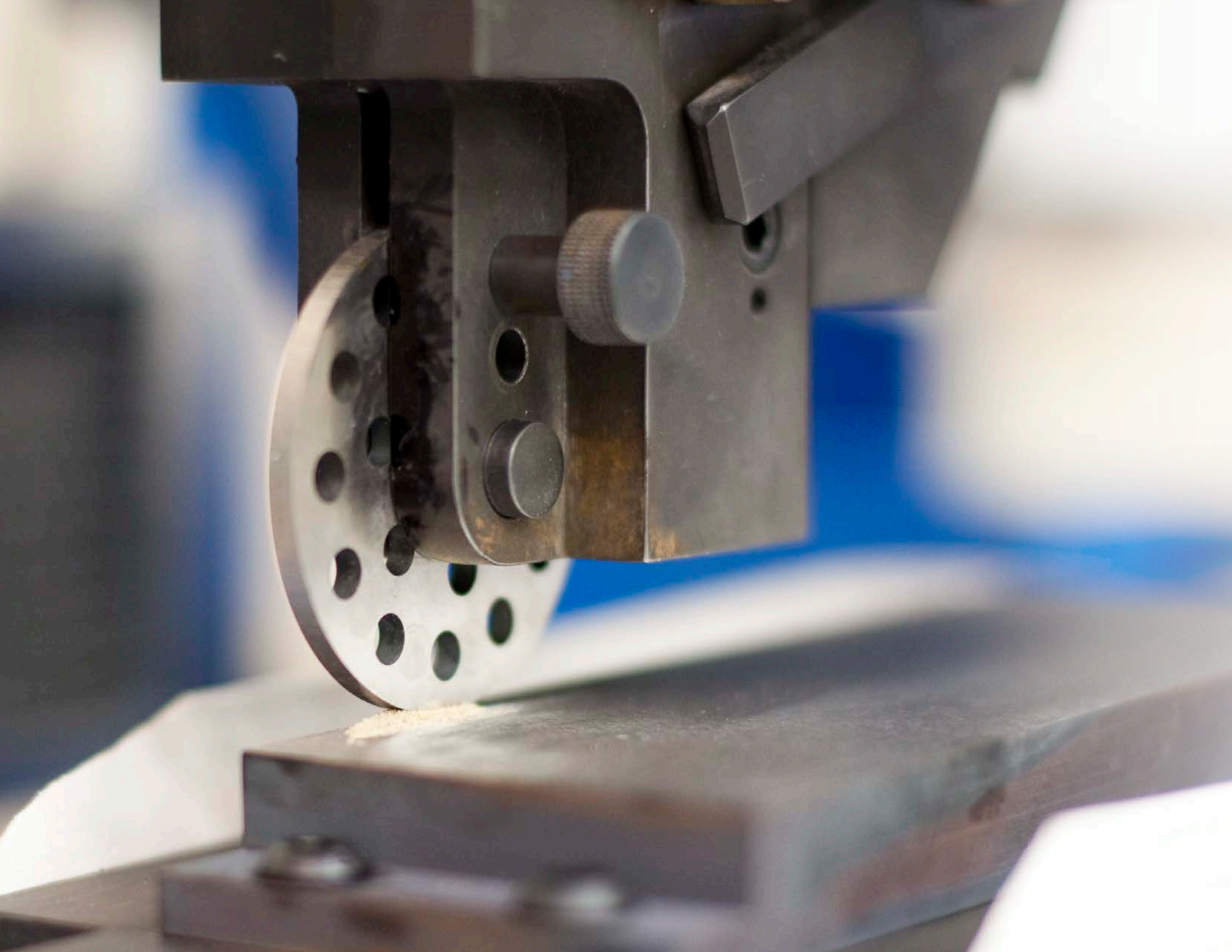




Training and
Consulting, LLC

Explosives Safety Training

Safeguarding People, Processes, and the Environment Since 1998



Explosives Safety Training

THE MISSION OF SAFETY MANAGEMENT SERVICES, INC. IS TO SAFEGUARD PEOPLE, PROCESSES, AND THE ENVIRONMENT. OUR MISSION IS ACCOMPLISHED BY ASSISTING OUR CLIENTS IN MAINTAINING THE SAFETY OF THEIR OPERATIONS THROUGH THE SYSTEMATIC IDENTIFICATION OF SAFETY-RELATED DEFICIENCIES, ALONG WITH THE DEVELOPMENT AND IMPLEMENTATION OF SOLUTIONS BASED ON SOUND PRINCIPLES.

Safety Management Services, Inc. (SMS™) and TCI Training and Consulting have collaborated to provide the explosives industry with a premier training experience for industry leading professionals. TCI successfully facilitates technical training for the explosives industry and has established itself as a leading provider for many government agencies. SMS has extensive industry experience that adds valuable insight into the application of regulation requirements and industry best practices.

Our engineering team has been performing explosives safety analysis and providing risk management solutions to explosives industry for over 40 years. Our engineering background combined with our experience conducting and organizing successful training programs allows us to implement a hands-on experience into a structured format that appropriately facilitates technical training content in an ideal training environment.

Frequently Asked Questions

Q: What training can SMS and TCI provide?

A: We provide training courses specifically addressing the following safety related topics:

- Process Safety Management (PSM) for explosive operations*
- Testing for DOT/DoD, ATF classification of energetics*
- In-Process classification of energetics*
- Process Hazards Analysis (PHA) for team leaders*
- Advanced explosive facility site plan (emphasis on DoD, ATF, and UBC)*
- Fundamentals of combustible dust (emphasis on NFPA 652)*
- Electrical classification, hazard recognition, and protection*

*See the course descriptions below

Actively Engaging with Industry Leaders

TCI has developed web-based and seminar training models for Defense industry leaders around the world. Boeing, Lockheed Martin, General Dynamics, Orbital ATK, Delphi, Raytheon are just a few of the defense industry leaders that rely on our explosives safety training. By leveraging our partnerships with industry, government, and academia experts, we are uniquely postured to develop comprehensive programs to benefit our clients.

In conjunction with the Explosives Testing Users Group, we have developed a valuable resource for the energetics industry called the “Test Methods Matrix.” This web page provides critical “In-Process” and UN test criteria for the classification of explosives. The Test Methods Matrix provides all of the information regarding test sequences, set-up, background, pass/fail criteria, and other relevant information. For more information visit:

www.etusersgroup.org/test-methods-matrix/

Q: Does SMS interact with industry groups and government organizations?

A: SMS continues to be involved in both industry and government organizations, actively looking for ways to improve explosive safety related programs. SMS is involved with the following organizations:

- Founder and chair for the Explosives Testing Users Group (ETUG)
- Delegate to the United Nations (SAAMI Delegation), Transport of Dangerous Goods and GHS subcommittees and delegate for the UN Explosives Working Group
- Participates with the International Group of Experts on the Explosion Risk of Unstable Substances (IGUS)
- Approved test lab for recommending DOT classification
- 15-year training relationship with DCMA, broadening the partnership between regulation and industry compliance
- 20-year partnership with Defense Ammunition Center (DAC)

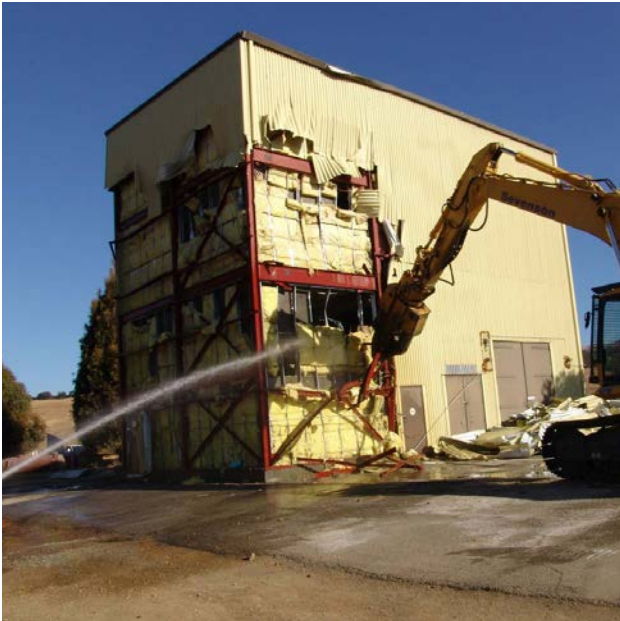
WHAT DO OUR CLIENTS SAY ABOUT OUR TRAINING?

“Really provided strong background and explanations of engineering work done on materials we use regularly.”

“Instructors were very enthusiastic and interested in the course material. Their experience meant they were able to include anecdotes that add a lot to the material/course.”



SAFETY
BY
DESIGN





Site-Specific Explosives Safety Standards

Management Commitment / Employee Accountability

Training Courses

Process Safety Management (PSM) Principles For Explosive Operations

Continuing Education Units (CEU): 3

This course addresses the unique aspects of the propellant, explosives, and pyrotechnic (PEP) materials as they relate to OSHA 29 CFR 1910.119 “Process Safety Management of Highly Hazardous Chemicals.” The course begins with a review of the heritage of the PEP industry and the fundamental principles of explosive safety. These principles are emphasized throughout the presentation and discussion of the elements of the PSM regulation. This course will provide managers, engineers, safety professionals, and others involved PSM compliance efforts with an understanding of the practices and procedures that should be implemented to provide safe operations and compliance with 29 CFR 1910.119. Emphasis will be given to the benefits of implementing explosives safety protocol in conjunction with a PSM system (e.g., improved safety, enhanced product quality, cost avoidance, etc.) risk-minimizing solutions that are based on sound, cost effective, and practical engineering and explosives safety principles.

Course content:

- Explosives manufacturing heritage
- PSM background
- Brief overview of inter-relationships of OSHA PSM, EPA RMP, ISO 9000, & ISO 14000
- PSM elements (with explosives safety perspective):
 - Employee Participation
 - Process Safety Information
 - Process Hazard Analysis
 - Management of Change & “Replacement in Kind”
 - Mechanical Integrity
 - Operating Procedures
 - Training
 - Contractors
 - Hot Work Permit
 - Incident Investigation
 - Emergency Planning and Response
 - PSM Audits
 - Pre-startup Safety Reviews
- Documentation requirements for PSM
- OSHA PSM interpretations

Training Courses

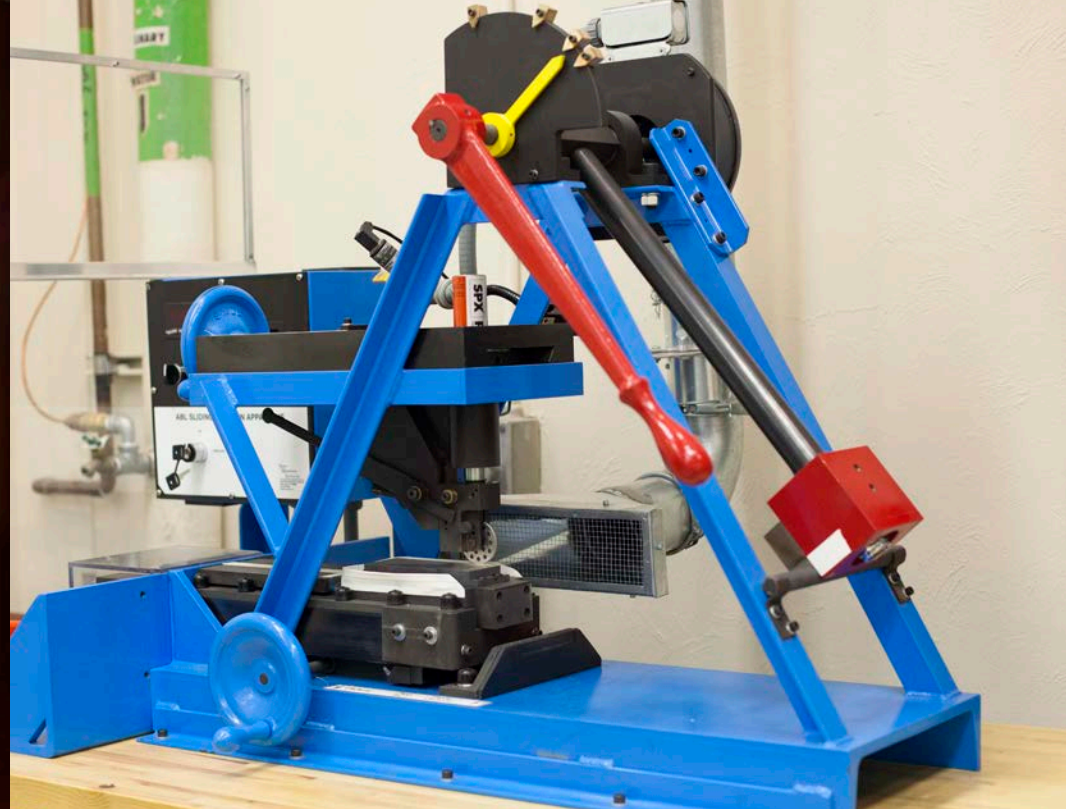
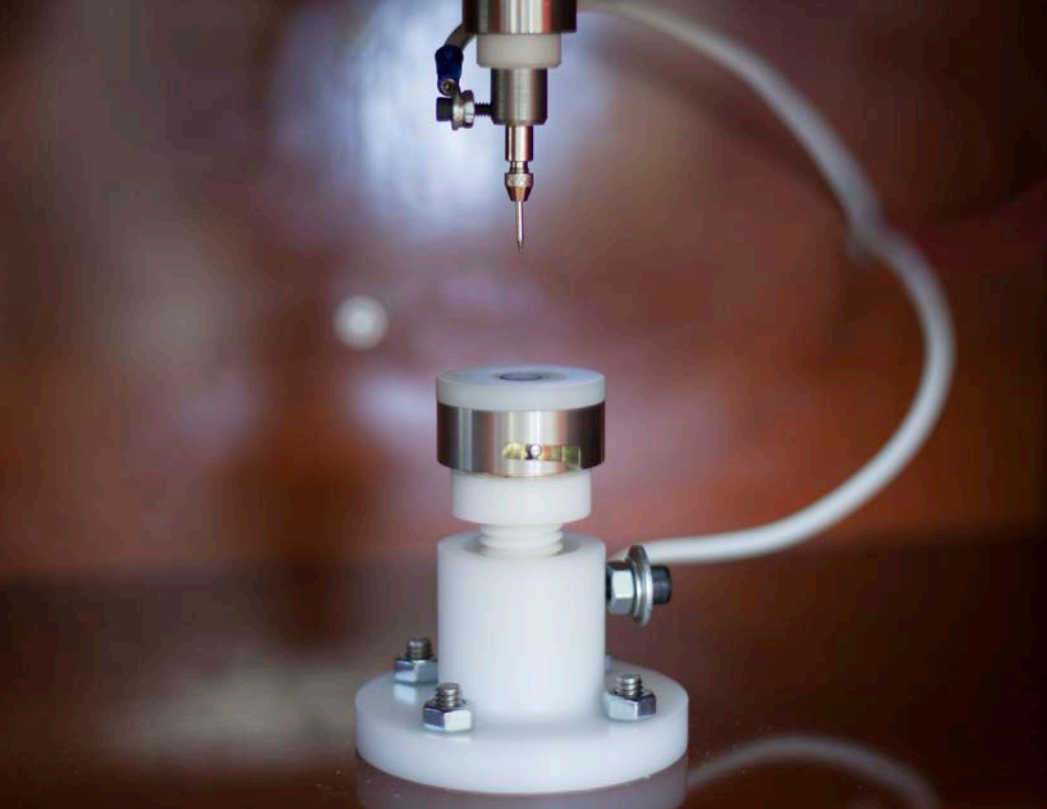
Explosive Classification Testing For Process, Storage, And Facility Design

Continuing Education Units (CEU): 3.5

This 1-day course presents the testing protocol associated with classifying propellant, explosives, and pyrotechnics (PEP) for transportation, storage, and facility siting. The course discusses similarities and differences in testing philosophy between these three classification types and provides a basis for understanding which tests appropriately address the related classification issues. Standard test methods and appropriate interpretation of test results will be reviewed. The approach for development and performance of in-process simulation testing required for facility siting will also be outlined and discussed. The course will then focus on how to apply the various test results to obtain DOT approval for transportation, ATF approval for storage, or local jurisdiction approval of facility siting. Considerable time will be spent discussing how proper classification of materials and articles can be used to facilitate the right decisions regarding personnel protection, facility/equipment design, and facility siting. This course will prove invaluable for personnel involved in obtaining material/article classifications (e.g., management, program managers, project engineers, facility engineers, safety engineers, safety professionals, others). At the conclusion of this course the participants will have an understanding of the applicable regulations, the philosophy of classification testing, how to properly apply classification test results to protect personnel and company assets, and the protocol required to obtain approval from the various agencies/jurisdictions.

Course content:

- Philosophy of classification testing
- Overview of applicable DOT, ATF, and building/ fire codes
- Classification test methods and procedures
- Sensitivity testing
- Reactivity testing
- Selection of appropriate tests
- Standard
- In-process simulation
- The role of process hazards analysis in specifying in-process test parameters
- Steps to obtain DOT and ATF classification of material/articles
- Facility siting and permit approval
- Quantity-distance
- Attended vs. unattended operations
- Inhabited buildings
- Magazines requirements
- Engineer controls
- Barricades
- Work station shielding per MIL STD 398
- Code compliance
- Permit application process





Training Courses

Process Hazards Analysis (PHA) Training For Team Leaders

Continuing Education Units (CEU): 3

This course consists of a combination of lecture and practical workshop exercises to allow participants to become familiar with the PSM requirements related to PHAs, selection of the appropriate PHA methodology(s), and how to effectively lead a PHA team. The unique aspects of propellant, explosives, and pyrotechnic (PEP) manufacturing/processing will be emphasized as PHA methodologies are discussed throughout the course. Participants will learn to organize and lead hazard analysis studies using the various PHA techniques. The course will address the tactics and success factors that help ensure a successful study. Participants will work in groups to apply PHA methodologies to example energetic material processes. Instructors will work closely with the participants throughout this session/workshop to ensure that key principles are understood. By applying the PHA methodologies to practical example processes, the participants will internalize the principles learned and gain added insight to the value of performing proper PHAs at their facilities.

Course content:

- Regulatory PHA requirements
- Preparing and organizing PHA studies
- Subdividing the process for study
- Determining appropriate PHA methodology
- Leadership skills for managing the team
- Applying qualitative & quantitative PHA methodologies
- Design intent, parameters, and deviations
- Human factors
- Material characterization test data
- How to document a PHA study
- PHA report preparation & approval process
- Managing the follow-up of PHA results

Training Courses

Advanced Explosives Site Plan Training

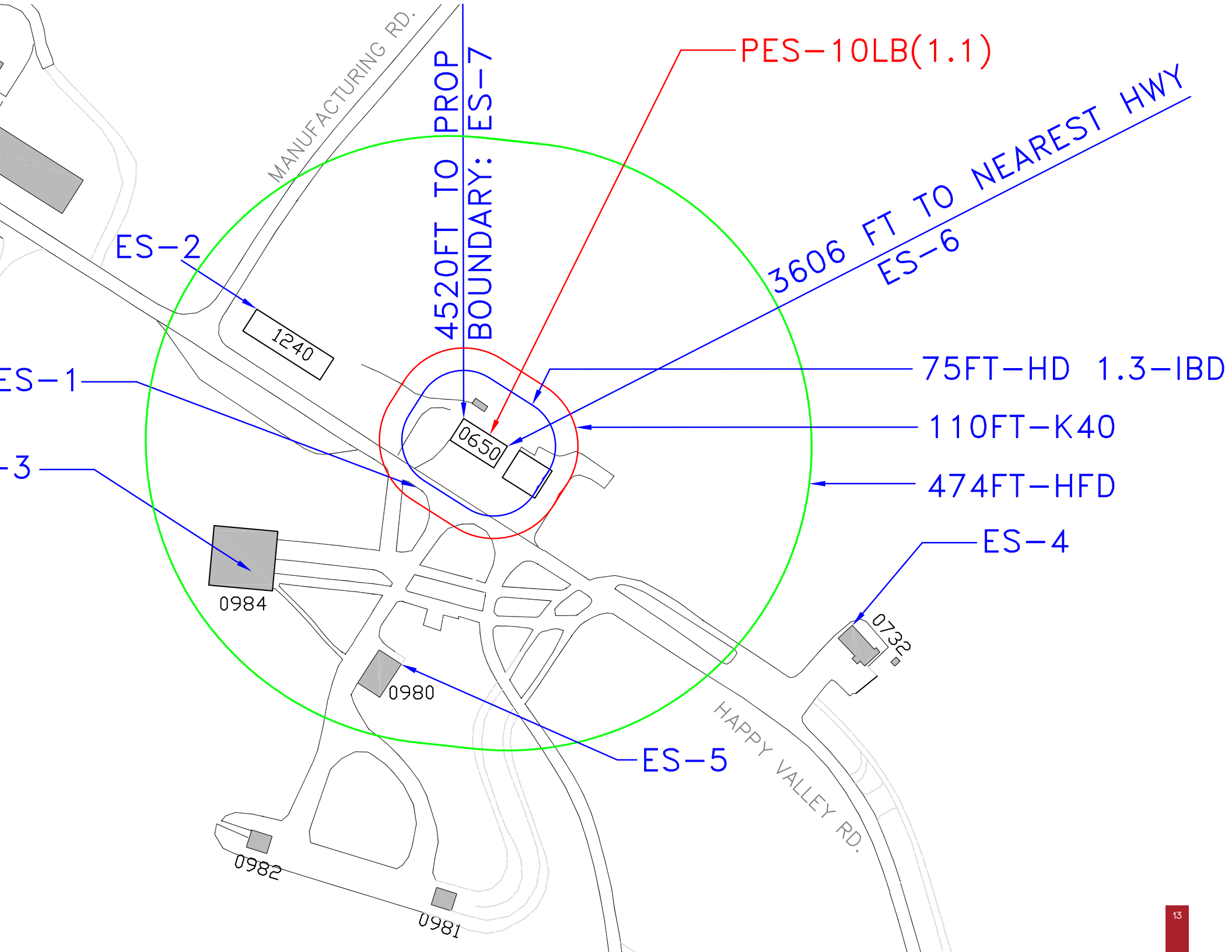
Continuing Education Units (CEU): 3

This course uses lecture, discussion, and workshops to provide an in-depth knowledge of explosives site plans (ESPs). Students will be immersed in explosives safety quantity distance (ESQD) tables, criteria, and calculations used in DOD 4145.26-M to perform in-depth evaluations of ESP scenarios based on real world examples and prepare required site plan documentation. The course will review mitigation strategies used to reduce risk and address regulatory compliance issues. Students will also learn how to apply maximum credible event (MCE) analysis results and integrate various analyses into ESP documentation to promote understanding for a smooth approval process.

Note: Course prerequisite is a fundamental understanding of DOD ESPs

Course content:

- Review key explosives safety principles applicable to ESPs
- ESQD application workshops
- Explosion effects and expected consequences
- HD 1.4 storage and operating facilities
- HD 1.1 operating facility
- Handling fragmentation (primary vs. secondary)
- Benefits and constraints of debris modeling
- Applicability of HFD and IBD to administrative facilities
- Developing the ESP components
- Facility siting and design in the real world
- Regulatory agency review and approval process
- HD 1.1 storage facility
- Benefits of earth covered magazines (ECMs)
- ECM ratings and orientation
- HD 1.2 AE facilities
- Distance determination and nomenclature
- Advantages of magazine design and substantial dividing walls (SDWs)
- HD 1.1 and HD 1.3 operating facility
- Applicability of DOD explosives service manuals to ESP
- Unique DOD service requirements
- Primary explosive handling and storage requirements
- Data to drive decision making
- ESP tips and traps
- ESQD mitigation strategies
- Open discussion



PES-10LB(1.1)

3606 FT TO NEAREST HWY
ES-6

4520FT TO PROP
BOUNDARY: ES-7

75FT-HD 1.3-IBD

110FT-K40

474FT-HFD

ES-4

ES-5

ES-2

ES-1

ES-3

MANUFACTURING RD.

HAPPY VALLEY RD.

1240

0650

0984

0980

0982

0981

0732



Training Courses

Fundamentals of a Combustible Dust Safety Program Training

This course addresses the NFPA 652 requirements for dust testing and the associated Dust Hazards Analysis (DHA). The course will begin with a review of combustible dust heritage and the development of the current industry standards as they relate to the current NFPA 652 regulation. The course will then review methods and protocols for hazard identification, including dust characterization testing and data analysis for risk reduction.

The second portion of this course will focus on how to organize, lead, and implement the DHA study. The course will address the tactics and success factors that help ensure a successful study. Participants will work in groups to apply DHA methodologies to example combustible dust scenarios. Instructors will work closely with the participants throughout this session/workshop to ensure that key principles are understood. By applying the DHA methodologies to practical example processes, the participants will internalize the principles presented and gain added insight to the value of performing thorough and accurate DHAs at their facilities.

The combustible dust course will provide managers, engineers, safety professionals, and others involved in combustible dust programs with an understanding of the practices and procedures that are required to ensure safe operation and regulatory compliance.

Course content:

- Combustible dust heritage
- Fundamentals of dust explosions
- NFPA 652 background and program development
- Regulatory review (OSHA PSM, NFPA, NEC)
- Material screening
- Material characterization
- Application of test data
- Responsibilities
- Fundamental combustible dust program
 - Hazard identification
 - Design options
 - Dust Hazard Analysis (DHA)
 - Hazard management
 - Management systems
- Preparing and organizing DHA studies
- Determining appropriate DHA methodology
- Leadership skill for managing the team
- Design intent, parameters and deviations
- Human factors
- Application of dust test data
- Documentation
- Implementation of recommendations
- Managing the follow-up DHA results

Training Courses

Electrical Classification, Hazard Recognition and Protection

This course is intended as a trainer level course to provide attendees with the skills and knowledge to take this information and train other staff within their respective organizations on the electrical classification, standards, compliance, and industry practices as they relate to electrical equipment in hazardous locations. This course addresses the unique aspects of the electrical protection required to meet the NFPA 70, IEC, and ATEX standards for processes involving flammable vapors, liquids, and combustible dust or fibers which may present a flammable or combustible hazard. This course will provide an understanding of the practices and procedures that should be implemented to provide safe operations and compliance. Emphasis will be given to the benefits of implementing explosives safety protocol in conjunction with a PSM system (e.g., improved safety, enhanced product quality, cost avoidance, etc.).

Course content:

- Course overview and background
- Defining hazardous locations per the regulation
- Class and division criteria
- Safeguarding based on defined NFPA class and division
- Approved equipment and limitations
- Application of various requirements (NFPA 497)
- Documentation and hazardous zone communication
- ATEX IP code, category, etc.
- NEMA, UL, CSA ratings
- IEC and IP classification
- ATEX marking standards
- Documentation requirements for PSM
- Workshops and application of course content

2018 Scheduled Training*

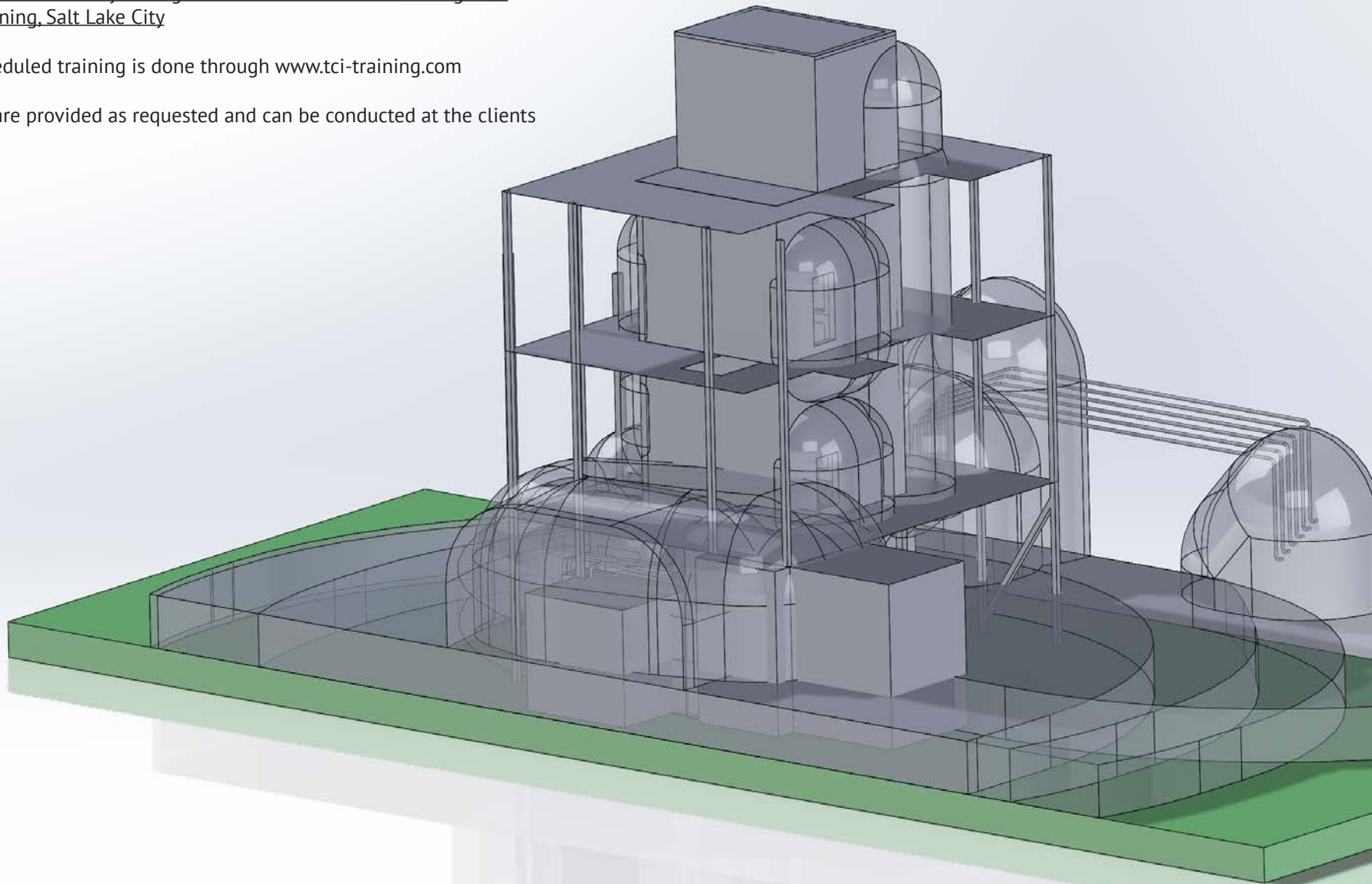
March 27 – 30, 2023: Advanced Explosives Site Plan Training, Salt Lake City

May 01 – 05, 2023: Explosives Shipping Classification DOT Ex-number Training & Workshop, Salt Lake City

Sept. 11 – 14, 2023: Process Safety Management and Classification Testing & Process Hazards Analysis Training, Salt Lake City

*Registration for scheduled training is done through www.tci-training.com

Customized courses are provided as requested and can be conducted at the clients facility/location.



Contact

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