

# Monitoring Nuclear Warheads

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## Summary

The effective verification of deep reductions in, and eventual elimination of, nuclear weapons will be an essential and challenging task, posing verification issues never before encountered in an arms control agreement. The emphasis will be on monitoring warheads, which are considered the most important component of weapons systems. They are also the smallest and contain the most sensitive technology. It is possible to distinguish among four monitoring tasks—deployed warheads, non-deployed warheads, virtual warheads and disassembled/dismantled warheads.

Fortunately, the successful implementation of the SALT, INF and START Treaties has provided us with a number of powerful and proven tools. These include National Technical Means, data exchanges, on-site inspection, Perimeter and Portal Continuous Monitoring, nuclear detection devices and remote monitoring techniques. The experience of UNSCOM and UNMOVIC in Iraq can also be useful.

Counting warheads which are *deployed*, or considered to be deployed, is straightforward and can be carried out with high confidence, using techniques which have previously been agreed between the U.S. and the Russian Federation. Monitoring the numbers of *non-deployed* warheads has never been attempted in an arms control

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45

agreement. Since this was on the agenda of the 1997 Helsinki Framework (START III), some work was done in the U.S. on how one might approach the task. The appropriate level of intrusiveness also became an issue in the Cooperative Threat Reduction Program. Keeping track of warheads removed from deployed status under agreed procedures should be possible, but an agreed baseline should also be established. Depending upon the degree of confidence required, rather intrusive inspections might be necessary.

Keeping track of “*virtual*” warheads would be similar to the problems posed by non-deployed warheads. If virtual is understood to be simply warheads removed from deployed status under agreed procedures, the problem should be manageable. However, there are systems which have never been deployed, but which are “real” and need to be accounted for, especially at very low levels of deployed systems. In addition, a realistic accounting of a virtual force should also consider the capability of missiles and bombers to carry additional warheads. One reason for this is that it will probably be difficult to account for all non-deployed warheads with high confidence. Another is that a portion of reductions will almost certainly result from “downloading” existing systems. Thus, although the focus will properly be on warheads, one cannot ignore the other components—missiles, missile launchers and bombers, especially as the numbers get very low.

Monitoring the *disassembly/dismantlement* of warheads and accounting for their special nuclear material will be the final task. Some useful work related to this task was done in anticipation of the Helsinki Framework, most specifically the Trilateral Initiative among the U.S., Russia and the IAEA. This work should be revived.

Existing, proven verification techniques are adequate for levels significantly lower than presently exist. At very low levels, however, new and quite intrusive measures will be needed, along with higher levels of transparency and trust than exist today. As reductions proceed, things may fall into place faster than we can now anticipate. On the other hand, verification and compliance problems may arise that will make further reductions politically difficult. Thus, it might be wise to plan for strategic pauses or plateaus to assess how well we have designed our verification regime and to make adjustments as necessary.