Proposal Abstract K31(A78)

1. **Arms Control Problem:**
   Nuclear weapons - comprehensive test ban

2. **Verification Type:**
   (a) Seismic sensors
   (b) Remote sensors - satellites

3. **Source:**
   Stockholm International Peace Research Institute. Yearbook of Armaments and Disarmament: 1978. London: Taylor and Francis, 1978, pp. 333-353.

4. **Summary:**

Substantial venting of radioactivity from underground nuclear explosions can be detected using available instruments. In addition, satellite observation can be used to obtain evidence regarding underground tests such as test site preparations, subsidence craters and dust clouds. However, while such non-seismic methods taken together represent a substantial verification capability, they are not effective in every case and therefore ultimate reliance must be placed on seismic monitoring.

The difficulties of seismic monitoring are outlined by SIPRI, as well as the current technological state of the art including networks, instrumentation, unattended seismological observatories and identification techniques. The threshold for identifying seismic events varies with the region, the stations providing the data and the distance from the event of the stations. Currently, it is about magnitude 4.0 or the equivalent of 1 kt in hard rock according to SIPRI. Problems of evasion arising out of decoupling, masking tests in natural earthquakes and earthquake simulation are also addressed. SIPRI concludes that any attempt at evasion would involve a balance of risks, costs and incentives. Since the military incentives for evasion are not large, it is difficult to see why evasions would occur.