

**Lockheed Martin
Energy Research Corporation**

**FY 2000
Environment, Safety,
Health, Quality, and
Infrastructure
Management Plan
and Execution Plan
for the
Oak Ridge National
Laboratory**

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**LOCKHEED MARTIN ENERGY
RESEARCH CORPORATION**

**FY 2000
ENVIRONMENT, SAFETY, HEALTH,
QUALITY, AND INFRASTRUCTURE
MANAGEMENT PLAN
AND EXECUTION PLAN**

FOR THE

**OAK RIDGE NATIONAL
LABORATORY**

December 6, 1999

**Prepared by
LOCKHEED MARTIN ENERGY RESEARCH CORPORATION
for the
U.S. DEPARTMENT OF ENERGY
under contract DE-AC05-96OR22464**

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ACRONYMS AND ABBREVIATIONS

ADS	activity data sheet
ALD	Associate Laboratory Director
ANS	American Nuclear Society
B&R	Budget and Reporting
CFC	chlorofluorocarbon
<i>CFR</i>	<i>Code of Federal Regulations</i>
DLD	Deputy Laboratory Director
DOE	Department of Energy
ES&H	environment, safety, and health
ESH&Q	environment, safety, health, and quality
ESHQ&I	environment, safety, health, quality, and infrastructure
ETTP	East Tennessee Technology Park
FWP	Field Work Proposal
FY	fiscal year
GPE	general-purpose equipment
GPP	general plant project
H&S	health and safety
HCFC	hydrochlorofluorocarbons
HFIR	High Flux Isotope Reactor
HPRR	Health Physics Research Reactor
HVAC	heating, ventilating, and air-conditioning
ISMS	Integrated Safety Management System
LCAM	Life Cycle Asset Management
LD	Laboratory Director
LDRD	Laboratory Director's Research and Development (ORNL)
LI	line item
LIDS	Laboratory Issues Database System
LMER	Lockheed Martin Energy Research Corporation
LMES	Lockheed Martin Energy Systems, Inc.
LMTPM	Lockheed Martin Transportation and Packaging Management
MFABs	master fire alarm boxes
NCS	nuclear criticality safety
NCSA	Nuclear Criticality Safety Approval
NCSE	Nuclear Criticality Safety Evaluation
NSR	Nuclear Safety Review
OE	Operating Expense
ORNL	Oak Ridge National Laboratory
ORO	Oak Ridge Operations Office (DOE)

OSHA	Occupational Safety and Health Administration
PAAA	Price-Anderson Amendments Act
PMTS	Program Management Tracking System
R&D	research and development
RAC	Risk Assessment Code
REDC	Radiochemical Engineering Development Center
RPM	Risk-Based Priority Model
S&H	safety and health
SAMS	Space Allocation Management System
scfm	standard cubic feet per minute
SME	subject matter expert
UL	Underwriters Laboratory
UNICALL	Unified Field Budget Call
URL	Uniform Resource Locator
UST	underground storage tank
WSSs	Work Smart Standards
WWW	World Wide Web

ORNL ENVIRONMENT, SAFETY, AND HEALTH GOAL STATEMENT

Oak Ridge National Laboratory (ORNL) is committed to excellence in all activities and to cost-effective operation in compliance with all applicable environment, safety, and health (ES&H) laws and regulations. This commitment is reflected in the Laboratory's mission statement and in the *ORNL R&D Strategic Plan*, which identifies the goal of conducting all operations in a safe and environmentally responsible manner.

The management contract between the Department of Energy (DOE) and Lockheed Martin Energy Research Corporation (LMER) establishes the fundamental ES&H expectations of DOE. The Laboratory has established critical outcomes, objectives, and performance indicators to help achieve the ES&H goals defined in the *DOE Strategic Plan*. Funding of ES&H for full compliance continues to be a challenge to Laboratory management, who will work within the constraints of decreasing budgets and use risk-based prioritization of activities as a basis for planning and budgeting.

EXECUTIVE SUMMARY

The Oak Ridge National Laboratory (ORNL) is a multiprogram science and technology laboratory managed for the U.S. Department of Energy (DOE) by Lockheed Martin Energy Research Corporation (LMER). In support of DOE's missions, ORNL conducts basic and applied research and development (R&D) to create scientific knowledge and technological solutions that strengthen the nation's leadership in key areas of science; increase the availability of clean, abundant energy; restore and protect the environment; and contribute to national security.

ORNL is committed to systematically carrying out its mission in a manner that achieves excellence, cost-effectiveness, and competitiveness in R&D, while simultaneously protecting its workers, the public, and the environment. Toward this end, ORNL has adopted the Integrated Safety Management System (ISMS) by Contract (DEAR Clause 970.5204-2) as the overarching philosophy and approach to systematically integrate safety into management tools and work practices.

ORNL systematically and fully integrates safety into management and work practices at all levels so that the mission of ORNL is successfully accomplished while protecting the public, the worker, and the environment. Operations are conducted in compliance with applicable Work Smart Standards (WSSs) and in a manner consistent with the hazards associated with the work. ORNL systematically evaluates work processes through an ongoing self-assessment program designed to ensure that the mission of the Laboratory is carried out in a safe and effective manner.

This *Environment, Safety, Health, Quality, and Infrastructure (ESHQ&I) Management Plan and Execution Plan* describes the approach used at ORNL to ensure the health and safety of employees and the public, to protect the environment, to develop and implement a comprehensive integrated planning process consistent with DOE 430.1A, "Life Cycle Asset Management (LCAM)," and to comply with requirements set forth in the WSSs agreed upon by LMER and DOE. This plan documents the systems and processes used by ORNL to (1) establish and communicate ESHQ&I expectations and requirements to the ORNL community, (2) identify and secure funding for ESHQ&I activities using risk-based planning and priority setting, (3) conduct R&D activities and operations through integration of ESHQ&I principles in work planning and execution, and (4) assess ESHQ&I performance and provide feedback to promote continuous improvement. The plan was prepared in accordance with guidelines in the *DOE Guidance Manual for the ES&H Planning Process for Fiscal Year (FY) 1999*, and its issuance satisfies the requirement in the DOE-LMER Management Contract, I.71 DEAR 970.5204-2 Paragraph C.

Achieving excellence in ESHQ&I is accomplished through effective interaction between the line organization and the ESHQ&I staff, with employee involvement at all levels. Line management is responsible for fully implementing requirements within their organizations by (1) developing systems

and approaches that result in the effective management of risks and (2) creating a culture that effectively integrates work planning, execution of work activities, and performance assessment and feedback. The ESHQ&I staff supports the line organization by providing specialized technical assistance and guidance, interfacing with DOE and external regulators, and providing program oversight necessary to assure effective integration of ESHQ&I management systems into all research and operations activities.

ORNL has a strong base on which to continue development of the ESHQ&I programs as well as the technical resources vital to program development. Factors that will aid in addressing future challenges include a renewed commitment by ORNL to foster line management accountability for ESHQ&I and to take greater advantage of untapped human resources. The continued effort to involve ORNL employees effectively is a key component of future ESHQ&I program development.

1. INTRODUCTION

Oak Ridge National Laboratory (ORNL) is managed by Lockheed Martin Energy Research Corporation (LMER) for the Department of Energy (DOE) under Contract DE-AC05-96OR22464. As part of the Management Contract, ORNL has agreed to submit to DOE an Environment, Safety, Health, Quality, and Infrastructure (ESHQ&I) Management Plan and Execution Plan. Issuance of this management plan satisfies the ORNL commitment stipulated in the Management Contract (Section I.71 DEAR 970.5204-2, Paragraph C).

This plan documents the systems and processes used by ORNL to (1) establish and communicate ESHQ&I expectations and requirements to the ORNL population, (2) identify and secure funding for ESHQ&I activities using risk-based planning and priority setting, (3) conduct research and development (R&D) activities through integration of ESHQ&I principles into work planning and execution, and (4) assess ESHQ&I performance and provide meaningful feedback to promote performance improvement. Implementation of the systems and processes described in this document provides the basis by which ORNL ensures the health and safety (H&S) of employees and the public, protects the environment, plans for infrastructure resources, and complies with the WSSs agreed to by DOE and ORNL.

2. ESHQ&I MISSION AND PROGRAM APPROACH

The ESHQ&I mission of ORNL is to conduct R&D and operations in a manner that protects the environment, staff, and public, while allowing ORNL to continue to carry out world-class research in a cost-effective, competitive manner.

The mission of infrastructure planning, conducted through the Office of Capital Asset Management, is to develop and implement a comprehensive/integrated planning process consistent with DOE 430.1A, "Life Cycle Asset Management (LCAM)." The long-term goal is to support DOE critical missions and provide a quality working environment of infrastructure support facilities and systems.

ORNL is committed to the advancement of science and technology while addressing important national and global energy and environmental issues. As DOE's largest multiprogram, nonweapons laboratory, ORNL employs approximately 4200 staff members and annually hosts about 3100 guest researchers from universities and industry. The mission of ORNL is to conduct basic and applied R&D to advance the nation's energy resources, environmental quality, scientific knowledge, educational foundations, and national economic competitiveness. This mission is accomplished with a commitment to excellence in all activities and to cost-effective operation in compliance with applicable ES&H laws and regulations. The diversity of R&D and its support activities creates challenges as well as opportunities for ORNL in the effort to apply ES&H goals and objectives in a manner that supports ORNL's mission and adds value to operational performance.

3. INTEGRATED SAFETY MANAGEMENT SYSTEM

3.1 PURPOSE AND POLICY

ORNL is committed to systematically carrying out its mission in a manner that achieves excellence, cost-effectiveness, and competitiveness in R&D, while simultaneously protecting its workers, the public, and the environment. Toward this end, ORNL has adopted the Integrated Safety Management System (ISMS) by Contract (DEAR Clause 970.5204-2) as the overarching philosophy and approach to systematically integrate safety into management tools and work practices.

It is the policy of ORNL to systematically and fully integrate safety into management and work practices at all levels so that the mission of ORNL is successfully accomplished while protecting the public, the worker, and the environment. Operations will be conducted in compliance with applicable WSSs and in a manner consistent with the hazards associated with the work. ORNL will systematically evaluate work processes through an ongoing self-assessment program designed to ensure that the mission of the Laboratory is carried out in a safe and effective manner.

In addition, the policy is to objectively and fully communicate environmental protection and safety and health information to ORNL staff, to subcontractor personnel, to DOE, to applicable stakeholders, and to the public.

3.2 SCOPE

The work conducted at ORNL varies widely in terms of complexity, hazard types and levels, and risk. To provide the tailored approach necessary for effective implementation in the workplace, each line organization determines the need for organization-specific ISMS plans to customize the ISMS principles and core functions to its operations. For complex or special-hazard situations, the line organization determines the need for ISMS plans tailored to specific mission programs or specific facilities.

The ORNL ISMS responsibility applies to all work activities directed by ORNL management and performed by ORNL employees and by guests and visitors at ORNL, as well as the inclusion of provisions into appropriate subcontracts for on-site activities.

Specific ORNL ISMS Plans are available on the ORNL Internal Network at
URL (<http://svr1.cmo.ornl.gov/isms/index.htm>)

This plan defines present and future plans for ORNL environment, safety, health, and quality (ESH&Q) activities. In addition, it serves as a reference for activity data sheets and funding documents which describe ESH&Q activities, schedules, and funded or requested resources.

3.3 ISMS CORE FUNCTIONS AND SYSTEMS

ISMS integrates safety considerations, along with R&D performance and infrastructure maintenance and improvement, into the management and execution of work at all levels so that the ORNL mission is accomplished while protecting the public, the workers, and the environment. Hence, both managers and workers give proper consideration to safety aspects at all stages of the work process: planning, performing, assessing the results, and defining the needed improvements for future work. ISMS directs responsibility to line management to plan, perform, and evaluate work activities. Line managers assure that work is performed according to standards and ESH&Q provisions that are consistent with the analyzed hazards of the work. They enlist technical assistance of appropriate ESH&Q subject matter experts (SMEs) when selecting, interpreting, communicating, and implementing the appropriate ESH&Q standards and resulting work procedures and when evaluating their effectiveness. It is the responsibility of each worker to work safely within the scope of the established safety envelope and controls.

3.3.1 Define the Work and Its Hazards

Core Function 1: Translate the ORNL mission objectives into defined work activities that will meet those objectives and identify expectations for the performance of that work.

Systems (some are available only on the ORNL Internal Network):

Work Smart Standards ¹	http://www-internal.ornl.gov/wss/
LMER Operating Contract	http://x10capserv.ornl.gov/htmldocs/x-10/contract/contrx10.htm
ORNL Funding Documents	http://www-internal.ornl.gov/auth-cgi-bin/cgiwrap?user=pmts&script=prod/menu.cgi&DOORKEEPER=GET
ORNL Institutional Plan	http://www.ornl.gov/inst_plan/IP_Outline.html (reference: 3.5.1.2)
ORNL Strategic Plan	http://www.ornl.gov/inst_plan/STRATEGIC_PLAN/title99sp.html (reference 3.5.1.3)
ORNL ESHQ&I Management Plan and Execution Plan	http://www.ornl.gov/camext/CAMIndex.htm
ORNL ESHQ&I Budget Formulation Submission	http://www.ornl.gov/camext/CAMIndex.htm
ORNL Land and Facilities Plan	http://www.ornl.gov/~dmsi/landUse/
Comprehensive Integrated Plan	http://www.ornl.gov/~dmsi/cip/
ORNL Organization Fact Sheets	http://oecdwsrv.oecd.ornl.gov/camplrpt/ESHPlan/plan99/FactSht.htm

¹The Necessary and Sufficient process [*Department of Energy Closure Process for Necessary and Sufficient Sets of Standards* (DOE M 450.3-1)] has been used to identify all work types, to perform in-depth reviews of hazards of ORNL operations and facilities, and to develop a

corresponding comprehensive set of WSSs for ORNL facilities referenced in the Contract, Section H 15(c).

3.3.2 Analyze the Hazards

Core Function 2: Identify and analyze the hazards and risks to the workers, the public, and the environment that are associated with the planned work activities.

Systems (available only on the ORNL Internal Network):

Work Smart Standards	http://www-internal.ornl.gov/wss/
ORNL Directives and Guidance ¹	http://www-internal.ornl.gov/ORNL/directives/ORNLcommand.html
Safety Checklist and Reviews	(Indicates a system rather than a document available on the WWW)
Director’s Review Committees	(Indicates a system rather than a document available on the WWW)

¹ORNL-level ESH&Q directives are developed to ensure conformance with the WSS-defined standards and implementation issues. These provide the implementation mechanism for WSSs. For line organizations, additional organization-specific standards, procedures, and instructions tailored to the work and hazards of that organization and that supplement the ORNL WSSs and Directives and Guidance System may be required.

3.3.3 Develop and Implement Hazard Control

Core Function 3: Identify the applicable standards and requirements that address the identified hazards, establish appropriate work controls to prevent and mitigate those hazards, implement those controls, and allocate resources to ensure that the work is performed safely.

Systems (some are available only on the ORNL Internal Network):

Work Smart Standards	http://www-internal.ornl.gov/wss/
ORNL Directive and Guidance	http://www-internal.ornl.gov/ORNL/directives/ORNLcommand.html
Safety Checklist and Reviews	(Indicates a system rather than a document available on the WWW)
Director’s Review Committees	(Indicates a system rather than a document available on the WWW)
Environmental/Waste Management Permits	http://oecdwsrv.oecd.ornl.gov/landerin/permits.htm
Safety and Health Permits	(Indicates a system rather than a document available on the WWW)

3.3.4 Perform Work Within the Controls

Core Function 4: Confirm readiness and perform the work safely in accordance with the established work controls.

Systems (available only on the ORNL Internal Network):

ORNL Directive and Guidance	http://www-internal.ornl.gov/ORNL/directives/ORNLcommand.html
(Nonnuclear) QA-P01, “ORNL Quality Assurance Program”	http://www-internal.ornl.gov/ORNL/directives/ORNLcommand.html
(Nuclear) Above plus QA-P02, “ORNL Nuclear Quality Assurance Program” and activities related to 10 <i>CFR</i> 830.120	http://www-internal.ornl.gov/ORNL/directives/ORNLcommand.html

3.3.5 Provide Feedback and Continuous Improvement

Core Function 5: Assess work performance and the adequacy of controls to provide feedback for improving performance and conduct self-assessment and oversight activities.

Systems (some are available only on the ORNL Internal Network):

ORNL LCAM Implementation	http://www-internal.ornl.gov/OQPI/pi/coopi.htm
QA-P03, “ORNL Self-Assessment Programs” ¹	http://www-internal.ornl.gov/ORNL/directives/ORNLcommand.html
QA-P07, “ORNL Lessons Learned Program”	http://www-internal.ornl.gov/ORNL/directives/ORNLcommand.html
OR-PO1, “ORNL Occurrence Notification and Reporting”	http://www-internal.ornl.gov/ORNL/directives/ORNLcommand.html
Performance Measures	http://www-internal.ornl.gov/OQPI/pi/copi.htm
DOE Teaming with Division and ESH&Q Offices for Walkthroughs	(Indicates a system rather than a document available on the WWW)
PAAA Board	http://www.ornl.gov/doe_oro_dmg/ip-paaaplans.htm
Director’s Review Committees	(Indicates a system rather than a document available on the WWW)
Human Resources Development Requirements	http://www-internal.ornl.gov/ORNL/directives/ORNLcommand.html
Integrated Safety Management Assessments	(Indicates a system rather than a document available on the WWW)

¹ ORNL has an institutionalized Self-Assessment Program. Each line organization has a self-assessment process for its ESH&Q operations, and these processes are in various stages of maturity. In addition, an ORNL-level Laboratory Assessment Program provides guidance for and monitoring of these line self-assessment activities. It also performs a triennial independent management assessment of their effectiveness. This function coordinates the Lessons Learned Program and the Corrective Actions Management System to address ORNL-level internal and external audit findings and self-assessment findings by means of the Laboratory Issues Database System (LIDS) for tracking Commitments.

3.4 ISMS GUIDING PRINCIPLES

The seven principles guiding the implementation of ISMS at ORNL are listed below. All personnel, at all levels, share responsibility for successful day-to-day use of these principles.

3.4.1 Line Management Responsibility for Safety

Line management is directly responsible for the protection of the public, the workers, and the environment.

3.4.2 Clear Roles and Responsibilities

Clear and unambiguous lines of authority and responsibility for ensuring safety are established and maintained at all organizational levels.

3.4.3 Competence Commensurate with Responsibilities

Personnel possess the experience, knowledge, skills, and abilities that are necessary to discharge their responsibilities.

3.4.4 Balanced Priorities

Resources are effectively allocated to address safety, programmatic, and operational considerations. Protecting the public, the workers, and the environment is a priority when activities are planned and performed.

3.4.5 Identification of Standards and Requirements

Before work is performed, the associated hazards are evaluated and an agreed-upon set of standards and requirements is established, which if properly implemented, provides adequate assurance that the public, the workers, and the environment are protected from adverse consequences.

3.4.6 Hazard Controls Tailored to Work Being Performed

Administrative and engineering controls to prevent and mitigate hazards are tailored to the work and its associated hazards.

3.4.7 Operations Authorization

The conditions and requirements to be satisfied for operations to be initiated and conducted are clearly established and agreed upon.

3.5 ORNL INFRASTRUCTURE PLANNING

Infrastructure planning defines present and future plans for ORNL facilities and site development. In addition, it serves as a reference source for a broad base of site and facilities characterization data. Future facility and land requirements are determined by the functional and physical adequacy of existing facilities and equipment and by future mission and program plans. The general plant projects (GPPs) and line item (LI) construction projects required to support ORNL's future mission and program plans are described, and the impacts of this construction on the site's assets are summarized. In addition, essential general-purpose equipment (GPE) needs and plans are described.

3.5.1 Infrastructure Planning Documents

Listed below are the key planning documents that support infrastructure planning as well as ESH&Q planning. A short description of the referenced document is provided along with a World Wide Web Uniform Resource Locator (URL) address, if one is available.

3.5.1.1 Comprehensive Integrated Planning: A Process for the Oak Ridge Reservation, Oak Ridge, Tennessee (September 1999) (<http://www.ornl.gov/~dmsi/cip/>)

The *ORR Comprehensive Integrated Plan* is intended to assist DOE and contractor personnel in implementing a comprehensive/integrated planning process consistent with DOE Order 430.1A, "Life Cycle Asset Management (LCAM)." DOE contractors are charged with developing and producing the *ORR Comprehensive Integrated Plan*, which serves as a summary document, providing information from other planning efforts regarding vision statements, missions, contextual conditions, resources and facilities, decision processes, and stakeholder involvement.

The *ORR Comprehensive Integrated Plan* is a planning reference that identifies primary issues regarding major changes in land and facility use and serves all programs and functions on-site as well as the DOE Oak Ridge Operations Office (ORO) and DOE Headquarters. The plan illustrates how the ORR, as a valuable national resource, is and shall be managed based on the principles of ecosystem management and sustainable development and how mission, economic, ecological, social, and cultural factors are used to guide land and facility use decisions. The long-term goals of the comprehensive integrated planning process, in priority order, are to support DOE critical missions and stimulate the economy while maintaining a quality environment.

3.5.1.2 ORNL Institutional Plan (http://www.ornl.gov/inst_plan/IP_Outline.html)

ORNL produces an institutional plan each year to convey information about the Laboratory to DOE. The institutional planning process provides a means for DOE to consider the Laboratory as an institution (rather than as a collection of programs) and to review its mission, its health as an institution, and its plans for the future. DOE approval of ORNL's institutional plan indicates that the Laboratory's mission, vision, and strategic plan are aligned with Departmental needs and plans.

3.5.1.3 ORNL Strategic Plan (http://www.ornl.gov/inst_plan/STRATEGIC_PLAN/title99sp.html)

Since its establishment in 1943, ORNL has anticipated and supported national needs for R&D, developing broad, multidisciplinary capabilities that today are directed primarily toward support for the missions of DOE. Throughout its existence as a DOE national laboratory, ORNL has conducted strategic planning to prepare for new challenges, focus its resources on the future, and explore new technical directions. The Laboratory's current strategic planning efforts are summarized in this document. They reflect significant changes that are occurring at many levels.

3.5.1.4 ORNL ESHQ&I Budget Formulation Submission (<http://www.ornl.gov/camext/CAMIndex.htm>)

ORNL's fiscal year (FY) 2001 ESHQ&I Budget Formulation Plan was developed in accordance with the guidance in the DOE guidance document entitled *Environment, Safety, and Health—Guidance for Fiscal Year 2001 Budget Formulation and Execution*, dated January 1999. It identifies the ESHQ&I activities considered necessary at ORNL to ensure the health and safety of employees and the public; protection of the environment; and compliance with applicable laws, regulations, DOE policies and orders, and other ESHQ&I requirements while carrying out the site's missions and the planning for ORNL infrastructure needs which support R&D as well as ESH&Q. This plan was developed using risk-based planning and priority-setting methodologies to (1) establish and communicate ESHQ&I expectations to all stakeholders, (2) support the development of Departmental budgets and secure funding for ESHQ&I programs and activities, (3) support the integration of ESHQ&I principles in site-wide work planning and execution, and (4) assess ESHQ&I performance and provide feedback to promote continuous improvement.

3.5.1.5 Oak Ridge Reservation Annual Site Environmental Report (http://www.ornl.gov/Env_Rpt/aser97/aser.htm)

This document contains a summary of environmental monitoring activities on the ORR and its surroundings. The monitoring and documentation criteria are described within the requirements of ORO O 450, "Protection of the Public and Environment." The results summarized in this annual report are based on the data collected prior to and through the reported year.

3.5.1.6 Oak Ridge Reservation Management Plan (<http://www-internal.ornl.gov/orrmp/>)

The primary purpose of this management plan is to define responsibilities and authority for ORR management. The management plan treats the ORR as a single site wherever possible and addresses roles and responsibilities for managing the physical and human resources of the reservation on both a day-to-day and long-term basis. The focus of the document is to address general overall reservation policy and management, particularly as it relates to the portion of the ORR outside the immediate site boundaries.

3.5.1.7 ORNL Facility Index (<http://www-internal.ornl.gov/~q9t/facility/>)

The ORNL Facility Index is a Web-based database of ORNL facilities with related links that include ORNL site maps, the ORNL Facilities Management Database, the ORNL Area Responsibility Listing, the ORNL Condition Assessment Survey, the ORNL Space Allocation Management System (SAMS), the Property Management System (PRISM), GLI Web - General Locator Information, and Whos. Photographs of the facilities are also available at this index.

3.5.1.8 ORNL Land and Facilities Plan (<http://www.ornl.gov/~dmsi/landUse/>)

The primary purpose of the *ORNL Land and Facilities Plan* is to provide information on ORNL land and facilities use and planning. Section 2, "ORNL Land Use Plan," provides information on current reservation uses (ORNL and others) and addresses ORNL plans for use of the land outside the ORNL fenced, developed site. Information on planned uses by non-ORNL projects (Bechtel Jacobs Company LLC, Tennessee Department of Transportation, etc.) is included when known. Section 3, "ORNL Integrated Facilities Plan," provides information on planning for facilities and uses within the ORNL developed area. This plan replaced the Technical Site Information Document, the Site Development Plan, and the Integrated Facilities Plan.

3.6 ROLES AND RESPONSIBILITIES

ORNL organizational structures are available internally at URL
(<http://www-internal.ornl.gov/ornlhome/thelab.htm>)

3.6.1 Senior Management

The ORNL Laboratory Director (LD) and the Deputy Laboratory Director (DLD) have the overall responsibility for assuring a safe workplace, for maintaining safe operations, and for maintaining adequate infrastructure resources to fulfill the mission of the Laboratory. The LD and DLD approve the ISMS Policy Statement and the ISMS Program Description, ensure implementation by conveying to line management their responsibilities for integration of safety performance into all work activities, evaluate the progress and health of the ISMS program, and ensure that planning of infrastructure is sufficient to meet the mission needs of the Laboratory.

The Associate Laboratory Directors (ALDs) are assigned responsibility to set guidance for development of ISMS Plans in the line organizations for which they are responsible, to ensure that these plans are tailored appropriately to mission portfolios, to approve plans, to ensure implementation, to evaluate ongoing effectiveness, and to ensure that infrastructure is maintained at an acceptable level to meet mission needs.

3.6.2 Line Organizations

The Directors of line organizations within the established ORNL organizational structure constitute the focus of “line management responsibility” for protection of the workers, the public, and the environment with the ISMS framework for all work conducted by their assigned employees, on-site subcontractors, and guests in their assigned operating facilities. These Directors, with the approval of their relevant ALDs, establish identified ISMS plan(s) appropriately tailored to the hazards and risks of the work, implement them, perform self-assessments of their effectiveness, and carry out improvements as identified. Infrastructure planning is accomplished by requested programmatic activities and landlord activities, providing maintenance to ensure infrastructure readiness, and to implement funded infrastructure allocations. These Directors are assisted in carrying out these responsibilities, as appropriate, by all line managers in the organization.

Line managers provide the primary operating interface for employees, on-site subcontractors, guests, and visitors. Within the framework of ISMS planning, they contribute to work planning, pre-job communication of work hazards and controls, work monitoring, and evaluation of results. Within the framework of infrastructure planning, they contribute to maintenance of existing infrastructure resources, planning of infrastructure upgrades, and planning of newly identified infrastructure needs.

Facility Managers provide an operating interface, both with workers in their own line organization and with support staff from other line organizations who perform work in the facility, in terms of understanding the facility standards and requirements and ensuring that they are communicated to and implemented by workers who are assigned tasks in the facility.

Effective integration of support from ESH&Q SMEs into line activities is essential to achieving excellence in ISMS. Line Management is responsible for defining and providing an adequate level of SME support, either from its own staff, matrixed from the ESH&Q Offices, or from external sources, as appropriate for the particular line organization and ESH&Q discipline involved.

3.6.3 Programs

ORNL has matrixed Program Directors who serve a program development, management, and coordination role for specific R&D areas and/or funding sources and who serve as the interface between the funding sponsors and the R&D divisions where the programmatic work is performed. These Program Directors have a shared responsibility to be aware of the safety issues and resource needs of work being proposed and managed, but the prime responsibility for safe performance of that work resides with the relevant line management Director.

3.6.4 ESH&Q Offices

Effective integration of ESH&Q support functions into line activities is needed for the success of ISMS. The ESH&Q Offices are responsible for ORNL-level ESH&Q programs, for providing overall policy and guidance on ESH&Q issues, and for working with the line organizations to make available necessary and agreed-upon SMEs and other support.

3.6.5 Workers

All ORNL employees, on-site subcontractors, and guests are responsible for becoming knowledgeable of and maintaining awareness of the ESH&Q hazards associated with their work, for contributing to the formulation of hazard controls, and for conducting their work safely in accordance with those controls. They are encouraged to identify ESH&Q issues in their workplace, to work with their management to provide input for improvements and to resolve concerns, and to exercise stop-work authority in cases of imminent danger.

4. RESOURCE PLANNING, PRIORITIZATION, AND ALLOCATION

The ORNL ESHQ&I management planning process is supportive of DOE's annual ESHQ&I budget formulation and management planning process. The budget is prepared consistent with guidance provided in the DOE *ES&H Management Plan Guidance Manual*, which is produced annually, with the guidance for providing ESHQ&I budget planning information incorporated annually in the DOE Controller's Unified Field Budget Call (UNICALL), and with specific guidance from the DOE-HQ Office of Science.

The ORNL ESHQ&I budget formulation and management planning process provides the planning structure and tools needed to help identify and prioritize ESHQ&I needs, make and communicate cost-effective ESHQ&I risk-management decisions, integrate ESHQ&I into all activities and operations, and establish accountability for ESHQ&I performance. ESHQ&I resource planning and prioritization are implemented in a manner consistent with guidance from DOE, as provided in the *ES&H Management Plan Guidance Manual*, the Office of Environmental Management Budget Formulation Guidance, and any supplemental guidance received from individual DOE program offices.

The process generally consists of the following steps:

- C ESHQ&I needs assessment,
- C activity data sheet (ADS) preparation,
- C risk-based prioritization of activities and risk-management decision making, and
- C ESHQ&I budget formulation and development of top-level ESHQ&I budget summaries (annually).

4.1 ESHQ&I NEEDS ASSESSMENT

ESHQ&I needs assessments are performed by ORNL organizations and line management to identify the activities, systems, and programs needed to ensure the effective management of safety, health, environmental, quality, and infrastructure risks and to create a culture within ORNL that effectively integrates employee protection into work planning and the execution of work activities. These assessments are an ongoing and integral part of ORNL work and mission activities and include identification of risks associated with implementing planned mission activities, applicable policies and standards, emerging or strategic issues, and performance expectations. In response to identified ESHQ&I needs, line organizations and ES&H oversight and support organizations identify cost-effective programs and activities to address the existing and anticipated risks, achieve performance expectations, and comply with applicable policies and standards.

4.2 ACTIVITY DATA SHEET PREPARATION

ESHQ&I ADSs contain the essential scope, schedule, cost, and management information necessary for ORNL organizations to support planning and provide input to the budgeting process. ADSs are prepared for all ESHQ&I programs and activities needed to operate ORNL in a manner that protects the employees, the public, and the environment; meets those requirements set forth in the WSSs agreed upon by LMER and DOE; and ensures adequate infrastructure resources to meet the mission of the Laboratory.

ADSs are prepared to document those programs and activities selected to address the identified ESHQ&I needs. Each ADS contains key information such as a description of the activity; major milestones and deliverables; estimated costs, funding source, and types of funds associated with the activity; and the risk/benefit score for the activity. ADSs are packaged at a level consistent with the manner in which programs and activities are organized and managed. They correspond to decision units in the overall planning and budgeting processes for ORNL.

4.3 RISK-BASED ACTIVITY PRIORITIZATION

The ORNL Risk Ranking Board uses a Risk-Based Priority Model (RPM) to perform risk evaluations of all ES&H, infrastructure, and overhead ADSs. Using the RPM, a risk-reduction benefit score is derived for each ADS, and ADS scores are used to establish preliminary priority lists that are reviewed by senior management. Priority adjustments are made as necessary in consideration of additional planning factors.

Risk-based prioritization of ESHQ&I activities supports ORNL's ability to allocate resources to the projects or activities that will produce the maximum feasible benefits to the organization. Risk prioritization is the basis for work planning and scheduling decisions for overhead funded activities at ORNL and is used in conjunction with other planning considerations, such as resource constraints. Where available resources do not allow full and

immediate implementation of all proposed ESHQ&I programs and activities, risk-based prioritization provides the mechanism for the allocation of resources.

4.4 RESOURCE ALLOCATION

ADSs are produced for all direct-funded ESHQ&I activities, both target and unfunded, and reflect projected out-year funding for target as well as unfunded activities. ADSs are also produced for all indirect funded (e.g., overhead) activities for which funding has been requested. The annual cost profile for all ESHQ&I activities to be funded is consistent with the overall funding decisions and target budgets for the planning period.

Resource planning and allocation are done on the basis of ESHQ&I programs essential for compliance, fulfillment of ORNL missions, and assurance of the safety and well-being of ORNL personnel, the public, and the environment. Resource allocation is determined by supporting the highest-ranking activities within the target funding levels. Breakpoints are identified where the cumulative cost of the highest ranked activities equals the target level of funding. Activities below the breakpoints are unfunded for the planning period. The identification of target and unfunded ESHQ&I activities is useful to ORNL management to (1) identify unfunded, risk-significant activities, (2) discuss alternative risk-management strategies, and (3) evaluate alternative resource allocation strategies.

4.5 PROGRAM MANAGEMENT TRACKING AND CHANGE CONTROL SYSTEMS

The value of having ESHQ&I embedded in the business cycle is demonstrated at ORNL. Achieving excellence in ESHQ&I is accomplished through effective interaction between the line organizations and ESHQ&I staffs and includes employee involvement at all levels. Line management is responsible for fully implementing ESHQ&I requirements by developing systems and approaches that result in the effective management of risks and by creating a culture that effectively integrates employee and environmental protection into work planning, execution of work activities, and performance assessment and feedback.

ORNL management has recognized that it is beneficial, cost effective, and efficient to integrate ESHQ&I management data into the information systems used at each Oak Ridge facility to manage and track projects for budgeting purposes. The Program Management Tracking System (PMTS) has been developed at ORNL to track projects and their requested funds. This includes information relative to ES&H and infrastructure support activities.

An important element in the planning and budgeting system is the control of significant funding allocation changes made during the life of a project/activity documented on an ADS. Laboratory overhead budgets are established prior to the beginning of a planned fiscal year. The DOE ORNL Site Office reviews and approves the annual overhead budget. The site office is notified for concurrence when a change or reallocation of funds in the overhead budget of greater than or equal

to \$250K is proposed. Initial allocation and subsequent reallocation of capital asset (GPP and GPE) funds are approved by the site office.

5. FY 1999 ESHQ&I PERFORMANCE SUMMARY

This section provides a summary of ORNL ESHQ&I performance for the prior budget year (FY 1999).

5.1 STATUS OF FY 1999 ESHQ&I PERFORMANCE MEASURES

Critical outcomes, objectives, and performance indicators for ESHQ&I and their FY 1999 measures under the LMER-DOE contract are located at the following ORNL Internal Network address: <http://www-internal.ornl.gov/OQPI/pi/coopi.htm>.

The specific areas which address ESHQ&I performance are in the following:

- C Subsection 2.6, "Laboratory management will demonstrate that all divisions/offices/programs have an effective self-assessment program that improves performance."
- C Section 3.0, "Environment, Safety and Health," including implementation of ORNL's Integrated Safety Management System.
- C Section 4.0, "Infrastructure," including Life Cycle Assets Management (LCAM).

5.2 SUMMARY OF ESHQ&I INDIRECT ACTUAL COSTS FOR THE PRIOR YEAR (FY 1999)

NOTE: Planned FY 1999 ESHQ&I budget data in Section 5 contains the original data in the FY 2001 Budget Formulation Plan submitted in March 1999. Sections 5.2 through 5.4 explain significant differences between planned and actual FY 1999 costs and funding.

Indirect target ADSs are those activities being funded by ORNL's overhead budget allocation. Typically, these activities are core functions required to achieve and maintain compliance to requirements set forth in the WSSs agreed upon by LMER and DOE. Indirect unfunded activities are unfunded supplemental and new activities which would improve compliance and infrastructure systems.

Actual ESHQ&I indirect expenditures (Laboratory Overhead) for FY 1999 were as indicated in Table 5.1.

Table 5.1 Actual FY 1999 ESHQ&I Indirect Expenditures (Laboratory Overhead)		
Activity	ESH&Q (ONLY) (\$ in 000s)	ESHQ&I (BOTH) (\$ in 000s)
Office of Environmental Protection	5,244	
Health	2,610	
Lab Protection	1,044	
Office of Safety and Health Protection and Office of Nuclear Safety	6,115	
Office of Quality Services	2,147	
Office of Radiation Protection	3,972	
Sanitary Industrial Waste	582	
OSHA/ES&H Corrective Actions - Emergency Egress Lighting, 7900 (\$24.8K) - Temporary Eyewashes, 4500N, 4501, 4500 (\$28.5K) - Machine Guarding 9201-2 (\$1.5K) - Fire Department Hose and Tools (\$10K) - Fire Department SCBA Units, 15 ea w/spare bottle (\$54K) - OSHA Electrical Upgrades (\$69.2)	188	
ORNL Engineering		34
Low Value Equipment		452
Plant & Equipment		562
Total	\$21,902	\$1,048

Actual ESHQ&I indirect expenditures (from Space Charge funds) for FY 1999 were as indicated in Table 5.2.

Table 5.2 Actual FY 1999 ESHQ&I Indirect Expenditures (from Space Charge Funds)		
Activity	ESH&Q (ONLY) (\$ in 000s)	ESHQ&I (BOTH) (\$ in 000s)
Lab Protection (for Fire Protection Engineering)	380	
Capital Assets Management		481
ORNL Engineering		257
Plant & Equipment		14,581
Special Requirements		3,830
Total	\$380	\$19,149

5.3 SUMMARY OF ESHQ&I DIRECT ACTUAL COSTS FOR PRIOR YEAR (FY 1999)

Table 5.3 contains a listing of planned and actual direct costs for FY 1999 by Program elements.

Table 5.3 Planned and Actual Direct Costs for FY 1999 by Program Elements				
Program	From the March 1999 FY 2001 ESHQ&I Budget Formulation Submission		FY 1999 Actual Cost As Reported in Tables 5.4 - 5.8 (\$ in 000s)	
	FY 1999 Planned Direct Budget (\$ in 000s)			
DA Activities ¹	6,362		6,362	
DI Activities ²	13,084		13,084	
HFIR Operating Cost ³	12,196		12,196	
KG Program Cost	ESHQ&I ⁴ (Table 5.4)	6,905	Planned ESHQ&I ⁴ (Table 5.4)	7,681
	I (only)	0	Planned I (only)	0
KC Program Cost	ESHQ&I ⁵ (Table 5.5)	4,258	Planned ESHQ&I ⁵ (Table 5.5)	4,474
	I (only) ⁶ (Table 5.6)	3,598	Planned ⁶ I (only) (Table 5.6)	3,128
			Not Previously Reported ESHQ&I ⁷ (Table 5.7)	997
			Not Previously Reported I (only) ⁸ (Table 5.8)	583
Total	\$46,403⁹	Total	\$48,505	

For Table 5.3, the following footnotes explain cost statements:

¹DA Activities – From the direct target ADSs, the R&D divisions/programs estimated that \$6,362K of their division programmatic funds were used to support ES&H needs. These activities

included support for internal division personnel with dedicated ES&H roles (e.g., division safety officer) and other expense activities such as the correction of safety shower and eyewash station deficiencies. In addition, direct target funds reported were from expected funding to support projects and activities with an identifiable percentage for ES&H support as well as infrastructure support. Direct unfunded ADSs were for ESHQ&I activities which would improve compliance. Unfunded items were continually reviewed to determine if funding allocations need to be adjusted to allow for completion of these activities.

²DI Activities – From the direct target ADSs, \$13,084K was designated cost by ES&H organizations which was distributed to other ORNL divisions/offices/ programs for personnel and other resources. These funds were not provided through the Laboratory overhead budget.

³HFIR Operating Costs – HFIR ES&H operating cost is \$12,196K as identified on ADS E93D0021, “High Flux Isotope Reactor Operation.” This funding recognizes costs for ES&H related activities which would be funded through the Basic Energy Sciences Program activities.

⁴Table 5.4 lists planned versus actual operating expense and capital funding for previously reported ESHQ&I FY 1999 Landlord activities KG Program cost.

Table 5.4 FY 1999 KG Program Planned vs Actual Cost for ESHQ&I Landlord Activities (Previously Reported)			
Activity	Type	Planned Cost (\$ in 000s)	Actual* Cost (\$ in 000s)
Electrical OSHA Noncompliances	OE	35	30
ORNL Subtitle I UST Compliance	OE	62	58
Total	OE	97	88
Steam Plant Upgrade (Boiler Addition)	LI	1,900	3,158
Roofing Replacement, ORNL	LI	4,908	4,435
Total	LI	6,808	7,593
Grand Total		\$6,905	\$7,681

*Actual costs may include budget authority from previous fiscal years.

Explanation of significant variance shown in Table 5.4:

- C Steam Plant Upgrade – \$1,900K in new BA in FY 1999 was added to \$2,145K carryover BA from FY 1998 for a total BA of \$4,045K. \$3,158K of this \$4,045K was costed.

⁵Table 5.5 shows planned versus actual operating expense and capital funding for previously reported ESHQ&I FY 1999 Landlord activities KC Program cost.

Table 5.5			
FY 1999 KC Program Planned vs Actual Cost for ESHQ&I Landlord Activities			
(Previously Reported)			
Activity	Type	Planned Cost (\$ in 000s)	Actual Cost (\$ in 000s)
N/A	OE	0	0
Total	OE	0	0
CFC Phaseout - Clean Air Act Compliance	GPE	1,125	2,135
Replace Fleet Vehicles	GPE	323	201
Replace Steam Plant Economizers	GPE	350	10
Replacement Valve Test Stand	GPE	20	24
Total	GPE	1,818	2,370
250,000-Gallon Steel Fuel Oil Storage Tank	GPP	1,000	44
3000 Scfm Air Compressor - Building 2519	GPP	250	1,125
Fire Protection Systems Upgrade	GPP	750	422
HVAC Upgrades	GPP	100	0
Upgrade the Condensate Return System	GPP	300	234
West End Steam Upgrade Completion	GPP	40	279
Total	GPP	2,440	2,104
N/A	LI	0	0
Total	LI	0	0
Grand Total		\$4,258	\$4,474

Explanation of significant variances shown in Table 5.5:

- C CFC Phaseout-Clean Air Act Compliance – \$1,125K of new BA in FY 1999 was added to \$987K of carryover BA for a total BA of \$2,112K in FY 1999. A small overrun on the 1505 Chiller Replacement resulted in total cost of \$2,135K.
- C Replace Fleet Vehicles – Underran the planned cost due to a \$35K credit on trade in of a truck and three vehicles projected to cost over \$25K each actually costing slightly less than \$25K. These vehicles were funded from Low Value Equipment overhead funds.

- C Replace Steam Plant Economizers – Procurement of the economizer was deferred pending resolution of service subcontract ruling disputed by the Knoxville Building Trades Council.
- C 250,000-Gallon Steel Fuel Oil Storage Tank – Award of the design/build contract was not made until August 1999 due to higher-than-estimated bids requiring revision of the specification and rebid to reduce bid prices.
- C 3000 Scfm Air Compressor - Building 2519 – Total BA, including FY 1998 funding, is \$1,250K. The bulk of this work was performed in FY 1999.
- C Fire Protection System Upgrades – Actual BA for this project was \$500K in FY 1999, not \$750K. It was planned to increase the Fire Protection Systems Upgrades project with funding from the canceled Computer Facility project. However, cost increases in the Environmental and Life Sciences Laboratory and the 250,000-Gallon Steel Fuel Oil Storage Tank precluded this.
- C HVAC Upgrades – This project was deferred to FY 2001 because of lower relative priority to other funded projects.
- C Upgrade Condensate Return System – This project is slightly behind schedule resulting in lower cost in FY 1999 than planned.
- C West End Steam Upgrades Completion – \$40K was added to this project in FY 1999 to fully fund project requirements. Radiological contamination encountered underground delayed completion of this project.

Planned versus actual operating expense and capital funding for previously reported “Infrastructure only” FY 1999 Landlord activities KC Program costs are reported in Table 5.6.

Table 5.6 FY 1999 KC Program Planned vs Actual Cost for “Infrastructure Only” Landlord Activities (Previously Reported)			
Activity	Type	Planned Cost (\$ in 000s)	Actual Cost (\$ in 000s)
N/A	OE	0	0
Total	OE	0	0
Building 4515 HVAC System Controllers	GPE	110	0
Computing Systems and Supporting Modules for SAP	GPE	800	818
Electronic Heat Sealer	GPE	41	24
Enterprise Gigabit Ethernet Backbone Switches	GPE	55	52

Table 5.6 FY 1999 KC Program Planned vs Actual Cost for “Infrastructure Only” Landlord Activities (Previously Reported)			
Activity	Type	Planned Cost (\$ in 000s)	Actual Cost (\$ in 000s)
LDRD Centrifuge	GPE	42	0
LDRD Computer Work Station	GPE	43	49
LDRD Fluorescence Imaging Station	GPE	50	50
LDRD Mask Aligner	GPE	105	105
LDRD Robotic Fluid Handling System	GPE	65	66
LDRD Semiconductor I-V Characterization Equipment	GPE	45	44
Mailmobile Replacement 4500N 2nd Floor	GPE	37	41
Network Video/Audio Broadcast System	GPE	55	56
Secure Network Remote Access/Firewall	GPE	100	102
Total	GPE	1,548	1,407
Environmental and Life Sciences Laboratory	GPP	2,000	204
Neutron Sciences Support Building	GPP	50	1,517
Total	GPP	2,050	1,721
N/A	LI	0	0
Total	LI	0	0
Grand Total		\$3,598	\$3,128

Explanation of significant variances shown in Table 5.6:

- C Building 4515 HVAC System Controllers – This project was not funded until September 1999 due to the need for adequate management reserve for the GPE program.
- C LDRD Centrifuge – Procurement of the centrifuge was not required, and this funding was deobligated.
- C Environmental and Life Sciences Laboratory – Bids for this project came in well over the project estimate delaying award of the contract until additional funding could be reallocated. Current TEC is \$2,700K with \$200K in FY 1998, \$2,300K in FY 1999, and \$200K in FY 2000. The contract was awarded in July, and construction began in August.
- C Neutron Science Support Building – Total BA for this project is \$1,740K with \$1,690 from prior year funding.

⁷Table 5.7 shows planned versus actual operating expense and capital funding for not previously reported ESHQ&I FY 1999 Landlord activities KC Program cost.

Table 5.7			
FY 1999 KC Program Planned vs Actual for “ESHQ&I” Landlord Activities			
(Not Previously Reported)			
Activity	Type	Planned Cost (\$ in 000s)	Actual Cost (\$ in 000s)
N/A	OE	N/A	0
Total	OE	N/A	0
Forklift	GPE	!	27
Dechlorination System	GPE	*	34
Condenser Pumps	GPE	*	52
Bootshop Spray Booth	GPE	*	50
Road Tractor	GPE	*	81
Bucket Truck	GPE	*	147
Truck Waste Compactor	GPE	*	167
Primary Transformers, HFIR	GPE	*	145
Rescue/Emergency Vehicle	GPE	*	112
Ambulance	GPE	*	59
LERC Data Acquisition System	GPE	!	50
Portable Gamma Spectrometer	GPE	*	10
Particle Counter Filter Test	GPE	*	61
Total	GPE	0	995
5505 Motor Control Center Replacement	GPP	*	2
Total	GPP	0	2
N/A	LI	N/A	0
Total	LI	0	0
Grand Total		0	\$997

*Projects completed with carryover funding.

! Projects added to GPE program in FY 1999.

⁸Table 5.8 shows planned versus actual operating expense and capital funding for not previously reported “Infrastructure only” FY 1999 Landlord activities KC Program costs.

Table 5.8			
FY 1999 KC Program Planned vs Actual for “Infrastructure Only” Landlord Activities			
(Not Previously Reported)			
Activity	Type	Planned Cost (\$ in 000s)	Actual Cost (\$ in 000s)
N/A	OE	N/A	0
Total	OE	N/A	0
Generator Mobile	GPE	*	15
Distilled Water Maker	GPE	*	36
Wrecker, 14-Ton	GPE	*	81
Server, Disk Storage Device	GPE	!	130
Server	GPE	*	51
Total	GPE	0	313
New Cooling Tower for REDC	GPP	*	270
Total	GPP	0	270
N/A	LI	N/A	0
Total	LI	0	0
Grand Total		0	\$583

*Projects completed with carryover funding.

! Projects added to GPE program in FY 1999.

⁹Total Planned ESHQ&I from the FY 2001 ESHQ&I Budget Formulation Submission.

The Operations, Environment, Safety, and Health Directorate performs a large portion of the indirect ES&H activities, and ORNL is committed to ensuring that budget reductions do not result in significant increases in risk to the environment or to the safety and health of the workers or the public. An important task of the indirect cost reduction effort is the introduction of more cost-effective approaches to ESH&Q management and service delivery.

5.4 FY 1999 ESHQ&I ABATEMENT PERFORMANCE

Several key abatement issues were addressed through the ORNL FY 2001 ESHQ&I Budget Formulation Submission reported in March 1999. ADSs were included in the submission to address these key issues.

ORNL possesses one of the oldest physical plant facilities within the DOE system. About one-third of ORNL's total existing buildings are over 40 years old, and DOE capital expenditures to upgrade and replace ORNL facilities have been only a small fraction of those in normal industrial practice. Thus, ORNL has accumulated a substantial legacy of ES&H problems for correction. The existing buildings, utilities, and equipment require substantial maintenance cost to ensure reliability to continue R&D efforts in an environmentally and worker-safe condition. The ESHQ&I process has been initiated at ORNL to provide a means of reporting infrastructure planning and budgeting information in an integrated, efficient, timely, and consistent manner that will support ORNL and DOE budgetary needs and requests. Many infrastructure activities may have an impact on the environment and on the safety and health of site workers and the public. Similarly, ES&H requirements and needs drive many infrastructure activities. Many infrastructure activities identified in the development of the FY 2001 Budget Formulation Plan were driven by ES&H needs.

A key objective of the ORNL Landlord Program is to achieve timely and efficient utilization of available capital funding. A general guideline is that 50% of available capital funding should be costed in any particular fiscal year. ORNL's objective is to cost at least 65% of available capital funding. Table 5.9 reflects the costing level achieved in FY 1999.

Funding Category	Available Funding (\$ in 000s)	Actual Cost (\$ in 000s)	% Costed
MEL/FS Line Item	11,086	7,592	68.5%
General Plant Projects	8,447	4,148	49.1%
General Purpose Equipment	5,730	5,143	89.8%
Total	\$25,263	\$16,883	66.8%

Overall, 66.8% of available capital funding was costed in FY 1999. One area for improvement is GPP costing. Factors which impacted GPP costing included the cancellation of the proposed Computer Facility project in January 1999 and the receipt of an additional \$250K of GPP funding in September 1999. The computer facility was budgeted for \$2,400K of ORNL's \$4,450K GPP funding. The cancellation of this project in January required the reallocation of the funding to contingency GPP projects, with resultant delays in costing for the newly authorized projects. Receipt of the additional \$250K in September 1999 did not provide time to cost any of these funds. Without the additional \$250K, the GPP costs in FY 1999 would have been 50.6%.

Key abatement issues for Landlord-funded Operating Expense (OE), GPPs, and LIs are noted below.

Electrical Occupational Safety and Health Administration (OSHA) Compliance (ADS P98D0034) (KG-OE)

This project corrected some of the currently identified Risk Assessment Code (RAC) 3 electrical noncompliances.

Status: Work planned under this project has been completed.

ORNL Subtitle I UST Compliance (ADS P98D0035) (KG-OE)

This funding is carryover funding from FY 1996 that supports land farming of soil, waste disposal, analytical services, geological subcontract support, program management, and project management. It provides for the disposal of soils and residues from the various tank removals/remediations and monitoring of UST sites prior to state approval of remediation activities.

Status: All work under this project has been completed with the exception of closeout of monitoring wells at 7931. This work will be funded from overhead in FY 2000.

Steam Plant Upgrade (Boiler Addition) (ADS S97D0017) (LI)

This project provides an additional 100,000-lb boiler capacity at the ORNL Steam Plant. The new boiler is capable of burning either natural gas or fuel oil using modern boiler technology. Also included in the project are those boiler auxiliaries (pumps, fans, tanks, etc.) necessary to support plant operations.

Status: Construction was 96% complete at the end of the FY 1999 compared to a planned 100%. Startup testing began the last week of October 1999.

Roofing Replacement, ORNL (ADS S97D0029) (LI)

This project involves the replacement of deteriorated roofs on buildings and facilities throughout the ORNL complex. Most of the roofs at the complex have been in service for over 30 years; because of deterioration, they have developed numerous leaks. In many instances, these leaks have adversely affected equipment, records, and research as well as health and safety of personnel working with the facilities. The scope of this project includes the replacement of built-up roofing, including removal and disposal of existing membrane and insulation, inspection and repair of damaged deck, and installation of new insulation and membrane with associated flashing and trim.

Status: In FY 1999, 28 buildings totaling approximately 452,000 ft² were completed. To date, 41 buildings totaling 887,000 ft² have been completed.

250,000-Gallon Steel Fuel Oil Storage Tank (ADS S97D0055) (GPP)

This project constructs a 250,000-gal prefabricated steel storage tank and secondary containment structure adjacent to the ORNL Steam Plant. This tank is used to store fuel oil, which is used as an emergency fuel source for the generation of steam at the facility. Associated fuel oil transfer lines and pumps used to move the fuel from the tank into the steam plant are included in the project as well as a fire suppression system for the tank and its equipment.

The construction of this tank is one of the initial steps needed to convert the steam plant from coal to natural gas. As the plant continues to age, increased maintenance and equipment replacement will make burning coal as a primary fuel uneconomical. Major capital investments will need to be made in the boilers, precipitators, coal-handling systems, ash systems, and the coal yard runoff over the next 10 to 15 years if the plant is to continue to use coal as a primary fuel.

Status: A design/build contract has been awarded for this project. Design was approximately 25% complete at the end of FY 1999 compared to a scheduled completion of 100%. Higher than expected bids in May required the rebid of this project after some specification changes. Design is now scheduled to be completed in November 1999.

3000 Scfm Air Compressor - Building 2519 (ADS S97D0010) (GPP)

This project purchases and installs a new 3000 scfm, rotary screw turbine type, oil-less air compressor to replace aging units at the plant. The new unit provides the steam plant with the capability to produce sufficient quantities of oil-free compressed air to satisfy the current 2200-plus scfm sitewide demand. Clean, oil-free compressed air is used throughout the Laboratory to control equipment, systems, and processes and is a critical utility in the operation and maintenance of the Laboratory.

Status: Construction has been completed with some electrical components still being tested. The baseline for this project called for an April 1999 completion date. However, high demand for this type of equipment delayed material delivery until June 1999. Electrical testing was subsequently delayed due to operational considerations and related time windows for testing. Testing should be completed in December 1999. Demolition of the old compressors remains to be accomplished.

Environmental and Life Sciences Laboratory (ADS C98D0120) (GPP)

This project constructs a 59-ft-wide by 154-ft-long laboratory building located in close proximity to two generic office buildings immediately west of Building 1000.

The new research laboratory facility consists of eight large laboratories of approximately 1,250 ft² each. The laboratories will have HEPA ventilated hoods, sinks, and topical counters. General laboratory equipment will be moved from Y-12 and other ORNL sites.

This project will assist in providing a means for achieving future research goals by relocation of development organizations at Y-12 to the ORNL research complex. Improved research capabilities and increased interaction with other strong R&D programs at ORNL are the primary objectives. Constructing the facility at ORNL is vital to a plan to relocate ORNL personnel so that they will be ideally situated for effective collaboration with scientists in other ORNL divisions instead of being adjacent to a high-security weapons production facility.

Status: Design has been completed, and construction is 11% complete. Site work and excavation are underway. Due to higher than estimated bid prices, start of construction was delayed from March 1999 to July 1999 as additional funding was obtained for this project. Project completion originally scheduled for January 2000 is now projected for July 2000.

Fire Protection Systems Upgrade (ADS C97D0071) (GPP)

Fire protection systems at facilities within ORNL are increasingly demonstrating lack of reliability and degradation of system components relative to age and exposure to corrosive conditions. This project provides the following improvements:

- Upgrade of fire sprinklers in the Central Research and Administration Building (4500S). This upgrade will include the extension of fire sprinklers into some areas not currently protected and interface modification between the sprinkler systems and the fire alarm systems.
- Replacement of identified aged and failure-prone automatic preaction sprinkler system deluge valves with highly reliable automatic wet-pipe sprinkler system alarm valves in the High Voltage Accelerator Laboratory (5500), the High-Level Radiochemical Laboratory Building (4501), the Experimental Engineering Building (4505), and the 3012 Rolling Mill.
- Replacement of identified aged and maintenance-intensive automatic dry-pipe sprinkler systems with reliable and effective automatic wet-pipe sprinkler systems in the General Stores, Shipping, and Receiving Complex.
- Upgrade of 4500N Wing 5 alarm system and connect it to the 4500N alarm system.
- Upgrade of antiquated fire alarm systems in the HFIR Building.
- Upgrade of antiquated fire alarm panels in various ORNL buildings.
- Replacement of fire doors in 4500N between the wings and main corridors.
- Upgrade of fire barriers in ORNL facilities. National Fire Codes and regional/DOE adopted building codes contain requirements to limit the spread of fire to a certain square foot area. The Life Safety Code requires physical separation in protected means of egress. Both code requirements must be met by installed fire barriers, which are rated by Underwriters' Laboratories, Inc. (UL) to withstand a fire for a time period (e.g., one-hour rated, two-hour

rated, etc.). These two old, very large administrative and research facilities do not currently have required fire barriers in place.

- Installation of early warning smoke detectors at the CESAR Laboratory in Building 6010 to provide area protection and to give early indication of an incipient fire to fire response forces. High-value, one-of-a-kind robotics equipment and work stations in this densely populated laboratory create the potential for a fire loss exceeding \$1 million.
- The manually operated gasoline engine driver and water pump in Pumphouse Number 7953 were installed in the early 1960s. This pump supplies fire protection and potable water to the DOSAR Site, which includes the Radiation Calibration Laboratory (7735), laboratories handling radioactive material in Building 7710, and Building 7709, the Health Physics Research Reactor (HPRR) building currently being utilized for storage of unique one-of-a-kind replacement parts for the HFIR. Recent tests of the aged pump and pump driver resulted in a failure to operate. This project will replace the manually operated pumping system with an automatic starting pump along with updating the aged maintenance-intensive equipment with modern equipment.
- Installation of fire alarm system in Building 7604, which is used for storage of experimental and test equipment such as development hardware, computers, and instrumentation. A portion of the building is used periodically as a control room for experiments conducted in adjacent areas outside the building. No personnel are housed full time in this building, but some personnel enter the building on a regular basis as part of their responsibilities, particularly when there is experimental activity in the control room area. The building has no fire protection system other than portable fire extinguishers. This activity adds a fire protection alarm system to Building 7604. Fire and smoke detectors will be installed in Building 7604 and will be connected to an existing fire alarm system in adjacent Building 7601.

Status: Replacement of the deluge valves in 4501, 4505, and 5500; replacement of the dry-pipe sprinkler system with wet-pipe system in General Stores, Shipping, and Receiving Complex; upgrade of the fire alarm system in 4500N, Wing 5; and upgrade of the fire alarm panels in 1505, 1506, and 7910 were completed in FY 1999. A preliminary proposal was written to increase the funding to \$650K. Replacement of the sprinkler system alarm valves in 3012 and the fire alarm panels in 3019 will be funded by this \$150K increase.

HVAC Upgrades (ADS S97D0051) (GPP)

This project provides the installation of new HVAC systems and replacements of deteriorated air conditioning components which provide environmental control for Laboratory facilities. A prioritized listing of activities included in this project is maintained by the P&E Division. All equipment on this list has exceeded its life expectancy. Replacing these deteriorated components will improve air conditioning reliability and reduce operating and maintenance cost.

Status: This project was deferred from the FY 1999 GPP Program until FY 2001 based on its lower priority with respect to funded projects.

Neutron Sciences Support Building (ADS S97D0001) (GPP)

This project provides a support facility of approximately 5000 ft² constructed adjacent to the existing beam room at the HFIR. The facility facilitates the separation of user activities from reactor operations at the HFIR for Basic Energy Science, Health and Environmental Research, and Energy Efficiency and Renewable Energy programs. The facility provides critically needed space for equipment storage during routine beryllium reflector changeouts and other reactor maintenance.

This project substantially reduces the risk of Health Physics and Safeguards and Security noncompliances and allows ORNL to project a more “user friendly” image while improving overall security at HFIR. HFIR has the highest thermal neutron flux in the world, and the multiprogram demand for HFIR research (materials, energy efficiency, structural biology) is growing. Approximately \$2 million/year is possible in new research funding and an additional \$10 million in equipment is contingent on completion of this project.

Status: Beneficial occupancy was achieved on September 24, 1999. The HVAC system and site work remain to be completed. Construction, originally scheduled to be completed in May 1999, will be completed in November 1999.

Upgrade the Condensate Return System (ADS C98D0177) (GPP)

This project provides an evaluation of the existing system to determine whether to repair or replace the various components of the system, purchase and install components needing replacement, and repair the repairable ones. Initial projections include 30 collection stations with 60 pumps which need to be reworked.

Status: Construction is 60% complete. It is projected that construction will be completed in November 1999, one month ahead of schedule.

West End Steam Upgrade Completion (ADS S97D0032) (GPP)

This project performed those activities necessary to complete the West End Steam System Upgrade. Included in the work was insulation of the pits and demolition of old pits, pipe, and pipe supports.

Status: This project was completed in February 1999 compared to a planned completion date of December 1997. Inability to reach an acceptable contract price for the remaining work under this project with the initial subcontractor resulted in the need to bid that work. The bid process and underground contamination encountered during the final phase of work delayed completion of the project.

5.4.1 Treatment of Key Abatement Issues

Compliance with ESHQ&I regulations, orders, and procedures is the responsibility of ORNL line management. Excellence in ESHQ&I is achieved through close cooperation with the ESHQ&I professional and technical staff members. An ADS describes each ESHQ&I activity, associated milestones, risk of not implementing or continuing activity, and activity funding requirements and funding sources. Risk-based ranking of programs and activities was performed to ensure that activities providing the highest-risk benefit were funded from the limited pool of funding resources.

6. FY 2000 ESHQ&I EXECUTION PLAN

6.1 BUDGET ANALYSIS AND IMPACTS

6.1.1 Major Planning Assumptions

Planning assumptions are based on direct guidance from the Cognizant Secretarial Offices funding programmatic activities at ORNL. In addition, DOE-ORO funding guidance is followed to assure consistency of Field Work Proposals (FWPs), ADSs, Capital Equipment Requests, GPP Requests, and LI Requests. All overhead planning assumptions are based on a prioritization of risk to the mission of ORNL, infrastructure needs, personnel safety and health, environmental issues, and public issues. ORNL is dedicated to assuring that all regulatory requirements are at least met. Reductions in funding may impact compliance with some of the requirements of DOE orders and may severely impact implementation of best management practices.

6.1.2 Funding Bases

The Secretarial Office responsible for Landlord activities at ORNL is the Office of Science, Basic Energy Sciences. With the exception of activities funded directly by the Office of Environmental Restoration and Waste Management Program (EM), all direct funding allocated to ORNL by Office of Science and other programs is recognized within the ESHQ&I Management ADS submittals. Where cost is escalated on an ADS included in this plan, a cost escalation rate of approximately 3.2% for labor and materials is used.

For each ADS submitted in the FY 2001 ESHQ&I Management Plan, ESHQ&I activities are designated as either direct (Program) funded or indirect funded from a variety of allocable cost pools. ORNL ESHQ&I activities to be direct (Program) funded are identified as either target (funded) or unfunded with the appropriate Resource Structure Code and budget and reporting (B&R) code specified. The allocable cost pools include the site overhead pool (OH) and division-specific overhead pools (DA). Other allocable cost pools which may be designated are distributed accounts through service organizations (DI) and burdened accounts supported by a specific division (BC). Each ADS to be funded from these allocable cost pools is identified as either target or unfunded and includes identification of the associated funding pool.

All indirect funded ORNL ESHQ&I offices (e.g., Office of Environmental Protection) recognize their cost of operation through target, funded supplemental, or funded new ADSs for which the costs correspond directly with the ORNL overhead budget documents. Unfunded activities corresponding with the ORNL overhead budget are recognized as unfunded supplemental or unfunded new. Direct programmatic funding requests by the ORNL ESHQ&I organizations are submitted through FWP with associated ADSs submitted to the Department of Energy-Office of Science. The FWP submittals working in concert with the ADS submittals allow both the overhead organizations and the programmatic organizations to request Landlord direct funding for ESHQ&I activities.

Current ESHQ&I funding targets were developed as part of the FY 2000 ORNL Site overhead budgeting process. Following risk prioritization of activities, recommendations were made to ORNL management for funding of targets and consideration for the funding of supplemental and new requests. ORNL management then allocated available target funding to ESHQ&I organizations for their activities. Overhead funding is reviewed by DOE Site personnel for concurrence. Following adjustments, ESHQ&I organizations were allocated the available funds to support the highest ranked activities. Adjustments of funded programs are made during the fiscal year based on risk prioritization and management approvals. In addition to the site overhead process, programmatic organizations support intradivisional ESHQ&I activities through a division-specific overhead structure. This funding is controlled by line management to ensure internal compliance to ESHQ&I requirements.

6.1.3 Impact of Potential Budget Reductions

Significant reductions in funding for labor, materials, and services affecting ORNL ESHQ&I programs have recently occurred. Further reductions are likely and could result in the elimination or reduction in scope of various ESHQ&I programs and activities. The most significant impacts will likely be on the ADSs associated with the lowest ranked activities and programs to which target overhead funding has been allocated in the plan.

Following the final allocation of functional area indirect budgets, it is anticipated that budget reductions would likely result in the deferral or reduction in scope of the following activities. More significant budget reductions would begin to affect core ESHQ&I programs (indirect funded) necessary to accomplish ORNL's missions and maintain current levels of regulatory compliance. The following activities could be impacted by budget reductions:

Freight and Cartage (Infrastructure)

Freight and Cartage Contract

WWW Electronic Forms Development (Infrastructure)

Conversion of the most frequently used forms so that they can be filled in via the WWW. This will include automatic routing and approval of the forms where this is possible. This activity is a major reengineering project targeted to eliminate the need for additional forms software packages by users, thereby saving purchases, money, and user time.

Safety Incentive Award Program (ESHQ&I)

Provide funds for safety incentive awards.

Price Adjustment (Infrastructure)

Provide funds for monthly reconciliation between the General Ledger and Subsidiary Ledger accounts. This function could result in debit or credit adjustments.

Loss on Disposal of Excess Stores Inventory (Infrastructure)

Required to fund reserve for loss on the disposal of stores inventory that is excess to ORNL requirement.

Returnable Containers (Infrastructure)

Provides for returnable container deposit charges that occur when materials are received in drums, carboys, and stainless steel kegs.

Scrap Materials (Infrastructure)

The function of this account is to collect revenue received from the sale of noncapital materials sold through Property Sales, the cost of materials shipped parcel post lost or damaged in transit that exceeds the liability limit of the carrier, and the cost of materials that have been deteriorated or been damaged while in stores inventory.

Transportation Services (Infrastructure)

This task funds resources to operate the ORNL Taxi service and ORNL Mail/Package Pickup and Delivery services. The Taxi Service operates with two vehicles on staggered schedules to maintain continuous service for the Laboratory until 5:15 p.m. every day. The taxi enables ORNL to reduce its vehicle fleet size, saving dollars on fuel cost, maintenance and operating cost, and capital outlays, as well as reducing air emissions. The taxi is also a service encouraged by DOE Property Management. The Mail/Package Pickup and Delivery service provides resources to pick up items from throughout ORNL buildings, Reproduction, and the Mail Room and deliver them to the entire Lockheed Martin complex, including off-site locations such as Commerce Park, Mitchell Road, Y-12, and the East Tennessee Technology Park (ETTP). These services benefit the entire ORNL community by easing transportation throughout the Laboratory and speeding information flow in the entire DOE complex.

FY 1999 Budget Reduction - Reallocation - Maintenance (ESHQ&I)

This project provides for the maintenance and repairs for ORNL occupied facilities located at the Y-12 site necessary to preserve the infrastructure and provide a safe environment. Tasks include repair of building structures, roofs, and masonry; maintenance and repairs of building electrical, piping, and HVAC systems; exterior and interior maintenance painting; maintenance of building insulating systems; and asbestos removal.

NRC-DOE Pilot Program (ESHQ&I)

This task provides funds for followup reviews and evaluations required after issuance of the final report of the NRC-DOE Pilot Program on external regulations which was conducted for the Radiochemical Engineering Development Facility (REDC) by NRC and DOE.

MOU-Reservation Area Manager (ESHQ&I)

This task funds additional support for the Reservation Area Manager with responsibilities including forestry management, wildlife management, the ORNL expanded area, and development of a comprehensive integrated plan.

NRC Transition Program (ESHQ&I)

If Congress mandates a transition of nuclear/radiological facilities owned by DOE to external regulation by the NRC or state of Tennessee, resources will be required to implement this requirement.

Corporate Information Center/Data Warehouse (ESHQ&I)

ORNL's share of the Lockheed Martin Energy Systems, Inc. (LMES) Corporate Information Center efforts includes a strategy for the future of ORNL's data warehouse. It also includes conversion of some data to Oracle; however, this funding will not allow complete conversion of data to ORNL's data warehouse. Therefore, this increment will violate terms of the MOU between LMES and LMER. The warehouse, when populated with data, will serve as a centralized repository for a wide range of institutional data from diverse sources such as human resources, finance, health and safety, compliance, facility, and other data. The most useful subsets of data from these source systems will be brought together in various ways to make the collection available in a coherent, integrated model. The data warehouse will form a foundation upon which a new generation of information-delivery applications can be built. Of particular interest is the utilization of the World Wide Web for information delivery.

ORNL Business Application Planning and Development (ESHQ&I)

This task includes planning for and creating ORNL's Business Application Architecture and Administrative IT Strategy. The business applications include many of ORNL's most vital infrastructure systems including payroll, PALS, etc. This task also includes compiling and monitoring all ORNL business application computing costs for the 90+ systems that will not be replaced by SAP (includes transaction fees in order to assess the true cost of computing for ORNL). Development of new technology systems is included in this function.

Reservation Emergency Management Program (ESHQ&I)

This task provides additional funds for ORNL's portion of shared assets such as Oak Ridge Emergency Operations Center, Joint Information Center, reservation Field Monitoring Teams, emergency management computer networks, ringdown phone systems, plus administration of the ORR Emergency Plan, and implementing procedures.

6.2 FY 2000 ESHQ&I INDIRECT BUDGET SUMMARY

Table 6.1 reports the ESHQ&I indirect budget (Laboratory Overhead) for FY 2000, pending DOE approval.

Table 6.1		
Planned FY 2000 ESHQ&I Indirect Expenditures (Laboratory Overhead)		
Organization/Functional Area	From the March 1999 FY 2001 ESHQ&I Budget Formulation Submission	Reflects Current ORNL Overhead Budget Planning Figures
	FY 2000 Planned Indirect Target (\$ in 000s)	FY 2000 Revised Target (\$ in 000s)
Office of Environmental Protection CA - Protection of Air Quality CW - Protection of Water Quality HW - Solid and Hazardous Waste (Oversight Only) CS - Control of Toxic Substances MR - Environmental Management, Oversight, and Reporting PP - Pollution Prevention Oversight	5,172	5,195
Health Division MS - Occupational Medical Services	2,481	2,814
Office of Laboratory Protection EP - Emergency Preparedness FP - Fire Protection Engineering	12,016 (Reflects entire OLP budget)	13,073 (Reflects entire OLP budget)
Office of Safety and Health Protection and Office of Nuclear Safety IS - Industrial Safety IH - Industrial Hygiene NS - Nuclear Safety TS - Transportation Safety MO - Management and Oversight	5,017	5,300
Office of Quality Services MR - Environmental Management, Oversight, and Reporting MO - Safety Management and Oversight	1,784	2,143
Office of Radiation Protection RP - Radiation Protection	3,805	4,151
Sanitary Industrial Waste	508	582
OSHA/ES&H Corrective Actions ¹	235	244
Low Value Equipment	396	412
Plant and Equipment	14,593	*549

Table 6.1 Planned FY 2000 ESHQ&I Indirect Expenditures (Laboratory Overhead)		
Organization/Functional Area	From the March 1999 FY 2001 ESHQ&I Budget Formulation Submission	Reflects Current ORNL Overhead Budget Planning Figures
	FY 2000 Planned Indirect Target (\$ in 000s)	FY 2000 Revised Target (\$ in 000s)
ORNL Engineering	300	*34
ORNL Cafeteria	0	599
Other Overhead Tasks ²	14,231	Projected 14,231
Total Planned FY 2000 ESHQ&I Indirect Budget	\$60,538	\$49,327³

*Space charge funds have been allocated to some of these tasks (see Table 6.2).

¹OSHA/ES&H Corrective Actions – These overhead funds were authorized for allocation to activities previously funded through KG02.

²Other overhead tasks – Some organizations receive Laboratory overhead funds which are not wholly dedicated to ESHQ&I activities; however, the activities may have a specific supporting role to ESHQ&I (e.g., transportation activities and the Tennessee Oversight Agreement). These overhead funds are designated for other overhead tasks such as permit fees, the State Oversight Program, the ORNL Audit Center, information centers, etc.

³Revision to FY 2000 target indirect ADSs following the FY 2000 budget review. The FY 2002 ESHQ&I Budget Formulation Plan will reflect the revised overhead budget.

Planned ESHQ&I indirect expenditures (from Space Charge funds) for FY 2000 are shown in Table 6.2.

Table 6.2 Planned FY 2000 ESHQ&I Indirect Expenditures from Space Charge Funds		
Activity	ESH&Q (ONLY) (\$ in 000s)	ESHQ&I (BOTH) (\$ in 000s)
Lab Protection	412	
Capital Assets Management		739
ORNL Office Moves		222
ORNL Engineering		260
Plant & Equipment		14,706
Special Requirements		2,422
Total	\$412	\$18,349

6.3 FY 2000 ESHQ&I DIRECT BUDGET SUMMARY

Table 6.3 is a listing of planned FY 2000 direct costs and revised funding targets following reconciliation of FWP and ADSs.

Table 6.3 Planned Direct Costs for FY 2000 by Program Elements				
Program	From the March 1999 FY 2001 ESHQ&I Budget Formulation Submission		Revised FY 2000 Planned Cost As Reported in Tables 6.4 - 6.6 (\$ in 000s)	
	FY 2000 Planned Direct Budget (\$ in 000s)			
DA Activities ¹	6,362		6,362	
DI Activities ²	13,084		13,084	
HFIR Operating Cost ³	12,196		12,196	
KG Program Cost ⁴	ESHQ&I ⁵	357	Planned ESHQ&I ⁷ (Table 6.4)	4,594
	I (only) ⁶	0	Planned I (only)	0
KC Program Cost ⁸	ESHQ&I ⁹	2,450	Planned ESHQ&I ¹¹ (Table 6.5)	9,963
	I (only) ¹⁰	1,149	Planned I (only) ¹² (Table 6.6)	2,443
	Total	35,598¹³	Total	\$48,642

¹DA Activities—From the direct target ADSs in the FY 2001 Budget Formulation Submission, \$6,362K was designated spending by R&D divisions and programs from their division programmatic funds in support of ES&H needs. These activities included support for internal division personnel with dedicated ES&H roles (e.g., division safety officer) and other expense activities such as the correction of safety shower and eyewash station deficiencies. In addition, direct target funds reported were from expected funding to support projects and activities with an identifiable percentage for ES&H support as well as infrastructure support. Direct unfunded ADSs will be identified in the FY 2002 Budget Formulation Submission. Unfunded items are continually being reviewed to determine if funding allocations need to be adjusted to allow for completion of these activities.

²DI Activities–From the direct target ADS C97D0148 in the FY 2001 Budget Formulation Submission, \$13,084K was designated as planned distributed cost incurred by the Office of Radiation Protection for services procured by other ORNL divisions/offices/programs.

³HFIR operating cost is the total operating cost of \$12,196K on ADS E93D0021, “High Flux Isotope Reactor Operation.” This funding recognizes some costs for ES&H-related activities which would be funded through the Basic Energy Sciences Program activities.

⁴Landlord responsibilities were previously reassigned from KG to KC.

⁵Planned FY 2000 KG ESHQ&I projects from the FY 2001 ESHQ&I Budget Formulation Submission.

⁶Planned FY 2000 KG “Infrastructure only” projects from the FY 2001 ESHQ&I Budget Formulation Submission.

⁷Table 6.4 below shows the revised FY 2000 planned KG Program cost for ESHQ&I expense and capital funding requirements associated with Landlord activities. (These figures are in the process of being updated for the FY 2002 Budget Formulation Submission to be completed March 2000.)

Table 6.4				
Revised FY 2000 Planned KG Program Costs for ESHQ&I Landlord Activities				
Activity	Type	Budget (\$ in 000s)	Carryover (\$ in 000s)	Planned 2000 Cost (\$ in 000s)
N/A	OE	0	0	0
Total	OE	0	0	0
N/A	GPE	0	0	0
Total	GPE	0	0	0
N/A	GPP	0	0	0
Total	GPP	0	0	0
Electrical Systems Upgrade	LI	357	0	357
Replace Deteriorated Roofing	LI	744	2,606	3,350
Steam Plant Boiler Addition	LI	0	887	887
Total	LI	1,101	3,493	4,594
Grand Total		1,101	3,493	4,594

⁸ORNL Landlord – DOE Office of Science/Basic Energy Sciences (KC).

⁹Planned FY 2000 KC ESHQ&I Projects from the FY 2001 ESHQ&I Budget Formulation Submission.

¹⁰Planned FY 2000 KC “Infrastructure only” Projects from the FY 2001 Budget Formulation Submission.

¹¹Table 6.5 lists the revised FY 2000 planned KC Program costs for ESHQ&I expense and capital funding requirements associated with Landlord activities. (These figures are in the process of being updated for the FY 2002 Budget Formulation Submission to be completed March 2000.)

Table 6.5				
Revised FY 2000 Planned KC Program Costs for ESHQ&I Landlord Activities				
Activity	Type	FY 2000 Budget (\$ in 000s)	Carryover (\$ in 000s)	Planned 2000 Cost (\$ in 000s)
N/A	OE	0	0	0
Total	OE	0	0	0
Engineering Equipment Replacement	GPE	323	0	323
CFC Phaseout - Clean Air Act Compliance	GPE	100	0	100
Replace Steam Plant Economizers	GPE	540	0	540
Primary Substation SF6 Breakers	GPE	490	0	490
Replace Fleet Vehicles	GPE	200	0	200
Whole Body Counting Lab Liquid Nitrogen Tank	GPE	82	0	82
Replace Cafeteria Vegetable and Milk Coolers	GPE	90	0	90
Total	GPE	1,825	0	1,825
HFIR Cooling Tower Replacement	GPP	4,450	0	4,450
Replace #1 Reservoir (1.5 M Gal) (Contingency)	GPP	1,900	0	1,900
Fire Protection Systems Upgrade (Contingency)	GPP	750	238	988
Seismic Upgrades, 1506 (Contingency)	GPP	500	0	500
Management Reserve	GPP	300	0	300
Total	GPP	7,900	0	8,138
N/A	LI	0	0	0
Total	LI	0	0	0
Grand Total		\$9,725	\$238	\$9,963

¹²Table 6.6 shows the revised FY 2000 planned KC Program costs for “Infrastructure only” expense and capital funding requirements associated with Landlord activities. (These figures are in the process of being updated for the FY 2001 Budget Formulation Submission to be completed March 2000.)

Table 6.6				
Revised FY 2000 Planned KC Program Costs for “Infrastructure Only” Landlord Activities				
Activity	Type	FY 2000 Budget (\$ in 000s)	Carryover (\$ in 000s)	Planned 2000 Cost (\$ in 000s)
N/A	OE	0	0	0
Total	OE	0	0	0
Enterprise Gigabit Ethernet Backbone Switches	GPE	55	0	55
Logic Analyzer, High-Speed, Deep Memory	GPE	99	0	99
Devlpmt System-ORNL Supercomputing Resource	GPE	56	0	56
Shared System Computing Equipmt for Separation	GPE	221	0	221
Spincoater, Developer, and Inspection Station	GPE	98	0	98
Photomask Aligner and Exposure Sys Upgrade	GPE	65	0	65
EMAIL.CIND System Upgrade	GPE	53	0	53
WWW.ORNL.GOV Web Server Upgrade	GPE	31	0	31
LDRD - General Purpose Equipment	GPE	260	0	260
Mailmobile Replacement 4500N 1st Floor	GPE	43	0	43
Tube Furnaces and Process Gas Handling Station	GPE	97	0	97
Wet Chemical Etching Station	GPE	65	0	65
Ethanol 10,000-Gallon Vaulted Fuel Storage Tank	GPE	100	0	100
Total	GPE	1,243	0	1,243
Environmental and Life Sciences Laboratory	GPP	200	0	200
Child Care and Fitness Center (Contingency)	GPP	300	0	300
Security Perimeter Reconfiguration (Contingency)	GPP	400	0	400
Lab Expansion-Nanoscience Metrology & Instrumt (Contingency)	GPP	300	0	300
Total	GPP	1,200	0	1,200
N/A	LI	0	0	0
Total	LI	0	0	0
Grand Total		\$2,443	0	\$2,443

¹³Total planned direct FY 2000 ESHQ&I budget from the FY 2001 ESHQ&I Budget Formulation Submission. (These figures are in the process of being updated for the FY 2002 Budget Formulation Submission to be completed March 2000.)

6.4 FY 2000 PLANNED ESHQ&I ABATEMENT ACTIVITIES

NOTE: This section contains current planning for the FY 2002 ESHQ&I Budget Formulation Submission. Additional details will be submitted in the March 2000 planning document.

Electrical Systems Upgrade (ADS C97D0106) LI

The ORNL electrical distribution system requires significant restoration and expansion to assure the continued operation in support of the research and operation missions of the Laboratory. Electrical components throughout the Laboratory are obsolete and increasingly dangerous to operate. Specific funded activities associated with this LI include

- *Overhead Feeders 244 and 264 Upgrade.* The 13.8-kV overhead feeders run from the ORNL Primary Substation to the 7600 Area Robotics and Process Systems Division facilities. The feeders serve the 6010 Oak Ridge Electron Linear Accelerator, the 6011 Computing and Telecommunications Facility, the 6012 Computer Science Research Facility, and the 5510 Analytical Mass Spectrometer Laboratory; they serve as a dual-feed to the 4509 and 2632 major 2.4-kV secondary substations within the Laboratory. The feeders will be completely rebuilt to ensure reliable continuation of service.
- *Electrical Metering System.* A computerized electrical metering system will be installed in the ORNL electrical distribution system. Electrical meters will be installed on major distribution feeders and on significant facilities throughout the Laboratory.
- *Building Electrical Service Entrance Upgrades.* Obsolete and inadequate switchgear, transformers, and conductors will be replaced at the main service entrances of Buildings 2519, 4501, 4500S, and 5500. New switchgear and cabling will be added to the bus ties in Buildings 4500N and 4500S.
- *Substation 4509 Improvements.* Secondary Substation 4509 will be upgraded by installing two new 13.8/2.4-kV, 7500-kV transformers, and new 2.4-kV switchgear to form a 13.8-kV primary selective arrangement and a 2.4-kV transformer and switchgear double-ended arrangement. Existing 13.8-kV switchgear "A" will be reinsulated and refurbished. A 13.8-kV primary selective system arrangement will be provided for two internal Building 4509 service transformers.

Replace Deteriorated Roofing (ADS S97D0029) (LI)

The project described involves the replacement of deteriorated roofs on buildings and facilities throughout the ORNL complex. Most of the roofs at the complex have been in service for over 30 years; because of deterioration, they have developed numerous leaks. In many instances, these

leaks have adversely affected equipment, records, and research as well as health and safety of personnel working with the facilities.

The scope of this project includes the replacement of built-up roofing, including removal and disposal of existing membrane and insulation, inspection and repair of damaged deck, and installation of new insulation and membrane with associated flashing and trim.

Steam Plant Upgrade, Boiler Addition (ADS S97D0017) (LI)

This project will construct an additional 100,000-lb boiler capacity at the ORNL Steam Plant. The new boiler will be capable of burning either natural gas or fuel oil using modern boiler technology. Also included in the project will be those boiler auxiliaries (pumps, fans, tanks, etc.) necessary to support plant operations.

HFIR Cooling Tower Replacement (ADS A99D0048) (GPP)

The HFIR Secondary Coolant System is composed of the secondary coolant piping, pumps, valves, cooling tower, and its control system. The components of the secondary coolant system are over 33 years old and are approaching their end of life. Recent inspection of the wooden cooling tower internal structural components shows extensive degradation. Additionally, recent ORNL fire protection inspections of the cooling tower fire protection system found leaks in this system and strongly argue for its complete replacement. The remaining life for the HFIR cooling tower is estimated at 3 to 5 years. This project will replace the HFIR cooling tower, including the piping to the primary pump flanges, on the existing basin. An updated flow control system will be provided. This project will be accomplished during the shutdown of the HFIR reactor for reflector changeout between May and October 2000.

Replace #1 Reservoir (1.5-Million-Gallon) (ADS S97D0021) (Contingency GPP)

This project will provide a new 1.5-million-gal steel water reservoir adjacent to the existing 3-million-gal No. 1 water reservoir. The concrete reservoir serves the Bethel Valley portion of the Laboratory and provides water storage capacity for both operational needs and fire protection purposes. Internal inspections are performed every 5 years to monitor and assess reservoir condition. Inspections indicate spalled concrete, corroding structural reinforcement, and cracks. The No. 1 reservoir must be drained and cleaned, structural repairs performed, and a new corrosion-resistant liner installed. Additional work must be performed on the exterior surfaces of the structure to help counter the effects of weather and age. The new 1.5-million-gal steel reservoir will provide water to ORNL during the repair of the No. 1 reservoir and will provide additional capacity for Laboratory requirements.

Fire Protection Systems Upgrade (ADS C97D0071) (Contingency GPP)

Fire protection systems at facilities within ORNL are increasingly demonstrating lack of reliability and degradation of system components relative to age and exposure to corrosive conditions. This project will provide the following improvements:

- Replacement of identified aged and failure-prone automatic preaction sprinkler system deluge valves with highly reliable automatic wet-pipe sprinkler system alarm valves in the High Voltage Accelerator Laboratory (5500), the High-Level Radiochemical Laboratory Building (4501), and the Experimental Engineering Building (4505) was completed in FY 1999. Building 3012 will be completed in FY 2000.
- Upgrade of antiquated fire alarm systems in the HFIR Building.
- Upgrade of antiquated fire alarm panels in various ORNL buildings. (Partially completed in FY 1999.) Building 3019 will be completed in FY 2000.
- Replacement of fire doors in 4500N between the wings and main corridors; upgrade of fire barriers in ORNL facilities. National Fire Codes and regional/DOE adopted building codes contain requirements to limit the spread of fire to a certain square foot area. The Life Safety Code requires physical separation in protected means of egress. Both code requirements must be met by installed fire barriers, which are rated by UL to withstand a fire for a time period (e.g., one-hour rated, two-hour rated, etc.). These two old, very large administrative and research facilities do not currently have required fire barriers in place.
- The manually operated gasoline engine driver and water pump in Pumphouse No. 7953 were installed in the early 1960s. This pump supplies fire protection and potable water to the DOSAR Site, which includes the Radiation Calibration Laboratory (7735), laboratories handling radioactive material in Building 7710, and Building 7709, the HPRR building currently being utilized for storage of unique one-of-a-kind replacement parts for the HFIR. Recent tests of the aged pump and pump driver resulted in a failure to operate. This project will replace the manually operated pumping system with an automatic starting pump along with updating the aged maintenance-intensive equipment with modern equipment.
- Installation of fire alarm system in Building 7604, which is used for storage of experimental and test equipment such as development hardware, computers, and instrumentation. A portion of the building is used periodically as a control room for experiments conducted in adjacent areas outside the building. No personnel are housed full time in this building, but some personnel enter the building on a regular basis as part of their responsibilities, particularly when there is experimental activity in the control room area. The building has no fire protection system other than portable fire extinguishers. This activity adds a fire protection alarm system to Building 7604. Fire and smoke detectors will be installed in Building 7604 and will be connected to an existing fire alarm system in adjacent Building 7601.

Seismic Upgrades, Building 1506 (ADS A99D0055) (Contingency GPP)

In response to a seismic evaluation driven by Executive Order 12941, Building 1506 was found to be in the "Definitely Needing Repair" category. A possible failure scenario has been postulated because of a lack of roof diaphragm action due to the absence of a topping slab. A study is

currently underway to recommend necessary modifications to improve the building's resistance to seismic failure modes.

Environmental and Life Sciences Laboratory (ADS C98D0120) (GPP)

This project will construct a 59-ft-wide by 154-ft-long laboratory building located in close proximity to two generic office buildings immediately west of Building 1000.

The new research laboratory facility will consist of eight large laboratories of approximately 1250 ft² each. The laboratories will have HEPA ventilated hoods, sinks, and topical counters. General laboratory equipment will be moved from Y-12 and other ORNL sites.

Lab Expansion - Nanoscience Metrology and Instrumentation (ADS A99D0020) (Contingency GPP)

The 3500 High-Bay is an existing two-story open space, within Building 3500 at the ORNL site, currently housing a machine shop, offices, equipment for environmental testing of instruments, and a systems mockup area. The modifications to this area are to add an exit stair and second floor structural system to the upper high bay to create approximately an additional 3000 ft² of usable modular clean room laboratory space and reconfigurable office space for the proposed Laboratory Expansion for Nanoscience Metrology and Instrumentation. In addition to the high-bay modifications, Room B-19 in Building 3500 will be converted from laboratory space to an electron microscope facility. The conversion will require modifications to the room HVAC system and possible foundation modifications for vibration isolation.

Child Care and Fitness Center (ADS C98D0123) (Contingency GPP)

This project will provide a Child Care and Fitness Center. Approximately 100 children could be accommodated in the facility, which will be located on the ORNL site and will encompass a fenced area of 675 ft by 130 ft. Traffic controls will be provided as required for access to the center. The building will have approximately 13,000 ft² of space. The addition of this facility will be a significant asset in attracting and maintaining talented R&D personnel and users of the various Laboratory facilities.

Security Perimeter Reconfiguration (ADS S97D0059) (Contingency GPP)

This project will reconfigure the existing security perimeter configuration to be more adaptable to the current and future scientific mission of the Laboratory and improve operational efficiency. The project will install guard booths at the main ingress/egress locations and establish the proper barriers to maintain the Property Protection Areas. This configuration would improve the competitive nature of the Laboratory and make the reservation more comparable to other premiere DOE laboratory facilities.

6.5 ESH&Q INITIATIVES

In addition to the projects and activities discussed in the preceding sections, several initiatives will be addressed which have not been documented on ADSs. Primary among these is the full implementation of the ORNL Integrated Safety Management System by September 30, 2000. Phase II readiness will be conducted by DOE during February of 2000. Other initiatives will include the implementation of requirements for compliance to the *ORO Chemical Operations Safety Plan* (issued September 23, 1999), findings from the *Emergency Management Program Follow-Up Review* (draft issued October 1999), and the *Fire Department Baseline Needs Evaluation Review* (closeout presentation conducted November 1999). ORNL continues to strive to be responsive to all recognized issues resulting from compliance reviews and improvement initiatives.

7. UNFUNDED COMPLIANCE ACTIVITIES

NOTE: This section contains current planning for the FY 2002 ESHQ&I Budget Formulation Submission. Additional details will be submitted in the March 2000 planning document.

The following are unfunded compliance tasks which have been identified for funding in the out-years. Significant changes to the compliance ADSs are expected in the FY 2002 Budget Formulation Document, which will be submitted March 2000. Therefore, these ADSs may not remain as the top unfunded ADSs for the out-years.

ORNL S&H Building Electrical System Upgrades (ADS P98D0019) (KC-OE)

The ORNL facilities Condition Assessment Survey identified legacy vulnerabilities from fire and electrical shock hazards principally due to aging facilities and installations which do not meet the National Electrical Code. Many of these were categorized as urgency repair code #1 - asset condition critical, urgency repair code #2 - asset condition serious, or urgency repair code #3 - asset condition degrades. Money is not available to address large electrical safety infrastructure issues under current funding programs. Therefore, a building electrical system upgrade proposal is logical and cost effective. It is essential that these needs be identified within the budgeting process. The primary areas requiring this enhanced support are (1) wiring and panelboard replacement, (2) circuit identification and removal of abandoned services, (3) upgrade of wiring to meet the National Electrical Code, and (4) motor control center upgrades.

Mitigative Actions: Electrical workers will follow safety-related work practices when performing electrical work on aging or potentially defective equipment. Facility maintenance personnel recognize that much of the electrical system and associated electrical apparatus located at the Laboratory is old and requires a higher level of care. Employees working on the equipment do so with a heightened sense of awareness and look for problems they would not normally be concerned with on newer equipment. Deficiencies found to be immediately dangerous to safety or health or property will be corrected with available maintenance funds.

Eyewash, Safety Shower, and Water System Upgrades (ADS C97D0081) (KC-GPP)

The scope of this activity includes the upgrade of water supply systems and encompasses the following:

1. Installation of safety showers and eyewashes with potable water supply.
2. Replacement of piping and associated components used to supply and remove process water.
3. Replacement of piping and associated components used for heating.

This project includes the removal and replacement of any existing eyewash stations and safety showers in the laboratories and corridors of Wings 2 and 3 of the Central Research and Administration Building, 4500N, and safety showers and eyewash stations in 4501 and 4505. To meet OSHA standards, potable water headers will be installed to supply the water for the safety shower and eyewash stations.

Mitigative Actions: The safety showers and eyewash stations in Building 4500N, 4501, and 4505 are supplied with process water. Portable eyewash stations have been installed at selected locations as an interim measure. Piping modifications are required to supply these safety showers and eyewash stations with potable water.

Fire Protection Systems Upgrade (ADS A99D0018) (KG-LI)

Fire protection systems at facilities within ORNL are increasingly demonstrating lack of reliability and degradation of system components relative to age and exposure to corrosive conditions. This line item project, which has been proposed for FY 2001, will provide the following improvements:

1. Replace antiquated fire alarm systems in seven major research buildings:
 - Isotope Technology Building, 3047
 - Instrumentation and Controls Building, 3500
 - Central Research and Administration Building, 4500N (Computer Room)
 - Radiochemical Laboratory Building, 4501
 - Experimental Engineering Building, 4508
 - Metals and Ceramics Laboratory, Building 4505
 - Central Research and Administration Building, 4500S
2. Add sprinkler protection in offices and corridors of Wings 1 - 4 in the Central Research and Administrative Building, 4500N.
3. Replace and add redundancy in the fire alarm and circuit monitoring functions of the central receiving stations.
4. Replace the 55-year-old 16-inch underground water main in the 6000 Area of ORNL with approximately 7000 ft of new lines. Associated isolation valves, pressure reducing valves, hydrants, and valve pits will be installed with the new water main.

Mitigative Actions: Although the systems are aging and becoming more failure prone, they are on a rigid inspection, testing, and maintenance schedule. Failure rates and types are recorded and accumulated. Should failure rates reach a "critical" level where negative impacts on people and property appear imminent, direct contact will be made with upper management to get funds for immediate action on an emergency basis. Routine fire protection engineering assessments, monthly building inspections, and frequency of alarms are other methods utilized to monitor systems reliability. Higher priority upgrades are being accomplished using GPP funding. See ADS C97D0071.

Asbestos Abatement, ORNL at Y-12 (ADS C97D0080) (KC-OE)

Asbestos abatement includes removing asbestos from piping and equipment, as well as replacing asbestos ceiling panels, deteriorated asbestos ceiling plaster, etc. All these items increase the cost of maintenance if repairs are required. Some rooms/areas where asbestos lines or ceiling panels have fallen (steam/water leaks) are totally closed off where HVAC units and controls are located.

Mitigative Actions: As maintenance jobs are worked that require removal of asbestos insulation and ceiling tiles, the repairs include going back with nonasbestos material. Several major problem areas are being administratively controlled with tagging and sealing off to limit access.

Remove Asbestos from Controlled Areas (ADS P98D0013) (KC-OE)

Asbestos controlled areas are areas where friable asbestos-containing insulation is deteriorated and presents a potential health hazard (employee exposure) to employees entering these areas. Personal protective equipment is required to enter these areas. Work includes the removal of friable asbestos-containing insulation via high-powered vacuum system (super sucker) and via insulation encapsulation. The targeted controlled areas are as follows: (1) Building 2000 attic, (2) Building 2001 attic, (3) Building 3550 attic, and (4) Building 2517 crawl space.

Mitigative Actions: Presently, these controlled areas have limited access from the general plant population. Workers entering these areas are required to have asbestos awareness training prior to performing any work in the area. A periodic walk-through, by a representative of the Asbestos Management Group, identifies areas needing additional attention.

ORNL H&S - Radiological/Toxicological Sabotage (ADS P98D0007) (KC-OE)

DOE Notice 5630.3A, "Protection of Departmental Facilities Against Radiological and Toxicological Sabotage," was made applicable to ORNL by inclusion of Oak Ridge Order 151.1, dated September 30, 1996, in the baseline. The order requires contractors to perform graded assessments of the risk due to sabotage with the level of hazards present in their facilities. Significant milestones would be to identify and rank hazardous materials targets, perform vulnerability assessments of credible threat and target combinations, evaluate sabotage risk reduction options, and select and implement prevention and mitigation options.

Mitigative Actions: At facilities where there are plans to modify current operations or significantly change the inventory of nuclear or hazardous materials that could cause potential adverse public health and safety impacts due to sabotage, the facility/program manager is required to provide funding for a radiological/toxicological sabotage assessment as part of the planning process.

Cooling Tower Maintenance (ADS C98D0167) (ERKCL30 (KC-OE))

Cooling Towers 2026, 3525, 4511, and 6001 are critically degraded due to age and lack of adequate maintenance. GPP funding is being requested to replace 4511 and 6001 towers; however, until the towers are replaced, extensive maintenance is required to preserve their operability and assure the safety of personnel required to periodically clean the towers and maintain fans and gearboxes. (a) 4511 is currently unusable and cannot be placed in operation until underground crosstie valves (connecting its basin to 4510 tower) are replaced. The wooden structure is deteriorating at a rapid rate under dry conditions and becomes increasingly hazardous to maintain. The stagnant basin provides fertile conditions for legionella bacteria. (b) 6001 has undergone numerous structural repairs in the last two years and currently is in need of fan control upgrades along with system and basin cleaning to improve bacteria control and operating efficiency. (c) 3525 is operated for a potentially surplus facility but is unsafe to access. Tower basin and piping leaks are also creating risk for unpermitted chlorine discharges to nearby storm drains. (d) 2026 requires a redesign of piping to eliminate overflows to the roof drain during bypass operation. Overflows increase risks for National Pollutant Discharge Elimination System permit violations and frequently shut down building cooling operations.

Mitigative Actions: Towers with structural deficiencies are inspected and repaired as necessary to minimize safety problems for maintenance workers and operators working on or around the towers. Operation of the towers (i.e., starting fans and pumps, water treatment controls) requires routine testing and monitoring by the operators and refrigeration mechanics. These towers are equipped with annunciated alarms in their respective control rooms.

Supplemental Roof Preventive Maintenance and Emergency Repairs - ERKCL30 (ADS C98D0169) (KC-OE)

Currently, leaks in roofing are causing structural failures and unsafe working conditions for the general plant population and visitors. Additional funding would permit the reduction of roof repair backlog and would permit predictive and programmed maintenance of ORNL roofing.

Mitigative Actions: Plant and Equipment Division inspects 100% of the ORNL roofs each year, and the results are communicated back to the facility managers within 45 days following the inspection. The roof inspections and communicated deficiencies are included in the LCAM performance measures for Operations and Maintenance. Roof replacement needs have been prioritized (based on asset condition and mission importance), and many of the roofs were scheduled to be replaced in FY 1999 and FY 2000 under the roofing line item.

Fire Systems Upgrade, ORNL at Y-12 - ERCKL51 (ADS C98D0181) (KC-OE)

Older ORNL facilities at Y-12 have served various occupancies and research projects. Less reliable sprinkler systems are in place to protect selected portions of these facilities. Both preaction- and deluge- (open-head) type sprinkler systems, which are maintenance intensive and substantially less reliable, were utilized for earlier occupancies and are still in use. As research emphasis shifted and occupancies changed, these systems were not updated to more reliable and minimum maintenance wet-pipe systems. Other fire systems upgrades include removal of exhaust fans, installation of fire barriers and louvers in duct systems, replacement of fire doors, replacement of illuminated exit and emergency signs, installation of emergency lighting, and installation of fixed fire suppression equipment in some of the walk-in cold rooms.

Plans are in place to relocate ORNL at Y-12 facility operations to the ORNL site. As these plans take place, the risk conditions will change at the ORNL at Y-12 facilities.

Mitigative Actions: Fire system upgrades include replacing and repairing identified fire protection issues (e.g., exit and emergency lights for egress, stairwell fire wall penetration repairs, fire door replacement or repair, sprinkler system installation, replacement of ceiling panels to comply with fire protection standards, etc.). Exit and emergency lights are checked quarterly and are replaced if required on overhead funds as part of the preventive maintenance program. Combustibles in unprotected areas are relocated by building personnel. Fire doors are repaired on building maintenance overhead funding as part of normal building maintenance. All fire protection issues are being evaluated to address the risk to building personnel. Administrative controls are in place where appropriate to limit access to areas with fire protection concerns.

Transformer Bonding, ORNL at Y-12 Facilities ERKCL51 (ADS A99D0031) (KC-OE)

During routine electrical inspections in some of the Y-12 facilities, a problem was identified in several transformers. The transformers are building transformers which have a neutral on the secondary side. Per the National Electrical Code, the transformer shall have a bonding jumper between the neutral and the grounding electrode conductor, which is also bonded to the equipment enclosure. The transformers did not have the required bonding jumper. Scope of work would include having electricians walk down facilities and correct any transformer bonding issues found. This would include at least Buildings 9201-3, 9204-1, 9204-3, 9210, and 9201-2. The transformers support both research projects and building maintenance activities.

Mitigative Actions: Corrections will be initiated as part of the present electrical maintenance program until additional funding is available to permit a concentrated effort to correct the bonding issue.

Lockheed Martin Transportation and Packaging Management Facility (ADS S97D0058) (KC-GPP)

The new Lockheed Martin Transportation and Packaging Management (LMTPM) Organization facility is to be utilized by all LMTPM employees at ORNL. LMTPM personnel are located in three facilities: Building 3036 in Isotope Circle houses packaging engineers, chemical operators, and a material assistant; Building 7001 houses primarily traffic and shipping personnel, but also has packaging and Quality Assurance employees; Building 6026G houses transportation management, packaging engineers, and compliance personnel. Besides improving the effectiveness and efficiency of the entire LMTPM operation at ORNL, the primary need for the new LMTPM facility is to relocate LMTPM personnel in Building 3036 and return Building 3036 to the Chemical Technology Division.

Mitigative Actions: LMTPM follows ES&H standards and procedures in ensuring compliance in relation to fixed-contamination controls. Such controls include, but are not limited to, conducting weekly health physics surveys for operations and office areas, green-tagging operational items (i.e., containers, equipment) before entering the facility, and conducting an annual integrity survey for wearing/thinning paint.

Beryllium Survey (ADS P99D0001) (KC-OE)

This task is necessary due to the increasing concern focused by the DOE on occupational exposure to beryllium. DOE Notice 440.1, "Interim Chronic Beryllium Disease Prevention Program", issued on July 15, 1997, enhances and supplements other worker protection programs with hazard-specific provisions designed to manage and control beryllium exposure hazards in the workplace. This interim Notice was issued in order to direct immediate action for protecting workers while rulemaking efforts continue. The provisions in Notice 440.1 necessitate a program directed at determining the location of beryllium and assessing the hazard potential.

Mitigative Actions: Activities have been initiated to verify the ORNL Baseline Beryllium Inventory. Any additional information gathered during the verification process will be added to the baseline inventory. This information will be used to identify exposed and potentially exposed workers by location, gather exposure assessment information, and develop sampling protocols.

Water System Upgrades, 1000 Area (ADS A98D0009) (KC-GPP)

This project will provide a needed infrastructure upgrade for the potable water system in the west end of the ORNL complex. Presently, this area is supplied by a single feed of 6- and 8-in. water mains. This project will install approximately 3000 ft of 16-in. main to the west end of the ORNL complex along with the associated pressure reducing valves, isolation valves, fittings, hydrants, and valve pits.

Mitigative Actions: Though provided by a single line, fire protection water for the facilities located in the 1000 Area is adequate. Any impairment on supply lines will be repaired as quickly and efficiently as possible while fire protection personnel stand by on fire watch at the affected facilities.

Water System Upgrades, 7600 Area (ADS A98D0010) (KC-GPP)

This project will provide a needed infrastructure upgrade for the potable water system in the east end of the ORNL complex. This project will install approximately 9000 ft of 16-in. main to the 7600 Area at the far east end of the ORNL complex along with the associated isolation valves, fittings, hydrants, and valve pits.

Mitigative Actions: Though provided by a single line, fire protection water for the facilities located in the 7600 Area is adequate. Any impairment on supply lines will be repaired as quickly and efficiently as possible while fire protection personnel stand by on fire watch at the affected facilities.

4511 Cooling Tower Replacement (ADS A98D0016) (KC-GPP)

Cooling Tower 4511 is degraded due to age and cannot be used. GPP funding is being requested to replace the cooling tower.

Mitigative Actions: The peak cooling load for the 4500 Area in the summer months is approximately 5800 tons. The 4510 cooling tower (4800 tons) and the 4521 cooling tower (2000 tons) have 1000-ton space capacity at peak loads. However, if either tower is out of service, the peak level cannot be met. In the event of an outage at peak load, load shedding would be initiated in order to maintain service to the most critical facilities, such as the super computer facility. In general, major maintenance activities for either 4510 or 4521 are accomplished in the low load season (late fall, winter, and early spring).

ORNL Safety and Health - OSHA Regulatory Compliance (ADS P98D0021) (KC-OE)

ORNL's goal of identifying and correcting all serious OSHA noncompliances (RAC 1s and RAC 2s) and 100% of all previous other-than-serious noncompliances (RAC 3s) has resulted in compliance funding requirements far beyond that which current programs can fund. Funding is not available to address large OSHA noncompliance issues. This activity is proposed to upgrade ORNL facilities and programs to achieve compliance with OSHA standards. The primary areas requiring the enhanced support are (1) continued assessment of OSHA noncompliances to evaluate and select compliance alternatives and define and prioritize abatement plans and (2) corrective actions for noncompliances with emphasis on serious and medium-risk noncompliances. A past survey identified OSHA noncompliance issues. Since that time, continued inspections and recent surveys have specifically identified and quantified many noncompliances by subpart. Significant additional out-year expense and capital funding will be required to provide upgrades of ORNL facilities and programs to a level of worker health and safety equivalent to OSHA requirements. In addition, programs would be established to ensure the maintenance of this level of worker safety and health protection.

Mitigative Actions: All serious noncompliances (RAC 1s and 2s) are corrected within 24 hours. All other than serious noncompliances are corrected within 90 days, or administrative controls are implemented to ensure that employees are safe.

ORNL Facility Asbestos Survey (ADS P98D0026) (KC-OE)

Approximately 60% of the facilities located at ORNL have been surveyed for the identification of asbestos. This program will provide funding to complete the asbestos survey for the remaining 40% of the buildings within the ORNL facility.

Mitigative Actions: The only records from the previous surveys are located in the Asbestos Program office. This information is contained in about 90 spiral-bound volumes. Requests for new work require a visit to the area and sampling by a member of the Asbestos Management Group. These samples are recorded in the program office for future reference.

Upgrade Electrical Systems, 3019, 3025, 3500 (ADS C97D0069) (KC-GPP)

This project will replace obsolete and inadequate switchgear and transformers at the main electrical service entrances to these buildings. These electrical devices are the control points for the main electrical systems in each of these facilities. Much of this equipment has been in service for 50 years and must be replaced to ensure reliable electrical service to the customers and provide a safe environment for building occupants, system operators, and maintenance personnel.

Mitigative Actions: Electrical service is provided to these facilities through 50-year-old service entrances and other aged equipment. In most facilities, this equipment is serviceable and will remain reliable as long as it is properly maintained. All new loads on facility electrical systems are reviewed for possible impacts on these older services. Facility maintenance personnel recognize that many of the electrical systems are old and require a higher level of care.

Upgrade Electrical Systems, 6000 and 7000 Areas (ADS C97D0070) (KC-GPP)

This project will replace obsolete and inadequate switchgear, transformers, and motor control centers at the main electrical service entrances to these buildings. These electrical devices are the control points for the main electrical systems in each of these facilities. Much of this equipment has been in service for 50 years and must be replaced to ensure reliable electrical service to the customers and provide a safe environment for building occupants, system operators, and maintenance personnel.

Mitigative Actions: Electrical service is provided to these facilities through 50-year-old service entrances and other aged equipment. In most facilities, this equipment is serviceable and will remain reliable as long as it is properly maintained. All new loads on facility electrical systems are reviewed for possible impacts on these older services. Facility maintenance personnel recognize that many of the electrical systems are old and require a higher level of care.

Electrical Upgrade, ORNL at Y-12 - ERKCL51 (S97D0036) (KC-OE)

Electrical upgrades include (1) replacing lighting center, (2) restoring 480V electrical systems, (3) replacing crane feed rails, (4) upgrading switchgear areas, and (5) upgrading intercom/radio system.

Mitigative Actions: During FY 1998, \$100K from building overhead funds was allocated to replace and perform preventive maintenance on deteriorated 480V breakers. Preventive maintenance will continue to be performed on breakers to avoid damage to the equipment as part of the building maintenance program.

Nuclear Criticality Safety Program: O 420:1 Upgrade (ADS P98D0003) (KC-OE)

Section 4.3 of DOE Order O 420.1 has been adopted as the principal Nuclear Criticality Safety (NCS) Work Smart Standard requirement for LMER. This proposal requests the additional funding, above that provided to base LMER NCS Program, that is required to bring LMER into compliance with O 420.1.

Mitigative Actions: A revised O 420.1 Section 4.3 Implementation Plan was submitted to DOE-ORO by LMER January 13, 1999. It points out that Field Work Proposal ERKCL10 has been submitted to fund developing a program to detect accumulations of fissionable material and to improve the surveillance of facilities with fissionable materials as required by 4.3.3.i.

Upgrade 480V Breakers at ORNL Facilities ERKCL51 (ADS A99D0029) (KC-OE)

The scope of this work involves upgrading and performing overdue preventive maintenance on aged 480V breakers in several ORNL at Y-12 facilities. The average pass due preventive maintenance is between 5-20 years. Because of the age of the existing breakers, they need to be upgraded with full function solid-state trip units. The preventive maintenance should also include cleaning, tightening, and testing of the switchgear. Buildings with these breakers includes 9201-3, 9207, 9210, and 9201-2. The breakers support both research projects and building maintenance activities.

Mitigative Actions: During FY 1998 and FY 1999, a total of \$125K from building overhead funds was allocated to replace and perform preventive maintenance on deteriorated 480V breakers. Preventive maintenance will continue to be performed on breakers to avoid damage to the equipment as part of the building maintenance program.

Replace Building 9401-1 Switchgear 322 (ADS A99D0030) (KC-GPE)

The scope of this work involves replacing an aged and deteriorated switchgear servicing offices and research areas in Building 9401-1, Engineering Technology Division, Motor Testing Facility. Job scope includes removal, disposal, and replacement of old switchgear and replacing it with a drawout type switchgear with solid-state trip elements.

Mitigative Actions: During FY 1999 a total of \$8K from building overhead funds was allocated to replace and perform preventive maintenance on deteriorated 480V breakers in this facility. Preventive maintenance will continue to be performed on breakers to avoid damage to the equipment as part of the building maintenance program.

HVAC HCFC 50-Pound Replacements (ADS A98D0119) (KC-GPE)

The scope of this work involves replacing deteriorated air conditioning equipment normally containing more than 50 pounds of refrigerant and subject to leaks which exceed the allowable 15% leak rate. Since Class I ozone-depleting refrigerants [chlorofluorocarbons (CFCs)] are being replaced under a separate ADS, this category will be geared to replace older Class II refrigerant systems [hydrochlorofluorocarbons (HCFCs)]. HCFC refrigerants are recovered from the machines as they are replaced and reused in operating units. Job scope includes removal and replacement of old units, electrical starters, and subsequent electrical, piping, and sheet metal tie-ins. The 7910 chiller is currently using makeup water for 7920 HFIR tower for condenser cooling.

Mitigative Actions: P&E will continue to repair refrigerant leaks to remain in compliance. The EPA rule for leak repairs (>15%) requires that the leaks be repaired within 30 days of discovery of the leak or 30 days from when the leak should have been discovered. Parts for old and obsolete machines are frequently not off-the-shelf items. If the leaks cannot be repaired within 30 days: (1) a Retirement Plan must be filed with EPA granting a one-year replacement period or (2) the unit must have the refrigerant removed and taken out of service.

8. EXECUTION OF RESOURCES

One common method will be initiated for tracking the execution of resources applied for ESHQ&I remediation activities and the change control process. ORNL has an integrated ESHQ&I management planning system. Along with this integration is a programming bridge to PMTS. Managers are responsible for entering overhead funding requests and FWP requests for direct funding into PMTS. PMTS provides data electronically to complete the corresponding ADS. Managers verify information and are responsible for tracking and updating information. The ESHQ&I Program Administrator monitors PMTS to ensure updated ADS information. The administrator verifies changes with the contractor manager prior to changing the database. Finance and Budget Division personnel are the only individuals who can give authorization for PMTS tasks prior to submitting information to ORNL management for resource allocations of overhead funds or for issuing an FWP to DOE. Planning information for GPPs, GPEs, and LIs is entered directly into the ESHQ&I Management Plan Information System database through the WWW. The ORNL Capital Assets Manager verifies all submitted GPE, GPP, and LI ADSs.

9. CHANGE CONTROL

The identified projects and planned costs in Section 6 reflect ORNL's commitment to meeting the requirements of DOE-LMER Management Contract I.71 DEAR 970.5204-2 Paragraph C at this time. Changing circumstances and requirements over the course of FY 2000 may necessitate revision of this plan. The Laboratory overhead, GPP, and GPE budgets and projects are approved by the DOE ORNL Site Manager.

Significant changes to these budgets will be submitted to the DOE ORNL Site Manager for concurrence. The ESHQ&I Management Plan Information System will be revised to reflect changes and updated on the World Wide Web as they occur.