MARTIN COMPANY

NUCLEAR
DIVISION
Baltimore,
Maryland
21203

July 20, 1964

U. S. Atomic Energy Commission
Division of Material Licensing
Washington, D. C. 20545

Attention: Mr. Lyall Johnson

Subject: By Product Material License No. 19-1398-20

Gentlemen:

We request that Martin-Marietta By Product Material License No. 19-1398-20 be amended to permit the measuring of basic spectrum derived from radioactive decay of several radioisotopes and are enclosing a description of the procedures which will be used for this work.

Very truly yours,

C W Keller

C. W. Keller
Nuclear Accountability
& Licensing Representative

CWK/plm

PROPOSED AMENDMENT TO

BY PRODUCT MATERIAL LICENSE 19-1398-20

Use of Radioisotopes:

1. To define and measure the basic spectrum derived from the radioactive decay of radioisotopes.

2. Measure the attenuation of the radiations resulting from radioactive decay by varying thicknesses of shielding type materials.

By Product Materials and Quantities to be Used:

Isotope	Amount	Form
Curium-244	5 mc	Electrodeposited isotope on planchet
Polonium-210	0.06 mc	Electrodeposited or evaporated isotope on planchet
Cesium-137	0.03 mc	Electrodeposited or evaporated isotope on planchet
Promethium-147	0.02 mc	Electrodeposited or evaporated isotope on planchet

Users:

1. M. Kniedler

2. V. Truscello

Place at Which By Product Material Will be Utilized:

Martin-Marietta Corporation, Middle River Plant, Middle River, Maryland. The experimentation will be perfromed primarily in the radioisotopes laboratory previously described in April 4, 1960 submission in connection with By Product License No. 19-1938-20. An updated drawing of the laboratory is included with this submission.

General Procedures:

Prepared sources will be received from off site facilities if available. If preparation at Martin is necessary, useful counting sources will be prepared by electroplating or evaporation of the radioisotopes on appropriate planchets or platinum disks.

Electroplating procedures will be similar to those described in Radioisotopes Techniques by Overman and Clark, Page 194-195. Evaporation techniques similar to those described in Radioisotope Techniques by Overman and Clark, Chapter 5, Page 191.

Unpackaging of all sources or solutions received from off site facilities shall be under the strict surveillance of the Martin Health Physics Section. Primary source containers shall be stored in a secondary metal container in a ventilated facility when not in use. All source preparation at Martin shall be in a hood equipped with an absolute filter, except Curium which will be prepared within an absolute filter equipped glove box. Prepared sources will be checked by Health Physics for removable contamination, and cleaned as required prior to removing them from the preparation area to the counting room. Preparation areas will be decontaminated as required to preclude the transfer of contamination to the laboratory. All transfers of sources from the laboratory to the counting area will be accomplished by use of a closed container. When not in use the sources will be stored in a closed container in a hood ventilated through an absolute type filter. The laboratory facility is equipped with operating area radiation monitors, alpha-beta air particulate monitor and fire detection devices which are connected to a central alarm system.

Health Physics:

Mr. Richard J. Brisson, Supervisor, Health Physics Section is the designated Radiation Protection Officer for the Martin Company. The basic function of the Health Physics Section including related Health Physics information was supplied in the April 4, 1960 submission in connection with By Product Material License No. 19-1398-20 with specific reference to Supplemental Sheets Nos. 1, 2, 3 and 4. Health Physics shall instruct laboratory personnel regarding the precautions to be taken during operations involving the handling of radioactive solutions and sources and shall monitor for alpha, beta, gamma and neutron radiations during source preparation, decontamination, and waste removal. Air samples shall be collected from the laboratory and the laboratory exhaust system and analyzed for alpha and beta radioactivity during the operations.

Radioactive Waste Disposal:

Solid radioactive waste generated during source preparation shall be removed utilizing standard bag out methods. Liquid wastes will be poured into an absorbing media and handled as solids. The waste shall be sealed in a plastic bag and placed in a closed I.C.C. approved waste container for ultimate disposal at an approved disposal site.

RESUME

NAME: Kniedler, M.

POSITION: Engineering Specialist

EDUCATION: Bachelor of Science Washington & Jefferson College - Washington, Pennsylvania Mathematics and Physics

Master of Science West Virginia University Morgantown, West Virginia - Mathematics and Physics

Three years graduate Study at University of Maryland College Park, Maryland - Goal PhD in Nuclear Engineering

TRAINING & EXPERIENCE: University of Maryland formal one year course in Principles of Nuclear Reactor Engineering.

University of Maryland formal one year course in Radioisotope Uses.

Use of Cobalt-60 and Cesium-137 as sealed sources at Martin Marietta Corporation for energy spectrum counting and analysis.

Since 1957 as a member of the Nuclear Engineering Department at Martin Marietta Corporation have developed and supervised the use of codes in connection with the solution of neutron criticality and shielding problems.

RESUME

NAME: Truscello, V.

POSITION: Acting Supervisor

EDUCATION: Bachelor of Science in Mechanical Engineering from Drexel Institute of Technology

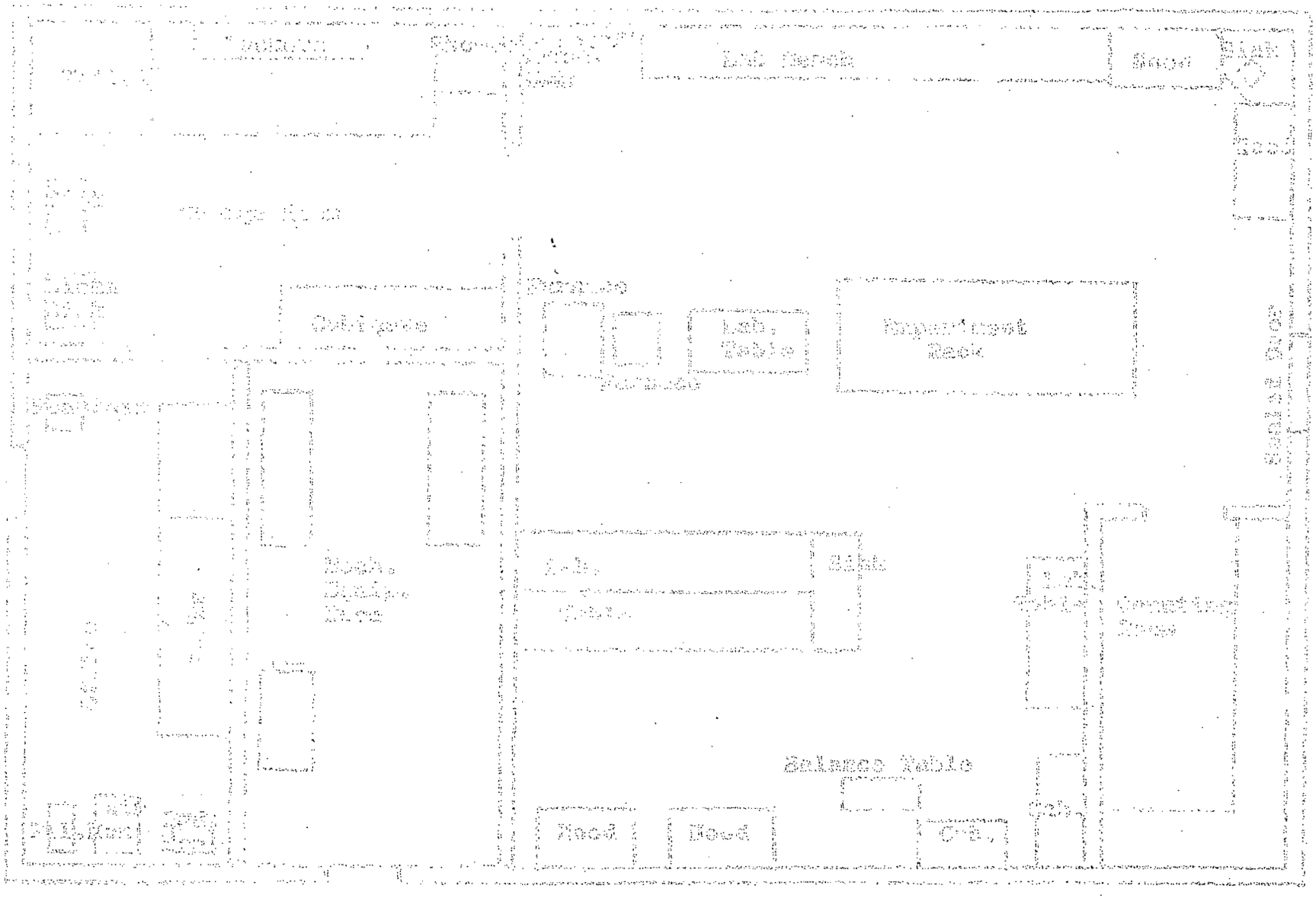
Master of Science in Mechanical Engineering from Drexel Institute of Technology

Additional Graduate Study at University of Maryland

TRAINING & EXPERIENCE: Have completed two formal courses at the University of Maryland dealing with the uses of radioactive isotopes including measuring and monitoring techniques, radiation detecting instruments and the biological effects of radiation.

Joined Martin Marietta Corporation in 1959 and have been active in design and development of radioisotope thermoelectric systems, preparation of radioisotope sources, and spectroscopic measurements of several isotopes including Promethium-147, Strontium-90 and Cesium-137.

Have obtained knowledge of the nuclear and biological properties of Promethium-147, Stronium-90, Cerium-144, Cesium-134 & -137 and Curium-242 and -244.



EJ Building Radioisotopes Laboratory