FORM NRC-2
(7-77)
10 CFR 40

Approved by GAO
R0203

U.S. NUCLEAR REGULATORY COMMISSION

APPLICATION FOR SOURCE MATERIAL LICENSE

Pursuant to the regulations in Title 10, Code of Federal Regulations, Chapter 1, Part 40, application is hereby made for a license to receive, possess, use, transfer, deliver or import into the United States, source material for the activity or activities described.

1. (Check one)
- ☐ (a) New license
- ☐ (b) Amendment to License No.
- ☒ (c) Renewal of License No. STB-930
- ☐ (d) Previous License No.

2. NAME OF APPLICANT: U.S. Department of the Navy
Strategic Systems Project Office

3. PRINCIPAL BUSINESS ADDRESS
Crystal Mall #3, Room 1142
Washington, DC 20376

4. STATE THE ADDRESS(ES) AT WHICH SOURCE MATERIAL WILL BE POSSESSED OR USED
A. POLARIS Missile Facility Atlantic, Charleston, SC 29408
B. Strategic Weapons Facility Pacific, Bremerton, WA 98314

5. NAME OF PERSON TO BE CONTACTED CONCERNING THIS APPLICATION
Mr. Dave Ellingson SP113

6. TELEPHONE NO. OF INDIVIDUAL NAMED IN ITEM 5
(202) 695-5266

7. DESCRIBE PURPOSE FOR WHICH SOURCE MATERIAL WILL BE USED
Source material (Magnesium/Thorium alloy) commercial designation HK-31 is part of the structure of the POLARIS missile. These structures are the equipment and interstage sections (0.160" thick) which are chemically composed of 96.2% magnesium, 3% Thorium and 0.8% zirconium.

8. STATE THE TYPE OR TYPES, CHEMICAL FORM OR FORMS, AND QUANTITIES OF SOURCE MATERIAL YOU PROPOSE TO RECEIVE, POSSESS, USE, OR TRANSFER UNDER THE LICENSE

(a) TYPE	(b) CHEMICAL FORM	(c) PHYSICAL FORM (*Including % U or Th.*)	(d) MAXIMUM AMOUNT AT ANY ONE TIME *(kilograms)*
NATURAL URANIUM			
URANIUM DEPLETED IN THE U-235 ISOTOPE			
THORIUM (ISOTOPE)	Alloy of magnesium Thorium, zirconium	Metal cylinder (3% Thorium)	Location (A) = 250 lbs Location (B) = 250 lbs

(e) MAXIMUM TOTAL QUANTITY OF SOURCE MATERIAL YOU WILL HAVE ON HAND AT ANY TIME *(kilograms)*

9. DESCRIBE THE CHEMICAL, PHYSICAL, METALLURGICAL, OR NUCLEAR PROCESS OR PROCESSES IN WHICH THE SOURCE MATERIAL WILL BE USED, INDICATING THE MAXIMUM AMOUNT OF SOURCE MATERIAL INVOLVED IN EACH PROCESS AT ANY ONE TIME, AND PROVIDING A THOROUGH EVALUATION OF THE POTENTIAL RADIATION HAZARDS ASSOCIATED WITH EACH STEP OF THOSE PROCESSES.
The metal cylinders are usually installed when a new missile is built up without processing of any kind. However, fleet-returned or training missiles often required sanding of corroded areas, down to bare metal (HK-31). This sanding process uses 200-400 grit sandpaper and is done both by hand and mechanically. Sometimes it is necessary to drill out steel rivets in the skin structure.

10. LIST THE NAMES AND ATTACH A RESUME OF THE TECHNICAL QUALIFICATIONS INCLUDING TRAINING AND EXPERIENCE OF APPLICANT'S SUPERVISORY PERSONNEL AND THE PERSON RESPONSIBLE FOR THE RADIATION SAFETY PROGRAM (OR OF APPLICANT IF AN INDIVIDUAL).
Jerry L. Lyman SBP 2112
David L. Unwin SPC 01A
(Resumes - See Attached)

23448

11. DESCRIBE THE EQUIPMENT AND FACILITIES WHICH WILL BE USED TO PROTECT HEALTH AND MINIMIZE DANGER TO LIFE OR PROPERTY AND RELATE THE USE OF THE EQUIPMENT AND FACILITIES TO THE OPERATIONS LISTED IN ITEM 9. INCLUDE: (a) RADIATION DETECTION AND RELATED INSTRUMENTS (including film badges, dosimeters, counters, air sampling, and other survey equipment as appropriate. The description of radiation detection instruments should include the instrument characteristics such as type of radiation detected, window thickness, and the range(s) of each instrument).
Persons performing mechanical operations on magnesium/Thorium will wear respirators (one piece filter mask (no. 8500) manufactured by 3M Company). Dust from mechanical sanding is collected with Vacu-Blast machine equipped with an absolute filter (Location See Attached)

(b) METHOD, FREQUENCY, AND STANDARDS USED IN CALIBRATING INSTRUMENTS LISTED IN (a) ABOVE, INCLUDING AIR SAMPLING EQUIPMENT (for film badges, specify method of calibrating and processing, or name supplier).
Location (A): All meters will be calibrated every 3 months at the Charleston Naval Shipyard.

Enclosure (1) to DIRSSP ltr
27422/JTM of FEB 22 1984

11(c). VENTILATION EQUIPMENT WHICH WILL BE USED IN OPERATIONS WHICH PRODUCE DUST, FUMES, MISTS, OR GASES, INCLUDING PLAN VIEW SHOWING TYPE AND LOCATION OF HOOD AND FILTERS, MINIMUM VELOCITIES MAINTAINED AT HOOD OPENINGS AND PROCEDURES FOR TESTING SUCH EQUIPMENT

See 11 (a)

12. DESCRIBE PROPOSED PROCEDURES TO PROTECT HEALTH AND MINIMIZE DANGER TO LIFE AND PROPERTY AND RELATE THESE PROCEDURES TO THE OPERATIONS LISTED IN ITEM 9, INCLUDE: (a) SAFETY FEATURES AND PROCEDURES TO AVOID NONNUCLEAR ACCIDENTS, SUCH AS FIRE, EXPLOSION, ETC., IN SOURCE MATERIAL STORAGE AND PROCESSING AREAS

Industrial Health Surveys will be conducted each quarter by professional Industrial Hygienists to determine amount of magnesium-thorium dust in air and precautions to observe. Hand sanding will usually be performed wet and mechanical sanding will be performed using a closed system with an absolute filter. In addition, personnel

(b) EMERGENCY PROCEDURES IN THE EVENT OF ACCIDENTS WHICH MIGHT INVOLVE SOURCE MATERIAL. (See Attached)

N/A

(c) DETAILED DESCRIPTION OF RADIATION SURVEY PROGRAM AND PROCEDURES.

Surveys and monitoring of operations will be performed by professional industrial hygienists using radiation detection instruments and air sampling devices.

13. WASTE PRODUCTS: *If none will be generated, state "None" opposite (a), below. If waste products will be generated, check here* ☐ *and explain on a supplemental sheet:*

(a) Quantity and type of radioactive waste that will be generated. (See Attached)

(b) Detailed procedures for waste disposal. (See Attached)

14. IF PRODUCTS FOR DISTRIBUTION TO THE GENERAL PUBLIC UNDER AN EXEMPTION CONTAINED IN 10 CFR 40 ARE TO BE MANUFACTURED, USE A SUPPLEMENTAL SHEET TO FURNISH A DETAILED DESCRIPTION OF THE PRODUCT, INCLUDING:

(a) PERCENT SOURCE MATERIAL IN THE PRODUCT AND ITS LOCATION IN THE PRODUCT. N/A

(b) PHYSICAL DESCRIPTION OF THE PRODUCT INCLUDING CHARACTERISTICS, IF ANY, THAT WILL PREVENT INHALATION OR INGESTION OF SOURCE MATERIAL THAT MIGHT BE SEPARATED FROM THE PRODUCT. N/A

(c) BETA AND BETA PLUS GAMMA RADIATION LEVELS (*Specify instrument used, date of calibration and calibration technique used*) AT THE SURFACE OF THE PRODUCT AND AT 12 INCHES. N/A

(d) METHOD OF ASSURING THAT SOURCE MATERIAL CANNOT BE DISASSOCIATED FROM THE MANUFACTURED PRODUCT. N/A

CERTIFICATE

(*This item must be completed by applicant*)

15. *The applicant, and any official executing this certificate on behalf of the applicant named in Item 2, certify that this application is prepared in conformity with Title 10, Code of Federal Regulations, Part 40, and that all information contained herein, including any supplements attached hereto, is true and correct to the best of our knowledge and belief.*

BY: [signature] (Signature)

Kenneth C. Malley
Commodore, U. S. Navy
(Print or type name)

Dated 2/22/84

(Title of certifying official authorized to act on behalf of the applicant)

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.

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Supplemental sheet to FORM AEC-2 for the U.S. Department of the Navy
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10. Jerry L. Lyman (SBP 2112)
547-52-5670

Formal Training in Radiation Safety

Theory and Application of High Energy X-ray by Aerojet General Corp., 12 hours, completed May 1963.

Radiation Health Physics by Budd Company, 24 hours, completed 17 March 1967.

Nuclear Safety by Air University Correspondence, 36 hours, completed 22 October 1974.

Radiation Safety Officer Training by Naval Nuclear Power Unit, Fort Belvoir, Virginia, 80 hours, completed 7 May 1976.

X-ray Radiation Safety Officer Course by Naval Energy and Environmental Support Activity, Port Hueneme, CA., 40 hours, completed 28 January 1983.

Work Experience

Aerojet General Corp., 1958 - 1964 - Assisted as a member of a team effort in installing and checking out a 25 MEV Betatron at Aerojet General Corp., in Sacramento, California and prepared it as a "Production Ready" facility for inspection personnel.

SWFPAC, 1964 to Present - As the only Radiologist at SWFPAC, have been responsible for the instruction and training of professional associates and technicians in the use of Betatron Radiological Equipment in the specialized field of film interpretation of technical x-ray film processing and radiological safety.

Developed curriculum and trained weapons personnel in radiation safety in connection with the Betatron and low energy x-ray equipment since 1964.

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10. (continued)

David L. Unwin (SPC 01A)
134-30-7179

15 May 1981	Satisfactorily completed the Radiation Safety Officer Course (A-4J-0016) given at Naval Energy and Environmental Support Activity Port Hueneme, CA 93043.
15 May 1981 to 4 Jan 1982	Worked as Radiation Safety Officer in conjunction with Mr. Martin J. Johnson, who was the previous POLARIS Missile Facility Atlantic Radiation Safety Officer.
4 Jan 1982 to Present	Appointed as Radiation Safety Officer and worked in this position at the POLARIS Missile Facility Atlantic.

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11.a. (cont.) Location (A) has ventilation system in work area by Devilbiss Water Wash Spray Booth. Location (A) has following detection equipment: AN/PDR 27 (Beta & Gamma)
PAC-1S (Alpha)

Location (B) has following detection equipment:
AN/PDR 27Q SURVEY METER
Radiation Detected - (Gamma (with probe shield)
(Beta-Gamma (without probe shield)
Range 0 - 0.5 milliroentgens/hour
0 - 5.0 milliroentgens/hour
0 - 50.0 milliroentgens/hour
0 - 500.0 milliroentgens/hour
Window thickness - .0005 inches

PAC-3GN SURVEY METER
Radiation Detected - Alpha
Range 0 - 1000 CPM
0 - 10,000 CPM
0 - 100,000 CPM
Window thickness - .00025 inches

11.b. (cont.) Location (B): The following calibration standards are used for calibrating the meters indicated:

Meter	Standard
AN/PDR 27Q	UDM-1A
PAC-3GN	UDM-7A

Instruments are calibrated in accordance with established Naval Electronics System Command procedures.

12.a. (cont.) performing the operations will wear respirators equipped with a super filter and gloves. Personnel protection will be as stated in item 11.a.

13.a. (cont.) It is expected that repairs to any component would not produce over 500 milligrams of magnesium-thorium dust in any one day.

13.b. (cont.) Because of the insignificant amount it is proposed to dispose of magnesium-thorium dust by placing it into the plant sewer system. Cleaning cloths and paper contaminated with magnesium-thorium dust will be burned in the trash dump which is located on U.S. Navy property.