

3D Hospital for Cybersecurity Training

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



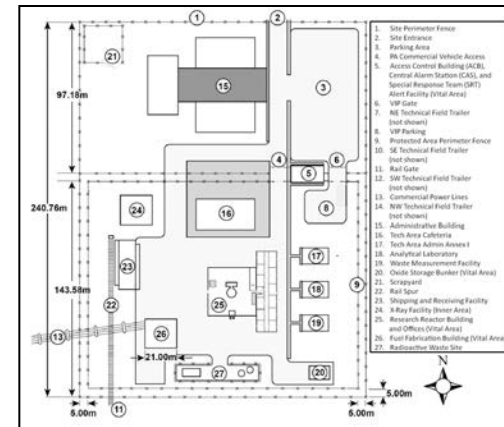
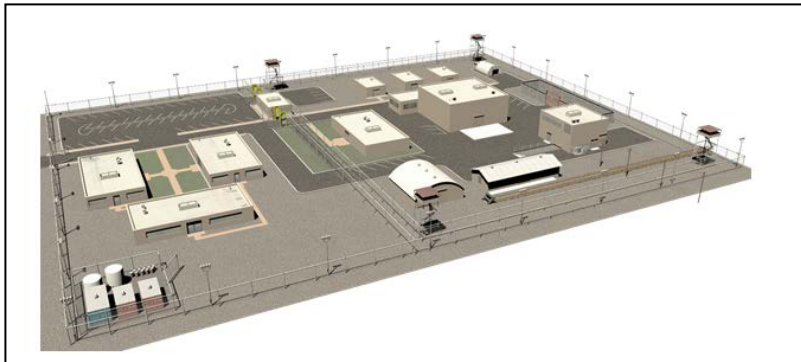
The need for hypothetical facilities

- 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

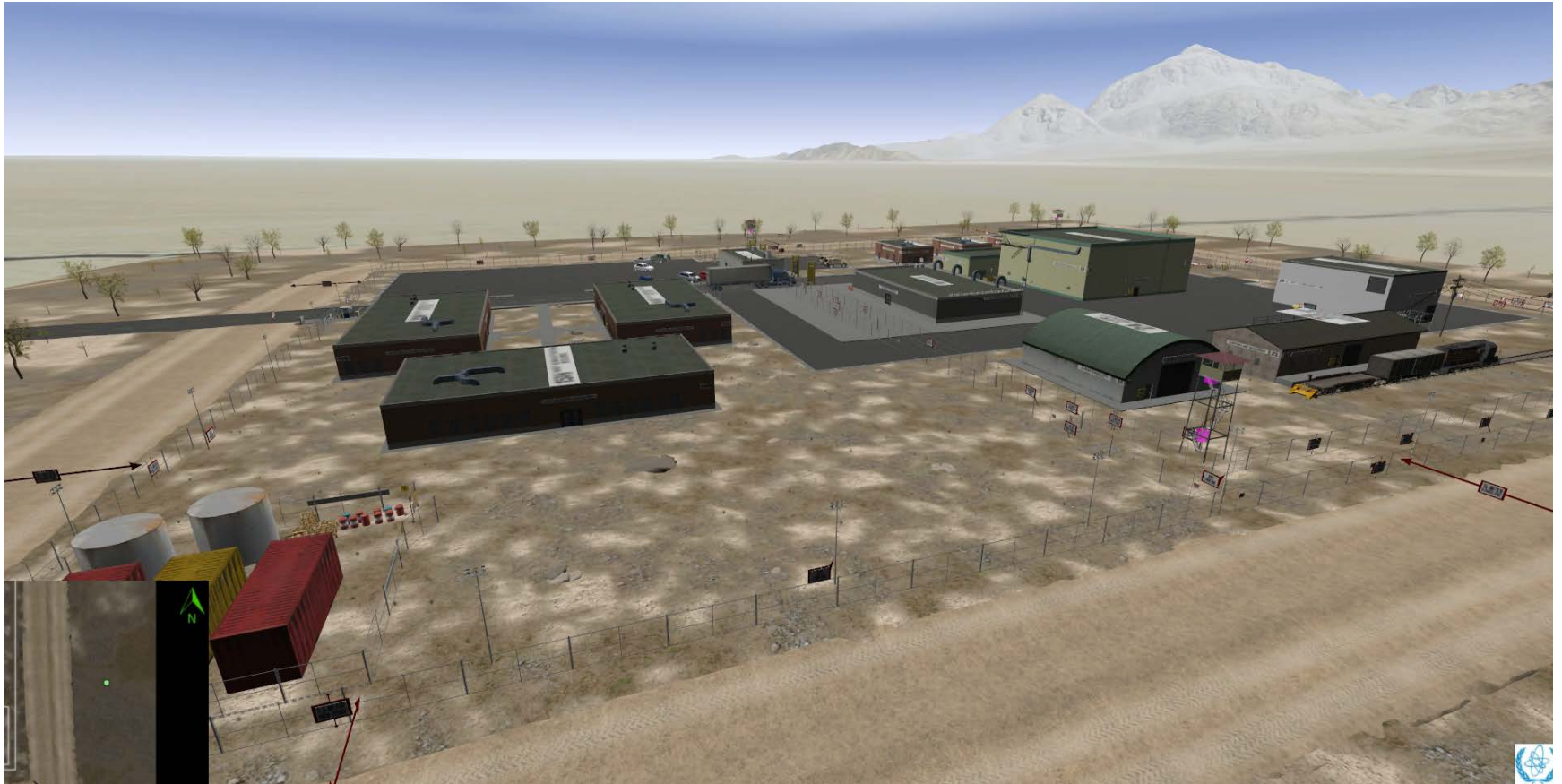


Hypothetical Facilities

- 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



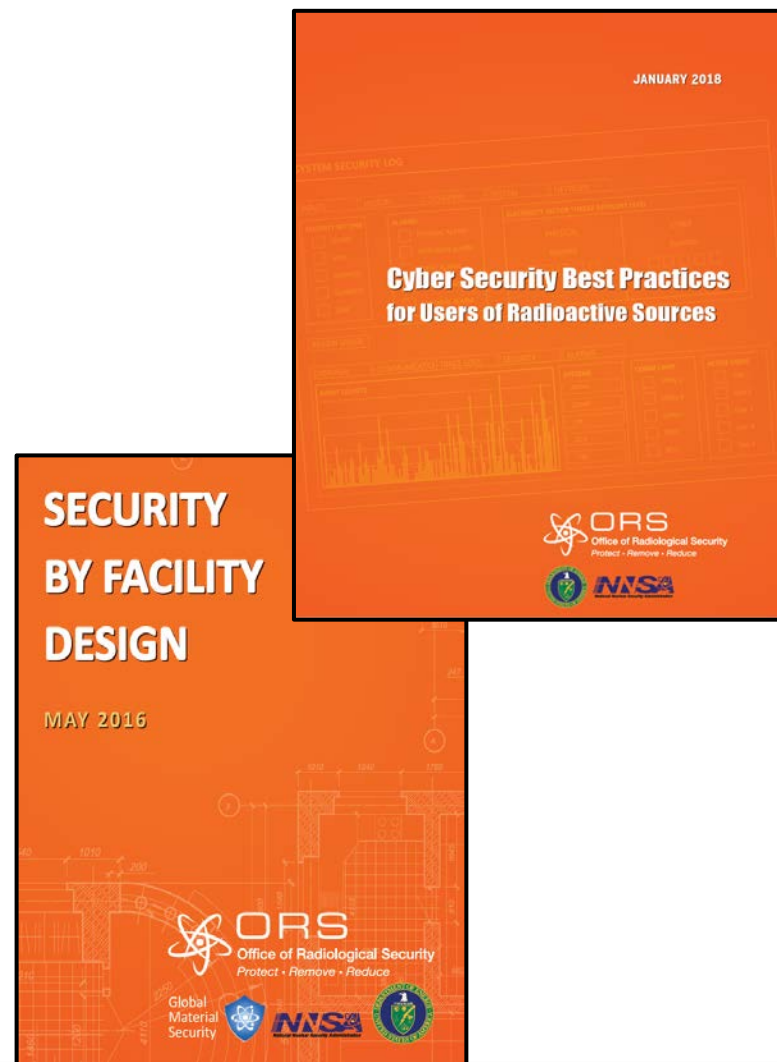
Gula Regional Hospital

- 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.

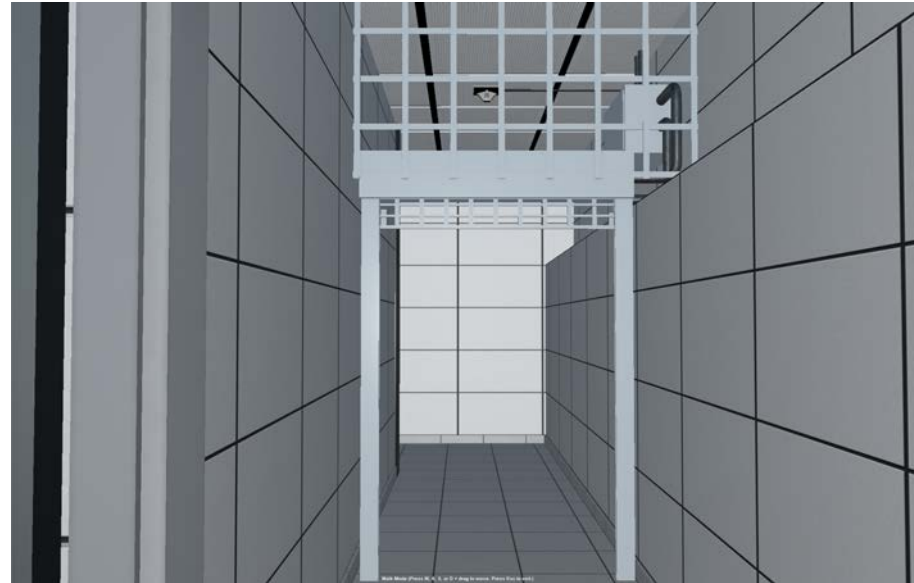
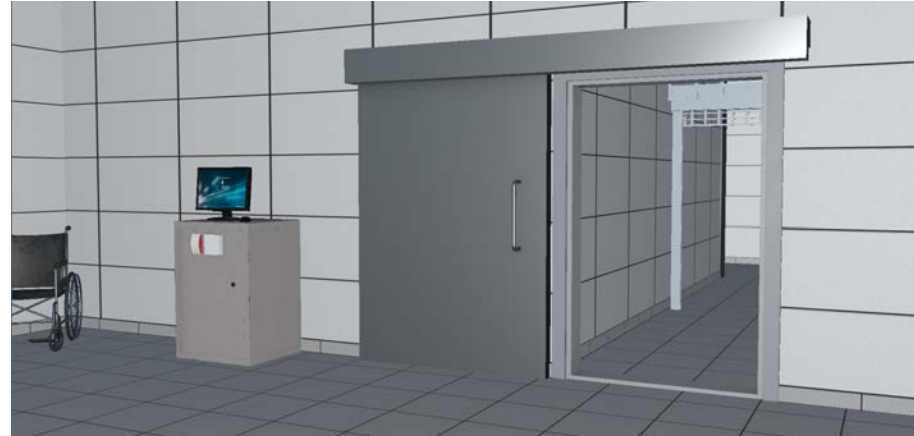


Two radiological sources in the basement

- 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.)



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Hypothetical Facilities

- Lone Pine Nuclear Power Plant
 - Resides in a hypothetical country of Lagassi
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