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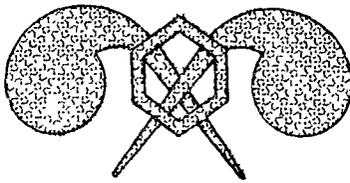
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(U) Radiological Warfare

Activity on offensive RW agents, phased out in FY 1955, is currently limited to those phases which support planning studies on tactical guided missiles and studies to support the requirements of the Operations Research Office (ORO), an agency of Johns Hopkins University, which is under contract with the Department of the Army. Future work in this field will be largely influenced by the availability of raw materials.

The potential availability of RW agent material from the combined U. S., Canadian, and western European nuclear power industries is estimated as being sufficient to stockpile 230 megacuries (MC) of Zr^{95} - Nb^{95} in 1960, 1100 MC in 1963, 2500 MC in 1965, 4500 MC in 1967, and 32,000 MC in 1980. These quantities of agent are sufficient to contaminate two 20 square mile areas (targets) in 1960 to a level of 5 MC/Mi² (500 roentgens/day), eleven targets in 1963, twenty-five in 1965, forty-five in 1967, and over three hundred targets in 1980. Munitions for disseminating these agents, and equipment and techniques for handling and filling have been developed. A plant for isotope separation has been designed, but no actual construction has begun. Recent developments and construction by the Atomic Energy Commission in the field of isotope separation have been so rapid that it is doubtful if the Department of Defense would require a separation plant. There are indications that interest in offensive RW agents may be revived in the near future. In response to a requirement for the establishment of a radiological test area, one is currently being built at Dugway Proving Ground, with additional test areas to be added later. This test area will be 200 yards in diameter, will be contaminated with Co^{60} pellets, and will have intensities of 100R/hr in the center of the area. Safety precautions are as required for the operation. It is planned that an area of one to ten square miles with intensities of 10mR/hr to 100mR/hr, with individual hotspots up to 1R/hr,

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will be constructed later for both technical and operational use. All Technical Services, Department of the Navy, Department of the Air Force, Atomic Energy Commission, Defense Atomic Support Agency, and Office of Civil Defense Mobilization have indicated interest in this area and have been invited to utilize these facilities. Establishment of these areas will permit studies on the effect of fallout on biological specimens, shielding afforded by vehicles and by field fortifications, and the effects of weather and decontamination on the fallout field.

The Chemical Corps is charged with staff supervision of all matters pertaining to the disposal of radioactive wastes within the Department of the Army. Holding areas for RW waste have been constructed and are in operation at Army Chemical Center and at Dugway Proving Ground. The waste is then packaged for burial at sea in accordance with all applicable regulations. This procedure is only an expedient until a more suitable method is developed. The U. S. Navy and the U. S. Air Force do not have a central agency charged with the responsibility of radiological waste disposal. As the use of radioactive materials within the Armed Forces increases, this function becomes more vital. Research is being conducted on the problem of reclaiming valuable by-products from certain types of radioactive waste.

Another phase of RW defensive aspects includes the development of a combined gamma-neutron, self-reading chemical dosimeter. This device can be carried by an individual and will total up all the gamma and neutron radiation received by the individual. Thus, the device provides a method of determining the amount of radiation received by one individual regardless of the source of radiation. Current dosimeters indicate gamma radiation only. The development of this instrument, and its subsequent use by troops, may provide a means of accurately predicting the number of radiation casualties and the severity of radiation sickness anticipated.

The shielding of troops from neutron and gamma radiation is also under study. Theoretical and experimental studies will ultimately result in shielding data for both initial and residual radiation which will be applicable to all current and developmental Army equipment, including field fortifications, vehicles, armor, and structures. Information obtained from these studies will provide the Army with vital field information needed to develop a capability for remaining operational under fallout situations.

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e(U) (S) Radiological Warfare

In the field of radiological warfare, the Chemical Corps has been, and continues to prepare studies pertinent to its responsibilities in this area. A radiological test area is being established at Dugway Proving Ground, and additional test areas at Dugway Proving Ground are planned as funds are made available and as experience and information in the utilization of these test sites are gained. All Department of Defense agencies and other recognized agencies having an interest in this endeavor have been invited to utilize these facilities.

The disposal of radioactive waste material for the Army only is a responsibility of the Chemical Corps. As a temporary measure, the waste material is collected, concentrated, and dumped at sea under prescribed regulations. Further study of this aspect is being made. Research is aimed at recovering valuable waste products which are now being disposed along with all radiological waste.

Theoretical and experimental studies on radiological shielding data are being conducted. These data will be applicable to all current and developmental Army equipment, including field fortifications, vehicles, and armor. In addition to this shielding aspect, the need for a gamma-neutron dosimeter to determine individual radiation dosages is recognized. Development of this device is currently in progress, with type classification anticipated for FY 1961. Information obtained from the radiological test areas, which includes shielding data, decontamination, effects of weather on fallout field plus the availability of a gamma-neutron dosimeter will provide the Army with vital information needed to develop a capability to remain operational under fallout conditions.

Graydon E. Essman
GRAYDON C. ESSMAN
Brigadier General, USA
Commanding

*Must be cleared
By DNA*