Chapter Six

Remaining Obstacles

Evasion

The detection capability of a seismograph network in any area is heavily dependent on the strength of the signals received and the level of background Earth noise.

An additional concern is that the detection and identification of underground explosions can often be evaded or interfered with by several possible methods:

- Keeping seismic signals below the level of background Earth "noise";

- Testing in an earthquake-prone zone or creating seemingly "normal" noises at the same time to mask any explosion;

- Selecting a site so that the signal will pass through an absorbent region of the Earth's crust; or

- Partial or complete "de-coupling" of the explosion from its immediate solid surroundings, by detonating the device in a large artificial cavern.

Even assuming the establishment of an extensive seismograph network within the USSR, it must be accepted that the detonation of a device with a yield of 0.1 kiloton (which is equivalent to 100 tons of chemi-cal explosive) will probably go unnoticed, even without resort to subterfuge. By suitable manipulation, such as cavity de-coupling mentioned above, that figure of 0.1 kiloton could be further increased by a factor of 50 to 100, making the test seem only one-hundredth as large as it is.

Cavity De-coupling

The USA was the first country to report the phenomenon of cavity de-coupling. In the 1960s the USA conducted large nuclear and chemical tests in underground salt domes, the results of which suggested that a cavity 50 metres in radius could fully muffle a five-kiloton explosion.

Such a technique might fully muffle an explosion several times larger if the cavity were created in a stiffer medium, such as granite. Although a single spherical underground cavity of so great a size would be difficult to excavate and might soon collapse because of damage to the surrounding rock, an alternate approach that has been used successfully is to increase the effective size of the chamber by connecting it to a tunnel network.