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WORKING PAPER

An FMCT Scope-Verification Arrangement

1. The value of a non-proliferation, arms control and disarmament agreement as a guarantor of national and international security is increased when it provides a framework that encourages compliance by all States Parties with their obligations. The ability to verify compliance comprehensively, independently and objectively greatly improves confidence that the agreement is achieving its aims, even in cases where there is mistrust or apprehension about the intentions of States Parties. Thus, an effective verification mechanism is an important element of any non-proliferation, arms control and disarmament agreement.
2. The characteristics of a verification mechanism depend, among other things, on the scope of the agreement. This paper examines the inter-relationship between verification and scope in a Fissile Material Cut-off Treaty (FMCT), taking into account that a verification regime for an FMCT must balance certain technical, financial, legal and political considerations.
3. This paper contemplates an FMCT that, at least initially, builds upon the existing verification tools utilized by the IAEA in the pursuit of its mandate to verify nuclear material in states that have safeguards agreements with the Agency. Specifically, an FMCT should provide for the current IAEA-based NPT safeguards regime to be used as a basis for demonstrating compliance of NPT non-nuclear weapon States (NNWS) with the treaty. In an effort to create a non-discriminatory FMCT, a treaty should adopt the IAEA safeguards regime, or applicable elements thereof, for use in states in which it is not currently being applied; i.e. NPT nuclear weapon States (NWS) and non-NPT states. Other verification measures that go beyond the current IAEA safeguards system could also be considered if there is agreement in the negotiations to do so.

I. Materials Subject to an FMCT

4. The IAEA defines “unirradiated direct use material” as nuclear material that can be used for the manufacture of nuclear explosive devices without transmutation or further enrichment, including unirradiated plutonium containing less than 80% Pu-238, uranium enriched to 20% or higher in the isotope U-235, and U-233. This definition would serve an FMCT well because it captures the materials most likely to be used to manufacture nuclear explosive devices. It would ensure that the prohibition on the production of these materials for nuclear weapons or other nuclear explosive purposes is consistent for NNWS, NWS and non-NPT states alike.

5. While other material such as separated americium and neptunium could also be made subject to an FMCT, this would require additional consideration with respect to an approach to verification. The IAEA has examined the challenges posed by americium and neptunium and has decided that safeguards against diversion are not currently required, but that the issue should continue to be monitored by the Agency. To keep an FMCT verification mechanism harmonized with IAEA standards and definitions for safeguards, it would be preferable to mirror the IAEA’s voluntary reports on these materials with the understanding that treatment of these materials could change at a later date if required by technological advancements or other developments.

6. Thus, for the purposes of this paper, references to fissile material should be taken as synonymous with a reference to the IAEA definition of “unirradiated direct use material” as explained above.

II. Verification

7. The main aim of an FMCT is to ensure an end to the production of fissile material for use in nuclear weapons or other nuclear explosive devices. A prohibition on such activity already exists in NNWS, with compliance verified by the IAEA pursuant to comprehensive safeguards agreements and Additional Protocols.

8. The IAEA verification system for the application of safeguards in NNWS is designed to enable the IAEA to draw conclusions concerning the peaceful use of all declared nuclear material in a state and concerning the absence of undeclared nuclear material and activities in a state. The IAEA’s ability to draw the latter conclusion is significantly enhanced when a state has an Additional Protocol in place. Thus, full implementation of this safeguards system would be sufficient to permit the IAEA to draw an annual determination of compliance by a NNWS with the FMCT in terms of assuring no diversion from declared use and no undeclared activities. NNWS that do not currently have a comprehensive safeguards agreement and an Additional Protocol in force would have to adopt these standards in order to verify their full compliance with the requirements of an FMCT.

9. For NWS and non-NPT states, the goal of the verification arrangements in principle would be the same: no diversion of fissile material to weapons programs, nor undeclared production of such material to such ends. In this regard, it is assumed that the primary focus would be on production facilities. While the application of relevant IAEA safeguards measures in such states would be encouraged, it is also recognized that alternative verification measures could be considered, drawing upon experience gained in the negotiation and implementation of other nuclear non-proliferation, arms control and disarmament treaties and initiatives (e.g. the INF Treaty, SALT, START, and the Trilateral Initiative). These verification measures could be pursued multilaterally, bilaterally or through national technical means with the verification conclusions drawn from such activities shared with all FMCT States Parties.

10. Thus, an FMCT verification regime should include measures to build a high level of confidence that all States Parties are in compliance with their treaty-based commitment not to produce further fissile material for nuclear weapons or other nuclear explosive devices. The verification system should, at least initially, incorporate existing verification techniques and technologies in order to build upon approaches that are already in place and in which states have a high degree of confidence. Pursuing the verification provisions noted above would, in addition to addressing the national security concerns of States Parties, have the added benefit of limiting the costs associated with verification of the treaty. The regime could be further supplemented by other confidence building measures that promote transparency. One way of accomplishing this could be for all states to accept adoption of the measures contained in the Additional Protocol.

III. Treatment of Existing Stockpiles of Fissile Material

11. NWS and non-NPT states could have unsafeguarded stockpiles of fissile material intended for either explosive or non-explosive purposes at the time of entry into force of an FMCT, and which may not be subject to its provisions. However, existing stockpiles of fissile material in these states, as well as new fissile material produced for non-explosive purposes, would represent a diversion risk that could jeopardize both nuclear non-proliferation (through export or theft) and nuclear disarmament (by providing some states with an amount of fissile material with which new nuclear weapons could be made). In light of this risk, these stocks should be addressed.

12. An objective for NWS and non-NPT states should be to undertake a process that would complement a ban on production by declaring the broadest possible fissile material inventories, accepting the application of verification provisions to the highest degree possible, ensuring that fissile material deemed to be in excess of military needs is made subject to international control, and working to ensure that overall fissile material stockpiles are reduced to the lowest possible levels.

13. Some NWS have already placed fissile material that has been deemed to be in excess of their national security needs under international safeguards. Canada has also presented ideas on how declared excess fissile material could be handled in parallel with an FMCT in CD/1578 and CD/1770.

IV. Treatment of Fissile Material for Non-explosive Purposes

14. There are non-weapon applications for fissile materials that must be taken into consideration when negotiating an FMCT. It should be recognized that, although production for such purposes increases the risk of diversion to weapons use and potentially adds more layers of complexity and cost to an FMCT verification regime, such a scenario is already addressed under the safeguards system of the IAEA (e.g, certain paragraphs of INFCIRC/153 Comprehensive Safeguards Agreements). Production of fissile material for military non-explosive purposes such as naval propulsion and production for civilian uses such as the production of radioisotopes may be permitted under an FMCT. A mechanism similar to that found in existing comprehensive safeguards agreements could be incorporated into the verification system of an FMCT, in order to allow states to make arrangements with the verifying agency to permit the production of fissile material for non-explosive purposes, while ensuring that the intent of the production is compatible with the purposes of the treaty.

V. Conclusion

15. It should be possible to develop a technically, financially, legally and politically effective package of verification measures by using existing IAEA definitions, extending or adapting elements of the existing IAEA comprehensive safeguards regime to NWS and non-NPT states, and exploring supplemental measures for existing stockpiles and declared excess fissile material. The inclusion of such a verification package in an FMCT will help build confidence among States Parties that the treaty will meet its objectives.
