030-28818 N 21-24546-01

NRC FORM 313
(1-84)
10 CFR 30, 32, 33, 34, 35 and 40

U.S. NUCLEAR REGULATORY COMMISSION
APPROVED BY OMB
3150-0120
Expires: 5-31-87

APPLICATION FOR MATERIAL LICENSE

INSTRUCTIONS: SEE THE APPROPRIATE LICENSE APPLICATION GUIDE FOR DETAILED INSTRUCTIONS FOR COMPLETING APPLICATION. SEND TWO COPIES OF THE ENTIRE COMPLETED APPLICATION TO THE NRC OFFICE SPECIFIED BELOW.

FEDERAL AGENCIES FILE APPLICATIONS WITH:

U.S. NUCLEAR REGULATORY COMMISSION
DIVISION OF FUEL CYCLE AND MATERIAL SAFETY, NMSS
WASHINGTON, DC 20555

ALL OTHER PERSONS FILE APPLICATIONS AS FOLLOWS, IF YOU ARE LOCATED IN:

CONNECTICUT, DELAWARE, DISTRICT OF COLUMBIA, MAINE, MARYLAND, MASSACHUSETTS, NEW JERSEY, NEW YORK, PENNSYLVANIA, RHODE ISLAND, OR VERMONT, SEND APPLICATIONS TO:

U.S. NUCLEAR REGULATORY COMMISSION, REGION I
NUCLEAR MATERIAL SECTION B
631 PARK AVENUE
KING OF PRUSSIA, PA 19406

ALABAMA, FLORIDA, GEORGIA, KENTUCKY, MISSISSIPPI, NORTH CAROLINA, PUERTO RICO, SOUTH CAROLINA, TENNESSEE, VIRGINIA, VIRGIN ISLANDS, OR WEST VIRGINIA, SEND APPLICATIONS TO:

U.S. NUCLEAR REGULATORY COMMISSION, REGION II
MATERIAL RADIATION PROTECTION SECTION
101 MARIETTA STREET, SUITE 2900
ATLANTA, GA 30323

IF YOU ARE LOCATED IN:

ILLINOIS, INDIANA, IOWA, MICHIGAN, MINNESOTA, MISSOURI, OHIO, OR WISCONSIN, SEND APPLICATIONS TO:

U.S. NUCLEAR REGULATORY COMMISSION, REGION III
MATERIALS LICENSING SECTION
799 ROOSEVELT ROAD
GLEN ELLYN, IL 60137

ARKANSAS, COLORADO, IDAHO, KANSAS, LOUISIANA, MONTANA, NEBRASKA, NEW MEXICO, NORTH DAKOTA, OKLAHOMA, SOUTH DAKOTA, TEXAS, UTAH, OR WYOMING, SEND APPLICATIONS TO:

U.S. NUCLEAR REGULATORY COMMISSION, REGION IV
MATERIAL RADIATION PROTECTION SECTION
611 RYAN PLAZA DRIVE, SUITE 1000
ARLINGTON, TX 76011

ALASKA, ARIZONA, CALIFORNIA, HAWAII, NEVADA, OREGON, WASHINGTON, AND U.S. TERRITORIES AND POSSESSIONS IN THE PACIFIC, SEND APPLICATIONS TO:

U.S. NUCLEAR REGULATORY COMMISSION, REGION V
MATERIAL RADIATION PROTECTION SECTION
1450 MARIA LANE, SUITE 210
WALNUT CREEK, CA 94596

PERSONS LOCATED IN AGREEMENT STATES SEND APPLICATIONS TO THE U.S. NUCLEAR REGULATORY COMMISSION ONLY IF THEY WISH TO POSSESS AND USE LICENSED MATERIAL IN STATES SUBJECT TO U.S. NUCLEAR REGULATORY COMMISSION JURISDICTION.

1. THIS IS AN APPLICATION FOR *(Check appropriate item)*

- [X] A. NEW LICENSE
- [ ] B. AMENDMENT TO LICENSE NUMBER _____
- [ ] C. RENEWAL OF LICENSE NUMBER _____

2. NAME AND MAILING ADDRESS OF APPLICANT *(Include Zip Code)*

Bradley - Thompson Tool Company
22108 W. Eight Mile Road
Southfield, Michigan 48034

3. ADDRESS(ES) WHERE LICENSED MATERIAL WILL BE USED OR POSSESSED.

Same as Applicant Address

4. NAME OF PERSON TO BE CONTACTED ABOUT THIS APPLICATION

Bruce T. Austin, Ph.D. Consultant Physicist

TELEPHONE NUMBER: (513) 229-8933

SUBMIT ITEMS 5 THROUGH 11 ON 8½ x 11" PAPER. THE TYPE AND SCOPE OF INFORMATION TO BE PROVIDED IS DESCRIBED IN THE LICENSE APPLICATION GUIDE.

5. RADIOACTIVE MATERIAL
a. Element and mass number, b. chemical and/or physical form, and c. maximum amount which will be possessed at any one time.

6. PURPOSE(S) FOR WHICH LICENSED MATERIAL WILL BE USED.

7. INDIVIDUAL(S) RESPONSIBLE FOR RADIATION SAFETY PROGRAM AND THEIR TRAINING AND EXPERIENCE.

8. TRAINING FOR INDIVIDUALS WORKING IN OR FREQUENTING RESTRICTED AREAS.

9. FACILITIES AND EQUIPMENT. Appendix E

10. RADIATION SAFETY PROGRAM. Appendix F

11. WASTE MANAGEMENT. Appendix G

12. LICENSEE FEES *(See 10 CFR 170 and Section 170.31)*
FEE CATEGORY 10CFR170.31 2G | AMOUNT ENCLOSED $ 350.00

13. CERTIFICATION. *(Must be completed by applicant)* THE APPLICANT UNDERSTANDS THAT ALL STATEMENTS AND REPRESENTATIONS MADE IN THIS APPLICATION ARE BINDING UPON THE APPLICANT.

THE APPLICANT AND ANY OFFICIAL EXECUTING THIS CERTIFICATION ON BEHALF OF THE APPLICANT, NAMED IN ITEM 2, CERTIFY THAT THIS APPLICATION IS PREPARED IN CONFORMITY WITH TITLE 10, CODE OF FEDERAL REGULATIONS, PARTS 30, 32, 33, 34, 35, AND 40 AND THAT ALL INFORMATION CONTAINED HEREIN, IS TRUE AND CORRECT TO THE BEST OF THEIR KNOWLEDGE AND BELIEF.

WARNING: 18 U.S.C. SECTION 1001 ACT OF JUNE 25, 1948, 62 STAT. 749 MAKES IT A CRIMINAL OFFENSE TO MAKE A WILLFULLY FALSE STATEMENT OR REPRESENTATION TO ANY DEPARTMENT OR AGENCY OF THE UNITED STATES AS TO ANY MATTER WITHIN ITS JURISDICTION.

SIGNATURE–CERTIFYING OFFICER	TYPED/PRINTED NAME	TITLE	DATE
Michael D. Huard	Michael D. Huard	President	7/23/85

14. VOLUNTARY ECONOMIC DATA

a. ANNUAL RECEIPTS
- [ ] < $250K
- [ ] $250K–500K
- [ ] $500K–750K
- [ ] $750K–1M
- [ ] $1M–3.5M
- [ ] $3.5M–7M
- [ ] $7M–10M
- [ ] >$10M

b. NUMBER OF EMPLOYEES *(Total for entire facility excluding outside contractors)*

c. NUMBER OF BEDS

d. WOULD YOU BE WILLING TO FURNISH COST INFORMATION *(dollar and/or staff hours)* ON THE ECONOMIC IMPACT OF CURRENT NRC REGULATIONS OR ANY FUTURE PROPOSED NRC REGULATIONS THAT MAY AFFECT YOU? *(NRC regulations permit it to protect confidential commercial or financial–proprietary information furnished to the agency in confidence)*
- [ ] YES
- [ ] NO

RECEIVED
JUL 26 1985
REGION III

FOR NRC USE ONLY

TYPE OF FEE	FEE LOG	FEE CATEGORY	COMMENTS	APPROVED BY
appl	agy III	2G		
AMOUNT RECEIVED	**CHECK NUMBER**			**DATE**
350	63985			8/1/85

PRIVACY ACT STATEMENT ON REVERSE

8512050314 851113
REG3 LIC40
STB-1463 PDR

CONTROL NO. 7 9420

Appendix A, Item 5 Licensed Material

a.Element and Mass Number	b.Chemical and Physical Form	c.Maximum Amount To Be Possessed At Any One Time
Natural Thorium (predominantly Thorium 232)	Thorium Oxide Alloyed with Magnesium NTE 4% By Weight	200 pounds

Natural Thorium in the form of a clean metallic alloy with Magnesium is to be acquired as raw castings. The Thorium content of the alloy is not to exceed 4% by weight and is usually 3% by weight as supplied by the foundry. Total possession is of the raw and finished castings and cuttings remaining from the machining process. The maximum amount to be posessed at any one time is 200 pounds.

Appendix B, Item 6 Purpose For Which Material Will Be Used

Material will be possessed and used pursuant to the physical processing of finished castings.

Magnesium - Thorium alloy, not to exceed 4% by weight, will be acquired as raw castings from the supplying foundry. Castings will be machined to design specifications using modern milling, drilling, boring, and tapping equipment that is maintained to exacting standards.

Approximately 4% of the raw casting will be removed in machining operations (2 lbs. of a typical 52 lb raw casting). Waste cuttings will be accumulated and contained by vacuum systems that are designed to contain cuttings at the time of production.

Wastes will be contained in the vacuum system collection drums until drums are filled. Inner plastic liners will be tied and filled drums sealed for removal as radioactive waste.

Finished castings will be inspected, partially assembled and forwarded to the prime contractor or other subcontractors as directed by the prime contractor. Neither finished castings or wastes will be distributed to the general public under the provisions of 10 CFR 40.13.

Appendix C, Item 7 Individuals Responsible For Radiation Safety

Bruce T. Austin, Ph.D.
Consultant Physicist

Training

1968 B.S. Chemistry, Grinnell College

1970 M.S. Radiation Biology, The University of Iowa

1973 Ph.D. Radiation Biology, The University of Iowa

Experience

1972-76 Staff Health Physicist, USAF RHL, Wright-Patterson AFB
USAF World-wide Health and Medical Physics Field Service
1972-74 Chief Film Dosimetry Branch, USAF World-wide service
1974-76 Executive Secretary USAF Radioisotope Committee

1976-82 Professor of Radiological Sciences, Wright State Univ
School of Medicine and University RSO

1982-85 Medical Physicist and Hospital RSO, Grandview Hospital

1976-85 Consultant in Health and Medical Physics
Named as RSO and/or consultant to numerous current USNRC licenses including: 34-06904-01 SNM 1603 34-11912-03 34-11912-04 SNM 1419

Arthur J. Solari
Consultant Physicist

Training

1950 B.S. MIT

1953 M.S. Health Physics, Boston College

Experience

1951-52 AEC Fellowship University of Rochester

1952-55 Health Physicist, Brookhaven National Laboratory

1955-57 Instructor in Radiology, University of Michigan

1957-85 University Radiation Safety Officer, Univ. of Mich.

1961 Certified ABHP
Named as RSO on several current USNRC Licenses including: 21-00215004 21-00215-06 SNM 1835 SUD 1398 SNM 1529

Appendix C, Item 7 (cont)

Michael D. Huard
President and Corporate Radiation Safety Officer

Mr. Huard is expert in precision machining operations and the successful management of Bradley - Thompson Tool Co. He will receive practical training in the administrative and supervisory requirements of Corporate Radiation Safety from the consultant physicists.

Mr Huard will be trained in the following topical areas as the topics relate to the licensed activities:

Principles and practices of radiation protection

Measurements of radioactivity, monitoring techniques and the use of monitoring instruments

Calculations related to the use and measurement of radioactivity

Biological effects of radiation

Safety practices applicable to protection from the chemical toxicity and pyrophoric properties of source material

Appendix D, Item 8 Training of Material Users

Material users will be trained machinists who are expert in the processing of Magnesium alloys. As such, they will be familiar with the requirements associated with the safe, precision processing of Magnesium - Thorium alloy.

Prior to beginning licensed activities, Corporate training of material users will include emphasis on the use of sharp tools and machine speeds consistent with production of large chips and shavings, requirements to position waste removal equipment to provide effective removal of wastes, and housekeeping requirements in the Magnesium - Thorium work area.

Material users will also be trained in emergency procedures to be followed in the event of mechanical accident or fire in the processing area. Restrictions against drinking, eating, and smoking in the processing area will be emphasized to prevent accidental ingestion of processing scrap.

All material users and employees who may frequent the processing area in the course of their duties will be instructed in accordance with the requirements of 10 CFR 19.12. This training, to be offered on an annual basis or more frequently if indicated by employee turnover, will include:

Identification of licensed materials and associated hazards

Precautions and procedures to minimize hazards

Purposes and functions of protective devices

NRC regulations to be observed

Terms of the NRC license applicable to employees who work in or frequent the processing area

Standard and emergency procedures to be followed

Responsibility of individuals to report unsafe acts or conditions in the processing area

The right of employees to receive personnel monitoring reports upon request

Otherwise uninvolved workers and visitors will be advised of the restricted access to the Magnesium - Thorium processing area during processing activities.

Appendix D, Item 8 (cont)

Personnel receiving training will be provided the opportunity to ask questions of the individual conducting training and will be encouraged to ask questions of his or her supervisor concerning radiation safety as they might arise.

Comprehension of individuals participating in training will be assessed by the Radiation Safety Officer by observation of compliance with instruction and oral quiz.

Records, including the date and duration of training, the names of participants, and the name of the individual conducting the training will be maintained with radiation safety records.

Appendix E, Item 9 Facilities and Equipment

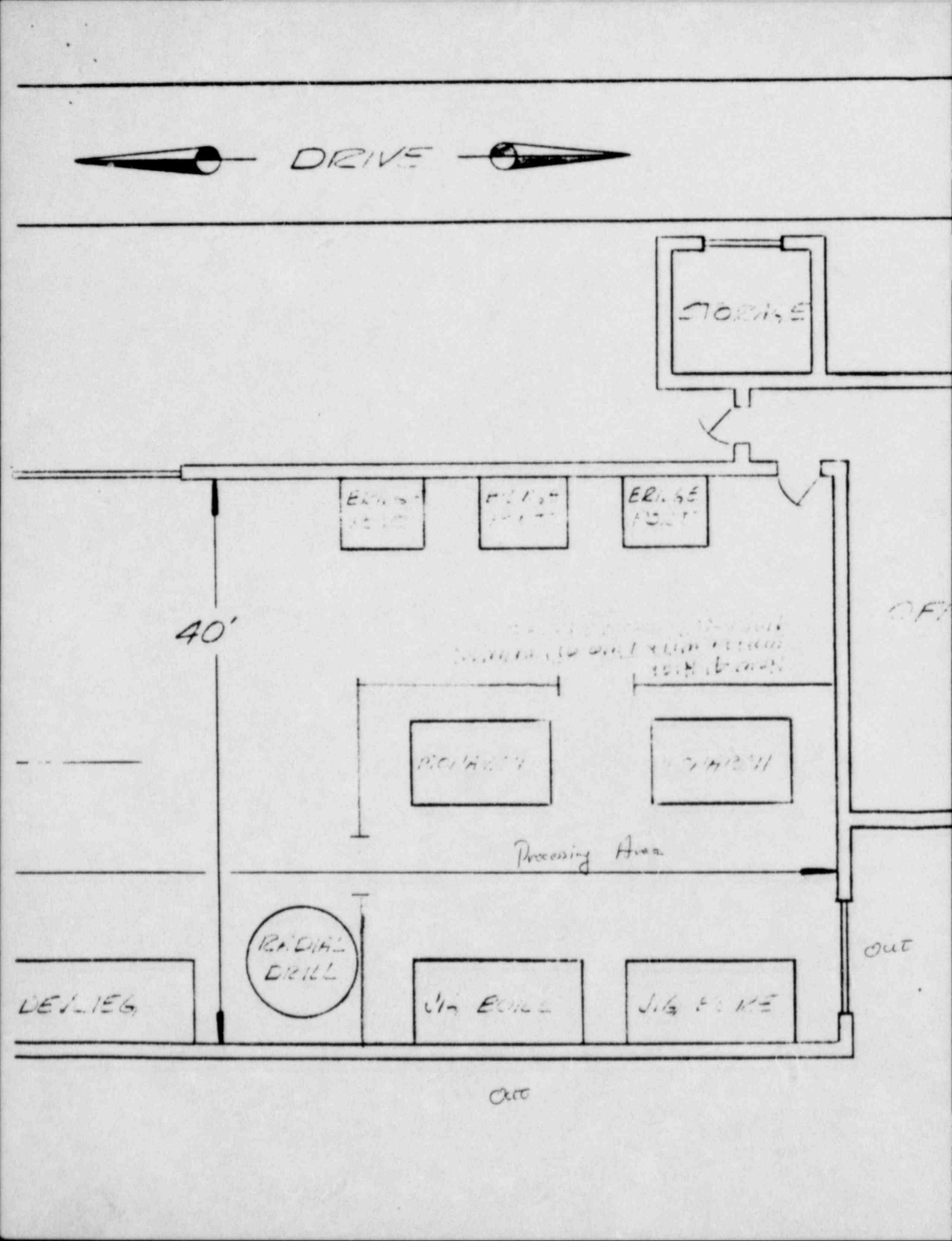
Magnesium - Thorium processing activities will be limited to the area illustrated in the enclosed drawing. Four machine tools will be isolated from surrounding areas by a partition wall designed to restrict access to the processing area and to afford a defined area within which waste removal activities may be confined.

The processing area is located in a high bay machine shop area on a concrete floor. HVAC in the area is minimal with only low velocity air movement, except that provided by the vacuum system for waste removal and containment.

Material storage of finished castings will be located in the area indicated. Raw castings will be held in the processing area until finished. Wastes will be contained in the vacuum system drums adjacent to the machine tools until filled. When filled, drums will be sealed and prepared for shipment as LSA waste in the processing area.

Materials are secured against removal as are other valuable properties of the Company. When not in the possession of material users, items in stages of finishing will be secured in the processing area. Finished items will be secured in the storage area prior to shipping.

Given the nature of the proposed activities, no special ventilation or containment system is necessary to assure compliance with the permissible occupational and environmental concentration limits specified in 10 CFR 20.


DRIVE
STORAGE
40'
Processing Area
RADIAL DRILL
OUT
OUT

Appendix F, Item 10 Radiation Safety Program

The radiation safety program is a multifaceted administrative management effort to prevent the reduction of waste to respirable particles or gases, to document the protection of material users, and to document the containment and control of material.

Personnel Monitoring

The previous operational experience of licensees authorized to process Magnesium - Thorium alloys indicates that material users are not likely to receive an occupational radiation dose in excess of 10% of the standards specified in 10 CFR 20.101 unless material is ground or otherwise reduced to respirable gasses or aerosols. In addition, and due to the training required for expert machine tool operation, personnel under the age of 18 years will not be employed as material users.

In accord with the provisions of 10 CFR 20.202, personnel monitoring devices will not be issued to material users.

Bioassays

Routine bioassay of material users is not expected to be indicated for the proposed activities. Previous experience in Magnesium - Thorium processing operations indicate that derived air concentrations of respirable Thorium will not exceed a few percent of the limits specified in 10 CFR 20, Appendix B, Table I.

Should pre-operational or periodic sampling of breathing zone air indicate that derived air concentrations cannot be maintained at a small fraction of the relevant standards, bioassays by urinalysis will be conducted in accordance with the procedures and schedule of USNRC Regulatory Guide 8.11.

Surveys and Monitoring

Machines and work areas will be monitored for fixed and removable activity at the end of each work shift. Each material user will be responsible for survey and clean-up of his or her work area. Periodic surveys of the processing and storage areas will be conducted by the Radiation Safety Officer or his designee on a weekly schedule or as otherwise indicated. Results of the weekly survey will be recorded and maintained for inspection purposes.

Initially, and whenever processing operations are to be reinitiated or revised, the breathing zone of material users will be monitored as a precaution to confirm airborne concentrations. Air monitoring results will be maintained for inspection purposes.

When Magnesium - Thorium processing is to be discontinued in the processing area, a survey of all machine surfaces, work areas, and floor areas will be conducted prior to release for other material processing. Complete documentation, including a drawing illustrating any area in which contamination was observed prior to cleaning will be retained in radiation safety files. For the puyrposes of area release, a contamination limit of 100 DPM per 100 cmsq will be observed.

In the event of unusual occurrance, area survey and air sampling will be performed by a consultant physicist to preclude or identify material release to the environment or area contamination.

Radiation Detection Instrument

One Ludlum Model 3 radiation survey meter equipped with a Model 43-5 alpha scintillation probe will be maintained by the licensee for routine area survey purposes. The unit has a range of 0-5,000 cpm and a calculated MDL of 114 pCi/100cmsq Thorium - 232 at a count rate that is three times background.

Proper instrument operation will be confirmed prior to and following each survey using a check source of Thorium - 230 to demonstrate constancy. The meter will be calibrated on an annual basis or upon damage or repair that could affect calibration. Calibration will be performed by Medical Radiation consultants, Inc. using National Bureau of Standards traceable Thorium - 230 standards. While sources are not USNRC regulated, procedures and record keeping procedures will be as specified in USNRC License No. 34-06904-01. The licensee will maintain calibration records for not less than 2 years.

Radiation Safety Program

Purpose

This is a formal, planned program to protect the health of employees, minimize danger to life and property, and make every reasonable effort to maintain radiation exposures and releases to unrestricted areas as low as reasonably achievable.

Appendix F, Item 10 (cont)

Scope

This program is applicable to the receipt, possession, processing, storage, transfer, and disposal of licensed material.

Reference

1. Title 10 Code of Federal Regulations, Parts 19, 20, and 40
2. License No. , issued to Bradley - Thompson Tool Company
3. USNRC Regulatory Guide 8.11
4. NBS/ICRP Handbooks

Responsibilities

1. The Bradley - Thompson Tool Company has overall responsibility for the radiation safety of all individuals who work in or frequent restricted areas under its control. The Company is responsible for compliance with applicable USNRC regulations and the terms of the license issued to the Company.

2. The Radiation Safety Officer or his designees are responsible for the conduct of day-to-day radiation safety operations, including the review and approval of standard operating and emergency procedures.

3. Material users are responsible for performing their jobs in a safe manner and in accordance with approved standard operating and emergency procedures. Material users must be alert to and immediately report all unsafe acts or conditions in the processing area to the Radiation Safety Officer or his designee.

Program Tasks

1. Provide training on a routine basis for personnel who work in or frequent the processing area.

2. Develop and implement procedures for routine and emergency operations involving licensed materials.

3. Provide appropriate radiological monitoring for personnel.

4. Control contamination.

5. Conduct area and environmental monitoring.

6. Obtain license authority and comply with license provisions appropriate to the radioactive material used.

7. Maintain inventory control of licensed materials.

8. Conduct investigations of all accidents or incidents and issue any necessary report.

9. Conduct and annual audit of the effectiveness of the radiation safety program.

Appendix G, Item 11 Waste Management

Waste Magnesium - Thorium will be collected and contained for ultimate disposal in vacuum system drums. Wastes will be shipped to the Prime Contractor, General Electric, Aircraft Engine Business Group, Cincinnati, Ohio, or to another authorized recipient for reclaimation or disposal.