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MONITORING FOR SNAPTRAN DESTRUCTIVE TEST

HSHP:DFB

One of the objectives of the STEP program is to evaluate the radiological hazards resulting from the SNAPTRAN Destructive Test. To this end, measurements of the radioactivity released to the environment will be made Phillips Petroleum Company (PPCo) is responsible for measurements in the immediate test area as described in the report PTR-746, Monitoring Program for the SNAPTRAN-2 Destructive Test, by Ray Fielding.

Measurements beyond the stock fence that surrounds the area will be made by the AEC-ID Health Physics Branch (HP). This letter outlines the program that the HP Branch will pursue to obtain measurements of the radiological hazards.

The monitoring for this test is similar in form, but not in scope, to that in the first SNAPTRAN Destructive Test (refer to memorandum from W. P. Gammill to D. E. Six dated June 25, 1963, subject: Monitoring for SNAPTRAN Destructive Tests). It is thought that as much information may be obtained with the less expensive proposed grid (figure 1) as the more heavily instrumented grid used before.

I. Objectives

1. The primary objective is to measure the source term, or fission product fraction released from the core. This will allow extrapolation of test data to a potential accident situation By comparing results with the earlier test it will also allow an estimate to be made of the retention capabilities of water. Air sampling data at the 13,000 foot arc and the highway - in conjunction with PPCo's monitoring, will provide an adequate description of peak concentration with distance (from this the source term can be estimated).

2. The secondary objective of our program is to evaluate the released fission products in terms of size distribution and deposition characteristics. This will allow meaningful estimates to be made of the potential inhalation hazard and, if significant quantities of iodine are released, of potential ingestion hazards. Since the transient will be terminated by rapid dissolution of hydrogen from the cladding, the released fission products will most likely be aerosolized. If so, the deposition and particle size measurement may be directly applicable to CERT data

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II. Monitoring Equipment

1. Air Sampling Equipment

Fourteen Staplex "Hi-Vols" will be used on the 13,000 foot arc, at about 5° intervals Since the cloud width at this distance is expected to be about 5000 feet, this should provide adequate sampling to measure the cloud dimensions within ± 3 · Fourteen trailer mounted "Hi-Vols" will be located at one-half mile intervals on Highway 28 to provide the same coverage Because of lack of knowledge of filtering characteristics of the Gelman AC-1 filter, the microsorban prefilter and BM-2306 carbon cartridge will be used to collect activity.

The monitoring capabilities of the telemetering stations will again be demonstrated with the locations as specified in figure 1.

In order to get some estimate of the physico-chemical nature of the released material, two sampling devices based upon the "May Pack" design will be placed inside the stock fence on one of PPCo's arcs.

2. Deposition Measurements

a. Fallout Plates

Gummed paper plates will be located at each Hi-Vol station on the 13,000 foot arc. This will allow comparison with data from other tests with regard to deposition on a known collection medium. Carbon-covered gummed paper will not be used for two reasons: (1) the preparation and handling of this material is both expensive and time consuming and (2) the collection efficiency, at best, is only a factor of 2-3 greater for iodine than on gummed paper and less for other radionuclides.

b. Sagebrush

In an attempt to more realistically evaluate the environmental impact of released fission products, detailed measurements of deposition of sagebrush will be undertaken. The actual number of samples taken will depend upon existing activity levels, but an effort will be made to gain the following information:

(1) deposition per unit area

(2) changes in "deposition velocity" by distance and by isotope

(3) effective half-life of deposited material on vegetation

3. Particle Size Measurements

   a. Caselle - 20 Caselle impactors will be placed on the two arcs. These were previously used in the KIWI tests and will be on loan.

   b. Electrostatic Precipitators - two will be placed on the 13,000 foot arc.

   c Cyclones - six two-stage cyclones will be placed on the 13,000 foot arc in place of the normal Hi-Vol system.

   d. Cascade Centripeters - one will be located on each mobile unit. If none are ready at the time of the test, Anderson samples will be used.

   e. Portable Air Monitor - The monitor developed by the Instrument Branch will be used to obtain particle measurements at higher levels, this will avoid dust loading and provide otherwise unavailable data of distribution by height.

   f. Graded filters - the SNAPTRAN will offer the first opportunity for us to evaluate this approach to particle sizing. Two units are presently being constructed and both will be located on the highway.

4. Miscellaneous

   a. Three mobile units will be used; two on the highway and one on the 13,000 foot arc.

   b. Aerial Monitoring will again be undertaken to obtain estimates of transient activity levels.

III. Cost Estimates

Neglecting dry runs, the cost of the test is estimated to be about $4000. This is broken down as follows:

Power Generators	$100
Sampling Media	$200

Manpower	Man Days
Health Physics Branch	
Field Work	20
Data Analysis	20

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Cost Estimate (Cont'd)

U. S Weather Bureau		
Forecasting	5	
Data Analysis	10	
Analytical Chemistry Branch		
Sample Analysis	5	
Hazards Control Branch		
Field Work	1	
Data Analysis	10	
Subtotal 71 at $40/day		$2940
Total		$3240
Contigent		$ 760
GRAND TOTAL		$4000

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