UKNI

UNITED KINGDOM – NORWAY
INITIATIVE

An Overview of the UK-Norway Initiative

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What is the UK-Norway Initiative?

- An equal partnership, promoting understanding between NWS and NNWS
  - Particular focus on how a NNWS might participate in verification of nuclear dismantlement
- NPT provides both stimulus and boundary for the UKNI:
  - NPT Articles I and II
  - NPT Article VI
    - "Each of the Parties to the Treaty undertakes …effective measures relating to … nuclear disarmament … under strict and effective international control."
- The UKNI has made concrete progress on nuclear weapon verification issues, whilst carefully avoiding any transfer of proliferative information

Participation

- Collaboration began in 2007
- Participating institutions
  - UK: Atomic Weapons Establishment (AWE), Ministry of Defence
  - Norway: Institute for Energy Technology (IFE), Norwegian Defence Research Establishment (FFI), NORSAR, Norwegian Radiation Protection Authority (NRPA)
  - NGO: Verification Research Training and Information Centre (VERTIC) participated until 2009

Our Projects

- Three areas of work, each aimed at developing verification measures for nuclear warhead dismantlement that are effective and protect sensitive information
- Managed Access
  - Explored how inspections can be carried out in practice at the facility level
  - Exercises in 2008 (Norway), 2009 (Norway) and 2010 (UK)
- Information Barriers (IBs)
  - Concept: a system of procedural and technical measures designed to allow one or more unclassified measurements to be made on a classified object
  - UKNI IB: measures isotopic ratio in a test object against pre-agreed criteria, returns a present/not proven result
- Confidence in verification processes
  - Encourage multinational participation in verification research
  - Understand the evolution of trust and confidence in inspection processes

Managed Access

- Project designed to give us a better understanding of the roles and concerns of NNWS and NWS in inspection scenarios
- Investigated these issues through an exercise programme
  - 2008: The NWS state ‘Torland’ (Norway) hosting a familiarisation visit from the NNWS state ‘Luvania’ (UK)
  - 2009: ‘Luvania’ monitors the dismantlement of a ‘nuclear weapon’ in ‘Torland’
  - 2010: Roles reversed, the UK plays ‘Torland’ and hosts a familiarisation visit
    - Greater focus on the impact of safety and security on verification processes

Student verification exercises

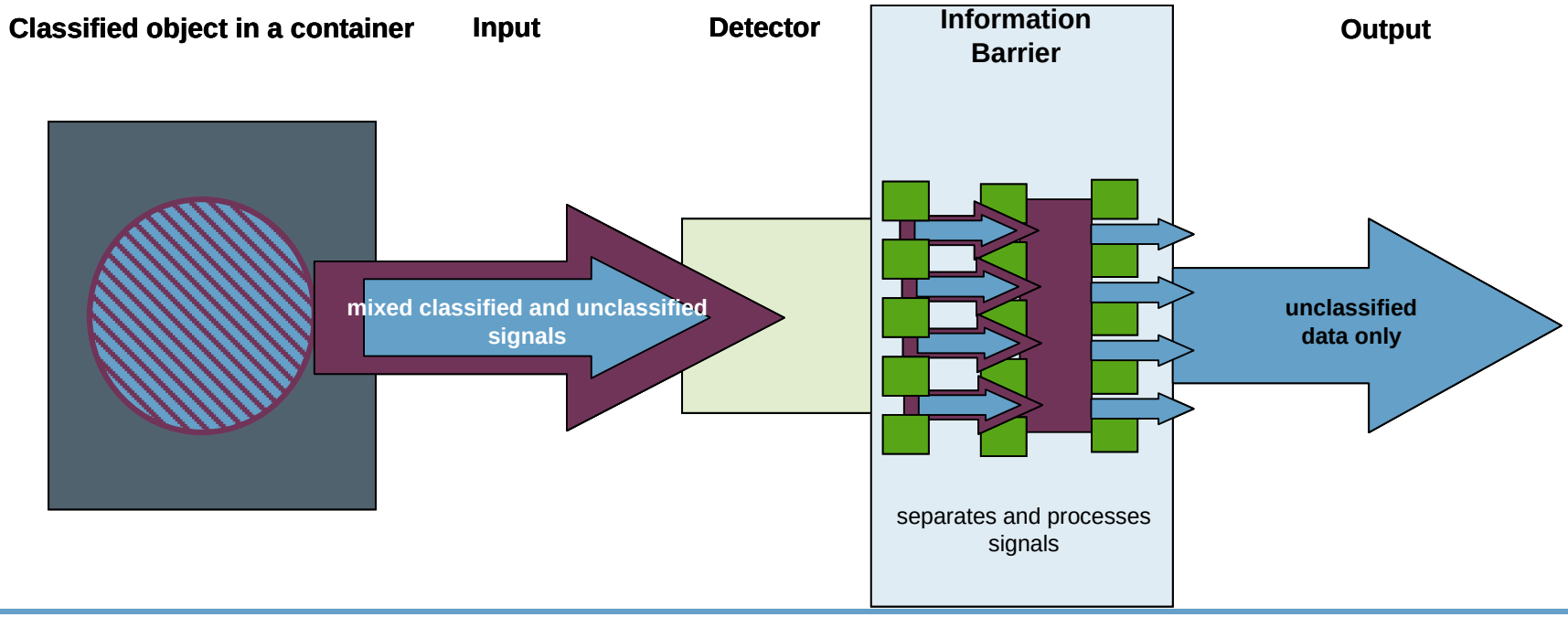
- Participants from academic institutions in Egypt, Germany, Russia, South Africa, the US and the UK
- Exercises provide an immersive environment in which to experience verification challenges
  - Background lectures before the specific exercise mission brief
  - Managed access protocols for facility inspections,
  - ‘100% proof’ is not possible
  - How much confidence do they have that the treaty has not been breached?
- Collect data on the factors that influence the development of inspector trust and confidence
  - Data collected using questionnaires, interviews, focus groups, ‘in play’ feedback, and by observation
  - King’s College London publishing study results later this year

The Information Barrier project

- Purpose: understand how to build and maintain ***mutual confidence*** in verification equipment
  - Investigate joint hardware/software design
  - Design for equipment authentication
- Need to consider:
  - Information security
  - Safety
  - Operational restraints
- All impact on suitable design and deployment process

Information Barriers

- Concept: a system of procedural and technical measures designed to allow one or more unclassified measurements to be made on a classified object
- UKNI IB: measures isotopic ratio of plutonium in a test object against pre-agreed criteria, returns a present/not proven result



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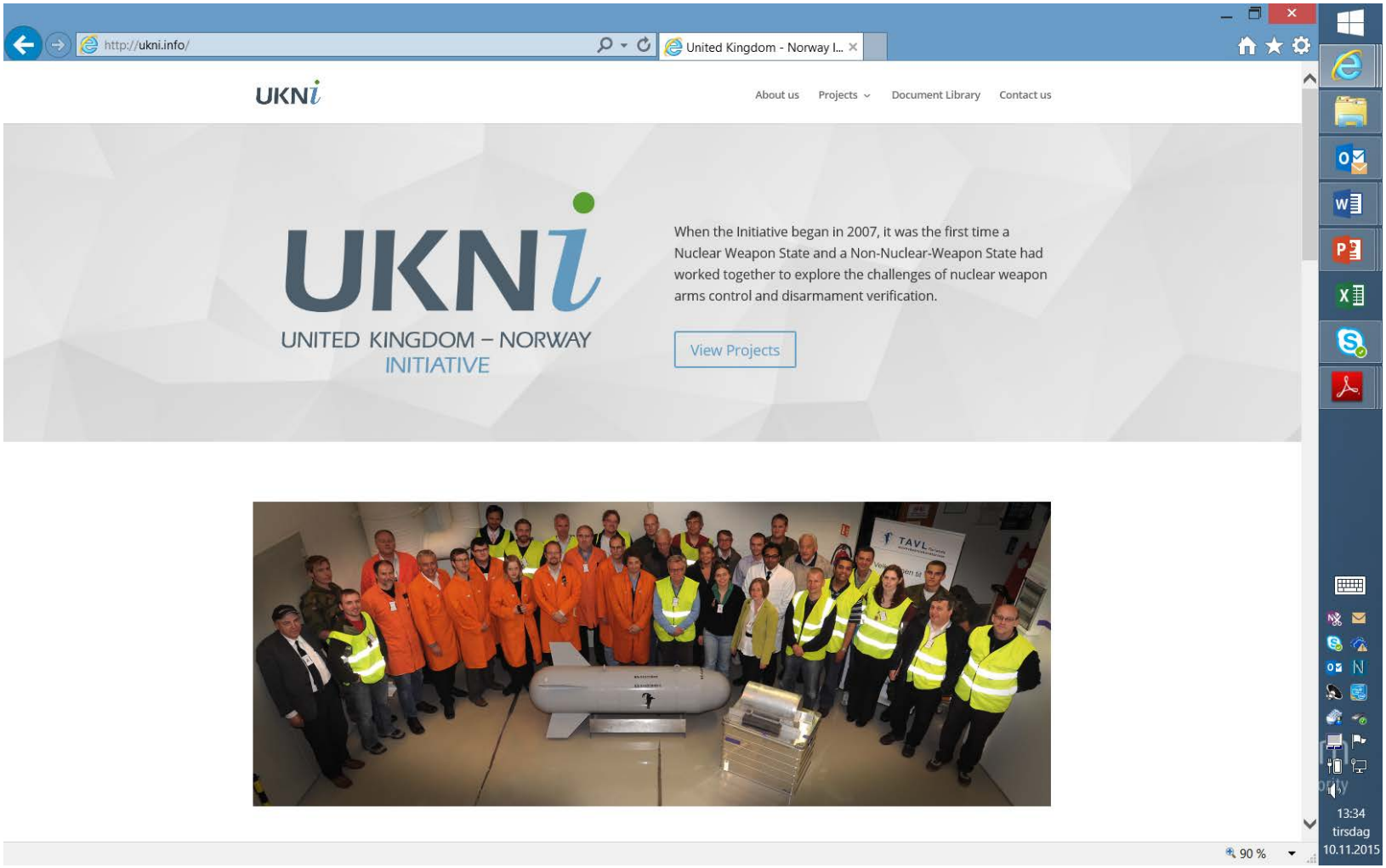

Scenarios used in the UK-Norway Initiative as well as more detail about the developement of the information barrier will be given tomorrow at IFE

Lessons learned - from a NNWS perspective

- Security requirements
  - Puts lots of constraints on what it is possible to do in nuclear weapons facilities
  - UKNI has worked on a host-supplied equipment approach
    - Takes time for scientists and engineers to adjust – usual approaches do not work
  - Difficult working with threshold values
  - NNWS don't neccesarily know what is proliferative

Joint developement

- Developing joint solutions without sharing sensitive and proliferative information
  - Testing becomes difficult – not possible to test on ‘real’ objects
  - ‘security through obscurity’ is difficult (should be impossible)

Context

- When developing techical solutions, the task need to be defined within the context of a specific regime
  - What value does one particular verification activity add to the overall objectives of the regime
  - What physical constraints will equipment and inspectors operate under
  - What time constraints will equipment and inspectors operate under
- Given constrains by the need to protect sensitive and proliferative infromation a verification regime will have to build confidence based on many pieces of evidence which each on their own does not neccesarily give sufficent confidence.