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**SURPLUS FACILITIES
MANAGEMENT PROGRAM**

**INTERIM POST REMEDIAL ACTION SURVEY REPORT
FOR
HOT CAVE (BUILDING 003)
SANTA SUSANA FIELD LABORATORY
ROCKWELL INTERNATIONAL
CANOGA PARK, CALIFORNIA**



**OCCUPATIONAL HEALTH AND SAFETY DIVISION
Health Physics Section
ARGONNE NATIONAL LABORATORY, ARGONNE, ILLINOIS**

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ARGONNE NATIONAL LABORATORY
9700 South Cass Avenue
Argonne, Illinois 60439

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Prepared by

R. A. Wynveen	Associate Division Director, OHS
W. H. Smith	Senior Health Physicist
C. M. Sholeen	Health Physicist
A. L. Justus	Health Physicist
K. F. Flynn	Health Physicist

Radiological Survey Group
Health Physics Section
Occupational Health and Safety Division

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INTERIM RADIOLOGICAL SURVEY REPORT FOR
ROCKWELL INTERNATIONAL, SANTA SUSANA LABORATORIES, BUILDING 003

INTRODUCTION

A post remedial action (certification) survey of the "hot" cave in Building 003 was undertaken at the behest of the Department of Energy, by the Radiological Survey Group of the Occupational Health and Safety Division, Health Physics Section (OHS/HP), of Argonne National Laboratory (ANL) during October 1981. This survey showed residual contamination in various parts of the building. As a result of this survey, additional decontamination work was conducted by Rockwell International. This decontamination work was concluded in March 1982, and the results of a comprehensive radiological survey of the building conducted at that time, by Rockwell International personnel, were documented (IL, F.E. Begley, "Radiation Survey of Building T003-Santa Susana" March 15, 1982).

A final post remedial action (confirmatory survey) was conducted by the ANL Radiological Survey Group during April 1982. At this time only those areas that had previously been found contaminated were surveyed.

The results of the investigations by the ANL-OHS/HP Radiological Survey Group together with concomitant conclusions and recommendations are included in this report.

The "hot" cave in Building 003 has been inactive since the close-out of the System for Nuclear Auxilliary Power Program (SNAP) in 1973. Prior to that time, the facility had been used for the analysis of SNAP fuel burn-up samples and the evaluation of irradiation experiments. After Building 003 facilities were declared "excess," decontamination and dismantling of the contaminated facility by Rockwell International proceeded as described in the Decontamination and Decommissioning of Facilities Program Plan No. PP-704-990-002.* The actual decontamination and decommissioning (D&D) efforts in Building 003 began in January 1975 and ended in June 1975. At that time the building was given a preliminary release.

*This report was prepared by Rockwell International and is available from their Canoga Park, California Division.

SITE DESCRIPTION

The Santa Susana Laboratories of Rockwell International are located in the Santa Susana mountains northwest of Los Angeles, California (see Fig. 1). The location of Building 003, with respect to the rest of the laboratory site, is given in Figure 2. A detailed drawing of Building 003 is given in Figure 3.

RADIOLOGICAL SURVEY PROCEDURES

Instrumentation

Four types of portable survey instruments were used to conduct the direct radiological surveys. Gas-flow proportional detectors with window areas of 51 cm² and 325 cm² (using Eberline PAC-4G-3 electronics) were used to monitor for alpha and/or beta-gamma radiation. NaI crystal detectors, 2 in. diameter by 2 mm thick (Eberline PG-2 with Eberline PRM-5-3 electronics), were used to monitor for low energy x-ray and gamma radiation. NaI crystal detectors, measuring 1 in. diameter by 1 in. thick (Eberline PRM-7 μ R meter) and calibrated with a ²²⁶Ra standard source, were used to measure the ambient external penetrating radiation field in units of μ R/h. An end-window Geiger-Mueller (GM) detector (Eberline HP-190 with a 7 mg/cm² window and Eberline 530 electronics), calibrated with a ²²⁶Ra standard source, was used to measure the contact exposure rate (mR/h) of contaminated areas. Integrated measurements of the ambient penetrating radiation field were taken with a pressurized ionization chamber (Reuter Stokes RSS-111) calibrated with an NBS traceable ¹³⁷Cs-^{137m}Ba gamma-ray source.

Whenever possible, a contaminant was identified by performing gamma spectral analysis on either the contaminated item or on a sample of material taken from a contaminated area, using a sodium iodide or hyperpure germanium detector coupled to a multichannel analyzer.

Smear Surveys

Dry smears were taken at representative locations throughout the building using a 4.75 cm diameter filter paper (Whatman #1). A smear sample was obtained by applying moderate pressure with the tips of the first two fingers to the back

of the filter paper and wiping the surface over an area of $\sim 900 \text{ cm}^2$. Smears were taken on original structures and components such as walls, floors, pipes, and vents. A smear of 100 cm^2 was taken if an area or object was found which had a higher than normal radiation level as indicated by a portable survey instrument. A smear area of 100 cm^2 was also taken if the surface was extremely dusty.

In order to expedite counting of numerous smear samples, two counting techniques were employed using two types of counters. A large-area, thin-window, gas-flow proportional counter, sensitive to alpha and/or beta-gamma radiation, was used to make an initial count on groups of smears. For more sensitive counts on individual smears, a Nuclear Measurement Corporation Model PC-5 (or 3A), Internal Gas-Flow Proportional Counter with a thin aluminized Mylar window (referred to as Mylar spun top) was used.

Initial counts were made with the large area counter on groups of ten smears at one time. Any set of smears indicating a reading above the instrument background was then counted individually in the PC counter. In addition, at least one smear of each group of ten was selected at random and counted in the PC counter. All smears of the areas or objects with elevated direct readings were counted individually in the PC counter.

Air Samples

Air particulate samples were collected using an ANL-modified, commercial vacuum cleaner to pull air through the filter media (HV-70). A total volume of 26.7 m^3 of air was sampled at a flow rate of 40 cubic meters per hour (m^3/h). A 10% portion (5 cm in diameter) was removed from the filter media after collection and counted for both alpha and beta-gamma activity in the PC counter, using a Mylar spun top. Radon (^{222}Rn), thoron (^{220}Rn), and the presence of any long-lived airborne radionuclides were determined based on the result of several counts at specified intervals on each sample.

Air particulate samples were also collected on Millipore Filter media for 40 minutes at a flow rate of approximately $1.5 \text{ m}^3/\text{h}$. A portion of each filter sample was used for alpha spectral analysis to determine the actinon (^{219}Rn) concentration.

