

MIT - EHS Management System Concept

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**MIT EHS Management System Using
SAP Automation**

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and

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A. MIT – General Information

- **4,300 Undergraduates**
- **5,672 Graduates**
- **931 Faculty Members**
- **10,516 Staff Members**
- **30,000 Cost Objects**
- **85,000 Purchase Orders/Year**
- **20,000+ Vendors on File**

A. MIT - General Information

1. As of June 30, 2000:

- **Research Revenue - \$728 Million**
- **Research Contracts and Grants - 4,765**

A. MIT – General Information

2. Purchasing Mechanism: December 2000

	Transactions	Percent
Paper Requisition	580	5%
Paper Flat File	575	8%
ECAT	215	17%
VIP Card	30	49%
SAP/ SAPweb Requisition	2750	21%
TOTAL	4150	100%

B. External Forces Compel a New Approach to EHS at MIT

1. The United States Environmental Protection Agency's “University Initiative” – US – EPA Enforcing Environmental Laws beyond Industry to Higher Education

- **Yale, Brown, Stanford, Boston University,
University of New Hampshire, University of Hawaii,
Among Others Subject to Enforcement**
- **MIT Inspected May, 1998 and Matter is Still Open**

B. External Forces Compel a New Approach to EHS at MIT

2. EPA found common problems in environmental management in higher education settings:

- **No organizational infrastructure for compliance with environmental laws – locally and centrally**
- **No clear delineation of roles, responsibilities and accountability for compliance – locally and centrally**
- **No systems approach to environmental management**
- **Inadequate institutional knowledge of materials in use locally for compliance and emergency response**
- **Inadequate regulatory training of faculty, principal investigators, staff and students who manage hazardous waste, chemicals and other regulated materials**

C. EPA-Required Management System

- 1. EPA is Requiring Universities to Create/Implement Environmental Management Systems (EMS) and Manuals that Provide Infrastructure/ Systems – automated and operating to:**
 - **manage environmental performance**
 - **ensure compliance/ prevent releases**
 - **create accountability locally and institutionally**

in Decentralized Research Culture
- 2. EPA – Required EMS Components**
 - a. Environmental Policy:**
 - **Commitment to Compliance and “Continuous Improvement in Environmental Performance”**
 - **Commitment of Adequate Resources**
 - b. Organizational Infrastructure/ Roles, Responsibility, and Accountability**
 - **Central and Local**
 - **EHS in Position Descriptions**
 - **Incentives for Good, and Consequences for Poor Performance**

C. EPA-Required Management System

- c. Legal Compliance Oversight**
- d. Regulatory Training and Record-keeping Through a Consistent Program**
 - Uniform Materials/Flexible Delivery**
 - Training Plan: Implementation and Initial Identification of Those to be Trained**
 - Central Record-keeping for Institution Accountability and Reliable Identification of Those to be Trained**
- e. Resources/Information – Compliance Updates on Regulatory Changes**

C. EPA-Required Management System

- f. Standard, Self and Outside Audits – Other Controls/Preventative Measures**
 - **Uniform Audit Forms**
 - **Implement Auditing Locally, Centrally, Outside**
 - **Standard Operating Procedures to Prevent Violations/Releases**
 - **Inventory of Chemicals/Radioactives/Biologicals**
 - **Central Record-keeping**
- g. Procedures for Responding to Violations and Releases**
- h. Pollution Prevention and Sustainability**
- i. Performance and Improvement Measurement**
- j. Outside Consultant Verification of EMS Implementation and Effectiveness**

C. EPA-Required Management System

- 3. To avoid imposition of an industry-oriented EMS that relies on central “command and control” and won’t work at MIT, we are designing an MIT EHS-MS that:**
 - Is tailored and is a model for academic research institutions**
 - Makes compliance more efficient, easier to achieve**
 - Doesn’t interfere with research/operations**
 - Achieves proper balance of local – central roles**
 - Is client-serviced oriented**

D. EHS Management Systems Approach

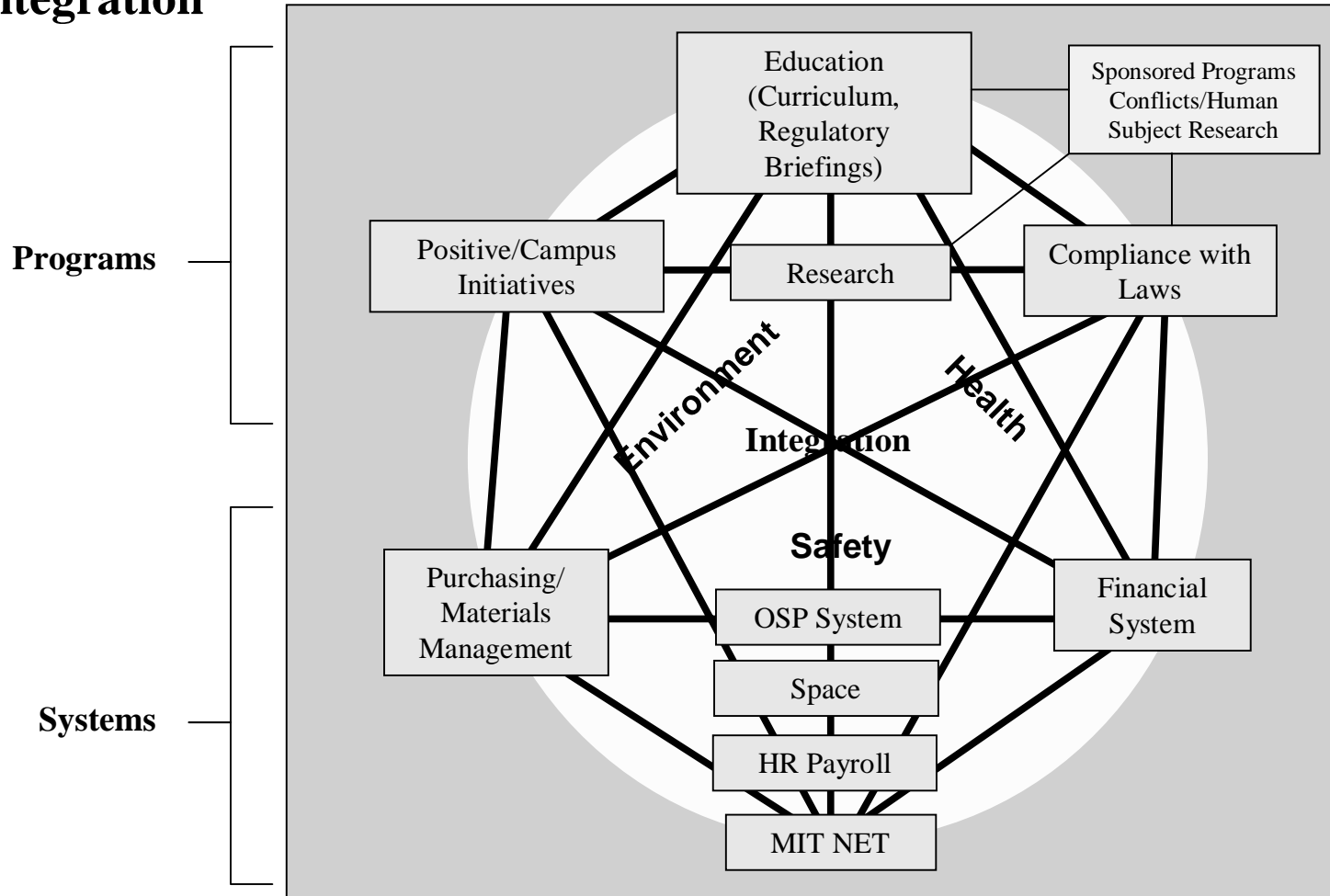
1. Opportunity for Management System to integrate:

<i>Subjects</i>	<i>Programs</i>	<i>Systems</i>
▪ Environment (land, air, water protection)	▪ Compliance	▪ Financial (SAP)
▪ Health	▪ Education	▪ Sponsored Programs (Tied to SAP)
▪ Safety	▪ Positive HS/ Environmental Sustainability Initiatives	▪ Purchasing (SAP)
	▪ Research	▪ Space (SAP +)
		▪ HR Payroll (SAP)

= **Environmental, Health, and Safety (EHS) Management System**

D. EHS Management Systems Approach

1. Integration



D. EHS Management Systems Approach

2. Policy Objective -

*MIT will be at the forefront of large research educational institutions in achieving and maintaining compliance with federal, state and local environmental, health, and safety laws in all of its laboratories, research centers, facilities, and operations, and in creating a more sustainable campus. The Institute will design a model environmental, health and safety management system (“EHSMS”) that represents best practices for large research academic institutions. **The EHSMS will be distinguished by its integration of compliance with positive initiatives and educational programs as well as research on campus, and its integration with the Institute’s financial, purchasing, sponsored programs, human resources, and information management systems.***

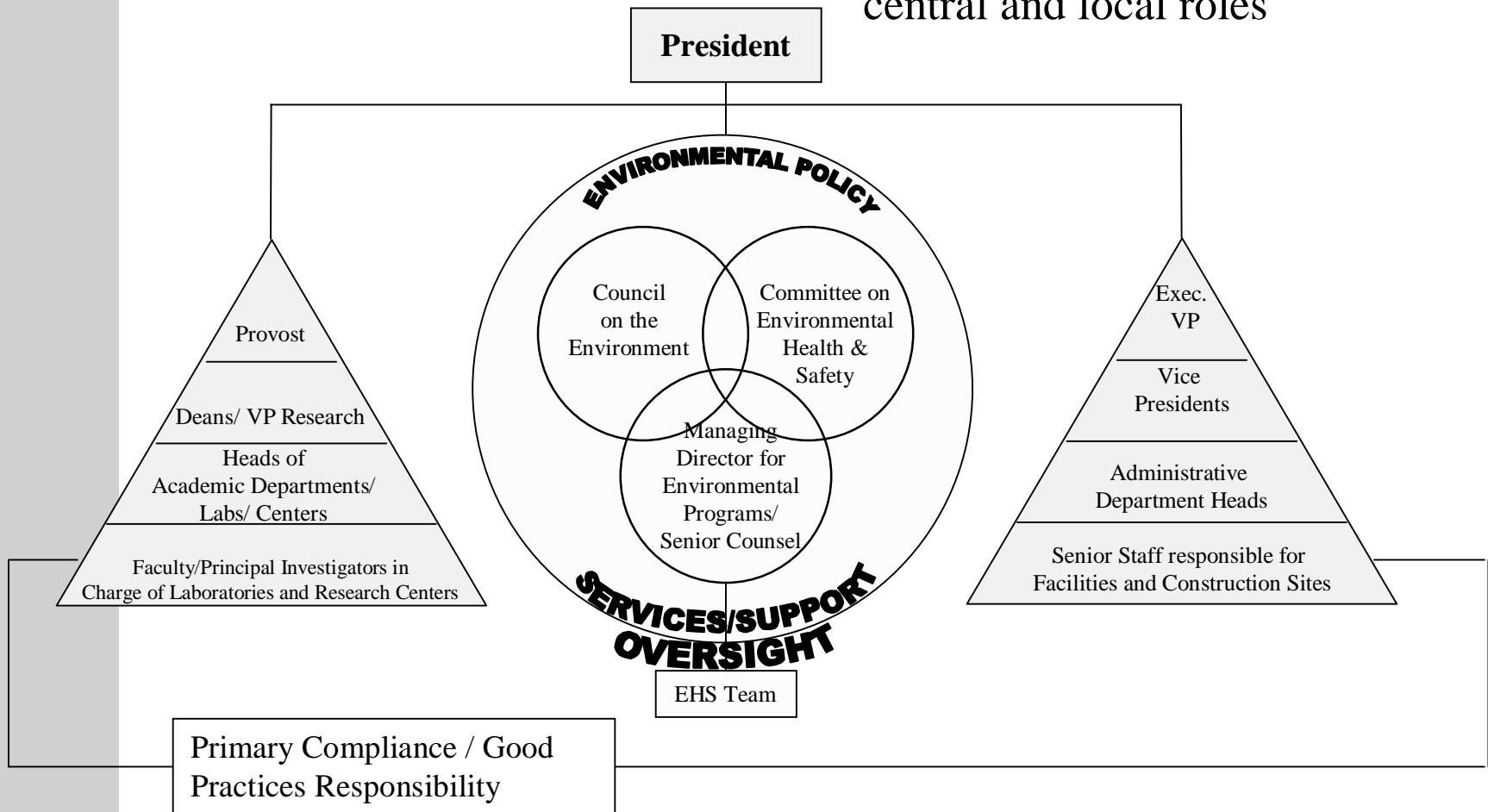
D. EHS Management Systems Approach

3. The Management System will:

- **Be sensitive to the independence of laboratories and research centers; achieve a balance of central and local roles.**
- **Be client-service oriented.**
- **Use or be compatible with the Institute's principal electronic information systems and increase efficiency of environmental management.**
- **Integrate faculty expertise and research.**
- **Eliminate duplication of effort and use existing resources/ organization to maximum extent possible.**
- **Capitalize on opportunities to reduce wastes and toxics, prevent pollution, conserve and reuse resources.**
- **Educate students and other members of the MIT community on responsible environmental, health and safety practices.**

D. EHS Management Systems Approach

4. **Define Roles /Create Accountability:** Use existing organization to maximum extent – Balance central and local roles



D. EHS Management Systems Approach

5. Single EHS Team Enhances Service to MIT/Accountability:

- **Administers/ Supports development and implementation of EHS-MS**
- **Single phone number access – service/emergencies**
- **Provides services to labs and research centers and to facilities:**
 - **Regulatory briefings and updates on legal requirements and good practices**
 - **Auditing for compliance with legal requirements and good practices/oversight for MIT**
 - **Maintenance of databases, automated systems and web page**
 - **Hazardous/ biological/ radioactive waste disposal**
- **Provides institutional oversight / accountability**
- **Single position responsible for each regulatory / positive program**
- **Coordinates implementation of positive environmental initiatives and integration of educational opportunities**
- **Represents MIT to regulatory authorities**

D. EHS Management Systems Approach

- 6. Each Department, Lab and Center (DLC) or Group of DLCs Must Designate an Officer for EHS**
 - Qualified, Influential, Interested**
 - Accountable to DLC Compliance and EHS-MS Implementation**
 - Each DLC Will Have Flexibility, Within Criteria, re: Program Implementation**

E. MIT-EHS Management System Concept Components

- 1. Controls/Preventative Measures/Compliance Oversight Linchpin -
Purchasing Automation and Integration:**
 - **Chemical/Biological/Radioactives Inventory**
 - **Automated tracking of purchase, destination and disposal of chemicals/biologicals/radioactives (Later phase may track internal consumption and transport.)**
 - **Facilitated by vendor (bar coding/other electronic transfer of information)**
 - **Facilitated by e-commerce service**
 - **Interface with regulatory briefing/training and auditing**
 - **Interface with internal marketplace**
 - **Interface with toxic use reduction opportunities**

E. MIT-EHS Management System Concept Components

- **Internal Chemical/Biological/Radioactives Marketplace**
 - **Purchasing process to include prompt to access internal marketplace before external**
 - **Consider web-based “virtual warehouse” for excess materials (voluntary participation with incentive of grant credits for unused materials)**
 - **Consider shared off-site warehouse serviced by chemical vendor (operator bar codes for inventory and dispenses smaller quantities of needed materials, reducing on-campus storage and hazardous waste production)**
 - **Consider enhancing vendor arrangements to “warehouse” purchased materials until needed, then deliver very quickly (offer unused purchased materials first to internal MIT market, then to vendor’s market to reduce hazardous waste)**
 - **Consider return to in-house stock room**

E. MIT-EHS Management System Concept Components

- **Toxic Use Reduction Opportunities (possible future phase)**
 - **Purchasing process to offer less toxic, less regulated options that are suitable for some of the same purposes as material of interest**
 - **Purchaser receives options and information and makes decision (can reduce regulatory burdens and reap environmental benefits)**

E. MIT-EHS Management System Concept Components

2. Regulatory Briefings/Training

- **Web-based modules that can be arranged flexibly and tailored to local needs**
- **Integrate EH&S training**
- **Integrate other required training for researchers (e.g., conflict of interest, human subject research)**
- **Minimize time in training, eliminate duplication**
- **Maximize relevance of training**
- **Provide options for delivery (local, central)**
- **Integrate positive initiatives, good practices, educational opportunities (to reduce regulatory burden, reap greater benefits)**
- **Tied to HR Payroll: reliably capture those who need training**
- **Tied to inventory of chemicals/radioactives**

E. MIT-EHS Management System Concept Components

3. Auditing

- **Multiple level: Local (labs, facilities), maybe departmental, EHS, outside**
- **Standard audit forms for all audits**
- **Automated – Forms loaded on hand-held pen computers**
- **Information automatically entered/uploaded in EHS team-serviced database**
- **Reinforce accountability locally**
- **Reinforce service by/accountability of EHS team**
- **Tied to inventory of chemicals/radioactives/biologicals**

E. MIT-EHS Management System Concept Components

4. Reporting and Record-keeping

- **Automated for efficiency; local control, central service/oversight**
- **External: regulatory/community**
- **Internal: management/assessment**
- **Calendar function: prompts to meet permitting, reporting deadlines**

5. Automated Contaminated Sites Inventory

- **Regulatory deadlines**
- **Tier classification**
- **Primary contaminants**
- **Project manager/other roles/responsibilities**

E. MIT-EHS Management System Concept Components

6. Performance Measures

- **Develop model that measures integrated system (values health/safety/environment; values compliance/positive initiatives/good practices/overall good management)**
- **Integrate regulatory priorities**
- **Measure improvement against baseline**
- **Report annually to MIT President**
- **Use audit results as tool**
- **Use performance reviews as tool**

E. MIT-EHS Management System Concept Components

7. Performance Consequences

- **Challenge to formulate academic model**
- **Annual performance report to President**
- **Prize for exemplary performance**
- **Supplementary training/support offered by EHS team**
- **Educate on federal grant requirements/consequences – incorporate in OSP process**
- **Include EHS responsibilities in job descriptions; integrate with management**
- **Consider allocating portion of Biennial Audit costs to poorly performing departments/labs/centers with advance notice.**
- **Other consequences for regulatory enforcement or poor performance?**

F. Organizational Capacity to Design MIT EHS Management System

1. Involve Faculty, Researchers, Administration and Students in EHS-MS Systems Design to Ensure Client Satisfaction, Utility, Widespread Acceptance

Institute Direction

Senior Officer
Committee
Provost
Chancellor
Executive Vice
President

Leadership and Oversight

Institute Committee on
Environmental, Health, and
Safety
Ad Hoc Subcommittee
Overseeing the EHS
Management System
Development

Work Production

Working
Committee
EHS Management
System Design
and
Implementation

“Heavy Lifting”

Project
Team

Project
Manager

Faculty

Senior
Administration

Researchers

Students

Rep. Faculty,
Researchers,
Administration

G. MIT - EHS

- 1. Why are we discussing this**
 - a. Developing MIT-EHS will be a major effort**
 - b. We are just starting**
 - c. Other school in the US may be forced to have a similar system**
 - d. We want to use SAP functional where possible**

G. MIT - EHS

- 2. MIT-EHS will be more than Financial System**
 - a. We need to have integrated data**
 - b. We need to track and account for people, supplies, equipment, space, training and record activities other than in \$**
 - c. We need to have easy excess to inputting and extracting data**

G. MIT – EHS

3. SAP – EHS

- a. SAP has an EHS solution**
- b. How much can we use?**
- c. Can we get other vendors, IT and suppliers , to join us**

G. MIT – EHS

- 4. Where we would like to use SAP**
 - a. One portal to purchase all CB&R**
 - b. Recording all persons (student, EE, visitor, faculty) by location**
 - c. Units will be tied to location in SAP**
 - d. Keep inventory of CB&R by location using MSDS and bar codes**
 - e. A record of training will be kept that can be referenced real time**
 - f. Integrated for reporting**

H. Additional Resources

1. <http://web.mit.edu/environment>
2. <http://web.mit.edu>
3. <http://web.mit.edu/sapweb/>
4. <http://web.mit.edu/ecat/>
5. jlkeith@mit.edu
6. jlmorgan@mit.edu

I. MIT – EHS

Questions