90:1711

**The Secretary of Energy**
Washington, DC 20585



October 15, 1990

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

Dear Mr. Chairman:

In accordance with Section 315 of Public Law 100-456 and with Defense Nuclear Facilities Safety Board Recommendation 90-5, which I accepted in my June 13, 1990, letter to the Board, I am enclosing the Department of Energy's (DOE) implementation plan for conducting a Systematic Evaluation Program at the Rocky Flats Plant. This program has already been initiated. We will keep you informed of our progress.

Our implementation plan is designed to take full account of the experience gained by the commercial power reactor industry under the Systematic Evaluation Program developed by the Nuclear Regulatory Commission to assess the safety adequacy of design at several of the older power reactors. As a result we believe that the overall concept and much of the detailed content of this plan can be equally applicable to other DOE facilities.

In connection with the above, I wish to take this opportunity to inform you that I have directed that a Systematic Evaluation Program also be initiated for the reactors at the Savannah River Site. We will keep you informed of our progress in executing this program as well.

Sincerely,

James D. Watkins
Admiral, U.S. Navy (Retired)

Enclosure

# SYSTEMATIC EVALUATION PROGRAM
# ROCKY FLATS PLANT IMPLEMENTATION PLAN

## 1.0 INTRODUCTION

### 1.1 Purpose

The structures and equipment at the U.S. Department of Energy (DOE) Rocky Flats Plant were, for the most part, designed and placed in operation long before current technical standards and criteria, design bases, and analytical procedures applicable to such structures and equipment were developed. In some cases, the design of these structures and equipment falls short of providing protection against natural phenomena and extreme conditions comparable to that which would be provided in facilities recently built. There is, therefore, a need to systematically assess the safety significance of differences between the facility designs at Rocky Flats and more modern standards to ensure that a balanced and integrated level of safety is achieved for long-term operation of the Rocky Flats Plant.

In the short-term, before plutonium operations are resumed, numerous safety and operational improvements will have been implemented. A DOE operational readiness review will also have been conducted to confirm that these improvements are in place and effective. These efforts will include the actions necessary to respond to Defense Nuclear Facilities Safety Board recommendations 90-4, "Operational Readiness Review," and 90-6, "Criticality Safety at the Rocky Flats Plant."

With the completion of these efforts, the Department believes that the health and safety of the public will be assured during the conduct of plutonium operations while a systematic evaluation program as described below is completed.

Accordingly, DOE will develop and implement a Systematic Evaluation Program (SEP) at the Rocky Flats Plant, to commence as soon as practicable and be completed over about the next 4 years. The DOE has discussed this completion date with the Board, which finds it responsive to the Board's recommendation. The reasons and justification for the 4-year completion schedule will be communicated to the appropriate congressional committee in accordance with the requirements of law. The purpose of the SEP is to establish an integrated approach to assessing the design adequacy of the current Rocky Flats facilities from a safety point of view and to establish a basis for defining any needed facility improvements. The SEP will address all outstanding safety issues related to design and include, but not be limited to, consideration of the following items:

- severe external events, with particular emphasis on seismic events, high winds, externally initiated fire, and airplane crashes;

- severe internal events, with particular emphasis on internally initiated fire or explosion, flooding, chemical reactions, and accidental criticality;

- ventilation system performance under severe external and internal events, including redundancy considerations; and

- systems interaction.

An integrated assessment of the results of the evaluation, including criteria and procedures for making backfit decisions, will permit appropriate emphasis to be given to improving safety defense in depth at the Rocky Flats Plant. Experience with an SEP at the Nuclear Regulatory Commission (NRC) showed that an integrated assessment process provides an effective and efficient means to resolve a large number of interrelated issues and make balanced decisions regarding the need for improvements in plant safety.

## 1.2 Background

In 1977, the NRC initiated a Systematic Evaluation Program to review the designs of older operating nuclear power plants to reconfirm and document their safety. Phase I of that SEP identified the safety topics to be reviewed and corresponding acceptance criteria. Phase II was the review of these topics for 10 older operating plants, including 5 of the oldest. The plant reviews consisted of comparison of the existing plant design against the current licensing criteria. Subsequently, the differences from current licensing criteria were evaluated in an integrated assessment to determine their relative safety significance and the appropriate corrective action on a plant-specific basis. The purpose was not necessarily to bring the older plants into compliance with the newer requirements, but rather to ensure that the safety issues addressed by the requirements were either not present, or were adequately treated by the older plants. For example, administrative controls may have provided adequate resolution of issues addressed by design features in later plants. Initial reports from the NRC's SEP were issued in 1982.

The NRC SEP took place at a number of facilities over a period of about 5 years. Although some facility improvements were accomplished during this period, the concept of making plant specific improvements on the basis of an integrated assessment meant that most improvements could not be implemented until the SEP was completed at the specific plant.

## 1.3 Terms and Definitions

The following terms and definitions are used within the SEP:

> Topic - A technical subject selected for evaluation within the SEP. The identification of topics is based on consideration of a broad range of technical issues, requirements, and potential topics. Topics may vary significantly in scope.

Safety Objective - A concise summary of the basic safety function(s) of the structures, systems, and components associated with a topic with respect to normal operation and design basis events. The safety objective is to be used to assess the significance of any deviations from current design requirements that may be identified during the SEP.

Current Design Requirements - Current DOE technical requirements for a topic applicable to new design activities. Commercial nuclear and industrial standards other than those currently referenced in DOE requirements will be considered in establishing design requirements, where necessary.

Acceptance Criteria - Technical requirements for a topic to be used in the SEP evaluation of the topic. These criteria are to support the safety objective for their respective topic, but they may be less conservative than current design requirements.

Evaluation Methodology - Technical approaches and methods to be applied in the evaluation of the facilities at the Rocky Flats Plant to determine how they measure up to the topic acceptance criteria. These methods may include deterministic analyses of selected design basis events, risk assessments to determine the contribution of the topic to overall facility risks, tests, design reviews, or as-built verifications.

## 2.0 PROGRAM DESCRIPTION

### 2.1 Scope

The SEP will focus primarily on public health and safety risks associated with accident prevention and mitigation. Significant contributors to the public risk resulting from normal operations, that are identified by the SEP, will also be addressed.

Worker safety within a particular facility will be considered when the SEP is applied to that facility. However, public safety is the primary reason for the SEP, and secondary emphasis will be placed on occupational hazards.

The SEP will provide for the early identification and timely resolution of any significant safety deficiencies discovered during the implementation of the program. The Rocky Flats Plant Issues Management Program will provide the necessary mechanism to ensure early evaluation of these significant safety deficiencies.

The Rocky Flats SEP will not address environmental, waste, emergency planning, and security issues, except to the extent that they are involved in the prevention and mitigation of the safety risks defined above. The SEP will not include upgrades of the plant required for the

resumption of plutonium operations. However, the SEP will take account of the upgrades made before resumption.

The SEP at the Rocky Flats Plant will include all high and moderate hazard facilities, as defined in DOE Order 5481.1B, and any other facilities which perform a special function required for accident mitigation or emergency management. The SEP will focus on assessing the safety of structures, systems, and components. Operator training, maintenance, organization and management, planning, etc., will not be addressed, except to the extent that they directly affect the functional capability and safety performance of the structures, systems, and components.

The SEP to be performed at the Rocky Flats Plant will be somewhat broader than the SEP performed by the NRC, which was limited to public health and safety risks associated with accident prevention and mitigation. It will not cover the same scope as the NRC's Integrated Safety Assessment Program, which provided the regulatory framework for plant-specific resolution of significant SEP issues, all pending licensing actions, changes in regulatory requirements, and dominant contributors to risk.

The schedule and budget for the required SEP improvement actions will be accomplished outside of the SEP as a part of the normal budget and schedule process for the Rocky Flats Plant. Provisions will be established for tracking the implementation and closure of these SEP-related improvement actions, including an appropriate change control process.

## 2.2 Approach

The program will be carried out in four phases. The SEP will consist of three phases: identification and selection of the topics and requirements; performance of the evaluation; and development of an integrated program of improvements. These will be followed by the fourth phase: implementation. These phases are described more fully in Section 3, below. Plans describing the objectives, procedures, and decision criteria for each phase of the SEP will be developed by the Rocky Flats contractor and approved by DOE. Upon the completion of each phase, a report will be prepared by the Rocky Flats contractor describing implementation and results, with special attention to any changes made to the original plan. DOE will issue a report on its evaluation of the contractor's report for each phase of the SEP.

A project management plan and quality assurance plan, developed by the contractor and approved by DOE, will provide for appropriate documentation and approval of any needed changes from the approved plans. Plan changes, if any, and the justification for the changes will be reported in quarterly reports, as well as in the final report for each phase.

Responsibilities and functions are specified in Section 4.

All plans and reports, including quarterly progress reports, will be submitted to the Defense Nuclear Facilities Safety Board upon receipt at DOE Headquarters.

## 2.3 SEP Objectives

DOE has established the following objectives for the Systematic Evaluation Program to be conducted at the Rocky Flats Plant:

(a) Compare structures, systems, and components in moderate and high hazard facilities with acceptance criteria for significant safety issues (topics).

(b) Evaluate departures from acceptance criteria, and provide for early identification of significant deficiencies for timely resolution.

(c) Decide on a program of plant improvements based on an integrated assessment.

(d) Assure that the SEP topic evaluations are brought to closure, and that provisions exist for tracking the implementation and closure of SEP-related plant improvements.

(e) Coordinate with other related programs at the Rocky Flats Plant, such as the upgrade of Safety Analysis Reports.

(f) Document the procedures, decision criteria, and results of each phase of the SEP.

## 2.4 Assumptions

The scope and approach for the SEP have been developed on the basis of the following assumptions:

- the other evaluation and upgrading programs for the Rocky Flats Plant (e.g., security, Safety Analysis Reports) will be implemented in reasonable accordance with current plans and schedules;
- DOE's new backfit policy will be available to guide decisions to be made in Phase 3 of this SEP;
- the existing program control and tracking systems will allow individual facility improvements derived from the SEP to be identified and tracked to resolution within the context of the overall plant program of upgrades and improvements.

## 3.0 DETAILED TECHNICAL APPROACH

This section describes the four phases of activity that constitute DOE's overall program for defining and implementing integrated safety improvements in the structures, systems, and components at the Rocky Flats Plant. The first three phases constitute the SEP, and the fourth phase covers implementation of any identified improvements.

Phase 1, "Topic Selection and Development of Evaluation Plans," includes the selection of SEP topics and development of a topics list, the definition of safety objectives, the identification of current design requirements, the definition of acceptance criteria and methodologies for the evaluation, and the planning for the detailed evaluation of each topic.

Phase 2, "Evaluation of Topics," includes evaluation of structures, systems, and components for each topic, determination and ranking of the safety significance of deviation(s) from criteria, for resolution of immediate safety concerns, identification of options for resolution of remaining deviations, and initial decisions for implementation of low cost improvements. Throughout this process an acceptable safety-safeguards interface will be maintained. In determining the safety significance of an item, the following attributes will be considered: an increase in the frequency of a plutonium release, an increase in the consequences of a plutonium release, a reduction in the safety margin that is provided to guard against a plutonium release, or identification of an Unreviewed Safety Question.

Phase 3, "Integrated Assessment," includes identification of improvement alternatives for the higher cost improvements, assessment of inter-relationships of topics and improvement alternatives, cost-benefit analyses and evaluations, and decisions regarding needed improvements. This effort will result in the identification and ranking of proposed improvement actions for the Rocky Flats Plant.

Phase 4 includes the planning, budgeting, and implementation of the improvements proposed as a result of the SEP integrated assessment.

### 3.1 Phase 1: Topic Selection And Development of Evaluation Plans

Phase 1 will include the identification and selection of potentially significant safety topics to be evaluated in the SEP and definition of the evaluation criteria and methodology to be used for evaluating each topic. An SEP Phase 1 Plan and Schedule will be developed by the Rocky Flats contractor and submitted to DOE for approval. The Phase 1 Plan will include more detailed instructions for performance of the Phase 1 activities.

#### 3.1.1 Topic Selection

The topic selection activity will include the identification and selection of safety topics to be evaluated within the SEP at the Rocky

Flats Plant. The identification of potential SEP topics is to include reviews of:

- experience and operating history at Rocky Flats and other comparable facilities, including input from experts on plutonium processing facility design and operations;
- technical issues contained in the Rocky Flats Plant Issues Management system; and
- NRC experience with commercial reactor SEPs, and commercial nuclear industry issues as identified in NRC generic licensing and inspection activities.

The topic selection process will consider sources of information from a broad perspective, including DOE orders and requirements, SEP experience gained from the commercial reactor sector, and other relevant documents such as NRC Regulatory Guides for plutonium facilities.

Potential topics are to be combined into a single master list of potential SEP topics. When combining these lists, the topics will be reviewed and screened using criteria similar to those applied in the NRC SEP. For example, redundant topics and topics not applicable to the Rocky Flats facilities may be deleted, and related and similar topics will be combined. In addition, topics may be deleted based on an assessment of potential safety significance, and the basis for deletion will be documented. Topic selection criteria are to be defined in the Phase 1 Plan. The underlying criterion for the SEP is that the topic must be of sufficient safety significance to warrant evaluation within the SEP. The resultant topics will be organized, to the extent practical, to align with the NRC standard format guide for safety analysis reports for plutonium processing facilities.

### 3.1.2 Acceptance Criteria and Evaluation Methodology

Safety objectives, current design requirements, acceptance criteria, and evaluation methodologies will be defined and documented for each of the selected topics. This process will consider the current design requirements defined in regulations and DOE orders, as well as the current industry requirements, standards, or practices.

### 3.1.3 Evaluation Plan

An evaluation plan will be developed for the evaluation of each topic. The development of the topic evaluation plans is to include the identification of any previous or ongoing safety evaluations at the Rocky Flats Plant that will be incorporated within the SEP evaluation of the topics, and the definition of interfaces with related topics. The topic evaluation plans will be directed towards identifying deviations from the acceptance criteria, with a focus on meeting the safety objective of the topic with respect to identified design basis events.

### 3.1.4 Phase 1 Report

The results of the Phase 1 activities will be documented by the Rocky Flats contractor in a Phase 1 Report, which will include the final SEP topics list, and for each topic the safety objectives, current design requirements, acceptance criteria, evaluation methodology, and the topic evaluation plan. DOE will issue a report of its evaluation of the contractor's Phase 1 Report.

## 3.2 Phase 2: Evaluation of Topics

An SEP Phase 2 Plan and Schedule will be developed by the Rocky Flats contractor and submitted to DOE for approval. The schedule for the evaluation of each topic or group of topics will be developed based on a relative ranking of the topics. This ranking will take into consideration the potential safety significance of the topic, relationship to other topics, sequential requirements, and other factors.

Phase 2 of the SEP will include the evaluation of the SEP topics and the definition of any proposed facility improvements. The evaluation of each topic will be performed in accordance with the topic evaluation plan. The evaluation will identify and address differences and departures between the existing facility configuration and the acceptance criteria. If the evaluation determines that the safety objectives, current design requirements, and acceptance criteria are met, the topic will be closed with no further action required, other than documentation of the basis for reaching this conclusion. The safety significance of any deviations from current design requirements will be evaluated with respect to the safety objectives and to determine if the acceptance criteria are met.

If potential Unreviewed Safety Questions are identified during the SEP, they will be promptly referred to plant managers for processing and resolution. Prompt corrective actions will be taken where necessary for protection of the health and safety of the public. If Unreviewed Safety Questions are identified early in the SEP program that could affect resumption of operations, prompt notification to management will be made and appropriate actions will be taken to resolve the questions or to suspend any associated plutonium operations that may have been resumed.

Those deviations from acceptance criteria that can be resolved at a low cost (for example, procedure or programmatic changes), will be identified for early action. If the deviation is determined to be of minor or no safety significance, the topic will be closed.

At the conclusion of the evaluation of each topic, the results will be documented in an evaluation report for that topic. Where appropriate, the topic evaluation reports will include proposed action(s) to resolve deviations from acceptance criteria.

The results of the Phase 2 evaluations will be documented in a Phase 2 Report prepared by the Rocky Flats contractor. DOE will issue a report on its evaluation of the contractor's Phase 2 Report.

### 3.3 Phase 3: Integrated Assessment

An SEP Phase 3 Plan and Schedule for the integrated assessment will be prepared by the Rocky Flats contractor and submitted to DOE for approval.

Upon completion of the Phase 2 evaluation of all topics, an integrated assessment of the SEP Phase 2 results and proposed improvement actions will be performed. This effort will include consideration of alternative means of satisfying the safety objective for each topic. The integrated assessment will be performed in accordance with a documented decision process, which will include the following considerations:

- interrelationship between individual topics and the associated actions for improvement;
- relationships between other ongoing DOE defense complex programs, e.g., Defense Programs modernization, and SEP proposed actions for improvement;
- cost-effectiveness of proposed actions with respect to a reduction in risk to the public health and safety;
- DOE's new backfit policy, including alternative actions for improvement;
- remaining facility lifetime; and
- improvements in defense in depth provided by safety systems and administrative controls.

The integrated assessment will result in the definition of an integrated set of recommended improvement actions. These proposed improvement actions will be ranked in broad categories of significance to facilitate the subsequent budgeting and scheduling of proposed plant improvement projects. The SEP will ensure that provisions have been made for tracking the proposed improvements to completion. However, the planning, budgeting, and implementation of the improvements will be carried out in Phase 4.

The results of the integrated assessment process will be documented in a Phase 3 report by the Rocky Flats contractor. DOE will issue a report on its evaluation of the contractor's Phase 3 Report.

### 3.4 Phase 4: Implementation

Upon completion of the integrated assessment as documented in the Phase 3 Report, the recommended SEP corrective actions and improvements will be planned and scheduled. This process will include ranking the proposed actions consistent with other ongoing or future programs to upgrade the Rocky Flats Plant, and obtaining necessary approvals including any required for NEPA.

## 4.0 ADMINISTRATION OF THE PROGRAM

### 4.1 Responsibilities

The principal DOE responsibility for the SEP at the Rocky Flats Plant is assigned to the Deputy Assistant Secretary for Facilities, Defense Programs. To ensure adequate DOE management direction to the SEP and ongoing oversight of the SEP implementation, these responsibilities are delegated, through the Defense Programs management chain, to the DOE Systematic Evaluation Program Manager. The DOE SEP Manager is responsible for development of overall SEP policy, program development, budget preparation and justification, and broad program direction. The SEP Manager will ensure proper involvement of affected DOE Headquarters staff in the Rocky Flats SEP, and proper coordination and approval of SEP plans and reports.

The DOE Rocky Flats Office SEP Coordinator is responsible for the routine DOE activities of the SEP, consistent with the SEP Implementation Plan for the Rocky Flats Plant and directions from the DOE SEP Manager. The DOE Rocky Flats Office SEP Coordinator is to be the point of contact for routine information flow from the Rocky Flats Contractor to Headquarters.

The Rocky Flats Contractor has principal responsibility for the implementation of the Rocky Flats SEP consistent with the SEP Implementation Plan and the DOE approved plans for each Phase of the SEP. This responsibility includes: development and maintenance of the Project Management Plan, the Quality Assurance Plan, and the detailed plans for Phases 1, 2, and 3; implementation of Phases 1, 2, and 3; preparation of reports to document the results of each Phase; and coordination of plans and reports with DOE for review and approval. The Rocky Flats contractor is responsible for assembling the necessary team to ensure effective execution of the SEP.

### 4.2 Project Management Plan

A Project Management Plan (PMP) will be developed for the Rocky Flats SEP by the Rocky Flats contractor in accordance with the requirements of DOE 4700.1, "Project Management System." The PMP is to document the plans, schedules, and systems that those responsible for managing the project are to use.

The Rocky Flats SEP PMP is to include:

(1) Project Summary (including a project description and objectives).

(2) Project Milestones (Levels 1 and 2).

(3) Work Breakdown Structure (Levels 1, 2, and 3).

(4) Activity Network (to reflect sequences and dependencies).

(5) Organization and Responsibilities (for both DOE and the Rocky Flats Contractor).

(6) Budget.

(7) Reporting and Review Process.

### 4.3 Quality Assurance Plan

A Quality Assurance Plan (QAP) will be developed for the Rocky Flats SEP in accordance with the requirements of DOE 4700.1, "Project Management System," DOE 5700.6B, "Quality Assurance," and ANSI/ASME NQA-1. NQA-1 has been chosen as the basic document since it is endorsed by DOE 5700.6B as the preferred standard for nuclear facilities. The purpose of the QAP is to provide adequate confidence that the Rocky Flats SEP objectives are accomplished, and that SEP activities are performed in a controlled manner to meet technical and documentation requirements.

Development of the QAP is to include identification of the quality assurance elements which are applicable to each phase of the Rocky Flats SEP, and definition of the specific requirements for each element. The QAP will include activities and responsibilities for the Rocky Flats contractor and for interfaces with DOE.

The QAP is to include provisions for establishment and implementation of a change control process for the Rocky Flats SEP. This change control process will not include those change controls associated with the implementation of the SEP improvements because they are outside the scope of the SEP.

The QAP is to be developed and maintained by the Rocky Flats contractor and approved by DOE. Annual reviews of the QAP are to be performed to assure that the plan is kept current.

## 5.0 SCHEDULE

Phase 1 of the SEP will be completed within 1 year of the issuance of this Implementation Plan. The Phase 1 report will include a schedule for the remaining phases. DOE will provide quarterly progress reports to keep the Board apprised of the status of progress being made toward completion of the SEP. In the event that additional time is necessary to complete a phase, or in the event that changes or supplements are required for already issued reports, DOE will promptly inform the Board and indicate the reasons justifying the change in the schedule or report content.