

then tight security to provide safe and secure storage. Since storage of plutonium and enriched uranium is a long-term proposition — Pu-239 has a half-life of 24,400 years and U-235 has a half life of 713 million years — conversion to peaceful purposes and disposal are better alternatives, but they are not easy technically.

A recent bilateral agreement calls for the United States to buy at least 500 metric tons of highly enriched uranium from the Russian government over 20 years. The uranium is to be diluted into commercial reactor fuel for civilian power plants.

Using the material in power reactor fuel would require an extensive conversion capacity as well as up-to-date technology. Russia's First Deputy Minister of Atomic Power has called for Western help with plans to recycle weapons-grade material, notably plutonium, as nuclear fuel for Russian power plants. Although Russia is said to be planning the construction of two temporary storage facilities, it wishes to avoid long-term storage of plutonium for reasons of economy, safety, security, and the environment. Objections to the use of plutonium in reactors have been voiced by German experts who fear unknown risks in the use of mixed-oxide fuel.

Enriched uranium can be mixed with natural or depleted uranium until its level of enrichment approaches that of natural uranium. Plutonium cannot be easily diluted isotopically; the only choice is to mix it chemically with highly radioactive, long-lived waste and store it. Consuming either material in a reactor is technically possible, but it is more feasible for uranium.

A verification regime for a formal agreement on a cut-off in the production of fissionable materials would need to take into account methods to demonstrate that the fissionable materials were put in safe and secure storage and/or burned. Cooperative measures such as data exchanges, notifications, and on-site inspections would be necessary to assure that these actions had taken place. Inspections might well

be conducted under the auspices of the IAEA, given its mandate under Section A.XII.A.5 (international plutonium storage) once the nuclear material was transferred from military to peaceful use.

*Limitations on Tests, Reducing the TTBT/PNET Thresholds, Testing for Safety Purposes, a CTB*

American policy on nuclear weapons testing, as stated by the Secretary of Defense in July 1992, has been that testing is necessary for the purposes of keeping nuclear weapons safe, secure, reliable, and effective. Since Russia and France recently suspended underground tests, international pressure has been mounting on the United States to accept a one-year moratorium on nuclear weapon testing. A U.S. Senate plan calling for a nine month moratorium was approved on 3 August 1992 by a vote of 68 to 26, enough to override a Presidential veto; the plan also called for a permanent ban on all tests by September 1996, unless Russia were to resume testing.

Verification of a moratorium or a comprehensive test ban (CTB) requires the same general category of activities associated with the Threshold Test Ban Treaty (TTBT) and Peaceful Nuclear Explosions Treaty (PNET): the availability of seismic monitoring equipment capable of detecting and locating seismic events that could be caused by an underground nuclear explosion, determining whether the event was created by such an explosion, and — in the case of threshold limits — estimating the yield. NTM for monitoring nuclear testing treaties include seismic stations outside of the monitored country as well as technologies such as reconnaissance satellites and communications monitoring. Seismometers are the main monitoring tools for detecting underground tests. Verification of a CTB is a prime example of the benefits of verification synergies among various technical methods. For example, data exchanges can provide critical information for improving monitoring by technical methods; these methods in turn can highlight anomalous events which may require closer examination, for example, by OSI.

