

## Portal Monitor for Authentication and Certification

Exploring Nuclear Disarmament Verification



PRESENTER:

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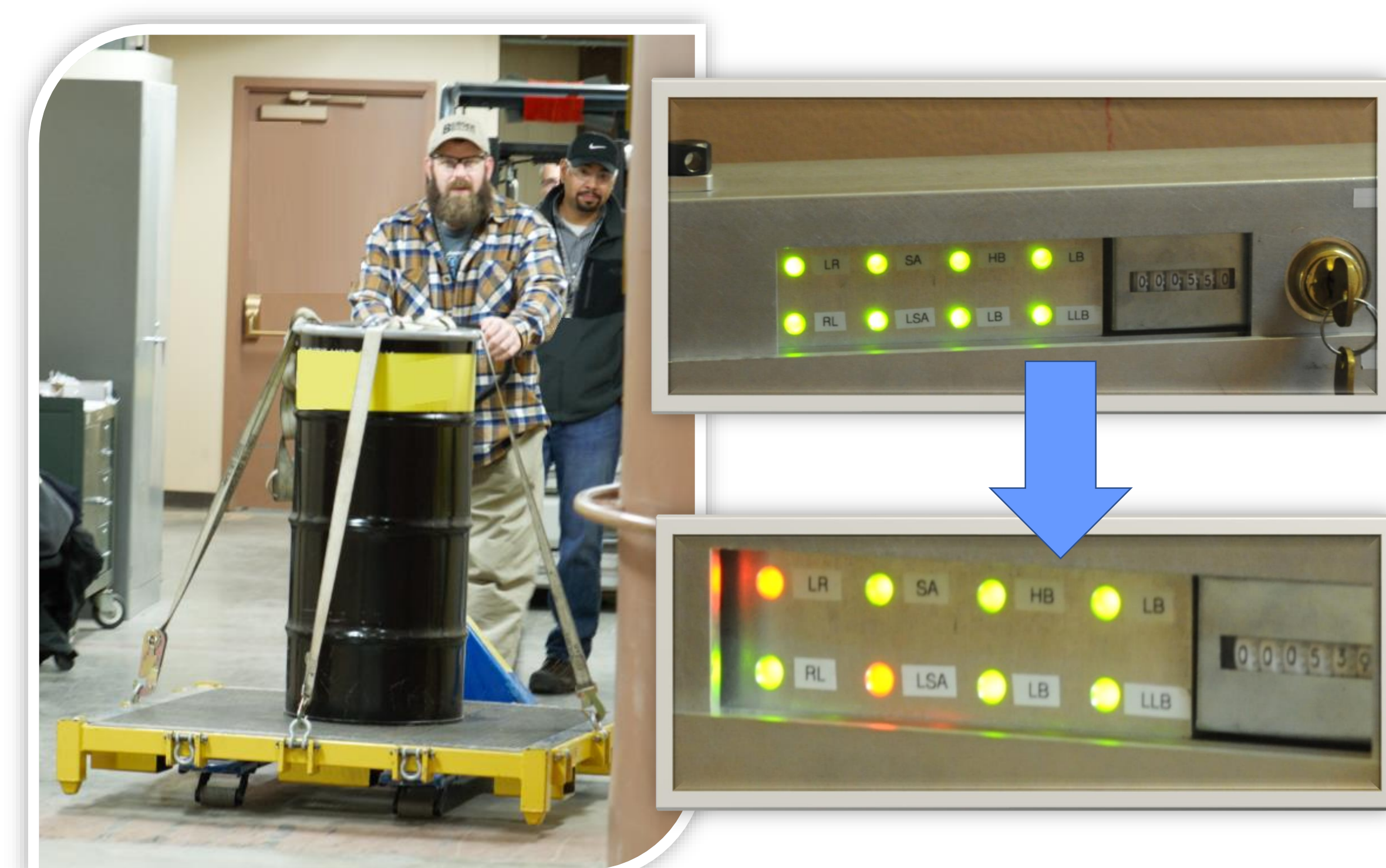
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### BACKGROUND:

Typically, Host and Inspector needs are at odds: the Host wants to limit inspector access to verification equipment to protect sensitive information, while the Inspector wants to maximize their access to obtain data and verify compliance with Host treaty obligations. Confidence considerations often lead to design features that are different from industry best practices, such as the elimination of software and data storage, so commercial technologies may not be best for arms control. It is also challenging to quantify confidence – how much is enough?

### METHODS:

The 2013 – 2019 United States (U.S.)-United Kingdom (U.K.) PMAC project explored technological and procedural options to maximize Host and Inspector confidence for boundary control in a hypothetical arms control treaty.



# The U.S.-U.K. Portal Monitor for Authentication and Certification (PMAC) is a novel nuclear disarmament verification technology prototype built to maximize Host and Inspector confidence.



### RESULTS:

The project team:

- Designed and built a novel portal monitor prototype that incorporates features for confidence, such as:
  - No data storage
  - One-layer (dual-sided) circuit boards for ease of inspection
  - Inherent tamper indicating enclosures / modularity
  - Custom bolts for loop seals
- Authored cradle-to-grave use procedures to address any gaps in confidence that could not be solved by the design, exploring options such as:
  - Who builds portal monitor – host or inspector?
  - Does there need to be chain of custody on portal monitor between visits?
  - What inspection techniques are needed during the joint inspection prior to use in a hypothetical regime?
- Conducted two exercises to test the prototype in realistic settings
- Created a new evidence-based approach to evaluate confidence



- U.S. National Nuclear Security Administration, U.K. Atomic Weapons Establishment, Pacific Northwest National Laboratory, Pantex Plant, Lawrence Livermore National Laboratory, Los Alamos National Laboratory, Sandia National Laboratories, Y-12 National Security Complex