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# EHSMS Seminar Series

## Plan, Do, Check & Act

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Discovery, Prioritization & Mitigation Strategies  
Environmental Health & Safety Management System

Presenter:  
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For:  
Departmental Safety Committee  
HFRR Department @ Kansas State University

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Introduction

## Land Grant Universities

As work settings, the land grant missions of KSU are very unique places of work within the University due to teaching, research and extension activities that occur in laboratories, greenhouses, farms and field sites in Manhattan and at locations throughout the state.<sup>1</sup>

In this environment, there is the potential for simultaneous exposures to a variety of hazard types, such as:

- Physical
- Electrical
- Fire
- Chemical
- Radiological
- Biological
- Thermal
- Vehicular

And a diverse population of students, faculty, staff and visitors.

<sup>1</sup>Source: J. Ernest Minton



Introduction

## COA EH&S Office: Roles and Responsibilities

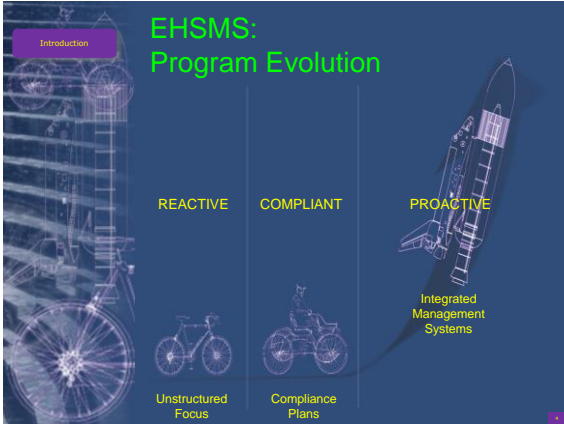
### Overarching

- Permits/Licenses/Registrations
  - Regulatory Applicability Matrix
- Purchasing
  - Design for Environment
- Design/Build/Backfill Input
  - EH&S Design Standards
  - A/E Reviews
- Regulatory Requirements
  - Evergreen attention to regulations
  - Coordinate third party inspections
- Business Reviews
  - Leverage EH&S against Core Values/COA Mission
- External Facing Customers

### Area Specific

- Aspects and Hazards Assessment
  - Establish Objectives & Targets
- Standards of Practice
  - Develop/Facilitate/Coordinate
- Training
  - New employee orientation
  - Regulatory, e.g., WPS
- Lab/Field/Product Assessments
  - Conduct
  - Facilitate/Coordinate self-assessments
- Documentation
  - Centralized dBase
  - Web site
- EH&S Committees
- Management Reviews
  - Ownership/Accountability






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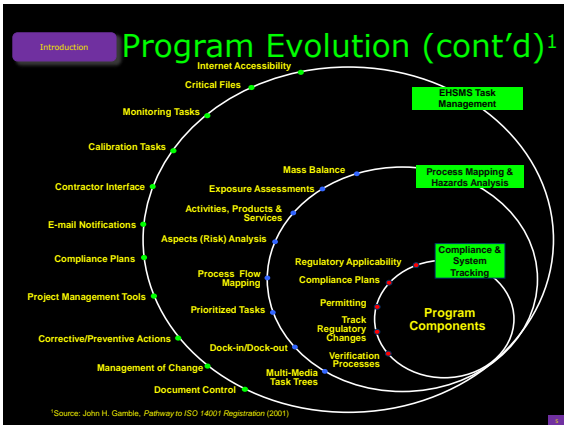
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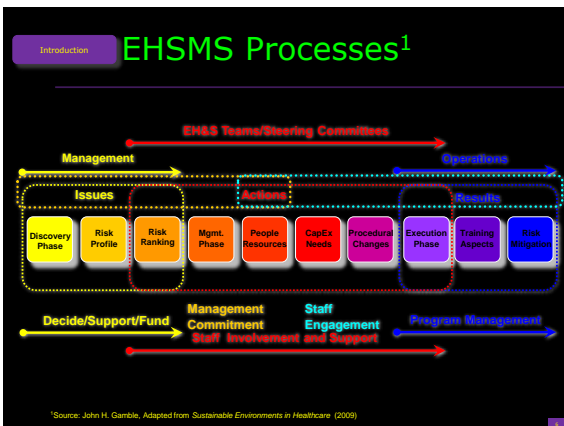
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Introduction

From Chemical Safety Board findings (Oct. 19, 2011):

- Physical hazard risks of research were not effectively assessed, planned for, or mitigated
- University lacked safety management accountability and oversight
- Previous incidents with preventative lessons were not documented, tracked and formally communicated



[https://www.youtube.com/watch?v=sjDdl\\_d8br8](https://www.youtube.com/watch?v=sjDdl_d8br8)

Texas Tech: explosion and injury to grad student on 01.07.10

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Introduction

## Elements of Strong Safety (EH&S) Cultures<sup>1</sup>

- Leadership:** Responsibility and accountability for safety must be clearly defined from the highest level down to individual faculty and staff. Leading by example is a requirement!
- Strong safety attitudes, awareness and ethics:** Strong positive attitudes about safety require long-term efforts through continuous emphasis on safety.
- Learning from laboratory incidents:** Studies of incidents capture interest and teach lessons...implement a system of reporting and investigating incidents.
- Establishing collaborative relationships:** Safety culture requires close, trusting collaborations among all members of the academic and supportive staff, students and emergency responders.
- Promoting and communicating safety:** Demonstrating safety practices through personal example and recognizing positive safety behaviors are important ways to promote safety. Safety should be reinforced through continuous and diverse efforts.
- Strong safety programs require funding:** All strong safety programs require investment of substantial effort with adequate and continuous funding.

<sup>1</sup>Source: Creating Safety Cultures in Academic Institutions, ACS (2012)  
<https://www.youtube.com/watch?v=N6esWJg6Cs>




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Lab/Field Safety

## EHSMS Processes

- Support, Engagement and Ownership** of the program(s)
  - Top down
  - Bottom-up
- Assessments** lay the foundation for the learning and quality improvement effort around reducing accidents/environmental incidents
  - Outcome driven EH&S inspections
  - PI supported self-inspections
- Training** in the labs
  - New hire(s)
  - General lab safety practices
  - Task specific
- Documentation** of the program elements
  - JSAs
  - Plans
  - Protocols




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# Support, Engagement, Ownership

- **Support, Engagement and Ownership** of the program(s)
  - *Top down/Bottom-up*
  - Dedicated and time committed Departmental Safety Coordinator
  - Departmental Safety Committee:
    - Administrative membership
      - » Funding and decision-making authority
    - Faculty/Staff/Student engaged
      - » Rotating membership
    - Accident patterns/trends
      - » Prevalence/Incident
    - Risk reduction strategies
      - » Qualitative assessment
  - Faculty, staff and students engagement
  - Accountability
  - Risk vs. Compliance
  - Systemic risk management
  - Safety performance woven into job description/reviews




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# EH&S Assessments Self-Assessments

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| <ul style="list-style-type: none"> <li>• <b>H/S Inspection Checklist</b> <ul style="list-style-type: none"> <li>- Documentation and Training</li> <li>- Emergency Equipment</li> <li>- Personal Protective Equipment (PPE)</li> <li>- General Hazards</li> <li>- Fire Safety</li> <li>- Electrical Hazards</li> <li>- Laboratory Refrigerator/Freezer</li> <li>- Chemical Storage</li> <li>- Hazardous Materials/Waste</li> <li>- Engineering Controls – Fume Hood and Biosafety Cabinets</li> <li>- Physical Hazards</li> <li>- Gas Cylinders</li> </ul> </li> </ul> | <ul style="list-style-type: none"> <li>• <b>H/S Inspection Checklist Cont'd</b> <ul style="list-style-type: none"> <li>- Biological Waste</li> <li>- Biosafety Level 2 (BSL2)</li> <li>- Radioactive Materials</li> <li>- Lasers (Class 3B and 4)</li> <li>- DEA Controlled Substances</li> <li>- Select Agents</li> </ul> </li> <li>• <b>Env. Inspection Checklist</b> <ul style="list-style-type: none"> <li>- Water, Wastewater, Stormwaters</li> <li>- Wastes – MSW, HW, Bio</li> <li>- RCY, Reuse, Repurpose</li> <li>- Air</li> <li>- DOT</li> <li>- Other: SPCC; Endangered Species; Sustainable Environments; Wetlands</li> </ul> </li> </ul> |
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Report  
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Best Practices : Opportunities for Improvement




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## Why perform a risk assessment?




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## Training

- **Training** in the labs/greenhouses/field sites
  - New hire orientation
  - General lab/greenhouse safety practices
  - Train-the-Trainer
  - Task specific, e.g., Skid-Steer, Pesticide application
- **Training delivery methods**
  - Live group sessions
  - WebEx
  - Online (JJ Keller, others)
- **Competency outcomes**
  - Pre-test
  - Knowledge check questions
  - Post-test




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## Documentation

- **Documentation** of the program(s)
  - **Permits, Licenses and Registrations:** AGT, Air Pollution Abatement Equipment, Permit by Rule, LQG/SQG/CESQG Status, Endangered Species, Water Wells, Septic Tanks, POTW industrial user discharge, etc.
  - **Plans:** Exposure Control, Chemical Hygiene, Hazard Assessments, Hearing Conservation, SPCC, RCRA Contingency, etc.
  - **Standards of Practice:** JSAs, HazCom, PPE, LOTO, Respiratory Protection, Confined Space, Emergency Shower/Eyewash, BBP, DOT Hazardous Materials, Hazardous Wastes, Universal Wastes, Hot Work, Fall Protection, Trenching & Shoring, Industrial Hygiene, Incident/Accident Reporting, Electrical Safety, Emergency Preparedness, Equipment Disposal, Medical Records, etc.
  - **Protocols:** Research Standard Operating Procedure(s)
  - **One Drive**
  - **Ag Safe Web Site**
  - **Track performance**
  - **Showcase** performance/results




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## General Safety Equipment

Shower

Eye Wash

Fire Safety

PPE

Flammable Storage

Spill Supplies




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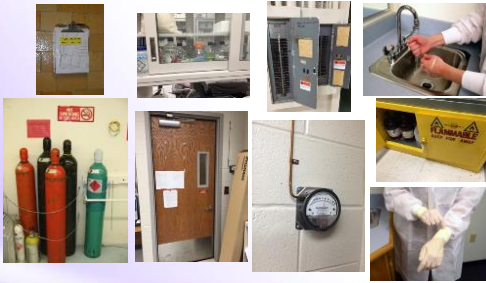
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## Safety Practices: DO




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## Safety Practices: DO NOT




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## Program Assessment

- **Compliance** with state and federal regulations and internal policies is uneven
  - KSU/COA has a safety policy
  - KSU/COA does not have a culture of safety
  - There is no centralized repository containing compliance information
  - Several safety committees exist, but they need strengthening
- Generally, there is **strong interest** in safety, but **limited faculty and staff engagement** in delivering improved performance
  - Departments are not universally sharing best approaches to managing safety
- **Oversight:** no consistent enforcement of safety standards in the labs
  - Perceived, stated, and actual roles of EH&S Department differ
  - Is EH&S supposed to act as the "safety police"?
- **Safety training** for research personnel is not effective at the COA
  - Limited training courses (WPS) are available and required for grad and undergrad students doing laboratory research
  - Additional training in the PI's lab is assumed to happen
  - Some online safety modules are available through JJ Keller
  - Many KSU EH&S risks have policies that are not current or they're non-existent

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# Opportunities for Improvement

Observations

- **KSU/COA needs to improve its culture of safety, which will depend on:**
  - Strong commitment from administration through words and deeds
  - Active engagement of faculty and staff
  - Service-oriented, collaborative approach by EH&S
  - Researchers performing in a responsible, conscientious and safe manner
- **KSU/COA EH&S Policy needs updating to establish succinct roles and clear opportunities for improving the risk resolution process**
- **EH&S needs to go from a just-in-time approach to a pro-active one by:**
  - Becoming an in-house consultant for researchers
  - Developing Standards of Practice that can then be tailored to individual labs
  - Partnering with PI's and Departments to develop safety training programs and lab safety plans
  - Assigning EH&S staff to buildings, to build relationships with individual labs
  - Revamping its web site to be a user-centered, repository of information
- **Safety training needs to be tailored to each area, of high-quality, recorded in a database and available as in-person + online sessions**
- **Needed is a centralized repository containing compliance and training information**



Deliverables

# What's in it for you?

Ownership in a culture and a work environment that ...

- Is proactive, not reactive
- Is outcome, metric focused
- Focuses on risk, not minimum compliance requirements
- Integrates good EH&S work practices into daily activities
- Reduces the likelihood of incidents and injuries
- Doesn't look the other way when risky behavior or conditions exist
- Provides you a safe and sound finish to your work day!




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