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MEMORANDUM FOR: ACTING ASSISTANT SECRETARY FOR ENVIRONMENTAL
MANAGEMENT
ACTING DEPUTY ADMINISTRATOR FOR DEFENSE
PROGRAMS
ACTING DIRECTOR, OFFICE OF SCIENCE
FIELD ELEMENT MANAGERS

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SUBJECT: ASSESSMENT CRITERIA AND GUIDELINES TO
ASCERTAIN THE CURRENT CONDITION OF
CONFINEMENT VENTILATION SYSTEMS AT DEFENSE
NUCLEAR FACILITIES

This memorandum transmits Assessment Criteria and Guidelines to Ascertain the Current Condition of Confinement Ventilation Systems in Defense Nuclear Facilities. This fulfills Commitment 9 in the *"Implementation Plan for Defense Nuclear Facilities Safety Board Recommendation 2000-2."*

The attached criteria and guidelines were approved by the 2000-2 Implementation Plan Executive Team on April 10, 2001. In accordance with Commitment 10 of the Implementation Plan, these criteria and guidelines will be tested at two pilot facilities to assess confinement ventilation systems, and then revised as necessary before issuance for general use with Commitment 11.

If there are any questions related to this correspondence, please contact Dr. Neal Goldenberg of my staff on 301-903-1236.

Attachment

cc:

2000-2 Executive Team Members



U. S. Department of Energy
Configuration Management - Vital Safety Systems

**Assessment Criteria and Guidelines
To Ascertain the Current Condition of
Confinement Ventilation Systems
In Defense Nuclear Facilities**



April 2001

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ACRONYMS

ASME	American Society of Mechanical Engineers
ASTM	American Society for Testing and Materials
Board	Defense Nuclear Facilities Safety Board
CFR	Code of Federal Regulations
DNFSB	Defense Nuclear Facilities Safety Board
DOE	U. S. Department of Energy
DP	Defense Programs
ERDA	U.S. Energy Research and Development Administration
HEPA	High Efficiency Particulate Air
STD	Standard
UL	Underwriters Laboratory
USQ	Unreviewed Safety Question

Assessment Criteria and Guidelines To Ascertain the Current Condition of Confinement Ventilation Systems in Defense Nuclear Facilities

INTRODUCTION

This document contains assessment criteria and guidelines for ascertaining the current condition of confinement ventilation systems in Department of Energy (DOE) defense nuclear facilities. The criteria and guidelines fulfill Commitment 9 of the DOE Implementation Plan for Defense Nuclear Facilities Safety Board (DNFSB or Board) Recommendation 2000-2, *Configuration Management, Vital Safety Systems*.

The 2000-2 Implementation Plan specifies two phases of assessments. Phase I assessments call for a review of operational and maintenance records and a qualitative determination of a “readiness state” for each vital safety system within defense nuclear facilities of interest as listed in Appendix E of the 2002-2 Implementation Plan. In the context of the Implementation Plan, vital safety systems are safety class or safety significant, or they perform an important defense in depth function. Phase II assessments call for more detailed assessments of the operational readiness of systems. Section 4.1.1 of the Implementation Plan states, “For the Integrated Safety Management-like [Phase II] assessments, the ventilation system guidance and criteria (discussed in Section 4.1.2) will be tailored for use in specific facilities.” Notwithstanding this additional use, the assessment guidance and criteria in this document focus exclusively on confinement ventilation systems.

This document was developed by a DOE-wide team of experts in the areas of defense nuclear facility and confinement ventilation system design, operation and maintenance. Commitment 10 of the Implementation Plan calls for the criteria and guidelines to be tested at two pilot facilities, and revised as necessary. Commitment 11 tasks field element managers to assemble teams to assess the condition of confinement ventilation systems that are important to safety. Confinement ventilation assessment teams will use existing information and processes (i.e., performance of the assessment should not require development of new or additional information by the facility being assessed).

The remainder of this document is organized as follows:

- The *Background* section describes typical safety functions of a confinement ventilation system and the Board’s concern about aging and degradation of these systems.
- The *Assessment Guidelines* section covers the purpose, scope, and guiding principles for assessments of confinement ventilation systems, and suggests a methodology for those assessments.
- The *Criteria and Approach* section presents an objective, criteria, and approach for the following topical areas: (1) safety function definition, (2) configuration management, (3) system maintenance, and (4) system surveillance and testing.
- The *Report Format* section provides a suggested report format.
- The *References* section provides a list of selected references that provide additional relevant information.

BACKGROUND

Confinement ventilation systems are generally used to prevent the uncontrolled release of radioactive contaminants to the environment, and to minimize worker airborne radiation exposure. To accomplish these functions, fresh air is directed through the facility according to controlled pathways and, finally, through filters, which collect contaminants.

A typical confinement ventilation system induces the flow of air through a facility via an array of components, including ductwork, filters, fans, dampers, and associated instrumentation, controls, and power sources. These components are typically used to direct fresh air (from outside the facility) to areas inside the facility of least contamination potential, such as offices and hallways. The air flow pathways then proceed through areas of greater contamination potential, such as laboratories, and then to areas with the greatest contamination potential, such as hoods and gloveboxes. Before being discharged from the facility, the air is directed through filters that remove contaminants and is monitored to ensure that contaminants are below specified limits. This directed ventilation flow is designed to entrain potential contaminants and remove them from worker breathing zones.

Confinement ventilation systems are also often used to control temperature and humidity conditions in the facility (heating or air conditioning). Confinement ventilation systems are often subdivided into zones, interlocked or interfaced with other safety systems (such as the fire protection system), and designed to perform additional safety functions such as isolation, air flow diversion, or shutting down upon detection of excessive contamination (radioactive or toxic materials).

In Recommendation 2000-2, the Board expressed concern that many DOE nuclear facilities were constructed years ago and are approaching the end of their design life. The Board concluded that confinement ventilation systems were degrading and might be approaching unacceptable levels of reliability and operability. As facilities age, a combination of age-related degradation and deficient maintenance may affect the reliability and ability of the system to perform its safety functions as designed.

In accepting Recommendation 2000-2, DOE analyzed oversight findings and information reported in the DOE Occurrence Reporting and Processing System. The DOE analysis reached many of the same conclusions as the Board, including a need for an assessment of confinement ventilation systems with special attention to the effect of aging on reliability and operability.

Assessment Guidelines

Purpose and Scope

The purpose of the guidelines and criteria is to provide a consistent framework for assessments of the current condition of confinement ventilation systems important to safety. The scope of these assessments includes electrical, mechanical, instrumentation and controls, and air cleaning components within the system boundary and essential support systems, such as electrical and pneumatic motive and control

power sources, that are essential for the operability of the confinement ventilation system. The scope should be tailored by the assessment team to suit the specific system as follows:

- The deficiencies identified in the Phase I assessments should be used to select the topical areas and specific criteria in this guide, if any, that will be applied during assessment of the confinement ventilation system.
- If no deficiencies were identified in the Phase I assessment, then the system should be walked down to evaluate material condition (if a walkdown has not recently been conducted). Maintenance and other topical areas may be reviewed during the walkdown. Using a graded approach, topical areas and criteria from this guide should be applied in any areas where the walkdown identifies deficiencies.
- The assessment plan should be appropriately graded with greater depth or breadth given to systems protecting against more significant hazards, greater safety reliance on the confinement ventilation system, greater system complexity, or a longer expected service life.
- Recent assessments, reviews, audits or inspections meeting the intent of the objectives, criteria, or approaches may be cited to fulfill the purpose of the assessment.
- If multiple systems under common management are being assessed, a suitable sampling plan may be employed to minimize duplication of effort.
- Commitment 11 applies to systems that are “important to safety,” (i.e., safety class or safety significant). Some vintage authorization basis documents do not use this terminology. Equivalent systems of other classifications should also be assessed.

The assessment of a confinement ventilation system will not reanalyze the safety/authorization basis or design of the system and essential support systems, nor will it second-guess the approval of safety basis, authorization basis, or design documentation. The current approved safety basis, authorization basis, and available design information will be reviewed to identify and understand safety functions (system requirements and performance criteria) of the system.

Finally, the assessment scope should build upon recent assessments, including the Phase I assessment of a confinement ventilation system. Review items that were already completed and documented in the Phase I assessment report should not normally be duplicated as part of Phase II assessments.

Guiding Principles

The following principles guided development of the assessment criteria and associated approaches for confinement ventilation:

- **If the team identifies a condition that poses an imminent threat to personnel or facility safety, line management is notified immediately.** In cases of an imminent safety condition, the assessment team personnel should immediately point out the condition to their points of contact or appropriate facility managers, and notify the assessment team leader as soon as practical.

- **Assessments take into account the previous 2000-2 Phase I assessment and specific circumstances and conditions of the facility-specific design for confinement ventilation system.** The evaluation will start with a review of the Phase I assessment and appropriate portions of the approved authorization basis and related safety documentation for the facility. This review will enable the assessment team to understand the previous 2000-2 Phase I assessment, specific system safety functions, associated requirements and performance criteria, and assumptions concerning system operation. Documents such as the following will be reviewed: Phase I assessment report, Safety Analysis Report, Basis for Interim Operation, Hazard and Accident Analyses, Technical Safety Requirements, System Design Descriptions, and system drawings.
- **The evaluation of the material condition of the system includes inspection and walkdown to determine system physical condition, and its consistency with safety documentation.** One or more inspections or walkdowns will be performed on a sample basis. Disruption to facility or system operation is expected to be minimal because the team should not request changes in system or component status beyond the facility's current mode of operation and the team should not request access to inaccessible components for current system operation.
- **System surveillance testing and maintenance procedures and records will be evaluated to determine whether they are appropriate and are being used to verify system requirements and performance criteria described in the safety documentation.** Special attention should be devoted to evaluating degradation of the system over its service life and processes or programs for managing degradation as components age (e.g., inspection, refurbishment, maintenance, performance monitoring). The team will assess whether normal operating data, maintenance and test procedures, and records of surveillance tests and maintenance confirm that system requirements and performance criteria (safety functions) are satisfied. The calibration, accuracy, and quality assurance of instrumentation used to measure performance will also be evaluated.
- **The processes that directly affect continued integrity, reliability and availability of the system will be evaluated.** Review of system configuration management, maintenance, and surveillance and testing is limited to confinement ventilation. These processes are typically required by Technical Safety Requirement administrative controls.
- **At the conclusion of the evaluation, the facility manager and DOE field element manager will be briefed on the results.** A report summarizing the results of the evaluation will be provided to the field element manager following the review. The report will contain noteworthy practices, opportunities for improvement, and a qualitative conclusion about the current condition of the confinement ventilation system. Recommended actions may also be included. Detailed discussions of results may be appended.
- **The assessment process will strive for continuous improvement.** Upon completion of confinement ventilation assessments at each site, the team leader should provide feedback to the 2000-2 Executive Team to assist in improving the confinement ventilation system assessment. Where appropriate, the feedback should include recommended changes to the assessment process, criteria, guidelines and approach.

Assessment Methodology

The suggested assessment method follows:

- Review of the 2000-2 Phase I assessment of confinement ventilation and supporting systems
- Review of safety basis documentation for the system
- Evaluation of the material condition of the system
- Review of system configuration management, maintenance, and surveillance and testing which affects system integrity, reliability and availability and includes high efficiency particulate air (HEPA) filters. This review is limited to application of these processes directly to the confinement ventilation system

Team leader appointment and team member selection should be consistent with previous Integrated Safety Management verifications. The team should include technical experts capable of assessing the current condition of a confinement ventilation system including team members with knowledge in the following disciplines: HEPA filter design, testing, aging, and performance; nuclear/mechanical systems; electrical, instrumentation and controls; safety analysis; and system maintenance, surveillance and testing.

Preparation. Where necessary, information needed to understand the confinement ventilation system functions, safety basis, design, configuration management, maintenance, and surveillance and testing should be requested from the facility staff. This information should be reviewed to identify safety functions, system requirements and performance criteria, and additional details of site or facility processes within the scope of the assessment.

Confinement ventilation system documents such as the following are suggested for review during assessment preparation:

- 2000-2 Phase I assessment report and Secretarial HEPA Filter report
- Safety Analysis Report, Basis for Interim Operation, Hazard Analysis, and other safety basis and authorization basis documentation, including applicable Unreviewed Safety Question Determinations
- Confinement ventilation system description and system design description (if available)
- Applicable Technical Safety Requirements, Operational Safety Requirements, and surveillance test procedures
- System piping and instrumentation drawings for confinement ventilation and support systems, electrical one-line diagrams, logic diagrams, and other such diagrams
- Design modification packages for any major work, changes, or modifications to the system, including related safety evaluations
- DOE and other industry standards applicable to the confinement ventilation system
- Reports of studies and assessments related to the system
- Maintenance history and occurrence reports for the system
- Surveillance and testing records for the system

- Other records that describe operational history of the system.

Pre Assessment Visit. The team leader may decide to visit the facility in advance of the assessment to gather additional information, and to become familiar with the site and facility and arrange coordination. The team leader may choose to have other team members accompany the team leader during this visit.

The safety functions of each confinement ventilation system are based upon facility-specific safety analyses. The requirements and performance criteria that must be met by the confinement ventilation system design to accomplish these safety functions should appear in system documentation and should be reviewed by the team. For some facilities the facility mission may have sufficiently changed such that confinement ventilation system functions relied upon to protect the public, worker, and environment may be different than those described in historical safety basis documents. In this situation, the team leader should meet with facility engineering or line managers to identify the safety functions relied upon for the current facility mission.

The topical areas in this guide should be assessed for applicability, and if necessary, tailored to suit the particular system under assessment. It is not anticipated that a formal assessment plan detailing lines of inquiry or other instructions to assessors would be needed for this document review.

On Site Assessment. Based on the preparatory document review, the team should request and review any additional documents (e.g., system drawings) not received earlier, and then walk down the system to determine overall material condition and physical layout. Once the assessment team has developed an understanding of the facility-specific conditions and layout, the team should review system records, perform additional walk downs, and interview personnel to evaluate maintenance and surveillance and testing processes that ensure reliable system performance.

Reporting. Guiding Principles described earlier cover site interactions during the assessment visit and report preparation. A suggested report format and content guide is provided later in this document. Reporting activities should be consistent with other Integrated Safety Management-like verifications of site or facility programs and practices.

CRITERIA AND APPROACH

The *Criteria and Approach* section is divided into topical areas: (1) safety function definition, (2) configuration management, (3) system maintenance, and (4) system surveillance and testing. Each of these topical areas includes:

- *Objective* describes the intent that the topical area should contribute to assessment of the current condition of a confinement ventilation system
- *Criteria* suggest characteristics of a confinement ventilation system that should be verified
- *Approach* suggests collection of information needed to assess the condition of the confinement ventilation system according to the criteria. The items in the *Approach* section are to guide the assessment team; however, the assessment team may choose to select another approach to meet assessment-specific needs.

For each topical area, the criteria and approach items are numbered for easy reference. The items under the *Approach* subsection are numbered such that the items can be readily linked back to the most applicable criterion (e.g., item number 2-1 under the Approach is most directly linked to Criterion 2). However, the evaluation of each criterion should consider relevant information collected during the assessment (not only information related to the linked items).

The 2000-2 Phase I assessment or other reviews of the confinement ventilation system may satisfy most or all of the objectives and criteria that follow. In such situations, this assessment should be limited to confirmation of these previous assessments, without reviewing the same material again.

Safety Function Definition

Objective:

Technical, functional, and performance requirements for the confinement ventilation system, as discussed or referenced in the facility safety analysis documents, are documented and maintained.

Criteria:

1. Safety/Authorization Basis documents identify and describe the confinement ventilation system safety functions.
2. Materials and installation of confinement ventilation system components are consistent with the requirements and performance criteria for the system.

Approach:

- 1-1 Review the appropriate safety/authorization basis documents, such as Safety Analysis Reports, Basis for Interim Operations, evaluations, and hazards and accident analyses, to determine if the definition/description of the safety functions of the confinement ventilation system includes:
 - The specific role of the system in detecting, preventing, or mitigating analyzed events
 - The associated conditions and assumptions concerning system performance
 - System requirements and performance criteria for the confinement ventilation system and active components, including essential supporting systems, for normal, abnormal, and accident conditions relied upon in the hazard or accident analysis.
- 2-1 Selectively review the installation of system components to determine whether the installation is consistent with system requirements and performance criteria.

Configuration Management

Objective:

Changes to confinement ventilation system requirements, documents, and installed components are controlled.

Criteria:

1. Changes to confinement ventilation system requirements, documents, and installed components are designed, reviewed, approved, implemented, tested, and documented in accordance with formally controlled procedures.
2. Changes to the confinement ventilation system requirements, documents, and installed components conform to the approved safety/authorization basis (safety envelope) for the facility; the appropriate change approval authority is determined using the Unreviewed Safety Question (USQ) process; and consistency is maintained among system requirements and performance criteria, installed system equipment and components, and associated documents.
3. Facility procedures ensure that changes to the confinement ventilation system requirements, documents, and installed components are adequately integrated and coordinated with those organizations affected by the change.

Approach:

- 1-1 On an audit/sample basis, walkdown confinement ventilation system equipment and components and compare the actual physical installation of the system to documentation of the system design and safety basis, such as Safety/Authorization Basis documents, System Design Descriptions, and Piping and Instrumentation Diagrams. Identify extra or missing components, temporary changes, or any other discrepancies that call into question (1) the operability or reliability of the confinement ventilation system or (2) the adequacy of the change control or document control processes applied to the system (e.g., presence of unauthorized changes or failure to properly document authorized changes).
- 2-1 Review documentation, such as change travelers and change packages, and interview individuals responsible for processing selected changes made to confinement ventilation system requirements, installed equipment, and associated documents. Determine whether:
 - Documents affected by the change are identified
 - Changes are accurately described and reviewed and approved as appropriate
 - Systems, structures, and components affected by the change are identified by facility management, system engineer, users, operators, or others affected by the change
 - Changes to the system are reviewed to ensure that system requirements and performance criteria are not affected in a manner that adversely impacts the ability of the system to perform its safety functions
 - The USQ process (i.e., USQ screens and USQ safety evaluations/ determinations) is used
 - Installation instructions, and post-modification testing instructions and acceptance criteria are specified

- Important documents affected by the change are revised.
- 3-1 Determine whether engineering (including the design authority and technical disciplines such as electrical, mechanical, nuclear, structural, etc.), operations, and maintenance organizations are made aware of confinement ventilation system changes that affect them, and are appropriately involved in the change process. Verify integration and coordination with other organizations that would logically be affected by the change such as training, document control, construction, radiological control, hazard analysis/safety basis, security, fire protection.

System Maintenance

Objective:

The system is maintained in a condition that ensures its integrity, operability and reliability.

Criteria:

1. For the confinement ventilation system, maintenance processes consistent with safety classification are in place for corrective, preventive, and predictive maintenance including replacement of HEPA filters, and to manage the maintenance backlog.
2. The system is periodically walked down in accordance with maintenance requirements to assess its material condition.

Approach:

1-1 Verify that maintenance for the confinement ventilation satisfies system requirements and performance criteria in safety basis documents or other local maintenance requirements.

1-2 Evaluate maintenance of aging confinement ventilation system equipment and components.

- Determine whether there are criteria in place to accommodate aging-related system degradation that could affect system reliability or performance
- Review the plans and schedules for replacing, inspecting, or upgrading system components needed to maintain system integrity, including the technical basis for such plans and schedules
- Determine conditions that require filter replacement and how filter aging is incorporated into preventive maintenance.

1-3 Determine whether maintenance source documents such as vendor manuals, industry standards, DOE Orders, and other requirements are used as technical bases for development of confinement ventilation system maintenance work packages.

2-1 Verify that the system is inspected periodically according to maintenance requirements.

2-2 Review system or component history files for selected system components for the past three years.

- Identify whether excessive component failure rates were identified
- Determine how failure rates were used in establishing priorities and schedules for maintenance or system improvement proposals.

2-3 Review the procedure and process for performing walk downs of the confinement ventilation system. Verify through manager and worker interviews that personnel performing walk downs understand operational features, safety requirements and performance criteria for the system.

System Surveillance and Testing

Objective:

Surveillance and testing of the confinement ventilation system demonstrates that the system is capable of accomplishing its safety functions and continues to meet applicable system requirements and performance criteria (e.g., safety basis requirements such as Technical Safety Requirements/Limiting Conditions for Operation).

Criteria:

1. Mandatory requirements in existing DOE Rules and Orders regarding Integrated Safety Management, Quality Assurance, Facility Safety, Nuclear Facility Design, and Authorization Basis (e.g., 10 CFR 830.120, 10 CFR 835, DOE Orders 420.1, 5480.21-23 and 6430.1A, DOE-STD-3009-94) are invoked for HEPA filters.
2. The system design includes provisions for conducting HEPA filter surveillance and testing necessary for maintaining system reliability and operability.
3. Surveillance and test procedures confirm that key operating parameters for the overall system and its major components remain within safety basis and operating limits.
4. The acceptance criteria from the surveillance tests used to confirm confinement ventilation system operability are consistent with the safety/ authorization basis.
5. Instrumentation and measurement and test equipment for the confinement ventilation system are calibrated and maintained.

Approach:

- 1-1 Review Filter Test Facility test reports to determine HEPA filter qualification relative to ASME Code AG-1, FC Section, noting whether purchaser waived qualification tests.
- 1-2 Review purchase requests and procurement documents to determine whether procurement specifications reference such standards as DOE-STD-3020-97 and ASME Code AG-1, Section FC.
- 1-3 Review filter housing acceptance documentation to determine if pre-installation testing needed to validate in-place HEPA filter test results was performed and met standards such as ASME Code AG-1, TA section.
- 2-1 Determine whether HEPA filter housings are designed so that valid in-place filter tests can be performed according to standards such as AG-1, TA Section.
- 2-2 Determine whether there are design provisions for visual inspection of in situ HEPA filters.
- 3-1 Review surveillance and testing procedures for the confinement ventilation system and major components and a sample of the test results. Perform a walkthrough of the surveillance test procedure

with appropriate facility personnel (e.g., test technicians, system engineers, operations personnel, etc.). Verify that:

- The procedure contains instructions to perform the test successfully and assure validity of test results
- Key parameters used to verify that system performance meets system requirements and performance criteria are appropriate for the current facility/ mission life-cycle
- Parameters that demonstrate compliance with the safety requirements can be measured or physically verified
- The system design includes provisions necessary for conducting the tests
- Test personnel are knowledgeable and able to satisfactorily perform the tests
- The procedure cites applicable Technical Safety Requirements/Limiting Conditions for Operation
- Limits, precautions, system and test prerequisite conditions, data required, and acceptance criteria are included
- Appropriate data recording provisions are included or referenced and are used to record results
- The procedure includes provisions for listing discrepancies
- The procedure requires timely notification to facility management about any failure or discrepancy that could impact operability
- Appropriate personnel reviewed the test results and took appropriate action.

4-1 Identify the acceptance criteria from the surveillance test procedure used to verify that the confinement ventilation system is capable of performing its safety functions. Compare the acceptance criteria with the safety functions, functional requirements, performance criteria, assumptions and operating characteristics. Verify that there is a clear linkage between the test acceptance criteria and the safety documentation, and that the acceptance criteria are capable of confirming that safety/ operability requirements are satisfied.

4-2 If an in-place filter test is scheduled during the visit, witness the test to determine that the procedure is followed and the results are valid.

5-1 For the surveillance and test procedures and records reviewed, determine whether the test equipment used was calibrated.

REPORT FORMAT

The report should be provided to the cognizant facility managers and DOE line management and should include the following sections:

1. **Title Page (Cover).** The cover and title page state the name of the site, facilities, and dates of assessments of one or more confinement ventilation systems (one report may cover a combination of assessments).
2. **Signature Page.** A signature page should be provided. All team members should sign the report, signifying their agreement as to the report content and conclusion in the areas to which they were assigned. In the event all team member signatures cannot be obtained due to logistical considerations, the team leader should gain members' concurrence and sign for them.
3. **Table of Contents.** The Table of Contents should identify, with page numbers, all sections and subsections of the report, illustrations, charts, and appendices.
4. **Introduction.** The introduction should provide information and background regarding the site, facility, system, team composition, methodology, and any definitions applicable to the review.
5. **Assessment Results.** Summarize noteworthy practices and opportunities for improvement, and include a qualitative conclusion regarding the ability of the system to perform its safety functions. Recommended actions may also be included. Note any topical areas that were not assessed and any limitations on the qualitative conclusion. Detailed discussion of results in each topical area that was assessed should be included as a separate attachment or appendix.
6. **Lessons Learned.** Identify lessons learned that may be applied to future reviews.
7. **Detailed discussions of results.** In each topical area assessed, include enough detail to enable a knowledgeable individual to understand the specific results. As specified in the 2000-2 Implementation Plan, assessment results needing correction will be tracked either locally or in DOE-wide systems.

REFERENCES

1. 10 CFR 830.120, *Nuclear Safety Management (Subpart) Quality Assurance Requirements*
2. 10 CFR 835, *Occupational Radiation Protection*
3. ASME N509 and N510, and ASME AG-1(*Code On Nuclear Air And Gas Treatment*)
4. ASTM F1471-93, *Standard Test Method For Air Cleaning Performance Of High Efficiency Particulate Air Filter System*
5. Brolin Report - *High Efficiency Particulate Air (HEPA) Filter Quality Assurance Program, 1996*
6. Department Response to DNFSB Tech 3, "*Plutonium Ventilation System Study Report*," dated February 1996, and forwarded to the DNFSB by a March 15, 1996, letter from the Secretary of Energy

7. DNFSB Recommendation 2000-2, *Configuration Management, Vital Safety Systems*
8. DNFSB Tech 23, *HEPA Filters Used in the Department of Energy's Hazardous Facilities*
9. DNFSB Tech 26, *Improving Operations and Performance of Confinement Ventilation Systems at Hazardous Facilities of the Department of Energy.*
10. DNFSB Tech 3, *Overview of Ventilation Systems at Selected DOE Plutonium Processing and Handling Facilities*
11. DOE Implementation Plan for DNFSB Recommendation 2000-2, dated October 31, 2000
12. DOE Order 420.1, *Facility Safety*
13. DOE Order 5480.21, *Unreviewed Safety Questions*
14. DOE Order 5480.22, *Technical Safety Requirements*
15. DOE Order 5480.23, *Nuclear Safety Analysis Report*
16. DOE Order 6430.1A, *General Design Criteria*
17. DOE/DP-0125, *Operating Experience Review -Ventilation Systems at Department Of Energy Facilities*
18. DOE-STD- 3022, *HEPA Filter Test Program*
19. DOE-STD-3009-94, *Preparation Guide for U.S. Department of Energy Nonreactor Nuclear Facility Safety Analysis Reports*
20. DOE-STD-3020-97, *Specification For HEPA Filters Used By DOE Contractors, U.S. Department of Energy*
21. DOE-STD-3025, *Quality Assurance Inspection And Testing Of HEPA Filters*
22. DOE-STD-3026-99, *Filter Test Facility Quality Program Plan*
23. ERDA-76-21, *Nuclear Air Cleaning Handbook*
24. Regulatory Guide 1.140, *Design Testing And Maintenance Criteria For Normal Ventilation Exhaust System Air Filtration and Adsorption Units of Light -Water Cooled Nuclear Power Plants*
25. Regulatory Guide 3.12, *General Design Guide For Ventilation Systems Of Plutonium and Fuel Fabrication Plants*
26. Regulatory Guide 3.32, *General Design Guide For Ventilation Systems For Fuel Processing Plants*
27. UL 586, *High Efficiency Particulate Air Filter Units*
28. UL 900, *Test Performance of Air Filter Units*