

OAK RIDGE NATIONAL LABORATORY

OPERATED BY MARTIN MARIETTA ENERGY SYSTEMS, INC

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July 16, 1993

Dr. W. A. Williams
Department of Energy
Trevion II Building
EM-421
Washington, D. C. 20585-0002

Dear Dr. Williams:

Independent Verification of the Radiological Condition of the Old Betatron Building Owned by the Granite City Steel Corporation, Granite City, Illinois

A team from the Measurement Applications and Development (MAD) group, Oak Ridge National Laboratory (ORNL), at the request of the Department of Energy (DOE) conducted an independent verification of the radiological condition of the old betatron building owned by the Granite City Steel Corporation. The uranium contamination present resulted from the handling of uranium slabs of metal during the time the betatron facility was being used to x-ray the slabs for metallurgical defects. The assessment was performed after the cleanup activities were performed under the direction of Bechtel National Incorporated (BNI). The designation survey, reported in ORNL/RASA-89/10, did not characterize the entire floor space because of equipment and debris that could not be moved at the time. Therefore, prior to the remediation by BNI, a thorough characterization of the floor was conducted and the results were immediately conveyed to BNI staff onsite. The process of characterization, remediation, and verification was accomplished within a five day period mostly due to the limited contamination present and the planning and cooperation of the various contractors.

The characterization of the floor was accomplished as follows. The floor was marked off in a one meter grid and was completely scanned for beta activity using large-area floor monitors and GM "pancake" detectors. Areas of radioactivity above background were marked for further characterization. All spots/areas with elevated activity were extensively characterized by determining the alpha and beta/gamma activity in dpm/100 cm² and smear samples were taken to determine the transferability of the activity. In addition, 31 of the 260 grid blocks were randomly selected and extensively characterized in the same manner as the elevated areas. Initially 12 locations were determined to be above 5000 dpm/100 cm² (beta) or marginally close enough to merit remediation. The contamination could best be described as spotty with the maximum being 30,000 dpm/100 cm². The contamination was predominately fixed as determined by the analysis of the smear samples. The maximum alpha activity detected on a smear was 15 dpm/100 cm² and the maximum beta activity was 80 dpm/100 cm².

Personnel from BNI were continually updated concerning the number and magnitude of contaminated spots so they could most efficiently schedule their work load. Once BNI completed cleaning an area of spots, cleanliness verification began. In most cases the contamination was successfully removed. However, some areas required multiple attempts at contamination removal/verification. Two reasons existed for this iterative process: 1. a difference in instruments and conversion factors among the contractors caused minor discrepancies; 2. as the "hottest" spots were removed, the lesser contaminated spots could be more readily identified. In either case, a mutual understanding between

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the contractors allowed for a quick turn-around in the overall process. The ALARA principle also influenced the decision to clean several spots significantly less than DOE guidelines. As a result of the remedial action taken by BNI and independently verified by ORNL staff, the betatron building conforms to all applicable DOE radiological guidelines established for release of this site for unrestricted use. If more details are needed or you have any questions regarding the survey, please contact Michael Murray at 615-574-5838.

Sincerely,


Michael E. Murray
Measurement Applications
and Development Group

MEM:ec

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