

# Progress Report

for the

# Radioactive Air Emissions Management Group, ESH-15

January 1 through March 31, 1994



CANGES

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# Introduction

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## Emissions at the Laboratory

Laboratory policy states that "no activity or operation will be done at the Laboratory unless it can be performed in a manner designed to protect employees, the public, and the environment." To ensure such protection, the Laboratory must meet all applicable federal, state, and local regulations.

In its operations, the Laboratory emits radionuclides into the air through various emission points. (The annual *Environmental Surveillance Report* details these emissions.) Radioactive air emissions from Department of Energy (DOE) facilities such as the Laboratory are regulated by the Environmental Protection Agency (EPA). ESH-15, the Radioactive Air Emissions Management (RAEM) Group, verifies data that ensures the Laboratory's compliance with EPA regulations for radioactive air emissions.

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## Background

In 1985, EPA issued its first radioactive air emissions regulations for DOE facilities. The Environment, Safety, and Health (ESH) Division's existing program to sample Laboratory stacks was in compliance with these regulations.

On December 15, 1989, EPA issued revised regulations for DOE facilities. The Laboratory assessed these regulations and found that it could not fully comply but determined that the existing sampling program, with verification from the ambient air program, was adequate. EPA disagreed and on November 27, 1991, issued DOE a notice of noncompliance stating five findings.

In May 1992, the Radioactive Air Emissions Management (RAEM) Program (formed in late 1991) was formalized with the charter to (1) ensure that reliable data are collected from Laboratory stacks and (2) take a proactive approach to managing the Laboratory's radioactive air emissions. The RAEM Program, now organized as ESH-15, has submitted to DOE (and to EPA through DOE) a plan to bring the Laboratory into compliance over 5 years.

EPA's Region 6 Office conducted an audit of the Laboratory on August 24–28, 1992. This audit was an independent baseline evaluation conducted pursuant to the National Emission Standards for Hazardous Air Pollutants (NESHAP) 40 CFR 61, subparts A (General Provisions) and H (Radionuclides Other than Radon). Following the audit, EPA issued a second notice of noncompliance to DOE on November 23, 1992, disallowing use of a shielding factor in calculating the dose to the maximally exposed individual (MEI) of the public. As a result of this notice, the RAEM Program is reporting emissions data monthly until the Laboratory is in full compliance. EPA is using data gathered during the audit as it develops a federal facilities compliance agreement (FFCA) between EPA and DOE.

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# Introduction

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## FFCA Negotiations

On November 13, 1991, DOE and EPA agreed to negotiate a federal facilities compliance agreement (FFCA) for the Laboratory. DOE submitted the Laboratory's first compliance action plan to EPA Region 6 on March 13, 1992. In March 1993, DOE submitted a revised plan to EPA. The objectives of the revised plan were consistent with those of the first; however, the revised plan featured a change in approach to compliance. On November 29, 1993, DOE resumed negotiations with EPA Region 6 and set a target date of early 1994 to submit a compliance action plan for public comment. This plan is similar in content to the March 1993 plan but has a revised format. A version of this plan, agreed upon by both EPA and DOE, will be published in the Federal Register.

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## Alternative Methods

Given the cost of following American National Standards Institute (ANSI) standards, the RAEM Program is pursuing alternative methods to achieve compliance. On August 9, 1993, the Laboratory submitted a proposal for four alternative methods to DOE Headquarters, which in turn submitted the proposal to EPA Headquarters. The proposed alternative methods follow:

- use of single-point sampling instead of multiprobe rakes
- use of a shrouded probe instead of standard isokinetic probes
- use of numerical criteria for determining the suitability of a sampling location instead of the "8 and 2 duct diameter rule"
- use of a computer code, for example, DEPOSITION, to evaluate losses in aerosol transport systems.

To date, EPA Region 6 supports the proposed alternatives, and the chair of the ANSI N13.1 Revision Working Group strongly supports their approval. The RAEM Program is awaiting the EPA administrator's decision on the proposal.

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## Stack Reduction

The Laboratory currently has approximately 130 stacks that emit or have the potential to emit radionuclides. In the interest of cost-effective operations, the Laboratory is considering a reduction in the total number of stacks. The RAEM Program is investigating how to reduce emission points and at the same time maintain flexibility in operations that involve radioactive materials. Several scenarios are being explored, which include the following:

- stack reduction and decommissioning
  - emission point consolidation
  - use of existing emission points for new or modified programs.
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# Introduction

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## Mission of ESH-15

The RAEM Program Office was established in December 1991 and was reorganized as ESH-15 in 1993. The primary mission of ESH-15 is to

- ensure that reliable data are collected from Laboratory stacks and
  - take a proactive approach to managing the Laboratory's radioactive air emissions.
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## Functions of ESH-15

ESH-15 manages the Laboratory's radioactive air emissions. Its functions are to

- establish criteria to assess data reliability,
  - provide technical guidance and support to Laboratory operations that emit airborne radionuclides,
  - recommend ways to reduce the number of sources of radioactive emissions,
  - coordinate Laboratory activities to ensure that all Laboratory operations are in full compliance with EPA regulations for radioactive air emissions,
  - develop and implement new methods and systems to reduce radioactive air emissions to as low as reasonably achievable (ALARA), and
  - serve as the Laboratory's point of contact with EPA and DOE on issues relating to radioactive air emissions.
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## Report on the Progress of ESH-15

This report summarizes ESH-15's progress in managing the Laboratory's radioactive air emissions. For the period from January through March 1994, this report describes and details the progress of ESH-15 activities, which are divided into five general functions: program development and administration; operations; quality assurance and quality control; reporting, risk assessment, and communication; and data analysis. The report provides a glossary of terms that may be unfamiliar to readers. Appendix A discusses the EPA notices of noncompliance, and Appendix B lists external audits of the Radioactive Air Emissions Management Program.

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# Progress in Program Development and Administration

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## Program Plan

**Description.** The Radioactive Air Emissions Management (RAEM) program plan describes the RAEM Program and its organization, responsibilities, authorities, and operations in detail.

**Progress.** Development of the ESH-15 program plan continued.

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## Project Management and Control Systems

**Description.** ESH-15 costs and schedules are tracked through a critical path method (CPM) scheduling system that establishes work and action plans, generates periodic progress reports, and provides timely and accurate data analysis for Laboratory managers.

**Progress.** The following actions were taken.

- Detailed schedules were completed for the Waste Management Group (CST-7) stack upgrades.
  - Project updates on current site upgrades are available.
  - Approximately 400 CPM schedule activities for characterized diffuse (nonpoint) source emissions were incorporated into the master CPM schedule database. Schedule logic development has begun for activities of diffuse source emissions not yet characterized. Over 1000 additional activities are anticipated for diffuse source emissions.
  - The work breakdown structure (WBS) was restructured such that major program activities are grouped by organization instead of by function.
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# Progress in Program Development and Administration

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## Contract Administration

**Description.** ESH-15 has agreements with several contractors to support various activities. These contracts include

- ICF Kaiser Engineering, Inc., which is involved in project development through a project management control system;
- Radian Corporation, which is involved in the source term inventory;
- Texas A&M University, which is gathering field data on the performance of several critical stack sampling components and performing 1/3 scale stack modeling as required;
- Oracle Corporation, which is involved in development and maintenance of a database of stack information;
- Los Alamos Technical Associates, which is involved in internal quality assurance audits; and
- Johnson Controls World Services, Inc., which plays a critical role in measuring stack flows and maintaining sample pumps.

ESH-15 provides oversight to ensure that these contractors' activities are compatible with and integrated into the Radioactive Air Emissions Management quality assurance program.

**Progress.** The following actions were taken.

- Fiscal-year 1994 quality assurance needs, including major procurements, continued to be assessed.
  - Critical contracts continued to be put into place or renewed.
  - A purchase request is being established with Graesby Anderson Inc. to build the shrouded probes required for stack upgrades.
  - A purchase request is being established with Texas A&M University to continue the upgrade of stack FE-16 at the Plutonium Facility (TA-55).
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# Progress in Operations

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## Configuration Control Documentation

Various configuration control documents are prepared and maintained:

- engineering drawings of all systems with stacks collected from the Laboratory's central drawings archive or, as resources allow, prepared from actual measurements ("as-built" drawings) to reflect current configurations
- lists of stacks, used to determine stack status, perform needs assessments, and establish priorities
- detailed operating procedures describing measurement and characterization methods.

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## Configuration Control Proposed Changes

**Description.** To determine how proposed changes to facilities will affect source terms, documents detailing these changes are reviewed. If necessary, configuration changes (such as new probe locations, additional stack characterizations, and new sampling equipment) are recommended. Reviews and recommendations are tracked and documented.

**Progress.** As-built drawings for scheduled upgrades were collected and reviewed.

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# Progress in Operations

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## Configuration Control Hardware Requirements

**Description.** Basic sampling systems for radioactive air emissions are divided into four categories:

- tritium sampling
- particulate sampling
- activated gas and noble gas sampling
- iodine and other halogen sampling.

For each of these systems, the requirements for stack and sampling hardware are provided to operating groups in guidance documents. In addition, a theoretical basis is being developed to describe state-of-the-art components and methods that can be applied to future stack monitoring systems to ensure representative sampling.

**Progress.** The following actions were taken.

- Designs of families of shrouded probes to fit particulate stacks of various sizes and with varying flow rates continued. Stacks at the Chemistry/Metallurgy Research (CMR) Building will be the first to use these probes.
  - Discussions of responsibilities for tritium systems continued with representatives from the Tritium Science and Technology group (ESA-3) and the Weapon Subsystems group (ESA-5).
  - ESH-15 personnel continued to address review comments from EPA personnel concerning a submitted document that discusses practices, instrumentation, and criteria for ensuring representative sampling of Laboratory stacks.
  - Results of aerosol tests of the stacks at the Plutonium Facility (TA-55) indicate inadequate particle-size distribution at the sampling points. To achieve proper turbulent mixing, ESH-15 personnel are coordinating mixing studies and 1/3 scale modeling of the TA-55 stacks at Texas A&M University. These studies will guide efforts to meet sampling criteria, which involve the design and implementation of necessary modifications to the plenum feeding the stack.
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# Progress in Operations

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## Technical Support for Facility Upgrades

**Description.** The RAEM Program provides guidance in prioritizing and assessing upgrades to stacks at all Laboratory facilities to bring them into compliance with EPA regulations for radioactive air emissions. An ESH-15 operations employee serves as a point of contact with Laboratory organizations responsible for stacks slated for upgrade.

**Progress.** The following actions were taken.

- ESH-15, engineering, and CMR Building operating group personnel continued to hold regular meetings on the status of the upgrades.
  - Stack characterization at the CMR Building began.
  - Tritium stack upgrades are proceeding as scheduled, with TA-33, building 86 being the first facility to near completion.
  - Upgrades at TA-48 and TA-3, building 29 (the CMR Building) continued.
  - Upgrades at the Hazardous Waste Incinerator (TA-50 ) began.
  - Numerous stacks were reviewed for potential removal as emission points or for consolidation. This effort continues as a part of the stack upgrades.
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# Progress in Quality Assurance and Quality Control

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## Quality Assurance/ Quality Control

**Description.** ESH-15 quality assurance is an integrated system of activities that ensures that radioactive air emissions samples and data meet defined standards of quality with a stated level of confidence. ESH-15 quality control comprises the technical activities that measure and control the quality of radioactive air emissions samples and data so that they meet the needs of those who use them.

**Progress.** The following actions were taken.

- The quality assurance program plan was revised to assure compliance with DOE Order 5700.6C, EPA regulation 40 CFR 61 subparts A and H, and the anticipated revision of EPA guideline QAMS-005/80 with QA/R-5 and ASQC E-4 release.
- The ESH-15 quality assurance project plan has been revised and is now being reevaluated and reviewed.
- Procedure updates continued for the TA-53 quality assurance project plan following a trial operation of the Los Alamos Meson Physics Facility.
- Quality assurance requirements for the TA-55 quality assurance project plan continued to be evaluated.
- Evaluation and initial discussions of quality assurance issues began at TA-50.
- Quality assurance project plans for tritium facilities at the Laboratory continued to be developed.
- Quality assurance project plans for category 1 and 2 stacks began to be developed.

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## Data Quality Objectives/Data Performance Criteria

**Description.** To ensure the quality of ESH-15 data, the uncertainty (or error) that can be tolerated in the data is analyzed. In addition, techniques, instruments, and criteria are chosen to ensure that the samples taken accurately represent the actual effluent.

**Progress.** The following actions were taken.

- TA-53 data quality objectives continued to be revised.
  - Data quality objectives continued to be developed for tritium facility quality assurance project plans.
  - Data quality objectives began to be developed for quality assurance project plans for category 1, 2, and 4 stacks.
  - A tritium error analysis draft report was prepared.
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# Progress in Quality Assurance and Quality Control

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## Audit Response

**Description.** Action plans and other responses are prepared to address deficiencies identified during audits conducted by EPA and other organizations outside the Laboratory. A historical list of external audits appears in Appendix B.

**Progress.** The following actions were taken.

- ESH-15 continued to survey the TA-53 quality assurance project plan.
  - Johnson Controls quality assurance continued an internal audit of Johnson Controls work procedures that support the RAEM Program.
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## Training

**Description.** Quality assurance/quality control training is an ongoing effort that ensures that all operations personnel have the skills they need to perform their duties effectively.

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# Progress in Reporting, Risk Assessment, and Communication

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## Reporting

**Description.** Reports of the Laboratory's radioactive air emissions are based on data that are either provided in reports or transferred electronically from the health physics analytical laboratories to the ESH-15 database. These reports include

- radioactive air emissions annual and monthly reports to Laboratory personnel;
- radioactive air emissions annual and monthly reports to DOE and EPA (required by 40 CFR 61);
- Effluent Information System/Off-site Discharge Information System (EIS/ODIS) annual reports to DOE; and
- site environmental reports (part of the annual ESH-8 *Environmental Surveillance Report*) to DOE and EPA.

**Progress.** The following actions were taken.

- EIS/ODIS 1993 annual reports were submitted to DOE both in print and on disk.
  - Data for the 1993 annual report to EPA were gathered and submitted to ESH-8.
  - A draft of the 1993 annual report to EPA was reviewed, and comments were provided to ESH-8.
  - Data from operating groups and the analytical laboratory were checked for accuracy.
  - Development of the 1993 annual emissions summary to Laboratory personnel continued.
  - Emission reports for the second half of 1993 have been distributed to operating groups.
  - Emission reports for the first quarter of 1994 are in preparation.
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# Progress in Reporting, Risk Assessment, and Communication

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## Data Management

**Description.** Databases are built and maintained to ensure that data used by all ESH-15 personnel are accurate and up-to-date. These data are used in all ESH-15 activities: administration, operations, quality assurance, reporting, risk assessment, and data analysis.

**Progress.** The following actions were taken.

- A database of historical and current documents (memos, reports, data, drawings, and procedures) related to radioactive air emissions was maintained.
- The ORACLE database has been refined to allow more efficient data retrieval and wider access to data.
- Software and hardware were obtained to expand access to databases.
- The point source database is being converted from dBASE to ORACLE.

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## Risk Assessment and Communication

**Description.** The RAEM Program has a radioactive air risk assessment function and is involved in several risk communication efforts.

**Progress.** The following actions were taken.

- A public relations database on radioactive air emissions was maintained.
  - Background information was provided to a newspaper reporter investigating an accidental release of tritium into the air.
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# Progress in Data Analysis

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## Source Inventory

**Description.** The RAEM Program collects information on possible radiation sources, analyzes the data to determine if they meet the criteria for point or diffuse (nonpoint) sources, and determines if the sources must be monitored. From this information, an inventory of identified potential release points (including both point and diffuse sources) is developed and maintained. Current efforts are aimed toward developing a method for estimating emissions from the identified diffuse sources.

**Progress.** The following actions were taken.

- Lists of radioactive diffuse sources continued to be updated. Four diffuse sources were added to the lists.
  - Approximately 44% of the diffuse sources have been characterized.
  - A peer review was conducted of diffuse source emission rate algorithms for outfalls, waste storage drum loading, storage tanks, active sources, calibration sources, unpaved road traffic, and soil movement. The algorithms were modified as appropriate.
  - "Source type" lists of the point sources were modified so that each source inventoried and characterized appears only on two lists—a list pertaining to the status of that particular point source and the historical list (which includes all point sources).
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# Progress in Data Analysis

## Assessment of Potential Effective Dose Equivalents

**Description.** The potential effective dose equivalent (PEDE) is the maximum dose that a person nearest a stack could receive from the total radioactive material inventory (the source term), not considering filters. The PEDE is calculated using the EPA-approved method, CAP-88, and used to establish monitoring requirements. Radian Corporation is assessing PEDEs for each identified potential release point. The following table shows the monitoring criteria for the four PEDE categories:

Los Alamos National Laboratory Monitoring Criteria			
PEDE (mrem/yr)	Required Monitoring	Applicable Citation	PEDE Category
>5	Continuous monitoring with real-time analysis	40 CFR 61.93(b)(1,2)	1
>0.1–≤5	Continuous sampling with periodic analysis	40 CFR 61.93(b)(1,2)	2
>0.001–≤0.1	Periodic confirmatory measurements	40 CFR 61.93(b)(4)	3
≤0.001	Controlled by radionuclide inventory limitations	40 CFR 61.93(b)(3)	4

**Progress.** The following actions were taken.

- Lists categorizing stacks by the PEDE of their emissions are reviewed on an ongoing basis.
- PEDEs continued to be calculated for the emissions from all identified and characterized diffuse sources.

## Stack Minimization

**Description.** Engineering studies are used to evaluate methods of minimizing the number of stacks, such as combining or eliminating existing stacks. Stack minimization decreases costs by decreasing maintenance, oversight, data collection, dose assessment, and reporting.

**Progress.** On a case-by-case basis, ESH-15 and operating groups are evaluating the possibility of eliminating or consolidating stacks and vents that emit radioactive material.

# Glossary

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<b>action plan</b>	approved plan that describes actions and provides schedules for correcting identified deficiencies
<b>aerosol test</b>	investigation in which particles of known size distribution are introduced into a stack to characterize the size distribution of particles at sampling points within and outside of the stack and within the sampling system components (probes, transfer lines, filters)
<b>ambient air program</b>	program for monitoring the surrounding atmosphere from a network of continuously operating air sampling stations including regional stations at Española, Pojoaque, and Santa Fe; perimeter stations at the Laboratory boundary; and on-site stations within the Laboratory boundary
<b>as-built drawing</b>	drawing to scale of all systems associated with radioactive air emissions, including exhaust ducts, fans, stacks, release points, and monitoring systems
<b>CAP-88</b>	Clean Air Assessment Package 1988; an EPA-approved computer code used to calculate potential effective dose equivalents
<b>CPM scheduling system</b>	a critical path method scheduling system that establishes work and action plans, generates progress reports, and provides data analysis
<b>configuration control</b>	establishing methods and maintaining systems to track and control the status of and changes to inventory, engineering controls (gloveboxes, fume hoods, hot cells), ventilation systems (ducts, fans), filters (high-efficiency particulate air, charcoal), sampling systems (probes, samplers, volume meters, continuous air monitors, sampling filters, pumps), release points, and associated piping (stacks, vents, venturi devices, fans)
<b>data performance criteria</b>	quantitative specification of how much uncertainty or error is acceptable in components used for making radioactive air emissions measurements

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# Glossary

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<b>data quality objectives</b>	qualitative or quantitative specification of the quality of data required to support radioactive air emissions decisions and to prepare reports
<b>diffuse source</b>	a source of radiation that cannot be traced to a discrete location; also called fugitive or nonpoint source, these definitions are under negotiation with EPA
<b>EPA Region 6</b>	EPA regional office, located in Dallas, Texas, which has enforcement jurisdiction over certain Laboratory activities
<b>error</b>	see <i>uncertainty</i>
<b>FE</b>	fan exhaust
<b>federal facilities compliance agreement (FFCA)</b>	agreement between DOE and EPA on methods and schedules the Laboratory will follow in attaining compliance with EPA regulations for radioactive air emissions
<b>fugitive source</b>	see <i>diffuse source</i>
<b>maximally exposed individual (MEI)</b>	the person most exposed to emissions from a particular source
<b>monitoring systems</b>	systems for assessing, reporting, or recording stack effluents as they are released, including probes, pumps, sample lines, flow meters, continuous air monitors, particulate-iodine-noble gas (PING) monitors, and ion chambers
<b>nonpoint source</b>	see <i>diffuse source</i>
<b>notice of noncompliance</b>	legal notice by EPA that the Laboratory is not in compliance with EPA regulations for radioactive air emissions

# Glossary

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<b>point source</b>	a source of radiation that can be traced to a discrete location such as a stack or vent
<b>potential effective dose equivalent (PEDE)</b>	effective dose equivalent that a person <i>could</i> receive from maximum exposure to all the source terms in a facility's inventory (not considering any effluent-scavenging devices such as filters); used to assess monitoring requirements for a given release point but <i>not</i> to assign annual dose
<b>probe</b>	a tube placed in a stack or duct to obtain gaseous and particulate effluent samples from stacks
<b>quality assurance</b>	an integrated system of activities involving planning, quality control, quality assessment, reporting, and quality improvement to ensure that a product or service meets defined standards of quality with a stated level of confidence
<b>quality control</b>	an overall system of technical activities whose purpose is to measure and control the quality of a product or service so that it meets the needs of those who use it
<b>release point</b>	source (such as a stack, vent, or other discrete source of emissions) from which radioactive effluent is exhausted into the atmosphere
<b>representative sampling</b>	obtaining an aliquot that is unbiased toward specific physical or chemical characteristics
<b>sampling systems</b>	systems for collecting representative samples from effluent streams for subsequent off-line analysis; these systems include probes, pumps, sample lines, flow meters, filters and filter holders, and tritium bubblers
<b>shrouded probe</b>	a sampling probe that is surrounded by a larger tube, or shroud, that improves the capability of the probe to collect a representative sample of effluent particulates over a wide range of effluent flow rates

# Glossary

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<b>source</b>	radioactive materials other than those that are sealed or encapsulated
<b>source term</b>	amount of radiation released to the atmosphere by a source, usually measured in Ci/y
<b>stack</b>	chimney through which radioactive substances are exhausted into the atmosphere; see also <i>release point</i>
<b>stack characterization</b>	establishing the proper probe location by considering effluent concentration and stack flow profile to ensure representative sampling and accurate dose calculations
<b>stack flow</b>	stack characteristic that considers the volume of air exhausted by the stack and the velocity of the air within the stack and at the exit point
<b>stack upgrade</b>	improvements that bring a stack into compliance with EPA regulations for sampling and quantifying radioactive air emissions
<b>TA</b>	technical area
<b>uncertainty</b>	with respect to measurements, the range around a measurement mean or mode within which the true value is expected with an established probability (usually 95%)
<b>WBS</b>	work breakdown structure; depicts ESH-15 estimated program performance and estimated stack upgrade costs for fiscal years 1994 through 1998

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# Appendix A: Notices of Noncompliance

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## November 27, 1991 Notice of Noncompliance

The following findings of noncompliance were reported to DOE by EPA.

1. Every release source from an operation that uses radionuclides has not been evaluated using the EPA-approved computer model to determine a dose received by the public as required by 40 CFR 61.93(a).
  2. DOE has failed to comply with 40 CFR 61.93(b)(4) because it has not determined each release point that has the potential to deliver more than 1% of the effective dose equivalent standard. The evaluation of emissions potential is to be performed by estimating the dose without taking any credit for any emissions controls on the effluent stream. The results of this modeling will then determine which release points must be monitored in compliance with 61.93(b) and which release points must be monitored periodically to confirm continuing low emissions.
  3. The facility currently has not installed stack monitoring equipment on all its regulated point sources in accordance with the above analysis and 40 CFR 61.93 (b)(2)(ii) and (iii).
  4. The facility has not conducted and is not in compliance with the appropriate quality assurance programs pursuant to 40 CFR 61.93(b)(2)(iv).
  5. The facility is in violation of 40 CFR 61.94, "Compliance and Reporting," because it has not calculated the highest effective dose equivalent in accordance with the regulations cited above. EPA does acknowledge receipt of an annual report, as required by 40 CFR 61.94(a), but for the reasons specified above that report is incomplete.
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# Appendix A: Notices of Noncompliance

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## November 23, 1992 Notice of Noncompliance

**Findings.** The following findings of noncompliance were reported to DOE by EPA.

1. DOE/LANL, by using a shielding factor that reduces its CAP-88 emission level by approximately 30%, is using "other procedures" without prior approval of EPA and is in violation of 40 CFR 61.93(a).
2. DOE had emissions of radionuclides to the ambient air such that an effective dose equivalent of 11.5 mrem/year was received by a member of the public from its 1990 emissions (as calculated using the specified methodology), thereby violating 40 CFR 61.92.
3. Since Respondent [DOE] violated the emission limits for the calendar year of 1990, it must immediately comply with the 40 CFR 61.94 and
  - report on a monthly basis all the information required by 40 CFR 61.94(b);
  - continue this monthly reporting until the requirement is either modified or ended by the Director, Air, Pesticides, and Toxics Division, EPA Region 6; and
  - include in each monthly report the additional information described at 40 CFR 61.94(c)(1) and (2).

**Response.** In response to these findings, the Laboratory has completed or is currently working on the following tasks.

Project	Task	Complete/ Ongoing	Finding Addressed
Reporting	<ul style="list-style-type: none"> <li>• Omit shielding factor from calculation</li> <li>• Submit monthly emissions reports to EPA</li> </ul>	Complete Ongoing	Findings 1 and 2 Finding 3

## Appendix B: Historical List of External Audits

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### Historical List of External Audits

1. October 1991—DOE Tiger Team Assessment
2. July 1992—Wastren, Inc. (Idaho Falls, Idaho) audit of LANL Radioactive Air Emissions Management Program
3. August 1992—EPA Region 6 audit of LANL Radioactive Air Emissions Management Program
4. July 1993—DOE Los Alamos Area Office audit of RAEM quality assurance project plan for the Los Alamos Meson Physics Facility.