Ames Laboratory
Integrated Safety Management System Description

The Ames Laboratory Integrated Safety Management System Description documents the primary systems, programs, plans, policies, and processes employed to support the principles and functions of the Department of Energy's Policy P450.4 *Safety Management System Policy* and Executive Order 13148, *Greening the Government Through Leadership in Environmental Management.*

Comments and questions regarding this plan should be directed to:

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Sign-off Record:

Approved by: Tom E Wessels — Environment, Safety, Health & Assurance — Date: 12-10-04

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Approved by: [illegible] — Science and Technology Division Director — Date: 12/14/04

Approved by: Bruce Harmon — Deputy Director — Date: 12/14/04

Approved by: [illegible] — Laboratory Director — Date: 12/14/04

Ames Laboratory Integrated Safety Management System

Policy Statement

(Policy 10200.010, Revision 0)

Ames Laboratory has a strong commitment to the safety and health of each Laboratory employee. The Laboratory is equally committed to preventing accidental loss of resources and assets and protecting the general public and the environment, through pollution prevention, property loss or damage to the environment. Therefore, it is our goal to eliminate foreseeable hazards and maintain a safe and healthful workplace through continual improvement. In addition, complying with applicable Laboratory Work Smart Standards, Department of Energy Orders and regulatory standards is a prerequisite for doing Laboratory business and the responsibility of each employee.

In order to accomplish these goals, the Laboratory has incorporated the principles of Integrated Safety Management (ISM) and the practices of an Environmental Management System (EMS) into an Integrated Safety Management System (ISMS). Our Integrated Safety Management System provides mechanisms to ensure that we incorporate safety and environmental management into all aspects of our work, from planning to completion.

Each employee must participate through compliance with the Laboratory's ES&H requirements. Each level of line management has the responsibility to consider the impacts of their activities on the environment and workplace, and to support the performance and continuous improvement of effective safety and environmental practices, such as pollution prevention. This "team" effort is necessary to achieve a safe and productive research laboratory.

Dr. T.J. Barton, Director
Ames Laboratory

1.0 Revision/Review Log

This document will be reviewed once every two years as a minimum.

Revision Number	Effective Date	Contact Person	Pages Affected	Description of Revision
0	2/1/99	T. E. Wessels	All	Original draft
1	7/1/99	T. E. Wessels	numerous	Reviewed, modified and approved revision
2	10/1/99	T. E. Wessels	several	Minor changes to reflect Pre-Verification report.
3	2/1/02	T. E. Wessels	most	Minor content updates, G://\Doc &Recs\DCP\Revision Description\ Plan 10200.016 ISM Description rev 3 desc
4	12/31/04	T.E. Wessels	All	G:\\Docs&Rec\DCP\Revision Description\ Plan 10200.016 ISM Description rev 4 desc.

2.0 Purpose and Scope

This document addresses Ames Laboratory's efforts to perform work according to a Safety Management and Environmental Management System in support of the principles and functions described in the Department of Energy's Policy P450.4 *Safety Management System Policy* and Executive Order 13148, *Greening the Government Through Leadership in Environmental Management.* These two systems are the Laboratory's Integrated Safety Management System (ISMS). The Laboratory's Integrated Safety Management System is required by Article 72 of the Ames Laboratory Contract (DEAR 970.5204-2 *Integration of Environment, Safety and Health into Work Planning and Execution*). The Laboratory's Environmental Management System (EMS) is required by Executive Order 13148, *Greening the Government Through Leadership in Environmental Management.*

This document provides a road map of the Laboratory's policies and practices that establish an environment where safety activities and functions are an integral part of the Laboratory's mission. It describes the principal safety programs and practices that provide a safe and healthful work environment for the protection of workers, the public and the environment. This document does not address all of the Laboratory's safety or environmental related requirements.

Within the context of this Integrated Safety Management System Description the term "safety" is defined to encompass environment, safety and health (ES&H), including pollution prevention considerations.

3.0 Background

In 1997, Ames Laboratory initiated a systematic approach to the development of a documented Integrated Safety Management System through planning discussions among the DOE-CH Ames Site Office, the DOE-CH Technical and Administrative Services Group and the Ames Laboratory's Environment, Safety, Health and Assurance office.

The Ames Laboratory Integrated Safety Management (ISM) System was reviewed through an ISM Self-Assessment in 1997, an ISM Pre-Verification Assessment in July 1999 and a ISM Verification in November 1999. Although all reviews noted areas for improvement, each review cited significant areas of noteworthy practices and a safety culture consistent with the principles and functions of Integrated Safety Management. The Laboratory accepted the results of the ISM related assessments and proceeded immediately to address the opportunities for improvement and the issues related to an identified deficiency. The Ames Site Office and the DOE-CH manager granted approval of the Ames Laboratory's Integrated Safety Management System in 2000.

Executive Order 13148 requires federal facilities to have an EMS implemented by December 31, 2005. At the request of the Laboratory the Environmental Protection Agency Region VII conducted an Environmental Management Review (EMR) (a.k.a "Gap" Analysis) in December 2002. International Organization for Standardization (ISO) 14001:1996, *Environmental Management Systems,* was used by the EPA to evaluate the Laboratory's Environmental Management System (EMS). The review identified recommendations and corrective actions that needed to be completed in order to comply with the ISO14001:1996 standard. The Laboratory accepted all applicable recommendations and incorporated them into this document and related Laboratory plans, policies, procedures and practices. The Laboratory has declared that it has an EMS that is fully integrated with its ISMS (See attached form 10200.161, *Environmental Management System Self-Declaration Statement*).

The feedback and improvement mechanisms of the Laboratory's ISMS, including the annual self-assessment reporting requirements, the annual Site Environmental Report, and the Ames Site Office operational observations, continue to be the basis for ISMS process improvements.

4.0 Introduction

The Ames Laboratory has a history of an organized, supportive safety culture built upon sound safety practices and open communication of safety concerns among all levels of line management. This culture and consistent management commitment prove to be a sound foundation for an Integrated Safety Management System.

The final Ames Laboratory ISMS Verification Report included several complimentary descriptions of the Laboratory's safety culture, but the real test of an Integrated Safety Management System (ISMS) is the level of understanding of safety principles and

responsibilities by the general employees. The ISMS Verification Report had the following to say about employee awareness of ES&H principles and practices at Ames Laboratory.

> "Laboratory areas were found to be well organized with respect to ES&H. Laboratory-wide ES&H procedures establish the foundation of ES&H performance in the Laboratory organizations. Communication between employees and management was demonstrated to be open from the lowest task levels through top management. In all cases, employees felt that open discussion of ES&H issues with management was encouraged, and management was supportive of maintaining a safe workplace. Employees were found to be well educated in ES&H topical areas, and knowledgeable of the ES&H issues relevant to their work. Employee participation in mandatory Laboratory ES&H training, applicable to the hazards associated with their work, was confirmed through record review."

The following description details the primary systems and mechanisms that form the backbone of the Ames Laboratory Integrated Safety Management System.

5.0 Integrated Safety Management System

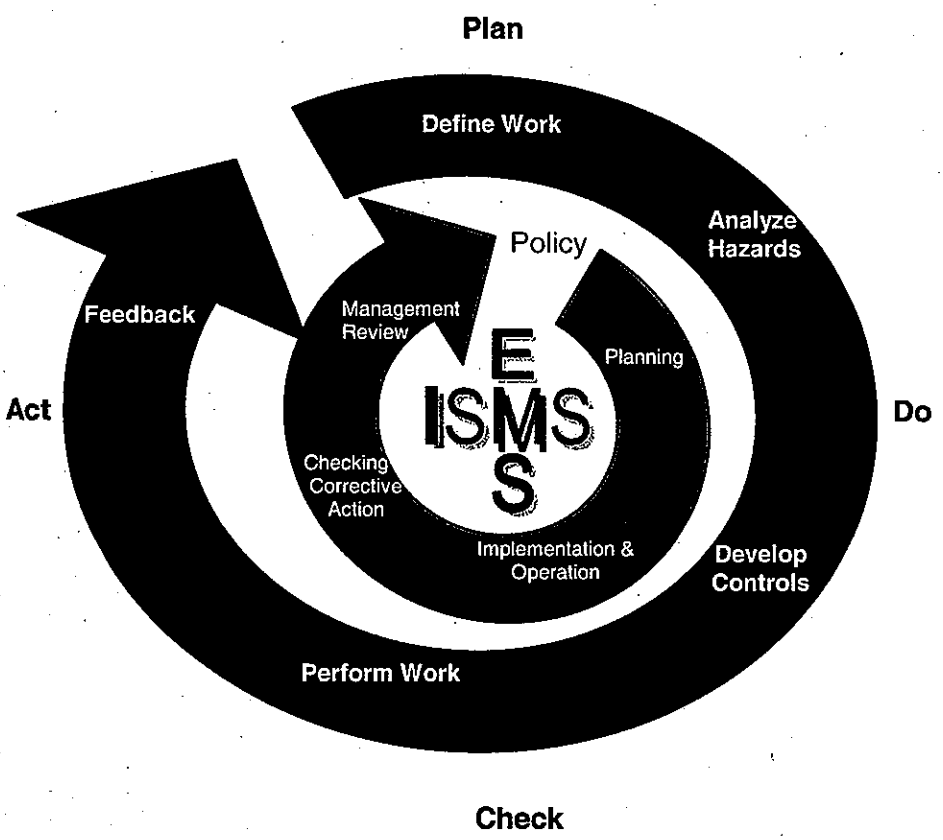
The Ames Laboratory has integrated safety into all levels of management and work practices so that the Laboratory's mission is accomplished while protecting workers, the public, and the environment. This objective is fulfilled through a system of programs, policies, procedures and practices based on the Guiding Principles of Integrated Safety Management. These Guiding Principles are:

- Line Management Responsibility for Safety
- Clear Roles and Responsibilities
- Competence Commensurate with Responsibilities
- Balanced Priorities
- Identification of Safety Standards and Requirements
- Hazard Controls Tailored to Work Being Performed
- Operations Authorization

Ames Laboratory work activities that can potentially affect workers, the public or the environment are defined, analyzed, developed, performed and reviewed according to the Laboratory's ES&H programs and practices. These work activities are subject to the Core Functions of Integrated Safety Management with the degree of rigor appropriate to address the type of work activity and hazards involved.

The Ames Laboratory's programs, policies, procedures, and practices are the mechanisms through which the ISMS functions. These mechanisms ensure compliance with standards described in the Ames Laboratory Contract. The Laboratory's programs, policies, procedures and practices also define responsibilities and provide implementation guidance according to and sufficient with the hazards associated with the work activity being performed.

The Laboratory utilizes a "Plan-Do-Check-Act" approach to work activities. This "Plan-Do-Check-Act" approach is fundamental to scientific processes, business processes and safety processes. The Core Functions of the Laboratory's Integrated Safety Management System are essentially the "Plan-Do-Check-Act" cycle applied to the integration of safety into planning and work performance. The Core Functions of the Integrated Safety Management System are illustrated in respect to a typical "Plan-Do-Check-Act" cycle as follows.



Key safety mechanisms (programs, policies, procedures and practices) of the Ames Laboratory's Integrated Safety Management System are described in the following sections. Often these mechanisms address several of the principles and functions of ISM and EMS and therefore some repetition exists within the following description.

5.1 Define the Scope of Work

"Define the Scope of Work" refers to the actions of translating the work idea into the planned tasks. It includes the definition and prioritization of the tasks, the initial scoping and the allocation of resources with particular emphasis of the principle of balanced priorities. The Laboratory's mechanisms for addressing this core function are performed at various organizational levels.

At the institutional level the fundamental mechanism for definition of work at Ames Laboratory is the GO/CO contract, ***Contract No W-7405-ENG-82***. The contract provides the general guidance for operation of Ames Laboratory. The ***Ames Laboratory Institutional Plan*** provides additional information regarding the Laboratory's mission, strategic plan, core businesses, critical success factors and resource projections. The scope of the Laboratory's overall activities was assessed in 1996 through the ***Necessary and Sufficient Process,*** which produced the Ames Laboratory ***Work Smart Standards***. In 2001 the Laboratory's work processes were reviewed and an updated Work Smart Standards set was generated.

The ***Environmental Aspects Procedure (Procedure 10200.75)*** is used to list, rank and prioritize the Laboratory's environmental aspects. Although this procedure was developed to initially identify the Laboratory's significant aspects, the ***Readiness Review Procedure (Procedure* 10200.010)** is a mechanism that also identifies environmental aspects.

Definition and prioritization of tasks, the initial scoping and the allocation of resources for research projects and support functions are achieved according to several mechanisms. These mechanisms include the ***Unified Field Budget and Work Authorization Systems (WAS) Call,*** the ***Preliminary Proposal Form (Form 10100.001),*** the ***Laboratory Directed Research and Development*** process, the ***ESH&I Management Plan***, and the ***Incremental Budget Request (Form 58100.012).*** Activities associated with research and support function projects are reviewed according to the procedure for ***Readiness Review (Procedure 10200.010)*** and ***NEPA Procedure (Procedure 46400.033)***. Specific requests for service work are documented according to the ***Service Order Requisition (Form 46200.036).***

The planning and fulfillment of human resource needs are achieved through the ***Professional and Scientific Position Information Questionnaire (PIQ)***, and the ***Position Description Questionnaire (PDQ)*** in conjunction with the ***Needs Assessment Procedure (Procedure 10200.029)***. A network of Safety Coordinators and Representatives is maintained at Ames Laboratory to facilitate communication on workplace health and safety and environmental protection issues between Program/Department offices and the Environment, Safety, Health and

Assurance (ESH&A) office. The special safety related roles and responsibilities of these positions are described in the ***Safety Coordinator and Representative Position Descriptions (Forms 10200.090 and 10200.091)***.

The ***Training Needs Questionnaire (Form 10200.030)*** is utilized to document individual training needs for each employee. Subcontract placements and changes are addressed through the Laboratory's ***Procurement Policies and Procedures Manual (Manual 58300.001)***.

The ***Visitor Safety Guide (Guide 10200.001)*** provides guidance on the safety requirements for visitors and vendors. Additional safety policies, programs, and practices and the related responsibilities are described in the ***Environment, Safety, Health and Assurance Program Manual (Manual 10200.002)***.

5.2 Analyze the Hazards

"Analyze the Hazards" refers to the actions of identifying, analyzing and categorizing the hazards associated with work. It includes the analysis of hazards at the institutional level as well as the analysis of hazards at the activity level.

During 1996 the Ames Laboratory, with participation from the DOE Chicago Operations Office, undertook an analysis of the work performed at Ames Laboratory according to the ***Necessary and Sufficient Process***. A review of the Laboratory's work process, hazards and associated standards was conducted in 2001. This process produced an updated ***Work Smart Standards*** set. In 1992, 1994 and 1998 the Laboratory utilized emergency management consultants to conduct ***Hazard Assessments*** of the activities performed at Ames Laboratory. These assessments provide a technical basis for emergency planning and safety management activities at the institutional level such as the ***Emergency Plan (Plan 46300.001)*** and the ***Site Security Plan (Plan 10200.007)*** and the ***Waste Management Contingency Plan*** **(Plan 10200.017)**.

The analysis of hazards and environmental impacts associated with specific activities is initially performed by personnel within research groups and departments. An ***Activity ES&H Hazard Identification Checklist (Form 10200.003)*** has been developed by the Laboratory's ***Safety Review Committee*** to document the identification of environmental impacts and hazards. Group Leaders and Department Managers advise activity supervisors on analysis of environmental impacts and hazards. Activity supervisors are also encouraged to seek assistance from Safety Coordinators and Representatives as described in the ***Safety Coordinator & Representative Program (Plan 10200.009)***. Safety Coordinators and Representatives are required and group leaders are encouraged to take ***Hazard Identification Training (AL-130)*** to supplement their hazard identification skills. Additional assistance is available through engineering and safety specialists within the Engineering Services Group (ESG), ESH&A and Facilities Services Group (FSG). The formal review of activities is conducted according to the procedure for ***Readiness Review (Procedure 10200.010)*** before the initiation of new or significantly modified activities and before the activity's five year anniversary

In addition to the hazard reviews associated with activities, hazards associated with specific employee positions are reviewed and documented through ***Hazard Inventory/Job Task Analysis (HI/JTA) (Forms 466001.021 and 466001.002)*** as part of the hiring process for new employees. ***Service Order Requisition*** reviews by ESH&A and service providers are utilized, as necessary, to identify hazards for work conducted and documented as part of the ***Service Order Requisition (Form 46200.036)*** process. An ESH&A specialist's attendance at FSG planning meetings also facilitates the analysis of work hazards.

Specialists conduct additional reviews of procurement events. ESH&A specialists conduct reviews of procurements as part of the ***Chemical Management Program (Manual 46400.004)***. This information assists in the identification of hazards and potential environmental implications associated with procured items. Additionally, Engineering Services Group performs review and inspection activities as described by the ***Procurement Quality Procedure (Procedure 46200.003)*** to identify and address quality and safety concerns.

5.3 Develop and Implement Hazard Controls

"Develop and Implement Hazard Controls" applies to the processes whereby applicable standards and requirements are identified and agreed-upon, controls to prevent and mitigate hazards are identified, the safety envelope is established and controls are implemented.

The Laboratory's ***Work Smart Standards*** form the basis for the safety management documents at the Ames Laboratory, such as: ***Environment, Safety, Health & Assurance Program Manual (Manual 10200.002), Chemical Hygiene Plan (ISU EH&S), Radiation Safety Manual (10202.001), Waste Management Program Manual (10200.003),*** and the ***Electrical Safety Manual (46200.001).*** Associated training modules are developed and documented according to the requirements of the procedure for ***Training Module Development (Procedure 10200.002).***

Hazard Controls for specific activities are initially selected and developed within research groups and departments. Group Leaders and Department Managers provide assistance to Activity Supervisors as part of the typical mentoring relationship. Also, Activity Supervisors and Group Leaders are encouraged to seek assistance from Safety Coordinators/Representatives as described in the ***Safety Coordinator & Representative Program (Plan 10200.009)*** and from safety specialists in the ESH&A office. Formal reviews of activities are conducted according to the procedure for ***Readiness Review (Procedure 10200.010)*** for new or significantly modified activities and at a five-year cycle for on-going activities. Formal activity reviews provide a forum for the activity supervisor, group/department personnel, safety specialists and engineering professionals to discuss the hazards associated with the activity, review the applicable standards, detail the required control mechanisms and establish the related safety envelope.

Emergency planning activities at the institutional level are documented in the ***Emergency Plan (Plan 46300.001)***. The emergency planning activities are based on information developed through contracted ***Hazard Assessments*** of the Laboratory's activities and facilities.

Visitor safety requirements are established according to the hazards encountered while involved with the Laboratory's activities. Guidance for visitors is provided through the ***Visitor Safety Guide (Guide 10200.001).***

5.4 Perform Work within Controls

"Perform Work within Controls" relates to confirmation and authorization of readiness to perform activities before work is conducted, and to the performance of work according to agreed upon conditions and requirements.

The primary mechanism for authorization of work at Ames Laboratory by the DOE is the GO/CO contract, ***Contract No W-7405-ENG-82***. The primary DOE process for confirmation that work is performed according to agreed upon conditions and requirements is the ***Ames Site Office Operational Surveillance Program Standard Operating Procedure***.

Approval and authorization of specific activities is accomplished through ***Readiness Review (Procedure 10200.010)*** for new or significantly modified activities and for on-going activities on a five year cycle. These procedures require approvals by the Group/Section Leader, Program Director/Department Manager, ESH&A Lead Specialist and a member of the Safety Review Committee. These approvals are documented on the ***Readiness Review Activity Approval Form (Form 10200.004)***. Approval from the Ames Laboratory Director is required for ES&H Hazard Level III activities. The formality and rigor of the activity review process and the extent of documentation is dependent upon the hazard and complexity of work related to the activity. A Safety Analysis Document (SAD) is prepared for ES&H Hazard Level III activities. This document is forwarded to the DOE Ames Site Office Manager and the Iowa State University EH&S Director.

Activity reviews allow for ***Developmental Approval*** at which time the specific conditions and requirements, including safety controls and documentation, are delineated. Once the agreed upon conditions and requirements are met the activity review is finalized through ***Operational Approval*** by the Safety Review Committee. The level and rigor of documentation related to activities, such as procedures, and training are determined according to the level of hazards and complexity of the work. Documentation may consist of general instructions for equipment operation, ***Group/Department process, activity or safety documents***, or formal procedures prepared according to the procedures for ***Writing Formal Procedures (Procedure 10200.001)***.

The ***Service Order Requisition (Form 46200.036)*** is utilized to document the approvals and the safety review related to in-house service work.

The Group Leader or Department Manager with management responsibility for the task being performed grants visitor and vendor work approvals. Guidance for visitors is provided through the ***Visitor Safety Guide (Guide 10200.001).***

5.5 Provide Feedback and Continuous Improvement

Ames Laboratory utilizes several mechanisms to ensure appropriate feedback and continuous improvement efforts are carried-out. The most important and effective process for identification and correction of deficiencies is the observation of individual employees. Employees are charged with the responsibility of continuously assessing their individual performances and their workspaces in order to prevent problems and to identify nonconforming conditions and opportunities for improvement. A ***Worker Observation Guide (Guide 10200.003)*** is available to assist workers in the observation of activities within office spaces and laboratory/shop spaces. Employees are empowered, through the ***Stop Work Authority Policy (Policy 10200.005)***, to initiate stop work where there is the apprehension of serious injury, impairment of health or adverse impact to the environment. Resolution of concerns should occur at the level of line management most directly responsible for the activity. If the issue cannot be resolved at this level, the employee is directed to proceed within his/her line management structure or to report the concern to the Environment, Safety, Health and Assurance (ESH&A) office as part of the ***Employee Safety Concerns Program (Plan 10200.008)***. During ***General Employee Training (GET)*** all employees are apprised of these rights and responsibilities and the right to contact DOE directly.

Ames Laboratory has developed a network of Safety Coordinators and Representatives to facilitate communication on workplace health, safety and environmental protection issues between Program/Department offices and the ESH&A office. Responsibilities and requirements are described in the ***Safety Coordinator & Representative Program (Plan 10200.009)***. Safety Coordinators and Representatives may be involved in group-specific walk-through and surveillance activities. Also, Safety Coordinators are usually responsible for ***Program/Department Walk-Throughs (Procedure 10200.014)***. Issues identified through Group and Program/Department feedback efforts are generally resolved within the respective organizational unit. Program/Department offices are encouraged to communicate unresolved safety issues to the ESH&A office.

Additional safety reviews are conducted by programs administered through the ESH&A office. ***Independent Walk-Throughs (Procedure 10200.021)*** are performed for each Program/Department on an annual basis. The Independent Walk-Through team includes a member of the Executive Council. Ames Site Office and/or DOE-CH generally participate in these walk-throughs. A corrective action database is utilized to track and document close out of concerns. ***ESH&A Topical Appraisals***, such as Inspections and Surveys of Analytical X-ray Systems, are conducted by ESH&A specialists on a periodic basis.

The ESH&A office provides assistance to Programs/Departments for ***Subcontractor Oversight (Procedure 10200.046)*** activities.

A review of an approved activity's operation is performed after five years according to the requirements of ***Readiness Review (Procedure 10200.010)***. Safety and engineering specialists perform this review, with approval by the chair of the Safety Review Committee.

Personal ES&H performance is addressed through supervisor interactions and an ***Annual Performance Review (Form 58200.001)*** as part of the ***Ames Laboratory Performance Review and Planning System***. Group Leaders, Program Directors and Department Managers are responsible for safety related performance measures as communicated through the ***Safety Performance Measures Policy (Policy 10200.007). Guidelines for Safety Performance Evaluations (Guide 10200.002)*** are provided to assist supervisors in reviewing an individual's safety performance during the annual performance review.

Incident and accident information is developed according to the requirements of the procedure, ***Accidents, Incidents & Employee Safety Concerns: Classification & Investigation (Procedure 10200.038).*** Occurrence reporting is achieved according to the ***Event Reporting Program (Plan 40000.001)***. Corrective Action Plans are developed according to the requirements of ***Corrective Action Development (Procedure 10200.039).*** Lessons learned from internal and external events are distributed according to the elements of the ***Lessons Learned Program Implementation Plan (Plan 10200.020).***

The **Citizens Advisory Group (CAG)** is informed of Laboratory activities past and present that have an impact on the community. These stakeholders have an opportunity to respond to the Laboratory's activities. The CAG as well as state and federal officials are sent the Laboratory's annual **Site Environmental Report** (SER). The SER is a yearly update of the Laboratory's environmental status and provides a feedback form for readers to respond back to the Laboratory.

Information from the various feedback mechanisms described above is reviewed according to the procedure for ***Trend Analysis of ES&H Concerns (Procedure 10200.041).*** This review is included as part of an annual self-assessment process as detailed in ***Appendix B, Performance Objectives and Measures (Contract No. W-7405-ENG-82).*** Significant institutional issues derived from Type A and B Investigations, from DOE program initiatives and from DOE surveillance activities are addressed by corrective action plans and tracked.

Management review is conducted annually at a minimum by the Laboratory's Executive Council which is appraised, of the status of the Laboratory's objectives and targets for the Laboratory's significant environmental aspects.

6.0 Post Performance Activity

On-going surveillance activities of Ames Site Office, DOE-CH and Ames Laboratory Management provide measurement of the effectiveness of the Ames Laboratory ISMS. Annual mid-year and year-end Ames Laboratory Performance Reports provide documentation of ISMS and EMS program efforts.

7.0 Additional Information

- Additional program information that supports the Ames Laboratory's Integrated Safety Management System is available in the ESH&A Program Manual (10200.002).
- Form 10200.161, *Environmental Management System Self-Declaration.*

ENNVIRONMENTAL MANAGEMENT SYSTEM

SELF-DECLARATION

Ames Laboratory-DOE declares that it has an environmental management system that is fully integrated with its integrated safety management system and meets the requirements of **Executive Order 13148, *Greening the government Through Leadership in Environmental Management*.** This integrated management system provides Ames Laboratory with the means to meet or exceed compliance with applicable environmental, public health and safety and resource protection laws, regulations and DOE requirements. In making this declaration, I have relied on the following: The Environmental Management Review conducted by the Environmental Protection Agency Region VII, ISM assessments and reviews, ESH&A personnel and open communication of safety concerns among all levels of line management.

Dr. T.J. Barton, Director
Ames Laboratory

Daniel A. Kayser
Environmental Specialist

Date: 12/9/04

Tom E Wenck
Manager, Environment, Safety, Health & Assurance

Date: 12/10/04

T.J. Barton
Laboratory Director

Date: 12/16/04