



TU-13 & TU-14 HAZMAT Training Using Virtual Reality Environments- CBRNE/Radiation

Presented by

John Rolando, Spectral Labs

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www.calcupa.org

Today's Plan

1. Give the 5 – 10 minute history on our core Computer Based Training offering, “RAILS” as a means of illustrating features and content, focusing on a few key examples
2. Give a short demonstration of how an instructor would use this training software
3. Stop talking so you can actually use some of the software. The point of this class is to provide familiarity with CBT for CBRNE / Hazmat...

Who are we?

- **Spectral Labs Incorporated (SLI):**
 - Is an Employee Owned Company
 - Was founded in 2009 in San Diego, CA
 - Has grown from 5 founders to 20+ technical professional employee owners
 - Is ISO9001:2015 Certified
 - Has a DCAA Approved Accounting System
 - Holds an approved Radiation Material License from the State of California
- **SLI R&D activities include:**
 - Full Scale Production of Radiation Particle Detectors/Samplers for NAVSEA
 - Major DHS/CBP R&D Program to develop a Next Gen Cargo Container inspection system upgrade to support DHS/CBP non-intrusive inspection
 - Design of a cost effective gamma ray spectrometer
 - Training “games” that model Gamma Flux and Chemical Dispersion – *we call this serious games platform “RAILS”*

Spectral Labs Training Technology: RAILS

RAILS ≠ Trains

RAILS = Training

**CBRNE Focused Computer Based Training
Leveraging Video Game Technologies**

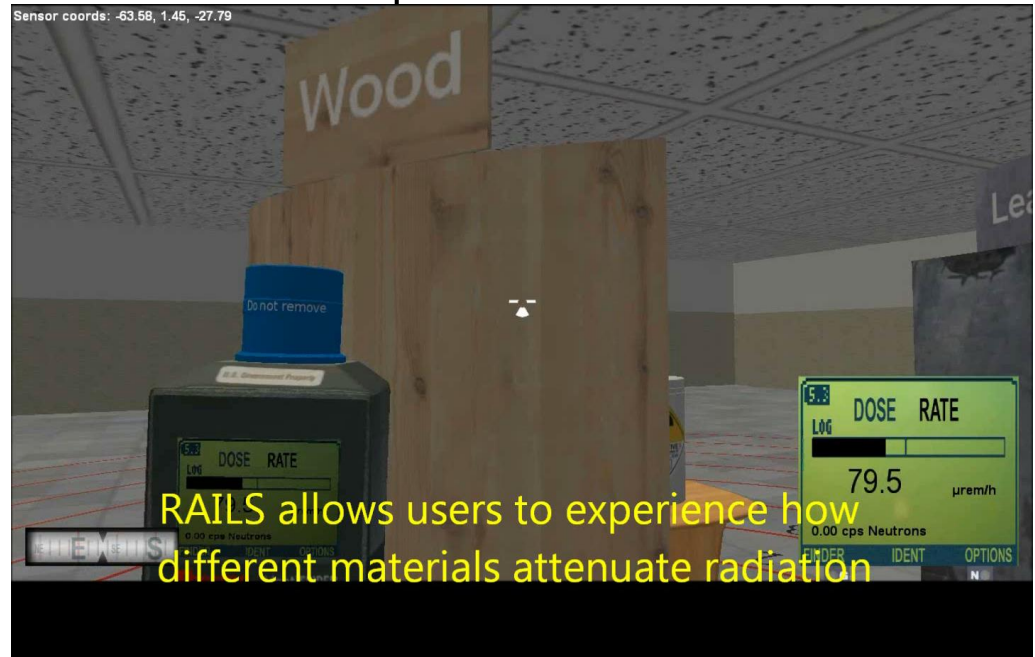
Realistic, Adaptive, Interactive Learning System (RAILS)



RAILS Background

- **RAILS Rad/Nuc—Original DNDO Funded Product**
 - **(Oct 2009 – Aug 2013)**

- Rad/Nuc instrument training for Law Enforcement
- Initial SBIR programs (Phases 1, 2, and 3) allowed Spectral Labs to develop radiation transport models and implement them in a proprietary game engine
- Gain an intuitive feel for time, distance, and shielding effects
- Safely interact with sources dangerous to use in real-world training scenarios
- Find virtual SNM sources normally unavailable for real-world training



RAILS Background, continued

RAILS-CHEM (CTTSO)

- Added chemical dispersion modeling and explosive trace (and bulk) simulation capability, hours of training content and new features (e.g. player health)
- Target Audience: First Responders (Fire, Hazmat)
- Approximate number of Agencies: **> 250 agencies** (fire, hazmat, law enforcement)



RAILS Background, continued

- RAILS-Search and Secure, a DOE ORS Program



Over 20 Detectors Available



RadEye



identiFINDER



PackEye



MultiRAE Pro



Draeger Tubes



M908



Polimaster 1703



Inspector 1000



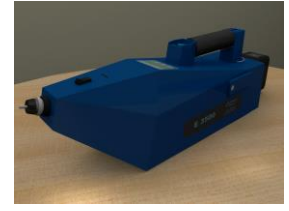
Radiagem



First Defender



AP4C



Scintrex E3500



Mini rad-D



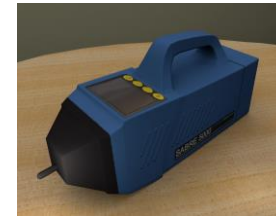
Gr-135



Pager-S



Mini Radiac



Sabre 5000



FLIR Fido

Hazmat Training Developed for NIEHS WTP

- Spectral Labs was awarded a Phase I SBIR funded by the WTP to develop and test a worker safety focused hazmat training module.
- Spectral Labs developed two modules, one for off-site assessment and one for onsite
- The two together cover 29CFR1910.120(c).
- Studies were conducted with Southwestern College to evaluate learning based on pre/post test data
- Additional data was collected from local public safety workers

Hazmat Training Developed for NIEHS WTP

➤ 1910.120(c)(1) General

Objectives:

- 1) Identify specific site hazards
- 2) Determine the appropriate safety and health control procedures needed to protect employees from the identified hazards.

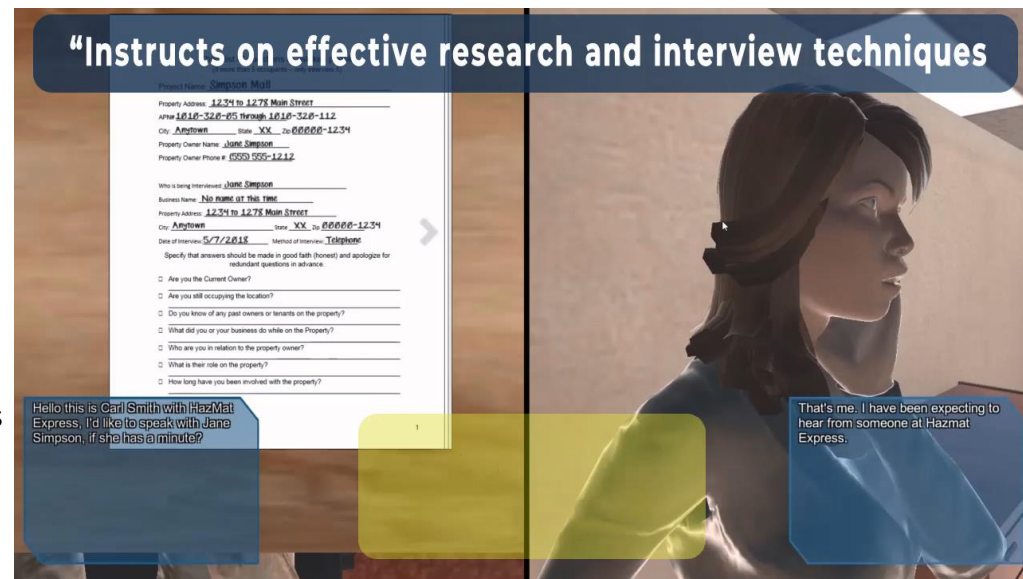
1910.120(c)(2) Preliminary evaluation:

Offsite reference search

- Talk to the property owners
- Historical usage of the property
- Interview and Review All Governmental Agency records for the sight

1910.120(c)(3) Hazard identification

- What chemicals may have been used or stored at this location
- *Records Review*
- How to perform a Site Reconnaissance
- How to Interview Past and Present Owners



Hazmat Training Developed for NIEHS WTP

➤ **1910.120(c)(3)** Hazard identification

- What chemicals may have been used or stored at this location
- *Records Review*
- How to perform a Site Reconnaissance
- How to Interview Past and Present Owners or Key site people
- How to Interview Government officials

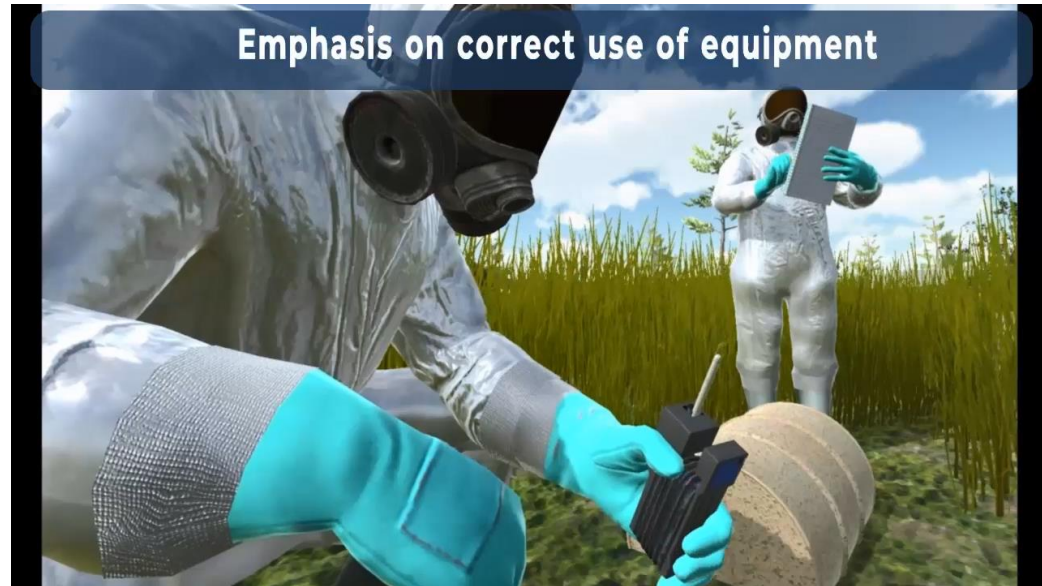
1910.120(c)(4)(5)

Preliminary evaluation: On-site investigation

- How to create an Incident Action and Site Safety Plan
- Selection of Personal protective equipment
- Use direct reading instruments as appropriate for identifying IDLH conditions.

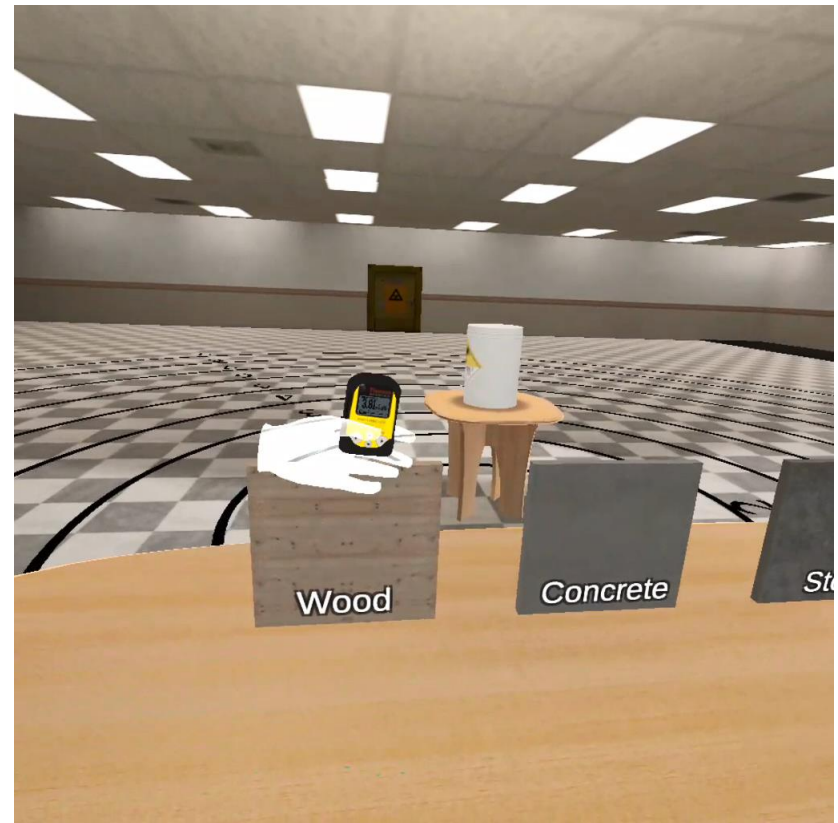
1910.120(c)(6)(7)(8)

- How to conduct on site air monitoring
- Visually observing for signs of actual or potential IDLH or other dangerous conditions.
- Risk identification.
- Employee notification



RAILS-VR, The Next Step

- Due to advancements in the State of the Art in VR hardware, effective, easy to set up and use VR based training is now possible even on a budget—this could not have been said even a year ago.
- *Demonstrations will be provided*



What's Available in Today's Class

- On/Off-Site Hazmat Safety Assessment Modules
- Radiation Basics and Instrument Operations Modules
- Hazmat Awareness Modules
- A selection of chemical monitoring, with “Illicit Lab” scenario
- A selection of explosive trace detector equipment training
- One at a time: **Demonstrator VR Training for Rad/Nuc**
- *Remember you need to stick around for the code for credits, but please do take breaks when you feel you need it – also, ask us for help if you get stuck.*

Thank you for attending

RAILS-X Demo (focused on explosive trace detector equipment)

https://youtu.be/ENrPS_jSHQ

RAILS OSU Demo (radiation lab equipment demo)

<https://youtu.be/3dcPWh7mLYY>

“Gamma Gear” educational game developed for the Canadian Nuclear Safety Commission (link to the full game)

<https://gammagear.net/>

RAILS- Search and Secure Demo (focused on Radiation detection equipment)

<https://youtu.be/OZao7QS4sb0>

Radiation Tutorial 2 (an example of a Complete Module)

<https://youtu.be/NJFaAbSmcnw>

Hazmat Guys podcast (interview introducing the RAILS software)

<https://youtu.be/2y7Q7RQy1uY>