

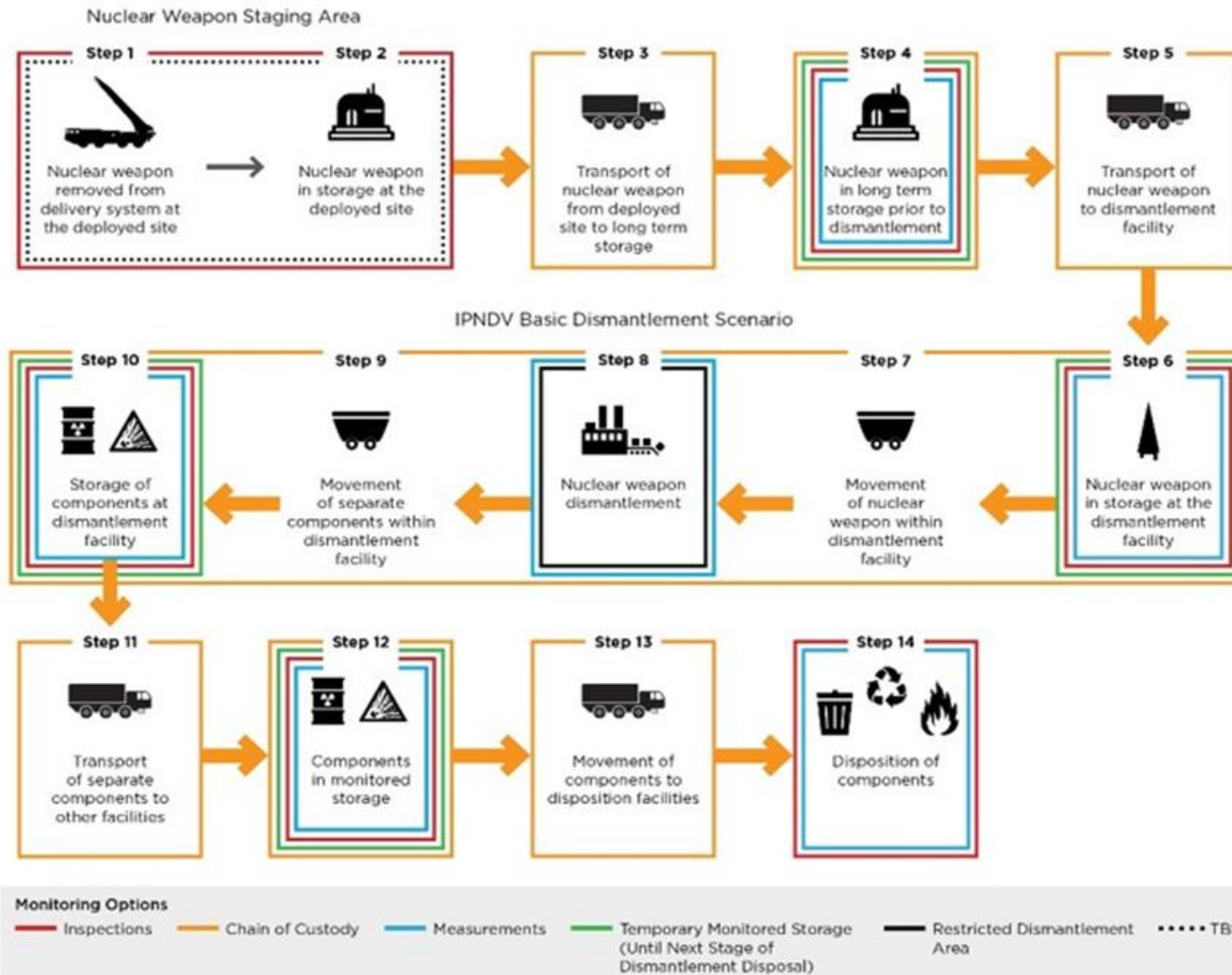
IPNDV Phase I - Work and Results

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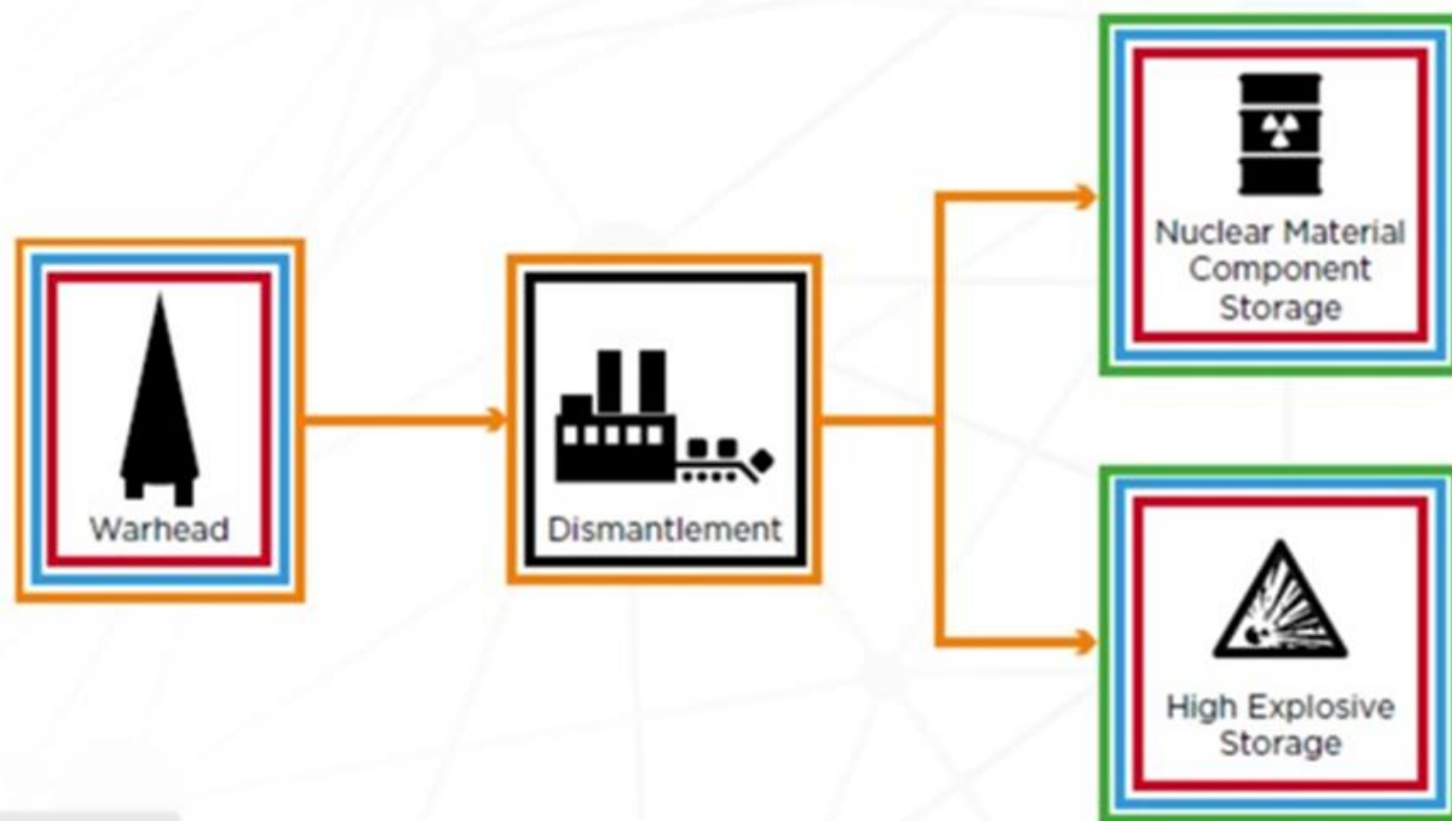
International Partnership for Nuclear Disarmament Verification

MONITORING AND VERIFICATION ACTIVITIES, AS IDENTIFIED BY THE IPNDV, FOR KEY STEPS IN THE PROCESS OF DISMANTLING NUCLEAR WEAPONS



*We make the assumption that there will be declarations at each step in the process.

International Partnership for Nuclear Disarmament Verification



Monitoring Options

- Declarations and Inspections
- Measurements*
- Chain of Custody
- Temporary Monitored Storage (Until Next Stage of Dismantlement Disposal)

*This could include:

- Presence of Pu/HEU/Explosives
- Absence of Nuclear or Explosive Material
- Isotopic Composition
- Minimum Mass

Note: Access to the dismantlement facility will be restricted in order to ensure no sensitive or classified information is revealed. The black box around the dismantlement facility illustrates that there will be no access during the dismantlement phase.



Step 8: Nuclear Weapon Dismantlement

Step 8a: Entry of nuclear weapon into dismantlement area

Monitoring/inspection tasks:

- Ensure unbroken chain of custody
- Ensure integrity of dismantlement area so that nuclear weapon/SNM or HE cannot leave area unobserved

Technologies/procedures options:

- Inspections, containment, and surveillance technologies to verify design and ensure no unauthorized removal or tampering with area
- Portal monitoring of entry-exit to dismantlement area
- Use of radiological/HE detection equipment to detect presence of SNM/HE in the dismantlement area

Step 8b: Exit from dismantlement area (after dismantlement)

Monitoring/inspection tasks:

- Ensure onward chain of custody of SNM/HE containers after exit
- Measure SNM/HE containers exiting area to confirm SNM/HE
- Confirm no remaining SNM/HE or weapon in dismantlement area—and no unauthorized removal
- Other inspection activities

Technologies/procedures options:

- Same as 6a (chain of custody, integrity of area)
- SNM/HE—same as 6b but added techniques given nuclear weapon now dismantled
- Portal monitoring of entry-exit
- Re-inspect with radiological/HE detection equipment to ensure absence of any remaining SNM/HE in dismantlement area
- Use of nuclear weapon “templates”

ipndv.org/learn/dismantlement-interactive/

GOAL 8A.1

Confirm unbroken chain of custody upon entry into the
dedicated dismantlement area

TASK

Verify container identity and integrity

TECHNOLOGIES & PROCEDURES

 Container Integrity Assessment Technologies and 3D Container Identification

  Physical Verification of the Container

  Tamper Indicating Devices and Seals

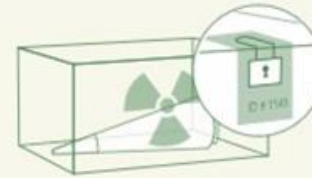


Image courtesy of the IAEA imagebank.



CHAIN OF CUSTODY: CONTAINMENT



CHAIN OF CUSTODY: IDENTIFICATION

Tamper Indicating Devices and Seals

Tamper indicating devices and seals, such as mechanical bolt seals or electronic optical seals, provide an indication if a container, room, or other enclosure has been opened or tampered with.

BENEFITS

- Many seals and enclosures are well-developed and tested through years of deployment in the field

LIMITATIONS

- Some seals and enclosures are one-time use and need to be reapplied after the container or room has been accessed.

TIME REQUIRED

- Several seconds up to several minutes for both installation and inspection

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Tags and Unique Identifiers

IPNDV Phase I Key Judgment:

While tough challenges remain, potentially applicable technologies, information barriers, and inspection procedures provide a path forward that should make possible multilaterally monitored nuclear warhead dismantlement while successfully managing safety, security, non-proliferation, and classification concerns in a future nuclear disarmament agreement.