ROCKY FLATS PLANT: TEST BED FOR TRANSITIONING FROM WEAPONS PRODUCTION MISSION TO ENVIRONMENTAL RESTORATION, WASTE MANAGEMENT, AND ECONOMIC DEVELOPMENT MISSIONS

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ABSTRACT

Department of Energy's Rocky Flats Plant is preparing to transition from its traditional nuclear weapons production mission to the new transition mission, i.e., *cleanup, preparation for deactivation and decontamination, decommissioning, dismantlement and demolition,* and when appropriate, *economic development,* of the facilities. This paper describes this transition process in the following subject areas : 1) Introduction and background on RF's historical and new missions, 2) Integration with the DOE Planning Process, 3) Site and facilities description, 4) Steps in Transition Planning and Implementation 5) Regulatory and statutory requirements that impact transition processes, 6) Facility Characterization and Assessments, 7) Transition Activities in Building 865, 8) Stakeholder concerns, 9) Economic development of usable buildings and facilities, and 10) Technologies for the transition process.

INTRODUCTION AND BACKGROUND

Redirection of Rocky Flats Plant's (RF) mission is an inevitable result of changes in the worldwide social, political, and environmental factors. These changes were exemplified in the cancellation of the W-88 Warhead in January 1992, by the President of the United States. These unprecedented changes have altered the RF's traditional nuclear weapons production mission to the transition mission, i.e., *cleanup, preparation for deactivation and decontamination, decommissioning, dismantlement and demolition,* and when appropriate, *economic development,* of the facilities.

The purpose of this paper is to describe the essentials of the technical approach and management actions advanced by EG&G Rocky Flats, Inc., [EG&G/RF, the Operating Contractor at RF, a Department of Energy (DOE) facility], to organize, staff, direct, and control the activities necessary to transition the Rocky Flats Plant from its historical weapons production mission to the transition mission.

Other papers will discuss the Transition Standards Identification Program (TSIP) being developed at RF as part of the Test Bed under DOE's direction. This paper provides only a brief introduction to TSIP. An important first step in transition is gathering accurate and real time data to characterize the facility conditions as they exist now, to assess that data, and to determine the activities needed. This function is encompassed in the Facility Characterization element described in this paper.

On July 3, 1992, EG&G/RF submitted to the DOE early draft versions of: 1) a Report to the Congress on the Rocky Flats Transition Plan and 2) the Mission Transition Program Management Plan (TPMP). After review and approval, the Report to Congress was sent to Congress on July 31, 1992, and the TPMP was issued for public review on October 1, 1992. Public comments were received through December 1992. A comment-response document is expected to be issued by April 30 1993, that incorporates not only the public comments but also DOE HQ comments, and the changes resulting from continuing activities that have occurred at the plant since the Plan's first issuance. Also the report to the congress may be reissued as a result of the review comments.

RF's Changing Mission and Reorganization

Elements of the new Rocky Flats Plant mission are: *environmental restoration, waste management, transition definition and implementation, economic development, production contingency, deactivation and decontamination, surveillance and maintenance.* Consistent with these mission elements, the EG&G RF was recently reorganized into the following nine major entities: Transition Management; Standards, Audits, and Assurance; Environmental and Waste Management; Facility Management and Operations; Environmental Restoration Management; Safety, Safeguards, and Security; Engineering and Technology; Maintenance and Plant Support; and, Administration and Planning.

Contents of this Paper

The following items are discussed in this paper:

1. Introduction and background on RF's historical and new missions
2. Integration with the DOE Planning Process
3. Site and facilities description,
4. Steps in Transition Planning and Implementation
5. Regulatory and statutory requirements that impact transition processes,
6. Facility Characterization and Assessments
7. Transition Activities in Building 865
8. Stakeholder concerns,
9. Economic development of usable buildings and facilities, and
10. Technologies for the transition process.

The bases for this paper are: 1) the draft Mission Transition Program Management Plan prepared by EG&G/RF and submitted to the DOE in October 1992, and 2) continuing plans and activities to transition some of the buildings,

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specifically the transition activities in Building 865, the first building to undergo transition at RF.

Information presented in this paper should be read with the understanding that, as with any transition scenario, the RF transition effort will also undergo revisions and mid-course corrections to reflect changes relating to emerging site safety or environmental issues, new information on a facility's condition, new or more cost effective technology and process development, development of more cost effective procedures, budgetary constraints, etc. Therefore it is reasonable to expect an updated status report of transition activities and progress in a follow-up paper, perhaps in the 94 Waste Management Symposia.

INTEGRATION WITH DOE PLANNING PROCESS

RF's Transition Planning and Implementation activities must be integrated into the DOE Office of Environmental Management (DOE-EM) planning process. This integration is essential because EM will eventually own most of the RF facilities. The planning process involves preparing three documents:

1. the Five Year Plan or FYP,
2. Site-Specific Plan or SSP, and
3. Integrated Roadmap.

DOE-EM's National FYP. DOE-HQ issued the first FYP i.e., for Fiscal Years 1990- 1995, in August 1989. The FYP for FY95-FY99 is the most recent and is planned to be released soon. FYPs are HQ-level documents that outline the plans, goals, and objectives that must be achieved to accomplish EM's 30-year goal. That goal is bringing all operating facilities into compliance with applicable laws and regulations and to clean up the 1989 inventory of contaminated inactive sites and facilities by 2019. When this goal was formulated in 1989, DOE had not yet embarked on the transition path. Future FYPs can be expected to contain the transition plans. Each DOE site prepares a site specific FYP that is used to compile and prepare the national FYP.

The SSP. The RF SSP is a document prepared by the Management and Operating (M&O) Contractor at Rocky Flats. The contractor, EG&G RF, will implement most of the activities addressed in the SSP. The objectives of the FY93 SSP are to:

- Describe strategies and activities for transition, environmental restoration, waste management, and technology development programs, with emphasis on FY93. (the FY93 SSP for RF was issued in August 1992, and did not permit the inclusion of detailed transition programs);
- Foster open communication between DOE and the community;
- Demonstrate DOE's emphasis on environmental stewardship and responsible management;
- Describe the policies that DOE and its contractors are using to meet the objectives;
- Provide to the public a planning document that is easily understood and can comment upon.

The SSP serves to complement the FYP and also includes more details on site operations. Any public comments on the SSP will be addressed in the comment-response document that RF will issue in early CY 1993.

The Roadmap. Roadmaps are prepared annually by the field offices (via the M&O Contractors) and are site-specific. Traditionally, a Road map is prepared for each major process (i.e., low-level waste management, residues management, hazardous waste management, etc.). Therefore, there can be more than one roadmap for any site.

Roadmaps identify factors/problems that could hinder each program or process from achieving a desired performance level. The root causes of the problems are identified and solutions to address the problems are outlined. The end product of the Roadmapping process is the Roadmap that reflects the current status of the process or program and the course of actions to meet requirement and overcome obstacles. The required activities are then integrated into the appropriate Activity Description Sheets (ADS).

Roadmaps are subject to public review and comments. An advantage of Roadmaps is the identification issues common to all sites, for DOE HQ's action.

Integrated Roadmap. In FY93, Rocky Flats is initiating preparation of a new type of Roadmap called the *Integrated Roadmap* to accommodate the needs of a more comprehensive, integrated, and sophisticated planning process.

Integrated Roadmaps would be based on the integration of the elements of mission planning, a process employed at the Hanford Site, emphasizing systems engineering analysis, options analysis, and integrated risk assessment with the elements of traditional roadmapping such as regulatory analysis, issues identification, and issues resolution.

The resulting planning process and products are expected to better serve the planning needs of the RF site. Integrated Roadmaps offer the following advantages as compared to individual Roadmaps:

- they provide more and better planning information faster;
- they have a comprehensive scope by presenting a total picture of RF's needs and requirements;
- they identify and clarify the roles and relationships amongst programs and organizations;
- they allow compilation of information from existing Roadmaps, Comprehensive Treatment and Management Plans, Transition Plans, Environmental Impacts Statements, etc., into one crosscutting issues document in a cost effective manner;
- they eliminate the need for updating or developing numerous individual Roadmaps; the resulting planning process allows effective options analysis for processes, facilities, and the site;
- Annual updating of one Integrated Roadmap should result in substantially more cost savings than updating all previously mentioned individual ER/WM Roadmaps;
- they provide the necessary link between strategic planning and program implementation.

DESCRIPTION OF ROCKY FLATS PLANT

Figure 1 shows the location of the RF site. The plant facilities occupy approximately 0.6 square miles in the center of an 11 square mile site. Thus, there is a large buffer zone around the plant facilities. The plant was first operational in 1952. In 1989, all of the plutonium production functions at the plant were suspended.

TABLE I
Five Complementary Missions and Groupings of Transition Buildings at RF

Mission Deactivation of currently surplus buildings Building Group #1 SURPLUS DEFENSE NUCLEAR PRODUCTION FACILITIES	Mission Short-term non-Pu production and subsequent deactivation Building Group #2 PROJECTED SURPLUS NON-PLUTONIUM DEFENSE PRODUCTION FACILITIES	Mission Environmental & Waste management support Building Group #3 WASTE & ENVIRONMENTAL FACILITIES	Mission Ongoing site support services Building Group #4 SITE SUPPORT FACILITIES	Mission Maintenance of a Pu production capability until alternatives are implemented Building Group #5 PRODUCTION CONTINGENCY FACILITIES
771 776/777 779 886 Above buildings are declared unnecessary for future DOE weapons production operations. Note: B-776 has the Super-compactor needed for transition functions; B-776 will be needed until transition is completed. Also, B-776 has the Advanced Size Reduction Facility (ASRF).	439 440 865 883 444 460	374 664 774	125 130 130 Trailer Complex 131 111 115 T115AS 116 334 371 441 452 452 Trailer Complex 750 850 881 893 Trailer Complex 991	559 707

Table I shows a table that segregates the various buildings (shown in Fig. 1) into five complementary missions and groupings of transition buildings at RF. The RF site is located in Jefferson County, Colorado, at the foot of Rocky Mountains. The site is approximately 16 miles northwest of downtown Denver and within about 10 miles of the suburban communities of Westminster, Broomfield, Arvada, and Boulder.

STEPS IN TRANSITION IMPLEMENTATION

Figure 2 shows a flow diagram and logic of the following transition planning steps. These steps and their interdependence serve also as indicators of the complexity and challenges inherent to the vast area of transition planning and implementation at RF:

A. Prepare Mission Transition Program Management Plan (TPMP)
B. Prepare Site-wide Economic Development Plan
C. Perform Facility Characterization and Building assessments
D. Integrate Transition process with Other Plant Mission Element
E. Prepare Transition Implementation Plan
F. Develop Safety and Reference Control Envelopes for Activities, Facility, and Site
G. Obtain Peer Review and Public Involvement
H. Execute Transition Process Implementation via Tasks and Activities
I. Building Final Conditions Documentation
J. Final Verification of Compliance and building conditions
K. Public Review of Final Conditions Document
L. Turnover-ready Facility for D&D or Alternative Economic Uses

Transition Program Management Plan (TPMP)

In preparing the TPMP, a systematic approach was used to accomplish the coordination and integration of the planning efforts of a number of organizations and individuals at Rocky Flats and DOE-HQ. Steps involved in coordinating the plan development were: 1) establish and maintain common assumptions for planning, 2) establish a common basis for task requirements, (3) establish dependencies and priorities, 4)

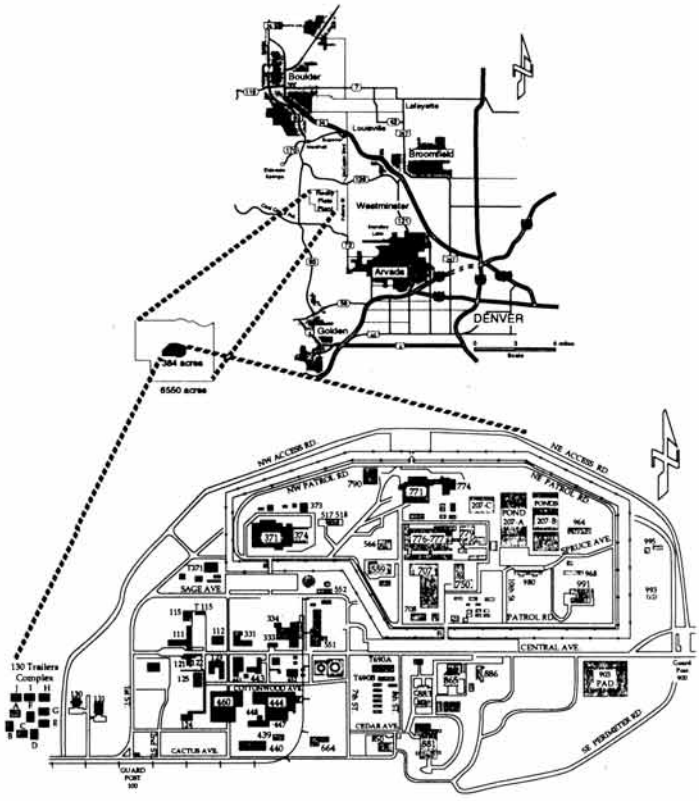


Fig. 1. Rocky Flats site and plant areas.

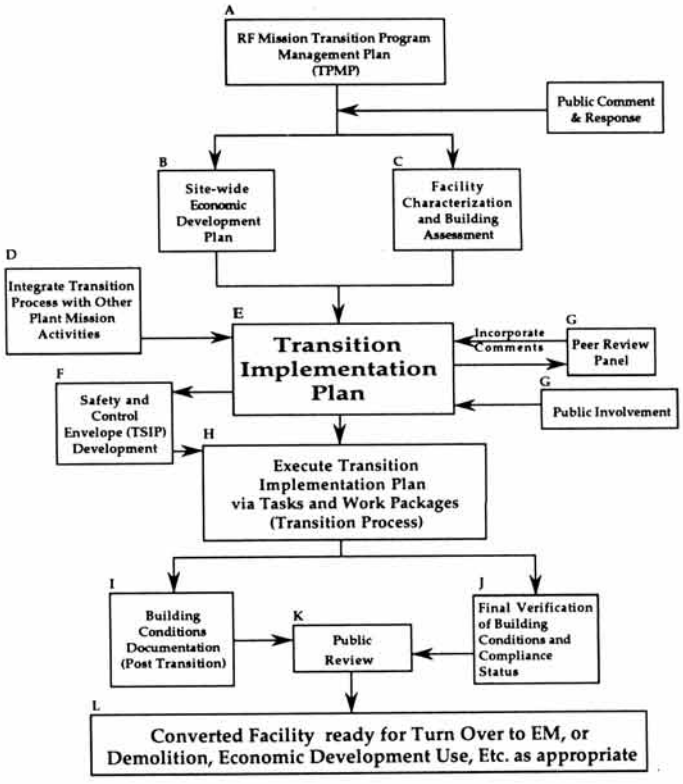


Fig. 2. Transition process steps and logic.

allocate resources between and within tasks and establish a schedule, and 5) assure integrity of the entire plan.

The high level assumptions were developed in coordination with and approval of a DOE Headquarters-level planning group prior to their use as a baseline in the planning process. RF created a plan integration group which, among other responsibilities, coordinated on assumptions and adjudicated differences in assumptions between planners. As more detailed assumptions were developed for each aspect of the planning effort, the assumptions were checked by this group against other assumptions developed for different portions of the plan. Where differences in assumptions were encountered, discussions were held to determine the most appropriate path to follow, and clarification was sought as required. This avoided the major pitfall of mutually exclusive assumptions in the same plan or the use of assumptions which were uncoordinated or based upon less than total information.

To resolve the requirement for dependencies within and between facilities, a large-scale dependency diagram and PERT task analysis using scheduling software was used. Initially, the sequence of tasks required within each facility were diagrammed and input to a computer model. Subsequently the dependencies between facilities were included. The model was then run to identify the necessary sequence of tasks within and between facilities. The result was the identification of inconsistencies which were resolved through group discussion and successive iteration. In several cases, this process resulted in the identification of difference in approaches, allowing early resolution of problems and revision of tasks.

TPMP is a top level description of the transition mission plans at RF. It provides a preliminary assessment of the current status of facilities, narrative of typical activities that will be required for conversion of buildings from DP to EM, and an assessment of resources required, budgets and schedules for accomplishing transition activities.

Site-wide Economic Development Plan

The SEDP focuses on the goals and objectives for future economic development of facilities at RF. It is a strategic assessment of economic alternatives and a description of how the transition process for specific facilities integrates into the plant mission, requirements, commitments and other drivers for future development. The approach will be to identify cost-effective alternatives, linking with input from government agencies, industry and the public. A selection methodology will be developed to optimize the choice of economic alternatives.

Facility Characterization & Building Assessment

Facility characterization and assessment of building conditions and hazards will be required to support the transition process from the beginning to the end of the process for each transition facility. Building assessments will provide all of the required documentation for a variety of requirements from government, regulators and public review. The completeness, consistency and quality control of documentation is an integral part of this process step.

Integrate Transition with Other RF Activities

Integration of the transition process with the RF plant mission will involve a systematic evaluation of other regulatory requirements, commitments and operational requirements that are impacted by transition. This will involve the integration of program requirements for environmental restoration, waste management, production contingency, economic development, and deactivation and decontamination.

Prepare Transition Implementation Plan

The Transition Implementation Plan is the action plan based on funded work packages that describes all of the current and future transition tasks and activities that will be required to complete the transition process for any given facility. The plan will show what specific activities are required to convert buildings, based on characterization assessments, and describes the safety and reference envelopes that need to be in place to accomplish the job. This plan is the nuts and bolts planning that is very task specific and should provide guidance for future work packages, funding and schedules.

Develop Safety and Control Envelopes

Based on facility characterization and the Transition Implementation Plan, appropriate safety and control envelopes will be developed for transition activities. There will be generic activities covered, as well as unique activities that might not have been anticipated, depending upon the conditions and hazards existing in a transition facility.

Peer Review of the implementation Plan

This process step is necessary to inform the public about the transition plan, and promote input and commitment from the general public. Peer Review will include justification of transition goals and objectives, review of cost-effective approaches to transition, and involvement in the selection process for deactivation and decontamination or alternate economic uses. The approach to public review will be linked to development of roadmaps and issues-based management.

Execute Transition Implementation Plan

The actual Transition Process is the implementation of a given set of transition activities for specific facilities, based on input from steps 1-7. During the process, many systems will be required to track progress, measure performance, record changes in building conditions and hazards, and document final conditions.

Document Final Building Conditions

This step will provide all of the required records, documentation and information to meet specific turnover and regulatory requirements for completion of the transition process. This documentation will be specific to each transition facility, and will show how initial building conditions and hazards have been dealt with in accomplishing the transition process. Detailed and complete documentation will be required to show that regulatory compliance has been achieved.

Final Verification of Compliance and Building Conditions

This step will provide appropriate documentation that all relevant regulatory requirements has been met, and verify that required final facility conditions, acceptable levels of risk have been achieved for identified hazards, and that all requirements of the transition process have been completed. The criteria and details of verification will have to be defined.

Public Review of Final Conditions

This step will provide the opportunity for the general public to review results of the transition process for specific facilities, and provide input before completion of the process. This step gives additional confirmation to the verification that all the goals and objectives of the transition process have been met.

Converted Facility

The final step in the transition process is the converted facility, either in a D&D Ready mode or in a final condition that meets requirements to be turned over to a new economic use. All of the documentation and information produced in steps 9-11 justifies that the transition process has been completed.

REGULATORY AND STATUTORY REQUIREMENTS AFFECTING TRANSITION

Appendix A-4 of the RF Transition Plan (i.e., TPMP), provides a detailed listing of the requirements affecting transition. Applicable DOE Orders, federal and state laws and regulations, court rulings, and agreements between state and federal agencies constitute the legal/regulatory requirements that apply to the transition buildings. The following, although not an exhaustive listing of applicable requirements, identifies the key requirements affecting transition:

Executive Order 12088-October, 1978

Like other federal facilities, RF is required to comply with substantive and procedural requirements of federal environmental regulations as applicable to the private sector, including:

- Compliance with all federal, state, interstate, and local environmental standards and regulations, including record-keeping and reporting requirements;
- Applications for permits and variances, including payment of permit fees; and
- Payment of any justified sanctions or fines.

Rocky Flats Interagency Agreement (IAG)-January 22, 1991

Signed by DOE, Environmental Protection Agency (EPA), and Colorado Department of Health (CDH), it incorporates the requirements of the Superfund Amendments and Reauthorization Act (SARA) of 1986, and clarifies the roles and responsibilities of the parties to comply with existing laws and regulations. It also supports the DOE-HQ's goal of having all environmental restoration completed by FY-2019, stated in the Five Year Plan.

The Settlement Agreement and Compliance Order on Consent-No, 89-10-30-01 - November 3, 1989

This is commonly referred to as the Residue Compliance Agreement (RCA), and documents the understanding between DOE and CDH regarding RF's status of compliance with 6 CCR 1007-3 of the Colorado Hazardous Waste Regulations resulting from storage of residues containing hazardous materials. The RCA identifies those residues contaminated with hazardous constituents and/or possessing hazardous characteristics that may be subject to Resource Conservation and Recovery Act (RCRA) regulations and sets forth the activities necessary to bring treatment and storage of such residues into compliance.

Mixed Residue Compliance Plan - September 28, 1990

The Mixed Residue Compliance Plan was submitted in response to the Residue Compliance Agreement, and addresses the generation, storage, and treatment of residues mixed with hazardous wastes, and the specific tasks required for regulatory compliance. The expected dates for task completions and compliance are also provided.

State of Colorado Compliance Order 91-07-31-01, Residue Compliance Order

This compliance order addresses the management of plutonium-bearing mixed residues in accordance with Colorado Hazardous Waste Regulations. In this order, CDH commented on, revised, and added to the requirements and *schedules* identified in the Mixed Residues Compliance Plan. The order stipulates that "The schedule for mixed residue inventory removal shall provide for the removal of all mixed residues covered by the Agreement and Order 89-10-30-01 by January 1, 1999 unless DOE believes that it is not feasible to eliminate the inventory of any specific type or class of mixed residue by January 1, 1999, and provides a detailed description of the information that supports that belief and a proposed schedule for elimination of that type of mixed residue." Content of this Compliance Order is being negotiated; it will likely incorporate the RF Mixed Residue Task Systems Management Plan, March 31, 1992, by reference.

Federal Facility Compliance Agreement (FFCA II)-May 10, 1991

This agreement between DOE and the EPA was entered into in order for DOE to achieve compliance with the Land Disposal Restrictions of the Hazardous and Solid Waste Amendments.

Court Actions

- Civil Action No. 89-B-181, Colorado District Court D, Residue Court Order

  The court's decision in the Sierra Club versus U. S. DOE dated April 12, 1990 stated that the RCRA hazardous material definition will be applicable to all substances listed in 40 CFR Part 261, Subpart C that have been incinerated or stored pending further treatment, i.e., mixed with regulated hazardous waste, or all residues (except Pu) from incinerations or other Pu treatment recovery processes.

- Civil Action No. 89-B-181, Colorado District Court D, Mixed Residue Court Order

  The court also ruled on August 13, 1991 that DOE must obtain a RCRA permit for the mixed residues currently being stored without a permit or interim status by August 13, 1993.

  A Part B Permit modification was submitted to the CDH in June 1992. It defines the unit specific conditions that will be attained (RCRA Permit Modification Request #8 - Mixed Residues, State RCRA Permit No. 91–09–003-01, CO7889010526). For further information on RCRA permitting, see Appendix G of TPMP.

Waste Isolation Pilot Plant Requirements

The Waste Isolation Pilot Plant (WIPP) accepts only TRU and TRU-mixed waste in accordance with the facility's waste acceptance criteria (WAC) as defined in various WIPP documents. RF must and will comply with WIPP's WAC requirements.

Federal Laws and Regulations

- The Resource Conservation and Recovery Act (RCRA)
- Comprehensive Environmental Response, Compensation And Liability Act (CERCLA)
- Clean Air Act (CAA)
- Clean Water Act (CWA)
- Emergency Planning and Community Right-to-Know Act
- Federal Insecticide, Fungicide, and Rodenticide Act
- Hazardous and Solid Waste Act (HSWA)
- National Environmental Policy Act (NEPA)
- Occupational Safety and Health Act (OSHA)
- Safe Drinking Water Act (SDWA)
- Solid Waste Disposal Act
- Superfund Amendments and Reauthorization Act (SARA)
- Toxic Substance Control Act (TSCA)
- Endangered Species Act (ESA)
- Migratory Bird Treaty Act
- Fish and Wildlife Act National Fishing Enhancement Act
- National Historic Preservation Act (NHPA)

Under the authority of the above statutes, EPA has published regulations in Title 40 of the Code of Federal Regulations (CFR). Many of these CFRs apply to RF. Also the Colorado Department of Health Regulations apply.

External Oversight Groups

The Defense Nuclear Facilities Safety Board (DNFSB) recommendations are applicable to selected site support buildings at the RF as follows:

- DNFSB Recommendation 90-2: Standards
- DNFSB Recommendation 90-4: DOE Operational Readiness Review (ORR) process for resumption buildings.
- DNFSB Recommendation 90-6: Duct Remediation. Additional information can be found in the DOE Implementation Plan for DNFSB Recommendation 90-6.

DOE Orders

Using RF Procedure 1-10000-ADM 16.08, "Compliance Management Program," EG&G Rocky Flats' Standards Management organization tracks compliance with the 43 DOE Orders identified by the DOE as "Level 1" Orders, and makes periodic reports to DOE and the Defense Nuclear Facilities Safety Board. EG&G Rocky Flats is in the process of incorporating five more orders into the compliance assessment system.

DOE Order 5480.19: Conduct of Operations, provides requirements and guidelines for developing directives, plans, and/or procedures relating to the conduct of operations at DOE facilities. A "Graded Approach" is used in the application of these guidelines.

Buildings 371, 991, and 881 are non-reactor nuclear facilities. DOE Order 5480.5, "Safety of Nuclear Facilities" applies, as do the requirements of other Orders invoked by DOE Order 5480.5. Appendix D, "Facilities Safety and Environmental Protection," of TPMP provides further information.

A Rocky Flats Plant Maintenance Implementation Plan, discussing current compliance with DOE Order 4330.4A, was

submitted to U. S. Department of Energy, Rocky Flats Office (DOE/RFO) on June 30, 1992. Prioritized budget proposals for implementation are being developed.

Handling, Storage, and Packaging of waste materials must comply with current RF approved procedures (reference Appendix G of TPMP). The Hazardous Waste Requirements Manual 1-10000-HWRM is the internal RF manual which lists the requirements for the proper management of RCRA regulated waste/residue. In addition, the Waste Requirements Procedures WO-4034, WO-1100, WO-1100, and WO-1101 list the requirements for the proper packaging and documentation for radioactive wastes.

The DOE/HQ Program Execution Guide provides DOE/HQ guidance for waste management operations and corrective activities. DOE/HQ-controlled deadlines for Rocky Flats are listed in the Program Execution Guide.

Environmental Assessment Action Plan

The Environmental Assessment Action Plan, dated May 11, 1990, provides a formal written response to each of the findings cited in the Special Assignment Environmental Team (Tiger Team) Assessment Report, dated August 1989. The Action Plan includes descriptions of the actions to be taken by RF to satisfy the Tiger Teams' findings, action schedules and milestones, associated costs, and parties responsible for implementing the Action Plan.

Transition Standards Identification Program (TSIP)

Information on the RF Transition Standards Identification Program will be found in Appendix C of TPMP, "Standards, Codes and Other Technical Requirements Element of Mission Transition." Appendix C describes a process for definition of applicable standards and the methods by which they will be implemented.

The purpose of TSIP is to design, develop, and implement a process for identifying and establishing *necessary and sufficient* standards for transition activities. When developed and implemented, TSIP is expected to provide unambiguous answers to three questions:

1. What are the standards that apply to a particular transition activity?
2. How does one know that the standards are adequate?
3. Is there compliance with the standards?

TSIP is conceived as a new way of ensuring that standards are adequate for discrete activities that occur in a facility.

TSIP uses a bottoms-up approach to identifying the requirements in contrast to the traditional approach that assumed that all requirements are applicable unless otherwise demonstrated. The contrast in approaches is evident in the bottoms-up order of standards identification (i.e., Control Envelopes development) that the TSIP concept uses for a site as follows:

1. Activity Control Envelopes (ACE),
2. Facility Control Envelopes (FCE), and
3. Site Control Envelopes (SCE).

As its name implies, TSIP is a standards identification program; the identified standards must be applied and implemented to discrete activities. Lessons learned therefrom would be useful to the development of TSIP's full potential.

It is emphasized that TSIP is in the developmental stage as yet. Because other papers in the symposium discuss TSIP, only an introduction to TSIP is provided here.

FACILITY CHARACTERIZATION (FC) AND ASSESSMENT

At RF, A Facility Characterization Working Group (FCWG) has been established with the following charter:

a. Identify all the customers at RF for FC data;
b. Identify all FC-type efforts now underway in various RF organizations to verify if duplication exists; and
c. Develop one uniform site-wide FC methodology and procedure that incorporates the needs of all RF customers and helps eliminate duplication of FC work at RF.

Customers of facility characterization data include several RF entities including: Transition Management, Emergency Preparedness, Economic Development Team, and TSIP. These entities will use the data to conduct assessments specific to their needs. Also, such data will be used by TSIP to identify activities needing ACE development in a facility or building.

FC will help the transition process in defining for a facility: point A (i.e., what is there now) to point B (i.e., where it has to go), what information needs to be known, what are the relevant issues, and how are problems to be solved and decisions made, what additional input is needed to define points A and B, and what requirements must be met in going from point A to point B.

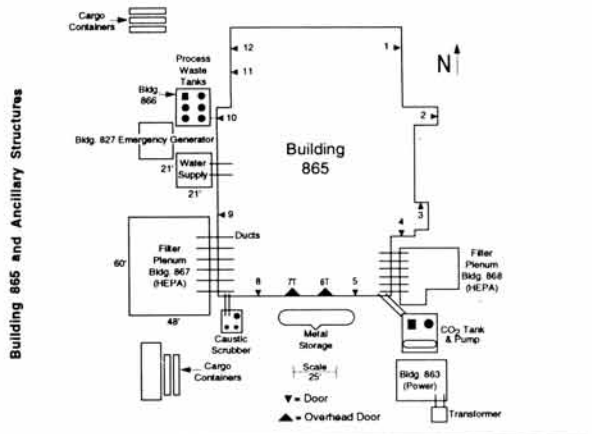
Facility characterization and building conditions assessment will help validate the information in 11 categories: Building Description, Vital Safety Systems, Radiological Status, Safety Analysis Report/Operational or Technical Safety Requirements implementation Status, Occupational Safety and Industrial Hygiene, Environmental Compliance Status, Chemical Inventory, Nuclear Inventory Including Regulated Residues, Waste Inventory, Physical Condition and Other Hazards for each of the transition buildings.

TRANSITION ACTIVITIES IN BUILDING 865

B-865 is the first building at RF in which two types of transition activities have started: 1) Material Removal and Preparation, and 2) Transition Cleanup activities. The first activity is considered to be typical of transition activities that would apply to similar facilities in the weapons complex. Therefore a description of B-865 transition is provided in this paper.

Figure 3 depicts the building and ancillary facilities. Building 865 is a one-story structure divided into two major parts: a 23,000 square foot high-bay area containing large metal working equipment (e.g., a rolling mill, an extrusion press, a hydraulic press, a machine shop) and a 12,000 square foot area containing administrative offices, a maintenance shop and a metallographic laboratory. There is a small mezzanine within the high bay area that contains building ventilation equipment. The total building floor area is 37,980 square feet.

Building 865 is non-plutonium facility. It contains and processes depleted uranium. Nearby support structures for Building 865 include Building 827 (emergency power), Building 863 (power distribution for extrusion press), Building 866



BUILDING 865 TRANSITION: Inputs, Processing, Outputs, and Expected Outcomes

Transition Process Inputs are: Building characterization and Hazards assessment; Economic development goals; Safety and Control envelopes; Building Structure; Metalworking Equipment; Process Wastes; Regulatory Requirements; Metals/alloy Inventory; Hazardous materials and chemicals; and Classified Materials

Building 865 Transition Processes are: Removal and disposal of materials and chemicals and waste; Equipment and functions relocation and use; Cleanup activities; Essential Safety System surveillance and maintenance; Decontamination; Documentation of Facility conditions including hazards conditions; and Staff training

Transition Process Outputs are: Reusable and discarded equipment; Liquid and Solid Wastes; Scrap Metal; and D&D-ready Facility

Expected Outcomes are: Reduced need for safeguards and security and compliance with environmental and other regulatory requirements; Reduced health and safety requirements. Stabilized facility for alternate uses or D&D; Reassigned weapons production mission; Permitted storage and disposal of waste.

Fig. 3. Building 865 information.

(RCRA storage) and Buildings 867 and 868 (exhaust fans and filter/plenums).

The building foundation consists of cast-in-place concrete piles connected by concrete tie beams cast integrally with the concrete floor slab. The high bay portion of the building is constructed of vertical, reinforced concrete twin-tee panels supported by concrete framework. The laboratory/office portion has walls made of concrete block. The mezzanine floor is structural steel on steel columns. The roof is comprised of pre-cast, prestressed concrete twin-tee slabs covered by neoprene roofing.

There are currently five RCRA satellite waste storage areas in Buildings 865 and 866, three RCRA permitted tanks in Building 866 and one 90-day accumulation storage area. In addition, a permitted storage and treatment facility is located in the beryllium electrorefining cell. The three RCRA tanks are piped to Building 374 for processing. The RCRA units contain acids, solvents, heavy metals and titanium fines.

To ensure confinement of radioactive and hazardous materials within the process areas, there are two containment levels: 1) interior building construction provides the primary containment around the process areas, and 2) the building shell provides the secondary containment. These two levels are maintained at negative air pressures with respect to the outside environment. The pressure in the primary containment is negative from the secondary and the secondary pressure is negative with respect to the outside atmosphere. There are two air supply and three air exhaust systems for the two-stage HEPA filtration system. Each independent air supply provides a capacity of 60,000 cubic feet per minute (cfm) of filtered, temperature regulated air. Additional engineering information is available in Addendum 865-1 in TPMP.

History

Building 865 was completed in 1970. Since then several upgrades and additions have been accomplished, including a second HEPA filter system located in Building 867, and the addition of Rooms 171 and 172.

The facility was designed to house large industrial metal working equipment for non-plutonium metallurgical research and development. The facility has been used to develop processes for various metals including stainless steels, aluminum, uranium, beryllium, and other metals since 1970.

No fissile material has been stored or processed in the building. The building has had no major operational upsets (such as major fires, floods, or industrial related incidents) in its history.

Operational Status

Currently, 49 people are working in Building 865. Thirty-six are residents of the building. The skills represented are Development Engineers, Management, Experimental Operators, Experimental Machinists, Radiation Protection Technologists, and Maintenance. The building and equipment are considered operational, and are providing continued support of environmental systems and defence production materials failure analysis and some weapons development activities.

Safety systems within the facility are sustained by routine surveillances and preventative/corrective maintenance. Currently, all systems are operable with minimal outstanding safety system related work orders.

In general, the large industrial metal working equipment is operational with few open maintenance work orders. Most equipment has had routine preventative and corrective maintenance. Operational capabilities include rolling, press forming, spin forming, heat treating, machining, metallography, and materials property testing. The metals worked are depleted uranium, beryllium, stainless and mild steels, aluminum, vanadium, tantalum, and other ferrous and non-ferrous alloys.

A non-operational area of the building is the beryllium electrorefining cell. This facility was designed as a one-half scale beryllium recovery experimental cell. The facility operated briefly during the early 1980s. It contains potassium chloride, lithium chloride, and beryllium chloride. If left indefinitely, these corrosive chemicals could leak from their confinement releasing chlorides and beryllium into the room. Surveillance is maintained to inspect for corrosion and the hazardous chemicals will be removed during transition.

Transition Activities: Two transition processes are occurring currently in Building 865: 1) material Removal and Preparation, and 2) Transition cleanup of electro-refining cell.

Material removal and preparation includes:

- actions to reduce hazards (remove excess chemicals and low-level, low-level mixed and TSCA waste, and relocate beryllium, uranium and other materials);
- actions to reduce the buildings security posture (remove classified documents, dispose or relocate classified parts and tooling, decertify computer and communication systems, and develop a Safeguards and Security Plan);

- preparation for turnover to EM (prepare a decontamination plan, commence initial cleanup, identify and inspect safety systems, assess and redline support engineering drawings, commence process hazards analysis, collect data on current surveillance and maintenance system, use advanced decontamination systems on a trial basis); and
- equipment reuse and staff training (assess manufacturing and testing equipment in B-865 for reuse within DOE weapons complex, survey reusable equipment for radioactive or hazardous contaminants, decontaminate, de-energize and prepare for shipment, identify staff and train them).

The above activities are typical of transition activities that would apply to similar facilities in the weapons complex. These activities are scheduled to be completed in FY 94 if funded.

In contrast, Transition cleanup of the Be electrorefining cell is an atypical activity, specific to B-865. It consists of relocating or stabilizing the unstable materials in the cell. Excess lithium chloride, potassium chloride, and beryllium chloride not contained in glovebox structures will be removed. An engineering work package is being prepared for follow-on activities, i.e., to decommission and remove from B-865 the cell and supporting electrical equipment. These activities are scheduled to be completed in FY 94 if funded.

STAKEHOLDERS CONCERNS

Stakeholders are individuals, organizations, corporations that claim an interest in or will be potentially affected by transition activities, regardless of whether they are aware of this potential. Key stakeholders and their principal interests and concerns include:

- The Public: Improving trust in both DOE's commitment to the EM program and its ability to manage it effectively. This attitude is increasingly combined with a concern that little progress is being made, despite significant expenditures.
- Congress: Although support for the EM program remains strong, there is growing concern about the program's pace and increasing costs. Members of both House and Senate continue to be actively interested in the economic and environmental impacts associated with DOE facilities and activities in their home districts and states, as well as the program in general.
- States and Tribal Governments: A principal concern is the degree of oversight and control they have over DOE activities. Particular focuses of concern include waste transportation; siting of waste treatment, storage, and disposal facilities; the establishment of cleanup priorities and milestones; and funding.
- National Laboratories: The national laboratories, with both enormous scientific and technical talent and the prospect of significantly reduced weapons development work, are actively pursuing the development of innovative and cost-effective waste management and remediation technologies.
- DOE Contractors: Faced with growing uncertainties about workloads and the potential for being held liable for environmental remediation, contractors expect DOE guidance and support to help them manage their programs and deal with regulators, other government entities, and the public.
- DOE Employees: DOE field and Headquarters employees are proud of their accomplishments in the environmental arena. However, the rapid growth in size and scope of the EM program, concerns about perceived resource constraints, and continued lack of public confidence in DOE are adversely affecting morale.
- Other Federal Agencies: EPA, OMB, the Office of Technology Assessment, the departments of Justice and Defense, the Army Corps of Engineers, and the Agency for Toxic Substances and Disease Registry (ATSDR) all play significant regulatory, budgetary, and program assessment roles. The Department of Defense is faced with environmental concerns that are in many ways similar to DOE's; it is reasonable to expect that each department can benefit from the other's knowledge and experience.
- International Community: Environment concerns are growing abroad. As this continues, opportunities will expand for international cooperative ventures in technology development and application, as well as other environmental initiatives.
- Private Sector: American industrial and service companies are significant contributors to the EM program. Their successful participation will depend upon reasonable federal procurement strategies, an equitable approach to the liability issue, and programmatic and funding continuity.

POTENTIAL ECONOMIC DEVELOPMENT OF USABLE BUILDINGS

Initially, four buildings have been identified as possible candidates for economic development, because these buildings are least likely to be environmentally contaminated. They are: Building 125 (Standards Laboratory), Building 334 (General Maintenance Shop), Building 440 (Vehicle Modifi-cation Center Building), and Building 460 (Consolida-ted Non-Nuclear Manufacturing Building). RF has initiated preliminary plans to support economic development and to develop a process for transfer and transitioning RF's facilities to alternative economic uses within the private or public sector. This process involves the description and documentation of facility resources, conditions and hazards, together with required documentation on regulatory compliance and turnover requirements that change during the transition process.

Detailed descriptions and documentation of facility resources and conditions will be required for turnover requirements and the feasibility of marketing the facilities to potential industrial or public customers. Assessment of resources will help determine the alternatives for economic development, and will help in developing incentives for future utilization of the facilities. The focus is on obtaining the necessary information and defining the process for economic development of transition facilities.

When Economic Development activities begin at RF, Building 460 may be used as an example to illustrate the individual tasks required for the transition towards economic development.

- Task 1: Provide baseline economic development assessment and prepare Individual Building Economic Assessment Reports.
- Task 2: Evaluate economic opportunities for selected buildings and Identify strengths and weaknesses of viable alternatives.
- Task 3: Define Selection Process and establish baseline criteria and methodology for selection of best option for economic use.
- Task 4: Prepare building documentation. Reports on building resources for economic development, facility conditions and hazards status, and turnover requirements.
- Task 5: Final verification and inspection of facility. Final conditions report prior to turnover for economic development.

TECHNOLOGIES THAT MAY BE USED IN TRANSITION PROCESS

In implementing transition of contaminated RF facilities from a weapons production mode to a stable deactivation state, numerous technologies will be required in areas such as environmental restoration, environmental monitoring, waste processing, residue elimination, cleanup and stabilization of production process systems, decontamination of obsolete or excess buildings, and waste minimization.

During the transition process, large volumes of hazardous, radioactive, mixed, and sanitary wastes will be generated. These require innovative and cost-effective management or disposal technologies to assure compliance with applicable laws and regulations, and to minimize the generation of waste. Existing programs attempting to address these issues are: 1) the Comprehensive Treatment and Management Plan (CTMP) as a strategy for bringing the RF Land Disposal Restricted (LDR) wastes into compliance; 2) Mixed Residue Removal Program to safely remove mixed residues from RF; 3) the Environmental Monitoring Program; and 4) Environmental Restoration Program.

Many of the technologies that deal with materials and process streams unique to RF already exist. Successful examples of applied technologies unique to RF include the immobilization, destruction or isolation of contaminants in site remediation at RF; duct remediation within process facilities; analytical techniques for sampling mixed wastes; mixed residue treatment; actinide separation; recycle of hazardous chemicals; environmental monitoring programs; and the separation, immobilization and destruction of mixed wastes. As regards integrated technology development, the majority of technologies stand alone currently; therefore efforts to integrate technology requirements to support transition are needed. Such integrated efforts must pursue a systematic approach for developing cost-effective process systems. Successful attempts at technology integration that are implemented are: CTMP for treatment of mixed wastes at RF and the Mixed Waste Integrated Program, a DOE HQ effort to integrate technology development in the mixed waste area on a national scale. Beyond these initial programs, there is need for effective technology planning and integration efforts designed to assure compliance with a variety of complex technical, regulatory and operational requirements during the transition process.

In addition to the need for integrated technology development efforts, other requirements for technology development that exist can be grouped as follows: mixed waste and mixed residue activities, waste minimization, environmental restoration, waste characterization and assay, and D&D efforts. Mixed waste and mixed residue requirements include innovative treatment technologies and techniques for handling, inspection, sorting, and repackaging. Waste minimization will require systematic analyses to eliminate waste at the source, implement recycle technology, identify markets for recycled and/or contaminated materials, reduce hazards, etc. Technology development requirements for environmental restoration include improved methods for in-situ remediation, equipment decontamination, subsurface monitoring, etc. Waste characterization and assay development requirements include improved sampling methods, automated/faster analyses, improved field laboratory capabilities, adapting standard EPA analytical methods for use in gloveboxes, etc. D&D needs exist in remote system delivery, improved characterization technologies, and better decontamination and dismantlement techniques.

CONCLUSIONS

In preparing itself for transition of its mission, Rocky Flats Plant has formulated and published a draft Mission Transition Program Management Plan, and has received public comments on it. This TPMP provides the basis for more detailed planning of Transition activities in the years to come.

The development of TSIP is underway as a new method of identifying adequate and necessary *and sufficient standards* for discrete activities that must be implemented in the facilities that will be transitioned. The M&O Contractor, EG&G RF, has reorganized its management structure to reflect the projects- and workpackage-oriented way of doing business.

There is a system in place that is fully intended to produce greater accountability of every dollar spent by the use of work packages. The Facility Characterization Working Group and other such entities are now geared to assist in integrating the various activities (such as facility characterization and assessment) and thereby reduce duplicate activities to an irreducible minimum. Transition Management's Program Integration group is gearing itself to implement this laudable goal, working in concert with various RF organizations and the DOE Rocky Flats Office.