

PREFACE

As a first step in clarifying what seismological resources would be available for world-wide exchange purposes to facilitate a comprehensive test ban prohibiting underground nuclear explosions, Canada proposed a resolution asking the Secretary-General of the United Nations to circulate to governments a request that they supply information concerning seismograph stations from which they would be prepared to supply records on the basis of guaranteed availability. This resolution (2604A) was adopted at the 1836th plenary meeting of the Twenty-Fourth United Nations General Assembly on December 16, 1969.

Following receipt by the Secretary-General of the solicited seismograph station summary information, the next logical step in clarification was an assessment of the significance of the guaranteed station data for purposes of detecting and identifying underground nuclear explosions. The Arms Control and Disarmament Division of the Department of External Affairs requested the Earth Physics Branch of the Department of Energy, Mines and Resources to prepare such a technical assessment. A preliminary assessment was completed and distributed at the Conference of the Committee on Disarmament (CCD) in early August, 1970, prior to an informal meeting on August 12, 1970, of the CCD on a Comprehensive Test Ban. At the time of preparation of the preliminary assessment, the returns to the Secretary-General's questionnaire were incomplete, the assessment being made on the basis of returns from 54 countries, only 33 of which reported information concerning seismograph stations on their territory. The report for which this preface is being written is the final version of the assessment and is based on returns from 75 countries received by the Secretary-General to August 15, 1970, 45 of the countries reporting information on seismograph stations.

These assessments, both the preliminary and final versions, present conceptual seismological schemes whereby existing seismological facilities throughout the world are applied to a test ban situation. It is necessary in such a hypothetical study to neglect all feasibility problems and financial consequences, and to examine the theoretical capability without prejudice to the necessity or otherwise of implementing such a scheme in any test ban situation. In reality, however, the analysis attempts to answer the following question: for country A, an event is either known or reported or thought to have occurred at approximately a certain time in country B; using world-wide data guaranteed by governments, what is the possibility that country A can form an opinion as to whether the event took place, and whether it was an earthquake or an underground nuclear explosion, and how does this capability for country A deteriorate as the size of an underground explosion is reduced? To answer this question, there is a requirement only for availability on demand of a limited amount of seismological data for this ad-hoc purpose. However, the analysis does attempt to answer the further question: if some agency, international or national, had access to the daily abstracted seismological data that is guaranteed, to what levels of earthquake magnitude or explosion yield could an event be determined