wider audience of readers, we present here a brief, non-technical summary of the basic procedures and conclusions. To do so we must retain three basic seismological terms; these are: "magnitude" (m), the logarithmic scale that is employed to define the size of both earthquakes and underground explosions (the reader is referred to Table 8 in the text for an easily understood equivalence between m and explosion yield), "P wave", the first arriving seismic wave which propagates through the body of the earth, and "Rayleigh wave", the most important (in this study) seismic wave that propagates around the surface of the earth. The summary follows.

Using data quoted in the UN returns and published in the open literature, the capability of each conventional and array station is described in terms of its ability to detect P waves and Rayleigh waves as a function of distance from the event. All such stations are reduced to two conceptual global networks, one that is used for global P wave detection calculations and the other for global Rayleigh wave detection calculations. The basic formally calculated results are global contours of m values for which there will be a 90 per cent probability of detection, by a certain number of stations, of P waves and Rayleigh waves from earthquakes and explosions. These are defined as the thresholds of detection.

The detection thresholds are m4.2 for explosion and earthquake P waves in Europe and North America, deteriorating to m4.5 for Asian coverage and further to m5.0 in parts of the southern hemisphere (all capabilities are much poorer in the southern hemisphere and any further discussion of this half of the earth is omitted here). The thresholds are m4.8 for Rayleigh waves from earthquakes in North America and northern Europe, deteriorating to m5.1 for generally complete Asian coverage. The thresholds are one magnitude unit larger for Rayleigh waves from correspondingly located explosions. A number of important empirical results from the seismological literature are cited to illustrate that these formally calculated detection thresholds can be considered conservative.

The most generally applicable identification criterion, the relative excitation of P and Rayleigh waves, has a threshold of application equal to the threshold of detection of explosion Rayleigh waves, i.e., m5.8 - m6.0 in much of the northern hemisphere. This rather high explosion identification threshold can be reduced in a number of ways. (a) By employing special processing of Rayleigh wave data from one or two of the highest sensitivity stations, the average northern hemisphere threshold can be reduced to m5.6 - m5.8 . (b) By taking advantage of highly efficient Rayleigh wave propagation over purely continental paths, the threshold has been reduced to m5.0 in North America, but an equal reduction remains unproven for other continental areas. (c) By employing identification criteria that rely only on P wave data, the criteria can, in theory, be applied near the lower P wave detection threshold. One such criterion is proven successful for one station-region combination at an identification threshold of m4.9 ; all other documented attempts have resulted in overlapping populations of earthquakes and explosions at all magnitudes. (d) By employing the absence of recorded waves, for example, long period Rayleigh waves, to identify explosions, on the basis that had the event concerned been an earthquake the waves in question would have been observed, the threshold of identification can