

Cooperative Verified
Dismantlement of
A Nuclear Weaponization
Program

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Dismantling a Nuclear Weaponization Program

- The issue of verified dismantlement of a nuclear weaponization program remains a key issue.
- North Korea has implied in its official statements that it asserts a right, if not an intention, to build nuclear weapons.
- Any cooperative, verified dismantlement plan will have to address any nuclear weapons and the facilities to make them.

Verified, Irreversible Dismantlement of a Nuclear Weaponization Program

- The purpose is to verifiably eliminate nuclear weapons and the means to research, develop, test, and manufacture them.
- The dismantlement occurs in an irreversible manner, which requires destruction of any nuclear weapons, key components, and certain equipment and conversion and monitoring of other equipment and facilities.

Goals of Cooperative Dismantlement

- The state voluntarily dismantles a nuclear weapons program in cooperation with a verification organization in a manner that results in high confidence that the program no longer exists.
- In the following discussion, the state conducts the actual dismantlement, and the verification organization verifies that the dismantlement has occurred.

Fissile Material Requires Special Consideration

- Any fissile material assigned to the nuclear weaponization program requires special care and accounting.
- At a minimum, the verification organization will need to carefully verify that all the fissile material assigned to the nuclear weapons program has been accounted for.

Basic Dismantlement Tasks

- Verifiably, irreversibly dismantle any nuclear weapons.
- Verifiably, irreversibly dismantle the nuclear weapons production complex.

Two Options to Dismantle Nuclear Weapons

- **Concurrent dismantlement and verification.** This strategy has been extensively researched in the context of US/Russian nuclear arms control agreements. Its implementation in the DPRK should be straightforward.
- **Dismantlement occurs before verification.** This strategy was followed by South Africa when it dismantled its nuclear weapons. This strategy will depend on the DPRK creating extensive, verifiable records of its dismantlement of any weapons.

Access to Sensitive Information

- The preferred option is that the verification organization has access to detailed nuclear weapon design information of the state conducting the dismantlement. Such access was the case in South Africa and is expected to be the case in Iran and Libya.
- If the state does not want to allow the verification organization access to such information, the verification process will be much more difficult. However, such a regime can be created.

Verification Organization

- Options for the verification organization include a new group composed of the P-5, or “IAEA Plus,” the IAEA safeguards department supplemented by weapons experts from key member states, probably limited to the P5.
- The organization will need a core staff of about 10 specialists and key support personnel.

Verification Organization: Rights

- This organization will need extensive rights, including broad access to sites and facilities, access to documents, including program documents and procurement data, the ability to interview program staff and officials, and the right to take environmental samples at declared sites and elsewhere.
- This organization may need access to procurement information from the state and supplier states.

Primary Focus of the Verification Organization

- Understand the program's origin and scope, including visits to all facilities involved in or associated with the program
- Ensure the adequacy of measures to dismantle and destroy nuclear weapons and sensitive components, and to recover any nuclear materials.
- Gain assurance that all nuclear materials used in the nuclear weapons program were recovered, adequately protected, and properly accounted for by the verification organization.

Primary Focus (cont.)

- Confirm the destruction of all non-nuclear weapons-specific components of the nuclear weapons.
 - The state and the verification organization will need to hold detailed consultations about what constitutes such components.
 - Such a discussion will require the state to produce a detailed parts list of its nuclear weapons, devices, and cold devices.

Primary Focus (cont.)

- Ensure the adequacy of measures to dismantle the nuclear weapons production complex. In particular, the verification organization would
 - Ensure that all laboratory and engineering facilities involved in the program had been fully decommissioned and abandoned or converted to a permitted use.
 - Ensure the destruction of all weapons-specific equipment and the conversion of all other equipment.
 - Gain assurance about the destruction of design and manufacturing information, including drawings.

Primary Focus (cont.)

- Reduce the likelihood or ease of reconstituting the nuclear weapons program.
- Ensure that on-going monitoring is established and is effective.

Step-by-Step Dismantlement of a Nuclear Weapons Production Program

- The following slides outline a series of steps involved in verifiably dismantling a nuclear weaponization program.
- These steps describe such a process, although the actual steps may differ in practice.
- Many details of these steps need to be developed before they could be implemented in an actual situation.

Initial Meetings of the State and the Verification Organization

- A series of high-level technical discussions between the state and the verification organization.
- The meetings would discuss the joint process of verifiable dismantlement and seek agreement on a schedule and a set of general procedures to carry out the dismantlement process.
- The meetings should also seek to identify problems requiring additional political decisions.

Joint Tour of Main Facilities in the Nuclear Weaponization Program

- A tour to familiarize experts from the verification organization with the nuclear weaponization program.
- The focus would be on visits to the main weaponization sites, including the research & development, component manufacturing sites, high explosive test sites, nuclear weapon assembly facilities, nuclear weapon storage vaults, and underground test sites.

Joint Tour (cont.)

- During these visits, the verification organization's experts would gain a familiarity with the state's plan for development, testing, and production of nuclear weapons.

State's Declaration of Nuclear Weaponization Program

- The state produces a comprehensive declaration of its nuclear weaponization program, reflecting initial discussions with the verification organization and the tour of the facilities.
- The declaration should include details of nuclear weapon development, production, and deployment. It needs to include a history of the program, including a chronology of major political and technical milestones of the program. It should also include major future goals and timelines.

An Agreed Understanding of Nuclear Weaponization Program

- The verification organization must develop a coherent technical understanding of the nuclear weaponization program in close consultation with the state.
- The verification organization needs to understand, in close consultation with the state, the origin, scope, and timing of the program.
- This understanding should be based on a detailed study of the declaration, a review of documents, and discussions with program officials, scientists, and technicians.

State Plan for Dismantlement

- The government may form a senior experts' committee to investigate methods to dismantle the program and draw up a schedule.
- The state should develop a comprehensive plan to dismantle its program.
- If the state has dismantled its nuclear weapons prior to verification, it will need to draw up a plan to satisfy the verification organization.
- The state should develop its plans in consultation with the verification organization.

Verification Organization's Plan

- The verification organization must develop its own plan to verify the dismantlement of the program.
- It must identify actions necessary to take in order to achieve effective and timely verification.
- The verification organization should develop its plans in consultation with the state.

Joint Agreement of a Plan to Dismantle the Program

- The state and verification organization agree on a plan to verifiably dismantle the program that incorporates the above plans and concerns of each party.
- Key agreements would include the exact items subject to destruction, conversion, or on-going monitoring.
- Careful records of dismantlement activities would be developed and maintained by both parties.

Joint Agreement (cont.)

- If dismantlement had already occurred, the state would have needed to have kept careful dismantlement records.

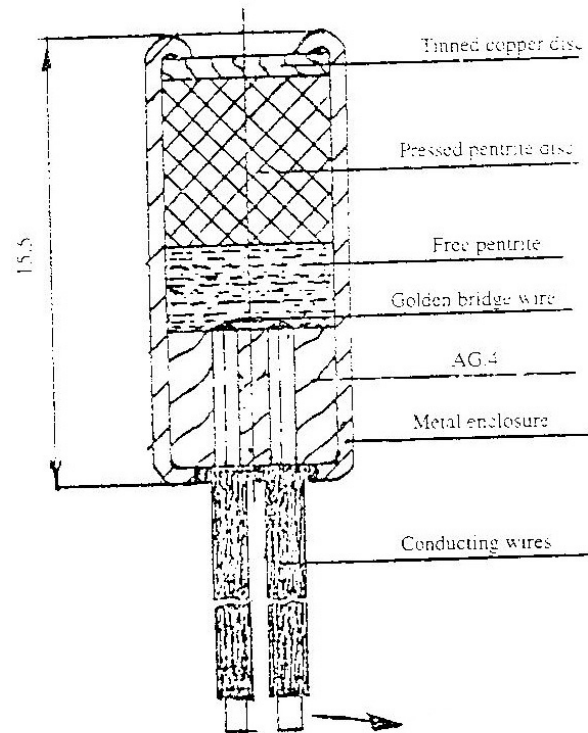
Dismantlement of Program

- Based on the joint plan, the state would dismantle the program and convert equipment and materials to other, non-proscribed uses.
- Many items would need to be destroyed or scrapped. Others would be converted to other uses.
- Buildings or facilities would not, in general, be subject to destruction.

Examples of Items Destroyed- Nuclear Weapons Components

- Included in this destruction plan would be major nuclear weapon components, including those kept in storage.
- Destruction is accomplished by smashing, cutting, burning, or other methods to disable the item against future use.

Key Nuclear Weapons Components – EBW Detonator



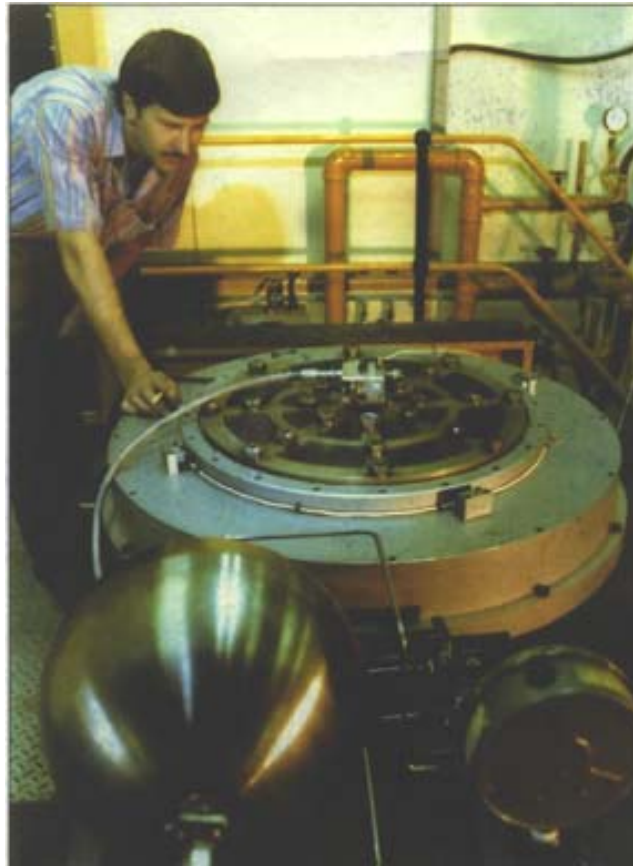
Examples of Items Rendered Unusable-Key Manufacturing and Testing Equipment

- Certain manufacturing and testing equipment may be rendered unusable for future use in a nuclear weapons program.
- Rendering a machine tool unusable may involve destroying special fixtures or computer programs produced to enable the machine to make weapons components.
- Some dual-use equipment may need to remain subject to monitoring due to its dual-use nature.

Key Manufacturing Equipment – Vacuum Induction Furnace



Environmental Testing Equipment for A Nuclear Weapon



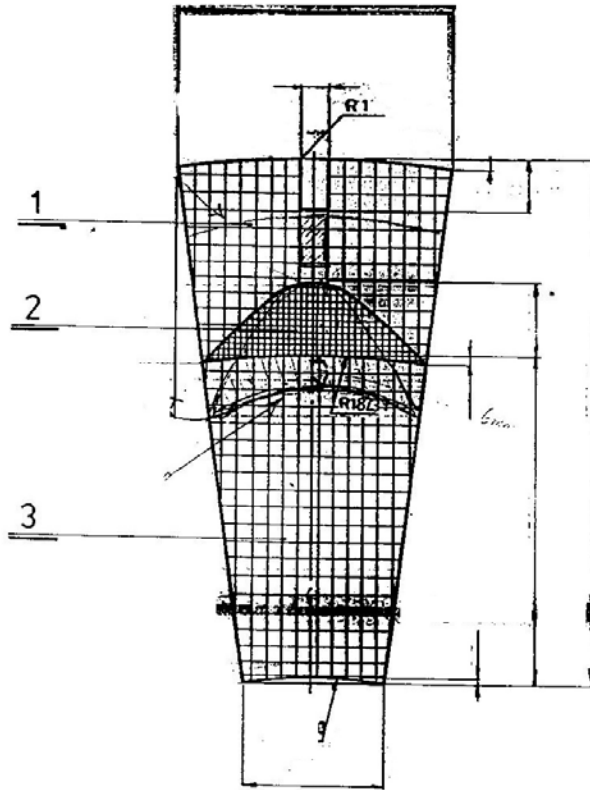
Precision Coordinate Measuring Machine for Weapons Components



Examples of Records Destroyed

- Designs, documents, and blueprints may also need to be destroyed.
- The destruction method may involve burning.

Sensitive Records – Explosive Lens Blueprint



Activities of Verification Organization

- The verification organization would witness the process of dismantlement and conversion, or confirm that it happened.
- It would implement the agreed upon program to verify the dismantlement of the program.
- Key to the success of this effort would be broad access to sites; access to documents, including program documents, procurement information, or personnel records; interviews with program staff and officials; and environmental sampling.

Converting Program to Non-Nuclear Weapons Use

- Facilities and remaining equipment or materials would be converted to alternative, allowed uses.
- The purpose would be to continue to employ program personnel in productive work.
- The priority would be to create economically viable programs or joint ventures.
- For example, clean-room facilities could be converted to other, allowed high technology uses.
- Machine tools could be assigned other industrial uses.

Clean Room Converted to Non-Weapons Use



On-Going Monitoring

- On-going monitoring of certain non-nuclear activities may be necessary.
- Nuclear material will require on-going monitoring.
- The verification organization conducting the dismantlement may not be the best organization to conduct on-going monitoring.

Verification Organization's Conclusion

- At the end of the agreed process, the verification organization would reach and announce a conclusion that the nuclear weaponization program has been dismantled according to the agreed plan.
- The organization would also state that the program has been dismantled and on-going monitoring has been successfully implemented.

Funding the Dismantlement of a Nuclear Weaponization Program

- Dismantlement will require funds to destroy items or render them unusable items.
- Conversion activities will also require funds.
- This funding may come from other states.
- Other states may continue to fund and participate in converted activities.