Integrating EH&S into Project Planning

Timothy Lockhart, CIH, CHMM – University of Colorado, Boulder

Brandy Howard, CIH, CSP – Landmark Environmental, Inc.

Why are we here?

- To discuss the importance of involving Environmental Health and Safety into the project planning process
- To appreciate what EH&S staff can offer and how they can help with project planning
- To understand how to effectively incorporate EH&S (and other groups) into the planning process

Presentation Overview

1. Project Planning
2. EH&S Capabilities and Project Involvement
3. Case Studies
4. What can you do to help

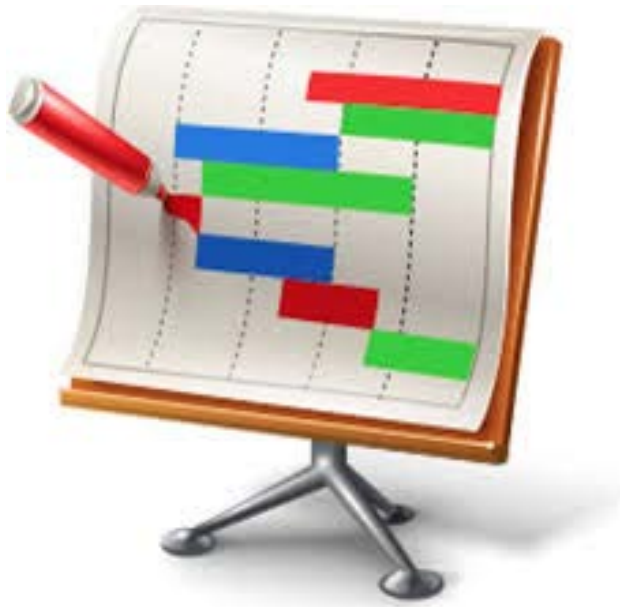
Project Planning

Why Do We Plan Projects?

1. **Get an Understanding of Client's needs and vision**
2. **Estimating Budgets**
3. **Code and Regulatory Requirements**
4. **Schedules**
5. **Organizational Impacts**
   - Building usage
   - Traffic and Pedestrian Flow
   - Person hours
   - Infrastructure
   - Future Ongoing Maintenance
   - Environmental Compliance

Project Planning Process

1. Research Department submits a project
2. Facilities reviews and assigns a team
    a) Internal team vs external Planning and Design?
3. Comment Period
    a) OIT
    b) Parking
    c) EH&S
    d) Facility Operations
4. Specifications are developed
5. GC is selected
6. Hazardous Materials (i.e. Abatement)
7. Construction



Poor Planning: Why Does It Happen?

- Lack of Process
- Unknown relationships
- Budget Constraints
- Value Engineering
- Poor understanding client needs
- Don’t understand impacts on Code and Regulations
- Past Experience
- Lack of accountability

Today’s focus is Project Planning and EH&S in an Academic Setting.

Results of Poor Planning…

- Unhappy Client(s)
- Budget Overruns
- Not on Schedule
- Unfunded support for new systems
- Indoor air quality issues
- Traffic and pedestrian congestion
- Undersized Mechanical Design

Today's focus is Project Planning and EH&S in an Academic Setting.

EH&S Capabilities and Project Involvement

Organizational structure can play a role in EH&S's involvement

EH&S Departments can report to different management and administration

- Risk Management
- Facilities Management
- Vice President of Vice Chancellor of Research
- Public Safety

- Organizational Structure can determine EH&S involvement in different processes

There is no correct answer

Traditional EH&S Roles

- Hazardous waste management
- Indoor air quality
- Research Compliance
  - Biological Safety
  - Chemical Safety
  - Radiation Safety
- Asbestos and lead management
- Occupational Safety

… And whatever other Health and Safety Concerns come in!

EH&S Best Practices

Number one goal is typically compliance related

Risk management driven systems (Proactive vs. responding to lagging indicators)

EH&S as a service to the University

Provide support and answers to questions as they arise

Promote accountability, culture, and follow-through

Universities are complex and have different classes of affected parties to protect

Key Performance Indicators

Tracking programs and other related information to measure performance

Traditional EH&S Project Involvement

- Compliance
  - Environmental
  - Health and safety
  - Campus standards
- Regulated building materials
  - Asbestos, Lead, etc.
- Hazard Communication
- Occupant Concerns
- Indoor air quality
- Water Quality

EH&S and Projects

Not all universities are the same and have different

- Reporting structure
- Types of research
- Student population
- Sizes
- Funding sources
- Regulatory oversight (or lack of)
- Views on safety and responsibility

Differences in Management and Organizational Structure often dictate the value of particular program areas and work flow.

But the world is changing…

- **Sustainability**: design and energy efficiency
- **Departmental Blending**
- **Emerging Technologies and new hazards**
  - 3D Printers
  - Laser Cutters
  - Low flow fume hoods
- **Increased knowledge on how to manage “old” hazards more effectively**
- **Increased regulatory overview**
  - Environmental
  - Safety

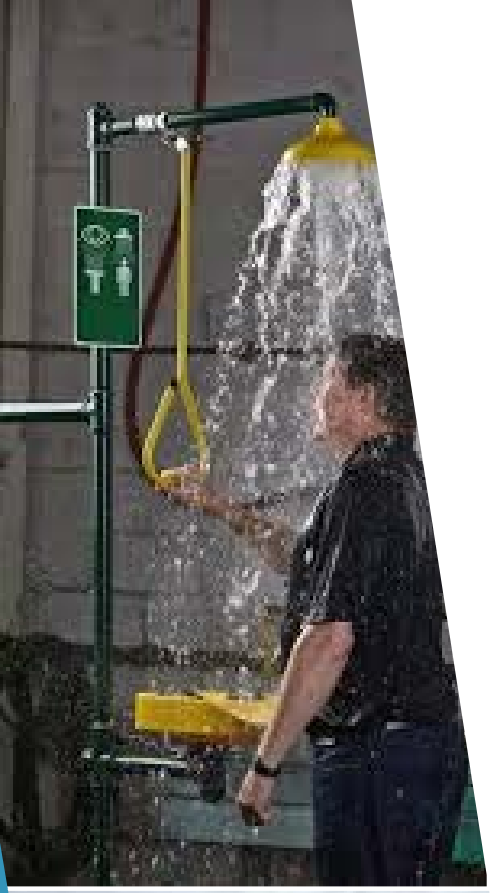
EH&S Project Review

EH&S reviews the research that is going to be done in a laboratory spaces but not always a review of what is being built to address the research.

Depending on the campus, Design Teams typically follow

- Code
- Industry standards
- Best practices
- Previous experience and projects

Case Studies

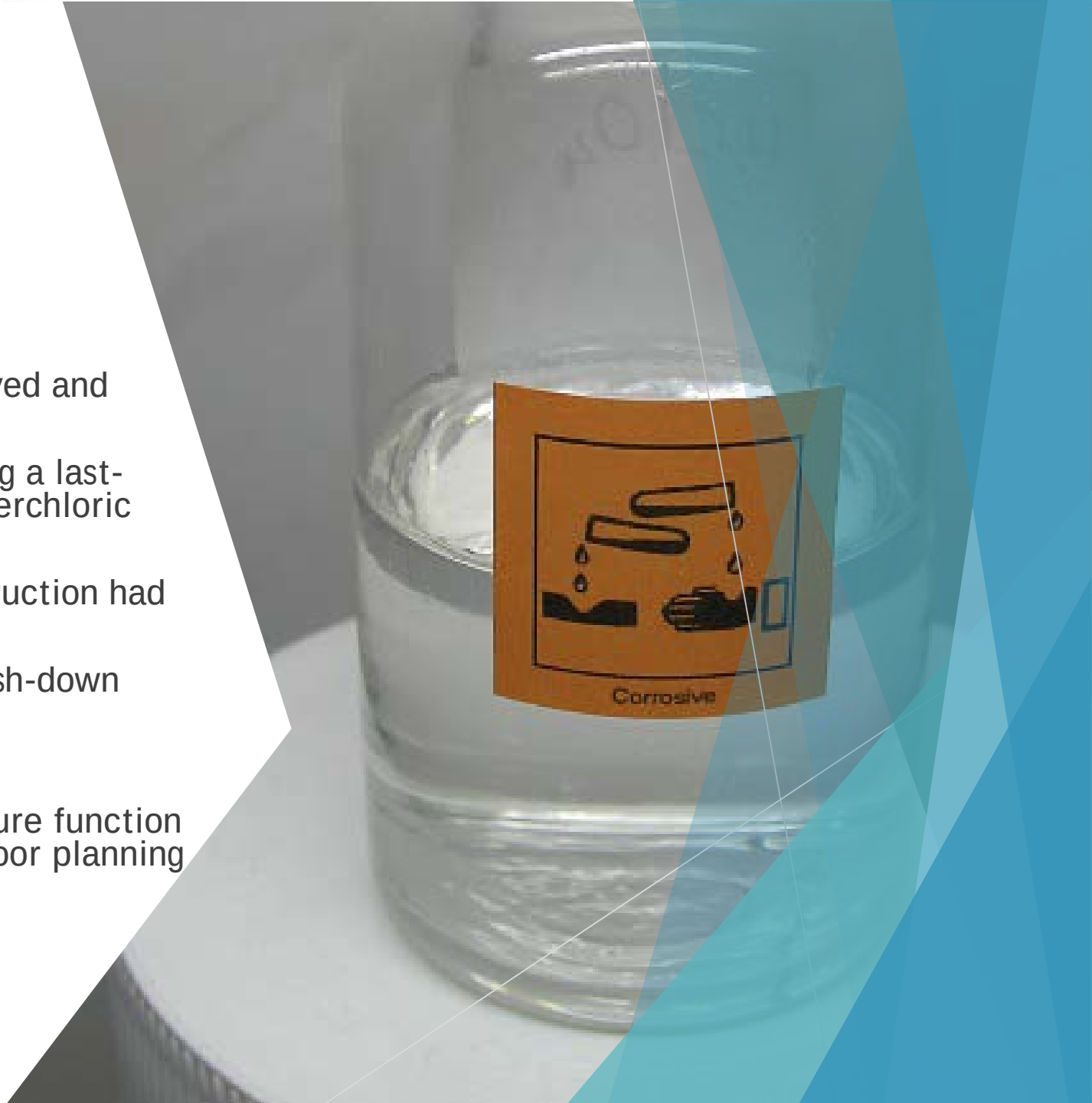


Floor Drains

- Background
  - Emergency Eyewash and showers are required for wet labs
  - Construction standards require floor drains
- Issue
  - Deviation from construction standards and floor drains were not added to new lab buildings
- Outcome
  - Retrofitting a completed lab building expensive and unlikely
  - Increased risk of damage to building in the event of an emergency
  - Potential loss of equipment, research and time

Perchloric Acid Hood

- Background
  - Specialty lab equipment must be approved and reviewed by EH&S
  - During construction of a new lab building a last-minute change was made to include a perchloric acid fume hood without alerting EH&S
  - EH&S stumbled on the hood after construction had begun
  - Hood design was not proper and the wash-down function of the hood was not adequate.
- Issue
  - Retrofitting the hood wash-down to ensure function and safety took almost 2 years due to poor planning
- Outcome
  - Lost research time (~2 years)
  - Increased (unbudgeted cost)



Laboratory Air Change Rate Reduction

- Background
  - Lab buildings are large consumers of energy
  - Lab buildings built over multiple decades with different opinions on exchange rates in lab spaces
- Issue
  - Lab buildings continue to consume large amounts of energy
  - Goal is to reduce carbon footprint of research facilities
- Outcome
  - EH&S teams with mechanical engineers to use a risk-based approach to model exposure potential based on risk and hazards
  - ~37% reduction in energy consumption over traditional design
  - Model that can be used on other buildings

Wind Studies

- Background
  - Large campus in a windy climate
- Issue
  - Indoor air quality concerns from exhaust re-entrainment
- Outcome
  - EH&S teaming with mechanical engineers and outside consultant to model dispersion of contaminant and likelihood of entrainment based on results
  - Allowed for optimal placement of hazardous exhaust stacks and outdoor air intakes

Asbestos-Containing Ceiling Tiles

- Background
  - Ceiling tiles in a large academic building contain asbestos
- Issue
  - Ceiling tiles are friable and easily disturbed during access above the ceiling
  - Management in place is difficult and increases likelihood of exposure
  - Wholesale removal is cost prohibitive and unlikely
- Outcome
  - EH&S is working with regulators to negotiate a possible alternative means of removal
  - EH&S is working with various groups on campus to minimize Risk and cost effective develop a path forward

Mercury Flooring

- Background
  - Hazardous materials inspection identified Mercury containing flooring in Recreation Center
- Issue
  - Budget for renovation was set
  - Disposal of flooring was too expensive
- Outcome
  - Removal of some mercury flooring where required for construction
  - EH&S conducted a Risk Assessment to understand implication of managing flooring in place

What can you do to help?

- Review and Update Construction Standards
- Build Relationships
- Process
- Accountability

Summary

- Develop a process for project planning
- Maintain relationships, know who to involve in the process
- Bring the right people to the table at the right time
- Applies to other groups too
- Lean on your EH&S folks they are talented and can offer a wealth of information that is invaluable if gathered at the right time.

Questions?

Tim Lockhart, CIH, CHMM

Assistant Director

University of Colorado, Boulder

303-492-6026

Timothy.Lockhart@Colorado.edu

Brandy Howard, CIH, CSP

Project Manager

Landmark Environmental, Inc.

720-283-8974

bhoward@landmarkenviro.com