implementation of Recommendation 94-1, Improved Schedule for Remediation. This report, covering the period March 1, 1996 through December 31, 1996, presents the status of actions and milestones associated with the 94-1 Implementation Plan and describes activities underway to address emerging issues associated with nuclear materials stabilization. The reporting dates for this report have been revised to coincide with the calendar year to align with other reports produced by the Department.

In addition, the following missed milestones for 1996 have been subsequently been completed:

- IP-3.6-002 *Complete Stabilization of Mk 31 Targets Via Dissolution in Savannah River F-Canyon* (September 1996). Completed on January 2, 1997.
- IP-3.2-012 *Thermally Stabilize backlog of reactive plutonium oxides at Rocky Flats* (October 1996) Completed January 9, 1997.

If you have any questions, please contact me or have your staff contact Mr. John Tseng, Acting Director, Nuclear Materials Stabilization Task Group, (202) 586-0383.

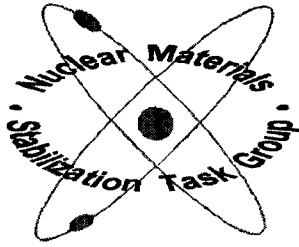
Sincerely,

A handwritten signature in black ink that reads "Alvin L. Alm".

Alvin L. Alm
Assistant Secretary for
Environmental Management

Enclosure

cc: M. Whitaker



DEFENSE NUCLEAR FACILITIES SAFETY BOARD
RECOMMENDATION 94-1 IMPLEMENTATION

ANNUAL REPORT

Covering the period
March 1, 1996 - December 31, 1996

Submitted: Frank Cole
G. Frank Cole, Acting Director
Nuclear Materials Stabilization Task Group

Date: 1/17/97

Reviewed,
Recommending
Approval: Jill E. Lytle
Jill E. Lytle, Deputy Assistant Secretary for
Nuclear Material and Facility Stabilization

Date: 1/27/97

Approved: Alvin L. Alm
Alvin L. Alm
Assistant Secretary
for Environmental Management

Date: 1/27/97

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EXECUTIVE SUMMARY

Defense Nuclear Facilities Safety Board (DNFSB) Recommendation 94-1, Improved Schedule for Remediation, addressed the need within the Department of Energy (DOE) to improve the schedule for remediating situations involving the storage of nuclear materials within the defense nuclear facilities complex. The Recommendation also called for an accelerated schedule for stabilizing and repackaging unstable special nuclear materials, spent fuel, unstable solid plutonium residues, highly radioactive liquids, etc.

On February 28, 1995, DOE submitted an Implementation Plan (IP) to the Board in response to Recommendation 94-1. The Implementation Plan describes the complex-wide plan of action and milestones to resolve the various nuclear materials stabilization issues identified in Recommendation 94-1. This report is the second annual update to the status of actions pertinent to the 94-1 Implementation Plan.

A Nuclear Materials Stabilization Task Group was established on February 28, 1995 to integrate the Department's programs for stabilizing excess nuclear material to achieve safe, stable states for interim and long-term storage pending ultimate disposition. The Task Group was made a permanent office (EM-66) within the Office of Environmental Management (EM) during the 1996 EM reorganization conducted as a part of the

Department's organizational review process. Their efforts to date have addressed stabilization activities complex-wide in the following areas:

- Integrating Department-wide approaches to stabilization issues
- Evaluating facility stabilization capabilities
- Procuring standardized equipment to support plutonium oxide stabilization and packaging for long-term storage
- Focusing research and development (R&D) efforts on the technical challenges facing stabilization, storage, and disposition of plutonium and other nuclear materials.

Significant progress was achieved in 1996 toward meeting 94-1 schedules and commitments. Per agreement with the Defense Board Staff and for consistency with other DOE reporting schedules, this annual report's schedule submission has been revised to coincide with the calendar year. The report contains a summary of completed 94-1 Implementation Plan milestone progress, a description of major program initiatives including plutonium residue trade studies, research and development program progress, plutonium stabilization and packaging system procurement progress, and a description of general issues related to 94-1 progress at selected sites. The data cut off date for this report was December 31, 1996.

I. SECOND YEAR STATUS

A. Overall Stabilization Progress

- 165 total milestones in Implementation Plan*
- 77 milestones completed since February 1995
 - 28 milestones completed early
 - 36 milestones completed on time
 - 13 milestones completed late
- 5 milestones past due

An appendix provides milestone descriptions and representation of milestone progress by site and material group.

* Total milestones through RFETS change June 1996 submission.

B. Milestones Past Due

IP-3.2-045

Begin Repackaging Material to Meet Metal and Oxide Storage Standard at Lawrence Livermore National Laboratory (May 1996)

Packaging will begin in April 1998. The original plans anticipated procurement of a full plutonium stabilization and packaging system. However, a full system would be costly relative to the small amount of material at LLNL. Livermore will obtain sufficient stabilization equipment to complete stabilization and packaging by May 2002.

IP-3.6-040

Complete Vacuum Consolidation of Savannah River's K-Reactor Disassembly Basin Sludge (September 1996)

Upgrades to basin water chemistry have superseded the need for basin sludge consolidation and removal. An Implementation Plan change reflecting this change is being prepared and will be submitted coincident with any changes emanating from the ongoing review of canyon utilization strategies.

IP-3.6-002

Complete Stabilization of Mk 31 Targets Via Dissolution in Savannah River F-Canyon (September 1996)

During mid-1996, Westinghouse Savannah River Company investigated seismic structural concerns with the F- and H-Canyons. As a result, progress on stabilization was delayed due to restrictions on introducing new materials into the canyons until resolution of the seismic concerns. The issues related to F-Canyon were resolved in August, and processing of Mk 31 targets has progressed well since recommencement of dissolution activities. This milestone was completed January 2, 1997.

IP-3.6-033

Begin Stabilization of Mk16/22 HEU SNF at Savannah River (November 1996)

Stabilization of Mk 16/22 spent fuel was scheduled to follow stabilization of Mk 31 targets. Stabilization of Mk 31 targets in the F-Canyon facility has been delayed as a result of canyon seismic issues requiring resolution. Additionally, more spent fuel requiring processing has been added to the schedule since the 94-1 Implementation Plan was prepared. Mk 16/22 stabilization is currently scheduled to commence July 1997.

IP-3.2-012

Thermally Stabilize Backlog of Reactive Plutonium Oxides at Rocky Flats (October 1996)

Delays were experienced due to emerging criticality concerns regarding storage of fissile material in the Building 371 stacker retriever and the storage of moderated residues in other vaults. Existing analyses did not adequately model either condition. These issues were resolved in late October, however, subsequent mechanical failure of the "XY Retriever" prevented movement of the last four plutonium metal items and 10 kg of plutonium oxide that remained to be stabilized and packaged. This milestone was completed on January 9, 1997.

II. ACTIVITIES

A. Trade Studies

Trade studies are the systems engineering method of identifying, analyzing, and comparing alternative methods for stabilizing materials to forms suitable for interim storage or disposal. The following listed trade studies have been completed during the past year to determine preferred methods for dealing with certain residue materials located at Rocky Flats, Los Alamos National Laboratory, Hanford, Lawrence Livermore National Laboratory, and other sites. The objective of each study was to evaluate alternatives for treating a category of residue to an end-state suitable for disposition. An end-state is either plutonium metal or oxide that meets the criteria for long term storage per DOE-STD-3013 or a form that meets criteria for disposal as waste. All of the studies evaluated worker risk, public risk, worker exposure, waste generation, discharge to the environment, cost, and timeliness as performance measures for comparison of options.

- Disposition of Sand, Slag, and Crucible Residues (Completed June 1996)
- Disposition of Ash (Completed October 1996)
- Disposition of Combustibles (Completed October 1996).

Plutonium Sand, Slag, and Crucible Residues Trade Off Analysis Study

The scope of this trade study was to perform a technical assessment of approaches available to stabilize plutonium-bearing sand, slag, and crucible (SS&C) residues within the DOE complex, develop and compare alternative courses of action that have the highest probability of success, and to provide input for decision makers to select the most feasible stabilization and disposition approach. The Trade Study began in February 1996 and completed in June 1996.

The trade study developed 10 alternatives (with the primary focus on Rocky Flats materials) grouped in the following areas:

- Direct disposal as waste to Waste Isolation Pilot Plant (WIPP)
- Immobilize (vitrify or cement) and ship to WIPP as waste
- Separate plutonium from matrix; store separated plutonium, dispose of remainder to WIPP
- Current Rocky Flats plan (heating in furnace to destroy reactive constituents).

Results: Analysis of the Department stabilization plans for SS&C resulted in a trade study recommendation to cement the majority of Hanford material and separate the small amount of high plutonium content SS&C; to send the Rocky Flats material to Savannah River for processing; and to separate the Plutonium from Los Alamos and Savannah River SS&C. As backup approaches, if shipment of SS&C proves impractical, the trade study team recommended cementation of all of the Hanford SS&C and vitrification of all Rocky Flats SS&C.

Recommendations were formulated based on the ability to implement technologies at a given site or existing site capabilities. Two key technical requirements drove the results to further treatment of the material. The first requirement was that there remains reactive calcium metal, a hazardous constituent in the matrix, which must be oxidized in order to meet shipping requirements for storage at WIPP. All alternatives analyzed, except for direct disposal, can meet this requirement. The second requirement was to make this material difficult from which to recover plutonium, thereby making it unattractive for proliferation. This requirement is met by reducing the plutonium concentration (<5% plutonium by weight) and/or by storage in hard to recover material forms (such as cementation or vitrification). As a result, further treatment of the SS&C residues is required beyond the baseline Rocky Flats plan.

Next Steps: The field office, in conjunction with the program office and the Task Group, must determine the path forward for this material to allow for its disposal. A decision point must be established for cementation at Hanford. Reactivity limits at WIPP must be resolved and

the family of 6M shipping containers must be reviewed for the effects on safety of increased radioactivity levels. Research into microwave vitrification, a promising technology, is being accelerated.

Plutonium Ash Residues Trade Off Analysis Study

The scope of this trade study was to perform a technical assessment of approaches available to stabilize and dispose of existing plutonium ash residues at Rocky Flats, Hanford, Los Alamos, and Lawrence Livermore, develop and compare alternative courses of action which have the highest probability of success, and provide input for decision makers to select the most feasible stabilization/disposition approach. The Trade Study began in May 1996 and was completed in October 1996.

The trade study developed 20 alternatives for existing plutonium ash residues grouped in the following areas:

- No processing with storage meeting minimum requirements (No Action)
- Repackaging and shipped as waste
- Immobilization on site through a chemical treatment process and shipment to WIPP as waste or stored onsite
- Separate plutonium from matrix; store separated plutonium, dispose of remainder to WIPP.

Results: This evaluation confirmed that further treatment of the ash residues is required to place material in a form suitable for safe, long-term storage. The study recommended that Livermore, Hanford and Los Alamos ash residue be processed and plutonium separated from the ash matrix. For Rocky Flats ash, the study identified technical uncertainties, however, the lowest lifecycle cost approach to ash residue disposition is to vitrify the material and ship to WIPP. Additionally, the vitrification option has

favorable outcomes related to a number of trade study performance measures.

Next Steps: The Department must accelerate the development of microwave vitrification and ceramic encapsulation at Rocky Flats. At Hanford, the silver persulfate technology must be demonstrated and National Environmental Policy Act documentation prepared. The WIPP capacity and schedule must also be integrated with other transuranic waste sources.

Plutonium Combustible Residues Trade Off Analysis Study

The scope of this trade study was to perform a technical assessment of approaches available to stabilize plutonium-bearing combustible residues within the DOE complex, develop and compare alternative courses of action which have the highest probability of success, and to provide input for decision makers to select the most feasible stabilization/disposition approach. The Trade Study began in March 1996 and was completed in October 1996. The trade study developed ten alternatives (with the primary focus on Rocky Flats materials) grouped in the following areas:

- Washing, volume reduction of materials and shipping to WIPP as waste
- Stand alone technologies with plutonium separated from the matrix, stored and the remainder shipped to WIPP
- Combination of technologies with plutonium immobilized or separated from the matrix and the remainder material shipped to WIPP.

Results: Analysis of the Department stabilization plans for Combustible residues resulted in the trade study recommendation to separate the plutonium from the residue matrix at Rocky Flats using mediated electrochemical oxidation (MEO) and cryogenic crushing technology. Additionally, the study recommended continued development of three other promising technologies: Sonication Washing, Detox, and Nitric/Phosphoric Acid

Digestion. Recommendations were based on the ability to implement technologies at a given site with existing site capabilities. Plutonium separation will mediate the strict transportation requirement unique to this type of residue, reduce cost, and minimize radiological exposure to workers.

Next Steps: The Department must actively pursue the development of the MEO and cryogenic crush technology, and continue the development of the other back-up technologies.

B. Plutonium Stabilization and Packaging Procurement Project

On March 11, 1996, the Oakland Operations Office awarded a \$54 million contract to provide the Department with plutonium stabilization and packaging equipment. The design of the stabilization and packaging system was reviewed and approved; the System Design and System Specification Documents were approved; and the Quality Assurance Program was approved. Authorization for fabrication of the prototype unit was granted. The prototype is to be delivered to Rocky Flats in mid-1997. Additionally, the plutonium storage package design was given preliminary approval. Prototype storage packages have been fabricated with testing completed successfully in September 1996. Final approval of the design depends on satisfactory completion of testing and review of the final test reports. The storage package meets the Department's criteria for long-term storage as defined in DOE-STD-3013-96. The ASME Boiler and Pressure Vessel Code Section VIII criteria was used as the basis for the package design. Upon final approval of the design, the storage package will become the Departmental standard for long-term storage of plutonium metals and oxides.

C. Research Activities

The original Research and Development Plan was prepared by the Research Committee and issued by the Task Group on November 30, 1995. The Research Committee was disbanded upon

issuance of the 1995 R&D Plan, and the Plutonium Focus Area (PFA), reporting to the Task Group, was chartered as the follow-on organization.

The Focus Area is managed by the Idaho Operations Office with support from Lockheed Martin Idaho Technologies and Argonne National Laboratories. The PFA purpose is to recommend solutions to site-specific and complex-wide technology issues associated with plutonium remediation, stabilization, and preparation for disposition. Its scope is primarily on Pu-bearing materials (excluding transuranic wastes and final-form weapons components), and includes interest in other fissile materials and special isotopes as assigned. It is organized to meet immediate and long-term requirements of the NMSTG. The PFA activities are coordinated with the Office of Technology Development programs and other focus areas to ensure effective use of resources and to prevent duplication of effort.

The Materials Stabilization R&D Program is executed by Los Alamos National Laboratory (LANL) under direction from the NMSTG. In response to the R&D needs identified in the November 1995 R&D Plan, LANL published a Technical Program Plan in December 1995, which defined its activities for calendar year 1996.

Plutonium Focus Area Progress

The products produced by the PFA in 1996 are shown in Table 1. These products were focused on defining a systems engineering management approach for the PFA, soliciting white papers from the at-large research community, direct support to the NMSTG for the 94-1 R&D Plan and trade studies, direct systems engineering support to the PuSAP procurement, and providing PFA-sponsored technology development for identified R&D needs which were of a complex-wide, integrating nature and which were not covered by ongoing research under the Stabilization R&D Program or at other DOE sites.

Table 1. PFA Products for Fiscal Year 1996

CATEGORY	PRODUCT	PURPOSE
Management	PFA Management Plan	Define roles & responsibilities
	PFA Quality Assurance Plan	Define Quality Assurance approach
White Paper Solicitation	PFA Technology Summary	Present R&D needs to general community
NMSTG Support	94-1 R&D Plan	Document R&D requirements including need dates, R&D recommendations, technology status, and R&D requirements gaps
	Ash End-state Trade Study	Recommend best technical path forward and options to NMSTG
Procurement Support	PuSAP System Specification	Support PuSAP procurement
	PuSAP Container Specification	Support PuSAP procurement
	PuSAP Marking Specification	Support PuSAP procurement
	PuSAP QA Support	Support PuSAP procurement
Integrated Technology Development	Ceramification Demonstration	Evaluate innovative technology for application at RFETS using SRS facilities
	Recycled Metal Trade Study	Prove feasibility of complex-wide mortgage reduction alternative to standardized can procurement
	Integrated Surveillance System Requirements Analysis	Document complex-wide R&D needs to meet identified R&D gap from 1995 R&D Plan

Technical Advisory Panel

The Technical Advisory Panel (TAP) of the PFA is a complex-wide panel of plutonium technical experts organized and applied to assessing research needs and relevance. Inclusion of systems engineering provided a thorough grounding in plutonium stabilization requirements and facilitated a process for technical and peer review of complex-wide and site-specific technical research.

The TAP completed the 1996 Research and Development Plan on an accelerated schedule, completed technical peer-review of the Materials Stabilization R&D Program at LANL, assessed 18 technology white papers, met with the Defense Board, and met with a senior Russian delegation to identify 15 potential technologies for cooperative research. A follow-up visit to Russia is planned by the PFA to the International Conference on Radwaste and to review additional contacts, facilities, and candidate technologies.

The November 1995 R&D Plan contained 18 recommendations based on technology gaps, technologies that needed to be tracked based on maturity scores, and other issues identified separately by the R&D Committee. Of the 18 recommendations, 6 have been closed and the other 12 are effectively underway toward closure to meet 94-1 Implementation Plan commitments. In general, the technology needs for stabilizing 94-1 nuclear materials continue to be addressed by existing DOE programs.

In general, the technology needs for stabilizing 94-1 nuclear materials are being addressed by existing programs. The principal programmatic risk identified this year by the TAP is that the technology need dates may not be met in all cases. This year, the TAP has also identified several research needs that address the path forward to materials stewardship and disposition.

Using the same system engineering approach employed in last year's R&D Plan, the TAP developed programmatic risk assessments based on the technical maturity score and R&D need date of each technology considered. The number of technologies reviewed for this plan was 64 compared with 99 for the November 1995 plan. Based on the systems engineering analysis, there is only one high risk technology, and there are 14 medium risk technologies that cause some programmatic risk with respect to meeting 94-1 Implementation Plan Milestone dates. The NMSTG has initiated a tracking program that incorporates the technology insertion schedules into the end-use Site Integrated Stabilization Management Plans (SISMP), and requires a monthly status of the schedule progress for these 15 technologies.

In comparing R&D activities to the comprehensive set of technical requirements, the TAP identified two new areas of R&D requirements, or "gaps" for immediate R&D efforts: (1) the need for a comprehensive assessment of the inventory of miscellaneous residues not subject to previous trade studies and their treatment alternatives, and (2) the need for a trade study to evaluate the approach to

treating pyrochemical crucible residues at Rocky Flats.

Four gaps were identified for R&D efforts that relate to long-term stewardship and materials disposition interfaces:

1. Assessment of adequacy of storage configurations of stabilized materials awaiting disposition;
2. Interface with the Office of Materials Disposition to support high level waste disposition R&D to evaluate ultimate disposition options;
3. Assessment of the 94-1 stabilization processing baseline against safeguards and security requirements;
4. The need for a comprehensive trade study to determine the necessity and validity of automation of processes that involve handling of plutonium storage containers that meet DOE-STD-3013.

Materials Stabilization R&D Program Progress

As the Lead Laboratory for 94-1 plutonium R&D, Los Alamos issued a Technical Program Plan outlining 29 funded R&D tasks with 180 milestones. At the end of FY96, 156 milestones were completed as scheduled. Of the incomplete milestones, seven are in projects continued in FY97.

The technological successes for FY96 are more significant than the milestone success ratio. The return on investment has resulted in a number of new technologies developed to address problems regarding plutonium stabilization and remediation. These include the development and testing of prototype equipment for cryogenic crushing and compaction; electrolytic decontamination of storage cans and gloveboxes; cold-testing and installation of a prototype hydrothermal processing reactor; and the technological data to support the long-term

storage of pure plutonium oxide and metal (per DOE-STD-3013).

Several of the technology development tasks specific to Rocky Flats Environmental Technology Site (RFETS) were demonstrated in FY96. The precipitation flow sheet development for RFETS solution stabilization was developed, optimized, and delivered to RFETS. This work is currently being applied at the site in order to meet several milestones. Salt oxidation technology has been demonstrated and processing optimization is nearly complete. In addition, a prototype salt distillation unit has been demonstrated at Los Alamos on actual salt residue and has produced low level salt waste and oxide suitable for long-term storage. This unit will provide sufficient data to support the design and procurement of a production unit. Finally, a number of technologies related to the stabilization of combustibles and ash were initiated to support RFETS baseline activities. Key core technology work includes the demonstration of x-ray absorption near edge structure and x-ray absorption fine structure techniques for plutonium residue characterization.

Research work for 1997 has been documented and approved by the NMSTG to meet upcoming stabilization commitments. Additionally, progress on critical technologies will be tracked on a quarterly basis and managed by the NMSTG.

D. Integration Working Group/Nuclear Materials Stewardship

Integration Working Group Activities

The Integration Working Group was chartered on March 27, 1995 to provide a complex-wide forum for integrating information, performing trades studies, and developing an Integrated Facilities Plan for nuclear material stabilization. Activities to date include:

- Developing and exercising a systems engineering screening process for identifying

and scoping integration opportunities for analyses and resolution using trade studies.

- Producing a set of lessons learned gained during the Savannah River facilities startups related to facility readiness and planning.
- Commencing development of an integrated strategy for dealing with material holdings at small sites and small holdings at large sites.

Transition to Nuclear Materials Stewardship

In that the Office of Environmental Management (EM) is responsible for most of DOE's excess nuclear materials and facilities, it will play a critical role in DOE's mandate to provide stewardship for these nuclear materials and facilities in the long term. EM must pursue all available opportunities to remove and consolidate nuclear material inventories, thereby reducing the mortgage costs of maintaining surplus facilities and allowing scarce funds to be directed to other tasks. Accordingly, as materials stabilization progresses and the nuclear materials program moves towards long term storage and management of facilities and materials, a stewardship function within EM will be required.

In the broad sense, "stewardship" means the responsible management of materials across their entire life cycles, through processes of production, use, recycle and recovery, storage, transportation, and disposition. DOE intends to fulfill its stewardship missions in a way that:

- ensures worker safety and public health
- provides cost-effective management of facilities and materials
- maintains the availability of resources for defense, medical, and industrial programs; and
- enhances public perception of DOE as a responsible custodian of materials missions.

EM is, therefore, establishing a Nuclear Materials Stabilization and Stewardship (EM-NMSS) program to further these goals for the materials it controls. This program will draw

upon expertise from DOE Headquarters and the Operations Offices at Albuquerque and Savannah River to define, evaluate, and implement stabilization, consolidation, storage, and disposition tasks, and to ensure close cooperation with other DOE programs and stakeholders who share responsibilities or interests.

The EM-NMSS program will develop policy and provide technology and implementation support for all materials that are within the scope of the emerging EM Ten-Year Plan to include excess weapons-capable fissile materials and byproduct materials that will be retained or stabilized for safe disposition. Stewardship will be implemented in a way that permits a possible hand-off to any future organization that may be assigned responsibility for all Department nuclear materials that are excess to National Security.

III. GENERAL ISSUES

Savannah River

During the spring and fall of 1996, Westinghouse Savannah River Company investigated seismic structural concerns with the F- and H-Canyons. Issues related to F-Canyon were resolved in August, and processing of Mk 31 targets has progressed well since recommencement of dissolution activities. Completion of this overdue milestone is expected in January 1997. Concerns related to the H-Canyon seismic status are expected to be resolved in January 1997.

DOE Savannah River has given Westinghouse approval to implement a phased restart of H-Canyon. This initiative will accelerate startup of the H-Canyon fuel dissolution capability from September 1998 to July 1997.

Since the loss of the second generation Americium/Curium (Am/Cm) test melter in July, Am/Cm vitrification process development has continued through use of the first generation melter. A new melter incorporating lessons

learned has been designed and is being procured. The new melter is expected to be delivered in late February 1997. The latest projection for the initiation of stabilization is June 1999—15 months after the scheduled milestone date.

Savannah River program managers at the Operations Office and Headquarters continue to examine the impacts of various scenarios for canyon utilization at the site. Any impacts and revisions to IP milestones will be reflected in an IP change.

Rocky Flats

The 94-1 Implementation Plan calls for the processing of all high-risk materials at Rocky Flats. During the course of the year Rocky Flats has presented a new set of baseline activities to resolve issues associated with stabilizing high-risk residues. Eleven new milestones have been added to the Implementation Plan and changes have been submitted to the Board for Rocky Flats, modifying three areas of the plan:

1. Highly-enriched uranium solutions were drained directly to bottles versus the original plan to blend down prior to shipment off-site. This milestone was completed late in November 1996 instead of September 1996.
2. Schedules for solid residue stabilization have been revised to reflect delays in completion of higher risk salt stabilization by six months, from December 1997 to June 1998, and SS&C stabilization by one year, from May 1997 to May 1998.
3. Schedules for liquid residue stabilization have been revised to reflect a nine-month delay, from December 1997 to September 1998, in completion of stabilization activities in Building 771. Additional interim milestones have been added for Buildings 771 and 371.

A recent review of plutonium storage at Rocky Flats was conducted and revealed that up to 100 additional plutonium metal items may be in

contact with plastic. A 10% sampling plan, conducted in 1995, identified 256 items out of a total of 1,858 items held as being in direct contact with plastic. Repackaging of this material to meet the 94-1 milestone was reported complete in September 1995. The original sampling plan did not recognize differences in packaging configurations for similar items stored at different locations (e.g., inert gloveboxes versus air vault). Consequently, 111 items were not inspected. Of these 111 items, 100 are now suspected to be in contact with plastic. The site is preparing a corrective action plan to inspect and repackage these items as necessary. The headquarters program office and the NMSTG will track and ensure completion of required repacking activities.

As a result of the recommendations provided through completion of the residues trade studies, progress on selected R&D initiatives, and the above mentioned implementation plan changes, Rocky Flats is evaluating various alternatives for integrating site-wide residue stabilization and disposition activities. With the addition of the preparation of an environmental impact statement to address disposition of selected Rocky Flats residues, Rocky Flats management is reexamining the current stabilization plans to determine more cost effective plans, if any, for remediating selected residues. The headquarters program office and the NMSTG are participating in this review process.

Los Alamos National Laboratory

Los Alamos plutonium vault sampling efforts conducted in July 1996 identified two small subsets (64 items) of the legacy 94-1 inventory, silica solids and cellulose cleanup rags, with unacceptably high sample failure rates. These material subsets have been reclassified as high-risk, and have been included in the Implementation Plan milestone requiring all high-risk items to be stabilized by September 1997.

LANL's mission requirements have been modified, resulting in two changes in the Los

Alamos response to the DNFSB Recommendation 94-1. First, the legacy 94-1 inventory has been redefined to reflect upgrades to the inventory based on completion of annual nuclear material assessment reports required by DOE Order 5660.1B. The 94-1 inventory includes items which are currently required for actively funded user projects in their present form/packaging system. These materials will not be subject to plutonium separation and recovery as long as they are required for programmatic activities. Any potential safety issues surrounding the age of the item, its form, or its current packaging system are being addressed with the same level of attention currently afforded the remaining 94-1 inventory. Second, because LANL is a DOE Defense Programs site, portions of the plutonium under Recommendation 94-1 will be available for movement into planned programmatic or active user projects. New programs and expansions of existing programs before 2002 make it inappropriate, from both a waste generation and a worker exposure standpoint, to package the stabilized plutonium metal and oxide per DOE-STD-3013 for long-term storage. The material is expected to be used within 5-7 years, and its temporary packaging will meet or exceed the Requirements of current LANL vault storage procedures.

Hanford

DOE and contractor management at the Plutonium Finishing Plant (PFP) are implementing breakthrough strategies to integrate stabilization activities with facility deactivation. These strategies include installing stabilization and packaging system equipment in the vault building rather than in PFP. These and other initiatives may result in changes to the methods and locations of stabilization activities. Once finalized, any changes from the breakthrough strategies will be included in an IP change.

Hanford is delaying the stabilization of polycubes from the accelerated schedule identified in its June 1996 Site Integrated Stabilization Management Plan. Stabilization of

polycubes will still be completed by January 2001, as scheduled in the Implementation Plan. Decelerating polycube stabilization will allow resources to be focused on higher priority solution stabilization and plutonium packaging needs, which are part of the 94-1 program.

Oak Ridge

Oak Ridge has submitted a draft implementation plan change to the NMSTG for the Molten Salt Reactor Experiment (MSRE) Project and proposes extending schedule completion dates for the three original milestones. In addition, Oak Ridge has committed to include several internal milestones within their SISMP to align project progress with the Comprehensive Environmental Response Compensation and Liability Act (CERCLA) activities involving the fuel salt.

The K-25 Enriched Uranium Deposit Removal Program at Oak Ridge is under review at this time and could possibly result in Implementation Plan changes in the near future. Recent criticality assessments indicate that there may exist low enriched uranium deposits in the K-29 Building that exceed risks imposed by the K-25 deposits. DOE is evaluating the K-29 criticality concerns to determine if reprioritizing deposit removal activities will be necessary.

Mound

A program review was conducted at Mound on May 8, 1996, at which the conclusion was reached that plutonium could be shipped to Los Alamos without significant repackaging thereby reducing repackaging costs by over \$500,000 and reducing the schedule by approximately 9

months. Mound shipped 1.2 kg of plutonium to Hanford and the remainder of its plutonium holdings to LANL. Mound's 94-1 commitments to repackage material in contact with plastic has been met through their efforts to repackage material for shipment offsite. Mounds remaining 94-1 commitment will be completed in early 1997.

Plutonium Residues Environmental Impact Statement

The current RFETS baseline path for residues satisfies DNFSB commitments for safe interim storage. However, for approximately 43 metric tons of the residue inventory, implementation of different options, in addition to or in place of those identified in the baseline, may be desirable in order to ensure that the resulting waste forms will meet the new safeguards and security requirements (issued on July 22, 1996, by the Office of Safeguards and Security, NN-51) and provide further advantages with respect to waste minimization and ALARA.

The Department intends to prepare an Environmental Impact Statement (EIS) to evaluate the impacts associated with alternatives to preparing plutonium residues and scrub alloy currently being stored at Rocky Flats for disposition or disposal. The EIS will serve to ensure that the significant effects of the treatment alternatives are identified and decisions are made on safe and cost-effective treatment for disposal of the affected plutonium residues and scrub alloy. A Notice of Intent (NOI) to conduct the EIS was issued November 19, 1996. The EIS is currently scheduled for completion in November 1997.

APPENDIX
Milestone Status Summary

DEPARTMENT OF ENERGY
NUCLEAR MATERIALS STABILIZATION TASK GROUP
DNFSB Recommendation 94-1 Implementation Plan Milestones
January 6, 1997

165 Milestones
(173 proposed)

NMSTG Milestone Number	SIMS Cmt #	Key Milestones	Mat'l Group	IP Page #	DOE Site	Milestone	Due Date	Revised Due Date	Completion Date	Status
IP-ES-042	001	*	General	6	All	Facilities will be started or restarted in accordance with DOE Order 5480.31. These restart and start-up requirements will be taken into account in the development of the "Facilities Section" of the Program Plan.	None			RF - Bldg. 771 tank draining ORR completed August 1, 1995. First three tanks drained September 29, 1995.
IP-3.2-028	002		Pu Met/Ox	47	HAN	Start engineering studies of a new repackaging line at Hanford.	Sep 1995		Sep 1995	Completed September 8, 1995. DOE-RL reported that the Milestone is being accomplished, since the overall issue of consolidated procurement of plant equipment has started and is developing information on specifications.
IP-3.2-029	003		Pu Met/Ox	47	HAN	Complete detailed design, equipment procurement, and installation of a new repackaging system.	Dec 1998			Possible delays in initiating definitive design occurred. DOE-RL believes major milestone (IP-3.2-018) will be achieved, but some of intermediate HQ milestones may be at risk. Delays push project tasks from FY97 to FY98 and outyears. (NOV 96 RPT)
IP-3.2-033	004	*	Pu Met/Ox	48	HAN	Start restabilizing high assay oxides at the PFP.	Jul 1999			
IP-3.2-030	005		Pu Met/Ox	47	HAN	Train staff, prepare procedures, perform operational readiness testing (prior to commencing operations).	Sep 1999			
IP-3.2-031	006	*	Pu Met/Ox	47	HAN	Commence repackaging operations at Hanford.	Oct 1999			
IP-3.2-032	007	*	Pu Met/Ox	47	HAN	Complete metal repackaging at Hanford.	Sep 2000			
IP-3.2-018	008	*	Pu Met/Ox	41, 48, 50	HAN	Thermally stabilize and repackage all plutonium oxide to meet the metal and oxide storage standard.	May 2002			
IP-3.3-031	009	*	Pu Res	4, 67, 73	HAN	Stabilize existing inventory of sludge (low organic residues) in muffle furnaces.	Sep 1995		Jun 1995	Completed early on June 13, 1995.
IP-3.3-032	010	*	Pu Res	4, 67, 73	HAN	Stabilize 46 cans of selected ash from RF in the muffle furnaces.	Mar 1996		Jan 1996	Completed early in January 1996.
IP-3.3-028	011	*	Pu Res	67	HAN	Stabilization of Polycubes begins.	Jul 1999			"Pyrolysis Furnace" and "Plutonium Stabilization and Handling" budget shortfall of ~ \$15M is being resolved (by the site) by "delaying polcube stabilization and ... until costs can be absorbed in FY97 & FY98 budgets. (July 96 RPT)
IP-3.3-026	012	*	Pu Res	67	HAN	Stabilization of reactive solids (SS&C) completed.	Jan 2000			A new jaw crusher with an improve throughput rates has been installed Affects from this the new jaw crusher improved throughput will be in the Dec monthly report. (NOV 96 RPT)
IP-3.3-029	013	*	Pu Res	67, 73	HAN	Stabilization of Polycubes completed.	Jan 2001			
IP-3.3-027	014		Pu Res	67	HAN	Stabilization and repackaging of interim-stabilized materials completed.	Jan 2002			Supporting action necessary to meet IP-3.3-033 due May 2002.
IP-3.3-033	015	*	Pu Res	4, 67, 73	HAN	Stabilize and package all remaining residues to safe storage standards	May 2002			
IP-3.1-024	016	*	Pu Soln	3, 36, 37	HAN	Complete transfer of 22,700 liters of PUREX solutions to tank farms at Hanford.	Aug 1995		Apr 1995	Completed early on April 28, 1995.
IP-3.1-014	017		Pu Soln	36	HAN	All bottles of plutonium solutions at Hanford inspected to ensure proper venting.	Sep 1995		May 1995	Completed early on May 15, 1995

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IP-3.1-015	018		Pu Soln	36	HAN	220 liters of chloride solutions at Hanford stabilized as part of a developmental testing program.	Sep 1995		Sep 1995	Completed September 29, 1995.
IP-3.1-021	019	*	Pu Soln	37	HAN	Complete solution technology development at Hanford Plutonium Finishing Plant (PFP).	Mar 1996		Apr 1996	Completed late in April 1996.
IP-3.1-016	020		Pu Soln	36, 37	HAN	ROD issued for PFP Clean-out and Stabilization EIS.	Jun 1996		Jun 1996	Completed. ROD was approved on June 25, 1996 and published in the Federal register on July 10, 1996. (June 96 RPT)
IP-3.1-022	021	*	Pu Soln	37	HAN	Begin processing solutions at PFP.	Jun 1997			No further testing or work accomplished on the vertical calciner due to other 94-1 priority work. Design of calciner is 80% and fabrication of calciner, scrubber, and glovebox is 60%. No operational testing expected before Jan 1997. (NOV 96 RPT)
IP-3.1-017	022	*	Pu Soln	3, 36, 37	HAN	Stabilization of 4,800 liters at PFP completed.	Jan 1999			
IP-3.6-016	023		SNF	105	HAN	Complete cofferdam installation in K-West Basin	Feb 1995		Feb 1995	Completed February 1995; USQ package approved by DOE (RL) June 7, 1995.
IP-3.6-014	024		SNF	105	HAN	Develop K-Basin potential funding options and an acquisition strategy, as appropriate.	Mar 1995		Mar 1995	Completed March 1995.
IP-3.6-015	025		SNF	105, 112	HAN	Issue Notice of Intent for K-Basins EIS.	Mar 1995		Mar 1995	Completed. Published in the Federal Register on March 28, 1995.
IP-3.6-017	026		SNF	5, 105	HAN	Complete cofferdam installation in K-East Basin	Apr 1995		Apr 1995	Completed April 1995; USQ package approved by DOE (RL) June 7, 1995.
IP-3.6-019	027		SNF	105	HAN	Initiate sludge retrieval demonstration in conjunction with cofferdam installation in K-Basins.	Apr 1995		Dec 1994	Completed early in December 1994.
IP-3.6-018	028		SNF	5, 102, 105, 112	HAN	Start fuel characterization in K-Basin hot cells	Apr 1995		Apr 1995	Completed. Started fuel transfer to PNL & characterization on March 30, 1995.
IP-3.6-020	029		SNF	105, 112	HAN	K-Basins Integrated Path Forward Schedule providing details of major system acquisitions and material movements issued.	May 1995		Apr 1995	Completed early. Schedule issued April 25, 1995.
IP-3.6-010	030		SNF	101, 103, 105, 112	HAN	Issue "Management of SNF from the K-Basins" EIS ROD.	Dec 1995		Mar 1996	Completed late on March 4, 1996.
IP-3.6-012	031	*	SNF	105, 112	HAN	Begin SNF and sludge removal from K-Basins.	Dec 1997			868 of 902 cans moved from K Basin W to Mid & E bays. Measurements done for cans above expected Cs concentrations, sludge volumes, & fuel damaged. 3 Design Criteria documents approved. Discuss with EPA on PCBs TSCA issues in K Basin sludge. (NOV 96 RPT)
IP-3.6-001	032	*	SNF	5, 96, 105, 112	HAN	Complete removal of all SNF from K-Basins	Dec 1999			See IP-3.6-012.
IP-3.6-201	153	*	SNF		HAN	Complete removal of all sludge from K-Basins	Dec 2000			IP-3.6-201 added to separate original milestone, IP-3.6-001, into two parts; SNF removal (001) followed by sludge removal (201).
IP-3.6-045	033	*	SNF	111	ID	Begin movement of CPP-603 South Basin SNF	Jul 1995		May 1995	Completed early on May 12, 1995.

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IP-3.6-043	034	*	SNF	110, 111, 113	ID	Move an additional 189 SNF units from CPP-603 North and Middle Fuel Storage Facility to CPP-666.	Dec 1995		Sep 1995	Completed early on September 11, 1995.
IP-3.6-044	035	*	SNF	110, 111, 113	ID	Move all SNF (6.84 metric tons) from CPP-603 North/Middle Basins to CPP-666.	Dec 1996		Aug 1996	Completed early on August 5, 1996.
IP-3.6-046	036	*	SNF	111, 113	ID	Complete the removal of all SNF not requiring overpacking from CPP-603.	Dec 1998			Phase VI Grp 4 & 5 Pt 1 - transfers completed. Phase VI Grp 5 Pts 2 & 3 - completed fabrication bucket & handling tools; safety document approved; training underway. Phase VI Grp 2 - fabrication of buckets & safety documents underway. (NOV 96 RPT)
IP-3.6-047	037	*	SNF	111, 113	ID	Construct and startup a CPP-603 dry storage overpacking station.	Dec 1998			Testing and modifications to the Canning/Drying Station being done to give uniform temperature profile. Training and Readiness Assessment will be done in Jan 1997 and operational in Mar 1997. Storage canisters are being installed. (NOV 96 RPT)
IP-3.6-005	038	*	SNF	96, 110, 112, 113	ID	Remove all SNF from the CPP-603 Fuel Storage Facility.	Dec 2000			Aluminum plate fuel removal tooling is nearly complete. Safety documentation is progressing. Procedure development and training is planned for Jan 1997. First fuel is expected to be processed Mar 1997. (NOV 96 RPT)
IP-3.2-037	039		Pu Met/Ox	49	LANL	Complete peer review of LANL packaging operations for long-term storage.	Apr 1995		Apr 1995	Completed April 28, 1995.
IP-3.2-039	040		Pu Met/Ox	49	LANL	Integrate and demonstrate repackaging operations at the TA-55 plutonium facility at LANL.	Apr 1995		Apr 1995	Completed April 28, 1995. Cold operations demonstrated April 28, 1995; hot operations demonstrated June 1, 1995.
IP-3.2-040	041		Pu Met/Ox	49	LANL	Begin repackaging of plutonium metal and oxide at the TA-55 plutonium facility in LANL.	May 1995		May 1995	Completed; repackaging operations commenced May 1995.
IP-3.2-035	042	*	Pu Met/Ox	48	LANL	Stabilize and repackage high risk vault items to meet long-term storage standards.	Sep 1997			No stabilization/packaging done in Nov. Completed processing backlog nitric acid solutions. Some crossovers done for Operations Center Upgrade. Operation expected restart early Jan 1997. Once operational will reassess impacts on milestone. (NOV 96 RPT)
IP-3.2-014	043	*	Pu Met/Ox	41, 48, 49, 50	LANL	Thermally stabilize and repackage all plutonium oxide to meet the metal and oxide storage standard.	May 2002			
IP-3.3-035	044		Pu Res	73	LANL	Perform 100% visual inspection of vault inventory	May 1995		Apr 1995	Completed early on April 7, 1995.
IP-3.3-034	045		Pu Res	73	LANL	(LANL lead, HAN, LLNL, RF and SR assist) Develop risk-based, complex-wide categorization and prioritization decision criteria that all stored residues will be required to meet.	Sep 1995		Mar 1996	LANL is assisting sites on the specific application of LANL's method and criteria. Hanford has evaluated LANL's methodology and provided feedback to LANL. (HAN June 96 RPT)
IP-ES-100	046	*	Pu Res	4	LANL	Stabilize 220 kgs of residues.	Oct 1995		Oct 1995	Completed in October 1995
IP-3.3-037	047	*	Pu Res	74	LANL	Process 90% of analytical solutions.	Oct 1995		Aug 1995	Completed early on August 31, 1995. All analytical solutions processing will be completed by September 30, 1995.
IP-3.3-036	048		Pu Res	74	LANL	Recover 100 neutron sources.	Oct 1995		Apr 1995	Completed early on April 21, 1995.
IP-3.3-038	049		Pu Res	74	LANL	Process 100 kgs of sand, slag and crucible materials.	Oct 1995		Apr 1995	Completed early on April 21, 1995.

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IP-3.3-039	050		Pu Res	74	LANL	Process 70 kgs of hydroxide solids.	Oct 1995		Apr 1995	Completed early on April 21, 1995.
IP-3.3-040	051	*	Pu Res	74	LANL	Oxidize 50 kgs of corroded metal items.	Oct 1995		Oct 1995	Completed revised milestone on time. Revised milestone is: "Stabilize 100 metal items by October 31, 1995."
IP-3.2-044	052		Pu Met/Ox	49	LLNL	Begin initial inspection of metal items.	Apr 1995		Apr 1995	Completed in April 1995. Inspections finished in November 1995.
IP-3.2-045	053	*	Pu Met/Ox	49	LLNL	Begin repackaging material to meet the metal and oxide storage standard	May 1996			Past Due. Milestone will have to be revised based on standard complex-wide procurement. Site estimates repackaging will begin in April 1998.
IP-3.2-042	054	*	Pu Met/Ox	49	LLNL	Complete the Plutonium ES&H Corrective Action Plan at LLNL.	Jan 1997			To date 265 of the 275 items are assessed. No assessments of items were done in November. The milestone is expected to be completed by Jan 1997. (NOV 96 RPT)
IP-3.2-043	055	*	Pu Met/Ox	49	LLNL	Excess plutonium metal items at LLNL repackaged in compliance with DOE STD-3013-94.	May 2002			Preparation Phase progress is being made. (August 96 RPT)
IP-3.2-015	056	*	Pu Met/Ox	2, 41, 50	LLNL	Thermally stabilize and repack all plutonium oxide to meet the metal and oxide storage standard.	May 2002			
IP-3.3-042	057		Pu Res	71, 73	LLNL	Complete trade-off study to develop plans for the stabilization and packaging of ash/residues for long-term storage.	Apr 1996			Past Due. Due to special characteristics of LLNL ash material, further work is needed for remediation. The project completion date is July 1997. Work can not be started until a bagless transfer system is operational in Aug 1997. (NOV 96 RPT)
IP-3.3-045	058	*	Pu Res	73	LLNL	Identify, characterize, and non-destructively assay all Pu items.	Jan 1997			Voluntary stand downs have reduced workoff rate. Jan 97 completion may be at risk. (August 96 RPT)
IP-3.3-043	059	*	Pu Res	71	LLNL	Materials identified in the Pu ES&H Vulnerability study requiring stabilization will be processed during the first year of Phase 3 operations.	Apr 1997			Site indicates Preparation Phase progress is being made. (August 96 RPT)
IP-3.3-041	060	*	Pu Res	4, 71, 73	LLNL	Stabilize and package all containers of ash/residue.	Apr 1998			Preparation Phase is reported 10% complete. (August 96 RPT)
IP-3.3-046	061	*	Pu Res	73	LLNL	Ship all excess items to LANL.	May 2002			Milestone to be deleted in a IP change. LLNL will process and store items.
IP-3.2-003	062	*	Pu Met/Ox	41, 50	Mound	Repackage all plutonium metal in direct contact with plastic.	Sep 1996		Sep 1996	Completed September 26, 1996. All material repackaged and shipped to LANL. (September 96 RPT)
IP-3.2-101	063	*	Pu Met/Ox	50	Mound	Repackage all plutonium metals and oxides to meet the DOE metal and oxide storage standard.	May 2002		Sep 1996	Completed September 26, 1996. All material shipped to LANL. All Mound 94-1 Implementation Plan milestones are complete. (September 96 RPT)
IP-ES-001	064	*	General	2	NMSTG	Issue a DNFSB 94-1 Integrated Program Plan.	Feb 1995		Feb 1995	Completed February 28, 1995.
IP-ES-004	065	*	General	3	NMSTG	Research Committee established.	Mar 1995		Mar 1995	Completed March 15, 1995.
IP-ES-005	066	*	General	3	NMSTG	Research Committee's comprehensive Research and Technology Development Plan issued (RC).	Nov 1995		Nov 1995	Completed November 30, 1995
IP-ES-041	067	*	General	5	NMSTG	Complete the "Facilities Section" of the Integrated Program Plan (IWG).	Dec 1995		Nov 1995	Completed early on November 7, 1995
IP-ES-006	068	*	General	3	NMSTG	Research and technology development efforts will be measured against the comprehensive plan, which will be updated annually.	Nov 1997			Plutonium Focus Area replaces Research Committee. Pu Focus Area will update. (November 26, 1996)
IP-3.2-011	069		Pu Met/Ox	2, 41	NMSTG	Pu Metals/Oxides Trade Study Completed	May 1995		May 1995	Completed May 15, 1995

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IP-3.3-050	070	*	Pu Res	73	NMSTG	Develop complex-wide secondary material storage standard for materials that are less than 50% assay.	Dec 1995		Jan 1996	Completed late on January 25, 1996.
IP-3.6-100	071		SNF	100	NMSTG	Issue Final Programmatic SNF EIS.	Apr 1995		Apr 1995	Completed in April 1995.
IP-3.6-053	072		SNF	100, 103, 112	NMSTG	Issue Programmatic SNF EIS ROD.	Jun 1995		Jun 1995	Completed. Published in Federal Register June 1, 1995.
IP-3.6-006	073		SNF	99, 112	NMSTG	Issue the SNF Program Plan	Nov 1995		Nov 1995	Completed November 30, 1995
IP-3.6-008	074		SNF	100, 112	NMSTG	Issue Foreign Research Reactor SNF EIS ROD.	Dec 1995		May 1996	Completed late on May 13, 1996.
IP-3.6-048	075		SNF	112	NMSTG	Environmental Management PEIS ROD issued	Sep 1995		Jun 1995	Completed early on June 1, 1995
IP-3.6-049	076		SNF	112	NMSTG	Repository EIS ROD.	Sep 2000			
IP-3.4-012	077		Spec Iso	80	NMSTG	Activities will be initiated to clarify end-states and disposition pathways.	None			Will be addressed by the IWG Small Sites, Small Holdings Initiative.
IP-3.4-013	078		Spec Iso	80	NMSTG	Activities will be initiated to establish storage standards and/or criteria for unique material forms as required.	None			Local standards/criteria for material storage are being developed for Am/Cm, Np and Pu-238.
IP-3.4-014	079		Spec Iso	80	NMSTG	Activities will be initiated to resolve transportation, storage space, and consolidation issues related to Special Isotopes.	None			Will be addressed by the IWG Small Sites, Small Holdings Initiative.
IP-3.4-009	080		Spec Iso	78	NMSTG	Non-defense users will define requirements for programmatic and National Asset reserves, in concert with DOE representatives (including NE). Inventories in excess of these requirements will be considered for long-term storage or disposal.	None			Will be addressed by the IWG Small Sites, Small Holdings Initiative.
IP-3.4-008	081		Spec Iso	78	NMSTG	Strategic goals will be refined for which parts of current inventories must be retained for future use. DOE(DP) will define isotope quantities and forms that will be reserved for national security needs.	None			
IP-3.2-017	082	*	Pu Met/Ox	2, 41, 50	OR	Thermally stabilize and repackage all plutonium oxide to meet the metal and oxide storage standard.	May 2002			Preparation phase activities remain on schedule. (September 96 RPT)
IP-3.5-010	083	*	Uranium	92, 93	OR	Complete "interim corrective measures:" drain water from ACB cell; partition the off-gas system; eliminate water sources	Nov 1995		Nov 1995	Completed November 30, 1995
IP-3.5-003	084	*	Uranium	87, 92, 93	OR	Complete mechanical removal of HEU deposits at OR's K-25 Plant.	Sep 1997			A status briefing was given to DNFSB staff on Nov 20. A follow-up briefing is scheduled for Dec 13. (NOV 96 RPT)
IP-3.5-004A	167	*	Uranium		OR	Submit MSRE Fuel Salt Disposition Feasibility Study to EPA/TDEC.		Feb 1997		CERCLA Feasibility Study in preparation for Feb. Responses provided to NAS Molten Salt Panel. NAS to complete report in Feb. Preparation started for inspecting coolant salt drain tank. Work identifies parameters for disposition of salts. (NOV 96 RPT)
IP-3.5-004B	168	*	Uranium		OR	Complete MSRE Off-gas System reactive gas removal.		Jun 1997		Proposed Implementation Plan milestone addition. RGRS passivated with F2 (September 96 RPT)
IP-3.5-004C	169	*	Uranium		OR	Submit MSRE Fuel Salt ROD to EPA/TDEC.		Jan 1998		Proposed Implementation Plan milestone addition. (August 96 RPT)
IP-3.5-005	085	*	Uranium	87, 92, 93	OR	Remove HEU Uranium deposits for ORNL's Molten Salt Reactor Experiment (MSRE) project.	Feb 1998			No progress toward this milestone has been made since May 1996. EM requires DP concurrence to ship UF6 removed by Reactive Gas Removal System to Building 3019. On July 26, 1996 DP Asst. Secy did not concur. (August 96 RPT)

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IP-3.5-005A	170	*	Uranium		OR	Complete MSRE uranium deposit removal		Feb 1999		Readiness evaluations were completed and approval was given on Nov 20 to operate the RGRS. Gas removal commenced with two operations on Nov 21. Initial indications suggest that there is additional plugging of the drain tank off-gas piping. (NOV 96 RPT)
IP-3.5-005B	171	*	Uranium		OR	Complete MSRE reactive gas and uranium deposit conversion.		May 2000		Proposed Implementation Plan milestone addition. (September 96 RPT)
IP-3.5-011	087	*	Uranium	92	OR	Fuel salts at OR's MSRE project removed	May 2000			See Milestone IP-3.5-005. Preparation Phase progress is approximately 33% behind (August 96 RPT)
IP-3.5-011A	172	*	Uranium		OR	Complete MSRE fuel salt removal.		Jun 2002		Proposed Implementation Plan milestone revision. (August 96 RPT)
IP-3.5-011B	173	*	Uranium		OR	MSRE stabilized fuel salt and uranium stored.		Feb 2003		Proposed Implementation Plan milestone addition. (August 1997)
IP-3.2-046	088	*	Pu Met/Ox	50	RF	Conduct a sampling and inspection program at Rocky Flats to determine the relative risk and priority for repackaging plutonium metals and oxides in close proximity to plastic and other synthetic materials.	Jul 1995		Sep 1995	Completed late on September 30, 1995. Late completion due to Bldg. 371 ventilation and Stacker/Retriever problems.
IP-3.2-020	089	*	Pu Met/Ox	41, 45, 50	RF	Repackage a total of 256 items in Building 707 where Pu metal is in direct contact with plastic	Oct 1995		Nov 1995	Completed late on November 14, 1995. DNFSB staff informed November 15, 1995.
IP-3.2-021	090	*	Pu Met/Ox	45, 50	RF	Repackage 1,602 Rocky Flats Pu metal items not in direct contact with, but in proximity to, plastic.	Oct 1996	Nov 1996	Dec 1996	The stacker/retriever failed Nov 26. There are four items remaining to be processed after the stacker/retriever is repaired. The remaining action should take one shift. (NOV 96 RPT). Completed in late Dec.
IP-3.2-012	091	*	Pu Met/Ox	41, 50	RF	Thermally stabilize the existing backlog of all known reactive plutonium oxide at Rocky Flats. (Est.: 63 kgs.)	Oct 1996	Nov 1996		The stacker/retriever failed Nov 26. There are 9.0 kg of oxidizer remaining to be processed after the stacker/retriever is repaired. The remaining action should take four shifts. (NOV 96 RPT). Schedule to be done Jan 3, 1997.
IP-3.2-022	092	*	Pu Met/Ox	45	RF	New Pu metal/oxide processing line operational in Building 371 at Rocky Flats.	Sep 1998			At risk. (September 96 RPT)
IP-3.2-016	093	*	Pu Met/Ox	2, 41, 50	RF	Thermally stabilize and repackage all plutonium oxide to meet the metal and oxide storage standard.	May 2002			
IP-3.3-011	094	*	Pu Res	4, 63, 73	RF	Vent 2,045 residue drums with a potential for hydrogen gas generation.	Oct 1995		Sep 1995	Completed early on September 25, 1995.
IP-3.3-008	095	*	Pu Res	63	RF	Vent 700 unvented residue drums.	Oct 1996		Dec 1995	Completed early on December 22, 1995.
IP-3.3-015	096	*	Pu Res	4, 73	RF	Vent all inorganic residues.	Oct 1996		Dec 1995	Completed early on December 22, 1995.
IP-3.3-016	097	*	Pu Res	4, 73	RF	Vent all wet/miscellaneous residues.	Oct 1996		Dec 1995	Completed early on December 22, 1995.
IP-3.3-014	098	*	Pu Res	4, 63, 73	RF	Stabilize all sand, slag, and crucible materials and graphite fines.	May 1997	May 1998		Implementation Plan change approved August 20, 1996.
IP-3.3-014A	154	*	Pu Res		RF	BEGIN stabilization of SS&C and graphite fines.		Sep 1997		Implementation Plan change approved August 20, 1996. On schedule. (September 96 RPT)
IP-3.3-012	099	*	Pu Res	4, 61, 73	RF	Stabilize by pyrochemical oxidation and repackage 6,000 kgs of higher risk Plutonium containing salts.	May 1997	Feb 1998		Implementation Plan change approved August 20, 1996. On schedule. (September 96 RPT)
IP-3.3-012A	155	*	Pu Res		RF	BEGIN stabilization by pyrochemical oxidation 6,000 kg higher-risk Pu salts.		Aug 1997		Implementation Plan change approved August 20, 1996. On schedule (September 96 RPT)
IP-3.3-013	100	*	Pu Res	4, 61, 73	RF	Stabilize remaining high risk salts (4,000 kgs.) via chemical oxidation.	Dec 1997	Jun 1998		Implementation Plan change approved August 20, 1996. On schedule. (September 96 RPT)
IP-3.3-017	101	*	Pu Res	4, 61, 73	RF	Stabilize high risk combustibles (11,000 kgs).	Nov 1998			On schedule. (September 96 RPT)
IP-ES-025	102	*	Pu Res	4, 63	RF	Repackage all Pu inorganic oxides and wet/miscellaneous residues (1,113 drums).	May 2002			

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IP-3.1-004	103	*	Pu Soln	34, 37	RF	Complete NEPA analysis (an Environmental Assessment) for solution stabilization.	Apr 1995		Apr 1995	Completed April 28, 1995.
IP-3.1-020A	156	*	Pu Soln		RF	START draining B771 hydroxide tanks and begin processing.		Nov 1996	Nov 1996	Milestone IP-3.1-020A was completed on Nov 4, 1996 when hydroxide precipitation processing was started. (NOV 96 RPT)
IP-3.1-020B	157	*	Pu Soln		RF	COMPLETE draining four (4) B771 hydroxide tanks.		Jan 1997	Aug 1996	
IP-3.1-020C	158	*	Pu Soln		RF	COMPLETE B771 hydroxide precipitation process.		Mar 1997		RFETS did not submit any information on the status of this item other than on schedule even though it is due in the next six months, Mar 1997. (NOV 96 RPT)
IP-3.1-020D	159	*	Pu Soln		RF	START draining five (5) B771 high level tanks and begin oxalate processing.		Nov 1997		
IP-3.1-020E	160	*	Pu Soln		RF	COMPLETE processing liquids from B771 high level tank & bottles.		May 1998		
IP-3.1-020F	161	*	Pu Soln		RF	COMPLETE processing all liquids in B771		Sep 1998		
IP-3.1-020G	162	*	Pu Soln		RF	START draining B371 tanks and begin processing.		Dec 1996		RFETS did not submit any information on the status of this item other than on schedule even though it is due in the next six months, Dec 1996. (NOV 96 RPT)
IP-3.1-020H	163	*	Pu Soln		RF	COMPLETE draining six (6) B371 Cat B tanks.		Feb 1997		RFETS did not submit any information on the status of this item other than on schedule even though it is due in the next six months, Feb 1997. (NOV 96 RPT)
IP-3.1-020I	164	*	Pu Soln		RF	COMPLETE draining two (2) B371 criticality tanks.		Jun 1997		
IP-3.1-020J	165	*	Pu Soln		RF	COMPLETE processing liquids from eight (8) B371 tanks.		Jun 1997		
IP-3.1-020K	166	*	Pu Soln		RF	COMPLETE processing all liquids in B371.		Jun 1999		
IP-3.1-005	105	*	Pu Soln	34, 37	RF	All solutions in Building 771 (12,000 l.) stabilized.	Dec 1997	Sep 1998		
IP-3.1-006	106	*	Pu Soln	3, 34, 37	RF	18,000 l. of solutions in Building 371 stabilized.	Jun 1999			
IP-3.1-003	107	*	Pu Soln	31	RF	Place plutonium metal and oxide generated from stabilizing solutions at RF in a form suitable for safe storage.	May 2002			
IP-3.5-006	108	*	Uranium	90, 93	RF	Begin bottling and shipping 2,700 liters of HEU solutions offsite for stabilization.	May 1996		Aug 1996	Completed late on August 13, 1996
IP-3.5-001	109	*	Uranium	87, 90, 93	RF	Remove all HEU uranyl nitrate solutions (2,700 liters) from Building 886 and complete all shipments offsite.	Sep 1996	Nov 1996	Nov 1996	Milestone IP-3.5-001 was completed on Nov 8, 1996 when all HEUN solutions from B886 were shipped offsite. (NOV 96 RPT)
IP-ES-018	110	*	General	4	RF, SR, Mound	All Pu Metal in direct contact with plastic repackaged.	Sep 1996		May 1996	RF completed on November 14, 1995. SR completed November 1995. Mound September 1996.
IP-3.2-100	111		General	101	SR	Final IMNM EIS issued	May 1995		Oct 1995	Completed in May 1995. Issued for public distribution and NOA to EPA October 13, 1995. NOA in Federal Register October 20, 1995.
IP-3.2-024	112		General	5, 35, 37, 46, 64, 81, 82, 90, 101, 112	SR	IMNM EIS ROD issued. (The ROD will select a method for stabilizing SR fuel and targets, H-Canyon Pu-239 solutions, metals & oxides, Pu residues, special isotopes, and HEU solutions.)	Jul 1995		Dec 1995	Completed late on December 12, 1995. Added TRR fuel (82 cans).

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IP-3.2-025	113	*	Pu Met/Ox	46, 50	SR	Metal turnings where plutonium metal is known to be in direct contact with plastic at Savannah River will either be processed (using the F-Canyon and FB-Line facilities) to a safe storable form, or repackaged.	Dec 1995		Nov 1995	Completed early on November 20, 1995.
IP-3.2-027	114		Pu Met/Ox	47, 65	SR	Modifications to the FB-Line facility (installation of a bagless transfer system) completed.	Sep 1997			Installation scheduled to begin ahead of schedule in June 1997.
IP-3.2-028	115		Pu Met/Ox	46, 65	SR	A new or modified Actinide Repackaging Facility at Savannah River, required to fully meet the metal and oxide storage standard, is available. (Assumes the approval of an FY98 Line Item Project).	Dec 2001			
IP-3.2-013	116	*	Pu Met/Ox	2, 41, 46, 50	SR	Thermally stabilize and repackage all plutonium oxide to meet the metal and oxide storage standard.	May 2002			
IP-3.3-021	117	*	Pu Res	65	SR	Processing in F-Area begins.	Sep 1996		Jun 1996	Completed early in May 1996. (however the site does not expect to complete Pu residue processing on time.
IP-3.3-018	118		Pu Res	65	SR	Characterization methods used will include NDA using digital radiography equipment, with selected sampling of containers using existing gloveboxes with modifications.	Dec 1997			IP text change and milestone revision will be submitted under separate cover. (October 96 RPT)
IP-3.3-022	119	*	Pu Res	4, 65, 74	SR	Processing of existing inventories of SS&C material completed.	Dec 1997			On schedule. (September 96 RPT)
IP-ES-032	120	*	Pu Res	4, 65, 74	SR	Stabilize all other residues at SR.	May 2002			See IP-3.3-021. Although processing began ahead of schedule the site does not expect to complete Pu residue process on time due to conflicting F-canyon requirements.
IP-3.1-007	121		Pu Soln	35, 37	SR	ROD for the F-Canyon plutonium solutions issued.	Feb 1995		Feb 1995	Completed. ROD issued February 2, 1995.
IP-3.1-008	122		Pu Soln	35, 37	SR	Begin F-Canyon processing operations.	Feb 1995		Feb 1995	Completed. Processing commenced February 3, 1995.
IP-3.1-009	123	*	Pu Soln	3, 35, 37	SR	Complete Stabilization of F-Canyon plutonium solutions (320,000 liters converted to metal).	Jan 1996		Apr 1996	Completed late on April 11, 1996.
IP-3.1-011	124	*	Pu Soln	35, 37	SR	Begin H-Canyon stabilization operations.	Feb 1999			IP text change and milestone revision will be submitted under separate cover. (August 96 RPT)
IP-3.1-013	125		Pu Soln	35	SR	SR's HB-Line Phase II start-up	Feb 1999			IP text change and milestone revision will be submitted under separate cover. (August 96 RPT)
IP-3.1-012	126	*	Pu Soln	35, 37	SR	Stabilization operations completed for Pu-239 solutions in SR's H-Canyon (34,000 liters converted to oxide).	Feb 2000			IP text change and milestone revision will be submitted under separate cover. (August 96 RPT)
IP-3.6-101	127		SNF	109	SR	Re-examine L-Basin corrosion surveillance coupons.	Feb 1995		Feb 1995	Completed in February 1995.
IP-3.6-034	128	*	SNF	109	SR	Complete vacuum consolidation of SR's L-Reactor Disassembly Basin sludge.	Sep 1995		Mar 1995	Completed early on March 31, 1995.
IP-3.6-035	129	*	SNF	109	SR	Reorient fuel in SR's L-Reactor Disassembly Basin to a horizontal configuration.	Feb 1996		Nov 1995	Completed early on November 29, 1995.

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IP-3.6-037	130	*	SNF	110, 112	SR	Complete fuel consolidation to free up approximately 1,250 additional storage spaces in SR's RBOF.	Dec 1995		Aug 1996	Completed late on August 26, 1996. (Completed ahead of proposed due date for SR June 1996 recommended milestone change, "Repackage SNF in RBOF to provide 900 MTRE additional capacity by December 31, 1996." (August 96)
IP-3.6-032	131	*	SNF	107, 110, 112	SR	Begin Mk31 target stabilization in SR's F-Area.	Nov 1995		Feb 1996	Completed late on February 12, 1996.
IP-3.6-038	132	*	SNF	5, 109, 110, 112	SR	Complete K- & L-Reactor Disassembly Basin upgrades	May 1996		May 1996	Completed May 31, 1996.
IP-3.6-002	133	*	SNF	5, 96, 108, 110, 112	SR	Complete stabilization of SR's Mk31 targets via dissolution in F-Canyon.	Sep 1996			Past due. Mk-31 target stabilization is 80% complete. A hold has been placed on cask car movements of target to F-Canyon. Expected completion date in Jan 1997. (NOV 96 RPT)
IP-3.6-040	134	*	SNF	110	SR	Complete vacuum consolidation of SR's K-Reactor Disassembly Basin sludge.	Sep 1996			Past due. Delays in target transfers to F-Canyon caused corroded targets in RR cars return to K-Basin. Sludge vacuum operations halted. Expected completion in July 1997. IP text & milestone revision to be submitted under separate cover. (NOV 96 RPT)
IP-3.6-033	135	*	SNF	108, 110, 112	SR	Begin stabilization of SR's Mk16 and Mk22 HEU SNF.	Nov 1996			Past due. Start stabilization of Mk-16 & Mk-22 delayed because TRR & EBR-II added to F-Canyon schedule. Mk-31 transfers to F-Canyon delayed & concentration of resources on F-Canyon restart delay dissolver availability. Expected July 1997. (NOV 96 RPT)
IP-3.6-036	136	*	SNF	109	SR	Reorient fuel in SR's K-Reactor Disassembly Basin to a horizontal configuration.	Feb 1997			Reorientation is scheduled to be completed ahead of schedule in November 1996. (August 96 RPT)
IP-3.6-041	137	*	SNF	110	SR	Remove consolidated basin sludge from SR's K-Reactor Disassembly Basins.	Sep 1997			IP text change and milestone revision will be submitted under separate cover. (August 96 RPT)
IP-3.6-042	138	*	SNF	110	SR	Remove consolidated basin sludge from SR's L-Reactor Disassembly Basins.	Sep 1997			IP text change and milestone revision will be submitted under separate cover. (August 96 RPT)
IP-3.6-003	139	*	SNF	5, 96, 108, 110, 112	SR	Complete dissolution of SR's Mk16 and Mk22 SNF.	Nov 1999			See IP-3.6-033. SNF processing delay will cause delay in completion until April 2000. (August 96 RPT)
IP-3.6-004	140	*	SNF	5, 96, 110, 112	SR	Complete stabilization of SR's resultant Uranium solutions from the dissolution of Mk16/22 SNF.	Apr 2000			See IP-3.6-033. SNF processing delay will cause delay in completion until April 2000. (August 96 RPT)
IP-3.4-001	141		Spec Iso	77	SR	Immediately discontinue active water cooling for Am/Cm solutions in F-Canyon.	Feb 1995		Feb 1995	Completed in February 1995.
IP-3.4-021	142		Spec Iso	77, 83, 84	SR	Transport Pu-238 solids currently in inadequate storage to the HB-Line for venting and repackaging	Apr 1995		Mar 1995	Completed early on March 2, 1995.
IP-ES-008	143		Spec Iso	3, 81	SR	Conceptual design report for the stabilization of Am/Cm Solutions completed	Dec 1995		Nov 1995	Completed early on November 30, 1995
IP-3.4-017	144	*	Spec Iso	82, 84	SR	Begin stabilization of Pu-242 Solutions at HB-Line, Phase III.	May 1997		Aug 1996	Completed ahead of schedule.

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IP-3.4-018	145	*	Spec Iso	3, 77, 82, 84	SR	Complete stabilization of Pu-242 Solutions at HB-Line, Phase III.	Nov 1997			DOE authorization to transfer Pu-242 solution into HB-Line was received Nov 8, 1996. Pu-242 stabilization is 85% complete and is still ahead of schedule. Expected completion date of milestone is Feb 1997. (NOV 96 RPT)
IP-3.4-015	146	*	Spec Iso	84	SR	Start vitrification of Am/Cm Solutions.	Mar 1998			Revised schedule delaying completion 7 to 10 months caused by melter problem will be issued September 26, 1996. (August 96 RPT)
IP-3.4-016	147	*	Spec Iso	3, 77, 80, 84	SR	Complete vitrification of Am/Cm Solutions.	Sep 1998			See IP-3.4-015 status. (August 96 RPT)
IP-3.4-019	148	*	Spec Iso	84	SR	Begin stabilization of Np-237 Solutions HB-Line, Phase II.	Jul 2001			HB -Line, Phase II startup has been deleted. Solutions will be transported from H-Canyon to F-Canyon for vitrification in the Multi-Purpose Processing Facility (MPPF) after Am/Cm is stabilized. (August 96 RPT)
IP-3.4-020	149	*	Spec Iso	3, 77, 84	SR	Complete stabilization of Np-237 Solutions at HB-Line, Phase II.	Dec 2002			IP text change and milestone revision will be submitted under separate cover. (August 96 RPT)
IP-3.4-003	150		Spec Iso	77	SR	Implement effective surveillance and monitoring programs to reduce the risk of extended storage of special isotope solutions.	None		Mar 1995	Completed in March 1995. Surveillance and monitoring programs are in place and are ongoing.
IP-3.5-008	151	*	Uranium	91	SR	Complete construction of blending facilities at F- and H-Areas (HEU Dilution Project).	Jul 1996		Jul 1996	Completed on July 25, 1996.
IP-3.5-002	152	*	Uranium	3, 87, 91, 93	SR	Complete FA-Line blending and processing of 230,000 liters of HEU solutions into a stable oxide.	Dec 1997			