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# Environmental Health & Safety at Stanford University

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USP Meeting

November 15, 2005



# Environmental Health and Safety

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- Organizational overview
- Health, Safety, Environmental Programs Scope
- Current Trends, Issues, Focus



# EH&S Risk Categories

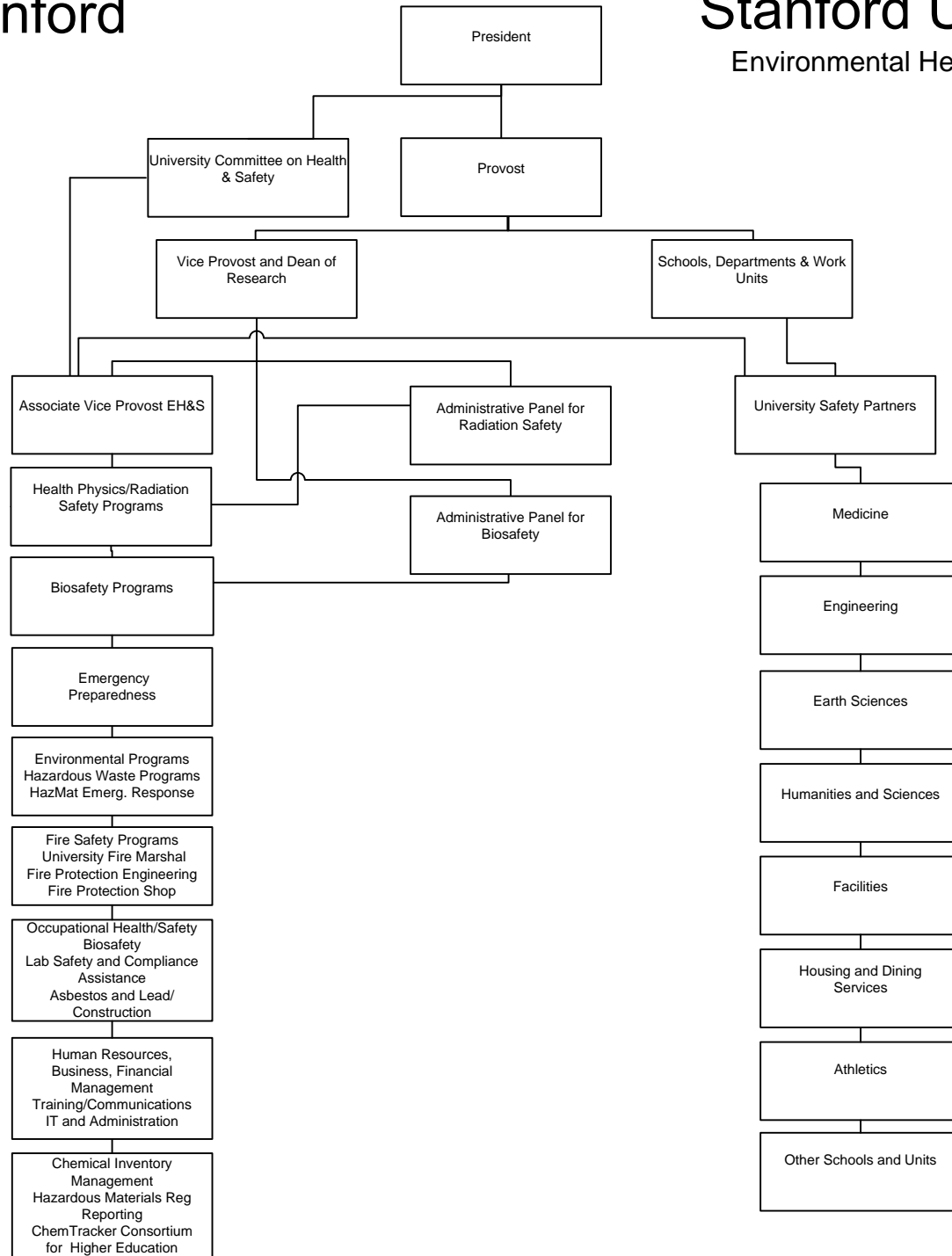
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- Health Decrement (Injury and Illness Prevention)
- Regulatory Liability (Environmental and Occupational Compliance Risk)
- Public Relations
- Operational Impact to University Mission
- General Liability (Third party lawsuits)



# EH&S at Stanford

# Stanford University Environmental Health and Safety



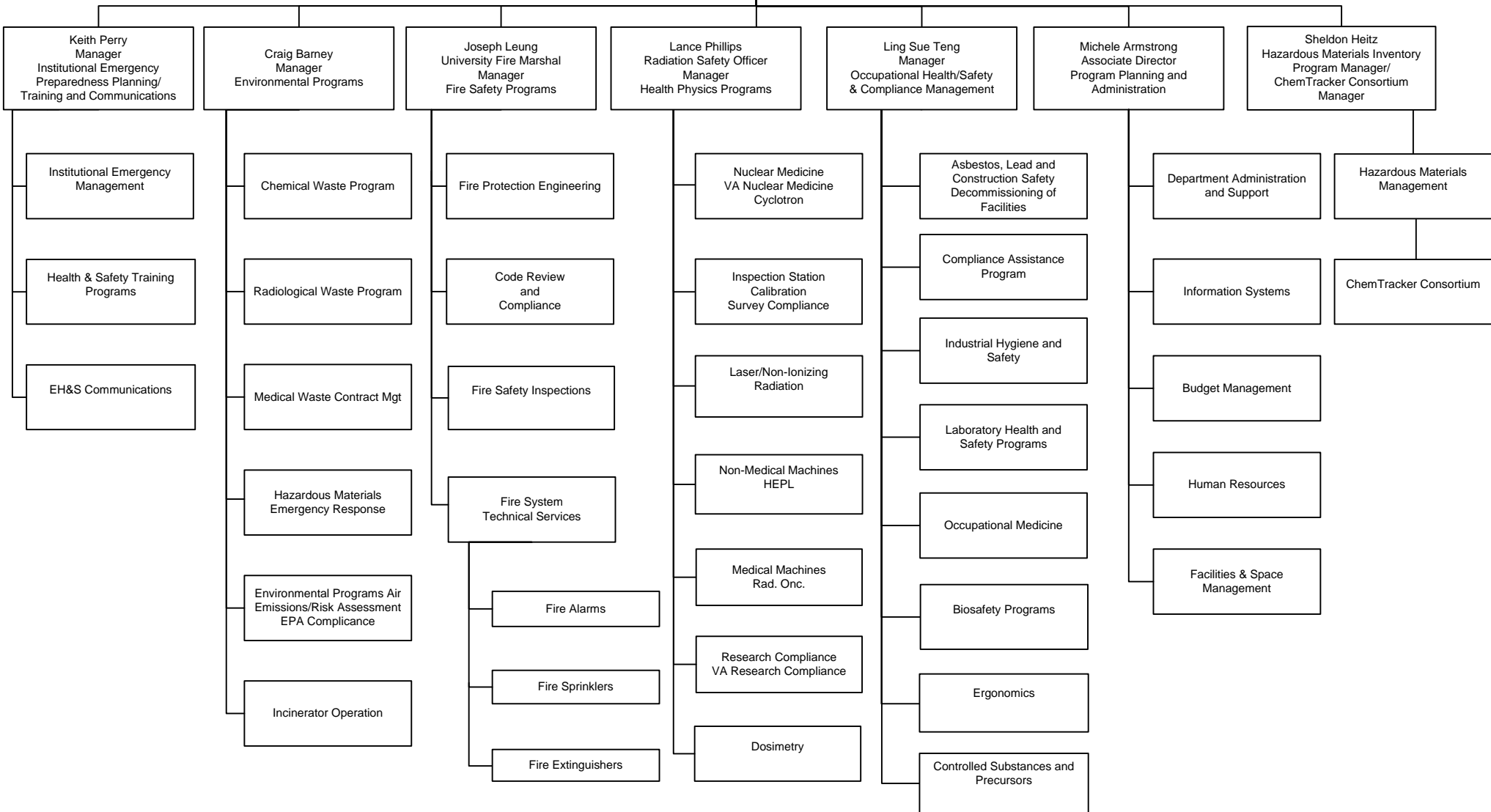
# Stanford University Environmental Health and Safety

Ver. 2.4

PROVOST

Arthur Bienenstock  
Vice Provost and Dean of Research

Lawrence M. Gibbs  
Associate Vice Provost - EH&S



# EH&S - Our Mission

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We will support and advance the teaching, learning and research activities of the University, and promote a safe and healthy campus environment, by providing and coordinating programs and services that minimize safety, health, environmental and regulatory risks to the Stanford University community in a manner consistent with responsible fiscal and environmental stewardship.



# Program Scope Review

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- Fire Safety
- Biological Safety
- Radiation Safety
- Hazardous Waste Management
- Emergency Preparedness Planning and Safety Training
- Hazardous Materials and Chemical Inventory Mgt.
- Occupational Health & Safety
- Program Administration



# Fire Safety

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- Fire Protection Engineering
- Aug 2000 - integrated Fire Protection Group from Fac Ops (alarm, sprinkler, extinguisher programs)
- Fire Safety Inspection Program
  - SUFMO: 185 campus buildings inspected
  - SCCFD: 342 buildings inspected (residential occupancies, high rises and assemblies)



# Fire Safety- inspection results

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- Common deficiencies from self-inspection
  - lack of emergency assembly point information
  - street addresses not posted on exterior of building
  - house keeping items (combustibles in exit pathways)
  - fire doors propped open
  - quantities of hazardous materials exceed exempt amounts (need for alternative means of protection)
- County inspections
  - no major deficiencies



# Fire Safety- challenges

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- Regulatory area with most impact on research buildings/construction (UBC/UFC haz mat limits)
- affects use, construction type and building characteristics
- Developing standardized facility infrastructure solutions
  - buildings/areas exceeding exempt hazardous materials limits
  - e.g.: prohibition on storage of Class 1 flammable chemicals in “basements”



# Biological Safety

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- Supports APB (institutional biosafety committee) in review of research protocols involving biohazardous agents and rDNA
  - Increased involvement with oversight of gene therapy clinical trials (coordinates with human subjects panel)
  - Goal is to streamline protocol submittal process for Principal Investigators
- Bloodborne Pathogen Program
- Coordinates with IRB and APLAC Panels
- Mold and some IAQ follow up
- Emerging issues with biosecurity management
- ESCRO Committee



# Radiation Safety

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- Stanford University, SH&Cs, CHAS, PA-VA Medical Center (under contract)
- University and Medical Center operate under one State DHS “Broad Scope Medical License” - VA under Federal NRC
- Administrative Panel, through 4 subcommittees, oversees all use of RAM and radiation producing machines
- Also oversees Laser use on campus



# Radiation Safety - issues

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- Currently anticipating state BRH inspection (every two years)
- Security of RAM in all facilities where used (stock materials must be secured at all times)
- Significant increase in human subjects research oversight
- Addition of cyclotron to Medical Center



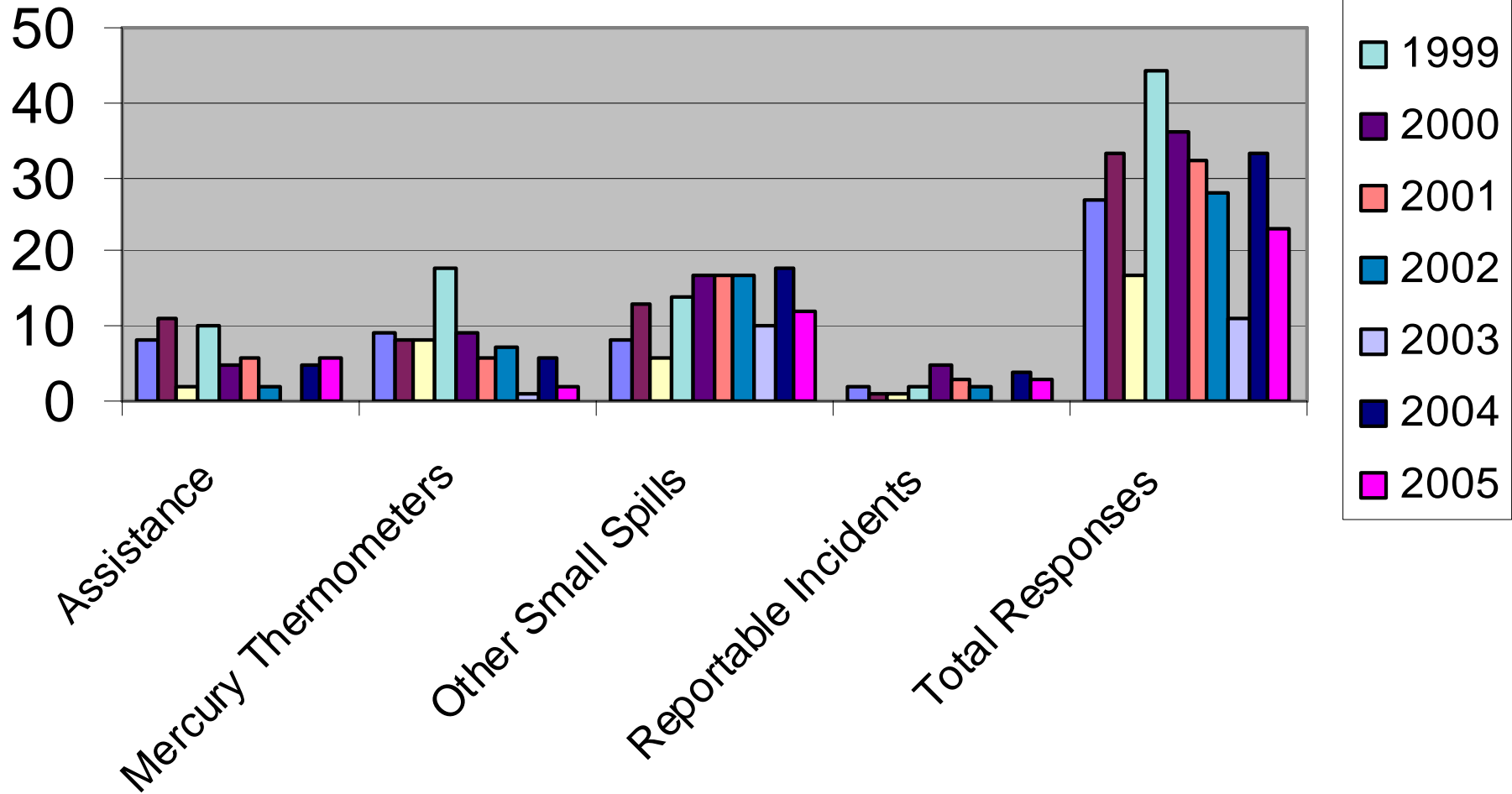
# Environmental Mgt. Programs

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- Hazardous Waste Programs
  - Chemical Waste
  - Radiological Waste
  - Biological Waste
- Universal Waste Program
- Hazardous Materials Release Response
- Environmental Compliance
  - Air emissions
  - SPCC (spill prevention control and countermeasures)
- New Building toxic emissions risk assessment



# HazMat Responses by Type



# Haz Mat Response Program

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- Maintain group of state certified Haz Mat Responders
- Problem issue for disaster response – limited number of personnel certified for first response
- Considering establishment of Hazard Assessment Response Team (HART)



# Environmental Programs\*

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- BAAQMD Air Regulations requirement
  - Air emissions from buildings and sources
  - lab buildings meeting requirements now must be permitted by BAAQMD
  - emergency generators (particulate emissions)
- CEQA Risk Assessment Analysis
  - required for all new construction in facilities using chemicals

\*Facilities Environmental Programs cover water and soil



# Emergency Preparedness Planning

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- EH&S assumed responsibility in 1997 for campus emergency preparedness planning from public safety
- Written Plans that includes all hazards approach and all academic and admin areas (SOCs)
- Engagement of senior administration
- Enhanced awareness due to impacts of Katrina and Rita



# University Emergency Exercises

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- April 1998 Earthquake response EOC Tabletop
- Oct 1999 Y2K power outage scenario EOC Tabletop/SOC Functional
- Oct 2000 Earthquake response EOC/SOC Functional
- Oct 2001 Earthquake disaster recovery EOC/SOC Tabletop  
Business Resumption
- Nov 2002 Earthquake response EOC/SOC Full Functional
- Nov 2003 Infectious disease outbreak  
response (yersenia pestis) EOC/SOC Functional
- Nov 2004 Infectious disease outbreak  
response (norovirus) EOC/SOC Functional
- Sept 2005 EOC Workshop EOC Tabletop
- Nov 2005 EOC Workshop EOC Tabletop
- April 2006 Earthquake response (planned) EOC/SOC Full Functional



# SU Emergency Management Program Development Needs

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- Comprehensive University-wide business impact analysis & mitigation/recovery plan
- Operationally ready Emergency Operations Center (EOC)
- Medical response plan for a disaster or critical incident
- On-going non-structural hazard mitigation program
- Teams of trained volunteers to support the efforts of the emergency responders (similar to the BAT Program)
- Institutional program prioritization
- Resources



# Safety Training and Communications

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- Developing new tools and programs
- Attempting to coordinate SafetyTrain with STARS
  - Next module BBP training
- Finalizing cross reference for identification of safety and health training needed for specific types of positions
- Use of short videos as training support tool
- Release of upgraded Ergonomic training via web



# Regulations & Chemical Inventory

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## Certified Unified Program Administration

(CUPA programs)

- State Hazardous Materials Business Plan
- Santa Clara County Hazardous Materials Storage Permit Ordinance
- State and Federal Risk Management Plans under Section 112(r) of the Clean Air Act
- Federal Emergency Planning and Community Right to Know Act (EPCRA, aka SARA Title III)
- Aboveground Storage Tanks
- Underground Storage Tanks
- Hazardous Waste Source Reduction

## Occupational Health Regulations

- OSHA Hazard Communication
- OSHA Chemical Hygiene Plan
- Report of Carcinogen Use
- Toxic Substances Control Act (TSCA)

## Other Environmental Regulations

- Santa Clara County Toxic Gas Ordinance
- State and County Storm Water Permit
- Industrial Waste Discharge Permit
- Pesticide Report of Use
- Report of Carcinogen Use
- California Environmental Quality Act (CEQA)
- Proposition 65
- Air Emissions: Toxic Hot Spots

## Fire and Life Safety Codes

- Uniform Building Code
- Uniform Fire Code

## Other Regulations

- Antiterrorism and Effective Death Penalty Act (select agents and biotoxins)



# Hazardous Materials & Chemical Inventory Mgt.

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- ChemTracker Inventory System maintenance and continued development
- Stanford HMBP and HMMP submittals for building permits
  - Adding person to help coordinate SU
- ChemTracker Consortium for Higher Education



# ChemTracker Consortium for Higher Education

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Stanford University

Carnegie Mellon University

Northwestern University

Vanderbilt University

University of Iowa

North Carolina State University

University of Nevada – Reno

Ramapo College

Penn State University

Stanford Hospital and Clinics

University of Nevada - Las Vegas

The Ohio State University

Desert Research Institute

Western Nevada Community Colleges

Columbia University

Louisiana State University

The Rockefeller University (pending)

Harvard University (pending)

Saint John's University (pending)

Massachusetts Institute of Technology  
(pending)



# Occupational Health & Safety

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- Asbestos, Lead and Construction Safety
- Biological Safety
- Compliance Assistance Program
- Laboratory Health & Safety
- Industrial Hygiene and Safety
- Occupational Health and Medical Surveillance



# Asbestos, Lead and Construction Safety

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- Heavily regulated area of construction activity
- Most construction activity involves need for asbestos evaluation and, when necessary, abatement
- Management of asbestos in facilities
- Lead-paint now heavily regulated
  - EPA/CPSA lead-paint disclosure requirements for all real estate transactions - student housing
- **Decommissioning** of facilities that housed materials requiring haz mat permit



# Compliance Assistance Program

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- Hazardous materials storage and handling
- Radiation surveys
- Medical waste
- Storage tank compliance
- Sewer code compliance issues
- Hazardous waste management
- Basic fire safety compliance
- Autoclave use and hazards
- Toxic gas use identification



# Industrial Hygiene and Safety

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- Injury Illness Prevention Program
- Hazard Communication
- Confined Space Program
- Respiratory Protection
- Indoor Air Quality/Odor Complaints
- Noise
- Chemical Exposure Assessments, Including Carcinogens
- Asbestos
- Lead
- Medical Surveillance
- Reproductive Hazards
- PPE Assisting Emergency Response Personnel
- Heat Stress
- Ergonomics/Lifting
- Project/Product Review
- Utility Shutdowns in Areas Containing Hazardous Materials



# Industrial Hygiene and Safety

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- Forklift Safety
- Ladder Safety/  
Scaffolding/Fall  
Protection
- Compressed Air and  
Gases
- Machine, Hand, and  
Power Tool Safety
- Lockout/Tagout  
Program
- Vehicle Safety
- Electrical Safety
- Illumination
- Stairs and Aisles/  
Walkways/Crawlspaces
- Contractor Site Safety  
Plan
- Eyewash/Safety  
Showers



# Laboratory Health and Safety

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- High Hazard experimental process review
- Reproductive hazards review
- Carcinogen use review
- General laboratory hygiene
- Need for better chemical hygiene plan development for laboratories
- Development of laboratory safety plans



# Injury Prevention

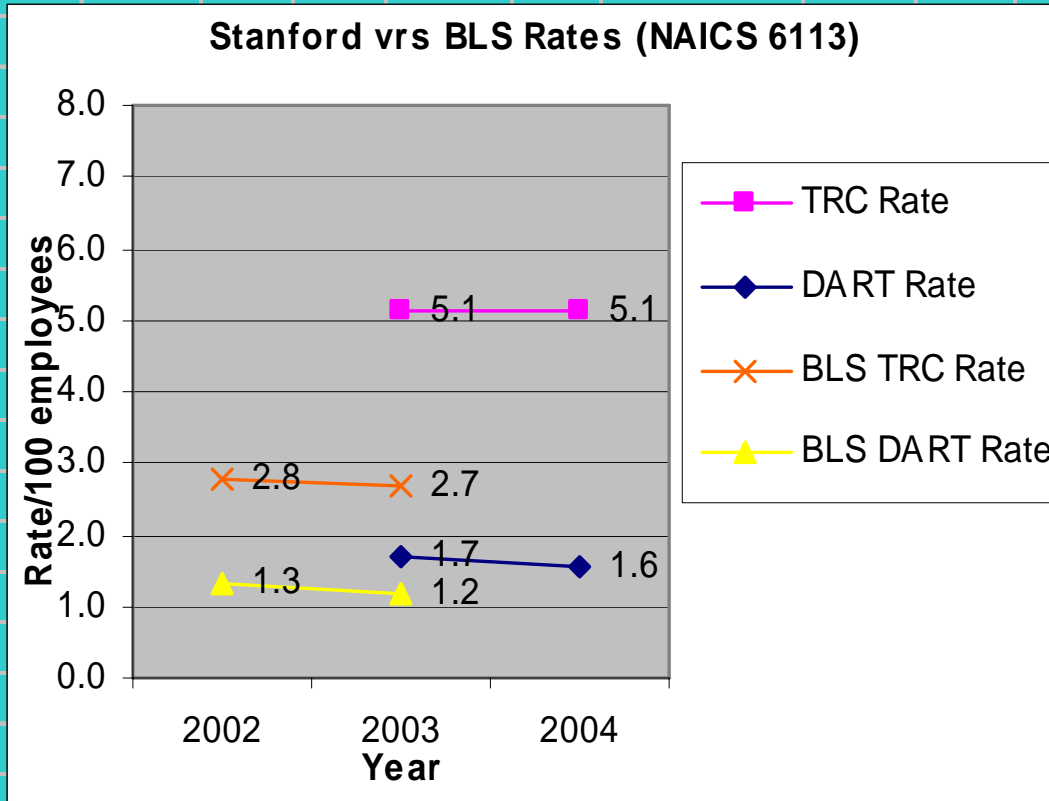
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- Risk-based approach
- Work closely with Risk Management (Workers' Compensation Section)
- University injury rates



# Stanford Campus vrs. Bureau of Labor Statistic BLS Rates for Colleges, Universities and Professional Schools

Year	RATE			BLS (NAICS 6113)*			Employee Hours/year	DART	ORC	TRC
	DART	ORC	TRC	DART	TRC					
2002				1.3	2.8		30,630,278			
2003	1.7	3.4	5.1	1.2	2.7		22,326,507	187	384	571
2004	1.6	3.6	5.1				23,051,373	180	412	592



\*North American Industry Classification System (replaced SIC codes in 2002)

6113 is Colleges, Universities and Professional Schools

Stanford University – Workers’ Compensation (***Excluding SLAC***)

Table 3. Highest Frequency of Incidents Period 9/1/03 – 9/1/04

Department	No. of Incidents	Costs	Percent of Total Incidents	Percent of Total Losses	Average Cost Per Incident
<b>Facilities/Transportation Programs/ID Mail</b>	<b>82</b>	<b>\$637,789</b>	<b>13.42%</b>	<b>24.92%</b>	<b>\$7,778</b>
<b>University Dining</b>	<b>69</b>	<b>\$352,688</b>	<b>11.29%</b>	<b>13.78%</b>	<b>\$5,111</b>
<b>Housing Services</b>	<b>41</b>	<b>\$98,727</b>	<b>6.71%</b>	<b>3.86%</b>	<b>\$2,408</b>
<b>Libraries</b>	<b>32</b>	<b>\$108,337</b>	<b>5.24%</b>	<b>4.23%</b>	<b>\$3,386</b>
<b>Med/Micro Bio/Immunology</b>	<b>25</b>	<b>\$63,503</b>	<b>4.09%</b>	<b>2.48%</b>	<b>\$2,540</b>
<b>Med/Blood Center</b>	<b>24</b>	<b>\$10,978</b>	<b>3.93%</b>	<b>0.43%</b>	<b>\$457</b>
<b>ITSS/Data Center</b>	<b>19</b>	<b>\$169,130</b>	<b>3.11%</b>	<b>6.61%</b>	<b>\$8,902</b>
<b>Pres/Provost/Continuing Studies/Hoover House</b>	<b>16</b>	<b>\$37,230</b>	<b>2.62%</b>	<b>1.45%</b>	<b>\$2,327</b>
<b>Public Safety</b>	<b>15</b>	<b>\$119,037</b>	<b>2.45%</b>	<b>4.65%</b>	<b>\$7,936</b>
<b>Humanities &amp; Science/Lit Cultures &amp; Lang/Jewish Study</b>	<b>14</b>	<b>\$59,002</b>	<b>2.29%</b>	<b>2.30%</b>	<b>\$4,214</b>
<b>Totals</b>	<b>337</b>	<b>\$1,656,421</b>			

Source: Zurich Risk Engineering / March 2005

# Occupational Health Surveillance

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- Asbestos exposures
- Hazardous Chemical Exposure
- Hazardous Materials Emergency Response Team
- Noise Exposure
- Police Officers
- Respirator Users
- Identified laboratory research materials
  - Specific viruses/bacteria
- Biohazardous agents
- Laser users eye-safety
- Workstation Ergonomics
- Laboratory Animal Occupational Health Surveillance
- Research personnel with clinical patient contact



# Occupational Health Center

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- Funding for on-site Occ. Health Service
- Renovating space at EH&S for small clinic
- Nurse Practitioner and support staffing with direct supervision from physician
- Focus
  - Medical surveillance
  - Medical triage of on-the-job injuries and symptoms
- Also adding Ergonomics support



# EH&S-Regulatory Agency Interaction

## Supporting the Stanford Community

### Stanford Community



### Environmental Health & Safety

- Chemical Waste
- Biological Waste
- Radioactive Waste
- Radiation Safety/Health Physics
- Fire Safety Engineering
- Hazardous Materials Mgmt.
- Environmental Compliance
- Industrial Hygiene
- General Safety
- Biological Safety
- Training and Communications
- Emergency Preparedness
- Program and Compliance Admin.

### Regulatory Agencies

- Federal Environmental Protection Agency
- California Environmental Protection Agency
- California Department of Toxic Substances Control
- Federal Occupational Health and Safety Administration
- California Occupational Health and Safety Administration
- The Governor's Office of Emergency Services
- Santa Clara County Health Department
- Santa Clara County Planning Dept. - Office of Building Inspection
- Santa Clara County Planning Dept. - Fire Marshal's Office
- California Fire Marshal
- Santa Clara County Water District
- Santa Clara County - Office of Toxic and Solid Waste Management
- San Francisco Bay Regional Water Quality Control Board
- Bay Area Air Quality Management District
- City of Palo Alto Fire Department
- City of Palo Alto Regional Water Quality Control Plant
- Federal Department of Transportation
- California Highway Patrol
- California Department of Motor Vehicles
- U.S. Nuclear Regulatory Commission
- California Department of Health Services

# Compliance Management

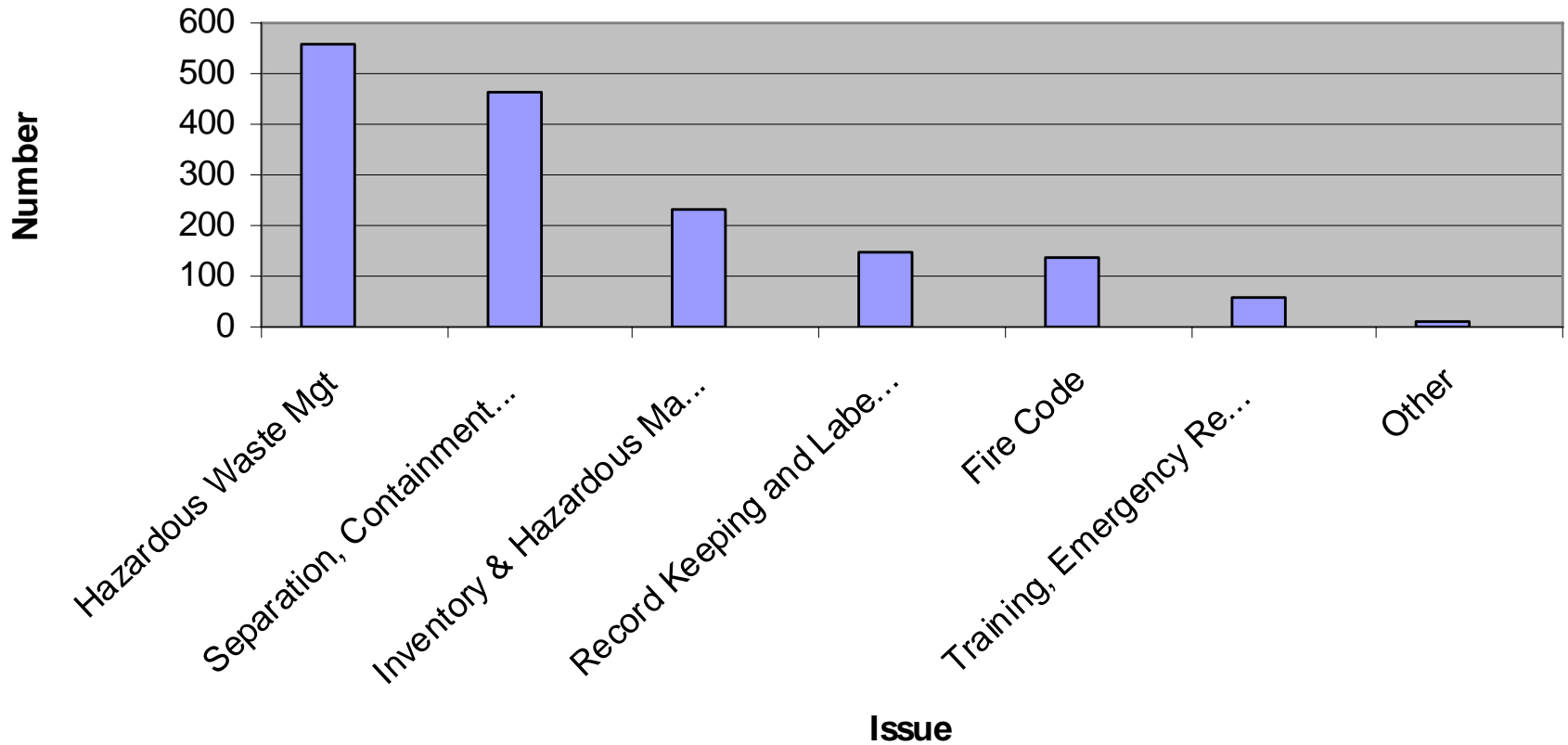
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- Fire inspections
- State Health Department – Bureau of Radiological Health
- VA Health Physics program (NRC)
- City of Palo Alto Haz Mat and Sewer
- Compliance Panel areas (FDA, USDA, AAALAC, NIH)
- County of Santa Clara Haz Mat



# Compliance Inspections

Inspections 2003-2004



# Compliance Management – County inspections

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- '03-'04 results
  - 144% Increase in total # found from directly comparable locations compared to 2001 (n=60)
  - 13 of 60 locations had decrease in # cited
- This year's inspection results to be communicated to University cabinet members (Deans and VPs by Department) and to Department Chairs by program area.



# Ongoing Focus Issues

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- Occupational Health Program development
- Emergency Management Planning
- EH&S Training
  - Additional Web-based training delivery
- Compliance management (County inspection results)
- Emerging Research Technologies and Issues
  - Nanotechnology safety
  - Gene therapy applications for clinical trials
  - Cyclotron and additional requirements



# Focus Issues

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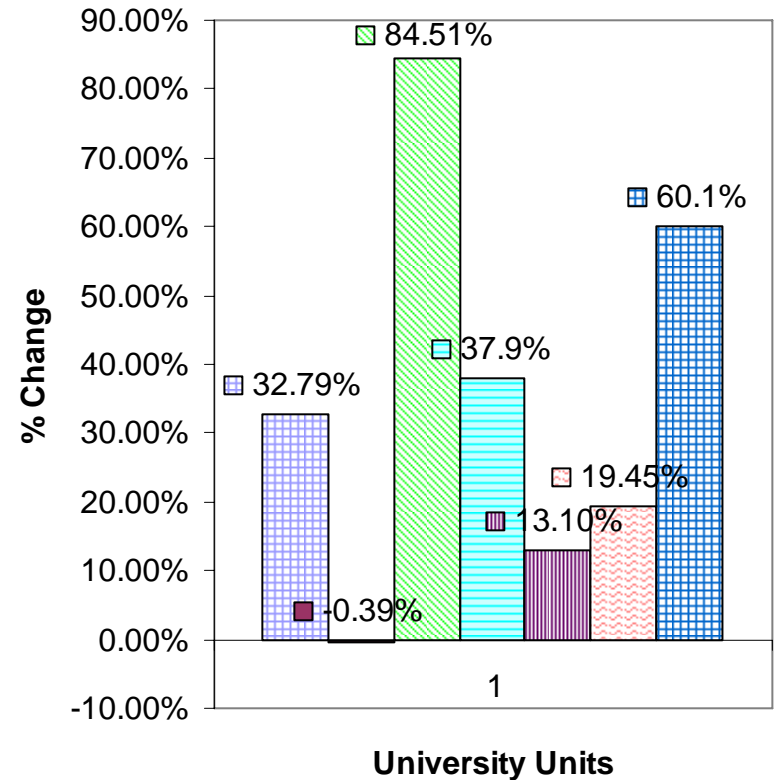
- Injury Reduction Program with targeted areas
- Construction and renovation impacts
  - New major building and construction programs (SEQII, Med School) (6-7 new buildings through 2012)
- Chemical inventory information management
  - Use in Risk assessments
  - Use in Decommissioning
- Environmental Programs Coordination
  - Promote emerging environmental stewardship program



# Resources

**Table 1: University and EH&S 10-Year Growth Comparison ('93-'03)**

- University Employees
- EH&S Base Staffing
- Total Spons Rsch Expenditures
- Total EH&S Base Expend
- Total Square Footage
- Total Research Square Footage
- Indirect Cost Recovery



# Overall Status of EH&S at Stanford

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- Programs remain effective and efficient
- Organizational structure being emulated throughout academia
- Critical EH&S issues and programs are stable – compliance management needs additional focus
- Injury incidence rates high relative to norm for industry.
  - Slips/falls; sprains/strains
  - Need to develop better accident control response programs
- Future focus on enhanced coordination of “Stanford Environmental Stewardship”



# University Safety Partner Program

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- USP program is critical to success of University programs
- University decentralized governance structure
- Role of each safety partner is very important and enriches overall program for Stanford

