3D Hospital for Cybersecurity Training

Greg White

WINS Round Table on Cybersecurity Best Practices for Users of Radioactive Sources
11 September 2019

Lawrence Livermore
National Laboratory

The need for hypothetical facilities

- In bilateral/multilateral training we need facilities as examples
  - We can't use real facilities because of operational sensitivities

- It makes the training more relatable

- Creates a "complete" facility in a larger environment
  - Country it resides in
  - Relationships with neighboring countries
  - Non-state actors
    - hackers, activists, criminals
  - Regulator / Competent Authority
  - Facility purpose and building layout
 - We may want to include vulnerabilities for

Hypothetical Facilities

- Shapash Nuclear Research Institute is used by the IAEA (Insider and Cyber) and US DOE cybersecurity training courses
  - Resides in a hypothetical country of Anshar
  - Documented in multiple large documents
  - Research Reactor and Fuel Fabrication facilities
  - Originally used by handing out documents to students and posting CAD drawings of facility and key buildings

- Made into a 3D game engine by three US DOE labs
  - LLNL, LANL, and SNL
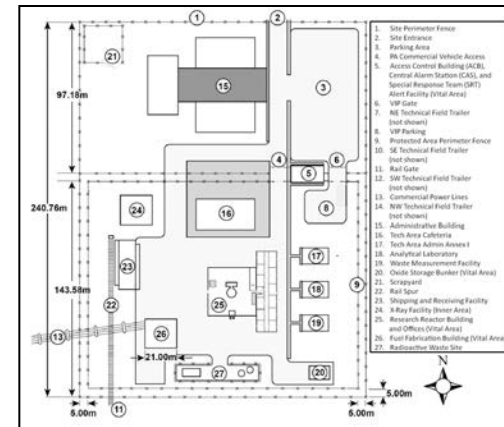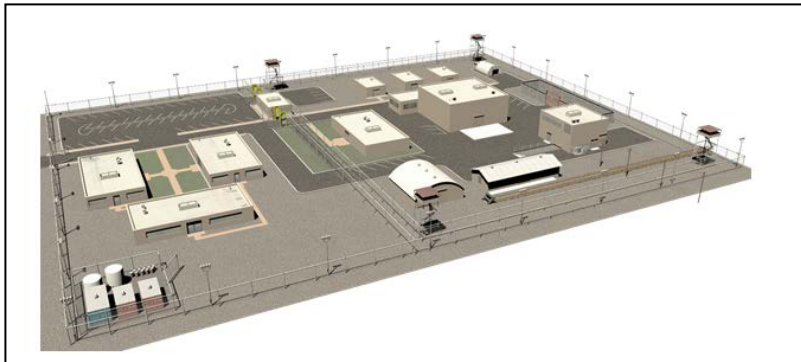
3D models in applications enhance the training experience (Shapash)
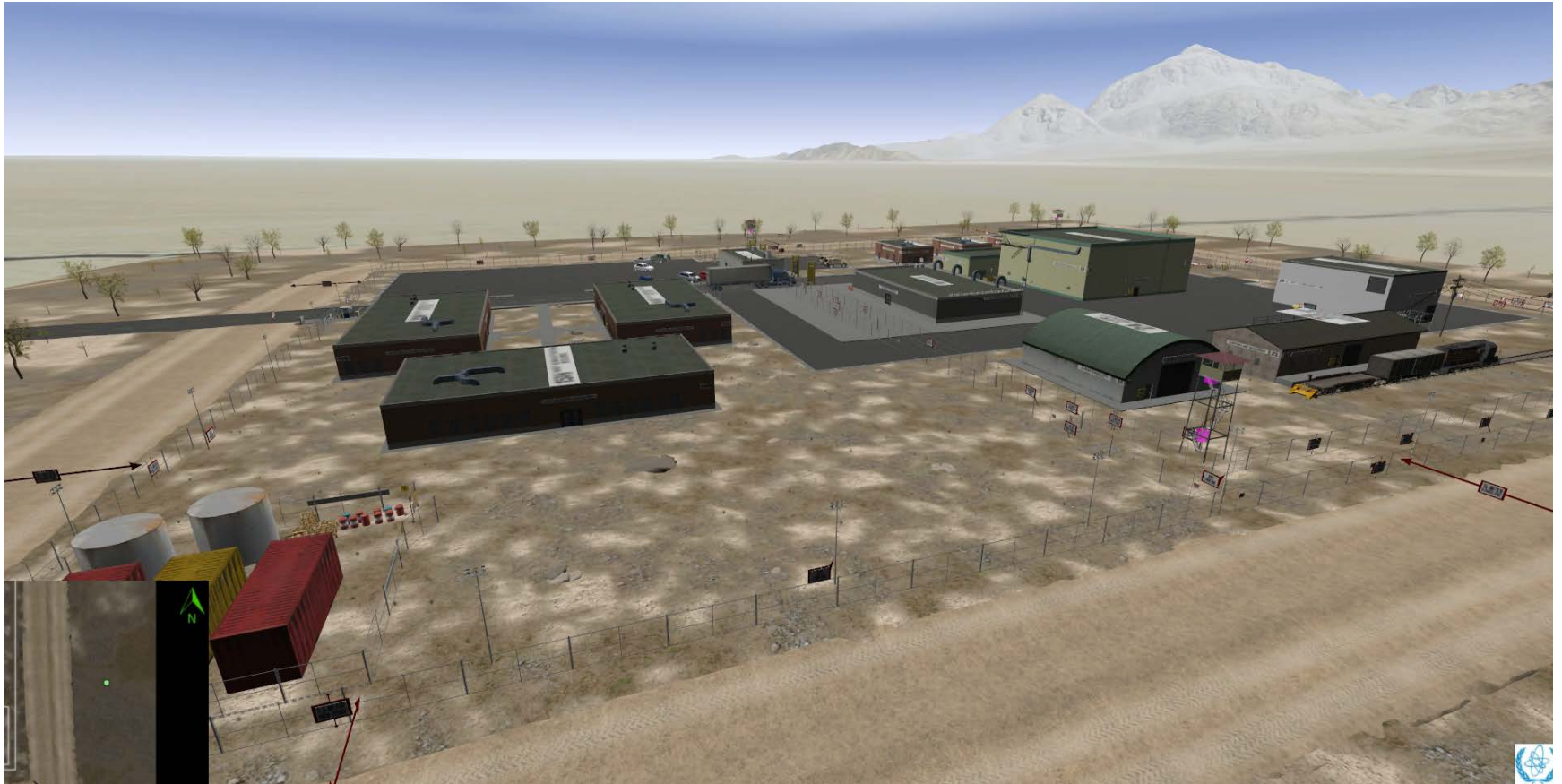
3D models in applications enhance the training experience

- Get a better 3D mental map of the facility by wandering / discovery

- Better retention than a large word document or presentation

- Game engine can simulate actions and procedures

Gula Regional Hospital

- Disclaimer: This is a work in progress, please be gentle, but we are looking for feedback ☺

- Hypothetical Facility in the Republic of Anshar (like Shapash)

- Named after the is the Mesopotamian goddess of healing and the divine patroness of doctors and medicine-workers

Features

- Runs using a commercial 3D game engine

- Follows DOE Office of Radiological Security Guidance

- Will be used to evaluate the impact of a cyber attack on physical protection systems as part of a blended attack

- Will be used as a training tool on ORS cybersecurity best practices
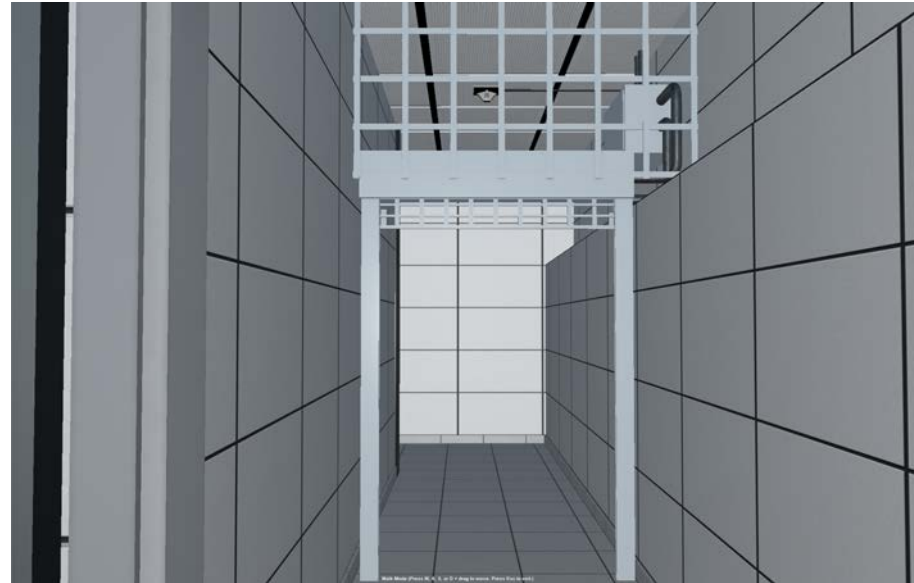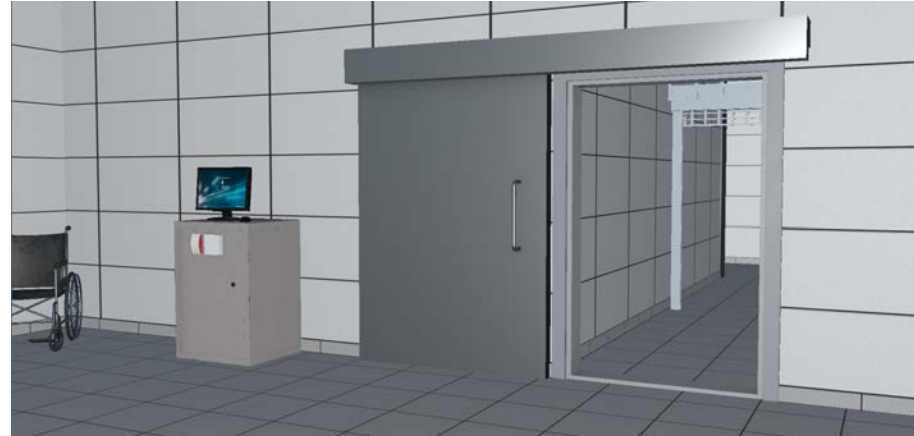 — network isolation, hardening, patching, etc.
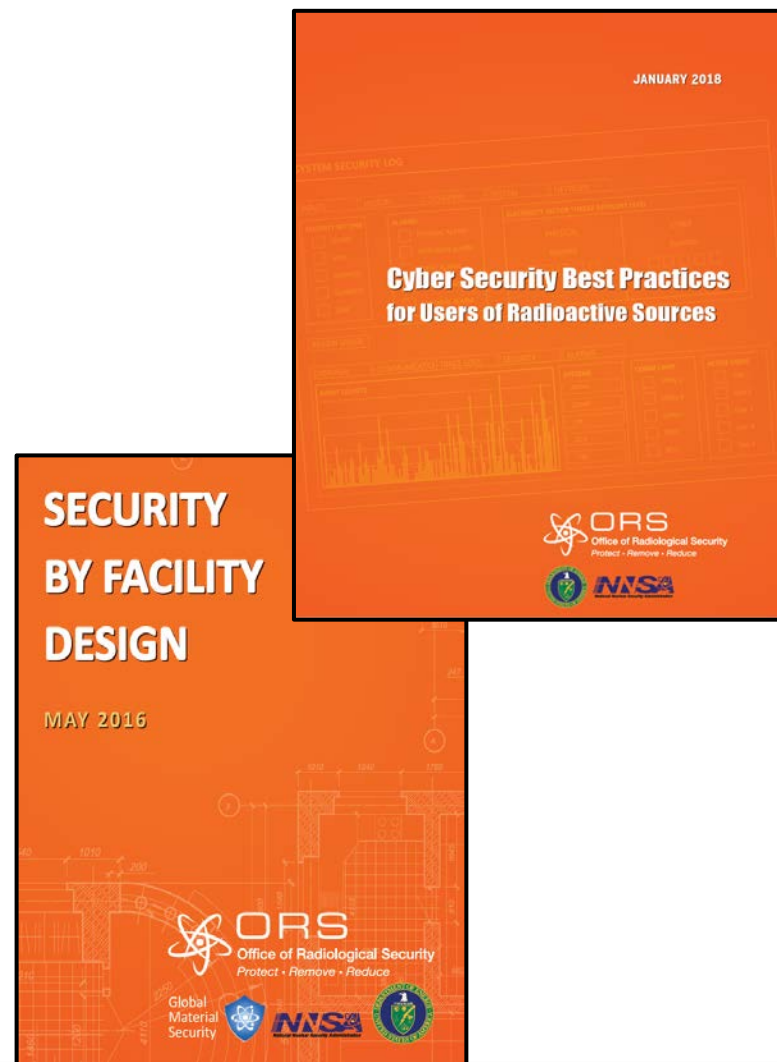
Two radiological sources in the basement

- Blood Irradiator with Cesium-137 source
  - Protected by US (domestic) Sentry/RMS

- Teletherapy Unit with Cobalt-60 source
  - Protected by US (international) RMS equivalent

Security Elements

Central Alarm Station

- Manned 24/7 by security staff

Regular Hospital Stuff

Next Steps

- Usability and performance testing

- Validation of security equipment and installation

- More "in-game" actions

- Revisions and enhancements
  — Cybersecurity (network topology, wireless, etc.)

Lawrence Livermore
National Laboratory

Hypothetical Facilities

- Lone Pine Nuclear Power Plant
  - Resides in a hypothetical country of Lagassi
  - Documented in multiple large documents