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Global Chemical and Biological Security Program Overview

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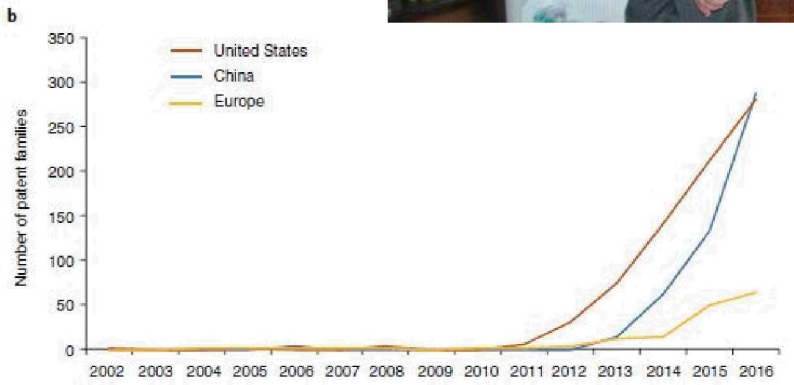
SAND

Future/Emerging Global Chemical and Biosecurity Issues and Concerns

- Degradation of international of norms against chemical weapons use and the implications for biological weapons.
  - State use of chemical weapons and toxic industrial chemicals against their own citizens
  - State use of chemical weapons as tools of assassination
  - ISIS use of chemicals in battlefield scenarios
- Chemical and biological materials security in ungoverned spaces.
- Geographical rebalancing of the global bioeconomy and application of underlying technologies
- Converging technologies and associated security considerations (e.g., genomic security, synthetic biology).

Victims of CW attacks in Kobani, Syria



Nature Biotechnology **37**, 613 – 620 (2019)

NEWS · 08 JULY 2019

Microsoft makes splash in AI-enabled lab solutions

Microsoft unveils the first collaborations for its Station B, a platform to automate lab experiments so scientists can test and reproduce ever-more-complex designs.

https://www.nature.com/articles/d41587-019-00018-3

Our Team

Global Chemical and Biological Security (GCBS) - Mission and Goals

GCBS Mission: Mitigate chemical and biological threats through integrated systems-based approaches to enhance global security.

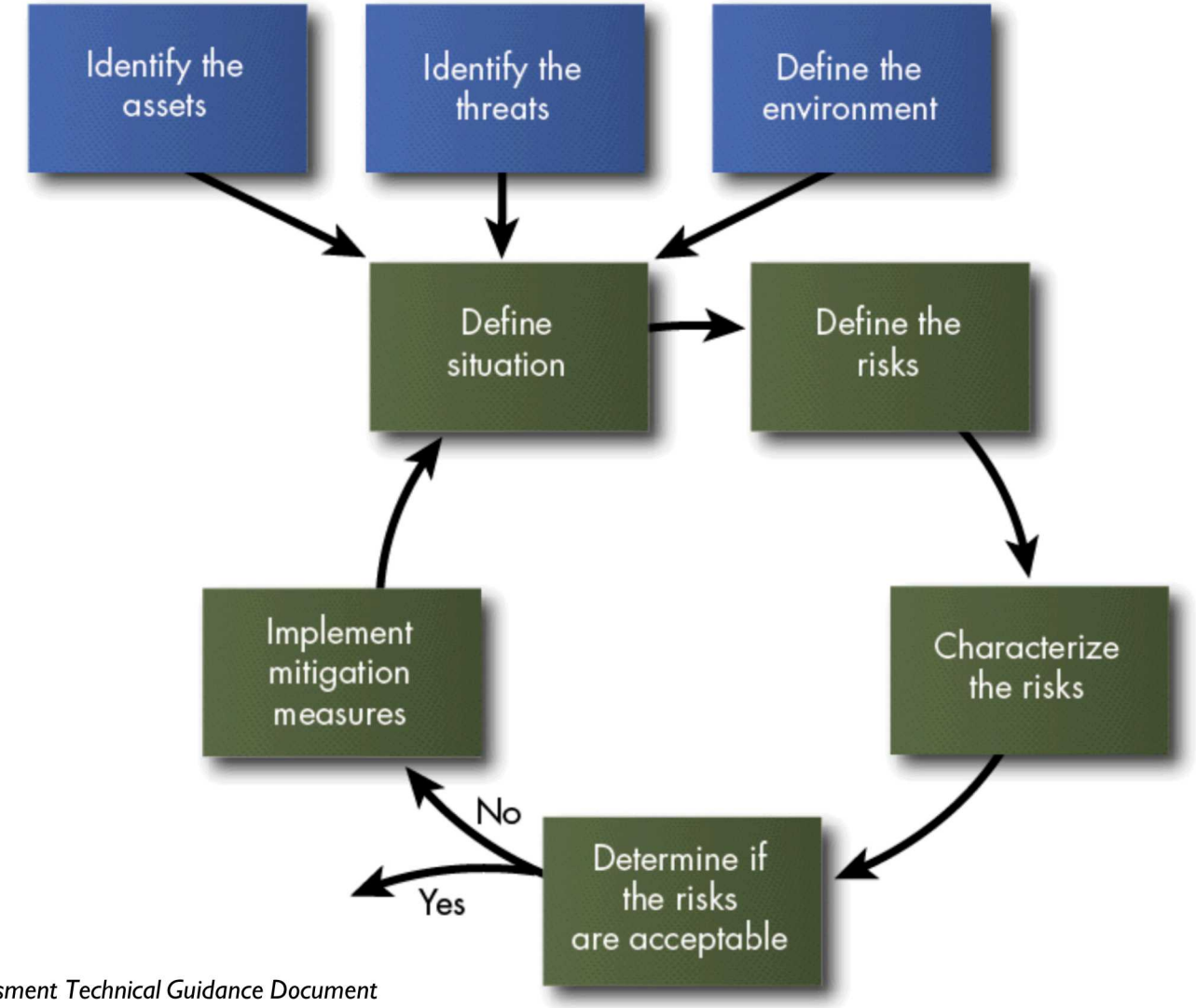
Our Goals:

1. Characterize the Problem
2. Design Innovative Solutions
3. Achieve Peak Performance

Our Approach – Systems View of Risk Management

GCBS engages risk management systems at multiple levels:

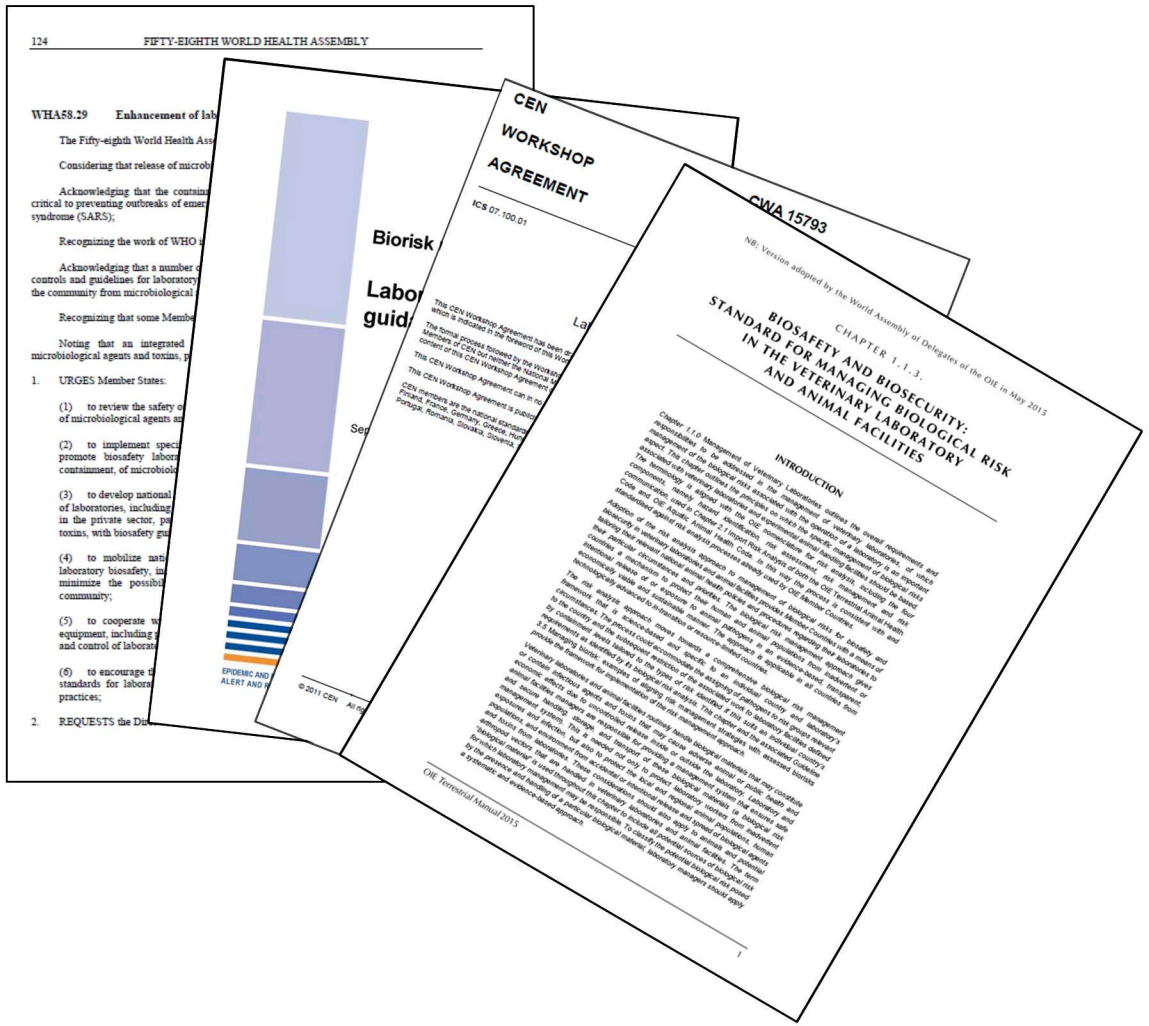
Biosecurity Risk Assessment – Basic Framework

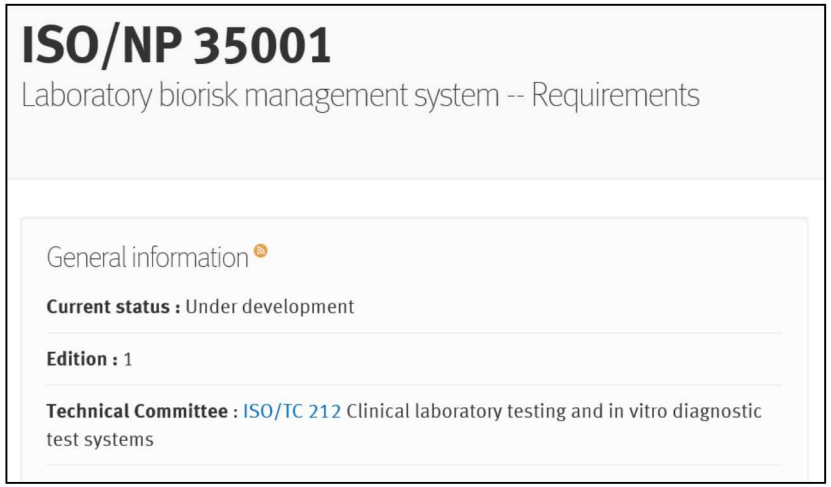


Laboratory Biosafety and Biosecurity Risk Assessment Technical Guidance Document
International Biological Threat Reduction, Sandia National Laboratories, in collaboration with The International Federation of Biosafety Associations,

Global Norms

Serve as technical experts to help develop global standards and guidelines





https://www.iso.org/standard/71293.html?browse=tc

Example: GCBS is contributing subject matter expertise to the development of the international standard ISO 35001 – *Laboratory biorisk management system*

Supporting National Frameworks for Risk Management

Iraq National Biorisk Management Committee

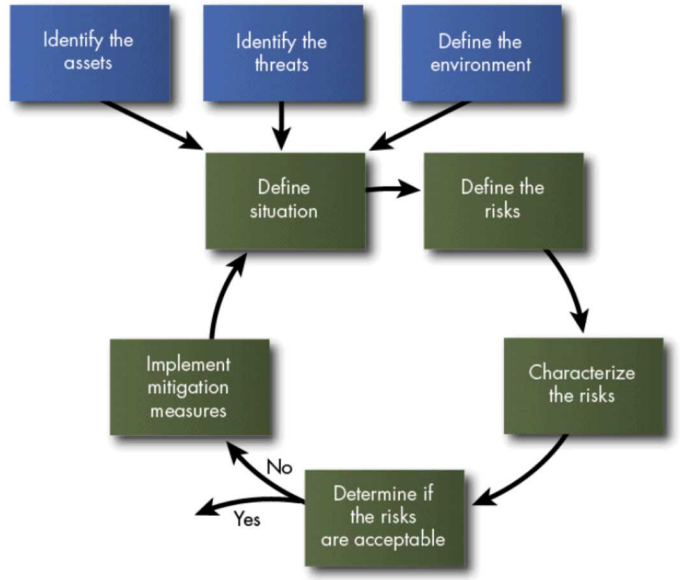
- A group comprised of more than 12 ministries working to discuss and promote biorisk management within Iraq.
- Working on draft national legislation regarding the handling and import/export of pathogens, and prioritizing pathogens of concern into national lists to be used in support of the draft legislation.
  - Subcommittees are formed to explore and work on specific tasks – e.g. pathogen list and national legislation

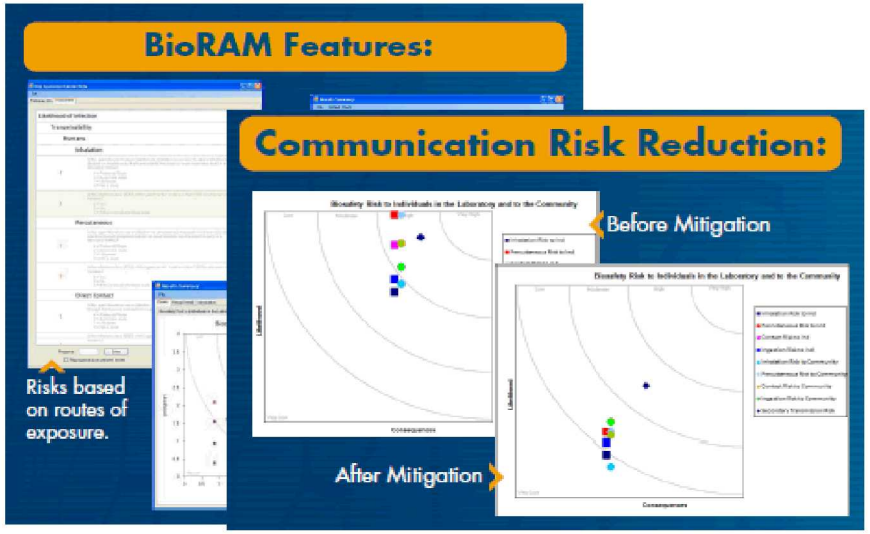
Advancing Facility Risk Management Systems

Facility-Level Safety and Security Risk Assessments

- **Comprehensive site assessments to determine and prioritize risks**
- **Utilize GCBS-Developed Risk Assessment Methodologies**
- **The Tools**
  - Biosafety RAM
  - Biosecurity RAM
  - Chem SAM

Basis for site-specific recommendations to address priority gaps in risk management





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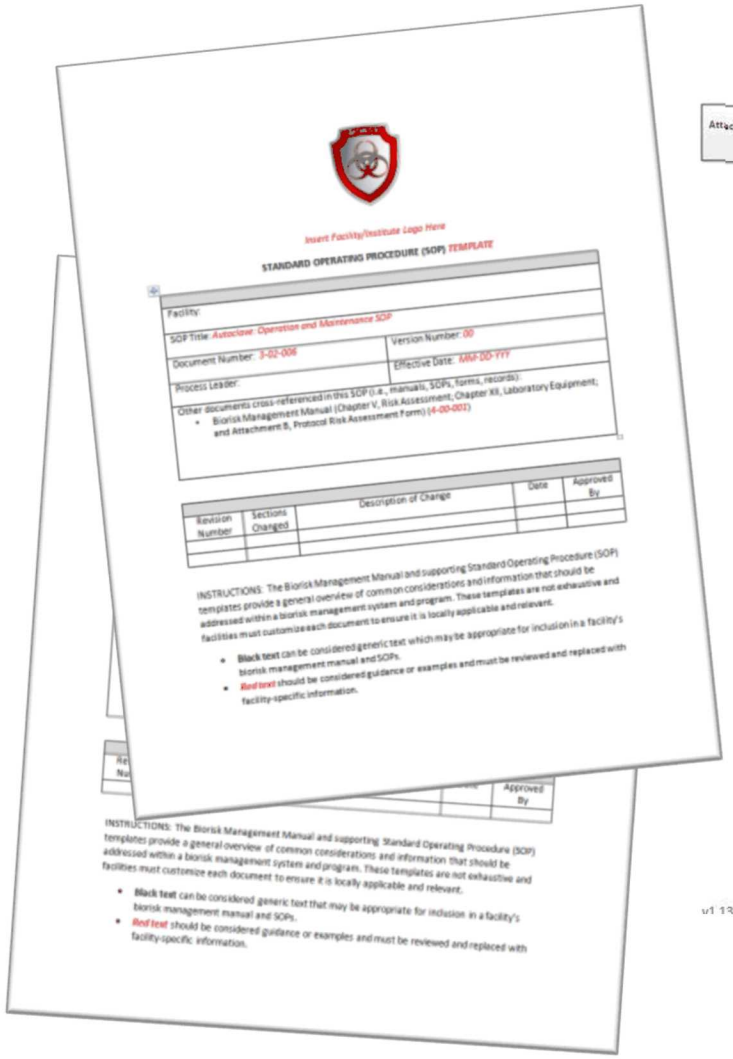
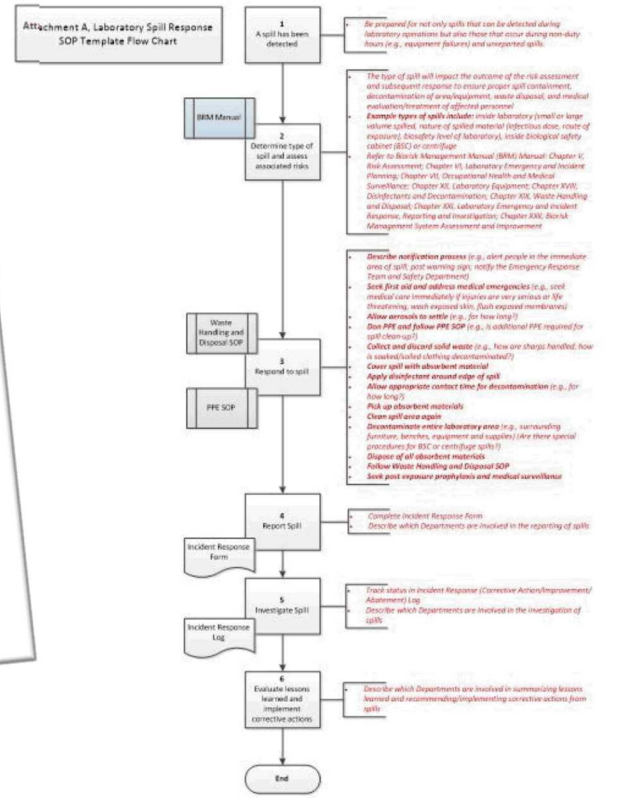
Advancing Facility Risk Management Systems

Library of Core Documents for risk management

- Biorisk Management Manual template
- Respiratory Protection Manual Template
- Facility Operations and Maintenance Manual template
- Chemical Hygiene Plan for Biological Facilities
- SOP templates





Laboratory and facility design

Design Drivers

- Risk based design vs. pre-defined solutions
- Sustainability
- Samples, waste, and people flow

Consistency in Design and Operations

- Equipment, SOPs, training

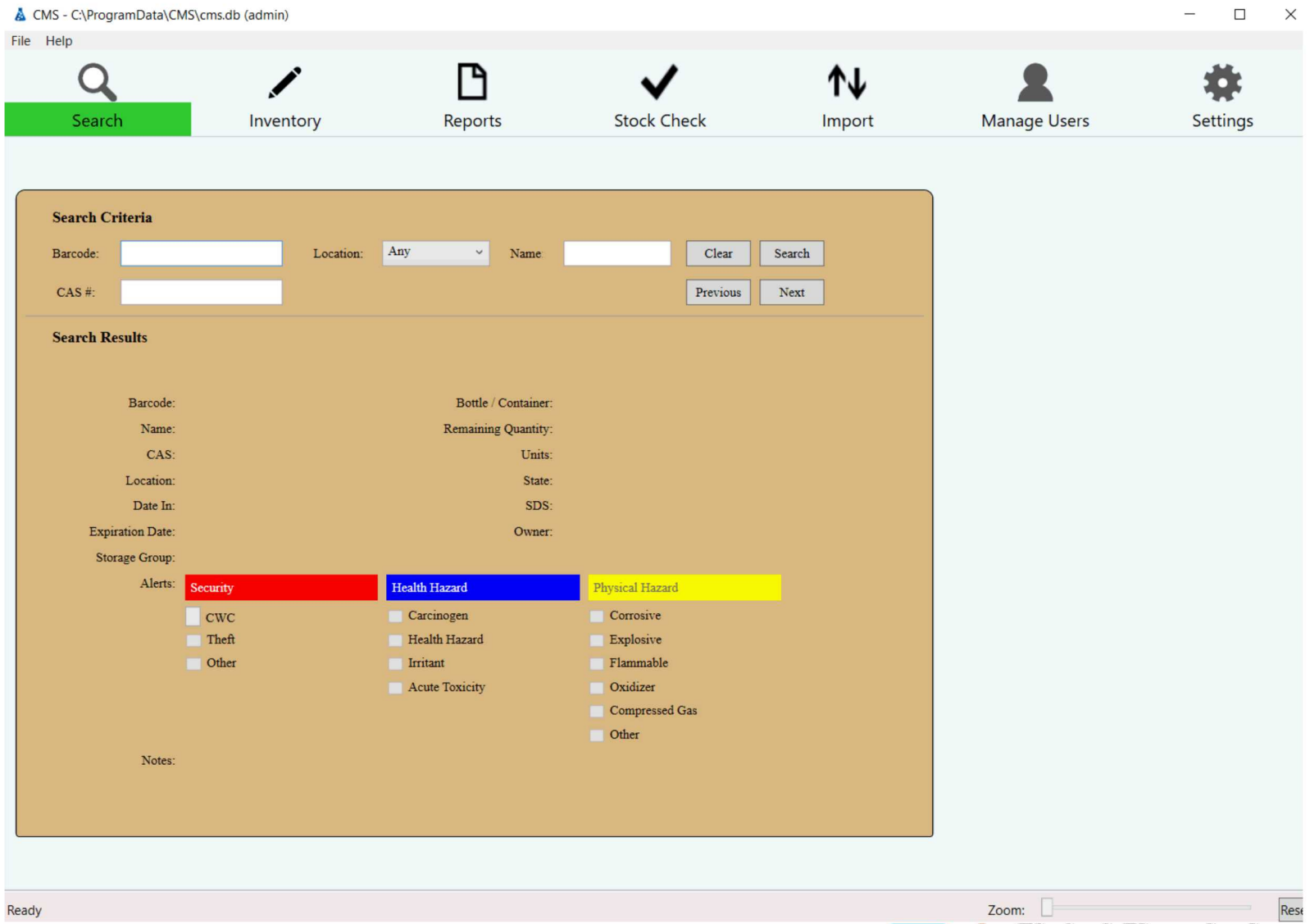
https://aupanvac.org/the-hand-over-ceremony-of-the-basis-of-design-bod-for-the-new-arican-union-pan-african-veterinary-vaccine-centre-au-panvac-laboratory-facility/

Challenge: Chemical Inventories

- Tracking of and accounting for chemicals is an important safety and security best practice
  - Knowing the hazards in the lab is essential for safety
  - Accounting for chemicals of concern is needed for security
- Many labs in low resource environments have either no or inadequate chemical inventory
  - Commercial solutions inadequate / unattainable
- A lack of inventory can present a dangerous situation

Chemical Management System (CMS©)

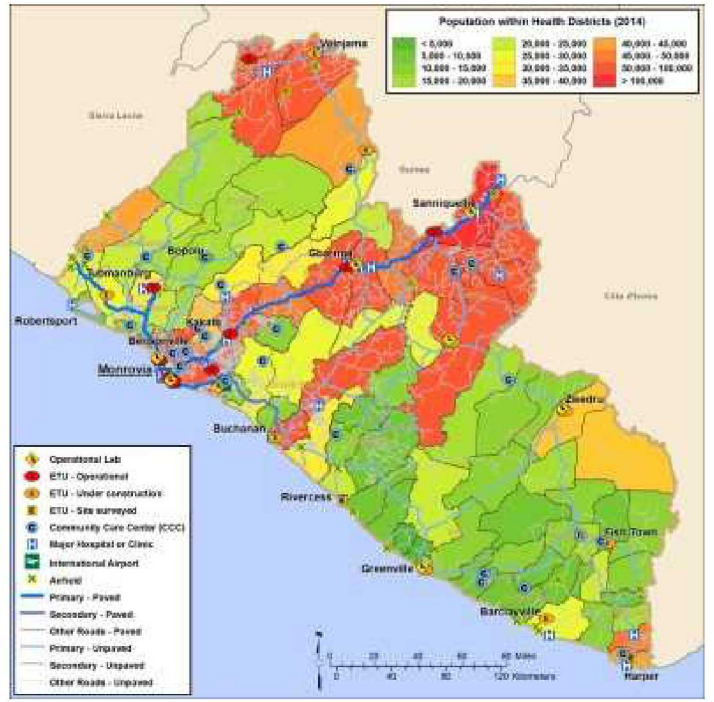
- Free to use/disseminate
- Managed by SNL for the USG
- Easy to use – icon and picture-based
- Access control
- Focus on chemicals of concern
- Barcode readers/scanners
- Reports
- Change history

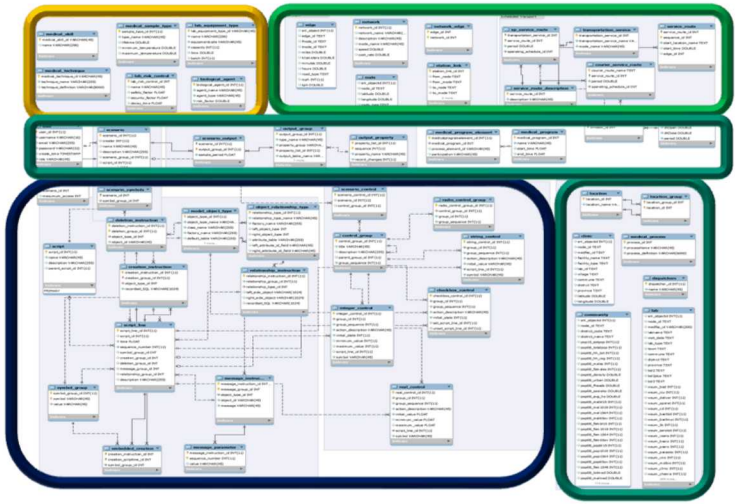


Laboratory Infrastructure Network Analysis (LINA)

- LINA combines secure data storage, maps, and modeling:
  - Database of laboratory and network information
  - Interactive maps
  - Modeling and analysis

- Example: West Africa Ebola Epidemic
  - Modeled national specimen referral and laboratory infrastructure
    - Informed placement of multiple DOD laboratories
    - Developed basis for national lab network
    - Provided strategic inputs on lab systems during drawdown and the post-outbreak steady state
  - Analyzed impacts of new technologies on laboratory network
    - Examined applicability of UAVs for sample transport in Liberia





Example: Global Biorisk Management Curriculum (GBRMC)

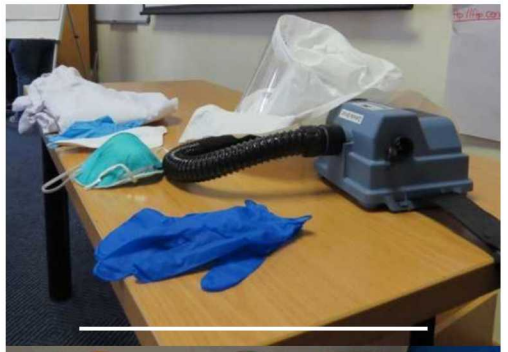
Biosafety and Biosecurity training materials

- Strategic, sustainable
- Anywhere, anytime
- Well-branded, well-managed
- Customizable

Network of trainers

- In over 61 countries
- 861 trainers in the network
- Since 2012, taught >850 times to >4600 students

GBRMC



Developing Sustainable Chem/BioReadiness Programs

Sustainable Readiness Programs

- Develop local "Bio/Chem Threat Readiness Leaders"
  - Mentorship to help leaders develop own TTXs, plans
  - Conduct scenario-based workshops/TTX
  - Facilitate multiyear strategies for exercises & planning
  - Multiyear course: planning, tabletops, drills and full-scale exercises
  - Use PREP™ for online mentorship and to assist in design

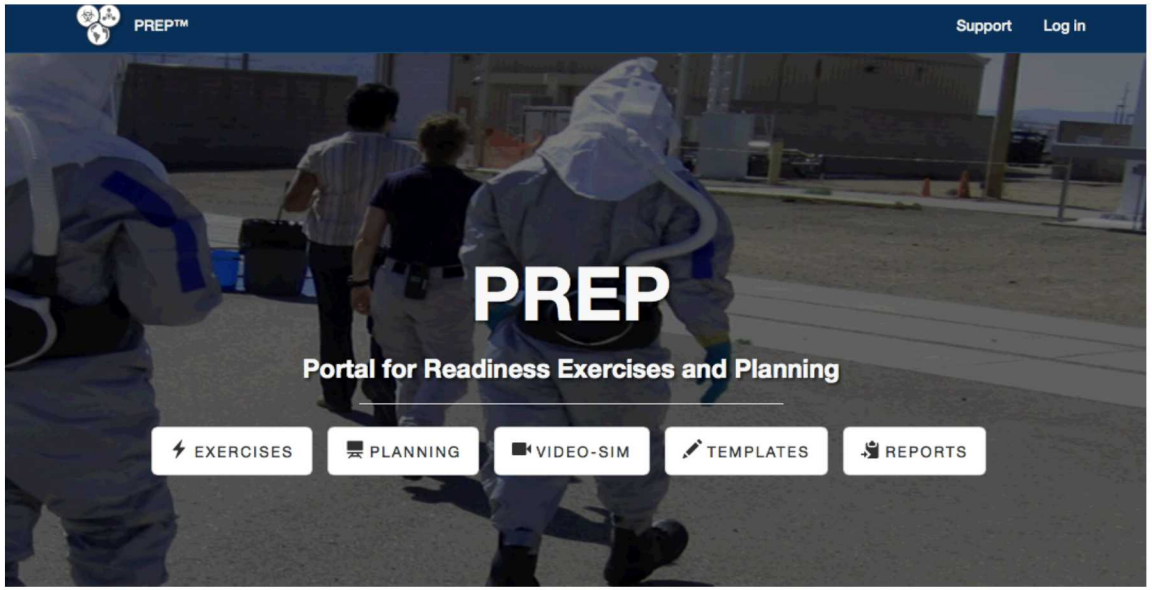
PREP™: Portal for Readiness Exercises & Planning

PREP is an online platform that provides simple, easy-to-use templates & tools for emergency managers, health, & security professionals to design and conduct:

- Tabletop exercises and drills
- Strategic and operational planning workshops

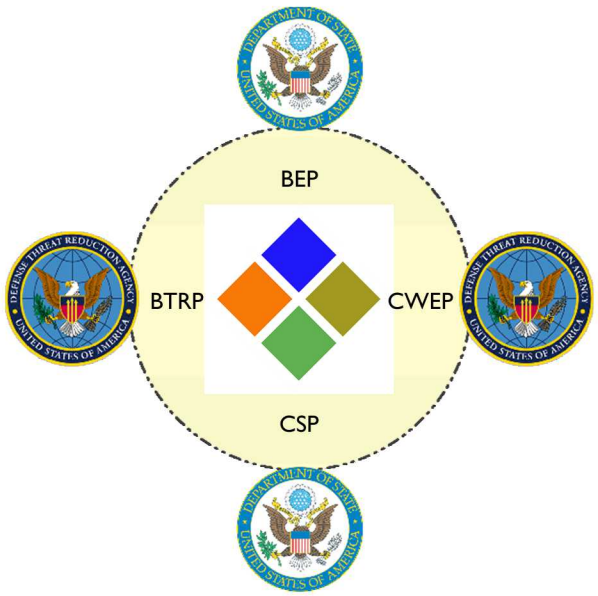
Features

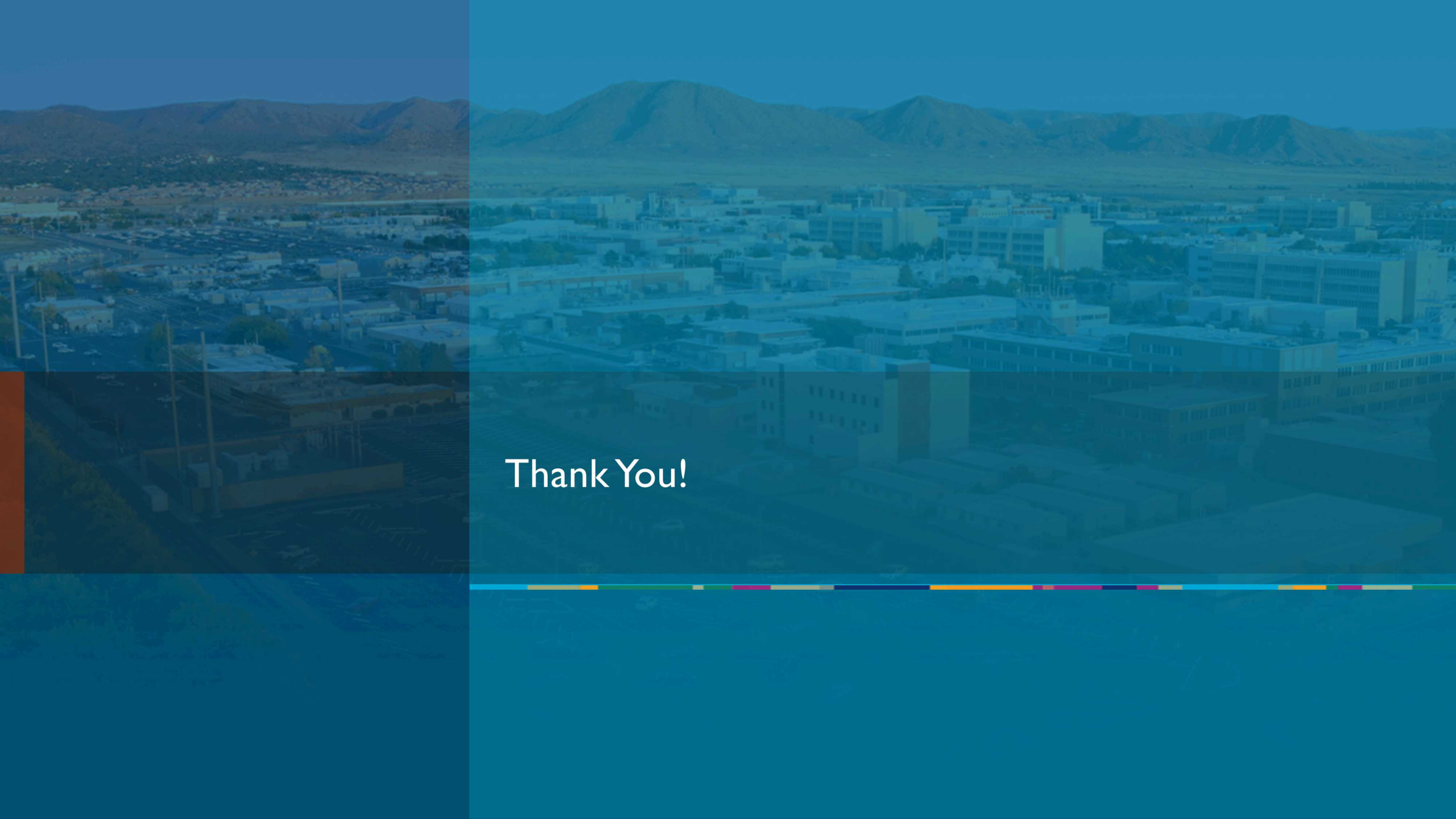
- Multi-Lingual capabilities
- Immediate report development
- Communication tracking
- Secure data collection
- Flexible adaptable templates
- Video Game activity
- Remote and in-person usability
- TTX/Planning Template in progress



GCBS PROGRAM ENGAGEMENTS

Support to the US Department of State and the Defense Threat Reduction Agency





Thank You!