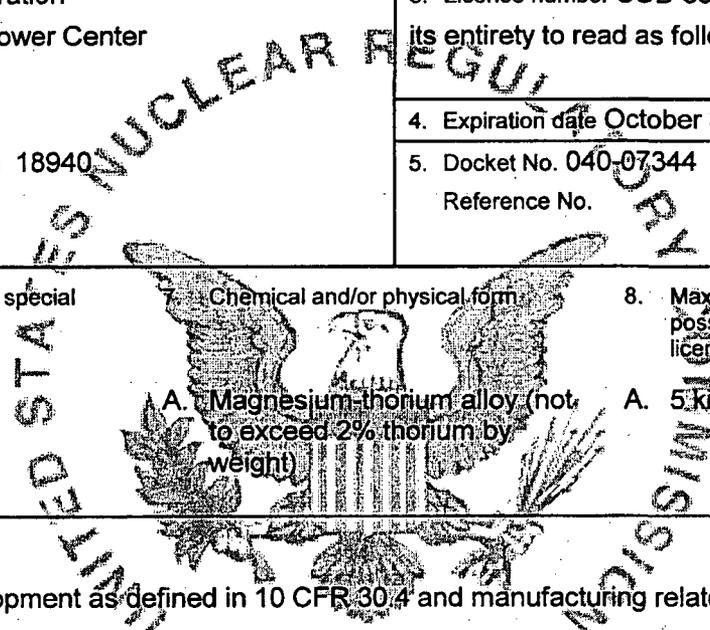


MATERIALS LICENSE

Pursuant to the Atomic Energy Act of 1954, as amended, the Energy Reorganization Act of 1974 (Public Law 93-438), and Title 10, Code of Federal Regulations, Chapter I, Parts 30, 31, 32, 33, 34, 35, 36, 39, 40, and 70, and in reliance on statements and representations heretofore made by the licensee, a license is hereby issued authorizing the licensee to receive, acquire, possess, and transfer byproduct, source, and special nuclear material designated below; to use such material for the purpose(s) and at the place(s) designated below; to deliver or transfer such material to persons authorized to receive it in accordance with the regulations of the applicable Part(s). This license shall be deemed to contain the conditions specified in Section 183 of the Atomic Energy Act of 1954, as amended, and is subject to all applicable rules, regulations, and orders of the Nuclear Regulatory Commission now or hereafter in effect and to any conditions specified below.

<p>Licensee</p> <p>1. Lockheed Martin Corporation Communications and Power Center</p> <p>2. 100 Campus Drive Newtown, Pennsylvania 18940</p>	<p>In accordance with the letter dated July 17, 1998,</p> <p>3. License number SUB-831 is amended in its entirety to read as follows:</p> <hr/> <p>4. Expiration date October 31, 2000</p> <hr/> <p>5. Docket No. 040-07344 Reference No.</p>
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<p>6. Byproduct, source, and/or special nuclear material</p> <p>A. Thorium</p>	<p>Chemical and/or physical form</p> <p>A. Magnesium-thorium alloy (not to exceed 2% thorium by weight)</p>	<p>8. Maximum amount that licensee may possess at any one time under this license</p> <p>A. 5 kilograms</p>
<p>9. Authorized use:</p> <p>A. Research and development as defined in 10 CFR 30.4 and manufacturing related to missile and space programs.</p>		

CONDITIONS

- 10. Licensed material may be used at the licensee's facilities at 100 Campus Drive, Newtown, Pennsylvania; Building 100 at 230 Mall Boulevard, King of Prussia, Pennsylvania; and at temporary job sites of the licensee anywhere in the United States where the U.S. Nuclear Regulatory Commission maintains jurisdiction for regulating the use of licensed material.
- 11. A. Licensed material shall be used by, or under the supervision of, individuals designated by the Radiation Safety Committee, Joseph J. Matula, D.O., Chairman.
- B. The Radiation Safety Officer for this license is Jeff N. Evans.
- 12. The licensee shall not use licensed material in or on human beings or in field applications where activity is released except as provided otherwise by specific condition of this license.
- 13. The licensee may transport licensed material in accordance with the provisions of 10 CFR 71, "Packaging and Transportation of Radioactive Material."

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Information in this record was deleted in accordance with the Freedom of Information Act, exemptions 1, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100.

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F-44

**MATERIALS LICENSE
SUPPLEMENTARY SHEET**License Number
SUB-831Docket or Reference Number
040-07344

Amendment No. 24

14. Except as specifically provided otherwise in this license, the licensee shall conduct its program in accordance with the statements, representations, and procedures contained in the documents including any enclosures, listed below. The Nuclear Regulatory Commission's regulations shall govern unless the statements, representations and procedures in the licensee's application and correspondence are more restrictive than the regulations.
- A. Application dated April 26, 1989
 - B. Letter dated June 28, 1990
 - C. Letter dated March 24, 1992
 - D. Application dated February 25, 1993
 - E. Letter dated August 15, 1997
 - F. Letter dated July 17, 1998



For the U.S. Nuclear Regulatory Commission

*Original signed by Keith D. Brown*Date November 5, 1998

By

Keith D. Brown
Nuclear Materials Safety Branch 2
Division of Nuclear Materials Safety
Region I
King of Prussia, Pennsylvania 19406

November 5, 1998

Docket No. 040-07344
Control No. 125901

License No. SUB-831

Ken Johnson
Vice President
Communications and Power Center
Lockheed Martin Corporation
100 Campus Drive
Newtown, PA 18940

Dear Mr. Johnson:

This refers to your license amendment request. Enclosed with this letter is the amended license.

Please review the enclosed document carefully and be sure that you understand and fully implement all the conditions incorporated into the amended license. If there are any errors or questions, please notify the U.S. Nuclear Regulatory Commission, Region I Office, Licensing Assistance Team, (610) 337-5093 or 5239, so that we can provide appropriate corrections and answers.

Thank you for your cooperation.

Sincerely,

Original signed by Keith D. Brown

Keith D. Brown
Health Physicist
Nuclear Materials Safety Branch 2
Division of Nuclear Materials Safety

Enclosure:
Amendment No. 24

cc:
Jeff N. Evans, Radiation Safety Officer

ML10

K. Johnson
Lockheed Martin Corporation

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DOCUMENT NAME: G:\DNMS\DOCWORK\LICLTRL\SUB831.

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To receive a copy of this document, indicate in the box: "C" - Copy w/o attach/encl "E" - Copy w/ attach/encl "N" - No copy

OFFICE	DNMS/RI	N	DNMS/RI				
NAME	KBrown <i>KB</i>						
DATE	11/05/98		11/ /98		11/ /98		11/ /98

OFFICIAL RECORD COPY



MISSILES & SPACE : Valley Forge Operation
P.O. Box 8555, Philadelphia, PA 19101

July 17, 1998

Mr. John D. Kinneman, Chief
Nuclear Materials Safety Branch 2
US Nuclear Regulatory Commission, Region 1
475 Allendale Road
King of Prussia, PA 19406-1415

Subject: Amendment Application
re: License No. SUB-831
Docket No. 040-07344
Control No. 124711

Dear Mr. Kinneman:

Lockheed Martin Corporation hereby submits an Amendment Application on Form 313, with Attachments, for the purpose of changing the Management and primary use Site, the Radiological Safety Officer and several other matters for the Subject License. These changes are connected with facility consolidation and a change in the location of certain contract activity in the Delaware Valley. The Communications and Power Center (CPC) now manages and is the location for the radioactive material. The Application is also responsive to Region 1 staff comments for better describing the safety activities of the more-limited manufacturing activity involving only one type of source material.

Mr. Evans, the new RSO designate, is a member of the Environmental, Safety and Health Department of the recently-formed CPC located in Newtown, PA.

A check for the Application Fee (\$580) is being processed for mailing to the usual NRC address in St. Louis, MO.

If you have any questions regarding this Application, feel free to call the undersigned at 610-354-3840, or Mr. Evans at 215-497-1312.

Sincerely,

A handwritten signature in cursive script, appearing to read "John L. Andrews".

John L. Andrews,
Radiation Safety Officer

cc: J. Zimmerman, E. M. Wisser, J. N. Evans (CPC), K. Johnson (CPC)

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OFFICIAL RECORD COPY

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REC'D IN LAT JUL 22 1998

This is to acknowledge the receipt of your letter/application dated

7/17/98, and to inform you that the initial processing which includes an administrative review has been performed.

- There were no administrative omissions. Your application was assigned to a technical reviewer. Please note that the technical review may identify additional omissions or require additional information. *AMEND. SUB-831*
- Please provide to this office within 30 days of your receipt of this card

A copy of your action has been forwarded to our License Fee & Accounts Receivable Branch, who will contact you separately if there is a fee issue involved.

Your action has been assigned Mail Control Number 1 2 5 9 0 1
When calling to inquire about this action, please refer to this control number.
You may call us on (610) 337-5398, or 337-5260.

NRC FORM 532 (R)
(8-98)

Sincerely,
Licensing Assistance Team Leader

(7-88)
10 CFR 30, 32, 33
34, 35, 36, 39 and 40

Estimated burden per response to comply with this information collection request: 7 hours. Submittal of the application is necessary to determine that the applicant is qualified and that adequate procedures exist to protect the public health and safety. Forward comments regarding burden estimate to the Information and Records Management Branch (T-8 F33), U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001, and to the Paperwork Reduction Project (3150-0120), Office of Management and Budget, Washington, DC 20503. NRC may not conduct or sponsor, and a person is not required to respond to, a collection of information unless it displays a currently valid OMB control number.

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.

APPLICATION FOR DISTRIBUTION OF EXEMPT PRODUCTS FILE APPLICATIONS WITH:

DIVISION OF INDUSTRIAL AND MEDICAL NUCLEAR SAFETY
OFFICE OF NUCLEAR MATERIALS SAFETY AND SAFEGUARDS
U.S. NUCLEAR REGULATORY COMMISSION
WASHINGTON, DC 20555-0001

ALL OTHER PERSONS FILE APPLICATIONS AS FOLLOWS:

IF YOU ARE LOCATED IN:

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

LICENSING ASSISTANT SECTION
NUCLEAR MATERIALS SAFETY BRANCH
U.S. NUCLEAR REGULATORY COMMISSION, REGION I
475 ALLENDALE ROAD
KING OF PRUSSIA, PA 19408-1415

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

NUCLEAR MATERIALS LICENSING SECTION
U.S. NUCLEAR REGULATORY COMMISSION, REGION II
101 MARIETTA STREET, NW, SUITE 2900
ATLANTA, GA 30323-0199

IF YOU ARE LOCATED IN:

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

MATERIALS LICENSING SECTION
U.S. NUCLEAR REGULATORY COMMISSION, REGION III
801 WARRENVILLE RD.
LISLE, IL 60532-4351

ALASKA, ARIZONA, ARKANSAS, CALIFORNIA, COLORADO, HAWAII, IDAHO, KANSAS, LOUISIANA, MONTANA, NEBRASKA, NEVADA, NEW MEXICO, NORTH DAKOTA, OKLAHOMA, OREGON, PACIFIC TRUST TERRITORIES, SOUTH DAKOTA, TEXAS, UTAH, WASHINGTON, OR WYOMING, SEND APPLICATIONS TO:

NUCLEAR MATERIALS LICENSING SECTION
U.S. NUCLEAR REGULATORY COMMISSION, REGION IV
811 RYAN PLAZA DRIVE, SUITE 400
ARLINGTON, TX 76011-8084

040-07344

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 JURISDICTIONS.

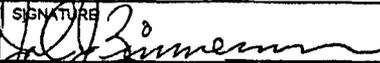
<p>1. THIS IS AN APPLICATION FOR (Check appropriate item)</p> <p><input type="checkbox"/> A. NEW LICENSE</p> <p><input checked="" type="checkbox"/> B. AMENDMENT TO LICENSE NUMBER <u>SUB - 831</u></p> <p><input type="checkbox"/> C. RENEWAL OF LICENSE NUMBER _____</p>	<p>2. NAME AND MAILING ADDRESS OF APPLICANT (include Zip code)</p> <p style="text-align: right;">*</p> <p>Lockheed Martin Missiles & Space P.O. Box 8555, Philadelphia, PA 19101</p>
--	--

<p>3. ADDRESS(ES) WHERE LICENSED MATERIAL WILL BE USED OR POSSESSED</p> <p>Lockheed Martin Corporation * See attachment if Application is approved, Two sites in Pennsylvania for detail concerning this block.</p>	<p>4. NAME OF PERSON TO BE CONTACTED ABOUT THIS APPLICATION</p> <p>Same *</p> <p>TELEPHONE NUMBER (610) 354-3840*</p>
---	---

SUBMIT ITEMS 5 THROUGH 11 ON 8-1/2 X 11" PAPER. THE TYPE AND SCOPE OF INFORMATION TO BE PROVIDED IS DESCRIBED IN THE LICENSE APPLICATION GUIDE.

<p>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.</p>	<p>6. PURPOSE(S) FOR WHICH LICENSED MATERIAL WILL BE USED.</p>
<p>7. INDIVIDUAL(S) RESPONSIBLE FOR RADIATION SAFETY PROGRAM AND THEIR TRAINING EXPERIENCE.</p>	<p>8. TRAINING FOR INDIVIDUALS WORKING IN OR FREQUENTING RESTRICTED AREAS.</p>
<p>9. FACILITIES AND EQUIPMENT.</p>	<p>10. RADIATION SAFETY PROGRAM Fee mailed to NRC @ St. Louis, MO</p>
<p>11. WASTE MANAGEMENT.</p>	<p>12. LICENSEE FEES (See 10 CFR 170 and Section 170.31) FEE CATEGORY 2C AMOUNT ENCLOSED \$580</p>

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, 36, 39 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.

<p>CERTIFYING OFFICER - TYPED/PRINTED NAME AND TITLE *</p> <p>Sal Capodici, VP, Valley Forge Operations</p>	<p>SIGNATURE</p> 	<p>DATE</p> <p>July 17, 1998</p>
---	---	----------------------------------

FOR NRC USE ONLY

TYPE OF FEE	FEE LOG	FEE CATEGORY	AMOUNT RECEIVED	CHECK NUMBER	COMMENTS
			\$		125901 JUL 22 1998
APPROVED BY				DATE	

Lockheed Martin Missiles & Space
Valley Forge Operations
Post Office Box 8555 Philadelphia, PA 19101
Telephone 610.354.1776 Facsimile 610.354.6090

LOCKHEED MARTIN



Salvatore C. Capodici
Vice President

February 25, 1998

To Whom It May Concern:

John Zimmerman, Director of Operations, Valley Forge Missiles & Space, is hereby authorized to sign on behalf of Lockheed Martin Missiles & Space for all Environment Health and Safety issues affecting the Lockheed Martin facility in King of Prussia, Pennsylvania: 230 E. Mall Boulevard. In the absence of written direction to the contrary, this authorization shall remain in effect through December 31, 1998.

A handwritten signature in cursive script that reads "S. Capodici". The signature is written in dark ink and is positioned above the printed name.

Salvatore C. Capodici
Vice President
Delaware Valley Operations

AMENDMENT SUBMITTAL DETAIL

Item No. 1: Application For Amendment

This Amendment Application is submitted for the principal reason of transfer of this License from the Valley Forge Operation (VFO) in King of Prussia, PA to the Communications and Power Center (CPC) in Newtown, PA. This Request follows the reduction of VFO radioactive source material use to just MgTh and the transfer of contract work involving MgTh to the CPC organization. The CPC and VFO are separate components within the Missile and Space organization of Lockheed Martin Corporation.

The Docket No. used most recently for this License is 040-07344.

Item No. 2: Name and Mailing Address of the Applicant

The Applicant shown on Form 313 is the current License holder. At the time of approval of this Amendment Application, the revised holder of this License is to be:

Communications and Power Center
Lockheed Martin Corp.
100 Campus Drive
Newtown, PA 18940

Also in the same vein, while this Application is submitted by Valley Forge management, the License Amendment is to be addressed to Mr. Ken Johnson, Vice President, at the above address.

Item No. 3: Address(es) For Use and Possession

Two sites are identified on this License Application; they are at Newtown and King of Prussia in Pennsylvania.

The Newtown, PA site is at 100 Campus Drive and is off PA State Route 332 as shown on Figure 1. The location of the two Lockheed Martin buildings and a separate Holy Family College facility at the site are shown in detail on Figure 2; our larger building is the Product Team Building and it is the site location for radioactive material storage and use.

This second site is the Valley Forge Space Center at 230 Mall Boulevard. This site is held in reserve for possible use. Appendix No. 1 details data supporting the release for unrestricted use of the Valley Forge source material use sites not previously cleared.

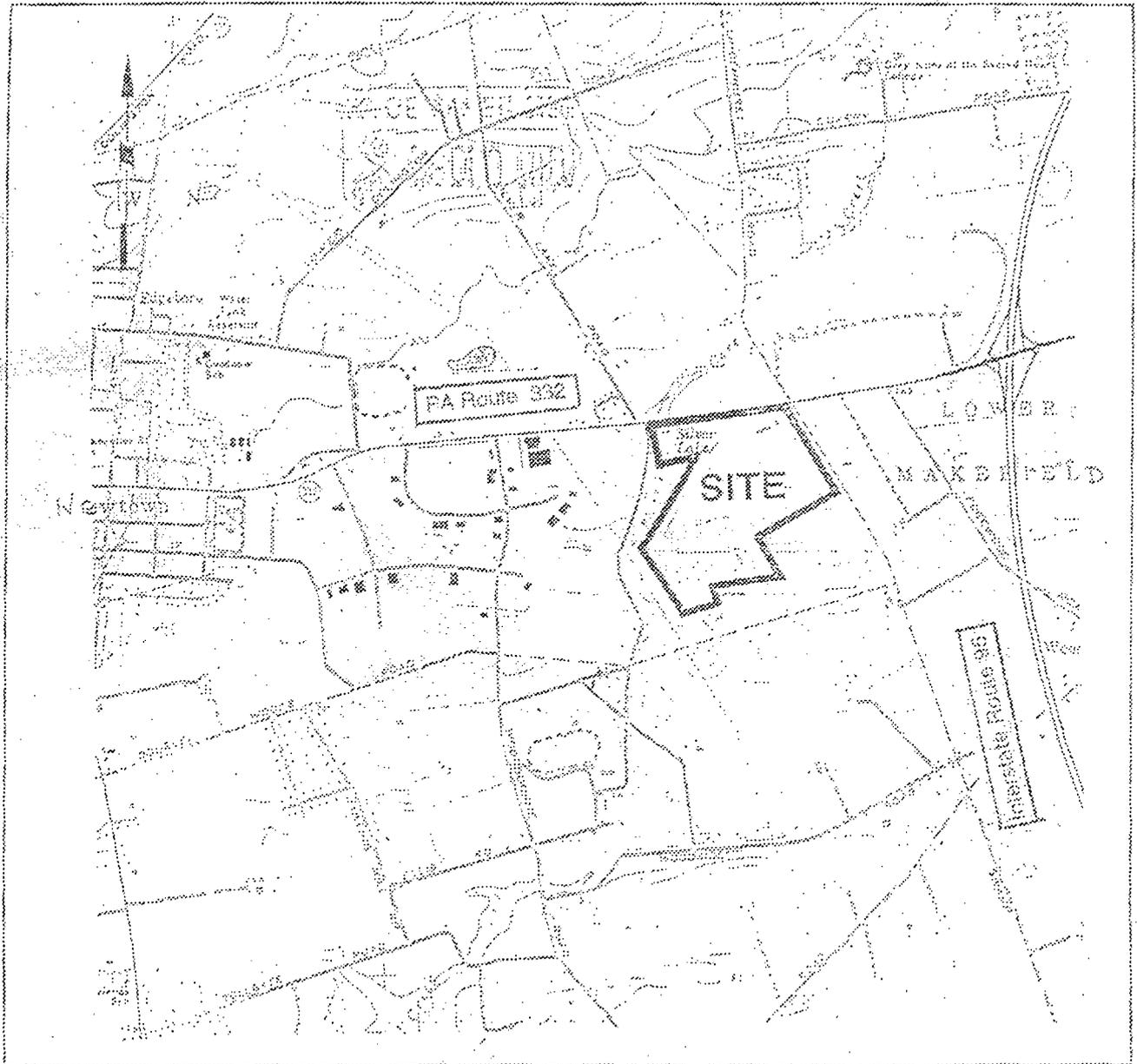
Item No. 4: Contact Person

The Applicant's Representative shown on Form 313 is the current RSO; at the time of approval of this Amendment Application, the revised holder of this License is to be Mr. Jeff N. Evans, RSO.

Mr. Evans address is:

Communications and Power Center, M/S 176
Lockheed Martin Corp.
100 Campus Drive
Newtown, PA 18940

Mr. Evans telephone number is: (215) 497-1312.



SCALE 1" = 2000'

Figure 1 - CPC Location Map



Figure 2 CPC Site Detail

Item No. 5: Radioactive Material

The requested radioactive source material is natural thorium in a quantity of 5 kg and a possession limit of 0.4 milliCurie. It is noted that the only source material to be used is thoriated- magnesium alloy metal which is 2% thorium by weight. This material consists of up to six hardware panels and a number of brackets and supports used as attachments for mounting equipment to the panels. Each of these hardware panels is about 4 by 7 feet in area, weighs about 40 pounds and has approximately 40 microcuries of activity.

Item No. 6: Purpose For Licensed Material Use

The purpose of possessing the material is manufacturing related to space programs.

The equipment on two (old) panels will be transferred to two new panels. Four of the panels may have minor machining performed, such as counter sinking of screw holes. Equipment mounting will be performed on each panel and then the operating equipment will be tested prior to shipment to another facility for assembly and test at the full spacecraft level. This work is scheduled for completion prior to the license expiration month of October 2000.

Item No. 7: Individuals Responsible For Radiation Safety And Their Experience

The Radiation Safety Officer will be Mr. Jeff Evans; he is a Staff Safety and Health Engineer in the Environmental Safety and Health (ESH) component at the CPC. Mr. Evans has considerable prior radiation safety experience as detailed in his resume in Appendix 2.

Mr. Todd Williams is the Deputy RSO; he is located at the Missiles & Space VFO in King of Prussia, PA. His resume is also shown in Appendix 2. The Deputy RSO will report to and perform duties as directed by the RSO, in a part-time capacity, while supporting other ESH duties at the VFO.

Mr. Andrews, the present RSO, is providing transition direction and assistance in the near term period.

Item No. 8: Training for Individuals Working in or Frequenting Restricted Areas

Training for individual employees who work in or frequent ionizing radiation (restricted) areas is accomplished through a combination of on-the-job instructions and formal classroom training. The classroom training takes one of several forms depending upon the risks of each workers specific activity:

Item No. 8: Training for Individuals Working In or Frequenting Restricted Areas, Continued

1. In the case of a worker doing assembly or test activity in the immediate vicinity of MgTh material, annual classroom training is provided. This training covers mandatory safety procedures and radiation, fire and magnesium concerns; it is conducted by the RSO or his approved representative in an in-house one hour session with specific instruction topics as detailed below.

2. In the case of ancillary individuals who frequent radiation source areas (but don't regularly control radiation sources), or managers of radiation areas/workers, there is an annual one-half hour class which covers highlights of regulations, terminology, radiation safety and mandatory procedures.

3. In the case of female radiation workers of child-bearing age, additional training materials are available on the risks of radiation exposure during pregnancy. The Plant Physician and/or the RSO would provide training relative to rules of notification, risks and practices. At present, there are no workers in this category.

Training coverage for the first two cases is detailed below:

Case 1: ANNUAL TRAINING FOR MGTH WORKERS
Class Outline

- I. Introduction: Hazards Identification and Work Overview
- II. Safety Considerations, Regulations and Handling
- III. Relevant Safety Procedures: Radiation, Exposure Monitoring, PPE and Resp. Prot.
- IV. MgTh Characteristics and Biologic Risks
- V. Key Program Elements: Safety, Contamination/Exposure Control Rules and Equipment, Decontamination and Disposal of Waste
- VI. Magnesium Fire Safety: Awareness, Rules and Methods
- VII. Radiation Exposure Limits (esp. external for our usages)
Terminology
ALARA
NRC-10CFR19 & 20
Lockheed Martin Policy
- VIII. Health Effects of Radiation Exposure
- IX. Radiation Levels
- X. Comparative Risks
- XI. Exposure Reduction: Time, Distance and Shielding

Item No. 8: Training for Individuals Working in, or Frequenting Restricted Areas, Continued

- XII. Procedures for emergencies, procurement, transfers
- XIII. Signage, dosimeters, record keeping, available help

Copy of the CPC Procedure for ionizing radiation and the training presentation are available to workers.

Case 2: RADIATION SAFETY TRAINING FOR ANCILLARY WORKERS
Class Outline

- I. LMC Operating Instruction Review/ Government Controls
- II. Definitions
 - Sources
 - Radiation Units
- III. Permissible Doses
 - Public
 - Radiation Workers
- IV. Procedures, licenses, approvals and audits
- V. Examples of Sources in use and storage at CPC
- VI. Protections
- VII. Monitoring and Record Keeping
- VIII. Health Risks of Various Events
- IX. Average Annual Doses from Various Sources in Community and Work

Copy of the CPC Procedure for ionizing radiation and the training presentation are available to workers.

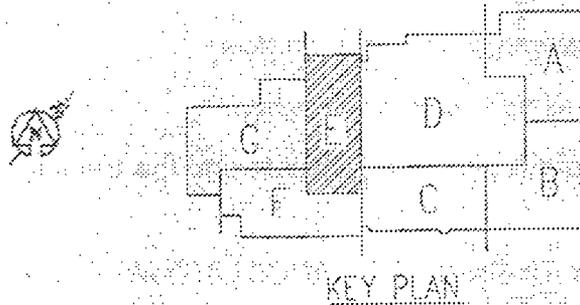
Item No. 9: Facilities and Equipment

9.1 Facility

At the Newtown site, Figures 1-2, the Product Team Building is the facility where MgTh (mounting panel) material will be stored, minor machining may be performed and the built-up panel (incorporating functioning hardware) will be tested.

The Product Team Building is a modern, two story structure combining factory and offices; the overall floor area is approximately 350K sq. feet. In Block layout, shown below, the MgTh will be located in Blocks E and F.

Item No. 9: Facilities and Equipment, Continued



Figures 3 and 4 detail the overall layouts of the two levels; some areas of the building are high bay which is floor to roof. The Block E area includes the Integration and Test High Bay room which is further detailed in Figure 5; this is where MgTh material is to be stored and where minor machining of MgTh material will be performed. The Block F area includes the Milsat Test Area (Room 179G) which is further detailed in Figure 6; this is where the built-up panel (incorporating functioning hardware) will be tested.

The Product Team Building and the areas detailed above contain high value equipment and product. There will be adequate continuous security for the safeguarding of the panels which incorporate the MgTh material; this security includes a guarded main building entry and security controls for access to each MgTh use area.

9.2 Radiation Safety Equipment

The basic radiation safety equipment to be utilized consists of survey instruments, personal protection equipment (PPE) and equipment for collection of MgTh waste. The survey instruments for this material (as well as other on-site x-ray radiography equipment) is a set of at least three survey meters; their characteristics are detailed in Table 9-1.

Item No. 9: Facilities and Equipment. (Text concluded)

Table 9.1 Basic Radiation Detection Instruments

<u>Type</u>	<u>Make & Model</u>	<u>Number Available</u>	<u>Radiation Detected</u>	<u>Scale Ranges</u>	<u>Window Thickness</u>
Gas Proportional Counter	Nuclear Measurements Corp. PC-55	1	Alpha Beta Gamma	0/99,000K counts	Window Flow Counter
Survey Meter	Victoreen Model 471	1	Alpha Beta Gamma	0/1, 3, 10, 30, 100 300 mR/hr and R/hr	0.6 mg/cm ² 500 mg/cm ²
Geiger Counter	Eberline Model E-520	2	Beta Gamma	.01/200 mR/hr	
Survey Meter	Ludlum Model 18	1	Alpha Beta	0/500,000 CPM	0.6 mg/cm ²

The PPE to be used during machining activity are disposable coveralls (with attached booties) and head covers, safety glasses, respirators and gloves. The respirators utilize HEPA filtration cartridges for airborne radionuclide collection. The equipment for fire protection includes Meta-L-X powder and/or Class D fire extinguishers. The equipment for waste collection includes a nitrogen-powered HEPA vacuum dust collection system and a 5 gallon step lid metal can for collection of debris and cleaning items.

9.3 Contamination/Leak Testing

Contamination testing of the panel work areas will be performed after completion of machining on each panel. Contamination surveys will be performed using swipes, and the Ludlum Model 18 meter with its alpha probe for in-place measurements. Swipe readouts will be either by approved outside vendors or using the PC-55 windowless proportional counter (located at the Lockheed Martin VFO facility in King of Prussia, PA). (The PC-55 is also used for leak testing of Gammacell irradiators at King of Prussia, on another NRC License held by the CPO).

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Item No. 10: Radiation Safety Program

10.1 General

Possession and uses of radioactive material under this license include the items permitted by NRC regulation, this particular License and Amendments thereto. The radiation safety program for this MgTh material at the CPC is a continuation of the one formerly maintained at the VFO facility.

It is the policy of the Lockheed Martin Corporation to keep ionizing radiation risks and personnel exposures as low as reasonably achievable (ALARA) and, in particular, below all levels detailed in existing regulations.

The Environmental Safety and Health (ES&H) function of the CPC administers the radiation safety program and is located in the Product Team Building. Administrative control is achieved through a mandatory procedure entitled "Ionizing Radiation Control" and contained in the site ES&H Manual. Mr. Jeff Evans, the RSO, is a member of this function and also performs other assigned ESH activities. The employees assigned to the MgTh panel manufacturing activities are members of the Engineering and Integration/Test functions; a majority of these current employees have prior work experience with MgTh material at the VFO Facility.

The RSO is responsible for overall license compliance and is the Secretary of the facility's Radiation Safety Committee (RSC). The RSC's Chairman is the Plant Physician (currently Dr. Joseph J. Matula, DO). The general duties of the RSC are to discuss and review all ionizing radiation activities, procedures and safety issues at the CPC, in accord with Lockheed Martin mandatory safety procedures. This MgTh work activity in particular, is an approved, mature use and as such will be operated under the direction of the RSO with annual review by the RSC.

The current RSC membership is as follows:

Status	Name	Title
Chairman	Joseph J. Matula, DO, FAAFP	CPC Plant Physician
Secretary	Jeff N. Evans	Radiation Safety Officer
Member	Todd J. Williams	Deputy Radiation Safety Officer
Member	Clare V. Tamman	Acting Mg'r., ESH
Member	Roman Herschitz, Ph.D.	Mg'r. Spec. Eng'g.
Member	Mark W. MacGregor	Payload Power Specialist
Member	John S. Daukas	Senior Staff Engineer

Resumes detailing training and experience with radioactive materials for each of the above individuals are presented in Appendix No. 2.

10.2 RSO Duties and Responsibilities

The duties and safety responsibilities of the Radiation Safety Officer (RSO) include:

1. Providing radiation safety direction, evaluation, assistance and currency of the authorizing license for activities involving radioactive sources.
2. Ensuring that the use of licensed material is by or under the direct supervision of individuals specifically identified in the license.
3. Radiation safety orientation, signage and training.
4. Ongoing evaluation of radiation hazards (radiation survey program).
5. Ensuring that all users (where appropriate) wear proper personnel monitoring equipment and protective equipment (PPE) when using, or frequenting the area of, licensed material.
6. Ongoing evaluation of radiation safety procedures (radiation inspection program).
7. Ensuring that licensed materials are properly secured against unauthorized removal at all times when not in use.
8. Management of radiation safety and material inventory records.
9. Ensuring that transfers and radioactive waste disposal are proper and in full compliance.
10. Providing periodic audit reports, status and guidance to management.

10.3 General Radiation Protection Plan

10.3.1 Radiation Safety Training

Radiation safety training is detailed above in Item No. 8 and is conducted on an annual frequency and as needed for workers and others new to the program.

10.3.2 Procedures for Manufacturing Operations with MgTh

As mentioned above, the manufacture and test of the spacecraft equipment panels employing MgTh is a mature program involving mainly seasoned employees. The equipment is a high value product and consequently written procedures cover each activity performed. At this point in time only limited and minor machining of MgTh is likely, such as countersinking of screw holes.

10.3.3 Personnel Radiation Badges

Landauer, Inc. is the certified vendor used for TLD badges; badges are issued on a quarterly cycle. Badges are assigned to those workers and visitors expected to be in close proximity to the MgTh panels for periods of four weeks or longer in a calendar quarter. (Measured dose rates for work activity on a panel are about 0.2 and 0.02 mR/hr, at a workers hands and body, respectively). Annual exposure records are provided to personnel, either at work or at the last address of record.

Any recorded personnel exposure of 50-mrem in one calendar quarter is cause for the RSO to perform an investigation of the causative circumstances.

10.3.4 Signage and Postings

The following signage is displayed at each MgTh use or storage area:

- a) NRC Form 3
- b) A "Caution Radiation Hazard" sign with a prominent trefoil radiation symbol.
- c) A "Radioactive Material Notice", see Figure 7.

The I&T High Bay has a segregated area about the North Panel work Area to exclude workers not assigned or trained for radiation work. The signage states (at two locations): "Caution Radioactive Material- Authorized Personnel Only".

10.3.5 Surface Contamination Levels

Contamination survey data on work surfaces shall establish that and record that, at the completion of machining on each panel, the fixed contamination level is below 1,000 dpm/100 cm² and the removable contamination level is below 200 dpm/100 cm² as measured with calibrated instruments.

10.3.6 PPE for Machining

The equipment detailed above (Item No. 9.2) is to be worn during each machining activity. At other times, since the MgTh is generally painted, no PPE is required.

10.3.7 Instrument Calibration

The survey meters and instruments used are calibrated on an annual basis, utilizing approved vendors such as RMC Calibration Services and Applied Health Physics.

10.3.8 Accident and Exposure Investigation

Any accidents involving MgTh activity are formally investigated and reviewed by the RSO and the RSC. Any quarterly badge exposure reading above 50 mrem is investigated by the RSO.

10.3.9 Program Self-Audit

The Radiation Safety Program is given an annual audit by the RSC and periodic, but less frequent, audit by a Corporate review panel. Monthly computer-generated compliance report forms are completed and reviewed by the ES&H Manager; these forms include many of the survey and other periodic activities performed by the RSO. The ES&H Manager's next higher manager is briefed annually on the Program.

10.3.10 Shipping and Receiving

The shipping and receiving areas shall have a sign indicating that the RSO be advised when there is any transfer of radioactive material. Each transfer is coordinated as to compliance with NRC and DOT requirements. Further detail is shown in Appendix 3.

10.3.11 Inventory

The inventory of accountable radioactive material is maintained and adjusted for transfers. On a semiannual basis the inventory is verified by a written report showing each item, its progress towards shipment and its location.

Item No. 11: Waste Management

All radioactive waste generated will be stored for shipment in the two waste collection containers and then transferred to the OPC's outdoor secured waste accumulation shed. Waste disposition will utilize a licensed radioactive waste processor.

RADIOACTIVE MATERIAL NOTICE

THE DSOS III SLEP PROJECT IN THIS AREA OF THE CLEAN ROOM HAS EQUIPMENT MOUNTED ON RADIOACTIVE METAL PANELS MADE OF MAG-THORIUM. THE THORIUM EMITS LOW LEVELS OF BOTH ALPHA PARTICLES AND GAMMA RAYS.

SAFETY TRAINING BY ES&H IS REQUIRED PRIOR TO WORK NEAR THESE BASE PLATES.

THE MAXIMUM GAMMA DOSE RATE AT CONTACT IS 0.5 MILLIREM/HR, DECREASING TO BACKGROUND AT THREE FEET FROM THE BASE PLATE.

ALPHA PARTICLES FROM THORIUM ARE AN INTERNAL LUNG AND INGESTION HAZARD. ALPHA CONTAMINATION/HAZARDS ARE AVOIDED BY VACUUM COLLECTION OF ALL MACHINING DEBRIS AND OTHER CONTROLS.

ES&H SURVEYS THE AREA FOR RADIOACTIVE CONTAMINATION.

COPIES OF ALL REGULATIONS, SAFETY PROCEDURES AND LICENSES ARE AVAILABLE FOR READING AT THE ES&H OFFICE.

JEFF EVANS, RAD. SAFETY OFFICER (RSO)

CPC PHONE NO.: 1812

REV. 2A

JUNE 29, 1998

Figure 7 Radioactive Material Notice

APPENDIX 1
DATA FOR RELEASE
OF
VALLEY FORGE
MGTH USE LOCATIONS

Appendix 1

Data for Release of Five Valley Forge MgTh Use Locations

1. Introduction

This Appendix details closeout surveys conducted upon, or after, completion of MgTh work or storage activities at the Valley Forge Space Technology Center in five areas. These areas are described as:

- Bldg. 800, Storage Room
- Bldg. 100, Room M6614
- Bldg. 100, Room M6405
- Bldg. 100, Room L9419
- Bldg. 100, Room M8613.

These surveys generally were wipe surveys looking for removable contamination due to either machinings or potential dispersion of 'surface reaction products'. Wipes were read locally using a calibrated windowless proportional counter, NMC Model PC-55. Since liquids were not used, flooring activation was not a concern and flooring was 'impervious' there was no technical reason to assess levels of non-removable radioactivity. Where mention is made of vacuuming, the vacuum was nitrogen gas powered with HEPA filtering and the trapped waste is segregated for removal as rad waste.

2. Bldg. 800, Storage Room

This room, partially exposed to the weather since it had an imperfectly fitting door to the outside, was used for storage of a stack of paper-wrapped MgTh plates for a period of about two years in the early 1990's. Wipes of three locations on the floor were taken on Sept. 1, 1993 at the time of relocation of this raw stock to another area. The counting results were as follows: no alpha counts and beta/gamma counts at background level. These results yield a maximum of 5 alpha and 19 beta/gamma dpm/100 cm² and support the conclusion that the area is releasable. It is noted that Bldg. 800 is slated for demolition as it is in the way of a planned road development.

3. Room M6614

This room, nominally called the Final Assembly Room, had been used, starting in about 1980 and ending in the summer of 1997, for final assembly and modification work on all spacecraft employing MgTh material. In particular, this work had been done in the northeast third of the room and five wipe samples were taken at eight scattered floor locations. The results were as follows: 1 alpha count was measured on one wipe and the others registered zero; 4 beta/gamma counts above background on two wipes and the others registered lower counts. These results yield a maximum of 8 alpha and 30 beta/gamma dpm/100 cm². Based upon these results being below the releasable/action levels shown in the 1993 NRC's 1993 Decontamination Guidelines

document, the area is considered releasable. The area was vacuumed one final time and is being outfitted for a new use on the existing flooring.

4. Room M6405, the Komo Milling Machine Room

This room contained a large milling machine which was used twice in 1997 to rework DSCS North Panels due to their 4 ft. by 7 ft. dimensions. For each rework operation plastic sheeting was used, in addition to continuous vacuuming of the cuttings, to minimize the entrapment of MgTh shavings in hard-to-reach locations. Finally, extensive vacuuming of the machine and its work area, followed by wipe surveys, concluded the rework. The set of 12 wipes taken after the second rework had readings of 8 or less alpha dpm/100 cm² and beta/gamma readings at about background level..

Subsequently, in March 1998, a Laidlaw Environmental subcontracted work crew did a removal of all furniture and supplies and then a full decontamination of oils and all machinings residues in the room and then as the machine was disassembled for transfer. At that time, a calibrated Ludlum Model 18 Survey Meter with a thin waffle-window alpha detector (Model 43-5) was used to survey the entire area and all piles of debris. The result was that all readings were below 20 cpm which equates to below the 130 dpm/100 cm² level. Since then the room has been used for storage activities.

5. Room L9419, Bridgeport Milling Machine Area

This room contained a Bridgeport Milling machine which was used in 1997-1998 for the rework of two equipment brackets made of MgTh metal; these reworks involved two man crews with one person performing continuous vacuuming cleanup. Both cleanups of this machine were checked with wipes. The count of the second set of 6 wipes gave these results: 1 alpha count was measured on one wipe and the others registered zero; 19 beta/gamma counts above background on one wipe and the others registered lower counts. These results yield a maximum of 5 alpha and 94 beta/gamma dpm/100 cm² and are below the releasable limits. The room is being cleared for other uses.

6. Room M8613 Last DSCS North Panel Assembly Area

This room was used for assembly activity after the two above panel reworks. Each activity included minor machinings such as hole counter-sinkings and rough edge filings followed by cleanup including vacuuming. The activity was completed by reinstallation of electronics and other equipment for a communications payload. The final wipe tests for removable contamination sampled 6 different floor spots. The readings were as follows: 1 alpha count was measured on one wipe and the others registered zero; 6 beta/gamma counts above background on one wipe and the others registered lower counts. These results yield a maximum of 5 alpha and 31 beta-

/gamma dpm/100 cm² and are below the releasable limits. The room was then revacuumed and has been cleared for other laboratory uses.

APPENDIX 2
RESUMES
OF
INDIVIDUALS
RESPONSIBLE FOR RADIATION SAFETY

LOCKHEED MARTIN



APPENDIX NO. 2

**Resumes
of the
RADIATION SAFETY COMMITTEE**

July 1998

Lockheed Martin Corporation
Communications and Power Center
100 Campus Drive
Newtown, PA 18940

Resume

Joseph J. Matula, DO, FAAFP
Plant Physician
AstroSpace East Windsor, NJ & CPC Newtown, PA

A. Education

Loyola Univ. of Chicago
BS in Biology

Chicago Coll. of Osteopathic Med.
Doctor of Osteopathy (DO)
Internship Certification

Rush Med. Coll., Chicago, IL
Residency Training Certificate

B. Experience

- Lockheed Martin Corp., East Windsor, NJ (October 1995 to present & CPC Newtown, PA (July 1996 to present) Plant Physician

Active part-time practice of Occupational and Industrial Medicine. Performs physical examinations. Implements and maintains procedures for examining, treating and treatment referrals of employees injured at work. Implemented comprehensive Workers' Compensation Management Program which resulted in 4.3 million man hours without a lost work day due to injury.

- Emergency Physician Assoc., P.A., Woodbury, NJ Ass't. Div. Director, Kennedy Mem. Hospital/Univ. Med. Center-Stratford Div. (1990-1991), R. Wood Johnson Univ. Hospital, Hamilton, NJ (1991 to present)

Active clinical practice of emergency medicine. Assured adequate staffing and scheduling of Emergency Physicians. Supervised and taught medical students and interns. Developed quality assurance procedures for patient chart reviews and Physician peer reviews. Resolved patient care and satisfaction issues. Performed sexual assault examinations and served as expert witness in criminal cases.

- East Coast Emergency Physicians, P.A., Stratford, NJ Ass't. Div. Director (1989-1990)

Active clinical practice of emergency medicine. Assured adequate staffing and scheduling of Emergency Physicians. Supervised and taught medical students and interns.

- USAF Clinic, McGuire AFB, NJ Chief and Major, Clinic Services (1985-1989)

Resume for Joseph J. Matula, DO concluded

Full time clinical practice to active and retired USAF community. Officer in charge of Radiology and Pharmacy. Rewrote five medical policy and procedure manuals. Performed examination, counseling and referrals for HIV-positive patients.

C. Specific Isotope/X-Ray Experience

Completed military medical radiation exposure training and radiation disaster training.

D. Associations

Fellow, American Academy of Family Physicians

American Medical Association

American College of Emergency Physicians

New Jersey Academy of Emergency Physicians

American Academy of Physician Specialists

American College of Occupational and Environmental Medicine

E. Licensure and Certifications

Medical Licenses in New Jersey and Pennsylvania

Basic Life Support, AHA

Advanced Cardiac Life Support Provider, AHA

Advanced Pediatric Life support Provider, AHA-AAP

Advanced Trauma Life Support Provider, ACS

Physician's Recognition Award for Continuing Medical Education, AMA

Meritorious Service Medal, USAF

Resume

Jeff N. Evans
Staff Safety and Health Engineer, RSO
Environmental, Safety & Health Component
Communications and Power Center, Newtown, PA

A. Education

BS - Occupational Safety and Industrial Hygiene Management; Millersville University, Millersville, PA

MS - Environmental Health Science; Temple University, Philadelphia, PA
Health Physics; Spring Semester, 1995 (2 credits).

Instruction on operation of radiation survey instruments, theory of ionizing and non-ionizing radiation, in depth review of the NRC regulations, radiation safety program development for effective protection of radiation workers.

Radiation Safety - American University, Washington, DC
Physics Department - Dr. Romeo Segnan.

Instruction covered review of scintillation counting for P-32; S-35, performing a contamination survey for beta emitters, sealed source leak surveys, radiation survey instrumentation, theory of ionizing radiation and NRC regulations.

Radiation Safety and Control Services, Inc. Stratham, NH
RSO Training Certificate 1998

B. Experience

- Lockheed Martin Missiles and Space, Communications and Power Center. Newtown, PA (Started July 1997)
Staff Safety and Health Engineer

Coordination of safety and Health activities; Deputy RSO for MgTh Source materials used in assembly and test activity.

- Lockheed Martin Missiles and Space, East Windsor, NJ
Staff Safety and Health Engineer

Coordination of X-ray safety and permit program, TLD personnel badge program. Coordination of annual IRAG meeting for review of Radiation Safety Written Program. Prime activity was in industrial hygiene and safety engineering. 1.5 years experience.

Resume for Jeff N. Evans, concluded

B. Experience

- American University, Washington, DC
Associate Radiation Safety Officer.

Performed contamination surveys in University laboratories for phosphorous-32 and sulfur-35 (sequencing gels) and performed leak checks on sealed sources: Cobalt-57, Cobalt-60. Coordinated Radiation Waste Disposal Program for P-32 and S-35. Coordinated Radiation Safety Committee meetings on a quarterly basis. 4 years experience.

C. Certifications

American Society of Safety Engineers, Certified Safety Professional (CSP)

D. Associations

American Society of Safety Engineers
American Industrial Hygiene Association

Resume

Todd J. Williams
Industrial Hygienist , Deputy RSO
Environmental Health & Safety Component
Valley Forge Operation, King of Prussia, PA

A. Education

Temple University, College of Engineering, Philadelphia, Pennsylvania.
MS in Environmental Health in progress, with a concentration in Industrial Hygiene,
including radiological health (Expected August 1998).

BS Occupational Safety and Hygiene Management
Millersville University, Millersville, Pennsylvania.

Radiation Safety and Control Services, Inc. Stratham, NH
RSO Training Certificate 1998

B. Experience

- Lockheed Martin Corp., Valley Forge Operation, King of Prussia, PA.
Industrial Hygienist (July 1996-Present)

Implements and develops safety/industrial hygiene training: confined space, lockout/tagout, hazcom, respiratory, hearing conservation, non-ionizing radiation, asbestos, and others. Review engineering standard operating procedures for test and manufacturing. Develops and documents industrial hygiene monitoring, ventilation surveys, ergonomic assessments, and process hazard reviews. Provides counsel to management and staff on industrial hygiene/safety related issues. Member of emergency and hazardous material response teams. Participates in construction, renovation, and demolition team meetings to ensure safety compliances.

- Galson Consulting, Plymouth Meeting, PA.
Industrial Hygienist (August 1993-July 1996).

Provided industrial hygiene monitoring for a variety of clients. Assignment included a sixteen month contract working with the safety/industrial hygiene staff at a Mobil R&D facility and a three month assignment working with safety and health staff members at a Mobil refinery. This last assignment included radioactive contamination swipe tests and use of a Geiger counter.

Also there was an eight month assignment at Lockheed Martin Corp., King of Prussia performing as an EH&S staff member and a separate activity for the conduction of industrial hygiene samplings at six General Electric Aircraft Engine facilities.

Resume for Todd J. Williams, concluded

- Lancaster Malleable Castings Company, Lancaster, PA. (Internship)
Safety & Hygiene Specialist

This internship included activity in ergonomic assessment, industrial hygiene sampling, design of an industrial vehicle safety program and safety training.

C. Specific Isotope/X-Ray Experience

Assisted RSO in collecting and counting of swipes, surveys of MgTh product dose rates and collection of radioactive waste for turnover to a processor.

D. Associations

- The American Industrial Hygiene Association (AIHA)
- The American Society of Safety Engineers
- Temple University AIHA Student Chapter Secretary

Resume

Clare V. Tamman
Acting Manager, Environmental, Safety & Health Department
Communications & Power Center (CPC), Newtown, PA

A. Education

Environmental Studies, BS, Rutgers University
OSHA training, 40 hours
DOT HM-181/126F Training
Life Safety training, NFPA

B. Experience

- Environmental, Safety & Health Department, CPC, Newtown, PA (Jan. 1997 to present)
Acting Manager

Responsibilities include all aspects of environmental, safety and health control, compliance and performance for a 1300 person new manufacturing facility; includes compliance with hazardous waste and water discharge regulation.

- LMMS ESH Department, East Windsor/CPC (1995-1997)
Staff Environmental Engineer

Emphasis on hazardous and water waste management issues and related procedures development and training of staff. Supported resolution of safety issues resulting in major reduction of recordable injury rate. Developed strategy for facility closure remediation and managed its budget. Coordinated environmental permitting for new CPC facility and prepared applicable procedures.

- Clayton Environmental Consultants, Inc. Edison, NJ (1992-1995)
Environmental Consultant

Consulting services, for multiple clients, encompassing environmental assessments, management plan preparation, permitting and auditing. Project management duties included proposal writing, budgeting and subcontractor reviews.

- CFM Environmental Services, Inc. Somerville, NJ (1989-1992)
Regulatory Specialist

Support group leader to design engineers for environmental issues.

Resume

Robert A. Gigliuto
Staff Design Engineer
Specialty Department, CPC, Newtown, PA

A. Education

Physics, BA, State Univ. of New York, Potsdam
Physics, MS, Clarkson Univ., Potsdam, NY

B. Experience

- Lockheed Martin Corp. Newtown, PA (1997 to present)
Staff Design Engineer

Coordinates radiation testing of electronic parts in gamma ray, cosmic ray and flash x-ray environments. Performs space radiation environment modeling and shielding analyses.

- Lockheed Martin Corp. King of Prussia, PA (1991-1997)
Staff Design Engineer-EOS-AM Spacecraft

Performed space radiation and radiation effects studies for spacecraft design. Directed contamination, electrostatic discharge, EMI/EMC, parts engineering and meteoroid engineering design/analysis activity. Conducted heavy-ion testing at Brookhaven Nat'l. Lab to simulate cosmic ray effects in space.

- Kaman Sciences Corp., Alexandria, VA (1989-1991)
Scientist

Supported survivability studies for strategic systems and advanced weapon lethality studies. Assessed survivability capability of spacecraft surface materials undergoing test on NASA's LDEF space mission.

- General Electric Co., King of Prussia, PA (1984-1989)
Survivability Physicist

Performed evaluations of spacecraft materials in nuclear, laser and particle space weapon environments. Performed spacecraft shielding analyses for proposal and on-contract design studies. Developed and implemented threat hardening concepts. Analyzed and reported on materials studies performed at underground nuclear device explosions at the Nevada Test Site.

C. Associations

- International Electronic and Electrical Engineers
- American Physical Society (former member)

Resume

Roman Herschitz, Ph.D.
Manager, Specialty Engineering Department
CPC, Newtown, PA

A. Education

Physics/Mathematics, BS, City Univ. of New York
Materials Science/Physics, MS, Cornell Univ., Ithaca, NY
Materials Science/Engineering, Ph.D., Cornell Univ., Ithaca, NY

B. Experience

- Lockheed Martin Corp. CPC, Newtown, PA (1996 to present)
Manager, Specialty Engineering Department

Manages department responsible for survivability engineering (radiation and laser), reliability engineering and advanced process development in support of RF and power subsystem components. Manages Radiation Effects Laboratory (Valley Forge facility) used for testing of ionizing dose and dose-rate response of electronics parts and circuits, and materials. Led successful team for \$ 2M RF technology study proposal to NASA.

- Lockheed Martin Corp. (and predecessors), Astro Space Div., East Windsor, NJ (1983-1996)
Senior Staff Engineer

Performed and guided radiation effects, EMI/EMC, materials and process engineering on multiple NASA spacecraft programs. Performed R & D on controls and thin film materials for reducing and eliminating ESD in spacecraft designs. Designed and implemented new ESD detector for spacecraft. Directed proposal and contract for laser weapon response methodology. Active in R & D of RF superconducting materials and devices.

- Rutgers Univ. and The College of New Jersey (1984-1989)
Adjunct Faculty Member

Taught courses in materials science and engineering technology.

- Cornell Univ., Ithaca, NY (1977-1983)
Research Assistan

Researched in area of radiation effects on materials and devices; activity involved handling of reactor-irradiated samples. Taught college-level courses in materials science and engineering.

Roman Herschitz, Ph.D., Resume concluded

C. Associations

American Institute of Aeronautics and Aerospace
International Electronic and Electrical Engineers
SAMPE

D. Awards, Patents & Publications

Dean's List, Magne Cum Laude Graduate
GE Engineering Excellence Team Award

3 U. S. Patents

40 technical paper publications- covering wide range of engineering studies

Resume

John S. Daukas
Chief Engineer, DSCS Communications Subsystem
CPC, Newtown, PA

A. Education

Electrical Engineering, BS, Drexel Univ., Philadelphia, PA

B. Experience

- Lockheed Martin Corp. CPC, Newtown, PA (1997 to present)
Chief Engineer, DSCS Communications Subsystem

Responsible for design, manufacture and test of RF subsystem upgrade.

- Lockheed Martin Corp. VF Operation, King of Prussia, PA (1986-1997)
Senior Staff Engineer

Responsible for RF Communications Payload integration and test. Led design, development and production of a GHz RF Receiver, MIC microwave amplifiers and 2 to 60 GHz RF components using HEMT technology. Supported test software design for on-orbit testing of RF subsystems.

- Bendix Field Eng'g. Corp., Columbia and St. Inigoes, MD (1985-1986)
Field Engineer

Performed installation and repair of LAMPS Data and Telemetry receiver.

- Naval Air Development Center, Warminster, PA (1982-1985)
Electrical Engineer

Designed and qualified test equipment for airborne missiles and performance measurement electronics. Researched RPV systems concepts. Evaluated radar counter system and test results.

C. Patent

US Patent No. 5,525,945: Dielectric Resonator Notch Filter

Resume

Mark W. Macgregor
Payload Power Specialist
CPC, Newtown, PA

A. Education

Burlington Comm. College, Wrightstown, NJ
Electronic Tech., Assoc. Degr., PENNCO Technical Institute, Bristol, PA
Electronics Diploma, Fort Gordon Signal School
Gen'l. Studies, Georgia Military College, Fort Gordon, GA

B. Experience

- Lockheed Martin Corp., CPC and Astro Space, Newtown, PA and East Windsor, NJ (1990 to present)
Payload Power Specialist

Responsible for corona, PIM and multipaction testing of RF components; multipaction tests involve handling and use of small Cs-137 radioactive sources. Wrote specs and designed RF test equipment. Supervises technicians in RF test operations. Designed a ring resonator to increase TWTA peak power. Evaluated TWTA performance.

- General Electric Co., Valley Forge and Philadelphia, PA (1985-1990)
RF Senior Electronic Technician

Performed tuning and testing of RF components for communications and arming/fusing subsystems. Trained and supervised technicians in computer-based testing.

- Booze-Allen & Hamilton, DAL Div., Huntington Valley, PA (1984-1985)
Specification Writer

Provided technical support to use of specs and drawings. Supported definition of procurement requirements.

- US Army, Fort Gordon, GA (1979-1983)
Strategic Microwave Systems technician (Enlisted)

Provided technical support of documentation for equipment maintenance.

C. Awards

Honorable Discharge, US Army

APPENDIX 3

PROCEDURES FOR
RECEIPT AND SHIPMENT
OF
RADIOACTIVE MATERIAL

**COLLECTED
OPERATING PROCEDURES
FOR
RECEIPT AND SHIPMENT
OF
RADIOACTIVE MATERIAL (RAM)**

ISSUE: REV. 1

JUNE 1998

**PREPARED BY
JOHN L. ANDREWS and JEFF EVANS
RADIATION SAFETY OFFICERS (RSO)**

**CONCURRED BY
JOHN DOMANICO AND JOSEPH BANGLE
MANAGERS, TRAFFIC**

**COMMUNICATIONS AND POWER CENTER (CPC)
NEWTOWN, PA**

AND

**VALLEY FORGE OPERATION (VFO)
KING OF PRUSSIA, PA**

LOCKHEED MARTIN MISSILES & SPACE

TABLE OF CONTENTS

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1	Introduction
2	Ordering Radioactive Material
3	Receipt and Examination of Radioactive Material
4	Labeling of Radioactive Material Shipments
5	Shipment of Radioactive Material
	Attachments

1.0 Introduction

This document is a compilation of procedures for the ordering, receipt and shipment of radioactive materials (RAM) which meets the requirements of the several federal sets of regulations (Nuclear Regulatory Commission, Department of Transportation, etc.) and Section 6.21/6.14 of the VFO/CPC EHS Procedures. Each procedure is a detailed "how to do" so the job is done correctly, safely for personnel and avoiding contamination of property.

Suggestions or comments for change should be directed to the Radiation Safety Officer.

Copies of this document are maintained by the Manager of Traffic, the Manager of EH&S and the RSO.

2.0 PROCEDURE for Ordering Radioactive Material

2.1 Each Material Request for radioactive material must be marked as RADIOACTIVE.

2.2 All purchase orders for radioactive materials must have the RSO approval before any order is placed. This is to ensure that all safety requirements and possession limits are complied with.

2.3 In other circumstances where these items are transferred into this facility (a loaned source, the return of a source from a customer, etc.), the RSO approval must be secured before the item is shipped.

2.4 The RSO may have to receive the approval of the NRC or the prior to approval of a purchase or transfer.

2.5 The RSO completes the "Certification of Authorization to Receive Radioactive Materials" form (see Attachment). The original accompanies the purchase order, or is sent to the transferee in other instances.

2.6 Radioactive Materials must be shipped to the attention of the RSO; further, the RSO is the designated receiver for radioactive material deliveries and is the person required to check packages within a mandated time limit..

3.0 Procedure for Receipt and Examination of Radioactive Material

3.1 Radioactive material is only to be accepted during normal Receiving Department work periods unless prior arrangements have been made.

3.2 Radioactive material is to be immediately segregated in the closed receiving area. This minimizes any unknown hazard to personnel and provides security against unauthorized removal or the spread of radioactive contamination at all times.

3.3 The RSO is to be immediately notified upon delivery of radioactive material.

3.4 RSO's:

The CPC RSO is Jeff Evans; his phone extension is 1312 and he is located in PTB Room 176. His home phone number is (b)(6)

The VFO RSO is Todd Williams; his phone extension is 4-1918 and he is located in Room UU6101. His home phone number is (b)(6)

3.5 The RSO has responsibility to inspect the condition of the package within 3 hours of receipt. The inspection consists of surface contamination measurements, measurement of leakage dose rates and examination of appearance, documentation and labeling.

3.6 The RSO opens the package to inspect the contents, wearing gloves as appropriate and inspecting as above for contamination and dose rates at the contents level. This step may involve the recipient for various reasons such as ESD handling procedures, etc.

3.7 If the RSO establishes the package and contents are acceptable in terms of radiation safety, he processes it into our inventory records (see attachment for form) and transmits any required receipt to the sender.

3.8 After reviewing his findings, the RSO contacts the recipient to take custody of the package

3.9 Notice is posted in the Receiving Dock Area summarizing this Procedure (copy reproduced here).

NOTICE

FOR ALL RADIOACTIVE MATERIAL DELIVERIES

- SEGREGATE PACKAGE IN CLOSED AREA
- IMMEDIATELY NOTIFY THE RADIATION SAFETY OFFICER (RSO).
CPC: JEFF EVANS, EXT.: 1312, PTB 176
VFO:TODD WILLIAMS, EXT.: 4-1918,U6101
- RSO WILL INSPECT FOR CONDITION AND, IF ACCEPTABLE PROCESS PRIOR TO HANDOFF TO RECIPIENT
- FULL PROCEDURE IS MAINTAINED IN TRAFFIC MANAGERS OFFICE

ISSUED 6/98, RSO

4.0 Labeling of Radioactive Material Shipments

4.1 Packages of radioactive materials being prepared for shipment require standard and distinctive labeling per Department of Transportation (DOT) regulations. This aids personnel who may be involved at any point in the shipment route to provide special handling. This is because radioactive materials are considered hazardous and the label is used to avoid harm to the public and other cargo goods.

This labeling is in addition to proper packaging, other required vehicle and package markings and shipping papers.

4.2 DOT Regulation 49 CFR 172.400 has the following label requirements:

- a. A "Radioactive White-I" label must be affixed to each package measuring 0.5 mrem or less per hour at each point on the external surface of the package.
- b. A "Radioactive Yellow-II" label must be affixed to each package measuring more than 0.5 mrem per hour but not more than 50 mrem per hour at each point, and not exceeding 1.0 mrem per hour at 3 feet from each point on the external surface of the package.
- c. A "Radioactive Yellow-III" label must be affixed to each package measuring more than 50 mrem per hour but not more than 50 mrem per hour at each point, exceeds 1.0 mrem per hour at 3 feet from each point on the external surface of the package or contains a "highway route controlled quantity" of radioactive material.
- d. Each package to be labeled must have labels affixed to two opposite sides of the package.
- e. Blank spaces on the labels must be completely filled in as required using a durable weather resistant means of marking. The information included includes 'contents', 'activity' in Bequerels and the 'Transport Index'.

4.3 Further guidance and direction can be provided by the RSO.

5.0 Shipment of Radioactive Material

- 5.1 Proper packaging, other required package markings and shipping papers are required to provide safety in shipment of radioactive materials since they are considered hazardous goods. Direction to perform this is per Department of Transportation (DOT) regulations as interpreted by the Manager of Traffic assisted by the RSO.
- 5.2 The RSO must be involved in examination of outgoing goods and completion of changes to inventory records, paperwork accompanying the shipment, labeling (see above) and checking that the receiver is authorized by license to receive the goods (see attachment: Certificate of License Verification).
- 5.3 Carriers must be notified in advance of carrying radioactive goods and be willing to accept same for transport.
- 5.4 In the case our drivers transport radioactive materials there are special training and record keeping requirements; see EH&S for details.
- 5.5 In the case our vehicles are used for transport there are special requirements; see the Manager of Traffic for details.

ATTACHMENTS

RADIOACTIVE MATERIALS: SHIPMENT/RECEIPT

To: _____

From: _____

Shipment No.: _____

Security Classification: _____

Mode of Shipment: _____

No. of Containers: _____

No. of Items: _____

Description: _____

Hazard Class: _____

Name; ID. No.: _____

WEIGHT (KG): _____

Volume (liters): _____

Isotope: _____

Form: _____

mR/hr at Surface: _____

mR/hr at One Meter: _____

Activities (Bq): _____

A1/A2: _____

Label: _____

SMEAR No.: _____

From: _____

To: _____

The above described articles are properly classified, packaged, marked, and labeled. The articles are in proper condition for transportation, and the spreadable activity, and dose rates are within the specified limits, as prescribed by the DOT regulations.

This package conforms to the conditions and limitations specified in 49 CFR 173.421 for the excepted radioactive material, limited quantity, N.O.S., UN2910.

SPECIAL PRECAUTIONS: _____

REMOVABLE ACTIVITY (DPM/SMEAR): _____

Radiation Safety Officer

Date

RAD HS #



**CERTIFICATION OF AUTHORIZATION
TO RECEIVE RADIOACTIVE MATERIALS**

This certifies that Lockheed Martin Missiles & Space, Valley Forge, is authorized to receive, possess and use the radioactive materials listed below according to the provisions of license number: _____ which expires _____.

MATERIAL	FORM	QUANTITY
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____

All radioactive materials are to be shipped to the attention of the undersigned at the following address:

Attention: Radiation Safety Officer
Lockheed Martin Missiles & Space
230 Mall Boulevard
King of Prussia, PA 19406-2995

100 Campus Drive
Newtown, PA 18940

Radiation Safety Officer

Date

Distribution: Original, accompanies Purchase Order or sent to transferor
Copy #1, Radiation Safety Officer
Copy #2 Radioactive Material Requester

NRC INFORMATION NOTICE 92-72

EMPLOYEE TRAINING AND SHIPPER REGISTRATION
REQUIREMENTS FOR TRANSPORTING RADIOACTIVE
MATERIALS

(Not supplied in copy for the NRC is the
Information Notice 92-72)

(FOR LFMS USE)
INFLUENCE INFORMATION FROM LTS

TWEEN:

License Fee Management Branch, ARM
and
Regional Licensing Sections

Program Code: 11300
Status Code: 0
Fee Category: 2C
Exp. Date: 20001031
Fee Comments:
Decom Fin Assur Req'd: Y

LICENSE FEE TRANSMITTAL

1. REGION

I

APPLICATION ATTACHED

Applicant/Licensee: LOCKHEED MARTIN CORPORATION
Received Date: 980722
Docket No: 4007344
Control No.: 125901
License No.: SUB-831
Action Type: Amendment

2. FEE ATTACHED

Amount: _____
Check No.: _____

3. COMMENTS

Signed *M. A. Perkins*
Date *7/22/98*

B. LICENSE FEE MANAGEMENT BRANCH (Check when milestone 03 is entered /_/_/)

1. Fee Category and Amount: *2C* *\$ 580*

2. Correct Fee Paid. Application may be processed for:

Amendment _____
Renewal _____
License _____

3. OTHER _____

Signed _____
Date _____

Log	<i>July 10</i>
Remitted	
Check No.	<i>R183784</i>
Amount	<i>\$580</i>
Fee Category	<i>2C</i>
Fee Code	<i>AMB</i>
Date Entered	<i>8/6/98</i>
Date Entered	<i>8/2</i>
By:	

I (98)