

Presented here are several papers describing the objectives, results, and the projected course of the AEC Civil Effects Test Operations Program and the AEC Nuclear Energy Civil Effects Program and the AEC and contractor individual and group fallout protection program through which information essential to non-military defense is sought, obtained, proof-tested and applied.

Part A is an introduction and background statement. It notes earlier presentations to the Congress, AEC interest in assisting non-military defense efforts, AEC responsibility with respect to non-military defense at its facilities, and the need for new information to satisfy the requirements set by these activities.

Part B describes the Civil Effects Test Programs for Operation Plumbbob (1957) and Hardtack Phase II (1958). In Plumbbob there were over 50 technical and scientific field projects in ten major areas of investigation representing AEC, DOD, and FCDA (now OCDM) interests. The subject of these studies were shelters, structures, and structural components, biomedical effects of blast, thermal radiation, and nuclear radiation, radioactive fallout, radiological instruments, radiological defense, radiation shielding, and the characteristics of prompt neutron and gamma radiation. During Hardtack Phase II at the Nevada Test Site there were 13 field projects generally extending the work of Plumbbob. Abstracts of AEC-sponsored projects are included.

Part C describes special projects and exercises conducted as Civil Effects Test Operations from 1955 to the present. Among the projects included are aerial radiological monitoring; aerial radiological survey of Nevada Test Site and adjoining areas; a study of decontamination techniques; the measurement of the reduction of radiation intensity in typical residences, heavy structures and shelters, and a modern office building using a technique in which fallout radiation was simulated; a study related to the physics of temperature rise inside shelters; surveys of Nevada Test Site and vicinity for certain contaminants resulting from detonations; airborne radiological surveys of sites and areas of interest to AEC operations; development and testing of a radiological survey vehicle; a group shelter design and human engineering experiment; and continuing botanical and ecological studies in the NTS area.

Part D is a statement on the Nuclear Energy Civil Effects Program. It details the civil defense program proposed for AEC communities; the development of the group shelter; the progress made in the evaluation of shielding for the protection of personnel against radiation effects; the accomplishments made in the program to provide a radiation detection and measuring instrument linked to a portable radio, the "citizens instrument;" the development and planned employment of the radiological survey vehicle for family shelter evaluation in AEC communities; the scientific work directed toward a more accurate determination of the prompt gamma and neutron doses received by Japanese survivors; and other continuing programs.

Part E describes the scientific work in progress which is developing a new concept that will permit comparing risks from the various weapons effects with other risks in a persons daily activities. It is proposed that this replace the currently used LD50 concept which is often the basis of casualty estimates and is not considered suitable for application to individuals, families and small groups. Since the LD50 concept presents an individual with only two choices, i.e. survival or death, it tends to discourage an optimistic and realistic approach on the ways and means of improving ones own chances of survival.

The purpose of the report will be to correlate information on the multiple effects of nuclear detonations for a variety of weapon yields, a variety of distances from the point of detonation, and different heights of burst. The synthesis will serve as a basis for plans and decisions on protective measures against both initial and residual effects of nuclear detonations with particular emphasis on the individual, family and group needs.