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April 22, 1958

U. S. Atomic Energy Commission  
Post Office Box E  
Oak Ridge, Tennessee

Attention: Mr. S. R. Sapirie

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Gentlemen:

Subject: Proposed Ichiban Program for F.Y. 1959, Activity 6600

- I. At Operation Plumbbob, in 1957, basic information on the radiation from weapons was accumulated by Civil Effects Test Group, Project 39.5. This information is given in detail in WT-1504 (Secret).
- II. Three additional major steps are necessary for accomplishment of the Ichiban Program. (The objectives of the program were set forth in letters dated February 13, 1957, and January 29, 1958, from C. E. Center to S. R. Sapirie).

These steps are:

- (1). A measurement of certain shielding factors for Japanese type houses; e.g. the mutual shielding afforded by two or more houses and the effects of house orientation, size and style.
- (2). Air dose-distance curves for weapons measurements to date must be normalized to dose-distance curves for weapons used in Japan.
- (3). Doses received by Japanese survivors must then be calculated using the composite of results from previous tests, (1) and (2) above, and the shielding histories provided by the Atomic Bomb Casualty Commission (ABCC). The representative of the Ichiban Dosimetry Program stationed at Hiroshima, Japan, with the ABCC, provides the close liaison with ABCC shielding personnel necessary to insure the shielding program of obtaining the information necessary for dose calculations.

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III. It is proposed that Step 1 of Paragraph II be accomplished in the Spring of 1959 at the Nevada Test Site. The proposal is based on the following:

(1). The dosimetric capabilities (equipment and personnel) required would be much less than if Steps 1 and 2 were undertaken simultaneously.

(2). At present there is no assurance that duplicates of the Japanese weapons will be fired in the near future.

IV. In order to carry out the F.Y. 1959 participation most efficiently, economically, and accurately, certain special requirements and facilities are requested. They include the following:

(1). Fourteen (14) facsimilies of Japanese residences, constructed largely of domestic materials to be specified by the Ichiban dosimetry group working in conjunction with a building representative from a NTS contractor.

(2). It is suggested that the representative indicated in (1) be sent to ORNL for a consultation visit of about two days. This visit should be no later than June 1, 1958, and should be followed by subsequent trips as required. This man should be a construction specialist familiar with building materials and costs at the test site. It would be convenient if preliminary discussions with this man be started at the test site by representatives of the Ichiban group who will be there on or about May 2.

(3). To lessen the problems associated with fallout (even low levels) on the laboratory trailers, it is proposed that these two trailers be stationed in Camp Mercury, as for Plumbbob, but that a concrete pad of approximately 100 feet along each edge be provided as a fenced-in trailer stand. The pad should be painted with heavy-duty, outdoor paint that can withstand repeated washings. Water outlets of sufficient capacity to wash down the pad should be provided. The details concerning necessary electrical services for the counting trailers, i.e. the voltage, current, and phase requirements, will be furnished when planning can be more detailed. In addition, a sheet metal or plastic roof above the trailers is under consideration to further reduce the fallout problem, but decisions on this matter can best be made after consultation with test site contractors.

(4). In order to get the fission foils to Mercury for quickest possible counting it is proposed that a helicopter be used as a "relay"

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vehicle. To utilize fully such a machine requires the following:

(a) That authority be granted for take-off from the control point helicopter pad no later than H + 10 minutes.

(b) That permission be granted for flight directly to a "relay" rendezvous at the "Y", Area 3 access road, or other point convenient to helicopter and recovery vehicles.

(c) That when loaded, immediate take-off be authorized (in advance) for direct flight to Camp Mercury, preferably to a pad adjacent to the laboratory trailer pad.

(d) That the helicopter be capable of carrying a load of several hundred pounds of detectors plus not less than two persons to open the blast containers and place samples in dispensers preparatory to counting immediately upon arrival at Mercury.

V. The number of participations proposed is five, all "1500-ft. balloon" shots. These would include a limited participation "warm-up" shot for testing the equipment; two shots for house measurements with 40 collimator stations (20 ea. neutron and gamma-ray) and 6 to 10 air dose measuring stations; one full scale collimator experiment to complete the angular distribution measurements; and one shot for which full capabilities could be used in neutron measurements for radiobiological experiments that may be planned by the CETG director. In summary, the total participation proposed is as follows:

Shot I	(1500' B)	40 collimators - 10 goal posts
Shot II	(1500' B)	40 collimators - 10 goal posts - 7 houses
Shot III	(1500' B)	40 collimators - 10 goal posts - 7 houses
Shot IV	(1500' B)	120 collimators* - 10 goal posts
Shot V	(1500' B)	Radiobiology shot - 10 to 30 goal posts - 10 to 20 collimators, and other stations as required

\*50 neutron and 70 gamma collimators

VI. Chemical dosimetry will be required for approximately 700 field stations and 300 calibration and intercomparison stations, or a total of 1000 stations.

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Based on Teapot and Plumbbob, a factor of 2 increase is warranted. Assuming 5 ampoules/station, the total gamma units (ampoules) necessary will be  $2000 \times 5 = 10,000$  ampoules. These should be grouped approximately in the following order:

1000 of less than 1000 rad maximum exposure range  
 4000 of less than 2000 rad maximum exposure range  
 4000 of less than 5000 rad maximum exposure range  
 1000 of over 5000 rad maximum exposure range.

The complete details on response ranges and "canning" for field use should be jointly formulated by this group and the EGG personnel involved. The liaison contact at EGG should be S. C. Sigoloff.

VII. It is suggested that the liaison with EGG be cleared for initiation in the near future as efforts to make neutron measurements by EGG personnel at future tests will necessarily be based on collaboration with ORNL researchers.

VIII. The program proposed herein (except that part concerning field support) has been analyzed cost-wise, and the FY 1959 Ichiban budget estimates (as given on AEC-189R) based on the analysis. This budget estimate does not include cost of constructing houses, moving collimators, etc. at the test site, but does include all apparatus and equipment for neutron measurements and for shielding studies at ORNL. In addition, gamma radiation shielding measurements are necessary in the laboratory and a critical experimental evaluation of gamma radiation dosimeters is underway.

Yours very truly,

UNION CARBIDE NUCLEAR COMPANY

*Clark E. Center*

Clark E. Center  
 Vice President

CEC:JAA:nb

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