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January 28, 1953

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SPRING TESTS, NEVADA TEST SITE - BIOLOGY PARTICIPATION

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During the visit of Dr. John Clark of Los Alamos Scientific Laboratory to Oak Ridge, January 21-22, provision was made for him to meet with personnel, who plan on taking part in the Spring Tests, from the Biology and Health Physics Divisions, ORNL. The discussion was extremely helpful, since for the first time those who will take material from the Biology Division to the Nevada Proving Grounds have now an introduction to the organization of the test site and have some idea of the conditions under which they will work. The meeting was held in the small conference room, Biology Division, ORNL, Building 9207, Y-12, at 8:30 A.M. Jan. 22, with the following present:

ORNL BIOLOGY	ORNL, HEALTH PHYSICS
A. Hollaender	Karl Z. Morgan
Drew Schwartz	H. H. Hubbell
W. K. Baker	G. S. Hurst
Kimball Atwood	G.
R. F. Kimball	
J. Kirby-Smith	AEC OAK RIDGE
C. P. Swanson	
E. F. Oakberg	Kenneth Kasschau
W. L. Russell	C. S. Shoup
Daniel Billen	Robert L. Shannon
S. F. Carson	

A number of the informatory items mentioned were of general interest to Research and Medicine and this report is prepared as a memorandum for reference to these.

Test Site and Organization

Dr. Clark began by describing pertinent parts of the Test Organization. Under the Los Alamos Scientific Laboratory there is a Test Director responsible for all phases of the Nevada Proving Grounds operation. Santa Fe Operations has a Field Manager, Mr. Seth Woodruff, located at the site with an office in Las Vegas. For the forthcoming series

of tests, the Test Director and his staff will be concerned with as many as 150 different projects within three main categories as follows:

(1) Weapons Effects, test programs 1 to 9; (2) Weapons Development, test programs 10 to 19, and (3) Civil effects,, test programs 20 to 30. Test programs 20-30 deal with a very large number of projects under the general heading of "Civil Effects". These include tests of shelters, blast studies, dosimetry for neutrons and gammas, and the entire spectrum of biological tests. ORNL Biology and Health Physics participation will be wholly within the "Civil Effects" category. Mr. Robert L. Corsbie, Division of Biology and Medicine, Washington, has been named as the Civil Effects Test Director. Personnel reporting to Las Vegas for participation in Civil Effects projects should contact the AEC Field Manager's office, and this office is expected to advise on transportation to Camp Mercury, Nevada, 65 miles from Las Vegas, and about 25 miles from the Control Point. The participants will be lodged in barracks at Camp Mercury and will be provided with board there at one dollar per meal. Either from Las Vegas, or on arrival at Camp Mercury, contact should be made with Mr. Corsbie for assignment and for maintenance arrangements. Participants from ORNL in the biological test program will also contact Cmdr. Cronkite, Project Director or Dr. H. H. Plough, Project Leader. ORNL contributors to the dosimetry study will probably contact representatives from the Radiation Instruments Branch temporarily stationed at the test site. Apparently it is somewhat uncertain whether officials may always be found available at the AEC Field Manager's office in Las Vegas, but it is believed that a test participant may telephone from there to the Control Point or to Camp Mercury. In discussing the general test program, it was emphasized that throughout the test organization at Los Alamos and at the proving grounds, the attitude is that the whole arrangement is for the support of experimenters and their various data-gathering requirements. There will be a classification officer on duty who classifies data and photographs as quickly as possible and at the lowest permissible classification. Various support units are on duty during the tests, including the weather organization, a photographic unit, monitoring aircraft, and both the "on-site" and "off-site" RadSafe monitoring organization. At 10 AM and 3 PM daily, time signals are sent out for instrument check. Project leaders submit monthly status reports to Los Alamos beginning about 6 months prior to a test. In these details are given on progress of preparation, requests for equipment, and requests for transportation facilities for each project. It was recommended that personnel attending the tests for the first time plan to arrive at the Test Site about two weeks prior to the first shot. This amount of time is needed for adjustment to the organization, for briefing, for the gathering, testing, and placement of equipment, for practice in placement and recovery and for the general fitting of a project into the test schedule.

The altitude of the Proving Ground is about 4000 feet above sea level, while the town of Las Vegas is about 1500 feet. The Test Site, about 25 miles from Camp Mercury, includes two main buildings: the Control Point and the RadSafe Building. Both are on a promontory overlooking Frenchman's Flat and Yucca Flat target areas. The distance from the Control Point to the nearest target area is about 9 miles. Most target areas are at least 3 miles apart. The entire proving ground comprises a desert and dry lake area of approximately 650 square miles to the north-northwest of Las Vegas.

Biological Test Shots

For the spring tests o 1953, ten shots are anticipated, including tower shots and air drops. For the biological tests, tower shots 1 and 8 are considered suitable. The 300 ft. towers will be constructed in the southeast corner of the test site and will be about 3000 feet apart. In the Civil Effects program, the prototype AEC shelters of concrete culvert will be tested during these shots, and the 20 lead hemispheres to be used for fast neutron exposure of biological materials will be arranged along the 3000 ft. line between towers 1 and 8. (These lead hemispheres are 7" in thickness, permitting an interior working space of 7" radius. Access is by a 4" recessed lead plug. A model in plastic of the working space with access plug has been made at the Biology Division, ORNL, and is now in use for placement and recovery practice and to assure proper dimensions of mouse cages under construction). Personnel will be allowed to place materials up to about two hours prior to shot time in the case of tower shots. These tower shots will probably be set for 30 minutes before sunrise. (In the case of air drops, personnel will be required to leave the target area at midnight, D-1.) Attention will have to be paid to clothing for personnel and temperature control for biological experimental material. The daily temperature fluctuation is as much as 40°F. at the test site, and March temperatures at shot time can be expected at below freezing. Animal quarters are currently available at Camp Mercury and this building is now being enlarged to some extent.

Routine of Preparations for a Test

Arrangements for a test shot were said to follow this approximate schedule:

1. Continuous check on meteorology falls into a detailed reception and evaluation of weather data.

2. Work plan has been filed for each project group.

3. Day before scheduled shot, (D-1), Test Director gets the detailed weather prediction for approximate shot time.

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4. If weather and placement of facilities are favorable, Test Director places "Execute" order. D-1.

5. On D-1 at 3 PM there is a time-signal "dry run" with all participants in position to report.

6. At 8:30 PM on D-1, there is a final meeting of the Advisory Committee on the test, if committee agress all is in readiness, then:

7. The Test Manager tells the Test Director to shoot.

8. Firing party and participants go into area but return by shot Time minus 2 hours.

9. Shot time minus 2 hours: First HE charged exploded for barographic recording.

10. Shot time minus 1 hour: Second HE charge for exploded barographic recording.

11. Shot time minus 30 minutes: Automatic Sequence timing begins.

12. Shot time. Observation from Control Point.

13. After shot, at as short as ~~/~~20 minutes, the RadSafe monitors go into the target area.

14. Recovery teams get their protective clothing.

15. At ~~/~~45 minutes to ~~/~~1 hour, the RadSafe reports will be coming in by coming in by radio giving ranges of readings up to the 100 mr/hr area. Recovery time will depend on these RadSafe reports.

16. Recovery teams begin to move into the target area at around ~~/~~2 hours or later, depending on urgency of the recovery.

Questions were asked with respect to protective clothing and the radiation background. It was indicated that the extent of protective clothing would depend on the amount of dust; respirators being worn when indicated, but that the usual clothing would be coveralls, cloth cap, and canvas shoe covers. Dr. Clark indicated the background radiation in the test area usually decayed rapidly, but the recovery teams were always accompanied by a RadSafe monitor to give continuous information on readings and on time available for recovery. 3.9 r. is the maximal permissible dose set at the test site for anyone on the operation.

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In concluding the meeting with Dr. Clark, a number of additional questions were asked regarding living conditions, means of travel to and from Las Vegas and surrounding areas. It was recommended that participants expecting to remain at the site for any length of time try to come by private automobile. On the question of expenses, it was stated that LASL personnel at the test site go on a 54-hour week work plan with per diem allowance at the rate of $7.

As a part of this memorandum on Biology participation at the test site, the listing of projects scheduled for the spring of 1953 under program 23, "Biological Effects", is given below. Attention is called to the prominent role of ORNL.

Projects

Project Number	Title	Participant	Institution
23.4	Chromosome mutations (Drosophila)	Ives Wallace	Amherst College, Long Island Biological Assn.
23.5	Rusts and Smuts	Stakman	University of Minnesota
23.6	Alteration in spec loci. (Drosophila)	Mickey Baker	Northwestern Univ. ORNL
23.7	Chromosome Breaks (Drosophila)	Lewis Stone	Calif. Inst. Tech. Univ. of Texas
23.8	LD/50 Studies Mice	Gowen	Iowa State College
23.9	Wasps. Eye color	Whiting	Univ. of Penna.
23.10	Chromosome Breaks (Tradescantia)	J. Kirby-Smith	ORNL
23.11	Datura seeds	Blakeslee	Smith Coll.
23.12	Heterokaryon mutants.(Neurospora)	Atwood	ORNL
23.13	Fast Neutrons on mice	Russell	ORNL
23.14	Shelter exposures with mice.	Gowen	Iowa State College
23.15	Shelter Tests. Physical effects	Roberts	ORNL
23.16	Corn mutations	Schwartz	ORNL
23.17	Neutron Dosimetry	Hurst & Rubbell	ORNL

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