



Disarmament Verification:

How to apply the UK-Norway Initiative for future work?

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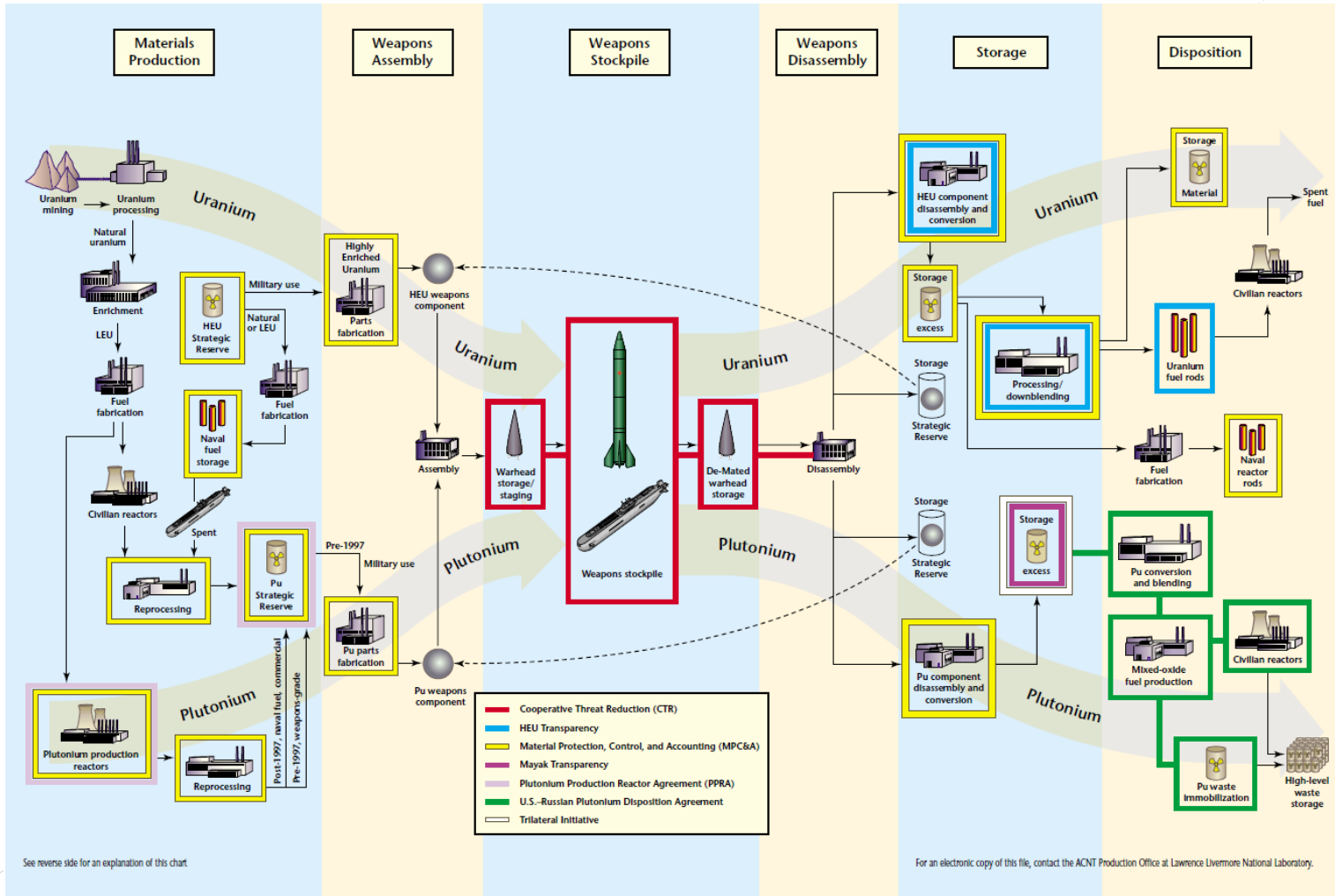
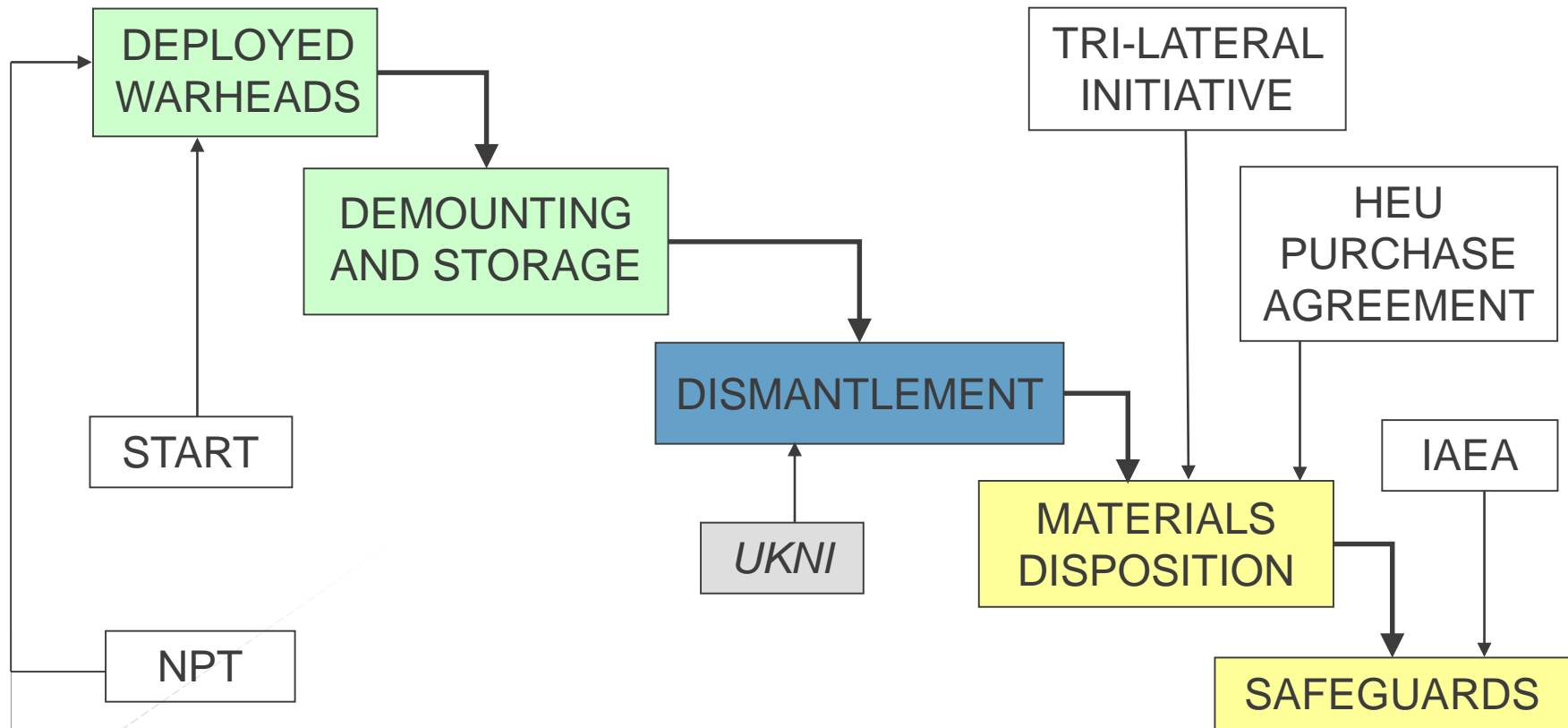


Image taken from 'Arms Control and Nonproliferation Technologies, Office of Non-proliferation research and engineering, 2001

What is the UK-Norway Initiative?

- An equal, laboratory-based partnership, started in 2007, 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 on non-proliferation obligations
 - NPT Article VI
 - “Each of the Parties to the Treaty undertakes to pursue negotiations in good faith on effective measures relating to cessation of the nuclear arms race at an early date and to nuclear disarmament, and on a treaty on general and complete disarmament under strict and effective international control.”
- UKNI has made concrete progress on nuclear weapon verification issues, whilst carefully avoiding any transfer of proliferative information

What is the UK-Norway Initiative?



Project areas

- Three areas of work have been pursued, each aimed at developing verification measures for nuclear warhead dismantlement that are effective and protect sensitive information:
 - Managed Access
 - Explore how inspections can be carried out in practice
 - 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
 - Confidence in verification processes
 - Understand the evolution of trust and confidence in inspections
 - Encourage multinational participation in verification research
- But... many areas and approaches not explored at all

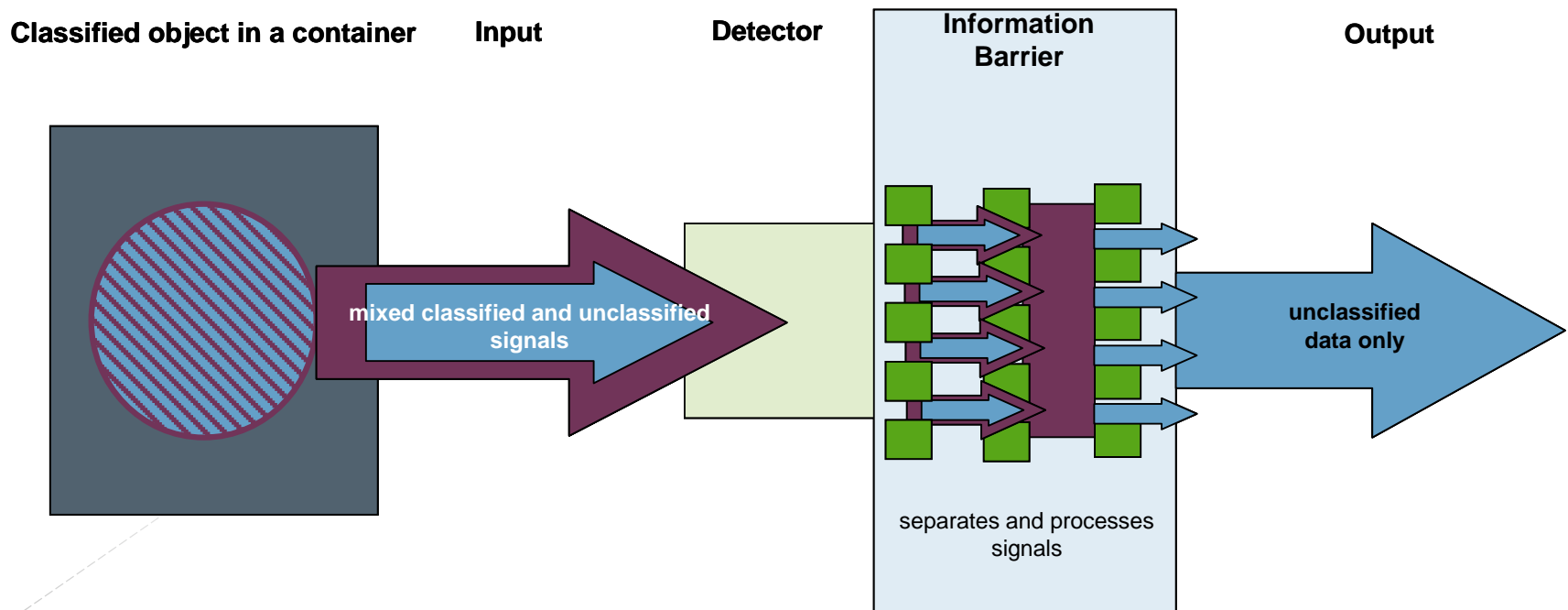
Managed Access

- Project designed to improve our understanding of the roles and concerns of NNWS and NWS in inspections
- Investigated this through an exercise programme:
 - 2008: The NWS 'Torland' (Norway) hosting a familiarisation visit from the NNWS '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



Information Barriers

- Purpose: Understand how to build and maintain joint confidence in verification equipment
 - Carry out joint hardware/software design
 - Design for equipment authentication



Confidence in verification processes

- Various strands of work designed to broaden awareness of nuclear weapon verification challenges and build international participation
- UKNI International Workshop
 - Three day meeting in December 2011
 - Brought a dozen NNWS together to discuss nuclear weapon dismantlement verification
- International student verification exercises
 - Eight exercises held in Norway since the inception in 2013
 - Designed to allow participants an immersive experience of nuclear verification challenges
- Academic study of trust and confidence 2014/ 15:
 - Co-operation with King's College London to use student exercises as a test environment to study the development of trust and confidence by inspectors in a verification process



Final Remarks

- The area of verification technologies and managed access related to disarmament verification is scientifically unexplored, despite UK-Norwegian effort in information barriers/ managed access:
 - Limited efforts completed in academia and international organisations
 - Limited number of approaches explored
 - Few laboratories and test-facilities established:
 - Most countries do possess relevant expertise
 - Existing results should be more widely communicated and adapted to relevant contextual frameworks
 - UK - Norway currently investigate the potential to form a small multilateral collaboration on nuclear weapon disarmament verification, in addition to strong support to international initiatives, such as International Partnership