2010 ISOE North American ALARA Symposium

EPRI Radiation Protection Conference

Virtual Radiation Environment Training

Dosimetry Training System for The Nuclear Worker

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The use of Remote Monitoring Systems has been seen by the Institute of Nuclear Power Operations as a "<u>strength</u>".

Reasons for this include:

- Increased efficiency through training simulations.
- Dose savings for non-HP personnel through real-time remote monitoring and instant communication with workers regarding dose and dose rates during simulation.

What is the Problem?

- Unnecessary Radiation Exposure is harmful to the worker.
- Training environments in plant settings afford realism, but are not practical due to cost and health effects of exposure to radiation.
- Workers tend to not get the needed instantaneous feedback required to reinforce and correct behaviors in a classroom environment.
- “Practice-like-you-play” strengthens the ability of the worker to comprehend and retain desired performance.

Needs Analysis

- **Shortened Outage Cycles**
  - outage cycles dropping from 45 days to as short as 20 days, more work is being performed in less time
- **Reduction in Contract Personnel**
  - fewer skilled contract personnel are available on a short term basis
- **Increase in First-Time Radiation Workers**
  - more first time nuclear workers
- **Challenging Oversight Goals**
  - all US plants are striving to meet “as low as reasonably achievable” (ALARA) work practices
- **Graying of the Workforce**
  - The radiation protection staffs as well as the work force tend to be dominated by older workers

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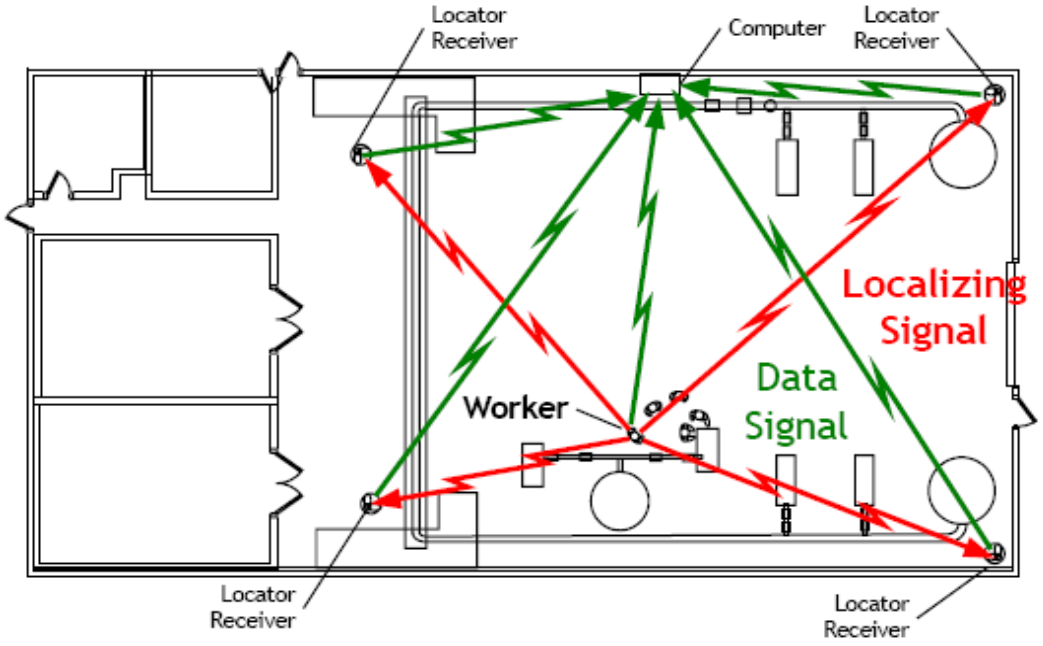
P. Tran, “Effective Personnel Exposure Control in Shortened Refueling Outages: Final Report: Review of Remote Monitoring Systems,” (Palo Alto, CA: Electric Power Research Institute [EPRI], December 2003).

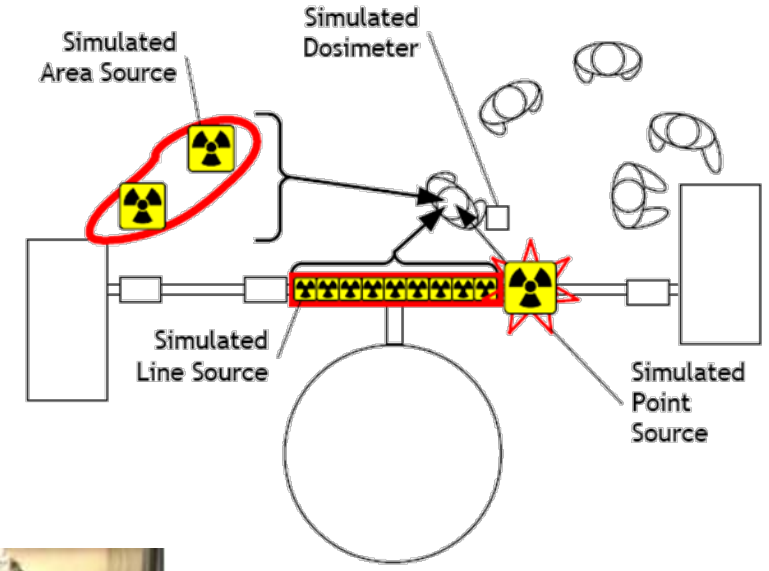
NFER® Tracking System

- 8 *Q-Track* Locator-Receivers
- Uses low frequency (~1MHz) Near-Field Electromagnetic Ranging or NFER® technology.
- Area: 100ft x 50ft (2 levels)
- Typical Accuracy: 1ft rms

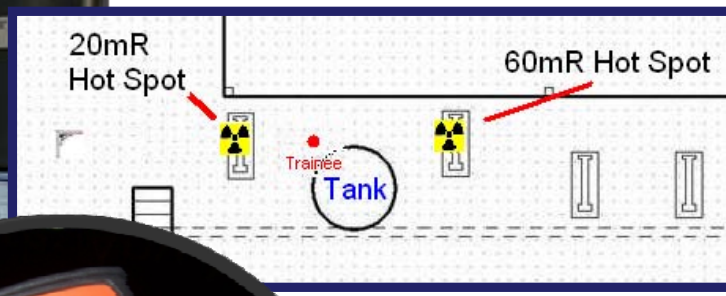


Simulated Radiation

- Place virtual hot spots
- Track up to 10 trainees
- Realistic dose accumulation / alarms

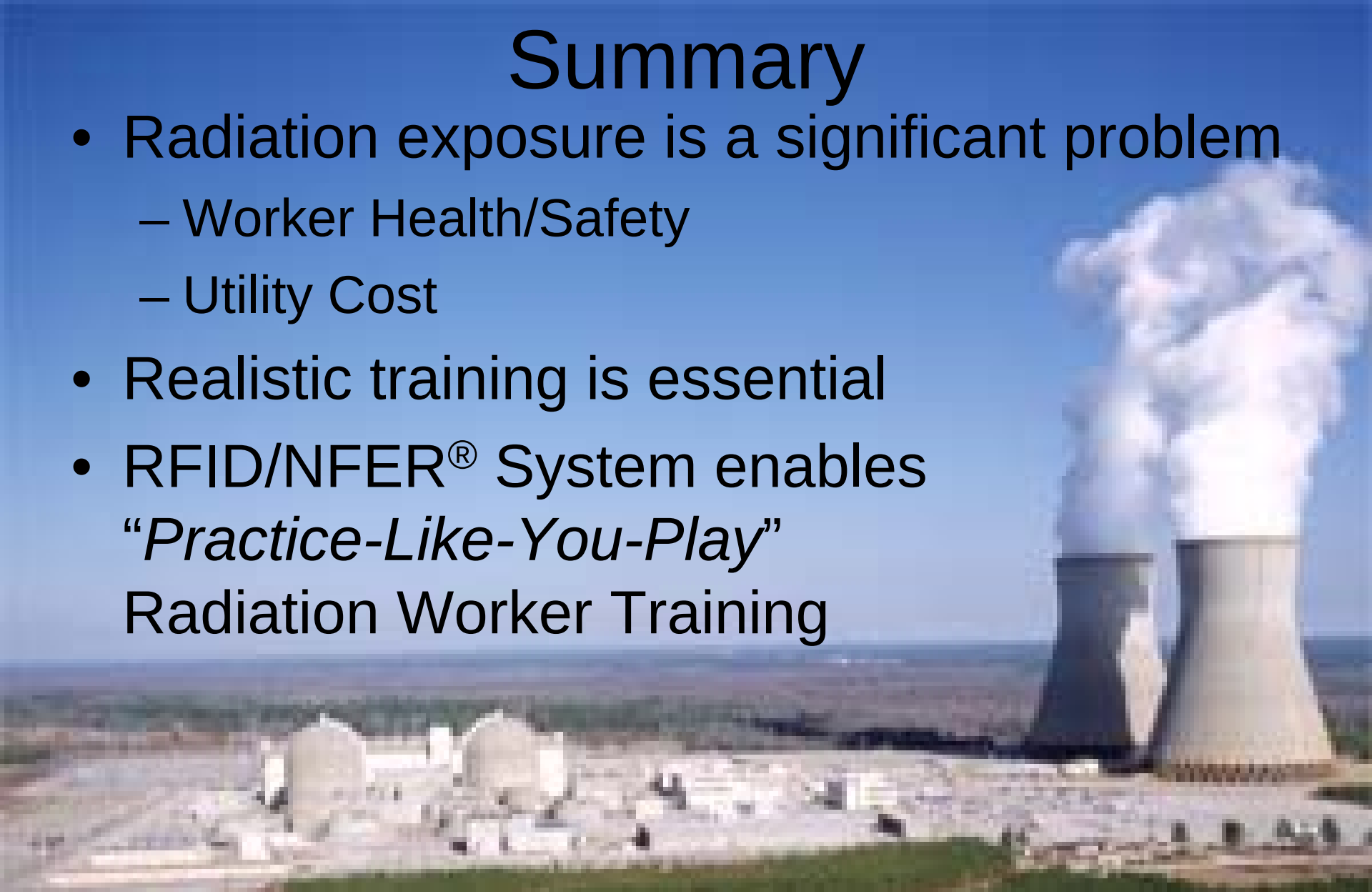


Screenshot



Summary

- Radiation exposure is a significant problem
  - Worker Health/Safety
  - Utility Cost
- Realistic training is essential
- RFID/NFER® System enables "*Practice-Like-You-Play*" Radiation Worker Training



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THANK YOU

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