5.0 INTENDED AUDIE

The following list is the intended audience for this QAP:

- Task Team Members
- EG&G Management
- DOE Management

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ANALYSIS OF OFFSITE EMERGENCY PLANNING ZONES FOR THE ROCKY FLATS PLANT

QUALITY ASSURANCE PLAN

EG&G ROCKY FLATS

ANALYSIS OF OFFSITE EMERGENCY PLANNING ZONES (EPZs) FOR THE ROCKY FLATS PLANT

QUALITY ASSURANCE PLAN

REVISION 0

August 1990

EG&G Rocky Flats, Inc.

Rocky Flats Plant

P.O. Box 464

Golden, Colorado 80402-0464

ROCKY FLATS PLANT

EMERGENCY ASSESSMENT SYSTEMS

ANALYSIS OF OFFSITE EMERGENCY PLANNING ZONES PROJECT

Quality Assurance Plan

Submitted by: J. Inger, TENERA, L.P.

TITLE: Quality Assurance Plan and Implementing Procedures

PROCEDURE NO.: EPZ-0-001 REV.: 0

Recommended for Approval:

EPZ Project Manager (TENERA)	Date
EPZ Project Administrator (EG&G)	Date
Manager Security Planning and EP	Date
Quality Assurance Engineer (TENERA)	Date

ROCKY FLATS PLANT
QUALITY ASSURANCE PLAN
REVISION STATUS SHEET

REVISION	DATE	APPROVAL	DESCRIPTION OF CHANGE
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1.0 INTRODUCTION

A quality assurance plan (QAP) is a documented description or a listing of the controls to be implemented to assure that an operation or activity is accomplished in a consistent manner and in accordance with requirements. Federal, State, and local governments require emergency planning for facilities that may affect the public in the event of an accidental release of nuclear or hazardous materials. One of the purposes of this EG&G Rocky Flats Plant (RFP) Analysis of Offsite Emergency Planning Zones (EPZ) project is to identify the EPZs where actions could be necessary to protect public health.

The RFP EPZ project is developing an interim basis for potential sheltering and evacuation recommendations in the event of an accidental release of radionuclides to the atmosphere from this facility. Also, RFP is developing EPZs for accidental releases of major nonradiological hazardous substances to the atmosphere, and will analyze the impacts of an unplanned surface water release from the facility.

The QAP developed for the EPZ project is a description of HOW implementation and program requirements will be met.

A QAP should be written in the following situations:

- An external requirement to have a quality plan exists (in this case, to meet requirements imposed on RFP by the Department of Energy).
- Numerous external requirements exist, and compliance depends on multidirectorate performance and procedures.
- The costs (in terms of dollars, safety, environmental insult, security, or safeguards) and probability of nonconformance to a requirement is higher than management is willing to accept.
- The costs of having to rework an activity are high, even if the inspection and test systems are in place to detect a nonconformance prior to violation of a requirement.

2.0 PURPOSE

The EPZ project's QAP is developed to implement controls and to minimize a perceived risk. The QAP addresses the need to understand the risks or requirements of an activity.

The risks of a given project failing can be minimized by identifying those items that can cause a project to fail and then developing a plan to ensure those items are conducted satisfactorily. The following is a list of items that can cause this project to fail:

- Invalid assumptions, giving erroneous results,
- Calculations in error, giving erroneous results,
- Lack of document control, resulting in invalid inputs or versions of computer software, and
- Incorrect or inadequate interface control, resulting in failure to transfer vital information.

To ensure that the above items, and others, do not occur, the quality elements in Section 7 below have been addressed in this QAP through implementing procedures contained in the appendices.

3.0 AUTHORITY

The authority for this plan is:

- ANSI/ASME NQA-1 and Supplements: Quality Assurance Program Requirements for Nuclear Facilities, 1986 and Addenda
- DOE Order 5700.6B: Quality Assurance, 1986
- DOE/AL Order 5700.6B, Rev II: General Operations Quality Assurance, 1989
- SOP 5700.6B: Quality Assurance, 1990
- Rocky Flats Publications Administration Manual
- Facilities Engineering and Project Management Manual
- MCA/EPZ documents
  - Analysis of Offsite Emergency Planning Zones for the Rocky Flats Plant, Overview (RFP ADD-001)
  - Analysis of Offsite Emergency Planning Zones for the Rocky Flats Plant, Interim Emergency Planning Zones Analysis, Maximum Credible Accident Project Plan
- EG&G Non-Weapons Quality Manual

4.0 SCOPE

This QAP addresses the requirements and responsibilities, and provides the implementation documents, to coordinate and administer the analysis of Offsite Emergency Planning Zones for the Rocky Flats Plant. This QAP has been developed in accordance with ANSI/ASME NQA-1 and the EG&G Non-Weapons Quality Manual.

The activities to be accomplished under this QAP consist of technical and nontechnical task requirements and quality element requirements.

The technical task requirements are the 15 tasks specified in the Analysis of Offsite Emergency Planning Zones for the Rocky Flats Plant.

Quality elements are defined as the 18 requirements addressed by ANSI/ASME NQA-1. Three elements have also been added from the EG&G Non-Weapons Quality Manual that include: Software Quality Assurance, Quality Improvements, and Surveillance. Thirteen of these 21 quality elements, after careful analysis, have been determined to be applicable for this project. The quality element requirements applicable to this task include the following:

- Organization
- Quality Assurance Program
- Design Control
- Procurement Document Control
- Instructions and Procedures
- Document Control
- Control of Purchased Services
- Corrective Action
- Quality Assurance Records
- Audits
- Software Quality Assurance
- Quality Improvements
- Surveillance

Procedures implementing this plan include:

- Indoctrination of Project Personnel to QAP and Procedures
- Design Inputs
- Design Calculations
- Preparation and Control of Design Documentation
- Design Interface Control
- Design Verification
- Design Change Control
- Control of Unverified Design
- Software Quality Assurance
- Control and Format of Project Procedures
- Document Control
- Corrective Action
- Quality Assurance Records
- Quality Assurance Auditing
- Surveillance Activities

5.0 INTENDED AUDIENCE

The following list is the intended audience for this QAP:

- Task Team Members
- EG&G Management
- DOE Management
- Offsite Reviewers
  - Colorado Department of Health
  - Colorado Division of Disaster Emergency Services
  - Environmental Protection Agency, Region VII
- General Public

6.0 TECHNICAL TASK REQUIREMENTS

In Phase II, entitled "Interim Emergency Planning Zones Analysis, MCA," we will utilize the RFP MCA, existing dispersion methodologies, and upgraded dosimetry methodologies to identify radiological EPZs for Rocky Flats as recommendations to the State of Colorado. We will also identify recommended screening-level EPZs for nonradiological hazardous materials releases and evaluate potential surface water releases from the facility. These interim analyses will be conducted in support of a revised State Radiological Emergency Response Plan for the RFP, now being developed by the State Division of Disaster Emergency Services (DODES).

The following sections summarize the tasks and subtasks associated with Phase II.

6.1 Administer Project

The project coordinator and project manager will coordinate and administer the program to ensure that the project objectives are fully met within the committed schedule.

6.1.1 Obtain Necessary Contract Staffing

The Phase II project coordinator will identify and obtain the temporary contract staffing needed to supplement the efforts of permanent team members. Contract staff will be assigned as necessary to ensure a total level of effort that will meet all schedules at the needed level of quality.

6.1.2 Develop Project Plan and Schedule

The Phase II project team will develop a detailed project plan for analysis of offsite EPZs. The plan will include identification of tasks, task interrelationships, critical path analysis, task scheduling, resource identification, and resource allocation. The plan will be summarized in a formal report.

6.1.3 Monitor/Coordinate Project Progress

The Phase II project manager will coordinate technical efforts for the project. He will monitor the progress of all technical tasks on a continuous basis. The project manager will

track the project progress against the schedule identified in the project plan and will adjust allocation of resources and staff efforts as necessary to ensure that the project objectives are met on schedule.

6.1.4 Act as Liaison Among Oversight Groups

The Phase II project coordinator and project manager will act as a liaison among Rocky Flats management, DOE-RFO management, the CDH, the Colorado DODES, the EPA, and other external groups. They will conduct this liaison to the full extent necessary to ensure that Phase II satisfies the needs of the State of Colorado and reflects concurrence from all associated groups. The project manager will conduct oversight review meetings at two-week intervals to keep management and external groups informed of the progress of the project.

6.1.5 Provide Clerical/Administrative Support

Emergency Assessment Systems and contract personnel will provide clerical and administrative support to the technical teams performing tasks in this project. Support will include word processing, data compilation, filing, and research.

6.2 Confirm and Quantify Interim Release Fractions – Radiological

The task team will review and confirm the interim release fractions that were developed during Phase I of the project. The team will ensure that the interim release fractions are calculated and formatted for use in source-term development and will produce detailed draft documentation for inclusion in the Phase II final report.

6.3 Confirm and Quantify MCA Using Interim Release Fractions – Radiological

Safety Analysis Engineering will complete all tasks, begun in Phase I of the project, to confirm and quantify the existing MCA for use in establishing EPZs. This task will focus on calculation and verification of source characteristics associated with the aircraft crash MCA. The team will also conduct a screening level investigation of other potential radioactive release scenarios.

6.3.1 Finalize All MCA Calculation Worksheets

Safety Analysis Engineering will calculate final source characteristics for the MCA using the interim release fractions. This analysis will also include calculation of release estimates and frequency of occurrence for plutonium scenarios with release estimates greater than 100 grams.

6.3.2 Complete Tours of Buildings 774 and 707

These tours will confirm the quantities and geometry of materials maintained in Buildings 774 and 707.

6.3.3 Issue Past Meeting Minutes

Safety Analysis Engineering will compile and formally issue the minutes from all Phase I task team meetings between December 1988 and April 30, 1990.

6.3.4 Discuss Criticality and Nonplutonium Materials

Safety Analysis Engineering will work with EG&G Rocky Flats, DOE-RFO, and the CDH to review design basis accidents for substances other than Rocky Flats plutonium. The team will consider Americium-241 , other transuranic radionuclides, and fission products from a criticality scenario, as well as other major radiation sources (for example, sealed calibration sources).

6.3.5 Produce Draft Documentation for Final Report

The technical task team will produce fully detailed, unclassified documentation of this task for inclusion in the final report for Phase II.

6.4 Establish Dosimetry Approach

EG&G Rocky Flats, DOE-RFO, and CDH have selected ICRP 26/30 dosimetry methodology for evaluating impacts from the MCA on the public. In this task, a task team will select among options for implementation of ICRP 26/30 methodology, develop the dose conversion factors representing Rocky Flats plutonium, and format the dose conversion factors for use in consequence modeling.

6.4.1 Resolve Americium Treatment

The task team will evaluate the need for including Americium-241 in the composite dose conversion factors being developed for Rocky Flats plutonium.

6.4.2 Choose Particle Size

The ICRP recommends 1.0 μm Activity Mean Aerodynamic Diameter (AMAD) as a default for particulate releases, while the RFP Environmental Impact Statement uses an AMAD of 0.3 μm. The task team will evaluate and choose between these two options and support the State in the final selection.

6.4.3 Resolve Dose Commitment Period

The ICRP, DOE, and the EPA evaluate dose for a 50-year commitment period. The CDH, other groups within the EPA, and the *Final Environmental Impact Statement (final statement to ERDA 1545-D) Rocky Flats Site, Golden, Jefferson County, Colorado (1980)* (FEIS) consider dose commitments over a 70-year period. The task team will evaluate the available options and support the State in selecting the one considered most appropriate.

6.4.4 Choose Inhalation Class

The release scenario postulated in the MCA can produce Class Y plutonium, Class W plutonium, or a mixture of both classes. The Phase II project team will review the scenario and recommend to the State the most appropriate class or combination of classes for development of dose conversion factors.

6.4.5 Choose Pathways

A number of environmental pathways can be considered for dose to the public (for example, inhalation, resuspension, immersion, etc.). The task team will evaluate the pathways appropriate for offsite emergency planning and support the State in the final selection.

6.4.6 Obtain Necessary Contract Staffing

The task team will identify and obtain the temporary contract staffing needed to supplement permanent team members. Contract staff will be assigned as needed to ensure a total level of effort that will meet all schedules at the necessary level of quality.

6.4.7 Calculate Dose Conversion Factors

The task team will combine the results of 6.4.1 through 6.4.6 along with ICRP 26/30 methodology to calculate dose conversion factors for evaluating public impacts from the MCA scenario.

6.4.8 Prepare Dose Conversion Factors for Consequence Modeling

The task team will convert the dose conversion factors calculated in 6.4.7 to a format compatible with the consequence modeling to be conducted for this project. The data will be stored in computer files for automated processing.

6.4.9 Produce Draft Documentation for Final Report

The technical task team will produce fully detailed documentation of this task for inclusion in the final report for the Phase II project.

6.5 Develop Consequence Modeling Approach – Radiological

CDH, EG&G Rocky Flats, and the DOE-RFO have agreed that an approved atmospheric dispersion model must be used to evaluate the consequences of the MCA on offsite populations. The State of Colorado has determined that straight-line Gaussian models are inappropriate for use in evaluating impacts from the RFP. But at the time of this project, straight-line Gaussian models will be the only approved methods available for emergency planning. Therefore, during Phase II of this project, the task team will select and implement a model from among those straight-line Gaussian models. Approval and utilization of a model that more realistically treats the complex conditions around Rocky Flats will be a focus of Phase III.

6.5.1 Obtain Necessary Contract Staffing

The team will identify and obtain the temporary contract staffing needed to supplement permanent team members. Contract staff will be assigned as needed to ensure a total level of effort that will meet all schedules at the necessary level of quality.

6.5.2 Identify Consequence Modeling Methods

The task team will identify the dispersion modeling approaches that are approved for radiological emergency planning. These models will include the Nuclear Regulatory Commission's Regulatory Guide 1.145 and any methods that may be identified in the 1980 Draft Protective Action Guide from the EPA.

6.5.3 Evaluate Consequence Modeling Methods

The task team will evaluate the atmospheric dispersion models identified in 6.5.2. We will address the thoroughness of the approach, the technical sophistication of the method, and the appropriateness of the model for use in facilities and terrain such as Rocky Flats.

6.5.4 Choose Consequence Modeling

EG&G Rocky Flats and DOE-RFO will use the evaluations from 6.5.3 to recommend to the State the atmospheric dispersion model most appropriate for Phase II emergency planning. The team will use the following criteria in making this recommendation:

- Appropriateness to Rocky Flats,
- Thoroughness of approach,
- Technical sophistication,
- Availability for use, and
- Ease of implementation.

The task team will support the State in the final selection of a consequence assessment model.

6.5.5 Develop Software

The task team will develop any computer codes necessary to implement the atmospheric dispersion model selected in 6.5.4. If software exists and is available, the team will modify the code to operate on RFP computing systems. The new code will accept input data available at the facility.

If computer codes do not exist or are not available, the task team will generate the software based on the theory documented for the approach. All software will be developed as FORTRAN 77 code operating in a Digital Equipment Corporation VAX environment.

6.5.6 Implement Software

The task team will implement the software developed under 6.5.5 on the Unclassified VAX Cluster at the RFP. The team will ensure zero defects in the software through comprehensive verification and testing of the code. The team will develop and format all input data sets needed to operate the code and will format model outputs for ease of use in subsequent tasks.

6.5.7 Produce Draft Documentation for Final Report

The technical task team will produce fully detailed documentation of this task for inclusion in the final report for Phase II.

6.6 Establish Protective Action Guides – Radiological

Protective Action Guides (PAGs) are an objective means of converting the dose received from a radiological accident to actions needed for protection of public health. PAGs for radiological releases are based on the risk of excess cancers or genetic defects among the population based on ICRP 2 dose methodology. It will be necessary to develop new PAGs for use for the ICRP 26/30 dose methodology to be applied in Phase II. The task team will identify, evaluate, and recommend to the State evacuation and sheltering PAGs appropriate to Rocky Flats plutonium.

6.6.1 Document Choice of Effective Dose Equivalent

The choice of ICRP 26/30 dose methodology leads automatically to selection of effective dose equivalent as the basis for PAGs in this project. The project team will document this choice and justification.

6.6.2 Obtain Necessary Contract Staffing

The team will identify and obtain the temporary contract staffing needed to supplement permanent team members. Contract staff will be assigned as necessary to ensure a total level of effort that will meet all schedules at the needed level of quality.

6.6.3 Identify Available PAGs

The task team will identify available options for evacuation and sheltering PAGs based on ICRP 26/30 dose methodology. This task will involve a literature search of existing methodology.

6.6.4 Evaluate Available PAGs

The task team will objectively evaluate each of the methods identified under 6.6.3 for its appropriateness to the evacuation and sheltering PAGs for RFP.

6.6.5 Choose PAGs Approach

Using the results of the evaluation in 6.6.4, EG&G Rocky Flats and DOE-RFO will recommend to the State a PAG approach for use in Phase II . The task team will make recommendations based on the following criteria:

- Appropriateness for use at Rocky Flats,
- Acceptance by the technical and regulatory community,
- Technical defensibility, and
- Thoroughness of documentation.

The task team will support CDH in its final choice of PAGs.

6.6.6 Prepare Draft Documentation for Final Report

The technical task team will produce fully detailed documentation of this task for inclusion in the final report for Phase II.

6.7 Develop Screening Level EPZs for Hazardous Materials

RFP maintains and uses significant inventories of nonradiological hazardous materials (HAZMAT). Some of these substances are used in sufficient quantities to represent a credible risk to the public in the event of an emergency at the facility. In Phase II, we will develop an initial set of recommended EPZs for nonradiological hazardous substances at the RFP. A screening level analysis will be performed that will produce initial EPZs for those large-quantity hazardous substances stored or used at the facility. The screening level analysis will be replaced with more refined evaluations during subsequent phases of the project.

6.7.1 Obtain Necessary Contract Staffing

The task team will identify and obtain the temporary contract staffing needed to supplement permanent team members. Contract staff will be assigned as necessary to ensure a total level of effort that will meet all schedules at the needed level of quality.

6.7.2 Select Potential Source Terms Using SARA Title III Reports

The task team will review Superfund Amendment and Reauthorization Act (SARA Title III) reports generated for the Rocky Flats Plant, identifying those hazardous chemicals where plant site use exceeds 10,000 pounds annually.

6.7.3 Select Potential Source Terms Using Occupational Health Information System (OHIS) Chemical Inventory

The task team will identify hazardous chemicals for evaluation from the OHIS chemical inventory maintained by the RFP. They will identify all substances that exceed 800 pounds, 100 gallons, or 10 four-foot (approximately four-feet high by one-foot diameter) gas cylinders (or their equivalents) in any single location.

6.7.4 Select Potential HAZMAT Source Terms

The task team will select recommended source terms from the list generated in 6.7.2 and II.7.3 based on the following criteria:

- Extremely hazardous substances list (SARA Title III),
- Toxic chemicals list (SARA Title III), and

- Toxic chemicals list (SARA Title III), and
- Large-quantity chemicals not on above list (case-by-case basis).

6.7.5 Finalize HAZMAT Source Term List

The team will finalize the Potential HAZMAT Source Term List developed in 6.7.4 based upon a generic prescreen modeling analysis designed to indicate which of the potential source terms may have significant offsite impact.

6.7.6 Field Verify Final HAZMAT Source Term List

The task team will field verify the final HAZMAT source term list with respect to each chemical, its location, and the maximum amount that could be present at that location.

6.7.7 Conduct Tour of HAZMAT Storage/Use Areas

The technical task team and representatives from the CDH and DODES will jointly confirm quantities and geometry of HAZMAT sources selected in 6.7.4. The team will verify these sources through direct inspection during a tour of the plant site.

6.7.8 Select Model for Consequence Assessment

The task team will identify atmospheric dispersion models that are generally regarded as acceptable for HAZMAT emergency planning. The State of Colorado determined that straight-line Gaussian models are inappropriate for use in evaluating impacts from the RFP. But at the time of this project, straight-line Gaussian models will be the only generally accepted methods available for emergency planning. Therefore, during Phase II of this project, the team will recommend to the State a model from among those straight-line Gaussian models. The team will implement the code upon approval from the State.

Approval and utilization of a model that more realistically treats the complex conditions around Rocky Flats will be a focus of Phase III.

6.7.9 Establish PAGs for EPZ Determination

EG&G Rocky Flats and DOE-RFO will jointly recommend PAGs to the State for the selected HAZMAT source terms. The task team will base the PAGs on exposure limits generally accepted as guidelines for exposure of the public to hazardous material concentrations during accidental release conditions.

The team will support the State in the final selection of the PAGs.

6.7.10 Model Consequences and Document Assumptions

The task team will operate the atmospheric dispersion model selected in 6.7.8 for each substance and source term established in 6.7.5. The team will prepare necessary input files, operate the models, and produce the outputs necessary for establishing EPZs.

This screening-level analysis will evaluate only simple ruptures as an initiating scenario. The team will treat other initiating scenarios (for example, aircraft crashes, explosions, etc.) in Phases III and IV of the EPZ project.

6.7.11 Delineate EPZs for each Source Term

The task team will use the results from 6.7.10 to determine screening-level recommended EPZs (evacuation and/or sheltering) for each substance and source term identified in 6.7.5.

6.7.12 Prepare Draft Documentation for Final Report

The technical task team will produce fully detailed documentation of this task for inclusion in the final report for the overall project.

6.8 Develop Final Contingency Plan for Water Releases

Introduction of radionuclides and nonradioactive hazardous substances to the environment via unplanned surface water releases is another pathway requiring emergency planning. Rocky Flats Plant has developed a contingency plan for release of surface water to Walnut Creek or Woman Creek from the RFP Detention Pond system, the dominant mechanism

for this scenario. This task will complete an upgrade of the contingency plan and submit the plan to the State of Colorado for possible inclusion in or reference by the State Radiological Emergency Response Plan.

6.8.1 Obtain Necessary Contract Staffing

The team will identify and obtain the temporary contract staffing needed to supplement permanent team members. Contract staff will be assigned as necessary to ensure a total level of effort that will meet all schedules at the needed level of quality.

6.8.2 Update Plan for Current Conditions

The task team will update the existing contingency plan in response to current regulations and detention pond management practices at the RFP.

6.8.3 Incorporate DOE-requested Revisions

DOE-RFO has recently reviewed the existing contingency plan and has requested upgrades and revisions. The task team will complete these revisions for the final plan.

6.8.4 Incorporate 1989 State Exercise Revisions

In September 1989, the State of Colorado, Rockwell International, and DOE-RFO conducted a joint State radiological emergency response exercise for RFP. The exercise focused on a simulated release of surface water due to dam failure in the detention pond system. The exercise participants generated a series of critique action items based on their evaluation of the exercise. These action items will be resolved and incorporated in the revised contingency plan as applicable.

6.8.5 Produce and Publish Revised Contingency Plan

The task team will incorporate the results from 6.8.2, 6.8.3, and 6.8.4 in a final contingency plan for unplanned surface water releases from the RFP. EG&G Rocky Flats and DOE-RFO will review and finalize the plan. The task team will then publish the plan as a formal RFP emergency plan.

6.8.6 Issue Plan as Controlled Document

The task team will issue the finalized contingency plan under controlled distribution. They will formally submit the plan to the State of Colorado for possible inclusion or reference by the State Radiological Response Plan for Rocky Flats.

6.9 Ensure Quality of Project

Because the EPZs developed in this project will be recommended for use in emergency planning, our technical results must be of high quality and free of errors. The project team will implement a comprehensive quality control and assurance program to meet these objectives.

Specialists will be placed under contract to develop and implement a quality assurance plan for the program. The plan will meet quality requirements established by DOE, EPA, and other agencies as appropriate. These independent quality assurance specialists will audit the results of Phase I to ensure and document zero defects in that analysis. These specialists will also institute a comprehensive quality control process for all activities in Phase II of the project.

6.9.1 Obtain Necessary Staffing Resources

The team will identify and obtain the temporary contract staffing needed to supplement permanent team members. Contract staff will be assigned as necessary to ensure a total level of effort that will meet all schedules at the needed level of quality.

6.9.2 Develop Quality Assurance Plan

The quality assurance contractor will develop a comprehensive quality assurance and quality control plan for Phases I and II of the project.

6.10 Ongoing Documentation

Complete documentation of this project will be essential to its defensibility and usefulness in emergency planning for the RFP. EG&G Rocky Flats will establish a professional technical writing team to support the technical staff and ensure that the documentation goals are fully met. This staff will produce a comprehensive final report for Phase II of the

program. The technical writing staff will also develop necessary documentation formats and style guides, and produce detailed minutes for each project meeting in Phase II of the program. The technical writing team will research and fully document Phase I .

6.10.1 Obtain Necessary Contract Staffing

The team will identify and obtain the temporary contract staffing needed to supplement permanent team members. Contract staff will be assigned as necessary to ensure a total level of effort that will meet all schedules at the needed level of quality.

6.10.2 Develop Documentation Formats and Style Guide

The technical writing staff will review available documentation formats and style guides and select an approach to be used for documentation of this project.

6.10.3 Fully Document Phase I of the Project

The technical writing staff will review all meeting minutes, notes, and reports generated in Phase I of the overall project. The technical writing staff will also conduct interviews with technical and management personnel from EG&G Rocky Flats, DOE-RFO, and CDH who conducted technical efforts during Phase I. The technical writing team then will compile a comprehensive report describing the analyses and results from this portion of the project.

6.10.4 Produce Minutes for Each Project Meeting

The technical writing staff will attend each review meeting during Phase II of the overall project. The staff will produce and distribute detailed minutes for each meeting.

6.11 Conduct Consequence Modeling – Radiological

The task team will utilize the atmospheric dispersion modeling approach developed in 6.5 to evaluate the consequences on the offsite public of the MCA. The team will develop all inputs needed to run the model, conduct the atmospheric dispersion analyses, incorporate dosimetry, and produce full documentation for the final report.

6.11.1 Develop Input Data – Source

The team will verify the source characteristics produced in 6.3 and modify the output files as necessary for input to the atmospheric dispersion model.

6.11.2 Develop Input Data – Meteorological

EG&G Rocky Flats, DOE-RFO, and CDH will jointly select a meteorological database to represent the RFP in the modeling analysis. The project team will compile the database. Then they will then format it as a joint frequency function or in another appropriate format for input to the atmospheric dispersion model.

6.11.3 Conduct Atmospheric Dispersion Analyses

The task team will utilize the selected atmospheric dispersion model along with input data sets to quantify the impacts from the MCA on offsite populations. The team will simulate environmental exposures via selected pathways.

6.11.4 Incorporate Dosimetry

The task team will combine the exposure data produced in 6.11.3 with the dose conversion factors from 6.4 to finalize offsite doses to the public associated with the MCA scenario. These results will be produced in a format that can be used to directly establish EPZs.

6.11.5 Produce Draft Documentation for Final Report

The technical task team will produce fully detailed documentation of this task for inclusion in the final report for the overall project.

6.12 Establish Emergency Planning Zones

The project team will combine the doses projected for the MCA in 6.11 with the PAGs developed in 6.6 to establish recommended EPZs for radiological emergencies at the RFP. Two circular EPZs will be identified: one for consideration of evacuation, and one for consideration of sheltering. CDH will review the appropriateness of the EPZs determined in this process.

6.13 Prepare Final Report

The technical writing staff will compile the draft documentation produced by each technical task team in a draft final report of the Phase II project. The technical writing staff and project team will review and revise the final report to ensure that the technical content is accurate and properly communicates the results of the project. The technical writing staff will then produce a final publication-quality report for the project.

6.14 Review and Accept the Report

The project team will submit the final report to management at EG&G Rocky Flats, DOE-RFO, and CDH for review and concurrence. The project team and technical writing staff will incorporate any revisions requested by management as a result of their review.

6.15 Issue Final Report to State

After concurrence by EG&G Rocky Flats, DOE-RFO, and CDH, the project team will formally publish the report and issue it to the State of Colorado.

7.0 QUALITY ELEMENTS

To satisfy the quality requirements for the Analysis of Offsite EPZs for the Rocky Flats Plant, the following elements have been selected from ANSI/ASME NQA-1. After evaluating the relevance of each of the NQA-1 quality requirements, the following elements have been chosen:

- Organization
- Quality Assurance Program
- Design Control
- Procurement Document Control
- Instructions and Procedures
- Document Control
- Control of Purchased Services
- Corrective Action
- Quality Assurance Records
- Audits

Included are the following three requirements from the EG&G Non-Weapons Quality Manual, which we feel augments those listed above. These requirements include:

- Software Quality Assurance
- Quality Improvement
- Surveillance

7.1 Organization

This project was developed jointly by an interdisciplinary team involving representatives from the U.S. Department of Energy - Rocky Flats Office (DOE-RFO), EG&G Rocky Flats, Inc., and its subcontractors. EG&G Rocky Flats will perform the bulk of the technical effort, supported by experts contracted specifically for this project. DOE-RFO, DODES, EPA, and CDH will also participate directly in the program. The chart in Appendix A–1 represents the organization of the project team for the Offsite EPZ Analysis. The structure shown has been specifically designed to meet the ambitious goals of this project.

7.1.1 Responsibilities

The organizational structure and the responsibility assignment shall be such that quality is achieved and maintained by those assigned responsibility for performing quality related activities; and this quality achievement is verified by persons or organizations not directly responsible for performing the quality related activities.

7.1.1.1 Project Manager

The project manager function will have overall responsibility for financial, human resources, and logistical coordination of the project. The manager will coordinate all technical efforts. The manager will track project progress against the schedule identified in the Phase II project plan and adjust allocation of resources and staff efforts as necessary to ensure that the project objectives are met on schedule.

The project manager shall ensure the design process to be in accordance with this QAP through:

- Management control,
- Training of project task members on this QAP and its implementing procedures,
- Implementation of this QAP,
- Technical design reviews, and
- Quality improvement activities.

The project manager will:

- Develop organization charts depicting key positions and levels of authority. See Appendix A-1 for details,
- Establish key positions along with titles and major responsibilities. See Appendix A-2 for details,
- Designate signature authority for the preparation, review, approval, and design verification of various project tasks. See Appendix A-3 for details, and
- Develop interface charts delineating both internal/external interfaces. See Appendix A-4 for details.

7.1.1.2 Task Team Leader

The Task Team Leader has overall technical responsibility for producing the results of a task as defined in the Analysis of Offsite EPZs Project Plan. The Task Team Leader shall coordinate the effort of the technical team assigned to a task. The Task Team Leader's responsibilities in the technical review cycle include final technical review of the draft product and evaluation/incorporation of review results following internal, technical, and oversight review.

7.1.1.3 U. S. Department of Energy - Rocky Flats Office (DOE-RFO)

DOE-RFO shall conduct an internal review of each report prior to external issuance.

7.1.1.4 Documentation Team

The documentation team is responsible for producing all draft and final documents associated with the Analysis of Offsite EPZs project. The documentation team responsibilities during the technical review cycle include editing, revising, and issuing draft reports following each review and revision.

7.1.1.5 Technical Information Office (TIO) and "Local" Classifier

The Rocky Flats Plant Technical Information Office and "local" classifiers are responsible for classification review of all documents to be externally issued by the Rocky Flats Plant. They shall review and classify each task report prior to external distribution.

7.2 Quality Assurance Program

The EPZ Quality Assurance Program will ensure that an adequate and appropriate program is planned, documented, and effectively implemented for all activities affecting quality. This program will be documented by written policies, procedures, or instructions and shall be carried out through a graded application throughout the life of this project.

Graded applications for quality assurance requirements involve selective applications of requirements and determination of the nature and extent of verifications required. This QAP is the quality assurance program for this project, is in accordance with NQA-1, and

identifies activities requiring the application of quality assurance. Quality assurance will be applied to activities to an extent consistent with their importance through a graded applications of the requirements.

7.2.1. Personnel

Quality affecting activities as described in Section 6.0 shall be accomplished by qualified, competent individuals. Task leaders and other key team members shall be indoctrinated and/or trained in their respective specialty areas. The extent of indoctrination and training shall be based upon the following:

- The scope, complexity, and nature of the activity,
- The education, experience, and proficiency of the person.

7.2.2 Indoctrination and Training

All project team personnel shall be indoctrinated in the requirements of this QAP prior to performing any quality affecting activities. Indoctrination session attendance sheets shall be used to document this training. See Appendix A–5 for procedure details.

7.2.3 Auditors

Personnel assigned the responsibility of audit team leaders shall be certified as Lead Auditors, (per NQA-1), and this certification shall be maintained as a QA record.

Additionally, the project manager shall periodically assess the effectiveness of the implementation of this QAP. This shall be accomplished by means of periodic audits and surveillance performed during the life of this project. The audit schedule and procedure are discussed in detail in Section 7.10, Audits.

7.3 Design Control

The design of the Offsite EPZs project for the Rocky Flats Plant project will be defined, controlled, and verified. Design control is defined as the necessary controls applied to the technical and management processes that commence with identification of inputs (regulatory guides, meteorological data, etc.) and that lead to and include the issuance

of output documents. Output documents are any written or pictorial information describing, defining, specifying, reporting, or certifying activities, requirements, procedures, or results.

The development of the Offsite EPZs recommendations for the Rocky Flats Plant is outlined in the project plan for Phase II of this project entitled "Interim Emergency Planning Zone Analysis, MCA." The project is defined by the following tasks to be completed during the project.

- Confirm and quantify MCA using interim release fractions - radiological
- Establish dosimetry approach
- Develop consequence modeling approach - radiological
- Establish Protection Action Guides (PAGs) - radiological
- Develop screening level EPZs for hazardous materials
- Develop final contingency plan for water releases
- Conduct consequence modeling - radiological
- Establish emergency planning zones

Activities requiring control for the project include the following:

- Data input - (for example, EPA Guidance, State Emergency Preparedness Requirements, ICRP 26, ICRP 30, NRC Regulatory Guide 1.145)
- Assumptions - (for example, MCA, source points, straight-line modeling for RFP, screening levels [arbitrary] HAZMAT, water runoff, particle size, commitment period for dose)
- References - (for example, DOE requirements, EPA, ICRP, State of Colorado [CDH], Industry Standards)
- Units of measurement - (for example, release fractions, grams of Pu, dose conversion factors, dose levels)
- Calculations - (for example, release fractions, dose conversion factors, HAZMAT screening, PAGs, dispersion modeling)

- Computer software - (for example, HAZMAT [CAMEO], dispersion model [NRC Reg. Guide 1.145])
- Design verification process - (for example, technical review teams)
- Output documents - (for example, PAGs, release fractions, dose levels, task report, source terms, EPZs, and water release plans)

Specifically for this QAP, design control is the management of the applicable requirements that included development, input, analyses, verification, change control, interface control, documentation and records, and computer software.

7.3.1 Design Process

Documents shall be adequate to support assigned EPZ tasks. Both appropriate quality and technical standards shall be identified and documented, and that selection shall be reviewed and approved. Changes from specified standards, including the reasons for the changes, shall be identified, approved, documented, and controlled. Applicable information derived from experience or "lessons learned," as set forth in reports and other documentation, shall be made available to task team personnel. The final products (approved output documents and approved changes thereto) shall be relatable to the inputs by documentation in sufficient detail to permit verification/review.

7.3.2 Design Input

The inputs to the development process shall be specified and approved on a timely basis and to the level necessary to permit the activity to be carried out in a correct manner; and to permit verification that the product meets requirements.

Inputs may consist of the following: State of Colorado EP requirements; DOE requirements and guidelines; EPA requirements and guidelines; industry standards for specific task areas/activities; recommendations from the International Commission on Radiation Protection (ICRP) Publications 26 and 30 for dosimetry methodologies; recommendations on the use of the NRC Regulatory Guide 1.145 for dispersion modeling

approach, meteorological data; use of Superfund Amendment and Reauthorization Act (SARA) Title III reports in the HAZMAT tasks. Design Control documentation shall follow procedures in Appendix B-1 through B-7.

Inputs such as design bases documents, performance requirements, regulatory requirements, codes, standards, and the project team's selection of these inputs shall be identified.

Note: Changes to these inputs shall be reviewed and approved by designated personnel. See Change Control (Appendix B-6) for details. Assumptions and unverified conditions shall be documented with reasons supporting selection. They shall also be verified, and if not verified, a status indicator used, that clearly identifies a given assumption as NOT verified. See Control of Unverified Information in Appendix B-7 for tracking unverified assumptions and conditions.

The development process shall proceed in a logical sense and be fully documented, to provide a trail utilizing information or data to ensure retrievability.

7.3.3 Design Analyses

Analyses (for example, MCA review, Pu release fractions, dosimetry methodologies, consequence modeling, contingency plan for water release) shall be performed in a controlled manner and documented. Documentation of the analysis shall be legible and in a form suitable for reproduction, filing, and retrieval.

Calculations (for example, dose, dose conversion factor, HAZMAT screening, water release, EPZs) shall be identified by subject, originator, reviewer, and date, such that the calculations are retrievable. See Design Calculations in Appendix B-2.

Documentation of the analyses shall include:

- Definition of the objective of the analysis,
- Definition of inputs and their sources,

- Results of literature searches,
- Identification of assumptions and indication of those requiring verification as development proceeds,
- Identification of any computer calculation, including computer type, computer program, revision identification, inputs, outputs, computer program verification, or reference thereto, and their bases supporting application of the computer program to the specific physical problem, and
- Review and approval.

7.3.4 Design Verification

Verification for Phase II of the MCA/IPZ project shall include design review or alternate calculations as described in Design Verification (Appendix B-5). Verification method(s) shall be identified and documented (for example, task technical review team). The results of the verification shall be clearly documented and the identification of the verifier clearly indicated.

The verification shall be performed by qualified personnel assigned by the project manager. The personnel should not have had responsibility for any part of the development, nor specified any of the approaches taken for the development processes (the verifier SHALL NOT verify his own work). The verification shall be performed prior to release to other organizations for use in other activities. If this is not possible, in those cases, the unverified portion of the product shall be identified and controlled in accordance with Control of Unverified Information (Appendix B-7).

Where changes to previously verified information/product have been made, verification shall be required for the changes including evaluation of the effects of those changes on the overall product. Any analyses upon which the product is based that are affected by the change shall also be verified. See Design Change Control (Appendix B-6) for the procedure details.

Where reviews are performed, the following questions shall be answered:

- Were inputs correctly selected?
- Are assumptions necessary to perform the activity adequately described and reasonable?
- Where necessary, are the assumptions identified for subsequent reverifications when the detailed activities are completed?
- Was an appropriate method used?
- Were the inputs correctly incorporated into the product?
- Is the output reasonable compared to inputs?
- Are the necessary input and verification requirements for interfacing organizations specified in the documents or in supporting procedures or instructions?
- Does the development proceed in a logical sense and is it fully documented to provide a trail of information and data to ensure retrievability?

7.3.5 Change Control

Changes to final products (for example, documents that have been released for use: task reports, water release plans, EPZs, etc.) shall be justified and subject to control measures commensurate with those applied to the original development. See Design Change Control (Appendix B-6) for the procedure details. Measures shall include assurance that the analyses are still valid. Changes shall be approved by the same affected groups or organizations that reviewed and approved the original documents. Where a significant change is necessary because of an incorrect development process, the process and verification procedures shall be reviewed and modified as necessary.

7.3.6 Interface Control

Interfaces shall be identified and controlled and the effort coordinated between participating organizations. See Section 7.1.2.1 for specific information on the multiple organizations and Design Interface Control (Appendix B-4) for procedure details.

Interface controls shall include the assignment of responsibility and the establishment of procedures among participating organizations for the review, approval, release, distribution, and revision of documents involving interfaces.

Information transmitted across interfaces shall be documented and controlled.

- Transmittals shall identify the status of the information or document provided, and
- Where necessary, identify incomplete items that require further evaluation, review, or approval.

7.3.7 Documentation and Records

Documentation (for example, release fractions, MCA, PAGs, fact sheets, dose levels, reports on choices or methods, final reports, source terms, EPZs, and plans) and records that provide evidence that the development and verification processes were performed in accordance with this QAP's requirements shall be collected, stored, and maintained in accordance with the procedures identified in Preparation and Control of Documentation (Appendix B-3).

The documentation shall include not only final product documents, such as calculations and revisions thereto, but also documentation that identifies the important steps including sources of inputs that support the final product.

7.3.8 Computer Software

Computer software shall be controlled to assure that a given program has been reviewed and approved, and no unauthorized changes shall be made. For further details, see Software Quality Assurance (Appendix C).

7.4 Procurement Document Control

For the purposes of this project, procurement documents shall address the procurement of services only and consist of the Scope of Work and the technical support document as the procurement documents. Procurement documents shall address the following items:

- Scope of work – This is a statement of the work that is to be performed or accomplished by the supplier.

- Technical requirements – These requirements describe the services that are to be provided by the supplier, and invoke any specifications, codes, standards, regulations, procedures, or instructions including any revisions thereto.
- Quality assurance program requirements – These are the requirements imposed upon the supplier by the purchaser, and are dependent upon the services being procured. The supplier shall be directed to further impose these requirements upon his subtier supplier.
- Right of Access – This item provides for access to the supplier's facilities, and his subtier supplier by the purchaser, or his designee, for the purpose of audit and inspection.
- Documentation requirements – This identifies those documents required by contract to be submitted for information, review or approval, and the time of submittal. Also, for supplier maintained records, it identifies retention times and disposition requirements.

Steps shall be taken to ensure that:

- All procurement documents are reviewed and approved, and that this review and approval is documented to provide objective evidence that it was accomplished prior to procurement, and
- Changes to procurement documents are subject to the same degree of control as the original procurement documents.

7.5 Instructions and Procedures

Instructions and procedures to accomplish the tasks delineated in this QAP are referenced under the individual quality elements and contained in the appendices. Because the EPZ project will not be using the standard Rocky Flats procedure formats, all implementing procedures in the QAP are designated working instructions. See Appendix D for control and format of project procedures.

7.6 Document Control

Document control is defined as the act of assuring that documents are reviewed for adequacy, approved for release by authorized personnel, and distributed to and used at the location where the prescribed activity is performed.

The EPZ document control system will provide the following:

- Identification of documents to be controlled and their specified distribution,
- Identification of assignment of responsibility for preparing, reviewing, approving, and issuing documents,
- Review of documents for adequacy, completeness, and correctness prior to approval and issuance, and
- Changes to documents (except editorial corrections) shall receive the same review and approval as the original document.

The following types of documents shall require control:

- Procurement documents (scope of work, technical support, project plan),
- Instructions and procedures (EPZ project implementing procedures in QAP Appendices),
- Audit checklists (checklists prepared by the lead auditor and utilized in audit performance),
- Input documents used by the project (regulatory guides, EPA guides, ICRPs, etc.), and
- Output documents generated by the project (task reports).

See Appendix E for Document Control Procedures.

7.7 Control of Purchased Services

Suppliers of services will be evaluated and selected. The results of this evaluation and selection shall be documented and based upon any one, or a combination of the following:

- Supplier's history that shall reflect current capability,
- Supplier's current quality records that can be objectively evaluated, and/or
- Supplier's technical and quality capability by direct evaluation of his personnel (for example, review of resumes).

7.7.1 Procurement Planning

Prior to procuring services, procurement planning shall take place to ensure the following items are addressed when planning procurement:

- Procurement document preparation, review, and changes thereto completed prior to issuing the procurement documents,
- Selection of procurement sources that can be accomplished by the establishment of a qualified supplier's list,
- Method of conducting bid evaluation and award of contract,
- Request for Proposal method of control of supplier's performance. This could be accomplished by Rocky Flats Plant's review of supplier's generated documents for compliance with the procurement documents (for example, the supplier's completion of the proposal),
- Verification methods of supplier's performance, again, by review of supplier submitted documentation,
- Supplier corrective action for conditions adverse to quality (see Section 7.8 for details),
- Acceptance of supplier services - this is based upon Rocky Flats Plant's review of supplier submitted documentation, and
- Quality assurance records shall be the supplier's final documentation. All supporting documents leading up to final documentation shall also be supplied.

7.7.2 Supplier Selection

Project personnel shall review the supplier completed Scope of Work and evaluate it based on the following weighting system to facilitate supplier selection:

Criterion	Weight in Evaluation (%)
1. Cost	15
2. Supplier Plan for Implementing Scope of Work	30
3. Experience/Qualification for Tasks	25
4. General Experience in Task Areas	15
5. Plans for Completing Task Within Schedule Constraints	10
6. Demonstrated Knowledge in Task Areas	5

7.7.3 Supplier Performance Evaluation

The project administrator shall assign task members the authority for the review of supplier submitted documents or deliverables, for review and approval, and incorporation in RFP final reports. Based upon their documented review, the supplier will be so evaluated against the requirements of the procurement documents.

7.7.4 Control of Supplier–generated Documents

Once supplier–generated documents are received at the Rocky Flats Plant and have been reviewed and accepted, they shall be identified as supplier documents and shall enter the project document control system (for more detail refer to Section 7.6).

7.7.5 Acceptance of Services

The project administrator shall accept services provided by a supplier using any one or a combination of the following methods:

- Technical verification of the documents produced,
- Surveillance and/or audit of the supplier's activities, and
- Review of objective evidence for conformance to the procurement documents.

7.8 Corrective Action

"Condition Adverse to Quality" is an all-inclusive term used in reference to any failures, malfunctions, deficiencies, defective items, and nonconformances. A significant condition adverse to quality is one that, if uncorrected, could have a serious effect on safety or operations.

Specific to this project, deficiencies and nonconformances are of concern. These deficiencies and nonconformances include deviations from requirements, errors in analysis, input and output data, use of inappropriate requirements, inadequate development process, failure to implement QAP requirements, etc.

Any deviations from the quality elements of this QAP need to be reported.

When conditions adverse to quality are discovered during an audit, surveillance, management program evaluation, or appraisal, the corrective action required depends upon the severity of the condition. At a minimum, the adverse condition has to be corrected, and if the condition is significant, not only the condition must be corrected, but action must be taken to assure the prevention of recurrence.

For significant conditions adverse to quality, the following additional actions will be taken:

- The cause of the adverse condition shall be determined and documented, and
- Corrective action to prevent recurrence shall be taken and documented.

For further details see Appendix F, Corrective Action

7.9 Quality Assurance Records

Records resulting from the implementation of quality activities shall be stored, maintained, retained, and protected. This shall be accomplished in accordance with the procedure identified in Appendix G, Quality Assurance Records.

7.10 Audits

An audit is a planned and documented activity performed to determine by investigation, examination, or evaluation the adequacy of and compliance with established procedures, instructions, drawings, and other applicable documents, and the effectiveness of implementation.

Audits shall be performed for Phase II of this project and the responsibilities for auditor certification and qualification, as well as the makeup of the audit team, audit planning, audit performance, and reporting shall rest with the auditing organization.

Audits of task activities during Phase II shall be accomplished during the life of this phase, with two audits scheduled.

- The first audit shall be scheduled for the last week of June 1990 and shall address the following quality elements:

  - Organization,
  - Quality Assurance Program,
  - Design Control,
  - Procurement Document Control,
  - Instructions and Procedures,
  - Document Control,
  - Control of Purchased Services, and
  - Software Quality Assurance.

- The second audit shall be scheduled before the completion of Phase II, and shall address the following quality requirements:

  - Design Control ,
  - Document Control,
  - Corrective Action,
  - Quality Assurance Records,
  - Audits,
  - Surveillance, and
  - Software Quality Assurance.

Audit team leaders shall be certified as Lead Auditors (see 7.2.3 Auditor) as required by NQA-1, Supplement 2S-3. Audit reports, follow-up, and audit closure are quality records and are deliverables for Phase II of this project that will be included in the QA final report. See Appendix H for Quality Assurance Auditing.

7.11 Software Quality Assurance

Quality elements of this QAP that apply to software quality assurance include the following:

- Design Control - This element defines how the computer program software is developed and controlled to assure that the software meets the specified tasks; defines change control; defines how software design is documented; and defines how software design is verified (test control).
- Document Control - This element describes how various revision levels are controlled; ensures that the current revision level is used; and how media is identified and labeled.
- Corrective Action - This element describes the mechanism to identify problems and prevent recurrence, thereby controlling defective or error–laden software.
- QA Records - This element defines those documents considered to be QA records.

Software shall be treated as any other document, and not as hardware. Although software is handled via electronic media, it can be developed (designed), verified, and issued in like

manner to other design output documents. This also means that similar change control techniques shall be applied. See Software Quality Assurance (Appendix C) for procedure details.

7.12 Quality Improvement

The methods of evaluating or measuring quality on this project shall be by means of audit, surveillance, and corrective action process. The project manager and his task team leaders shall use any of these methods in conjunction with their own observations to measure project quality. The lack of significant conditions adverse to quality, audit findings, significant negative surveillance, or any other significant negative attributes observed shall be cause for a positive response in measuring project performance.

7.13 Surveillance

Surveillance is defined as the act of monitoring or observing to verify whether an item or activity conforms to specified requirements. Surveillances are informal, real time observations, usually unannounced, and will measure both negative and positive attributes.

In addition to formal audits of Phase II and ongoing appraisals and reviews of the project, surveillances of this project shall be accomplished in accordance with this QAP. Periodic surveillance shall be performed and documented by the quality engineer. See Surveillance Activities (Appendix I) for procedures on surveillance.

8.0 GLOSSARY

The following glossary contains a list of terms used in the Quality Assurance Plan. We have also included standard abbreviations and acronyms that shall be used in reporting quality activity.

8.1 TERMS

Acceptance Criteria: Specified limits placed on characteristics of an item, process, or service defined in codes, specifications, standards, or other requirement documents.

Alternate Calculations: These are calculations or analyses that are made with alternate methods to verify the correctness of the original calculations or analyses.

Audit: A planned and documented activity performed to determine by investigation, examination, or evaluation objective evidence of the adequacy of and compliance with established procedures, instructions, drawings, and other applicable documents, and the effectiveness of implementation.

Auditor: Any individual who performs any portion of an audit, including lead auditors, technical specialists, and others such as management representatives and auditors in training.

Certification: The act of determining, verifying, and attesting in writing to the qualifications of personnel, processes, procedures, or items in accordance with specified requirements.

Characteristic: Any property or attribute of an item, process, or service that is distinct, describable and measurable, as conforming or nonconforming to specified quality requirements. Quality characteristics are generally identified in specifications and drawings that describe the item, process, or service.

Commercial Computer Programs: These programs may include those that may be purchased by the general public for use without modification, such as those used for calculations (for example, Lotus 1-2-3, SuperCalc, etc.), or those used primarily for information management (for example, dBASE, R:BASE, etc.). Such programs are recognized as having sufficient

history of use to establish their validity, and the documentation for these programs (for example, user's manuals) may be maintained as with standard programs, or at the project level such as with project-specific programs. If the programs are used without modification, they shall be controlled as public domain programs. If modified, they must be verified and controlled either as standard programs, or project-specific programs.

Computational Error: Software errors that cause the computer program to produce output that is incorrect, but could be interpreted as valid results.

Conditions Adverse to Quality: An all-inclusive term used in reference to any of the following: failures, malfunctions, deficiencies, defective items, and nonconformances. A significant condition adverse to quality is one that, if uncorrected, could have serious effect on safety or operability.

Corrective Action: Measures taken to rectify conditions adverse to quality and, where necessary, to preclude repetition.

Deficiency: A deviation from program requirements, or a program inadequacy, compromising the quality of the item or activity of concern.

Design Checker: A designated, competent task team member, other than who provided the original disposition. The designated individual may be from the same organization as the original designer. The designated individual shall have demonstrated competence in the specific design area of interest and have adequate understanding of the requirements and intent of the original design. The design checker may be the original designer's supervisor provided he meets the preceding qualifications, and did not specify a singular design approach.

Design Criteria: Requirements, codes, standards, and technical publication, etc. that establish the design bases, parameters, etc.

Design Input: Those criteria, parameters, bases, or other design requirements upon which detailed final design is based, such as design bases, performance requirements, regulatory requirements, codes, and standards.

Design Interface Control: The coordination of design among participating organizations and individuals, and requiring the documented assignment of responsibilities and the establishment of procedures among individuals and organizations for the review, approval, release, distribution, and revision of documents involving design interfaces.

Design Output: Documents, such as drawings, specifications, and other documents, defining technical requirements of structures, systems, and components.

Design Process: Technical and management processes that commence with identification of design input and lead to and include the issuance of design output documents.

Design Reviews: These are critical reviews to provide assurance that the final design is correct and satisfactory.

Design Verification: The act of independently reviewing, checking, or otherwise determining the adequacy of a design by one or more, or any combination of the following methods: the performance of design reviews, the use of alternate calculations, or the performance of qualification tests.

Document: Any written or pictorial information describing, defining, specifying, reporting, or certifying activities, requirements, procedures, or results. A document is not considered to be a Quality Assurance Record until it satisfies the definition of a Quality Assurance Record.

Document Control: Consists of the review and approval of a document, the issuance of the document, and changes thereto to an established and controlled distribution list, and the assurance that the current document is being used at the location for the accomplishment of the prescribed quality affecting activity.

Final Design: Approved design output documents and approved changes thereto.

Internal Audit: An audit of those portions of an organization's quality assurance program retained under its direct control and within its organizational structure.

Lead Auditor: An individual qualified and certified to organize and direct an audit, report audit findings, and evaluate corrective action. (Only qualified and certified lead auditors shall function as audit team leaders.)

Major Revisions: Significant changes in procedure, scope, or responsibilities and actions.

Minor Revisions: Obsolete organizational names and position titles, obsolete/incorrect abbreviations, spelling errors, and updating revisions to attached forms.

Noncomputational Error: Software errors that render the software dysfunctional and do not give results, have no effect on accuracy or validity of the computer program output, or give results that cannot be interpreted as valid.

Objective Evidence: Any documented statement of fact, other information, or record either quantitative or qualitative, pertaining to the quality of an item or activity, based on observations, measurements, or tests that can be verified.

Procedure: A document that specifies or describes how an activity is to be performed.

Procurement Document: Purchase requisitions, purchase orders, drawings, contracts, specifications, or instructions used to define requirements for purchase.

Program Deficiency (Finding): Failure to develop, document, or implement effectively any applicable element of the quality assurance program as required by licensing commitments, regulatory requirements, or DOE orders.

Project-specific Computer Programs: These programs may be a project revision of standard or public domain programs, may be task-specific programs developed for project use and not applicable outside the project, or may be programs verified for a project-specific application.

Public Domain Computer Programs: These programs are maintained by vendors or suppliers in stable, verifiable form, or are standard industry codes imported for use without significant modifications. Some of these programs are general industry programs that are recognized as having sufficient history of use to establish their validity, while some are unverified and require in-house verification.

Qualification Tests: These tests demonstrate the adequacy of performance of the design under conditions that simulate the most adverse design conditions.

Qualified Procedures: An approved procedure that has been demonstrated to meet the specified requirements for its intended purpose.

Quality Assurance Record: A completed document that furnishes evidence of the quality of items and/or activities affecting quality.

Satisfactory: Results of surveillance are determined "satisfactory" when evaluation of objective evidence and/or observation of the activity verifies conformance to specified requirements.

Significant Condition Adverse to Quality: A condition adverse to quality, which, if uncorrected, could have a serious effect on safety or operability.

Standard Computer Programs: Programs that are "custom" programs developed in-house, developed under contract from a supplier, imported by RFP, or adapted from other sources. These programs are issued as fully certified for use.

Surveillance: The act of monitoring or observing to verify whether an item or activity conforms to specified requirements. Surveillances are informal, real time observations, usually unannounced, and will measure both negative and positive attributes.

Traceability: The ability to trace the history, application, or location of an item and like items or activities by means of recorded identification.

Unsatisfactory: Results of surveillance are "unsatisfactory" when evaluation of the objective evidence and/or observation of the activity clearly indicates noncompliance with specified requirements.

Verification: The act of reviewing, inspecting, testing, checking, auditing, or otherwise determining and documenting whether items, processes, services, or documents conform to specified requirements.

ANALYSIS OF OFFSITE EMERGENCY PLANNING ZONES FOR THE ROCKY FLATS PLANT

QUALITY ASSURANCE PLAN

APPENDICES

EG&G ROCKY FLATS

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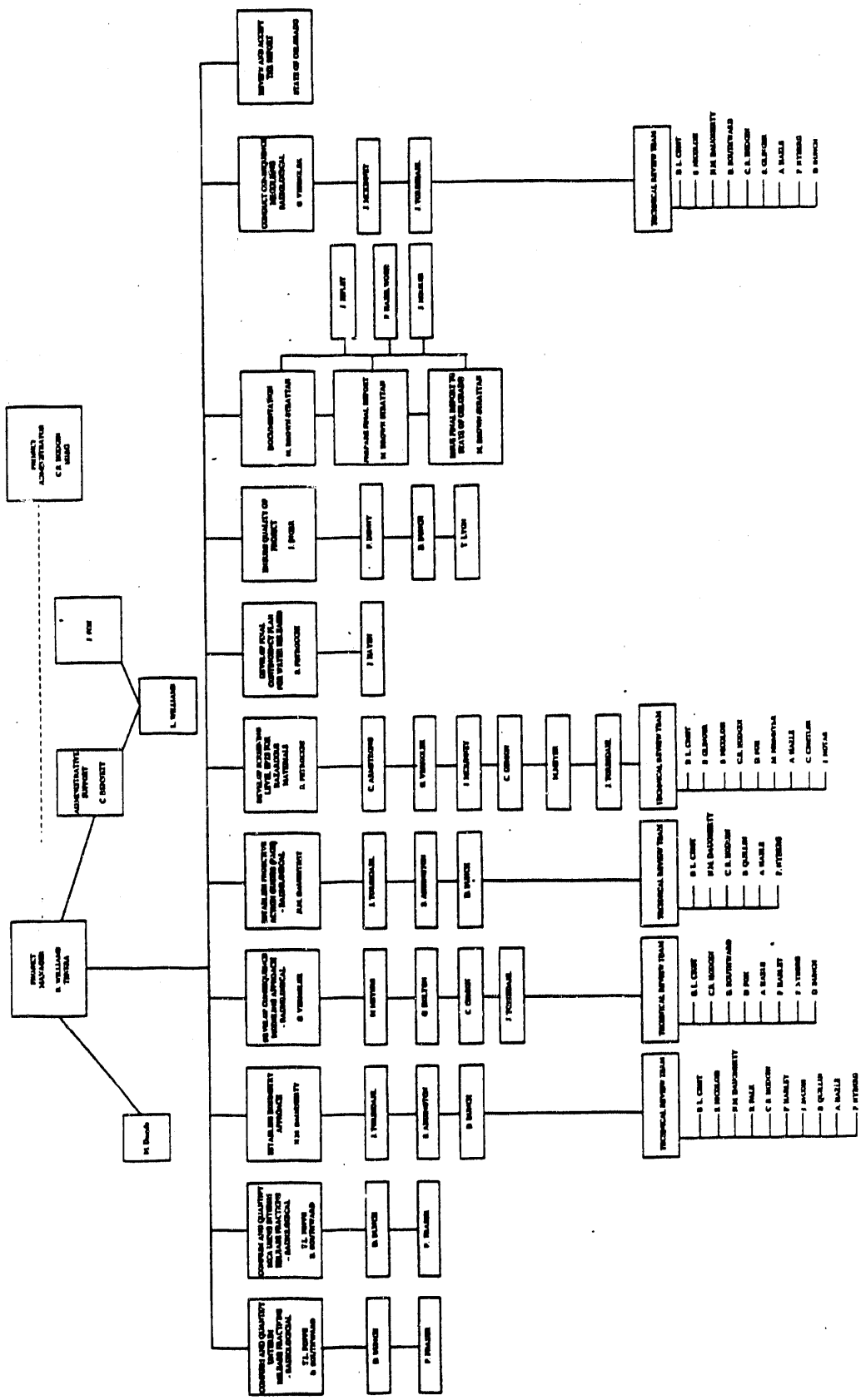
APPENDIX A

Administrative Information



Task Team Members

Responsibilities of each of the participating task team members are as follows:

TASK 1 - Project Administration

- Robert R. Williams - TENERA Project Manager, responsible for overall project coordination, completion schedules, and authorization for all documentation.
- Reed Hodgin - EG&G Project Administrator , responsible for overall project quality and delivery of report to the State of Colorado.

TASK 2 - Confirm and Quantify Interim Release Fractions - Radiological

- Terry Foppe - EG&G Task Team Leader, responsible for the technical material developed for each task including the research, computation, and drafting the final task report.
- Ben Southward - EG&G Primary contact for data collection and reporting.
- Del Bunch/Peter Fraser - TENERA technical support.

TASK 3 - Confirm and Quantify MCA Using Interim Release

- Terry Foppe - EG&G Task Team Leader, responsible for the technical material developed for each task including the research, computation, and drafting the final task report.
- Ben Southward - EG&G Primary contact for data collection and reporting.
- Del Bunch/Peter Fraser - TENERA technical support.

TASK 4 - Establish Dosimetry Approach

- Nancy Daugherty - EG&G Task Team Leader, responsible for the technical material developed for each task including the research, computation, and drafting the final task report.
- Jim Toresdahl/Del Bunch - Onsite TENERA technical support.
- C.E. Eichhorn/Steve Addington - Offsite TENERA technical support.

TASK 5 - Develop Consequence Modeling Approach - Radiological

- Gary Verholek - TENERA Task Team Leader, responsible for the technical material developed for each task including the research, computation, and drafting the final task report.
- Rob Myers - TENERA technical support, review model selection criteria and report development.
- Mike Meyers - TENERA technical support, implement model analysis.
- Greg Holton - TENERA technical support, develop model selection criteria.
- Jim Toresdahl - TENERA technical support, implement model and report development.

TASK 6 - Establish Protective Action Guides (PAGs) - Radiological

- Nancy Daugherty - Task Team Leader, responsible for the technical material developed for each task including the research, computation, and drafting the final task report.
- Jim Toresdahl - TENERA technical support.
- Del Bunch - TENERA technical support.

TASK 7 - Develop Screening Level EPZs for Hazardous Materials

- A. J. Petrocchi - Task Team Leader, responsible for the technical material developed for each task including the research, computation, and drafting the final task report.
- Craig Armstrong - EG&G technical support.
- Gary Verholek - TENERA technical support, data reduction coordinator, prioritization, and model selection.
- Jim Toresdahl - TENERA technical support, scenarios and source terms, limiting conditions for operations (LOC) selection, and EPZ rationale.
- John McKinney - TENERA technical support, model implementation/analysis and data reduction.

TASK 8 - Develop Final Contingency Plan for Water Releases

- A. J. Petrocchi - EG&G Task Team Leader, responsible for the technical material developed for each task including the research, computation, and drafting the final task report.
- John Hayen, Jr. - EG&G technical support and plan coordinator.

TASK 9 - Ensure Quality of Project

- Joe Inger - TENERA Task Team Leader, Quality Assurance Engineer.
- Frank Denny - TENERA Quality Assurance Lead Auditor.
- Del Bunch - TENERA Q-Cleared Audit Support.

TASK 10 - Documentation

- Marlene Brown-Strattan - EG&G Task Team Leader.
- Julia Ripley - EG&G technical support.
- Peggy Hazelwood - EG&G technical support.
- Joyce Hooker - EG&G techncial support.

TASK 11 - Conduct Consequence Modeling - Radiological

- Gray Verholek - TENERA Task Team Leader, responsible for the technical material developed for each task including the research, computation, and drafting the final task report.
- John McKinney - TENERA technical support, model implementation/analysis.
- Jim Toresdahl - TENERA technical support, model runs.

For Project Tasks and Administrative Procedures the following persons have signature authority:

Project Manager: Robert Williams, TENERA
EG&G Project Administrator: C. Reed Hodgin, EG&G Rocky Flats, Inc.

Task Team Leaders/Technical Review Members for Specific Tasks include:

Task 4 Leader: N. M. Daugherty, Clean Air and Environmental Reporting

TENERA:	Technical Review Team :	
Jim Toresdahl - Principal Consultant	Bert Crist	Jake Jacobi
Steve Addington	Steve Nicolosi	Bob Quillin
	Roger Falk	Al Hazle
	C. Reed Hodgin	Phil Nyberg
	Pam Harley	

Task 5 Leader: Gary Verholek - Principal Consultant, TENERA

TENERA:	Technical Review Team:	
Jim Toresdahl	Bert Crist	Pam Harley
Rob Meyers	C. Reed Hodgin	Mark Niemeyer
John McKinney	Ben Southward	Al Hazle
Mike Myers	Dick Fox	Phil Nyberg
Carol Gibson	Del Bunch	Jim Toresdahl
Greg Holton	Gary Verholek	Jake Jacobi
	Steve Nicolosi	

Task 6 Leader: N. M. Daugherty, Clean Air and Environmental Reporting

TENERA:	Technical Review Team:
Del Bunch	none
Jim Toresdahl	
Rob Myers	
Steve Addington	

Task 7 Leader: A. J. Petrocchi
Craig Armstrong

TENERA:	Technical Review Team:	
Gary Verholek - Principal Consultant	Bert Crist	Al Hazle
Rob Myers	Shirley Olinger	Cheryl Cristler
John McKinney	Steve Nicolosi	John Notar
	C. Reed Hodgin	Jim Toresdahl
	Dick Fox	Gary Verholek
	Mark Niemeyer	

Task 8 Leader: A. J. Petrocchi, Emergency Preparedness
John Hayen, Jr.

TENERA:	Technical Review Team:
none	none

Task 9 Leader: Joe Inger, TENERA

TENERA:
Frank Denny - Principal Consultant
Del Bunch

Technical Review Team:
none

Task 10 Leader: Marlene Brown-Strattan, EG&G - EAS
Julia Ripley
Peggy Hazelwood
Joyce Hooker

Task 11 Leader: Gary Verholek - Principal Consultant, TENERA

TENERA:
John McKinney
Rob Myers
Jim Toresdahl

Technical Review Team:
Bert Crist
Nancy Daugherty
C. Reed Hodgin
Ben Southward
Dick Fox
Pam Harley
Al Hazle
Phil Nyberg
Del Bunch
Jim Toresdahl
Gary Verholek
Mark Niemeyer

Task 12 Leader: C. R. Hodgin, Emergency Assessment Systems

TENERA:
none

Technical Review Team:
none

Additional signature authority includes the Oversight Committee - Review

U S Department of Energy:
Primary: Shirley Olinger
Secondary: Bert Crist

Colorado Division of Disaster Emergency Services:
Primary: Jeff Everitt
Secondary: Richard Bardsley

Colorado Department of Health:

RF Program Unit
Primary: Al Hazle
Secondary: Dick Fox

Radiation
Primary: Bob Quillin
Secondary: Jake Jacobi

HAZMAT
Primary: Pam Harley
Secondary: David Maxwell

Environmental Protection Agency, Region VII:

Primary: Philip Nyberg
Secondary: Milton Lammering

Internal Interface

The internal interface between TENERA and EG&G is as follows.

TENERA	EG&G
TASK 1 - Project Administration	
Robert Williams	Reed Hodgin
Peter Fraser	
Mark Daniel	
TASK 2 - Confirm and Quantify Interim Release Fractions - Radiological	
Del Bunch	Terry Foppe/Ben Southward
Peter Fraser	
Robert Williams	
TASK 3 - Confirm and Quantify MCA Using Interim Release	
Del Bunch	Terry Foppe/Ben Southward
Peter Fraser	
Robert Williams	
TASK 4 - Establish Dosimetry Approach	
Jim Toresdahl	Nancy Daugherty
Steve Addington	
Del Bunch	
C.E. Eichhorn	
TASK 5 - Develop Consequence Modeling Approach - Radiological	
Gary Verholek	Reed Hodgin
Rob Myers	
Mike Meyers	
Greg Holton	
Carol Gibson	
Jim Toresdahl	
TASK 6 - Establish Protective Action Guides (PAGs) - Radiological	
Jim Toresdahl	Nancy Daugherty
Del Bunch	

TENERA	EG&G
TASK 7 - Develop Screening Level EPZs for Hazardous Materials	
Gary Verholek	A.J. Petrocchi
John McKinney	Craig Armstrong
Carol Gibson	
Rob Myers	
Mike Meyer	
Jim Toresdahl	
TASK 8 - Develop Final Contingency Plan for Water Releases	
	A.J. Petrocchi
	John Hayen, Jr.
TASK 9 - Ensure Quality of Project	
Joe Inger	Reed Hodgin
Frank Denny	
Del Bunch	
TASK 10 - Documentation	
Robert Williams	Marlene Brown-Strattan
Mark Daniel	Julia Ripley
	Peggy Hazelwood
	Joyce Hooker
TASK 11 - Conduct Consequence Modeling - Radiological	
Gray Verholek	Reed Hodgin
Rob Myers	
John McKinney	
Jim Toresdahl	

TITLE: INDOCTRINATION OF PROJECT PERSONNEL TO QUALITY ASSURANCE PLAN AND PROCEDURES

1.0 PURPOSE

All personnel assigned to the Emergency Planning Zones (EPZs) Project shall receive indoctrination in this Quality Assurance Plan (QAP) and applicable procedures contained therein (Appendices).

2.0 SCOPE

2.1 Indoctrination shall be provided to all assigned project personnel on this QAP.

2.2 This indoctrination shall be performed prior to the start of any quality affecting activities.

3.0 DEFINITIONS

Not Applicable

4.0 INSTRUCTIONS AND RESPONSIBILITIES

4.1 The Project Manager shall:

4.1.1 Assign a project person (QA task team) the responsibility for performing project personnel indoctrination of the QAP and procedures therein (Appendices),

4.1.2 Ensure that all project personnel receive their indoctrination prior to performing quality affecting activities,

4.1.3 Provide attendance sheets for the indoctrination sessions, and ensure that all in attendance sign them, and

4.1.4 Maintain these attendance sheets as a QA record, documenting accomplishment of required indoctrination.

4.2 The QA task team shall:

4.2.1 Provide orientation of this QAP and appendices to the oversight team,

4.2.2 Provide indoctrination of this QAP and appendices to the project team, and

4.2.3 Provide detailed training on selected procedures (found in these appendices).

4.3 Project personnel shall:

4.3.1 Attend the scheduled indoctrination sessions and

4.3.2 Sign the provided attendance sheets (Attachment 5.1), providing evidence of their attendance at these required indoctrination sessions

5.0 ATTACHMENTS

5.1 Indoctrination Attendance Sheet

6.0 REFERENCES

6.1 Non-Weapons Quality Manual

6.2 ANSI/ASME NQA-1-1986: Quality Assurance Program Requirements for Nuclear Facilities

ATTACHMENT 5.1 - INDOCTRINATION ATTENDANCE SHEET

ATTENDANCE SHEET

QUALITY ASSURANCE INDOCTRINATION FOR

ANALYSIS OF OFFSITE EMERGENCY PLANNING ZONES (EPZs)

Subject:_____

Name	Organization/Title	Phone No.

INSTRUCTOR _____ VERIFICATION _____ _____

DATE _____ PAGE ____ OF ____

APPENDIX B

Design Control

TITLE: DESIGN INPUTS

1.0 PURPOSE

The purpose of this procedure is to ensure that design inputs are controlled and documented.

2.0 SCOPE

This procedure covers the preparation of all design input documents and applies to all project personnel assigned to the project team.

3.0 DEFINITIONS

3.1 Design Input: Those criteria, parameters, bases, or other design requirements upon which detailed final design is based, such as design bases, performance requirements, regulatory requirements, codes, and standards.

3.2 Design Output: Documents, such as drawings, specifications, and other documents, defining technical requirements of structures, systems, and components.

3.3 Design Process: Technical and management processes that commence with identification of design input and lead to and include the issuance of design output documents.

3.4 Final Design: Approved design output documents and approved changes thereto.

3.5 Design Criteria: Requirements, codes, standards, technical publications, etc., that establish the design bases, parameters, etc.

4.0 INSTRUCTIONS AND RESPONSIBILITIES

4.1 The Project Manager shall ensure that:

4.1.1 All project personnel implement this procedure,

4.1.2 Review and approval of design inputs are accomplished by personnel other than those selecting the inputs. Such review and approval shall be completed prior to use of these design inputs, and

4.1.3 Design inputs are documented, including the reason for changes, and approval of changes to previously approved design inputs.

4.2 Task team leader, or his designee, shall be responsible for:

4.2.1 Preparing or ensuring the completion of approved design input documents such as the Design Criteria.

4.2.2 Preparing and obtaining review and approval of the Design Input Review and Approval (DIRA) form (Attachment 5.1) prior to commencing definitive design,

4.2.3 Preparing and obtaining review and approval of all revisions to the DIRA form prior to use of the revised inputs in the final design,

4.2.4 Ensuring the correct translation of the design inputs into the final design documents, and

4.2.5 Maintaining the original of all DIRA forms in project QA record's files.

5.0 ATTACHMENTS

5.1 Design Input Review and Approval (DIRA) Form

6.0 REFERENCES

6.1 Non-Weapons Quality Manual

6.2 ANSI/ASME NQA-1-1986: Quality Assurance Program Requirements for Nuclear Facilities

6.3 Facilities Engineering & Project Management Manual, Procedure No. DCT-1, Design Inputs

ATTACHMENT 5.1 - DESIGN INPUT REVIEW and APPROVAL

PROJECT TITLE: _____ BLDG NO.: _____

AUTHORIZATION NO.: _____ DATE: _____

DIRA REVISION NO.: _____ PREPARED BY: _____

Check All That Apply:

____ An approved Operational Requirements Document shall be used as design input for this design.

____ A reviewed and finalized Design Criteria shall be used as a design input for this design.

____ The following design inputs and/or additional design inputs or revision(s) to previously approved design inputs, shall be used for this design. List design inputs below such as performance requirements, regulatory requirements, codes and standards.

If this is a revision, why is it necessary?

REVIEW AND APPROVAL:

I am technically qualified to review and approve the appropriateness and correctness of the design inputs noted above for use in this design. I did not select or specify the design inputs noted. I have thoroughly reviewed these design inputs and hereby approve them.

_____ _____
Signature and Title Date

TITLE: DESIGN CALCULATIONS

1.0 PURPOSE

The purpose of this procedure is to ensure that design calculations are performed, verified, and documented in a planned, controlled, and correct manner.

2.0 SCOPE

Design calculations shall be applied to the development of Emergency Planning Zones (EPZs). The extent required shall be proportional to the critical nature of the design inputs.

Final designs shall be supported by documented design calculations permitting adequate design verification. Changes to final design are subject to the same controls as the original design.

3.0 DEFINITIONS

3.1 Design Checker: A designated, competent task team member, other than the member who provided the original disposition. The designated individual may be from the same organization as the original designer. The designated individual shall have demonstrated competence in the specific design area of interest and have adequate understanding of the requirements and intent of the original design. The design checker may be the original designer's supervisor pro iding he meets the preceding qualifications, and did not specify a singular design approach.

3.2 Design Input: Those criteria, parameters, bases, or other design requirements upon which detailed design is based, such as design bases, performance requirements, regulatory requirements, codes, and standards.

3.3 Final Design: Approved design output documents and approved changes thereto.

3.4 Design Output: Documents, such as drawings, specifications, and other documents, defining technical requirements of structures, systems, and components.

4.0 INSTRUCTIONS AND RESPONSIBILITIES

4.1 The Project Manager shall be responsible for:

4.1.1 Ensuring compliance to this procedure by task team personnel, and

4.1.2 Establishing the extent of design calculations required. A listing of all such calculations and a record copy of each calculation shall be maintained in the project QA record file.

4.2 The task team leader, or his designee, shall be responsible for:

4.2.1 Preparing design calculations for all project final reports, presentation, fact sheets, etc, as follows:

4.2.1.1 Design calculations shall be identifiable by subject, project task number, originator, reviewer, and date.

NOTE: Computer programs may be utilized for design calculations without individual verification of the program for each application provided the program is controlled under FE Non-Weapons Software Quality Assurance.

Computer programs shall be controlled to ensure that changes are documented and approved by authorized personnel. Where changes to previously verified computer programs are made, verification shall be required for the change.

4.2.1.2 Design calculations shall be legible and contain sufficient detail such that a qualified checker can verify the adequacy of the results without recourse to the originator.

4.2.2 Documenting design calculations that shall include the following:

- Definition of analysis objectives,
- Design inputs and their sources,
- Applicable literature search results,
- Identification of assumptions and those to be verified,
- Applicable information derived from lessons learned experience,
- Identification of any computer calculation, including computer type, computer program (for example, name), revision identification, inputs, outputs, evidence of or reference to computer programs verification, and the bases (or reference thereto) supporting application of the computer program to the specific physical problem, and
- Design calculation verification and approval.

4.3 The Design Checker shall be responsible for verification of design calculations.

4.3.1 Design calculations shall be verified by performance of a design calculation check, or use of alternate calculations.

4.3.2 The method(s) chosen shall be identified and documented.

5.0 ATTACHMENTS

5.1 Design Calculation Sheet (Sample)

6.0 REFERENCES

6.1 Non-Weapons Quality Manual

6.2 ANSI/ASME NQA-1-1986: Quality Assurance Program Requirements for Nuclear Facilities

6.3 Facilities Engineering & Project Management Manual, Procedure No. DCT-3, Design Calculations

ATTACHMENT 5.1 – DESIGN CALCULATION SHEET (Sample)

CAL. NO._____ PROJECT NO. _____ REV._____ Page_____ of ____

Prepared By: _____

Reviewed By: _____ TITLE: _____

_____

TITLE: PREPARATION AND CONTROL OF DOCUMENTATION

1.0 PURPOSE

The purpose of this procedure is to ensure that design documentation is controlled and documented.

2.0 SCOPE

This procedure addresses all in-process design documentation, such as various reports, including design reports, technical evaluations, safety analysis reports, and the interim EPZ report. This procedure applies to all project personnel.

3.0 DEFINITIONS

3.1 Design Input: Those criteria, parameters, bases, or other design requirements upon which detailed final design is based, such as design bases, performance requirements, regulatory requirements, codes, and standards.

3.2 Design Output: Documents, such as drawings, specifications, and other documents, defining technical requirements of structures, systems, and components.

3.3 Design Process: Technical and management processes that commence with identification of design input and lead to and include the issuance of design output documents.

3.4 Final Design: Approved design output documents and approved changes thereto.

4.0 INSTRUCTIONS AND RESPONSIBILITIES

4.1 The Project Manager shall be responsible for:

4.1.1 Identifying all documentation required to be prepared for this project.

4.1.2 Assigning project personnel to the preparation, review, verification, and approval of design documentation,

4.1.3 Maintaining a Project Document Index and Revision Status Log (see Attachment 5.1) indicating the document identification, revision level, revision date and index number of all issued documents, and

4.1.4 Maintaining a Document Control Log (see Attachment 5.2) for the controlled distribution of design documents. The Document Control Log shall indicate the control number, document identification, document assignee, document revision level issued, issuance date, and acknowledgement of receipt of the copy.

4.2 The task team leader, or his designee, shall be responsible for:

4.2.1 Preparing design documentation in a format directed by the Project Manager, design specifications/criteria, RFP formats, or lacking any specific direction, in a format that is convenient for effective presentation.

4.2.2 The design verifier shall be competent to review the design, and independent from those responsible for the design.

4.3 Documentation task team personnel shall be responsible for assuring that all documentation for public release has been reviewed by a Rocky Flats designated authorized classifier.

5.0 ATTACHMENTS

5.1 Project Document Index and Revision Status Log (sample)

5.2 Document Control Log (sample)

6.0 REFERENCES

6.1 Non-Weapons Quality Manual

6.2 ANSI/ASME NQA-1-1986: Quality Assurance Program Requirements for Nuclear Facilities

ATTACHMENT 5.1 – PROJECT DOCUMENT INDEX AND REVISION STATUS LOG

(SAMPLE) Page _____ of _____

DOCUMENT INDEX AND REVISION STATUS LOG (Typical)

Index No.	Document No.	Document Description	Revision Level and Date					
			Rev	Date	Rev	Date	Rev	Date

ATTACHMENT 5.2 – DOCUMENT CONTROL LOG (Sample)

Page _____ of _____

INDEX No. _____

DOCUMENT CONTROL LOG

DOCUMENT TITLE: _____

DOCUMENT NUMBER: _____

CONTROL No.	NAME	REV.	ACK.	ISSUE DATE	REV.	ACK.	ISSUE DATE

TITLE: DESIGN INTERFACE CONTROL

1.0 PURPOSE

The purpose of this procedure is to ensure the control of both internal and external interfaces to ensure that information flows from one group or oganization to another when necessary.

2.0 SCOPE

This procedure covers the control of information between internal and external groups of organizations and applies to all project personnel.

3.0 DEFINITIONS

3.1 Design Input: Those criteria, parameters, bases, or other design requirements upon which detailed final design is based, such as design bases, performance requirements, regulatory requirements, codes, and standards.

3.2 Design Output: Documents, such as drawings, specifications, and other documents, defining technical requirements of structures, systems, and components.

3.3 Design Process: Technical and management processes that commence with identification of design input and lead to and include the issuance of design output documents.

3.4 Final Design: Approved design output documents and approved changes thereto.

3.5 Design Interface Control: The coordination of design among participating organizations and individuals, and requiring the documented assignment of responsibilities and the establishment of procedures among individuals and organizations for the review, approval, release, distribution, and revision of documents involving design interfaces.

4.0 INSTRUCTIONS AND RESPONSIBILITIES

4.1 For Internal Interfaces:

4.1.1 The Project Manager, through designated task team leaders, shall be responsible for:

- Ensuring that all interfaces are identified and information flow meets requirements,
- Coordinating these interfaces,

- Assigning and documenting these interfaces, and providing interface charts to all project personnel so that they are aware of these interfaces, and
- Revising interface assignments as project progresses, if required.

4.2 For External Interfaces:

4.2.1 The Project Manager through designated task team leaders, shall be responsible for:

- Identifying, documenting and assigning responsibility for external interfaces and
- Assigning the responsibility for review and approval of various input and output documents in accordance with other procedures under Appendix B.

5.0 ATTACHMENTS

(None)

6.0 REFERENCES

6.1 Non-Weapons Quality Manual

6.2 ASNI/ASME NQA-1-1986: Quality Assurance Program Requirements for Nuclear Facilities

TITLE: DESIGN VERIFICATION

1.0 PURPOSE

The purpose of this procedure is to describe the requirements for the performance of design verifications. The procedure is generic, and the review checklist may be modified to accommodate EPZ project tasks.

2.0 SCOPE

This procedure covers how product acceptance is verified and is applicable to all task team personnel assigned the responsibility for the performance of design verifications.

3.0 DEFINITIONS

3.1 Alternate Calculations: These are calculations or analyses that are made with alternate methods to verify the correctness of the original calculations or analyses.

3.2 Design Input: Those criteria, parameters, bases, or other design requirements upon which detailed final design is based, such as design bases, performance requirements, regulatory requirements, codes and standards.

3.3 Design Output: Documents, such as drawings, specifications, and other documents, defining technical requirements of structures, systems, and components.

3.4 Design Process: Technical and management processes that commence with identification of design input and lead to and include the issuance of design output documents.

3.5 Design Reviews: These are critical reviews to provide assurance that the final design is correct and satisfactory.

3.6 Design Verification: The act of independently reviewing, checking, or otherwise determining the adequacy of a design by one or more, or any combination of the following methods: the performance of design reviews, the use of alternate calculations, or the performance of qualification tests.

3.7 Final Design: Approved design output documents and approved changes thereto.

3.8 Qualification Tests: These tests demonstrate the adequacy of performance of the design under conditions that simulate the most adverse design conditions.

4.0 INSTRUCTIONS AND RESPONSIBILITIES

4.1 General Requirements for Design Verification

4.1.1 Design verification shall be required for all tasks on this project, and shall be perormed by any competent individual or group other than those who performed the original design but who may be from the same organization.

4.1.2 Individuals or groups performing design verification shall not:

- Have immediate supervisory responsibility for the individual or group performing the design,
- Have specified a singular design approach,
- Have ruled out certain design considerations, and
- Have established the design inputs for a particular design aspect being verified.

4.1.3 The review of the design by the manager responsible for the overall design, or by the immediate supervisor of the person performing the design, shall not be construed to constitute the required independent design verification.

4.1.4 The design verification is not a substitute for normal management review and approval of the various design documents.

4.1.5 The design verification shall be performed upon completion of the design process.

4.1.6 The design verification process shall consist of either one or both of the following:

- Design Reviews
  - Design reviews are an acceptable verification method for ensuring the adequacy of a design or portion of the design. This method involves a critical analysis of the design to provide assurance that the appropriate design documents have been satisfactorily prepared and that the information included in the design is correct.
  - Design reviews can be accomplished by a single-person review or by a multi-organization (Design Review Board) review.
  - The alternate method used for comparison may be a simplified or less rigorous approach, such as hand calculations used to check the computer code output.

4.2 The Project Manager shall be responsible for:

4.2.1 Assigning a competent person or group the responsibility of performing the design verification,

4.2.2 Reviewing and approving design reviews where this method of design verification is performed, and

4.2.3 Ensuring that where changes to previously verified designs have been made, design verification shall be required for the changes, including evaluation of the effects of those changes on the overall design.

4.3 The person or group (for example, technical review team) assigned the responsibility for design verification shall be responsible for ensuring that:

4.3.1 The extent and method(s) of the design verification required for a particular design are established, identified, and specified. The extent and method(s) shall be governed by the importance to safety of the item(s) under consideration, the complexity of the design, the degree of standardization, the state-of-the-art, and the similarity with previously proven designs.

4.3.2 The results of the design verification effort are clearly documented, with the identification of the verifier clearly indicated and filed.

4.3.3 The documentation of results are auditable against the verification methods identified by the person(s) performing the verification.

4.3.4 The following format guides are used for design reviews :

- Design Review Sheet (typical) (see Attachment 5.1)
- Design Review Checklist (typical) (See Attachment 5.2)

4.3.5 The Design Review Sheet documenting their function as the design verifier is signed.

4.3.6 The completed Design Review Sheets and Checklists are forwarded to the Project Quality Assurance Records Administrator.

5.0 ATTACHMENTS

5.1 Design Review Sheet (typical)

5.2 Design Review Checklist (typical)

6.0 REFERENCES

6.1 Non-Weapons Quality Manual

6.2 ANSI/ASME NQA-1-1986: Quality Assurance Program Requirements for Nuclear Facilities

ATTACHMENT 5.1 - DESIGN REVIEW SHEET (typical)

1.0 SUMMARY DESCRIPTION OF THE DESIGN

Prepare a brief summary of the design being reviewed. If the design is for a modification or addition to the existing design, provide the reasons why the change is needed.

2.0 REFERENCED DOCUMENTS

List those documents that were used in performing the design review.

3.0 DISCUSSION

Provide a discussion of any "No" or "N/A" answers on the Design Review Checklist or any other significant items found in the review.

4.0 SUMMARY

Provide the conclusions of the design review. This shall include statements as to the adequacy of the design and whether the design meets the specified design inputs.

Design Review Number: _____

Revision Number: _____

Preparer: _____ Date: _____
Name and Title

Reviewer: _____ Date: _____
Name and Title

Approver: _____ Date: _____
Name and Title

ATTACHMENT 5.2 - DESIGN REVIEW CHECKLIST (typical)

DESIGN REVIEW CHECKLIST

		YES	NO	N/A
1.	Were the inputs correctly selected and incorporated into the design?	___	___	___
2.	Are assumptions necessary to perform the design activity adequately described and reasonable? Where necessary, are the assumptions identified for subsequent reverifications when the detailed design activities are completed?	___	___	___
3.	Are the appropriate quality and quality assurance requirements specified?	___	___	___
4.	Are the applicable codes, standards, and regulatory requirements including issue and addenda properly identified and are their requirements for design met?	___	___	___
5.	Has applicable operating experience been considered?	___	___	___
6.	Have the design interface requirements been satisfied?	___	___	___
7.	Was an appropriate design method used?	___	___	___
8.	Is the output reasonable compared to inputs?	___	___	___
9.	Does the design proceed in a logical sense and is it fully documented to provide a trail of information and data to ensure retrievability?	___	___	___
10.	Has the design properly considered radiation exposure to the public and plant personnel?	___	___	___
11.	Are the acceptance criteria incorporated in the design documents sufficient to allow verification that design requirements have been satisfactorily accomplished?	___	___	___
12.	Are adequate identification requirements specified?	___	___	___
13.	Are requirements for record preparation, review, and approval, retention, etc., adequately specified?	___	___	___

14.	Are human interface requirements adequately addressed?	___	___	___
15.	Have design interface requirements including definition of the functional and physical interfaces been adequately addressed?	___	___	___
16.	Have access and administrative control requirements for plant security been adequately addressed?	___	___	___
17.	Have personnel requirements and limitations including the qualification and number of personnel available for plant operation, maintenance, testing, and inspection, and radiation exposures to the public and plant personnel been adequately addressed?	___	___	___
18.	Have other requirements to prevent undue risk to the health and safety of the public been adequately addressed?	___	___	___
19.	Have safety requirements for preventing personnel injury including such items as radiation safety, criticality safety, restricting the use of dangerous materials, escape provisions from enclosures, and grounding of electrical systems been adequately addressed?	___	___	___
20.	Have requirements for criticality control and accountability of nuclear materials been adequately addressed?	___	___	___

Design Review Number: _____

TITLE: DESIGN CHANGE CONTROL

1.0 PURPOSE

The purpose of this procedure is to ensure that the impact of a design change is carefully considered, required actions documented and information transmitted to all affected persons and organizations.

2.0 SCOPE

This procedure covers how modifications to the design are controlled and applies to all design documents that have been released for use. Design change control is initiated through a Change Request (CR), which when reviewed and approved provides a vehicle (Change Order - CO) to change a design that has been baselined or design verified.

3.0 DEFINITIONS

3.1 Design Input: Those criteria, parameters, bases, or other design requirements upon which detailed final design is based, such as design bases, performance requirements, regulatory requirements, codes, and standards.

3.2 Design Output: Documents, such as drawings, specifications, and other documents, defining technical requirements of structures, systems, and components.

3.3 Design Process: Technical and management processes that commence with identification of design input and lead to and include the issuance of design output documents.

3.4 Final Design: Approved design documents and approved changes thereto.

4.0 INSTRUCTIONS AND RESPONSIBILITIES

4.1 Initiation of a Change Request (CR):

4.1.1 The CR initiator is:

- Anyone identifying a potential problem,
- Responsible for reporting this potential problem by means of the CR/CO form,
- Responsible for completing the appropriate sections of the CR/CO form to the best of his/her ability, in accordance with Section 4.4 of this appendix, giving a description of the problem and a suggested solution, and

- Responsible for forwarding the prepared CR/CO form to the Project Quality Assurance Records Administrator via the Project Manager for processing.

4.1.2 The Project Quality Assurance Records Administrator is responsible for:

- Receiving the CR/CO form from the Project Manager,
- Assigning a unique number from the CR/CO Log to the CR and logging the information from the form onto the log for status and tracking purposes,
- Routing the CR/CO form to the assigned task team member for processing,
- Closing the CR and returning it to the CR originator if the CR is NOT approved,
- Assigning a unique number from the CR/CO Log to the CO,
- Tracking and closing out the CR/CO once the CO is approved and completed, and
- Maintaining the QA record file.

4.1.3 The assigned task team member is responsible for:

- Describing in detail his recommended design change as well as the design documents impacted,
- Identifying any required reviewers and routing copies of the CR to proper personnel for impact evaluation, and
- Coordinating and completing the impact evaluation of the proposed change, and returning the completed CR to the Project Manager.

4.1.4 The Project Manager is responsible for:

- Receiving the CR from the initiator,
- Evaluating the completed CR for impact on design, and dispositioning the CR,
- Causing a design reverification to be performed when the requested change impacts a verified design, prior to change implementation, and
- Approving the CR. An approved CR becomes an CO, and
- Routing the CR to the Project Quality Assurance Records Administrator.

4.2 Processing and Change Order (CO)

4.2.1 Once the approved CO is issued, the Project Manager is responsible for ensuring that:

- The approved CO and supporting documentation supersedes the document(s) affected until incorporated and
- Once the CO is incorporated, the CO is closed out and voided.

4.3 CR/CO Log format:

4.3.1 The Project Manager is responsible for ensuring that a CR/CO Log is established, divided into two sections, and contains the following information:

- Change Request (CR) Section shall contain as a minimum:
  - Sequential CR Number,
  - Date,
  - Requestor,
  - Brief Description of Change, and
  - Disposition of CR (Approved/Disapproved).
- Change Order (CO) Section shall contain as a minimum:
  - Sequential CO Number,
  - A Cross Reference to Appropriate CR Numbers,
  - Approval Date, and
  - Final Incorporation Date.

4.4 Instructions for completing the CR/CO form:

NOTE: These instructions provide guidelines to be used as an aid for completing the CR/CO form to ensure complete identification and assessment of a proposed change. Additional sheets should be used when necessary to provide complete information.

4.4.1 CR No.: Change Request Number. This number shall be assigned by the Project Quality Assurance Records Administrator from the CR/CO Log.

4.4.2 Date: The assigned task team member shall complete when the CR Number is assigned.

4.4.3 Description of Problem/Suggested Solution: The initiator shall complete this section to the best of his ability. The project manager shall evaluate the initiator's description and suggested solution and add additional information as required to clarify information and accurately reflect the problem and suggested solution.

4.4.4 Affected Documents/Software: The initiator and project manager, in conjunction with other appropriate reviewing personnel, should indicate all affected documentation or software by number and title. If, during the review cycle, additional affected documents are impacted, the reviewer should add them to this section.

4.4.5 Change Instructions: The task team member shall provide complete detailed instructions for the necessary design change in this section.

4.4.6 Reviewers: The task team member shall print the names of the applicable organizations/personnel impacted by the proposed change. The reviewers shall assess the proposed change, indicate any additional documentation affected, and indicate any impact in his area of responsibility. The impact may be described on the CR form, in the appropriate section, or on additional sheets as necessary. The task team member should review the CR last, describe the impact in his area of responsibility, recommend approval or disapproval, sign and date the CR, and return it to the Project Manager.

4.4.7 Impact of Change: The impact of change should be described as completely as possible by those reviewers affected by the change. The last reviewer shall forward the completed CR to the task team member. The task team member may elect to send a copy of the CR to each reviewer in parallel in order to expedite the review. If he does so, he should indicate on each copy for each reviewer to return his copy of the CR directly back to the task team member.

The task team member shall complete the form in accordance with this appendix. If the original described change is altered in any way during the decision making process, it shall be described in the comments section.

5.0 ATTACHMENTS

5.1 Change Request/Order

6.0 REFERENCES

6.1 Non-Weapons Quality Manual

6.2 ANSI/ASME NQA-1-1986: Quality Assurance Program Requirements for Nuclear Facilities

ATTACHMENT 5.1 – ENGINEERING CHANGE REQUEST/ORDER

CHANGE REQUEST/ORDER FOR ROCKY FLATS PLANT

Page _____ of _____

ORIGINATOR: _____ DATE: _____ CR NO. _____

DESCRIPTION OR PROBLEM:

SUGGESTED SOLUTION:

AFFECTED DESIGN DOCUMENTS/SOFTWARE:

CHANGE INSTRUCTIONS:

REQUIRED REVIEWERS:

Name	Initials	Date

RESPONSIBLE: _____ _____ _____ _____

Task Team Member: Name | Recommend | Signature | Date

IMPACT OF CHANGE:

APPROVED: _____ _____ CR No.: _____

Project Manager | Date

DISAPPROVED: _____

COMMENTS:

TITLE: CONTROL OF UNVERIFIED INFORMATION

1.0 PURPOSE

The purpose of this procedure is to control and identify all unverified design to ensure that they are verified and finalized prior to being utilized for final design output.

2.0 SCOPE

This procedure covers how unverified design is controlled and applies throughout the design process.

3.0 DEFINITIONS

Unverified Information: This includes assumptions and conditions that have not been verified or validated and are used in the development of the product, for example, assuming certain engineering fixes will be implemented or using data that has not been validated.

4.0 INSTRUCTIONS AND RESPONSIBILITIES

NOTE: The project manager, through designated task team leaders and project QA records administrator, shall log and track each unverified design condition or assumption utilized in the design process.

4.1 Task team members shall:

4.1.1 Prominently identify unverified design conditions and/or resumptions by noting "unverified" close to the condition or assumption.

4.1.2 Obtain sequential tracking number from the project quality assurance records administrator,

4.1.3 Record the sequential tracking number next to the statement "unverified", (for example, Tracking No.: _____), and

4.1.4 Close the item on the tracking log when condition is verified.

4.2 Project quality assurance records administrator shall:

4.2.1 Maintain the tracking log (Attachment 5.1), and

NOTE: Unverified design conditions and assumptions shall be sequentially numbered.

4.2.2 Maintain the status of each unverified design condition and assumption as "open" until the task team member closes the item.

5.0 ATTACHMENTS

5.1 Unverified Condition or Assumption Log

6.0 REFERENCES

6.1 Non-Weapons Quality Manual

6.2 ANSI/ASME NQA-1-1986: Quality Assurance Program Requirements for Nuclear Facilities

ATTACHMENT 5.1 – UNVERIFIED CONDITION OR ASSUMPTION LOG

Page _____ of _____

TRACKING NO.	DOCUMENT NO.	DESCRIPTION OF UNVERIFIED DESIGN	VERIFICATION OF CLOSURE	CLOSED BY SIGNATURE

APPENDIX C

Software Quality Assurance

TITLE: SOFTWARE QUALITY ASSURANCE

1.0 PURPOSE

The purpose of this procedure is to delineate the requirements pertaining to quality assurance for software activities. For Phase II of this project commercially developed software and custom software will be used.

2.0 SCOPE

This procedure covers the document control for software and applies to all project personnel involved with software activities. Software quality assurance is limited to the control of commercially developed software.

NOTE: This procedure does NOT apply to software used for such applications as project management, scheduling, or other activities not directly associated with output documents leading to project deliverables.

3.0 DEFINITIONS

3.1 Standard Computer Programs: Programs that are "Custom" programs developed in-house, developed under contract from a supplier, imported by RFP, or adapted from other sources. These programs shall be verified and issued certified for use.

3.2 Project-Specific Computer Programs: These programs may be a project revision of standard or public domain programs, may be task-specific programs developed for project use and not applicable outside the project, or may be programs verified for a project-specific application.

3.3 Public Domain Computer Programs: These programs are maintained by vendors or suppliers in stable, verifiable form, or are standard industry codes imported for use without significant modifications. Some of these programs are general industry programs that are recognized as having sufficient history of use to establish their validity, while some are unverified and require in-house verification.

3.4 Commercial Computer Programs: These programs may include those that may be purchased by the general public for use without modification, such as those used for calculations (for example, Lotus 1-2-3, SuperCalc, etc.), or those used primarily for information management (for example., dBASE, R:BASE, etc.). Such programs are recognized as having sufficient history of use to establish their validity, and the documentation for these programs (for example, user's manuals) may be maintained as with standard programs, or at the project level such as with project-specific programs. If the programs are used without modification, they shall be controlled as public domain programs; if modified, they must be verified, and controlled either as standard programs, or project-specific programs.

ATTACHMENT 6.2 QAP REVISION STATUS SHEET

ROCKY FLATS PLANT
QUALITY ASSURANCE PLAN
REVISION STATUS SHEET

3.5 Computational Error: Software errors that cause the computer program to produce output that is incorrect but could be interpreted as valid results.

3.6 Noncomputational Error: Software errors that render the software dysfunctional and do not give results, have no effect on accuracy or validity of the computer program output, or give results that cannot be interpreted as valid.

4.0 INSTRUCTIONS AND RESPONSIBILITIES

NOTE: For Phase II, Public Domain, Commercial programs, and custom programs shall be utilized. If no modifications are made to Public Domain or Commercial programs, no verification is required. However, if modifications are made, or when custom programs are to be used, verification is required in accordance with Appendix B-5 of this QAP, and document control of the program(s) shall be maintained in accordance with Appendix E of this QAP.

4.1 The Project Manager shall:

4.1.1 Assign personnel the authority of selecting and implementing software acceptable and applicable to accomplishment of project tasks, and

4.1.2 Ensure that responsible project personnel are aware of the applicable software life cycle activities, and address them as required by Table 4.1.

4.1.3 Notify affected individuals and ensure the suspension of use of retired programs.

NOTE: This action is taken when a program is no longer in active use or has been superseded by a new or revised program. Retirement places a computer program in suspended use, and users are so notified.

4.2 Task team members shall be responsible for the following:

4.2.1 Preparing Software Support Documentation (SSD) that shall include the following for the programs applicable to this project:

- Computer Program Certification Form (Attachment 5.1)

NOTE: This form shall be completed by assigned personnel and may reference the user's manual. This person shall use this form to define the use of the software package in this project. Verification is required for custom programs. Unless a Public Domain Program's supplier–furnished verification is considered to be unsatisfactory or inadequate, and unless a Commercial Program is modified, no additional verification is required.

The assigned personnel shall sign Attachment 5.1 in the "Verification" block if verification is acceptable.

- Inclusion of the user's manual (current copy) or program manufacturer's documentation supplied with the program in the SSD package.

4.2.2 Assuring that all controlled software programs (the program source medium for example, diskette, magnetic tape, etc.) are appropriately labeled. The label shall indicate the following:

- Program Name,
- Program Date, and
- Program Revision Number.

This label information shall be repeated on the output of the computer analyses.

4.2.3 Notifying the project manager immediately when errors are discovered in verified programs.

NOTE: Notify all other program users of error(s). Notification to users and impact on program performance shall be by means of the "Computer Program Error Notification" form (Attachment 5.3). Errors shall be identified as either computational or noncomputational.

4.2.4 Handling change control in accordance with Appendices B-6 and E of this QAP.

4.3 The project Quality Assurance Records Administrator shall:

4.3.1 Maintain the computer programs in safe storage,

4.3.2 Maintain record files, and

4.3.3 Distribute user's manuals and program media in accordance with Appendix E of this QAP.

4.3.4 Maintain distribution and control using a Program Log (Attachment 5.2) that shall contain the following:

- Program Name,
- Program Date or Revision,
- Type of Program,
- Person technically responsible for other than commercial programs, and

- A list of user projects.

4.3.5 Maintain traceability of program status through multiple revisions

- Retention of all historical revisions of the source code. A hardcopy listing and a copy on an electronic storage medium (for example, diskette, tape, etc.) of each revision shall be permanently retained by the project manager in accordance with Appendix G Quality Assurance Records.

- Retention of the Program Log (Attachment 5.2) noting all revisions.

4.4 Task team leaders shall:

4.4.1 Have a verification performed if the Public Domain Computer Program verification is not acceptable, and the verifier shall sign the "Verification" block, Attachment 5.1.

4.4.2 Have a verification performed if a Commercial Computer Program is modified, and the verifier shall sign the "Verification" block, Attachment 5.1.

4.4.3 Forward completed documentation required by this procedure to the Project Quality Assurance records administrator for indexing, filing, and retention (Appendix E).

5.0 ATTACHMENTS

5.1 Computer Program Certification Form (Typical)

5.2 Program Log (Typical)

5.3 Computer Program Error Notification (Typical)

6.0 REFERENCES

6.1 Non-Weapons Quality Manual

6.2 ANSI/ASME NQA-1-1986: Quality Assurance Program Requirements for Nuclear Facilities

COMPUTER PROGRAM CLASSIFICATIONS

SOFTWARE LIFE CYCLE ACTIVITIES	PUBLIC DOMAIN PROGRAMS	COMMERCIAL PROGRAMS
Program Plan	Not Applicable	Not Applicable*
Functional Specifications	Not Applicable	Not Applicable*
Design Specifications	Not Applicable	Not Applicable*
Source Code Development	Not Applicable	Not Applicable*
Functional Test Plan	Applicable	Applicable
Functional Test Results	Applicable	Applicable
Software Support Documentation/ Records Retention	Applicable	Applicable
Maintenance/Modification	Applicable	Applicable
Error Resolution	Applicable	Applicable
Retirement	Applicable	Applicable

*Commercial Computer Program used "as-is" and controlled as a Public Domain Computer Program.

TABLE 4.1 - Software Life Cycle Activities

ATTACHMENT 5.1 – COMPUTER PROGRAM CERTIFICATION FORM (Typical)

Page _____ of _____

COMPUTER PROGRAM CERTIFICATION

PROGRAM NAME _____

PRINCIPAL USE _____

_____

STANDARD ☐
PROJECT SPECIFIC ☐
PUBLIC DOMAIN ☐
COMMERCIAL ☐

REVISION

NO.	DATE	ORIGINATOR	DATE	VERIFIED BY	DATE	REVIEWED BY	DATE	APPROVED BY	DATE

VERIFICATION

CAPABILITY

(ANALYTICAL METHODS DERIVATION REFERENCES TO BE LISTED SEPARATELY)

ATTACHMENT 5.2 – <u>PROGRAM LOG</u> (Typical)

Page _____ of _____

PROGRAM LOG

PROGRAM NAME ______________________________

PRINCIPAL USE ______________________________

____

RESPONSIBLE PERSON __________________________

STANDARD ☐
PROJECT SPECIFIC ☐
PUBLIC DOMAIN ☐
COMMERCIAL ☐

USER PROJECT			PROGRAM REVISION		DATE ISSUED TO PROJECT	CLOSED √
PROJECT NUMBER	QA PROJECT?	RESPONSIBLE PERSON(S)	NO.	DATE		

ATTACHMENT 5.3 – COMPUTER PROGRAM ERROR NOTIFICATION (Typical)

Page _____ of _____

COMPUTER PROGRAM
ERROR NOTIFICATION

PROGRAM NAME_____ NOTIFICATION BY _____ DATE_____ DATE _____ DISTRIBUTION _____ REV. _____
PREVIOUS VERSIONS WITH ERROR/DURATION:
ERROR DESCRIPTION: ☐ COMPUTATIONAL ☐ NON-COMPUTATIONAL
USER IMPACT
USER RECOMMENDATIONS

ERROR CLOSEOUT

CAUSE OF ERROR
RECOMMENDED CORRECTIVE ACTION APPROVED BY: _____ DATE: _____

APPENDIX D

Control and Format of Project Procedures

TITLE: CONTROL AND FORMAT OF QA PROJECT PROCEDURES

1.0 PURPOSE

This procedure describes the format and control of procedures contained in this QAP.

2.0 SCOPE

This procedure covers the preparation and control of all procedures for quality affecting activities and applies to all procedures that are or will be included in the appendices of the EPZ QAP.

3.0 DEFINITIONS

3.1 Major Revisions: Significant changes in procedure scope or responsibilities and actions.

3.2 Minor Revisions: Obsolete organizational names and position titles, obsolete/incorrect abbreviations, spelling errors, and updating revisions to attached forms.

3.3 Procedure: A document that specifies or describes how an activity is to be performed.

3.4 Qualified Procedures: An approved procedure that has been demonstrated to meet the specified requirements for its intended purpose.

4.0 INSTRUCTIONS AND RESPONSIBILITIES

NOTE: All new and revised procedures to this QAP shall be controlled by the QAP in accordance with Appendix E, Document Control.

4.2 When a need arises and a procedure is prepared for inclusion in the QAP appendices, the QAP revision will be processed by the document support staff. In addition, the following steps shall be followed:

4.2.1 To issue a new procedure or revise a previously issued one requires the issuance of the QAP Cover Sheet, Revision Status Sheet, and Table of Contents Sheet.

4.2.2 The QAP Revision Status Sheet must be signed and dated before any of the contents of the QAP, including contained procedures (Appendices), become effective.

4.2.3 The standard format for the QAP procedures shall be as follows:

TITLE: Descriptive Title of the Procedure

1.0 PURPOSE

Brief statement of the objective to be met.

2.0 SCOPE

Describes the area covered by the requirements. Includes parameters forming boundaries for the requirement and to whom the procedure applies.

3.0 DEFINITIONS

Defines any unusual terms or terms used in a standard manner. This section also includes acronyms and abbreviations that without definition, may confuse the reader.

4.0 INSTRUCTIONS AND RESPONSIBILITIES

Explains the steps that must be taken and identifies the function, position, or organization title responsible to act .

5.0 ATTACHMENTS

Lists by number and title all forms, tables, diagrams, or other attachments. Numbering system will be sequential and will begin 5.1, 5.2, 5.3, etc.

6.0 REFERENCES

Lists by number and title pertinent DOE orders, plant policies, codes and standards, department procedures, and any other reference material.

4.1 The project manager is responsible for:

4.1.1 Approval of the issue and revisions thereto to the QAP and all appendices,

4.1.2 Assigning revisions of the QAP and appendices as required,

4.1.3 Controlled distribution of the QAP,

4.1.4 Locating the QAP and appendices where quality affecting activities are being accomplished,

4.1.5 Implementing this QAP, and

4.1.6 Overseeing that the task team members implement the most current revision of the QAP and appendices issued.

5.0 ATTACHMENTS

5.1 QAP Cover Sheet

5.2 QAP Revision Status Sheet

6.0 REFERENCES

6.1 Non-Weapons Quality Manual

6.2 ANSI/ASME NQA-1-1986: Quality Assurance Program Requirements for Nuclear Facilities

ATTACHMENT 6.1 - QAP COVER SHEET

ANALYSIS OF OFFSITE EMERGENCY PLANNING ZONES (EPZs)

FOR THE ROCKY FLATS PLANT

QUALITY ASSURANCE PLAN

JULY 1990

EG&G ROCKY FLATS, INC.
Rocky Flats Plant
P.O. Box 464
Golden, Colorado 80402-0464

ATTACHMENT 6.2 QAP REVISION STATUS SHEET

Page _____ of _____

ROCKY FLATS PLANT
QUALITY ASSURANCE PLAN
REVISION STATUS SHEET

REVISION	DATE	APPROVAL	DESCRIPTION OF CHANGE
0			Initial Issue

APPENDIX E

Document Control

TITLE: DOCUMENT CONTROL

1.0 PURPOSE

The purpose of this procedure is to provide direction for the control of project documents. The purpose of document control is to ensure that quality affecting activities are correctly performed using the current document addressing that activity, and that the current document has received the proper reviews and approvals prior to issuing.

2.0 SCOPE

This procedure covers all project documents that can have an effect on the EPZ project or are produced by the EPZ project and applies to all project personnel preparing and using documents that are required to be controlled on this project.

3.0 DEFINITIONS

3.1 Document: Any written or pictorial information describing, defining, specifying, reporting, or certifying activities, requirements, procedures, or results. A document is not considered to be a Quality Assurance Record until it satisfies the definition of a Quality Assurance Record.

3.2 Document Control: Consists of the review and approval of a document, the issuance of the document, and changes thereto, to an established and controlled distribution list, and the assurance that the current document is being used at the location for the accomplishment of the prescribed quality affecting activity.

3.3 Quality Assurance Record: A completed document that furnishes evidence of the quality of items and/or activities affecting quality.

4.0 INSTRUCTIONS AND RESPONSIBILITIES

4.1 The project manager shall:

4.1.1 Assign project personnel to the tasks of preparing, reviewing, and approving documents generated by the project.

NOTE: This assignment shall also pertain to any changes thereto to these documents. The review shall determine the adequacy of the documents, and the approval for release shall be by authorized personnel.

4.1.2 Ensure that documents are maintained and distributed and controlled as described in Section 4.2.

4.2 Project document issuing personnel shall:

4.2.1 Maintain a Document Index and Revision Status Log, providing information on the assigned document including identification by document number, description, revision level, effective date, and index number. (See Attachment 5.1 for a typical log form.),

4.2.2 Control document distribution using a Document Control Log that provides such information as control number (unique to the assignee of the document), document identification (description and number), document assignee, document revision level issued to assignee, issuance date, and acknowledgement of receipt by assignee. Also, the Index Number refers to the Index Number found on the Document Index and Revision Status Log. (See Attachment 5.2 for a typical Document Control Log form.), and

4.3 Assure that all documentation for public release has been reviewed by a Rocky Flat designated authorized classifier.

5.0 ATTACHMENTS

5.1 Document Index and Revision Status Log (Typical)

5.2 Document Control Log (Typical)

6.0 REFERENCES

6.1 Non-Weapons Quality Manual

6.2 ANSI/ASME NQA-1-1986: Quality Assurance Program Requirements for Nuclear Facilities

ATTACHMENT 5.1 – PROJECT DOCUMENT INDEX AND REVISION STATUS LOG

(SAMPLE) Page _____ of _____

DOCUMENT INDEX AND REVISION STATUS LOG (Typical)

Index No.	Document No.	Document Description	Revision Level and Date					
			Rev	Date	Rev	Date	Rev	Date

ATTACHMENT 5.2 – DOCUMENT CONTROL LOG (Typical)

DOCUMENT CONTROL LOG (Typical)

Page _____ of _____

INDEX No.: _____

DOCUMENT No.: _____

DOCUMENT TITLE: _____

CONTROL NO.	NAME	REV.	ACK.	ISSUE DATE	REV.	ACK.	ISSUE DATE

APPENDIX F

Corrective Action

TITLE: CORRECTIVE ACTION

1.0 PURPOSE

The purpose of this procedure is to define the methods used to ensure that corrective action is taken for conditions adverse to quality, which includes actions taken to prevent recurrence.

2.0 SCOPE

This procedure covers the control of conditions adverse to quality and applies to all personnel assigned to this project.

3.0 DEFINITIONS

3.1 Conditions Adverse to Quality: An all-inclusive term used in reference to any of the following: failures, malfunctions, deficiencies, defective items, and nonconformances. A significant condition adverse to quality is one that, if uncorrected, could have serious effect on safety or operability.

3.2 Corrective Action: Measures taken to rectify conditions adverse to quality and, where necessary, to preclude repetition.

4.0 INSTRUCTIONS AND RESPONSIBILITIES

4.1 Initiating the Request for Corrective Action (RCA) Form
(See Attachment 5.1)

NOTE: The attainment of quality is the responsibility of all project personnel. It is the responsibility of all project personnel, when they identify an apparent discrepancy, or find an area where quality is either questionable or indeterminate, to initiate an RCA form. Anonymity shall be preserved, if requested (as indicated on the RCA form).

4.1.1 The initiator of the RCA form shall:

4.1.1.1 Complete the initiation section of an RCA form, and

4.1.1.2 Forward the form to the contracted QA services.

4.1.2 The project manager shall:

4.1.2.1 Review the RCA form.

4.1.3 Contracted QA shall:

4.1.3.1 Determine whether the RCA is a valid request (actual condition adverse to quality),

4.1.3.2 Approve the RCA,

4.1.3.3 Return the RCA to the initiator, and

4.1.3.4 Initiate a Corrective Action Report (CAR) form (Attachment 5.2).

NOTE: If the RCA is determined to be outside the scope of quality assurance, or the request is NOT valid, the RCA shall be returned to the requestor with the reason for rejection so stated.

4.2 Processing the Corrective Action Report (CAR) form

4.2.1 Contracted QA shall:

NOTE: If the RCA requestor wishes to remain anonymous, contracted QA shall sign the "Reported By" space on the CAR.

4.2.1.1 Complete items one through six on the CAR that include the identification of the condition, as well as assigning the organization and individual the responsibility for taking the necessary corrective action.

4.2.1.2 Review the corrective action proposed or taken, release any stop work action, if applicable, and close-out the CAR once verification of corrective action is accomplished.

4.2.1.3 Periodic follow-up is performed to verify the effectiveness of the corrective actions taken to correct significant adverse conditions. This follow-up shall be documented by means of the Surveillance Report form (See Appendix I of this QAP, Attachment 5.1).

4.2.2 Responsible organization shall:

4.2.2.1 For significant conditions adverse to quality, determine the cause of the discrepancy and state the corrective action to prevent recurrence of the condition adverse to quality.

4.2.2.2 Indicate proposed corrective action and scheduled implementation date or corrective action actually implemented.

4.2.2.3 Take or propose corrective action indicated by the affected organization within 5 working days of CAR issuance due to the short duration of this project phase.

4.3 CAR Log (See Attachment 5.3)

QA shall maintain a log of Corrective Action Reports by number, which shall indicate the status of all CARs at all times.

4.4 CAR Summaries

QA shall issue a CAR summary report biweekly or at a frequency determined by QA, commensurate with CAR activity listing all outstanding CARs and identifying any corrective action over 5 days delinquent.

Copies of the CAR summaries shall be distributed to the project manager, as a minimum.

5.0 ATTACHMENTS

5.1 Request for Corrective Action (RCA) (Typical)

5.2 Corrective Action Report (CAR) (Typical)

5.3 Corrective Action Report Log (Typical)

6.0 REFERENCES

6.1 Non-Weapons Quality Manual

6.2 ANSI/ASME NQA-1-1986: Quality Assurance Program Requirements for Nuclear Facilities

ATTACHMENT 5.1 – REQUEST FOR CORRECTIVE ACTION (RCA) (Typical)

Page _____ of _____

REQUEST FOR CORRECTIVE ACTION

REQUESTOR: _____ DATE: _____

Do you prefer to remain anonymous? Yes ☐ No ☐

DESCRIPTION OF APPARENT DISCREPANCY: _____

(Use additional sheets if necessary)

RECOMMENDED CORRECTIVE ACTION (IF ANY):

(Use additional sheets if necessary)

QA REVIEW:

APPROVED: _____ DATE: _____ CAR NO.: _____

DISAPPROVED: _____ DATE: _____

REASON(S) FOR REJECTION:

(Use additional sheets if necessary)

ATTACHMENT 5.2 – CORRECTIVE ACTION REPORT (CAR) (Typical)

Page _____ of _____

CORRECTIVE ACTION REPORT

1. CAR No.:_____

2. REPORTED BY:_____ DATE:_____

3. ORGANIZATION AFFECTED: _____

4. DESCRIPTION OF APPARENT DISCREPANCY:_____

☐ ATTACHMENT

5. RESULTS OF INVESTIGATION:_____

_____

☐ ATTACHMENT

6. IMPOSED RESTRICTIONS: ☐ None ☐ Stop Work ☐ Other

ACTIVITY/ORGANIZATION RESTRICTED:_____

DATE IMPOSED: _____ QA SIGNATURE: _____

RESTRICTION DETAILS:_____

_____

☐ ATTACHMENT

7. ASSIGNED RESPONSIBILITIES:

ORGANIZATION:_____ INDIVIDUAL:_____

DETERMINED CAUSE OF DISCREPANCY:_____

_____

☐ ATTACHMENT

CORRECTIVE ACTION (Proposed or Implemented)_____

_____

☐ ATTACHMENT

QA REVIEW:_____ DATE:_____

STOP WORK RELEASED BY:_____ DATE:_____

CAR CLOSED OUT:_____ DATE:_____

ATTTACHMENT 5.3 – CORRECTIVE ACTION REPORT LOG FOR ANALYSIS OF OFFSITE EMERGENCY PLANNING ZONES

Page 1 OF 2 SAMPLE 8/16/90

CAR NUMBER	DATE ISSUED	DATE CLOSED	RESPONSIBLE ORGANIZATION	DESCRIPTION OF CONDITION ADVERSE TO QUALITY	COMMENTS
EPZ–1	7/2/90		Emergency Assessment Systems Rocky Petrocchi	Discrepency in Chemical Inventory Printouts	Recommended corrective actions were agreed to and documented in CAR at issuance and accepted by QA – Implementation not complete
EPZ–2	7/2/90 (Draft) 7/10/90 (Issue)		Analysis of Offsite EPZs Terry Foppe	Discrepencies in Phase I MCA Analysis	No corrective actions proposed or implemented have been received
EPZ–3	7/6/90 (Draft) 7/18/90 (Issue)		Analysis of Offsite EPZs Gary Verholek	Failure to follow Regulatory Guidance for Consequence Modeling	Corrective actions proposed in CAR at issuance have been accepted by QA – Implementation not complete
EPA–4	8/15/90		Meteorological Data (APG) Wanda Busby	Wind direction instrumentation found out of calibration; no correction made to data Data not corrected for activities affecting meteorological data	Corrective action proposed in CAR at issuance have been accepted by QA – Implementation not complete

APPENDIX G

Quality Assurance Records

TITLE: QUALITY ASSURANCE RECORDS

1.0 PURPOSE

The purpose of this procedure is to delineate the requirements for record administration, storage, preservation, safe-keeping, and retrieval.

2.0 SCOPE

This procedure covers all records generated by this project and applies to all associated project personnel.

3.0 DEFINITIONS

3.1 Document: Any written or pictorial information describing, defining, specifying, reporting, or certifying activities, requirements, procedures, or results. A document is not considered to be a Quality Assurance Record until it satisfies the definition of a Quality Assurance Record as defined in this procedure.

3.2 Objective Evidence: Any documented statement of fact, other information, or record, either quantitative or qualitative, pertaining to the quality of an item or activity, based on observations, measurements, or tests that can be verified.

3.3 Procurement Document: Purchase requisitions, purchase orders, drawings, contracts, specifications, or instructions used to define requirements for purchase.

3.4 Quality Assurance Record: A completed document that furnishes evidence of the quality of items and/or activities affecting quality.

3.5 Traceability: The ability to trace the history, application, or location of an item and like items or activities by means of recorded identification.

4.0 INSTRUCTIONS AND RESPONSIBILITIES

4.1 The project manager shall ensure that:

4.1.1 Project records as a minimum shall include:

- Design documents,
- Procurement documents,
- Instructions and procedures,
- Audit checklists,

- Inputs developed by and/or used by project, and
- Output documents generated by the project.

4.1.2 A Project Quality Assurance Records Administrator is assigned specifically for the purpose of QA records administration.

4.2 The Project Quality Assurance Administrator shall be responsible for ensuring that:

4.2.1 Documents received by him:

- Are legible, accurate, and complete,
- Have been stamped, initialed, or signed and dated by authorized personnel or otherwise authenticated, and
- Are indexed. The indexing system shall include as a minimum, record retention times and the location of the record within the record system. (If the project treats all records as life time records, the retention time does not have to be addressed.)

4.2.2 Records are properly stored. The project shall use duplicate storage method of storing the records. This means, that during the life of Phase II, the Project Quality Assurance Administrator (PA) shall collect the records, establish a project file index for the records, receipt inspect the records for legibility, completeness and authentication, and file these records in the records storage area so designated. Once this project phase is completed, a duplicate set of all records shall be made, and transported to a remote storage area (such as Building 881 or the Federal Center) meeting the same requirements as the primary storage area.

4.2.3 Safekeeping of the records is maintained. This requires that access to records be controlled, so that unauthorized personnel are precluded entry to records storage area for the purpose of theft and/or vandalism.

4.2.4 The records are traceable to the record's index so that the records are retrievable.

5.0 ATTACHMENTS

Not Applicable

6.0 REFERENCES

6.1 Non-Weapons Quality Manual

6.2 ANSI/ASME NQA-1-1986: Quality Assurance Program Requirements for Nuclear Facilities

6.3 Facilities Engineering & Project Management Manual, Procedure No. FAC-13, Project Record Management

APPENDIX H

Quality Assurance Auditing

TITLE: QUALITY ASSURANCE AUDITING

1.0 PURPOSE

The purpose of this procedure is to delineate the requirements for QA audits on Phase II of this project.

2.0 SCOPE

This procedure covers all audits performed on this project and applies to auditors and audited project personnel.

3.0 DEFINITIONS

3.1 Audit: A planned and documented activity performed to determine by investigation, examination, or evaluation objective evidence of the adequacy of and compliance with established procedures, instructions, drawings, and other applicable documents, and the effectiveness of implementation.

3.2 Auditor: Any individual who performs any portion of an audit including lead auditors, technical specialists, and others such as management representatives and auditors-in-training.

3.3 Certification: The act of determining, verifying, and attesting in writing to the qualifications of personnel, processes, procedures, or items in accordance with specified requirements.

3.4 Characteristic: Any property or attribute of an item, process, or service that is distinct, describable, and measurable, as conforming or nonconforming to specified quality requirements. Quality characteristics are generally identified in specifications and drawings that describe the item, process, or service.

3.5 Conditions Adverse to Quality: An all-inclusive term used in reference to any of the following: failures, malfunctions, deficiencies, defective items, and nonconformances.

3.6 Corrective Action: Measures taken to rectify conditions adverse to quality and, where necessary, to preclude repetition.

3.7 Document: Any written or pictorial information describing, defining, specifying, reporting, or certifying activities, requirements, procedures, or results. A document is not considered to be a Quality Assurance Record until it satisfies the definition of a Quality Assurance Record as defined by this procedure.

3.8 Internal Audit: An audit of those portions of an organization's quality assurance program retained under its direct control and within its organizational structure.

3.9 Lead Auditor: An individual qualified and certified to organize and direct an audit, report audit findings and evaluate corrective action. (Only qualified and certified Lead Auditors shall function as audit team leaders.)

3.10 Objective Evidence: Any documented statement of fact, other information, or record, either quantitative or qualitative, pertaining to the quality of an item or activity, based on observations, measurements, or tests that can be verified.

3.11 Program Deficiency (Finding): Failure to develop, document, or implement effectively any applicable element of the quality assurance program as required by licensing commitments, regulatory requirements, or DOE orders.

3.12 Quality Assurance Record: A completed document that furnishes evidence of the quality of items and/or activities affecting quality.

3.13 Surveillance: The act of monitoring or observing to verify whether an item or activity conforms to specified requirements.

3.14 Verification: The act of reviewing, inspecting, testing, checking, auditing, or otherwise determining and documenting whether items, processes, services, or documents conform to specified requirements.

4.0 INSTRUCTIONS AND RESPONSIBILITIES

4.1 The audit team leader shall be responsible for:

4.1.1 Audit planning that shall be accomplished to ensure that all aspects of the QA program are scheduled for audit and that audit(s) are performed and documented during the life of the project at frequencies commensurate with the activity(s) importance to quality.

4.1.2 Audit scheduling that auditing is initiated early enough in the project to ensure the implementation of quality assurance for all activities. Audits shall be regularly scheduled to ensure adequacy of, and compliance with the established QA program.

4.1.3 Audit preparation that shall consist of a written Audit Plan, Team Selection, and Team Orientation.

- The Audit Plan consists of a written audit notification letter to the audited organization and contains the following:
  - audit scope,
  - basis for the audit (QAP, contractual requirements, regulatory requirements, etc.),
  - activities and/or QA Program elements,

- organization to be notified,
- applicable documents,
- audit dates (schedule), and
- team leader and team member(s) assignments.

• Audit Team Selection: The team leader shall be a qualified and certified Lead Auditor and have the following responsibilities:

- orientation of the audit team,
- coordination of the audit process,
- assurance of communications between the audit team and the audited organization,
- participation in the audit, and
- coordination of the preparation and issuance of the audit report.

• Audit Team Orientation: The audit team leader shall ensure that:

- the audit team is prepared,
- procedures, QAP, standards and DOE orders are available for review by the audit team,
- auditors are provided with a copy of the audit plan,
- audit team has prepared audit checklists, and
- audit team understands internal and external organization interfaces of audited organization.

4.1.4 Performance of the audit that shall address the following areas:

• Preaudit Meeting - its purpose is to confirm the audit scope, introduce the auditors, meet counterparts, discuss audit sequence, establish communication channels, and tentatively schedule the post-audit conference. An attendance list should be generated.

• Audit Process that includes:

- Interface Relationships: established at beginning of each day,

- Checklists: utilized for both areas of interest and to document observations and as a guide,
- Examinations: objective evidence examined to evaluate compliance with checklist criteria,
- Evidence: document in the checklist the specific item that was observed, and
- Adjustment of Audit Progress: based on results of observations.

4.1.5 Audit Team Pre-Exit Meeting to review audit team observations and determine those that are bona fide findings, and to consolidate any findings for the exit meeting.

4.1.6 Audit Exit Meeting that shall address the following:

- Audited organization's understanding of all findings and comments,
- Summary evaluation of the audited program by the audit team leader,
- Each auditor presenting their own findings and comments, and
- Prepared draft of any audit findings to be left with the audited organization.

4.2 Formal Audit Reporting

4.2.1 Shall be signed by the audit team leader, and contain the following information:

- Description of the audit scope,
- Identification of the auditors,
- Persons contacted during the pre-audit, audit, and post-audit activities,
- A summary of audit results, an evaluation statement regarding the effectiveness of the quality assurance requirements that were audited,
- Description of each QAP deficiency in sufficient detail to ensure that corrective action can be effectively carried out by the audited organization, and
- Recommendations for correcting QAP deficiencies or improving the quality assurance program as appropriate.

4.2.2 Shall be distributed to management of both the audited and auditing organizations, and

4.2.3 Shall be issued within 5 working days after completion of the audit.

4.3 Audit followup actions shall be performed by the audit team leader to:

4.3.1 Obtain the written responses when applicable from the audited organization,

4.3.2 Evaluate the adequacy of the response,

4.3.3 Ensure that the corrective action is identified and scheduled for each finding, and

4.3.4 Confirm that the corrective action is accomplished as scheduled.

4.4 Audit Records - After an audit is closed out, the audit team leader shall transmit audit records to the project manager for his handling in accordance with Appendix G to this QAP.

4.4.1 Audit Records shall include:

- audit plan,
- audit report,
- written replies and correspondence, and
- record of completion of corrective actions.

4.4.2 Personnel Records shall include documentary evidence of the qualifications and training of auditors and shall be retained for the same period of time as required for the audit report with which the auditors are associated.

5.0 ATTACHMENTS

5.1 Internal Audit Report Cover Sheet and Audit Report (Typical)

5.2 Audit Evaluation Sheet (Finding form - Typical)

5.3 Audit Evaluation Continuation Sheet (Typical)

6.0 REFERENCES

6.1 Non-Weapons Quality Manual

6.2 ANSI/ASME NQA-1-1986: Quality Assurance Program Requirements for Nuclear Facilities

ATTACHMENT 5.1 – INTERNAL AUDIT REPORT COVER SHEET AND AUDIT REPORT
(Typical)

QUALITY ASSURANCE INTERNAL AUDIT REPORT **AUDIT No.** _____

Audited Organization: _____

Dates: _____

Audit Team	Title	Reviewed

Prepared By: _____ Date: _____

Approved By: _____ Date: _____

ATTACHMENT 5.2 - AUDIT EVALUATION SHEET (FINDING FORM) (Typical)

1.0 Scope of Audit

A statement of what was actually used as a base for conduct of the audit including procedures (by title and numbers) and/or any other requirements used. Include also the method of conduct, such as checklists from codes, standards, procedures used as checklists, etc.

Example:

This audit of _____ was conducted in accordance with the EPZ QAP, Appendix H, to determine their compliance with the QAP. Implementation of the above referenced appendix was evaluated by compliance with, and the adequacy of, the following procedures: (EPZ-QAP)

Section or Appendix Title

Number and Revisions

The above documentation was reviewed and procedural checklists were prepared to ensure depth and continuity of the audit.

In addition, implementation of corrective action to finding Nos. ____, ____, and ____ previously submitted in response to audit 90-XX, conducted on _____ XX, 1990 was evaluated. Results of this follow-up activity are summarized in Section 4.0 (if applicable).

2.0 Summary

Conclusions and recommendations. Include this also in the transmittal memorandum to the project manager.

3.0 Persons Contacted

List all EPZ Project Personnel contacted during the conduct of the audit.

4.0 Discussion

An objective short discussion and comments concerning the implementation of the requirements noted in the scope including pertinent information reviewed and referenced to evaluation sheet numbers, as required. Include follow-up activity, if accomplished. Do not include general information how the audited organization operates except where it pertains to a finding. Write comments in your notes for the file if they are not included in the report.

5.0 Findings

The attached evaluation sheet(s) provide details of the ___(X)____ findings noted above that were observed in those areas audited (if none, say so).

6.0 Audit File

Information accumulated during preparation and conduct of this audit has been assembled in an audit records folder, to be a deliverable to the project records file once this audit is closed-out. The contents of this folder include memorandums, notes, checklists, a copy of this audit report, and any other documentation pertaining to follow-up activity concerning this audit.

7.0 Attachments (Optional)

List what this consists of (other than evaluation sheets).

ATTACHMENT 5.2 – AUDIT EVALUATION SHEET (Finding Form) (Typical)

PROJECT QUALITY ASSURANCE AUDIT	EVALUATION SHEET	AUDIT No._____ No._____

AUDITED ORGANIZATION _____

LOCATION _____

CONTROL ELEMENT _____

REQUIREMENT(S):

OBSERVATION(S):

CONTACT(S):

REPORTABLE: ☐ YES ☐ NO

AUDITOR(S): _____ DATE: _____

AUDITED ORGANIZATION REP.: _____ DATE: _____

TITLE: _____

SIGNATURE SIGNIFIES UNDERSTANDING, NOT NECESSARILY AGREEMENT.

ATTACHMENT 5.2 AUDIT EVALUATION SHEET (Finding Form) (Typical) (Continued)

AUDIT No.	Finding No.
CORRECTIVE ACTION PROPOSED BY AUDITED ORGANIZATION: (Including Scheduled Implementation Dates)	
AUDITOR COMMENTS:	
CORRECTIVE ACTION VERIFIED: AUDITOR: _____ DATE: _____	

ATTACHMENT 5.2 – AUDIT EVALUATION CONTINUATION SHEET (Typical)

PROJECT QUALITY ASSURANCE AUDIT	EVALUATION SHEET CONTINUATION PAGE	AUDIT No. _____

ITEM No.	ITEM

APPENDIX I

Surveillance Activities

TITLE: SURVEILLANCE ACTIVITIES

1.0 PURPOSE

The purpose of this procedure is to delineate the responsibilities of the personnel–assigned surveillance activities.

2.0 SCOPE

This procedure covers observations and monitoring QA of EPZ project activities and applies to all project personnel both performing surveillance as well as those being surveilled, and are responding to the surveillance report.

3.0 DEFINITIONS

3.1 Acceptance Criteria: Specified limits placed on characteristics of an item, process, or service defined in codes, specifications, standards, or other requirement documents.

3.2 Characteristics: Any properties or attributes of an item, process, or service that are distinct, describable, and measurable.

3.3 Conditions Adverse to Quality: An all-inclusive term used in reference to any of the following: failures, malfunctions, deficiencies, defective items, nonconformances, and noncompliances. When an item, process, or service does not meet the acceptance criteria, that particular condition is considered adverse to its expected and desired quality of the end product or service.

3.4 Corrective Action: Measures taken to rectify conditions adverse to quality and, where necessary, to preclude recurrence.

3.5 Deficiency: A deviation from program requirements, or a program inadequacy, compromising the quality of the item or activity of concern.

3.6 Objective Evidence: Any documented statement of fact, other information, or record, either quantitative or qualitative, pertaining to the item or activity, based on observations, measurements, or test, which can be verified.

3.7 Satisfactory: Results of surveillance are determined "satisfactory" when evaluation of objective evidence and/or observation of the activity verifies conformance to specified requirements.

3.8 Significant Condition Adverse to Quality: A condition adverse to quality which, if uncorrected, could have a serious effect on safety or operability.

3.9 Surveillance: The act of monitoring or observing to verify whether an item or activity conforms to specified requirements. Surveillances are informal, real time observations, usually unannounced, and shall measure both negative and positive attributes.

3.10 Unsatisfactory: Results of surveillance are "unsatisfactory" when evaluation of the objective evidence and/or observation of the activity clearly indicates noncompliance with specified requirements.

3.11 Verification: The act of reviewing, testing, checking, auditing, or otherwise determining and documenting whether items, processes, services, or documents conform to specified requirements.

4.0 INSTRUCTIONS AND RESPONSIBILITIES

4.1 Contracted Quality Assurance Services shall be responsible for:

4.1.1 Performing random periodic surveillance of all project activities. These surveillances shall be unannounced, and shall confirm adherence to the QAP and attached procedures, as well as project technical procedures.

4.1.2 Reporting and documenting surveillance by means of the Surveillance Report Form (Attachment 5.1).

4.1.3 Reporting both satisfactory and unsatisfactory observances. If an unsatisfactory observance is made, and is not significant, and can be corrected on the spot, this need only be addressed on this form. Otherwise, a CAR needs to be prepared in accordance with Appendix I to this QAP, Attachment 5.1.

4.1.4 Submitting the Surveillance Report Form to the project manager and any other affected organizations within 2 working days of the closed-out surveillance.

NOTE: If QA determines that a CAR must be written, the CAR shall be issued to the responsible organization within 2 working days of the negative observation requiring a CAR.

4.1.5 Entering only one observation per Surveillance Report form. Multiple observations require multiple Surveillance Report forms.

4.1.6 Maintaining a Surveillance Report Log, from which sequential Surveillance Numbers are obtained. This log shall contain the information shown in Attachment 5.2.

5.0 ATTACHMENTS

5.1 Surveillance Report Form (Typical)

5.2 Surveillance Report Log (Typical)

6.0 REFERENCES

6.1 Non-Weapons Quality Manual

6.2 ANSI/ASME NQA-1-1986: Quality Assurance Program Requirements for Nuclear Facilities

ATTACHMENT 5.1 – SURVEILLANCE REPORT FORM (Typical)

SURVEILLANCE REPORT

SURVEILLANCE No. _____

PROJECT No. _____

OBSERVATION:

STATUS: Satisfactory ☐ QA SIGNATURE: _____

Unsatisfactory ☐ (Corrective Action Below)

CAR Required: ☐ Yes ☐ No

IF YES, CAR No._____

CORRECTIVE ACTION:

_____ DATE_____

REP. OF OBSRVATION ORGANIZATION

CORRECTIVE ACTION
COMPLETED: _____ DATE_____

ATTACHMENT 5.2 – SURVELLANCE REPORT LOG (Typical)

SURVEILLANCE REPORT LOG					
REPORT NO.	DATE	DESCRIPTION	QA REP	DATE CLOSED	REMARKS

END

DATE FILMED

03 / 04 / 91