source identification and, by implication, a reduction in the source identification threshold.

Now let us consider the potential significance of a slight reduction in the source identification threshold pertaining to small regional events. According to the Office of Technology Assessment report[4], data collected in the Soviet Union appear to suggest that m_b of 3.0 in an area of good transmission corresponds to a decoupled explosion with a yield between 2.6 and 3.8 kilotons. This means that monitoring of a 5 kiloton decoupled explosion in the Soviet Union requires a small, partial closure between the detection threshold (m_b between 2.0 and 2.5) and the identification threshold, which is conservatively estimated at m_b 3.5.

It is to be noted that some progress in in-country seismic instrumentation has already been made. A 1986 agreement reached between the Natural Resources Defense Council (NRDC), a non-governmental American organization, and the Soviet Academy of Sciences resulted in temporary installation and operation of seismic instruments in the Soviet Union — not far from the Shagan River nuclear test range in eastern Kazakhstan. Relocated NRDC stations were subsequently permitted, in 1988, to record Shagan River nuclear explosions at regional distances.

In the summer of 1988, four in-country seismic stations were installed in the Soviet Union by another private U.S.A. organization, the Incorporated Research Institutions for Seismology, a consortium of some 70 American colleges, institutes and universities. These installations, also permitted under an agreement with the Soviet Academy of Sciences, were in place in time to record a historical seismic event in the Soviet Union — the Joint Verification Experiment of September 14, 1988, which was conducted by the U.S.S.R. and the U.S.A. The current plans by the United States Geological Survey envisage the installation of as many as 25 in-country stations within the Soviet Union.

Event Location

Following detection, it is necessary to determine where the seismic source was located. Suppose several stations record P waves coming from a given event. At each station, the P wave arrival time depends on the path length connecting the source with a given station. The arrival time differences among the recording stations provide the necessary information for a seismic analyst to locate the source, generally within 10 to 30 km accuracy for many modern networks conducting routine monitoring of earthquake activities. If the stations also record other wave types of varying propagation speeds, the location accuracy would be better, as would also be the case if the station coverage density is increased.