

NPT/CONF.2010/50: “The Conference recognizes that **nuclear disarmament** and achieving the peace and security of a **world without nuclear weapons** will require openness and **cooperation**, and affirms the importance of enhanced confidence through increased transparency and **effective verification**”

The Non-Proliferation Treaty

Verification

- I Each nuclear-weapon State Party to the Treaty undertakes not to transfer to any recipient whatsoever nuclear weapons [...] and not in any way to assist, encourage, or induce any non-nuclear-weapon State to manufacture or otherwise acquire nuclear weapons [...]
- II Each non-nuclear-weapon State Party to the Treaty undertakes not to receive the transfer from any transferor whatsoever of nuclear weapons [...]; not to manufacture or otherwise acquire nuclear weapons and not to seek or receive any assistance in the manufacture of nuclear weapons [...]
- 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**.

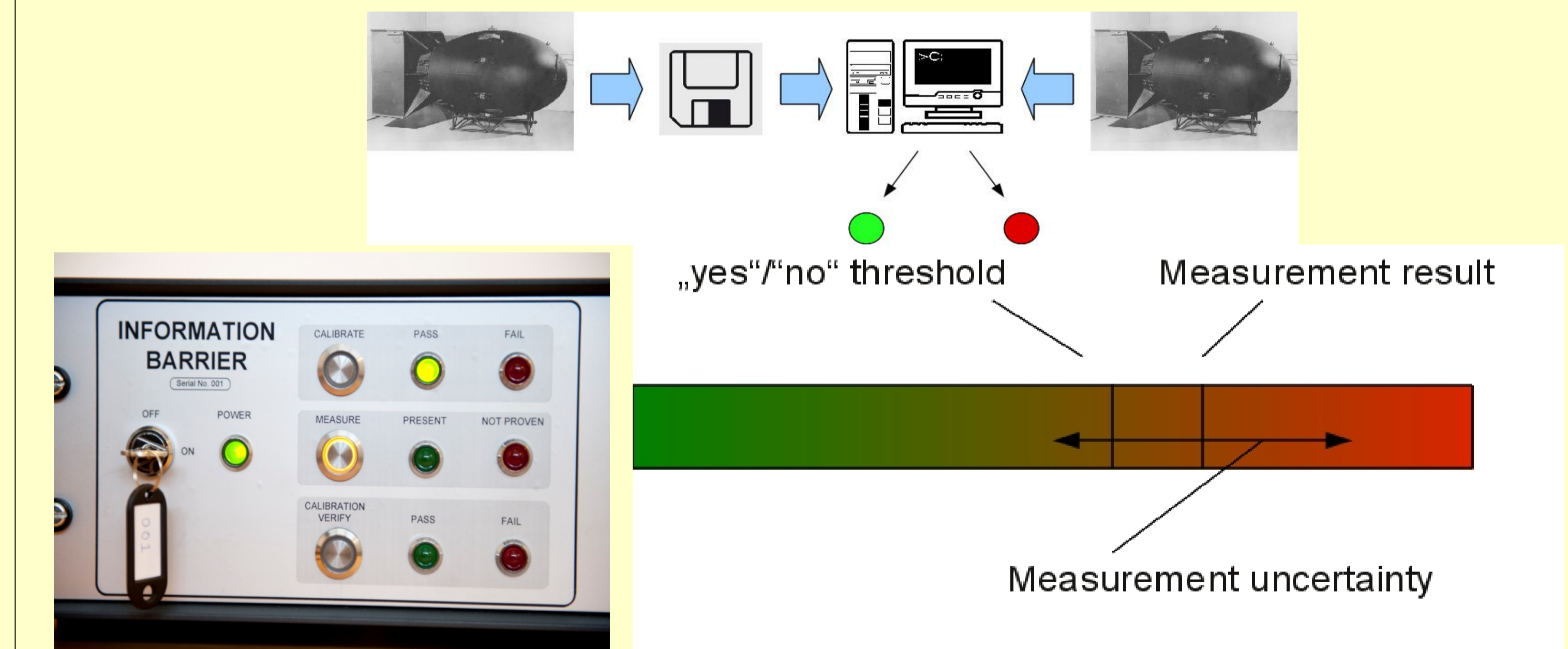
NNWS obligations:
IAEA Safeguards

NWS obligations:
no multilateral
verification

Effective Verification: Technical Methods

Warhead and warhead component authentication

Purpose	to determine if items declared to be warheads and warhead components are, in fact, that
Implementation	measurements behind an information barrier (e.g. gamma and neutron measurements and the attribute or template approach)
Issues	<ul style="list-style-type: none"> • Joint development without discussing sensitive information, authentication and certification • Inspector cannot review measurements → high reliability required, not always achieved yet • Difficulty with uranium (research in Hamburg)



Unique identification

Purpose	to prevent miscounting warheads (e.g. double)
Implementation	<ul style="list-style-type: none"> • record intrinsic fingerprint-like feature on item • safe and secure tamper-resistant tag (not serial numbers) → research and collaboration need!

Continuity of knowledge

Purpose	to keep continuous track of treaty limited items (uninterrupted thread of evidence over time)
Implementation	remote monitoring (e.g. cameras), tamper-indicating devices (e.g. seals) → managed access issue requires research and collaboration, e.g. UKNI

Involving Non-Nuclear Weapon States (NNWS) in an International Cooperation

NPT/CONF.2010/50 Action 19: “All States agree on the importance of supporting **cooperation among Governments, the United Nations, other international and regional organizations and civil society** aimed at increasing confidence, improving transparency and **developing efficient verification capabilities related to nuclear disarmament**.”

Why include non-nuclear weapon states?

- The NPT text strongly suggests their participation
- Global disarmament requires NNWS confidence in Art. VI fulfillment, otherwise not all might adhere to NPT in long-term

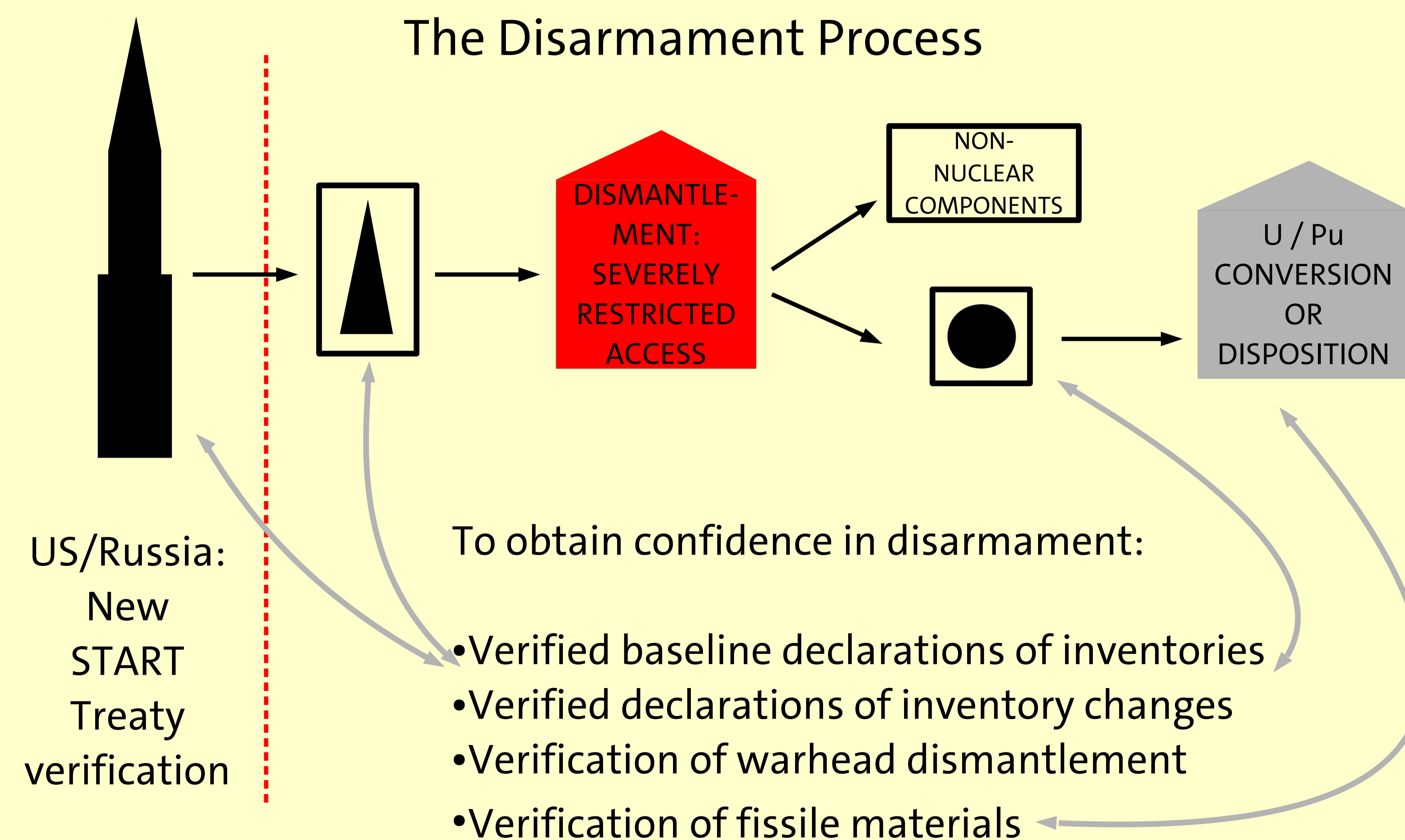
How can NNWS gain confidence?

- NNWS only gain confidence from verification activities if they understand the effectiveness of procedures and equipment

NNWS must be actively involved!

- **Domestic development of capacities (education, research)** is essential for independent assessments
→ initiating and supporting programs in academic and other research institutions such as in Hamburg (natural sciences, engineering, policy)
- **Multilateral cooperation: Joint research** across institutions and countries, in particular joint technology development and joint technical exercises
→ reproducible research, peer-reviewed publications facilitate effective dialogue
- Examples: UK-Norway-Initiative, (Trilateral Initiative), Nuclear Threat Initiative's Verification Pilot Project, US-initiated International Partnership for Nuclear Disarmament Verification
- NPT Art. I/II: all partners must be careful not to share sensitive information
declassification of certain non-proliferative information could facilitate the process and increase confidence from verification

The Disarmament Process



References

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 US Department of State, Fact Sheet: An International Partnership for Nuclear Disarmament Verification, December 2014, see <http://www.state.gov/t/avc/rls/234680.htm>