

LA-UR- 95-420

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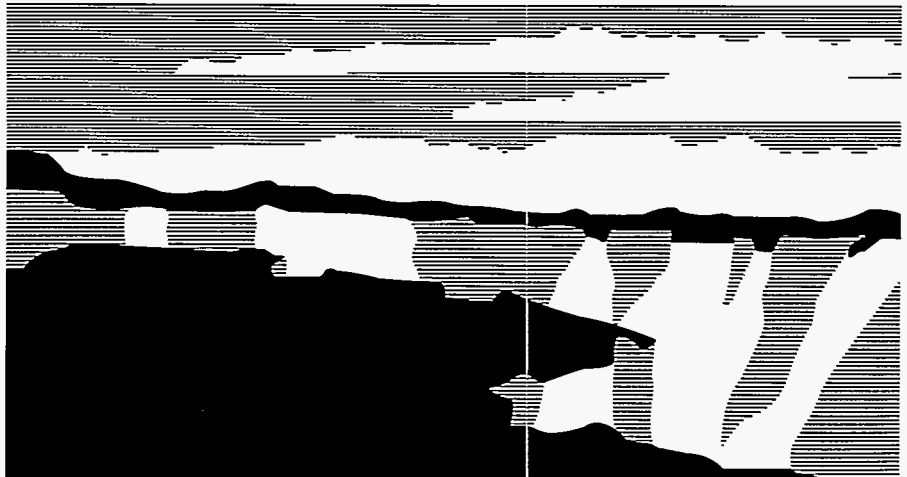
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Submitted to: Waste Management '95  
Tucson, AZ  
Feb. 26 - Mar. 2, 1995

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**IMPLEMENTING AN INTEGRATED STANDARDS-BASED MANAGEMENT SYSTEM TO ENSURE  
COMPLIANCE AT LOS ALAMOS NATIONAL LABORATORY  
LA-UR-95-420**

Prepared By:

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**ABSTRACT**

Los Alamos National Laboratory (LANL or the Laboratory) is developing and implementing a comprehensive, Integrated Standards-Based Management System (ISBMS) to enhance environmental, safety, and health (ESH) compliance efforts and streamline management of ESH throughout the Laboratory. The Laboratory recognizes that to be competitive in today's business environment and attractive to potential partnerships, Laboratory operations must be efficient and cost-effective. The Laboratory also realizes potential growth opportunities for developing ESH as a strength in providing new or improved services to its customers. Overall, the Laboratory desires to establish and build upon an ESH management system which ensures continuous improvement in protecting public health and safety and the environment and which fosters a working relationship with stakeholders. A team of process experts from the LANL Environmental Management (EM) Program Office, worked with management system consultants, and the Department of Energy (DOE) to develop an ESH management systems process to compare current LANL ESH management systems and programs against leading industry standards. The process enabled the Laboratory to gauge its performance in each of the following areas: Planning and Policy Setting; Systems and Procedures; Implementation and Education; and Monitoring and Reporting. The information gathered on ESH management systems enabled LANL to pinpoint and prioritize opportunities for improvement in the provision of ESH services throughout the Laboratory and ultimately overall ESH compliance.

Preliminary results of the ESH management systems self-assessment were analyzed to determine trends, and compliance management system gaps and redundant activities. Based on the study results, LANL identified short-term and long-term goals for improving the ESH compliance process throughout the Laboratory, and options for achieving the goals. The Laboratory is using this baseline of ESH management systems performance to establish a framework for identifying, developing, evaluating and implementing ESH compliance requirements. By assessing its baseline performance and utilizing benchmarking data to reengineer the ESH compliance management process, LANL is laying the foundation in its effort to establish a Laboratory-wide ISBMS.

**BACKGROUND - ESH MANAGEMENT SYSTEM SELF-ASSESSMENT**

The LANL EM Program Office initiated the effort to improve its formalized ESH management system. To be successful, an ISBMS must: establish management commitment to ESH compliance; assure compliance with external and internal requirements; focus on prevention and continuous ESH improvement instead of "fire fighting;" reduce costs of compliance and increase competitive advantage; and identify related operational and ESH costs including short and long-term liabilities, thereby revealing hidden costs and potential benefits.

To accomplish this task, LANL's EM Program Office contracted Environmental Resources Management (ERM) to jointly conduct an ESH management systems self-assessment and to provide a process and framework for enhancing existing management systems. ERM's approach addresses three fundamental questions:

**Where is the Laboratory Now?** To determine the current performance of the Laboratory's ESH management systems.

<b>Principle #3 Process of Improvement</b>	
<b>Features of Programs</b>	<ul style="list-style-type: none"> <li>• External Sources</li> <li>• Internal ESH Improvement</li> <li>• Process for Change</li> </ul>
<b>Level 4</b> <b>Leadership</b>	<ul style="list-style-type: none"> <li>• Formal continuous ESH Improvement program implemented throughout Laboratory includes:               <ul style="list-style-type: none"> <li>- Reviewing, tracking, and updating ESH management systems, operating procedures, and ESH technologies to incorporate TQM and latest ESH technological developments, scientific understanding, engineering practices, and regulations.</li> <li>- Continuous ESH program performance monitoring, including incorporation of employee and external stakeholder feedback.</li> </ul> </li> </ul>
<b>Level 3</b> <b>Compliance Assurance</b>	<ul style="list-style-type: none"> <li>• Improvement process includes:               <ul style="list-style-type: none"> <li>- Reviewing and integrating emerging ESH technologies, management practices, and goals, beyond compliance.</li> <li>- Tracking ESH performance beyond compliance criteria.</li> <li>- Establishing goals and measuring/tracking performance by CQI teams representing applicable Divisions and Groups.</li> </ul> </li> </ul>
<b>Level 2</b> <b>Compliance Management</b>	<ul style="list-style-type: none"> <li>• Improvement process involves periodic review and revision by ESH staff of operating programs and procedures to incorporate potential new legal requirements, risk reduction measures, scientific and technological improvements, external stakeholder expectations, and employee input.</li> <li>• Identified information is disseminated to Divisions/Groups by ESH management.</li> <li>• Management is held accountable for performance improvement.</li> <li>• CQI teams and lessons learned are implemented Laboratory-wide.</li> <li>• Findings are acted upon and responsibility assigned.</li> </ul>
<b>Level 1.5</b> <b>Baseline Program</b>	<p style="text-align: center;"><b>Laboratory</b></p> <ul style="list-style-type: none"> <li>• Continuous reaction to information from external sources on DOE/regulatory requirements exists.</li> <li>• No tracking or anticipation of emerging ESH trends occurs.</li> <li>• No formal, comprehensive improvement program exists; Laboratory reacts on case-by-case basis and focus is on compliance; top down decision making for changes, not involving line management or employee input.</li> <li>• CQI teams are formed to study problems, but implementation of findings occurs infrequently.</li> <li>• Lessons Learned program is a good start for program improvement. System needs to be implemented Laboratory-wide.</li> </ul>

**Fig. 1 - ESH Management Systems Assessment, Levels of Performance**

**Where Does the Laboratory Want To Be?** To identify a set of goals and measurable objectives for improving ESH management systems throughout the Laboratory.

**How Does the Laboratory Get There?** To design and implement an Integrated ESH Standards-Based Management System to facilitate the achievement of Laboratory goals and objectives.

The scope of the self-assessment covered Laboratory-wide management systems for compliance, monitoring and prevention programs for air quality, water quality, solid, hazardous, radioactive and mixed wastes, environmental restoration, occupational safety and health, training, emergency preparedness and response, recordkeeping and reporting, measurement and improvement, hazardous and nuclear materials management, and process safety. The self-assessment addressed ESH programs at the Division, Group, and facility levels, focusing on both Laboratory research and operations.

### **Assessment Methodology**

A proven private sector methodology, the GEMI ESAP (Global Environmental Management Initiative's Environmental Self-Assessment Program) coupled with established "best-in-class" management system elements was used to benchmark Laboratory's ESH management systems. The ESAP is a management tool designed to assess an organization's progress in meeting the intentions of the International Chamber of Commerce (ICC) Business Charter for Sustainable Development. The ESAP tool was customized to address the unique characteristics of the Laboratory and was also supplemented to include elements of the International Standard Organization's draft Environmental Management Standard (ISO 14000), as well as the Malcolm Baldrige National Quality Award criteria. Together, these standards define the "best-in-class" ESH management system characteristics and provide the Laboratory with a pathway to achieve improved performance in ESH management.

The modified ESAP is comprised of sixteen principles for effective and sound ESH management. Each principle contains a series of elements which describe the management systems and activities necessary to implement the principle. Each element contains four successively comprehensive performance levels, which allows respondents to rate the Laboratory's performance from one to four. A score of "one" indicates a baseline level of compliance where management systems are reactive and informal and regulatory compliance is not always achieved. Level "two" indicates that formal management systems are in place to maintain compliance. A score of "three" indicates the presence of an integrated ESH management system that ensures the facility always meets or exceeds compliance. Level "four" indicates that a fully implemented, integrated ESH management system with total quality management is in place that allows the facility to always exceed compliance. The protocol also requires the respondents to weight the importance of each element to arrive at a weighted average score for each principle. Figure 1 presents LANL's self-assessment results for one of the management principles - Process of Improvement. The Laboratory achieved a level of 1.5 based on the status of ESH management systems processes of improvement. System elements necessary to improve performance to successive performance levels are described at each increasing level of compliance. **INSERT FIGURE 1 HERE.**

To conduct the assessment, representatives from 39 Laboratory organizations, plus Johnson Controls (LANL's facility support contractor), and DOE were interviewed using the modified ESAP protocol. Interviewees comprised "top-to-bottom" LANL personnel including senior and mid-level Laboratory management, facility managers, line staff, and ESH coordinators. These interviewees provided substantive insights regarding the performance of ESH management systems throughout the Laboratory. ERM also reviewed documentation of numerous Laboratory and DOE policies, strategic plans, procedures, requirements, and reports to supplement the understanding of Laboratory organizations and activities.

## COMMON THEMES FROM THE SELF-ASSESSMENT

The self-assessment results were presented to the interviewees and other Laboratory personnel with ESH-related responsibilities. LANL's results are illustrated in Figure 2. LANL's self-assessment results can be grouped into the following topics: Laboratory ESH Management Systems; Accountability, Priority, and Goals; Integration; and ESH Issues Management. The following discussion summarizes self-assessment observations on these topics. **INSERT FIGURE 2 HERE.**

### Laboratory ESH Management System

Basic components of an ESH management system include: Strategic Planning; Organizational Roles and Responsibilities; Policies and Standards of Performance; Programs and Implementation; Training and Communication; and Measurement of Performance. Overall, the assessment revealed that basic ESH management systems are in place for the majority of issues identified in the assessment protocol. However, many of these management systems are ad hoc, fragmented or not Laboratory-wide.

Due to fragmentation and inconsistent application, some ESH management systems are perceived as ineffective and are, therefore, not utilized by many of the respondent organizations. Once systems are established, however, they become entrenched and are not systematically evaluated for improvement opportunities.

Although an overwhelming array of ESH policies and procedures, administrative requirements and internal Laboratory standards define "what is required," a lack of "how to" guidance for operations and facilities impedes implementation. The requirements do not assign responsibility, or define criteria for measuring performance. Consequently, without supporting management systems and limited tools to interpret, customize and implement requirements, compliance cannot be sustained.

### Accountability, Priority, and Goals

Accountability is critical at each level of the organization to ensure that individual responsibilities for ESH management are defined, communicated, understood, and fulfilled. Accountability starts with top management commitment through identifying ESH priorities and goals and establishing policies and standards of performance. It also occurs through such measures as effective oversight and monitoring, routine reinforcement of positive performance, written job descriptions, written performance standards, and when performance lags, disciplinary action.

The self-assessment results indicate a lack of accountability for ESH performance throughout Laboratory organizations. Although staff and management interviewees voiced a personal commitment to ESH performance, most respondents indicated that ESH priorities, goals, and expectations are undefined, and it appears that effective systems are not in place to hold management accountable. Respondents were quick to point out that in an environment of competing priorities and resources, responsibility for ESH compliance is often shifted to individual ad hoc initiatives versus an organized, systematic, integrated effort.

### Integration

As discussed in the Assessment Methodology section, Laboratory ESH management systems were benchmarked against performance criteria contained in the ICC Business Charter, ISO 14000, and Baldrige National Quality Award. A fundamental principle of these standards is the integration of ESH systems with mainstream operating and business activities of an organization. The most effective and efficient ESH management occurs by identifying and addressing ESH issues routinely within the context of day-to-day management, operating, and research functions.

The self-assessment results indicate that ESH roles and responsibilities are not consistently integrated with position descriptions, ESH procedures are not integrated with standard operating practices, and communication of ESH priorities is not generally integrated with existing forums and mechanisms for communicating Laboratory-wide initiatives and priorities.



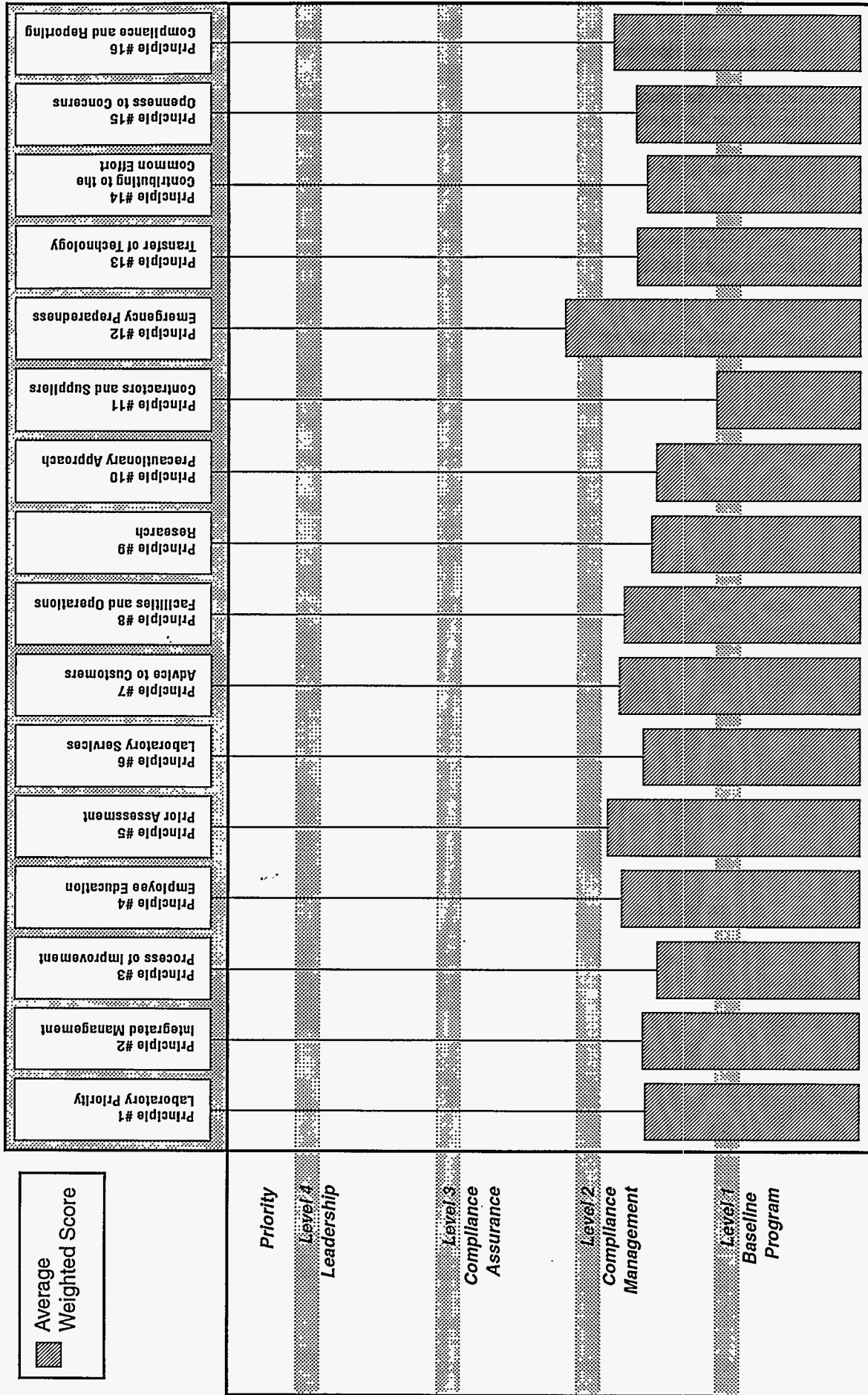


Fig. 2 – ESH Management Systems Assessment, Average Weighted Scores

The Laboratory has undertaken efforts to integrate ESH management as evidenced by recent ESH re-engineering activities, and development and implementation of a Facility Management Model, which will streamline and coordinate building management functions, including ESH. These are important steps in moving the Laboratory from a reactive, crisis management-mode of operation to preventive, cost-effective consideration and attention to ESH issues.

### **ESH Issues Management**

ESH issues management is a critical function in an effective ESH management system. An issues management system facilitates the identification, tracking, evaluation, and response to new information; such as upcoming regulations or advances in technology, allowing an organization to proactively manage ESH issues.

At the Laboratory, ESH issues typically are recognized when they pose a potential problem. Extensive efforts are then made to characterize and assess the issue, often with no attempt to match dedicated resources to the seriousness of the problem, and without assigning "ownership" to ensure the issue is resolved.

Extensive resources are also directed at collecting ESH data; however, little attempt is made to determine which data is important for operations, and should be funneled to the operating groups, and which data is for DOE consumption or external public relations. While these efforts to collect and disseminate information and data are necessary, it is equally important to synthesize and prioritize information for the end user. As a result, critical ESH issues may not get the attention they deserve, while other less significant problems may reap ample resources which may not be warranted. This is especially evident with regard to DOE Orders. Interviewees noted that continually shifting priorities from DOE leads the Laboratory to inefficient issues management.

Similarly, tremendous resources are expended in preparing for and responding to continuous and simultaneous ESH-related audits (by DOE, New Mexico Environment Department, US Environmental Protection Agency, and internal auditors). Audit prioritization and rationale are often not communicated, and corrective actions responding to audit findings do not focus on improving the management systems which are, in many cases, the root cause of the deficiencies.

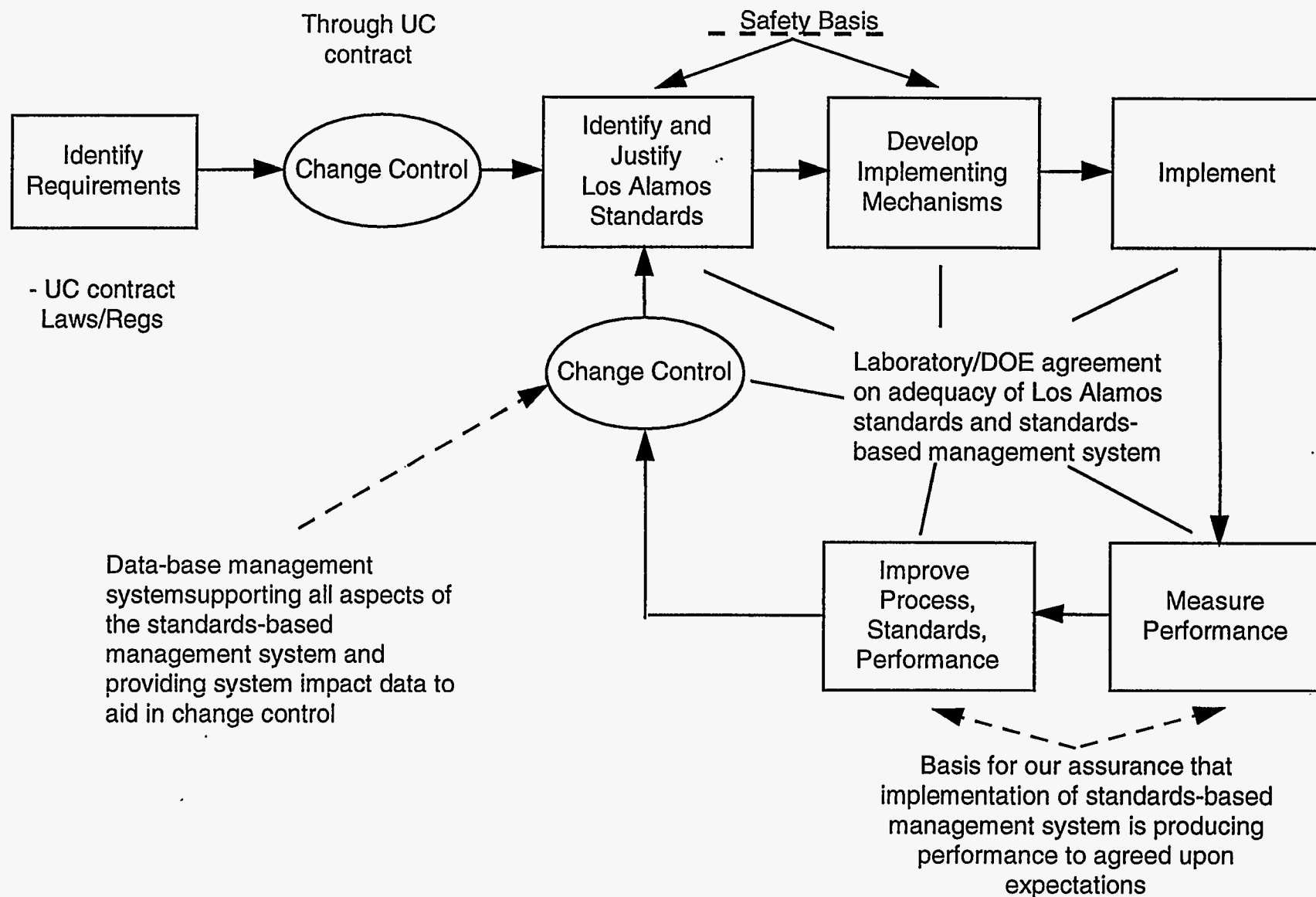
### **INTEGRATED STANDARDS-BASED MANAGEMENT SYSTEM**

Results of the ESAP self-assessment, and preliminary improvement goals and objectives were presented to senior Laboratory management (the Operations Working Group) in early August 1994. Coincidentally, DOE Headquarters had begun a number of new initiatives designed to move the Department and its subcontractors from a compliance-based approach to regulatory requirements to a performance-based approach. Inherent in these initiatives are efforts to reduce DOE Orders and establish standards for documenting expectations of how work will be performed. To address this initiative, the Operations Working Group established a Standards Committee in early Summer 1994 to review current Laboratory standards and identify a process to develop and implement one consistent set of Laboratory standards. Additionally, the Operations Working Group established the Compliance Process Team (CPT) to work with the Standards Committee to evaluate specific ESH compliance-related requirements and ongoing activities throughout the Laboratory to address the requirements.

Subsequently, the Operations Working Group directed that the ESH management system project and the Standards Committee be merged with the initiative to move the Laboratory toward an ISBMS in accordance with Criteria for DOE's Standards Program. This entire effort is currently under the direction of the CPT. Key elements of the Integrated Standards-Based Management System as it has been defined by the CPT are depicted in Figure 3. **INSERT FIGURE 3 HERE.**

The ESAP self-assessment established a performance baseline, including system gaps and overlaps, for broad, Laboratory-wide ESH issues. To supplement the assessment results, additional information was gathered by the CPT from throughout the Laboratory to identify and better understand specific program initiatives, efforts, and institutional functions and organizations addressing ESH compliance. This effort





**Figure 3 - Key Elements of an Integrated Standards-Based Management System**

confirmed the preliminary ESAP self-assessment results, that redundant efforts to develop compliance standards, collect performance data and conduct audits are routinely occurring without coordination, integration, or communication. Additionally, systems are not in place to ensure implementation of standards, measure and improve compliance performance, or to hold employees accountable.

The findings were presented to an expanded group of representatives from numerous Laboratory Divisions, Groups, facilities, and levels of management at workshops conducted by the CPT in December 1994 and January 1995. The goals of the workshops were to: verify and enhance the identified list of redundant ESH compliance activities and system gaps; evaluate options for eliminating redundant activities and closing system gaps; and determine preliminary goals and actions to move the Laboratory towards an ISBMS.

To identify redundant ESH compliance activities and system gaps, workshop participants defined the "As Is" process flow of each management system element in Figure 4. Workshop participants then defined how each system element process flow "Should Be," following the ISBMS approach advocated by DOE. This effort to define the "Should Be" process flow included establishing detailed procedures and organizational roles and responsibilities for identifying applicable ESH requirements, developing standards, implementing standards, and measuring and improving performance for each management system element in Figure 4.

The Laboratory's ISBMS will address customer (DOE) requirements, prioritize compliance activities, define areas to be measured, and establish a continuous improvement process. The preliminary ISBMS is under review by DOE Headquarters and senior Laboratory management. The Laboratory CPT is proposing to "jump start" the system by developing preliminary Laboratory-wide standards by mid-June 1995 and finalizing the standards by November 1995. Additionally, the CPT is proposing to test the ISBMS by modifying and implementing a Laboratory standard to address radiation worker protection requirements of 10 CFR 865 as a pilot ESH compliance project.

## **SUMMARY**

The implementation of an ISBMS will allow the Laboratory to align current efforts for assuring ESH compliance while eliminating system gaps and overlaps. By identifying goals, objectives, responsibilities, accountability, and measurable endpoints, the Laboratory can achieve its goal of cost-effective compliance assurance.

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## **REFERENCES**

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ISO 14000 Environmental Standards  
Environmental Management Systems Specification  
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