



Verification: how we can use it and what it can do

Larry MacFaul, VERTIC

VCDN

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Verification goals

- Increasing transparency
- Confidence-building
- Deterrence
- Broadening participation in stabilizing actions
- Informing measures and responses

When might verification be applied?

- **Necessity:** is it needed, are there alternative mechanisms, what about doing nothing?
- **Feasibility:** is it technically & logistically feasible, and to what level of effectiveness?
- **Effectiveness:** how reliable will the results be? Can we base decisions on them? Can it be spoofed?
- **Political acceptability:**
 - for the verified, what about intrusiveness, costs and unintended side-effects?
 - for the verifier, effectiveness, costs and unintended side-effects?
 - will it be used as a political football?

When might verification be applied? con't

- Security context
- Equal standards and reciprocity
- Asymmetrical capacities and reciprocity
- Mitigation options:
 - capacity building for multilateral, lower sensitivity apps.
 - capacity building and tailored techniques for higher sensitivity apps, e.g. managed access?

Starting blocks

- *What* is the target of verification?
What items or activities should be assessed? And what is the scope of the mission
- *How* should verification be carried out?
Which methods, instruments & techniques can be used?
- *Who* should be responsible?
For carrying the various tasks involved in the verification process?

Verification object/target

Weapons and accessories!

- Delivery systems
- Warhead arsenals
- Warhead dismantlement



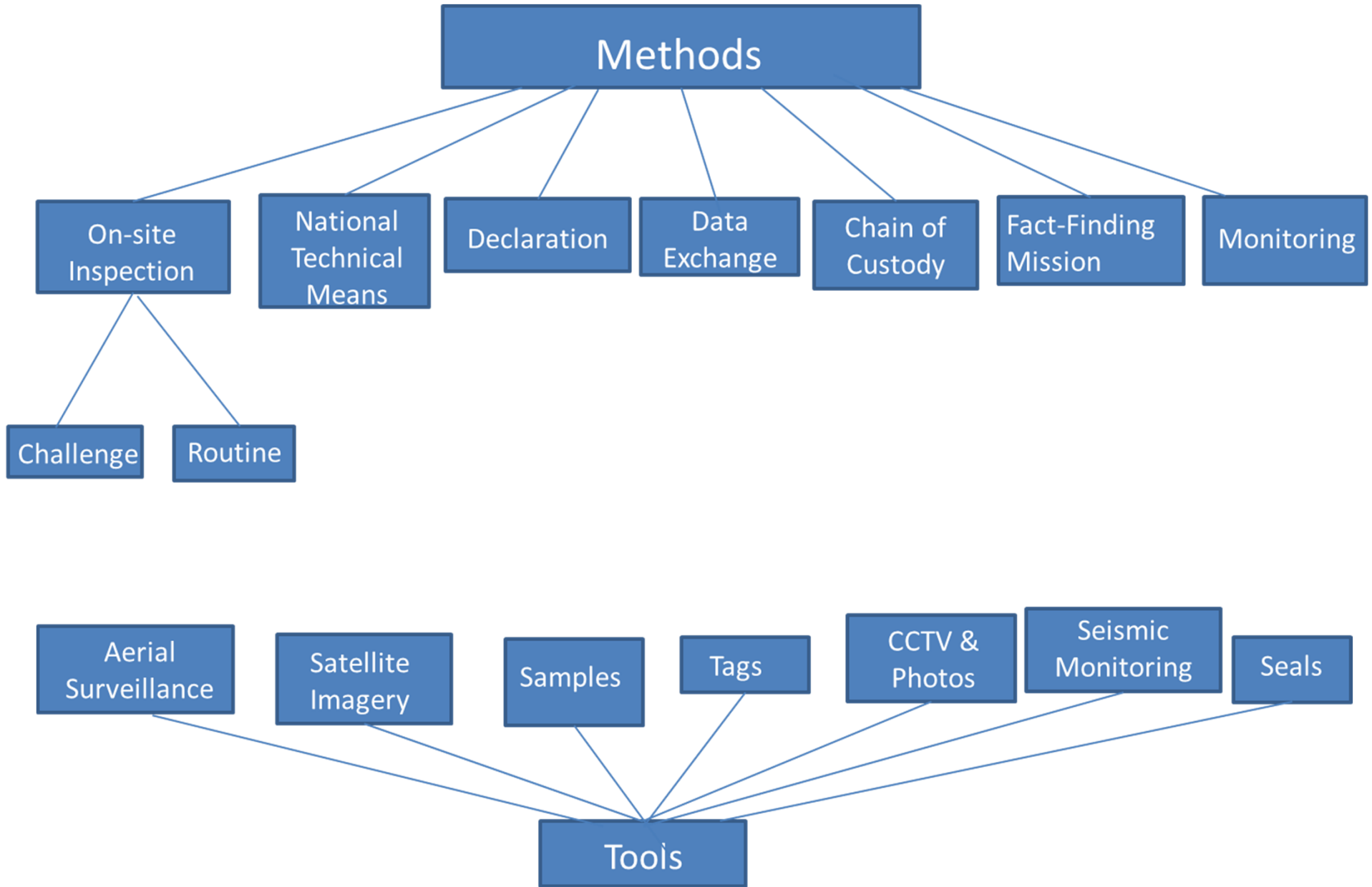
Production capacity and tools

- Weaponization facilities
- Technology, R&D facilities
- Import/Export activities



Both!

- Fissile material



Who is involved?

Arrangements:

- Bilateral-state to state or 3rd party
- Multilateral-state to state or 3rd party

3rd party=regional or international inspectorate

May be influenced by:

- Item or activity being verified—military sensitivity, proliferation concerns.
- Capacity—technical know-how and resources
- Diffuseness of items—logistics and coordination

Who is involved? Con't

Verifiers' (inspectors') rights

- Entry/exit visas
- Freedom from harassment

Verifiers' standards of professional conduct

- Information management, sharing and confidentiality—especially when inspectors representing different countries might be involved

Regional/international inspectorate

- Who do inspectors ultimately report to?
- Budgets, organisational management, vetting and training schemes
- Information management and protocols

Who is involved? Con't

State being verified needs to establish mechanisms and procedures to facilitate verification system

This may include national implementation measures providing for:

- Collecting and reporting specified information
- Hosting inspections

e.g. CWC, IAEA

Uncertainties

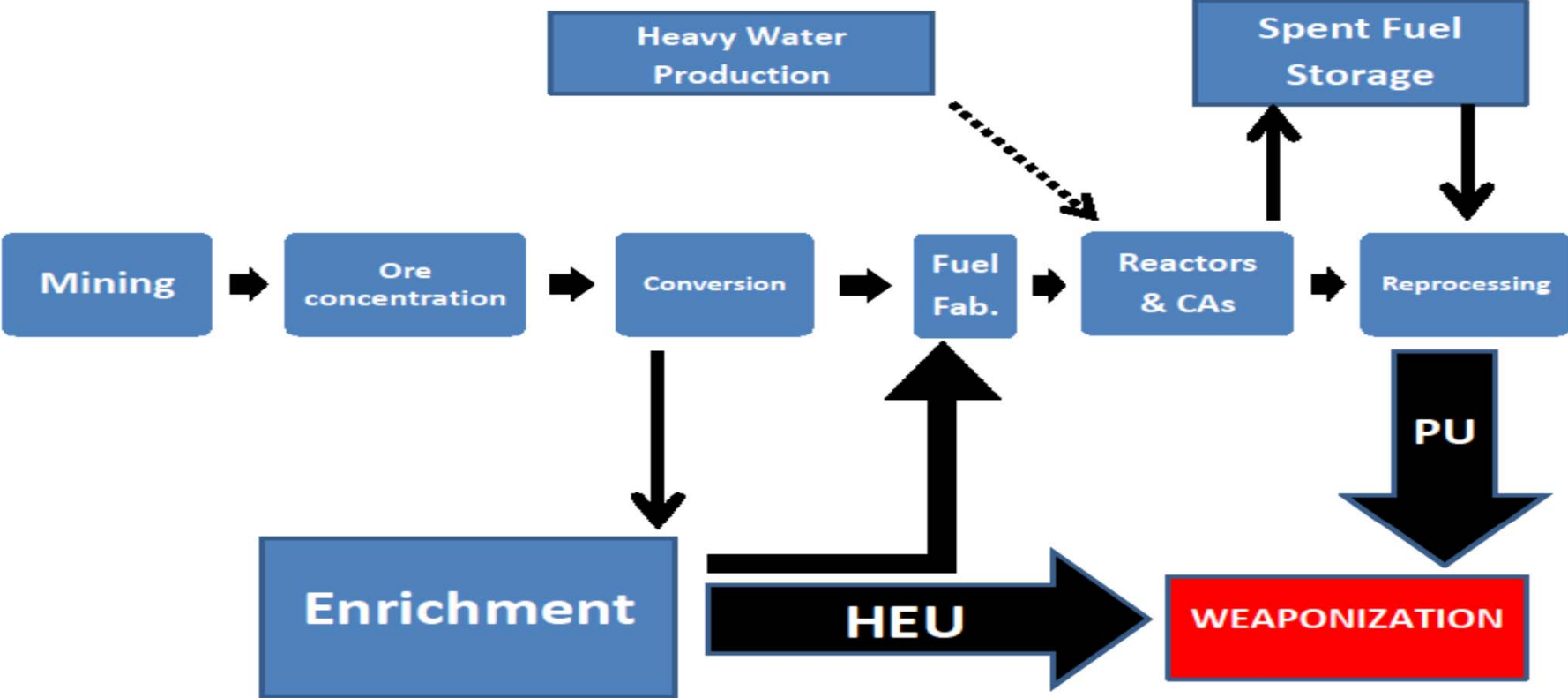
Achieving 100% certainty is generally unlikely, or impossible, or too costly. Uncertainties are an inherent feature of many scientific processes.

- Measurement uncertainty – information barriers, swipes
- Statistical uncertainty—how many examples are needed?
- Imagery uncertainty—what is the level of resolution in comparison to the level of change constituting an infringement
- Baseline uncertainties
- Proving a negative

Verification in practice

- Open Skies-quota of state to state fly overs
- Start-verification regime involving 18 OSIs a year
- IAEA Safeguards: material accountancy & control techniques
record checking; physical inspections (e.g. of barrels);
cameras and seals to prevent diversion of material from a
declared facility; and producing material in undeclared
facilities
- Iraq, South Africa, Libya, DRPK

Verification and the fuel cycle



R&D in practice

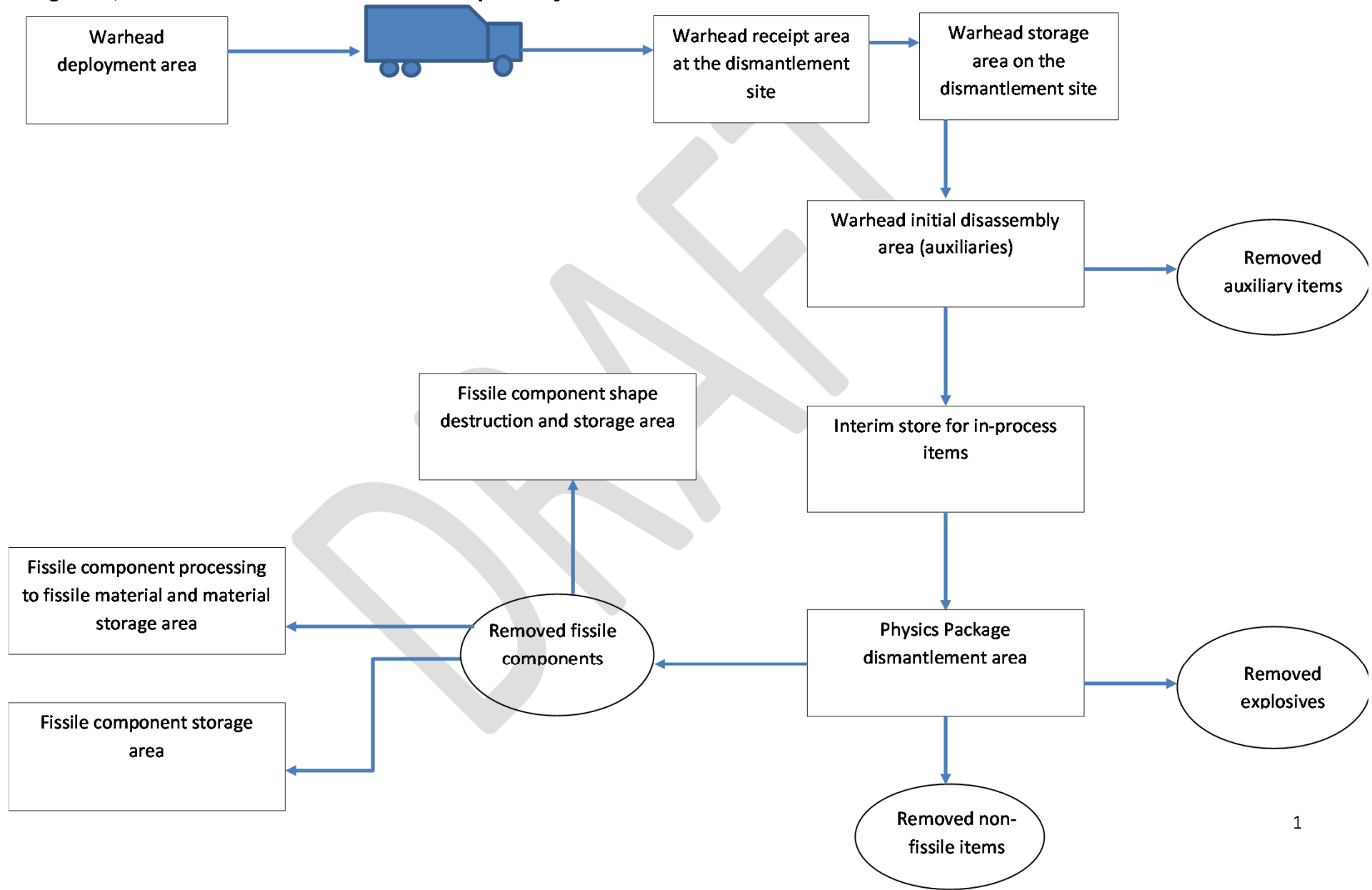
UK-Norway Initiative

- Experiment taken on by representatives from a NWS and NNWS observed by VERTIC
- Explore how to effectively verify warhead dismantlement without contravening proliferation prohibitions
- Chain of custody
- Managed access
- Information barrier
- Learning process

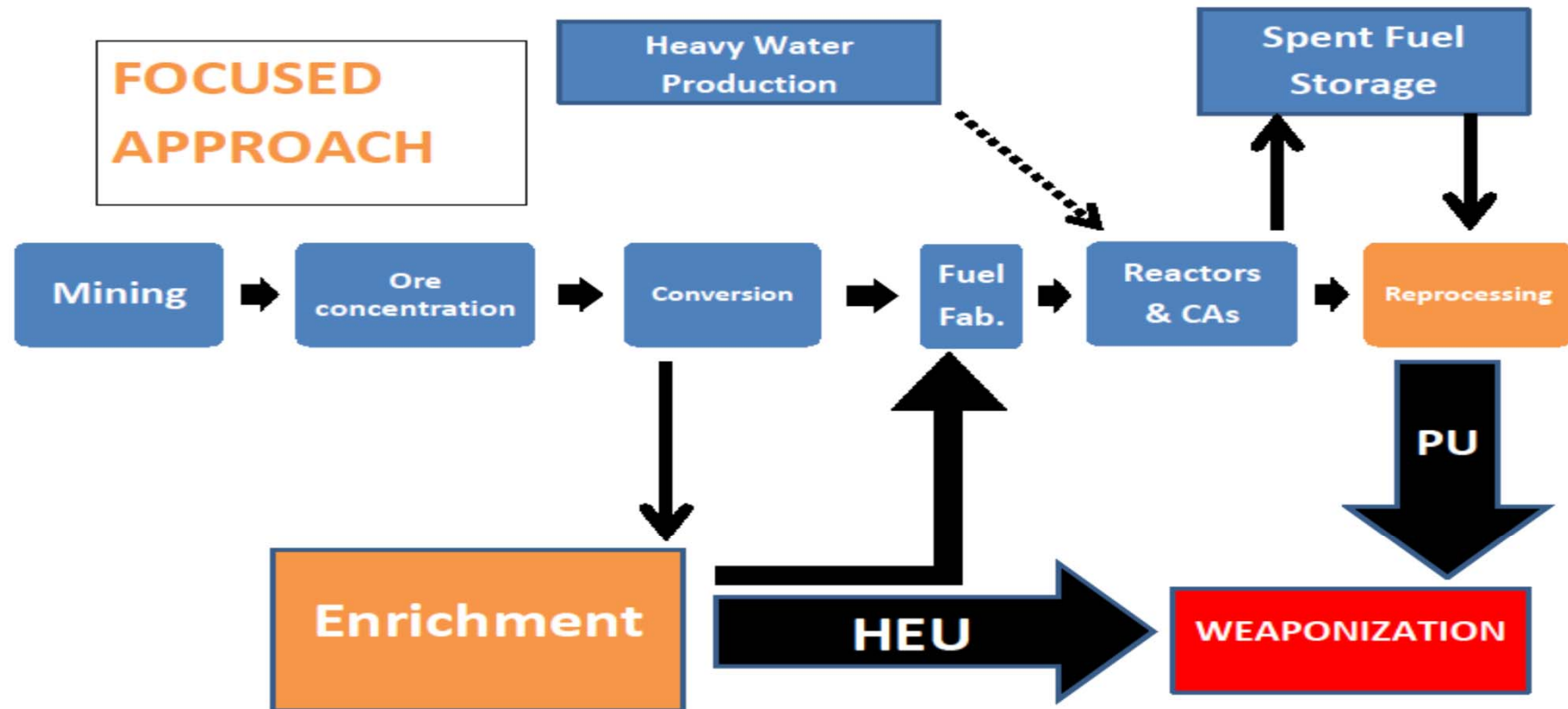
Multilateral approaches:

Exploring the role of international organisations in nuclear disarmament verification to increase confidence and transparency.

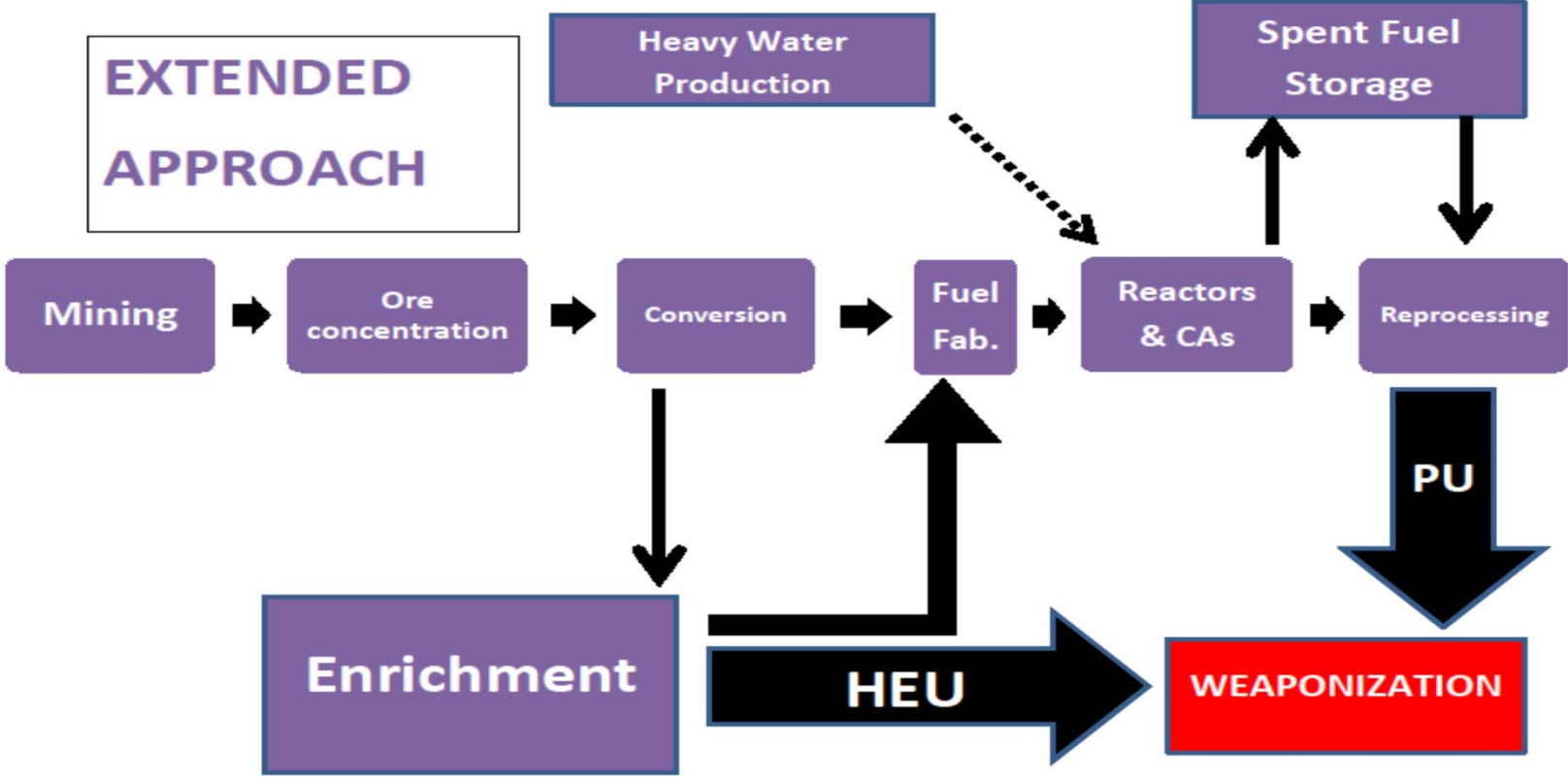
Figure 1, Possible warhead dismantlement pathways



FMCT Verification options and the fuel cycle



FMCT verification options and the fuel cycle



Monitoring & verifying pre-cut-off stocks

- Large uncertainties in historical production could make establishing accurate/credible baseline inventories very challenging.
- Nevertheless, some may consider importance of having measures on fissile material stocks as outweighing concerns over potential difficulties with verification.

Concluding thoughts

- Existence of military fuel cycles and fissile materials in non-explosive military uses complicates matters— managed access may help.
- Who would carry out verification has yet to be decided—IAEA, a FM(C)T body?
- Lessons to be learned from other treaties on how to:
 - equip an FMT with a verification regime e.g. CTBT, CWC, KP vs NPT model
 - address issue of scope