TEXAS TECH UNIVERSITY™
Department of Chemistry and Biochemistry

Texas Tech: An Update on Safety Culture Changes and How We Plan to Use the ACS Hazard Document as Part of the Process

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Disclaimer

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Texas Tech Chemistry:

- **Buildings**: Two (1928 (Renovated 1988); 1968-1971)
- **Faculty:** 26
- **Graduate Students:** 105
- **Postdoctoral Research Associates:** 34
- **Technical Staff:** 10
- **Clerical Staff:** 10
- **Chemistry Undergraduate Majors:** ~ 250
- **Biochem Undergraduate Majors:** ~ 256

- **Total Funding (2009):** $4,225,265
  - **Federal Grants:** $ 1,939,044
  - **Non-Federal Grants:** $ 1,532,962
  - **Co-PI:** $ 753,259
- **Federal R&D Expenditures (2010):**
  - Top 100

- January 7, 2010: Explosion in Energetic Materials Lab Injures Student

- Call from National Chemical Safety Board
  - January 8, 2010

- Accident Picked Up in National Media:

-C&EN, Jan. 25, page 7 - C&EN, Feb. 1, pages 25-26
-C&EN, July 23 (Online) - C&EN, Aug. 23, pages 34-37

- Feb. 11: Lab Reopened
- Feb 26: DHS Visit (Northeastern)
- March 19-23: Visit by Chemical Safety Board
- April 9: Internal Investigation Results Released
- May 25: DHS (ALERT) Visit
- October 19, 2011: NCSB Webinar
- October 20, 2011: CSB Release of "Experimenting with Danger"

http://www.depts.ttu.edu/vpr/integrity/csb-response/index.php

CSB Report:

• Ensure that research-specific hazards are evaluated and then controlled by developing specific written protocols and training.

• Expand existing laboratory safety plans to address the physical hazards of chemicals.

• Ensure that safety personnel report directly to a university official who has the authority to oversee research laboratories and implement safety improvements.

• Document and communicate all laboratory near-misses and incidents to educate individuals and track safety at the university.

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Texas Tech University's Response Before CSB Report:

- Working Group Established to Review Lab Safety Policies and Training
- Institutional Laboratory Safety Committee (ILSC) Established
- Peer Review Panel Commissioned to Review Safety Culture (April 4-5, 2011)
- Research Programs Requiring Significant Monitoring Identified
- Search for Ph.D. – Level Chemical Safety Officer (Hire in Spring 2012)
- Safety Information to be Required in Tenure and Promotion Packages
- Safety Information to be Required in Theses and Dissertations
- New Emergency Action Plan (EAP) Instituted Campus-Wide

TTU: Self-Imposed Recommendations

1) Adapt elements of physical risk into our chemical hygiene plan.
2) Require Texas Tech University (TTU) to become an exemplary institution around the culture of safety.
3) Require the University to report annually to the U.S. Chemical Safety Board about progress made toward improving the culture of laboratory safety; the parameters will need definition.
4) Establish a TTU Faculty Chemical Safety Committee to help firmly establish the culture of laboratory safety.
5) Acquire an online chemical inventory system.
6) Require the Provost and Vice President for Research to make laboratory safety an element of annual evaluations (e.g., college, department, faculty).
7) Others to be determined.

Texas Tech Chemistry Response

• Department Safety Committee Reorganized and Charged to Change Department Safety Culture:

- Biweekly Meetings
- Committee Contains Representation from All Stakeholders
- Each Research Group has a "Safety Captain"

- New Model Results from Reflections on Visit from Rick Danheiser (MIT)

• Mandatory Chemical (and other) Safety Training: Required Verification in Personnel File: 100% Compliance

Texas Tech Chemistry Response

- All Relevant PPE Required in Research Labs

- Regulatory Authority of VPR/EH&S
  - Increased Safety Surveys by EH&S
  - Labs can be Rekeyed or Shut Down if Seriously Non-Compliant

- "Peer Safety Surveys"
  - One per semester.
  - Complement EH&S safety surveys

- Incident Report Forms Developed For Both Research and Teaching Labs
- EH&S, ILSC, and Chemistry Safety Committee Revamping CHP
- Common University Chemical Inventory System In Use: (EH&S Assistant)

Texas Tech Chemistry Response

• TA Training: In conjunction with Department of Theater and Dance, Training Course Designed to Teach Useful Teaching Behavior and Role Playing in Chemical Safety Scenarios in the Laboratory

• Synthesis Labs Working to Develop Protocols and Procedures, Code of Conduct and General Laboratory Rules. Reviewed and Signed by Students in most labs.

Texas Tech Chemistry Response

- Common Departmental Scheme for Labeling All New Chemicals (Prudent Practices)

- Safety Graduate Cumulative Exam Each Fall

Texas Tech Chemistry Response: Since April 2012

- Three semesters of safety training for TAs with the Department of Theater and Dance
- Scripting and Beginning Filming of New Safety Video
- EH&S/ILSC/Safety Committee rewrite of CHP (Annual Updates)
- Required Exam Over Contents of CHP by all Appropriate Researchers/Staff

Texas Tech Chemistry Response: Since April 2012

- Bar Coding of All Chemicals Underway
- New Input Procedure for All Chemicals
- EH&S/ILSC/Safety Committee Developing SOP's for Use Campus-Wide
- Additional PPE for All Teaching Labs Purchased
- New GHS stickers purchased to re-label all existing chemicals

Texas Tech Chemistry Response: Since April 2012

- Personalized Lab Coats Purchased for all New Graduate Students/Postdocs: White Coat Ceremony in Development

- Ongoing Peer Safety Evaluations: Results Used in Annual Report for Merit Raises, etc.

- EH&S/ILSC/Safety Committee Developing Near Miss Database and Reporting Scheme

Texas Tech Chemistry Response: Since April 2012

- New Graduate RCR Document/Handbook Under Development

- New Procedures for Accident Reporting in Place in Teaching Laboratories

- Faculty Members Involved in NAS Chemical Safety Culture Committee

- September has been designated as "Safety Month" for Texas Tech

- New website launched at Texas Tech: (Safety @TTU.EDU)

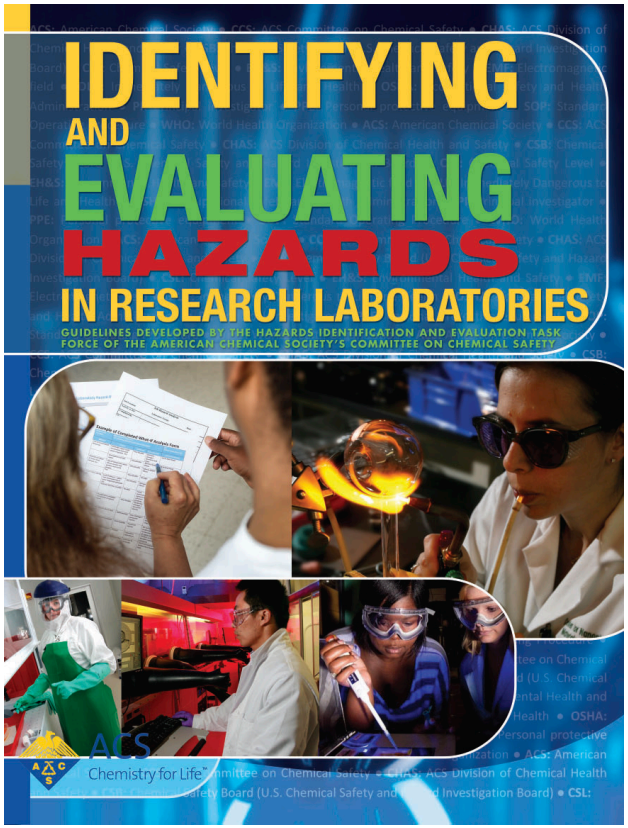
Texas Tech Chemistry Response: Since April 2012

- Safety Activities Now Required in Faculty Annual Reports

- Where Appropriate, Safety Section Now Required in Theses and Dissertations

How Texas Tech Plans to Use the New ACS Hazard Evaluation Document

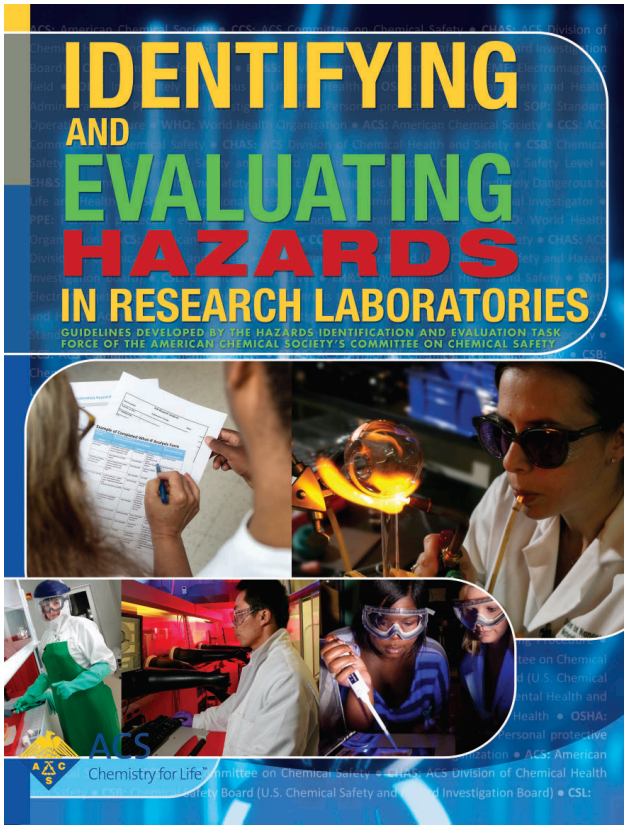
- Graduate Students from the TTU Department of Chemistry and Biochemistry, the Texas Institute for Environmental and Human Health (TIEHH), Members of the Departmental Chemical Safety Committee, and the Vice President for Research's Office Worked Through The Sections on "What If" Analysis, Job Hazard Analysis, and Writing SOP's and Provided Feedback to the Committee During the Development Phases of the Document



How Texas Tech Plans to Use the New ACS Hazard Evaluation Document

- Rather than adopting a "one size fits all" approach to hazard analysis, the various STEM disciplines will be able to do the analysis most suited to their laboratories

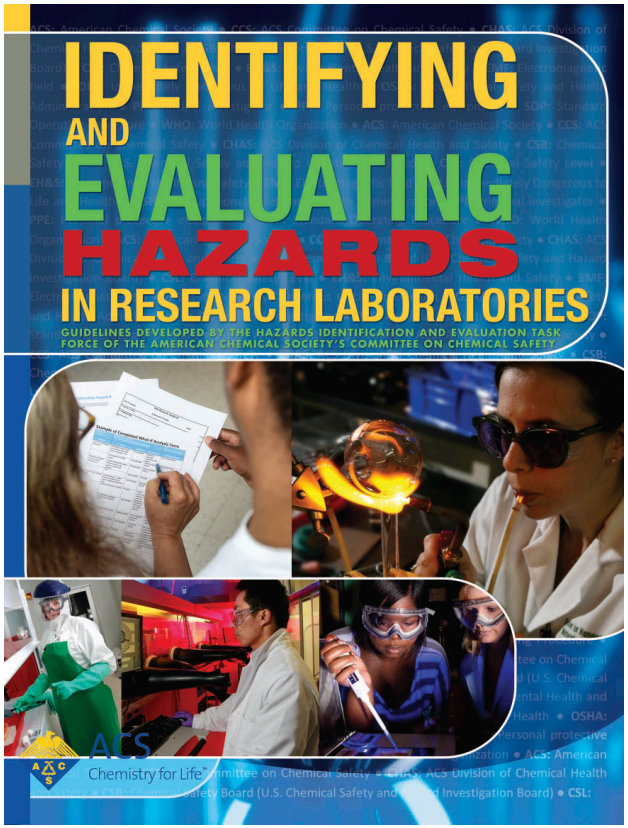
- Graduate Students and Postdocs will perform the analyses after consultation with EH&S and PIs to determine most appropriate analysis methodology.



How Texas Tech Plans to Use the New ACS Hazard Evaluation Document

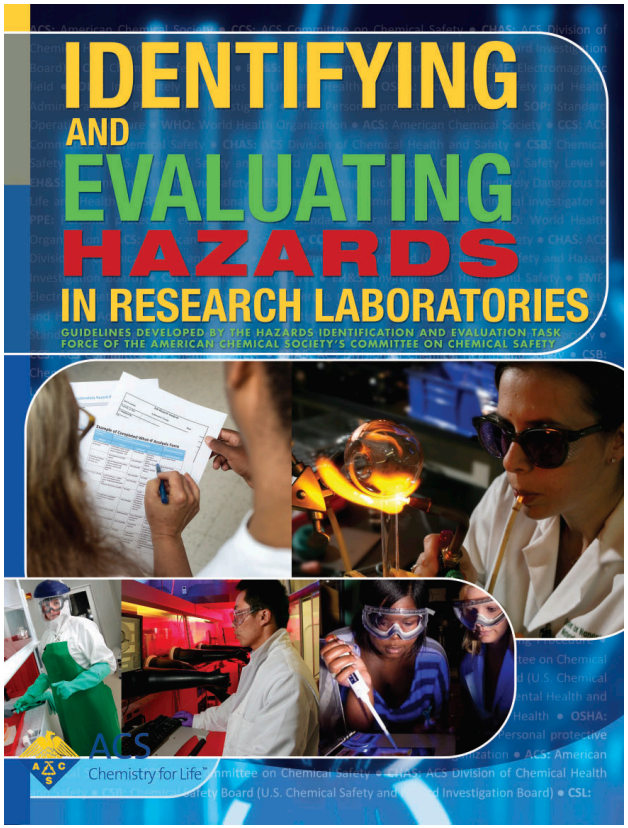
- This document will allow graduate students and laboratory researchers to take a personal hand in identifying hazards and in the the development of laboratory protocols.

- We also believe that the document will stimulate discussion in the labs about safety, safety culture, and how to evaluate risks and hazards in the work environment.



How Texas Tech Plans to Use the New ACS Hazard Evaluation Document

- THIS DOCUMENT IS WRITTEN WITH THE RESEARCHER IN MIND. The graduate students and staff at TTU who used the preview chapters were uniform in indicating that they learned a lot from following the worked examples, and it caused them to think about how to evaluate hazards in the lab in new and proactive ways. The analyses and SOPs that were written as a result are currently in use in these labs.



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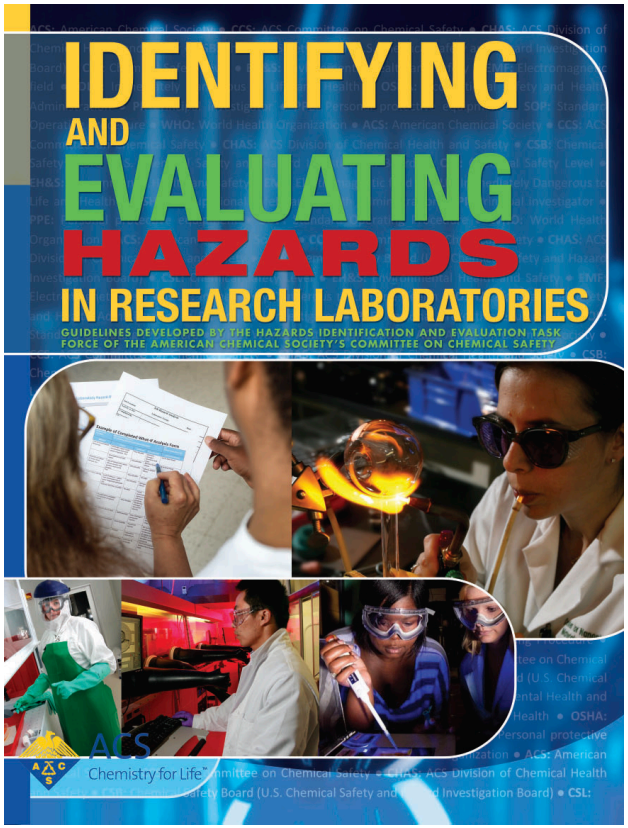

- In Chemistry and Biochemstry, we will use the document in our ongoing training of graduate students through cumulative exams and in lab safety training.

- Our Departmental Chemical Safety Committee will use the document in two ways:

  1) To Compliment Peer Safety Surveys
  2) To Provide Labs with Alternative Modes of Hazard Analysis and Inspection

Conclusions

1) Accidents at Public Universities are Public Events

2) Chemistry Labs are Dynamic:
The Safety Culture Must Be Vigilant

3) A Culture of Complacency Must Be Replaced by a Culture of Safety

4) Faculty: EH&S Relationships Must Be Changed
- Sherif – Maurader → Collegial

Conclusions

5) Faculty Under Increasing Pressure to Get Results: What Mechanisms Will Allow the Culture Be Changed with this Reality?

6) COMMUNICATION IS THE KEY!

7) A Stick is More Effective than a Carrot to Start the Cultural Change

8) We Need More Carrots!

Conclusions

9) Consequences for Lack of Safety = ???

10) Computerization of MSD and CHP Can Lead to Complacency

11) A Survey of Current Safety Practices is Needed, and Needs to be Shared with the Community

12) More Safety Videos, Prudent Practices, etc. Needed

Conclusions

13) Specific Protocols for Specific Lab Procedures: Database

14) Templates for Common Safety Paperwork (!!!)

15) Active Participation by Industry and the Government Are Welcomed

16) The University, College, Department, Faculty, Staff, Students Must All Work Together for the Culture to Change: Safety Really is EVERYONE'S Responsibility

Conclusions

17) Good Safety Doesn't Make Headlines: Bad Safety Does!

18) Not Everyone Has the Same Idea of What Constitutes Safety in a Pluralistic Society: Dialogue Needed!

19) It Saves Time and Resources to be Safe!
Safety Costs Money, but Saves Money (and Lives)

20) The Culture Must Change Through the Younger Generation : Postdocs, Graduate Students, Undergraduates, etc. Trust in Faculty Must Be Supplemented.

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