[redacted] H-6 Radiolo[redacted] Group Annual

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document consists of 7 pages
2 of 2 copies. Series A

11-6-47

GENERAL (T. N. White)

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(NB. It is assumed that t[redacted] and mechanics of the H-1, H-6 reorganization [redacted] d in the H-DO part of the annual report. Perh[redacted] e following should go there too.)

Within the scope of operations [redacted], the general purpose of Group H-6 is to provide specialized [redacted]ort for the H-1 Monitoring Group in the fields of radiolo[redacted]nd meteorology. Responsibility for Health Division support of [redacted] membership in the Test Director's Advisory Panel, advice on rad-[redacted] certain specialized meteorological and dosimetry services), and H[redacted] support of miscellaneous off-site field test work, have com[redacted] to a considerable extent in Group H-6.

In terms of man-hours expended, [redacted] of J-Division activities represents a greater fraction of the [redacted] Group than might appear from a reading of the following repo[redacted] On the other hand, the report does not make apparent the very consider[redacted] to which this work has been facilitated by a military assig[redacted] assignment of Major John D. Servis (Army Chemical Corps) to Los Al[redacted] (April 1952) where he has been able to work closely with this Group on [redacted] planning for Operations Ivy and Castle (and has assisted with so[redacted] problems of Tumbler-Snapper and Upshot-Knothole) has been very benefici[redacted] all concerned.

The Special Problems Section (as [redacted] the preceding Biophysics Section of H-1) has been occupied most of the time with pressing programmatic problems, with little opportunity for the stimulus of research. The situation has improved somewhat over 1951 in this respect, however, and it is hoped that it can be improved further by the addition of another member during the coming year.

It became evident during Operation Ivy that a two-man Field Test Section is not large enough to cover all the problems that may arise at one time. However, the necessary work was done satisfactorily with aid from elsewhere in the Division, and no effort will be made to augment the Section unless it is found that this method of solving such problems is unsuccessful.

In the Meteorology Section, the high quality of the support, in personnel assignments from the Air Weather Service, has continued to be apparent. As one example, notable contributions were made by the officer in charge at a recent conference with representatives from the Savannah River Project concerning radiological hazards that might follow the explosion of a pile.

Of particular interest to the Group Office has been an effort to improve the criteria for airways closure prior to detonations at Nevada Proving Ground. Although some improvements have been made, lack of data on eddy diffusion remains the chief obstacle. The problem of the spectral distribution in an atomic cloud continues to be of interest, and although little progress has been made here, a possible source of information has been found.



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Toward the end of the year, re-investigation of the wave-length response of the LASL film badge was undertaken, using the theory of Greening (Proc. Phys. Soc. LXIV, 11-B, p. 977) as a guide. Results to date indicate the possibility of considerable improvement in the badge.

The Group Office has been considerably overcrowded during much of the year. The pending move to H-Building should relieve this situation.

SPECIAL PROBLEMS SECTION (S. [illegible] Israel)

A. PERSONNEL

With its inception (in fact a [illegible] of the "Biophysics Section" of former H-1) at the start of th[illegible], the Section acquired, on paper, two members (B. Schnap, A. Dodd) w[illegible] actively participate in the work of the Section but had other d[illegible]s. During the year, these two were transferred to H-6 Field Test S[illegible]ion. Four other individuals formed the complement of the Section a[illegible] its creation, and a new member (I. Israel) was added in February. At the [illegible]se of the year, the Section consisted of the six, with one member (G. Anglet[illegible] having been on leave of absence from September on for the purpose of [illegible] graduate study.

B. ACTIVITIES

As the name implies, there is v[illegible] little that is routine in the work of the Special Problems Section. T[illegible] Section's services to other Groups have ranged from consultation and adv[illegible]e, through information and education, to investigation and research. [illegible] the following paragraphs, some of the problems handled by the Section [illegible]ill be noted and briefly described in order to give some idea of the n[illegible]ge and variety of the work done.

1. Perhaps the nearest to [illegible]utine were the problems that arose in connection with the monitor[illegible] activities of H-1 and other Groups. These problems involved chi[illegible]ly instrumentation, and entailed the calibration, evaluation and [illegible]odification of monitoring materials. In addition, many calculati[illegible]s were done, for example, those required by source shielding problems.

2. In the field of informat[illegible]on and education, the Section was responsible during the year for a number of lectures delivered before several different groups. Radiation hazards and radiologic safety procedures were the principal subjects of the lectures. The nature of the material covered varied with the type of group. The groups ranged from civil defense personnel to new staff members attending the orientation course.

3. The Section participated in weapons test programs, cooperating with J-13 in making film measurements of gamma-radiation exposure as a function of distance. The measurements were made both at Nevada and at Eniwetok. The Section designed and tested the stations that were used, and had members at both test sites to see to the installation of stations and the recovery of film. The results obtained have been analyzed, and the analysis will appear in a forthcoming report. The results of like measurements made by the Section at Operation Buster were published in March as report WT 408.

4. Post-shot measurements were made in October at tower shot sites in Nevada are covered in the report of the Field Test Section.

5. Investigations of a research nature concerning properties of plutonium and thorium were made. The plutonium investigation was an inquiry into the energy and intensity of the x- and gamma-rays from plutonium metal. The results of the inquiry, combined with results obtained by other Sections of H-6 in studies of plutonium metal, were presented in October at an AEC Health Physics Conference in Idaho Falls. In addition, a part of the results obtained in the Section were published in The Physical Review.

6. The thorium investigation [illegible] was concerned with the development of a more sensiti[illegible] more accurate method of monitoring thoron concentration in air. [illegible]per on the existing methods and their inadequacy was presented at t[illegible] Meetin[illegible]s on Industrial Health at Cincinnati in April. Subsequ[illegible] to the meeting, a more sensitive method for monitoring thoron was dev[illegible]ed, and the completed description of the work was forwarded to the [illegible] Public Health Service at Cincinnati in August.

METEOROLOGY SECTION (Lt. Col. Cli[illegible] A. Spohn)

A. PERSONNEL AND ADMINISTRATION

Military administration underwent [illegible]eral changes during the year, the detachment being assigned successiv[illegible] to the 2049th Air Weather Wing, the 6th Weather Squadron and the 4th We[illegible]ther Group. It is now stabilized as Detachment 22, 4th Weather Group, [illegible] headquarters in Baltimore, Maryland, under the command of Colonel George [illegible]aylor.

Two personnel changes took place du[illegible] the year. CWO Blair M. Younkin leaving in July and Major George J. [illegible]ewsorden III arriving in December.

B. OPERATIONS

1. Scheduled

a.) Preparation and dissemi[illegible]tion of a fifty-four hour forecast on all regular work days.

b.) Maintenance and servici[illegible] of meteorological instruments at various points throughout the project.

c.) Accumulation and proces[illegible] of climatic data for the project.

2. Non-scheduled

a.) Meteorological advisory service to the Test Director during Operation Tumbler-Snapper, main elements being fall-out forecasts, cloud height forecasts, CAA warning service, and post-shot trajectories.

b.) Preparation and dissemination of climatic studies relative to atomic test activities.

c.) Preparation of local climatic statistics for the support of miscellaneous laboratory operations throughout the year.

d.) Preparation of reports to the Test Director of the Section's activities in support of Operations Buster-Jangle and Tumbler-Snapper.

C. RESEARCH ACTIVITIES

Major activity was directed at the problem of forecasting atomic cloud heights and a study of the accuracy of the fall-out forecasting techniques in use at Nevada Proving Grounds.

FIELD TEST SECTION (W. B. Kennedy, [illegible] Schiavone)

The Field Test Section was created January 1, 1952 to assist in the handling of problems arising as a result of the increased frequency of, and duration of, and Health Division participation in atomic tests.

Activities of the Section were divided into two main categories: test operations and laboratory operations. Laboratory operations were conducted during times not taken up with field test work, or preparations for same (which usually consumes more time than that actually spent on field tests). An outline of the work performed in both categories is as follows:

A. TEST OPERATIONS

1. Buster-Jangle

a.) Prepared data for the final Buster-Jangle report.

2. Mark 8 Operational Suitability Tests

a.) Provided complete Rad-Safe coverage for the operations at Eglin Field, Florida and Kirtland, New Mexico.

b.) Chemical testing of fired components.

3. Tumbler-Snapper

a.) Provided advisory service

b.) Investigated high film-badge readings of cloud sampling personnel. It was shown by film comparisons and Victoreen R chamber experiments that high film readings were due to interpretation of film badges under a portion of the film which had a lead filter on one side only. This investigation led to a conference in Washington later in the year (at which we were represented) called by the AEC for the purpose of specifying a standard film badge and film processing method for use at atomic tests. As a result of this conference and additional work by the Bureau of Standards, AEC Division of Biology and Medicine and the Test Section, design for a test badge has been completed and standard processing techniques recommended.

c.) Investigated the problem of the average photon energy of radiation encountered by cloud sampling personnel. This study revealed the importance of geometrical factors in the dosage indications by film badges and verified the correctness of the decision to apply no energy correction factors to film exposure readings of cloud sampling personnel during Buster-Jangle.

d.) Additional dosimetry problems arose during the decontamination of the tower-shot areas at Nevada Proving Ground, which occurred during the Ivy Operation. Members of Special Problems Section (H. Israel) and the H-1 Monitoring Group carried out this work for the Field Test Section (on duty at Ivy). The relative importance of beta and gamma dosage in the contaminated areas

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was given special attenti... theoretical calculations have indicated that the beta d... measured by the personnel film badges) may be about a hun... larger than the gamma dose. Under actual working condi... was found experimentally that the beta dose is approximately ... the gamma dose. Since the permissible skin dose is a... only twice the permissible depth dose, it was concluded tha... the conditions investigated) no serious over-exposure co... controlling exposures by gamma ray badges.

4. Ivy

a.) Provided advisory ser... planning stages.

b.) Assisted in the decisi... conference in Washington to have lead-impregnated suits manu... for cloud sampling personnel to minimize radiation exposure... two cases on Mike shot exposures of about 13r were reduced t... than 3.5r. Reductions by a factor of three or more were experi... in two other cases. The remaining cases averaged reductions of... 40%.

c.) Conducted studies on t... rties of the film packet proposed for the test.

d.) Became working members... Rad-Safe organization for the duration of the operation. ... Kennedy was in charge of the Information Center and P. R. ... one shared with Harold Abee (loaned by RHL) responsibil... operation of the Dosimetry Section.

5. Upshot-Knothole

a.) Provided advisory servic...

b.) Assisted in the procurem... of film badges.

6. Castle

a.) Provided advisory service.

B. LABORATORY OPERATIONS

1. Made extrapolation chamber measurements on bulk plutonium and analyzed the results in the light of spectrometer measurements made by other investigators. A report is currently being prepared on this work.

2. Extrapolation chamber measurements were made on several samples of natural uranium in LASL stock. Surface dose rates about 15% lower than the generally accepted value of 24 mrep/hr were determined. Our measurements were confirmed by an independent surface dose estimation of one specimen by the New York Operations Office. Analysis of the samples used is being made to account for the discrepancy.

3. A formal report was written on the decontamination of platinum containing alpha-active material.





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4. An informal report on considerations of health hazards and precautions incidental to the casting of ton quantities of normal uranium was prepared for a consultant agency to CMR Division.

5. A stack was designed for CMR-2 for work with large quantities of tritium.

6. Assistance was given in the instrumentation and administration of radioiodine treatment for two patients at the Medical Center.

7. Supervision of circulating and drinking water contamination analyses (B. Schnap), and certain aspects of a broader environmental survey program, were undertaken.

8. A chart of true mass absorption curves for X & γ radiations between 10 and 100 Kev was prepared from N.B.S. #33, "X-Ray Attenuation Coefficients from 10 Kev to 100 Mev"; Claire H. White.