

Photographic systems cannot penetrate darkness and cloud. Infra-red sensors permit night photography, but resolution capabilities are reduced significantly when this method is used. Frequent cloud cover over Eastern Europe and the Soviet Union prevents constant coverage.

SIGINT systems often lose some effectiveness because of their high altitudes. Satellites at geosynchronous altitudes may be unable to pick-up signals which are significantly weaker than those on the ground and they may be unable to pick up any signals during the initial boost phase of missile launches. Intercepted encrypted telemetry is of no use.

There are considerable uncertainties in calculating the yield of nuclear explosions because of variations in geologic characteristics. Seismic decoupling can alter the measured yield of an explosion by a factor of ten. There is also regional variation in the amount of attenuation seismic waves experience as they pass through the upper mantle of the earth. It is therefore difficult to evaluate charges of Soviet non-compliance. A detonation with an estimated yield of 120 kilotons might in fact have an actual yield of between 60 and 240 kilotons. One classified study found that seismically measured yields of Soviet weapons indicated observance of the 150 kiloton limit, but that the distribution of actual yields indicated that some events were above 150 kilotons. Accusations of non-compliance have not been made because of these uncertainties, but these experiences suggest that seismic verification of a CTBT will not be able to provide absolute assurance of detection and identification of explosions below a significant threshold.

American collection systems must also deal with Soviet concealment and deception practices. Several reports suggest that the Soviet General staff has established a Chief Directorate of Strategic Deception to coordinate these activities.

Richelson argues that absolute verifiability of treaty provisions is not necessary. Uncertainty does not necessarily create risk and absolute verifiability itself may be insufficient. Emphasis on technical collection capabilities for verification neglects the necessity for gathering information on the entire range of Soviet military capabilities which is a requirement for proper evaluation of the potential impact of a treaty.