



UNITED KINGDOM – NORWAY
INITIATIVE

New Verification Exercises: A Collaboration with King's College, London



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UKNI Strategic Context

- An equal partnership between states
 - Promoting understanding between NWS and NNWS
 - Promoting discussions on how a NNWS might participate in a nuclear dismantlement verification process
 - Explore issues within the NPT objectives:
 - NPT Articles I and II
 - “Each nuclear-weapon State Party to the Treaty undertakes not to transfer to any recipient whatsoever nuclear weapons...”
 - “Each non-nuclear-weapon State Party to the Treaty undertakes not to receive the transfer from any transferor whatsoever of nuclear weapons...”
 - NPT Article VI
 - “Each of the Parties to the Treaty undertakes ...effective measures relating to ... nuclear disarmament ... under strict and effective international control.”
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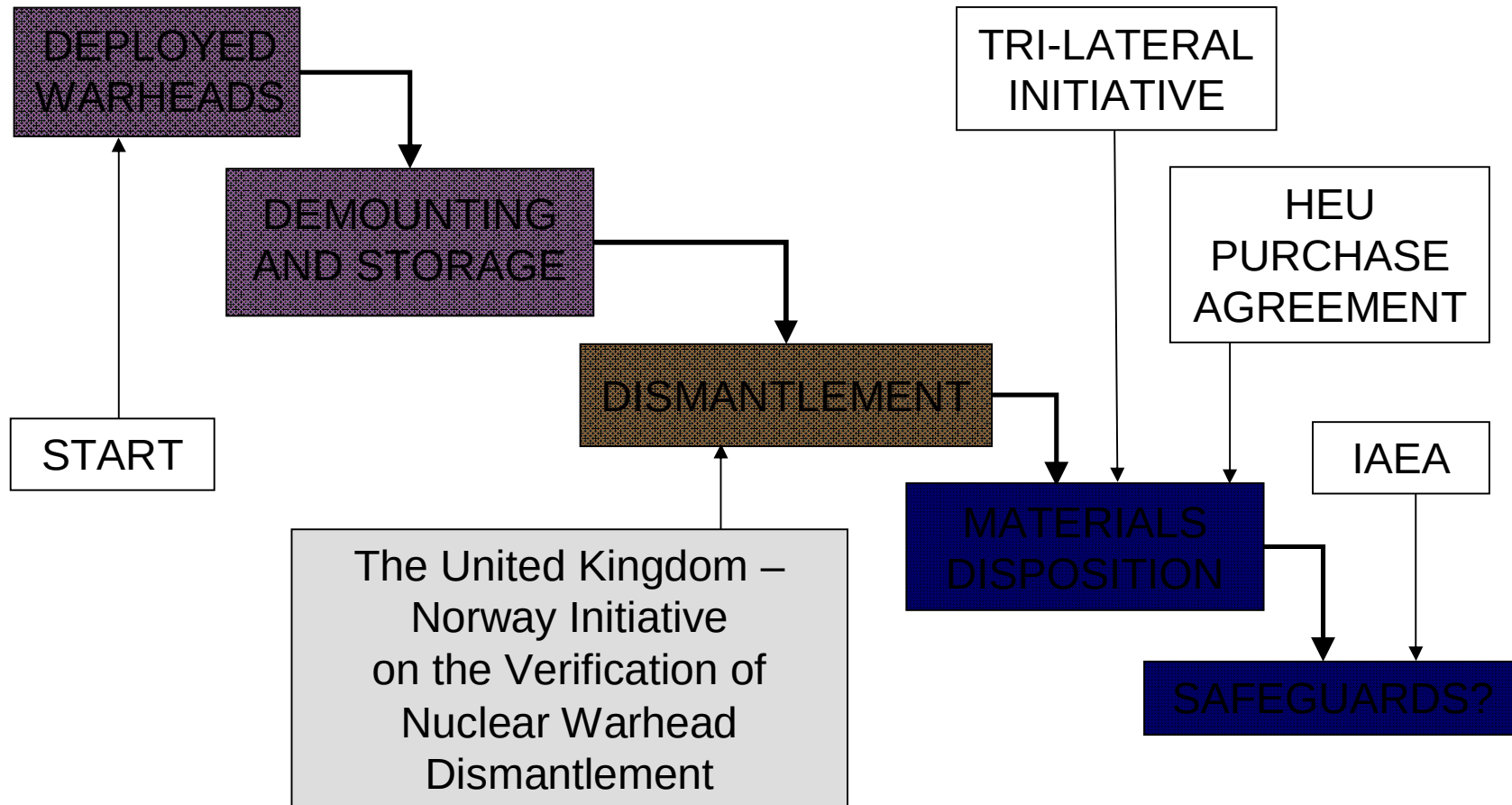
UKNI: Scope, Purpose & Aim

SCOPE: Explore the technical and procedural challenges of verifying nuclear warhead dismantlement.

PURPOSE: Use fictional and generic scenarios to identify challenges to verifying nuclear warhead dismantlement.

AIM: To research, develop, and test possible tools, techniques and methodologies for possible future use in verification of nuclear warhead dismantlement.

The UKNI in relation to nuclear weapon disassembly



- Exercises between UK and Norway in 2008, 2009 and 2010
 - Opportunity to learn very general lessons concerning the challenges of dismantlement verification
 - An exploratory and educational tool
 - Free flowing exercises with a broad scope
 - Not designed to assess the impact of specific events or issues
 - Focused exercises were suggested to explore specific issues further



UKNI*i* Key lessons

- Successful verification regimes in the context of nuclear warhead dismantlement will require years more research
- Verification is particularly challenging: Security concerns severely restrict actions and access to information
- Rigorous and highly structured procedures are required to facilitate inspections in security sensitive areas
- 100% 'proof, 100% 'confidence' is not achievable
- Yet 'Inspecting parties' often reported 'a high level of confidence' in achieving certain objectives
- What does a 'high level of confidence' mean, in a context where primary information may not be available?
- The influence of intangible human factors became evident during exercise reviews



Next steps: Education and research

- Research
 - Can a satisfactory assessment be made when the available information is incomplete or inconclusive?
 - What does it mean to have 'confidence' in an assessment?
 - Do human factors such as trust, affect confidence? If so, to what extent? And what impact might this have on an overall assessment of evidence?
 - Education
 - Partner with universities to explore these issues in a meaningful and conceptually robust manner
 - Share lessons learned and provide direct experiences to the next generation of verification practitioners
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Partnering with King's College, London: A new research project

- KCL student exercises in 2011 and 2012
 - Natural partner to take forward educational aspect of exercises
- In order to study the effects of human factors further , UKNI have formed a research partnership with King's College, London
- Research project to explore the role of trust in the verification of nuclear warhead dismantlement through a series of controlled simulations
- Aims to develop a systematic and original approach to identifying the dynamics, requirements and risks associated with trust in dismantlement verification
- Planning in place until 2017



Definitions:

- Confidence may be understood as an evidence-based judgement concerning the capability of the inspecting team to suitably account for all items under their jurisdiction, at all points in the monitoring process
- Trust may be defined as positive expectations about another's motives and intentions with respect to oneself in a situation entailing risk

A 'managed access' exercise:

- A tightly controlled scenario designed to isolate (insofar as it is possible) issues of trust and confidence, for study
- Based in the fictitious country of 'Westermark'
- The resolution of an ambiguous situation that has arisen during the implementation of an agreed treaty monitoring regime
- Participants receive evidence, but some information is inaccessible. '100% proof' is not available



- Immersive
 - more complete understanding of the scenario
 - fewer notional elements
 - fewer ambiguities and assumptions
- Rigorous
- Focused
- Repeatable
- Controlled: Variables tested and effects monitored
- Data collected throughout exercise
- Extrapolate simplified exercise information and events to real world



- Participants
 - Post-graduate students from technical/policy backgrounds
 - A range of universities
- Preparatory reading
 - Concise and relevant readings on issues relating to arms control and verification
- Preparatory discussions
 - Overview of arms control and treaty verification
 - Treaties and practical issues
 - Insights from experienced inspection personnel
 - Multidisciplinary approach to promote the investigatory mindset
- Pre-exercise situation briefing
 - To immerse participants in their role and start the simulation



- July 2013: King's College, London (UK)

- Nov 2013: Joint team -
 - Texas A&M University (USA)
 - Tomsk Polytechnic University (Russia)
 - Tomsk State University (Russia)

- April 2014: Witwatersrand University (South Africa)



Exploring the Influence of Human Factors in Verifying Nuclear Warhead Dismantlement

Wyn Bowen, Hassan Elbahtimy, Chris Hobbs, Matthew Moran



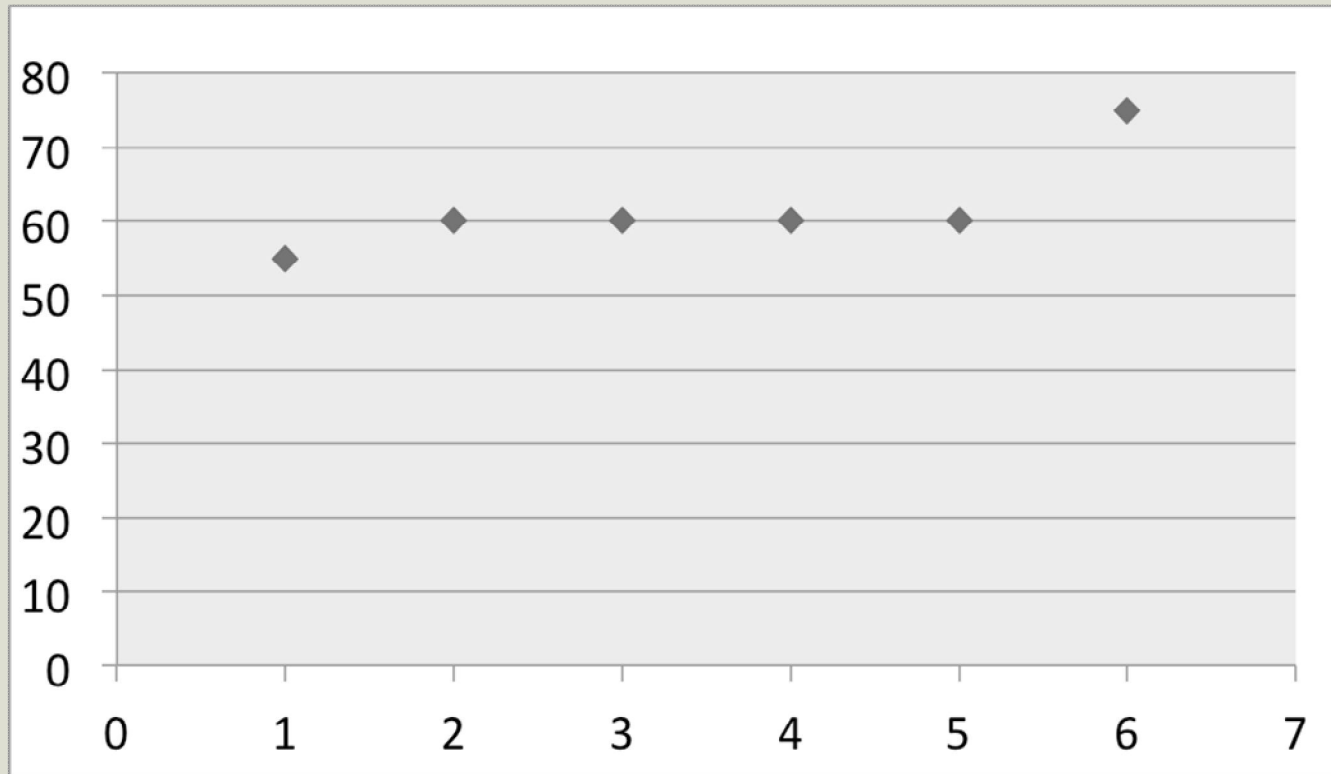
The difficulty of studying trust...

- Human factors – perceptions, relationships, intentions, trust – are subjective and intangible
- Trust can develop or change intuitively or subconsciously and is a fluid issue
- Likely that trust has some influence on confidence (or at least the context framing confidence) but difficult to isolate for study
- How can trust be isolated and evaluated in a meaningful and conceptually robust way? How can we determine the extent of its influence on the verification process?

Methodology

1. Develop a tightly controlled scenario designed to isolate (in so far as is possible) human factors for study.
1. Develop a series of working hypotheses to be tested
 - Communication Management
2. Adopt a qualitative research approach based on 5 distinct methods:
 - Participant observation
 - Situation Reports (SitReps)
 - Semi-structured interviews
 - Questionnaires
 - Focus groups

Sit Reps



Confidence categories

Very high 90-100%

High: 70-90%

Moderate: 50-70%

Low: 30-50%

Very low 0-30%



% Confidence

SitRep number →

Preliminary findings

- Confidence levels of the monitoring teams (MT) tends to fluctuate during the exercises – not a consistent increase or decrease in confidence

Tangible factors influencing confidence

- Level of facility access
- Direct observation of facilities
- Corroborative Measurements (e.g. Environmental reports)
- Consistency of information provided
 - Contradictory or inconsistent information results in a dip in confidence levels

Human factors influencing the process

- Attitude of the host team
 - 'professionalism'; 'The attitude of the host team seemed very accommodating...all our requests were met and this made us feel more confident'; 'There was a good degree of openness'
 - 'The WDE team seems increasingly compliant and forward with the requests of the inspection team'
- Speed and manner in which information was provided was highlighted as an important issue
 - 'at times we have felt that we are not getting full answers or that answers have been unnecessarily delayed'
 - 'we keep finding out that there is more information that we need to see but haven't yet asked for. If they are so keen to resolve the situation they could have volunteered information rather than waiting for us to ask ... the fact that they volunteer information isn't going to directly increase confidence, but it will improve the overall relationship ... and that goes towards improving confidence in the bigger picture'.

Emergent themes

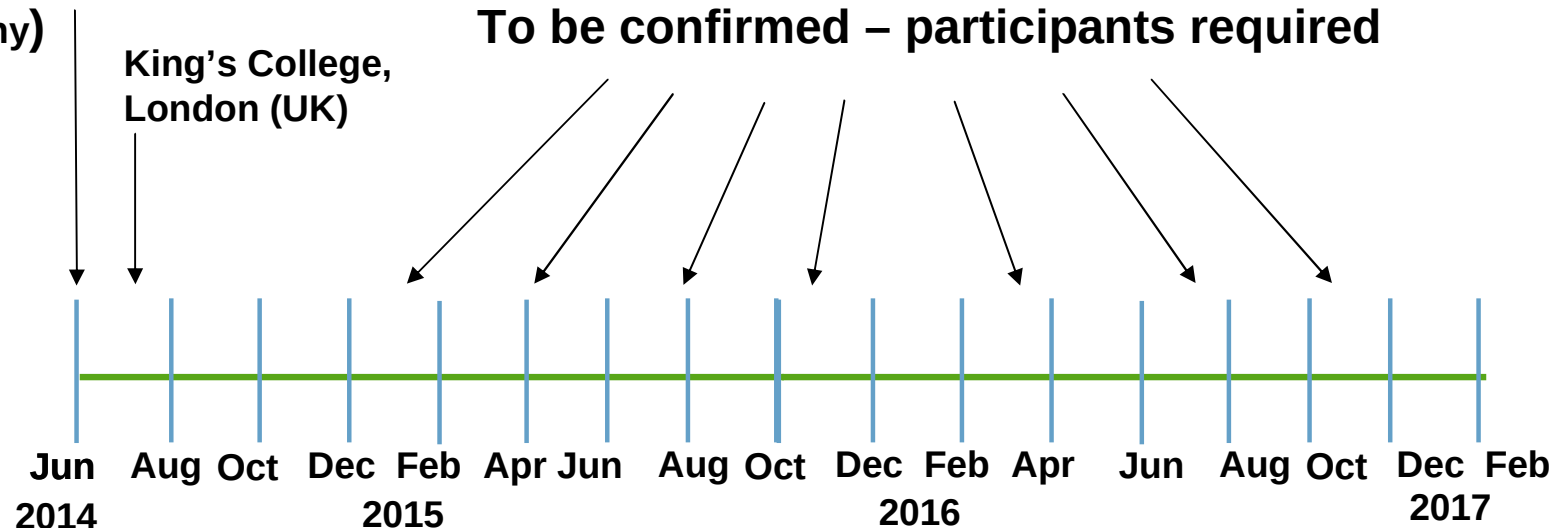
- Judgements primarily evidence-based but also influenced by perceptions of host intentions
- A proactive approach by the host can be beneficial if it contributes to the provision of more credible and reliable information.
- The speed of delivery of information was important to the MT but more important was the quantity, quality and consistency of the information provided.
- On the surface, it appears that the development of personal relationships between the hosts and members of the MT plays a minor role in confidence building.
 - *However* less tangible issues such as trust frame events and contribute to the construction of a particular interpretative framework on the part of inspectors

- The UKNI will continue, with plans already in place until 2017
- Exercise schedule:

University of Hamburg
(Germany)

King's College,
London (UK)

To be confirmed – participants required



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- Engagement with other institutions from NWS and NNWS
 - Education and outreach
 - Training and development for technical and policy personnel
 - Adapt the scenario to further research trends emerging from earlier exercises
 - Adapt the scenario to test particular techniques or verification methods
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- Better understand interactions between trust and confidence and how this dynamic influences the verification process
 - Target resources and develop key techniques
 - Development of methods for assessing confidence in ambiguous environments or with incomplete information
 - Better understand effects of human factors on trust
 - Understand how trust might affect an overall verification assessment
 - Better inspection facilitation and management techniques
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- Verification in the context of nuclear warhead arms control and disarmament is difficult and will require years more work
 - Information security might reduce the amount of data available to inspectors
 - The UKNI is actively researching solutions. A new exercise has been developed in partnership with King's College, London
 - The exercise will provide data to research the meaning of 'confidence' and 'trust' in a nuclear arms control context
 - The exercise also provides educational opportunities
 - A number of exercises have taken place, with more planned for future years
 - There is the potential for engagement with other institutions to further develop the exercise
 - Please consider sending a team to take part
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