Arms Control Verification Research at AWE

Neil Grant

May 2016
Arms Control Verification Research

- Support and advise HMG/MOD on nuclear arms control matters
- Develop the means to verify possible future nuclear-related treaties, in partial fulfillment of UK NPT Article VI commitments, through:
  - Analysis of current nuclear treaties & exploration of credible scenarios
  - Consideration of verification requirements
  - Research into applicable technologies and methodologies
Our research

Verification Science

Device and Material Monitoring
- Characterising nuclear material
- Exploring and developing diagnostic techniques

Chain of Custody
- Continuity of evidence throughout the duration of a treaty

Authentication
- Building trust in equipment
Device and Material Monitoring

- Understand detection of nuclear material
- Research methods to detect nuclear material
- Assess performance of available technology
- Gather only the information required and nothing else
- Challenges:
  - Develop high confidence results without knowing specifics of the item
  - Develop mutual trust in equipment: authentication & certification
Chain of Custody

- Maintain continuity of knowledge of treaty accountable items
- Developing toolkit of technologies for different scenarios
  - Tags & seals
  - Boundary control
  - Templating techniques for item tracking
- Challenges:
  - Authentication & certification of equipment
  - Data management
  - Assessment of diversion risk
Authentication

- Methods of building trust in equipment
- Developing range of techniques
  - Physical evaluation of electronics
  - Software and digital-design verification
- Challenges:
  - Authentication vs certification of equipment
  - Timeliness of evaluation
  - Rapid increase in electronic complexity