

SPACE OPERATIONS

P.O. BOX 707
BRIGHAM CITY, UT 84302-0707
801-863-3511

THIOKOL
AEROSPACE & INDUSTRIAL TECHNOLOGIES

February 25, 1997
A912-FY97-DRT-M042

Christopher Brown
United States Nuclear Regulatory Commission
M/S T8F5
2 White Flint North
11545 Rockville Pike
Rockville, Maryland 20852

Dear Mr. Brown:

Enclosed is requested information from Thiokol Corporation. This is in response to your verbal request in early February, regarding specific information about materials listed on Registration Certificate Number NR275-S-101-S, which was transferred to Morton Thiokol Incorporated in March, 1986, under Utah Bureau of Radiation Control (UBRC) License #UT 0200113. The materials specifically referenced on the Registration Certificate, and the subsequent UBRC License, were Electron Tubes, containing either 40 microcuries (μ Ci) of Nickel-63 or 85 microcuries of Carbon-14. Enclosed are diagrams of the devices in which the Electron Tubes are found. For clarification purposes, Thiokol (or Morton/Thiokol as the company was known previously) Corporation has been neither a manufacturer nor producer of the electron tubes under evaluation. The company has served as a testing, storage and transfer facility for these devices.

The Ordnance Initiation System (OIS) unit contains two overvoltage gaps (Electron Tubes), each containing 85 μ Ci of Carbon-14. The Flight Termination Ordnance System (FTOS) unit contains a single overvoltage gap (Electron Tube), containing 40 μ Ci of Nickel-63. Thiokol has an inventory of 305 Electron Tubes in storage at two designated facilities at Thiokol.

Prior to the State of Utah becoming an Agreement State in March, 1984, Morton Thiokol was operating under NRC Materials License #43-03227-03. This NRC license was transferred to Morton Thiokol's UBRC license number UT 0200113. On September 12, 1988, radioactive material license number UT 0200113 was terminated. All materials listed on UT 0200113 were transferred to radioactive material license number UT 0200112. Subsequent to that transfer, this license UT 0200112 was terminated and all radioactive material was included under license UT 0200356. Copies of appropriate documents have been included in this package.

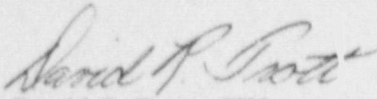
9711060019 971017
PDR RC *
SSD PDR

A schematic of the licensing history of the Electron Tubes at Thiokol would look like:

NRC 43-03227-03 => UT 0200113 => UT 0200112 => UT 0200356

Should more information be needed, please call me at (801) 863-2015.

Sincerely,



David R. Trott, CIH
Radiation Safety Officer



Donald E. Brown
Director, Safety

Attachments:

1. Radioactive Material License Number UT 0200356, Amendment 04, dated September 17, 1996.
2. May 5, 1993 letter from Thiokol to State of Utah, terminating Radioactive Material License UT 0200112.
3. Radioactive Material License Number UT 0200113 (corrected copy), dated September 12, 1988.
4. August 31, 1988 letter from Thiokol to State of Utah, terminating Radioactive Material License UT 0200113.
5. Notification to Morton Thiokol from NRC of Materials License 43-03227-03 termination, dated April 8, 1986.
6. March 19, 1986 letter from Morton Thiokol to NRC, requesting termination of NRC License 43-03227-03.
7. Radioactive Material License Number UT 0200113, dated November 19, 1984.
8. Amended NRC Materials License 43-03227-03, dated November 8, 1982.
9. Letter from Thiokol to NRC requesting amendment to License 43-03227-03, dated October 22, 1982.
10. Safety Evaluation of Electron Tubes, Evaluation No. NR-275-S-101-S, dated October 6, 1982.
11. NRC Materials License 43-0322703 (corrected copy), dated May 14, 1981.
12. Sketch of FTOS and OIS firing units, indicating position of sealed radioactive source.

UTAH DEPARTMENT OF ENVIRONMENTAL QUALITY
DIVISION OF RADIATION CONTROL
RADIOACTIVE MATERIAL LICENSE

Pursuant to Section 19-3-104, Utah Code Annotated, (1953 as amended), and the Utah Radiation Control Rules, and in reliance on statements and representations heretofore made by the licensee designated below, a license is hereby issued authorizing such licensee to transfer, receive, possess and use the radioactive material designated below; and to use such radioactive material for the purpose(s) and at the place(s) designated below. This licensee is subject to all applicable rules and orders now or hereafter in effect and to any conditions specified below.

LICENSEE
1. Name Thiokol Corporation, Space Operations
2. Address Mail Stop A91
P.O. Box 707
Bingham City, Utah 84302-0707
3. License Number UT 0200356
Amendment # 04
4. Expiration Date
April 30, 1998
5. License Category - 3-i
In accordance with letter dated
September 5, 1996, this license
is amended in its entirety.

6. Radioactive Material (element and mass number)	7. Chemical and/or physical form	8. Maximum Quantity licensee may possess at any one time
A. Nickel-63	A. Foil and/or plated source(s) in detector cells registered pursuant to R313-22-210 or an equivalent U.S. Nuclear Regulatory Commission or Agreement State regulation	A. No single source to exceed 555 mega- becquerels (15 mCi) per detector cell
B. Nickel-63	B. Electron Tubes (EG & G Type 343812)	B. No single source to exceed 1.48 mega- becquerels (40 μ Ci)
C. Carbon-14	C. Electron Tubes (EG & G Type 343814)	C. No single source to exceed 3.15 mega- becquerels (85 μ Ci)

UTAH DIVISION OF RADIATION CONTROL
RADIOACTIVE MATERIAL LICENSE
SUPPLEMENTARY SHEET

License # UT 0200356
Amendment # 04

- | | | |
|---------------|--|--|
| D. Cesium-137 | D. Sealed Source(s) registered pursuant to R313-22-210 or an equivalent U.S. Nuclear Regulatory Commission or Agreement State regulation | D. No single source to exceed 6.11 giga-becquerels (165 mCi) |
|---------------|--|--|

9. AUTHORIZED USE

- A. Foil and/or plated sources in a detector cell (registered pursuant to R313-22-210 or an equivalent U. S. Nuclear Regulatory Commission or Agreement State regulation) for use in compatible gas chromatographs for sample analysis.
- B. & C. For receipt, possession, and storage in components for installation into missiles; testing; and for transfer to persons authorized to receive the licensed material pursuant to the terms and conditions of specific licenses issued by the Division, Nuclear Regulatory Commission or an Agreement State.
- D. For use in compatible calibration devices (registered pursuant to R313-22-210 or an equivalent U.S. Nuclear Regulatory Commission or Agreement State regulation) for performing calibration of survey meters and alarming dosimeters.

CONDITIONS

10. Licensed material shall be used only at the licensee's facilities at Promontory, Utah.
11. The licensee shall comply with the provisions of R313-18 "Notices, Instructions and Reports to Workers, by Licensees or Registrants, Inspections" and R313-15 "Standards for Protection Against Radiation."
12. Licensed material shall be used by, or under the supervision of, the Radiation Safety Officer.
13. The Radiation Safety Officer for the activities authorized by this license is David R. Trott.

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RADIOACTIVE MATERIAL LICENSE
SUPPLEMENTARY SHEET

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14. A. Sealed sources and detector cells shall be tested for leakage and/or contamination at intervals not to exceed 6 months or at such other intervals as specified by the certificate of registration referred to in R313-22-210 or in equivalent requirements of an Agreement State or the U.S. Nuclear Regulatory Commission.
- B. Notwithstanding paragraph A. of this Condition, sealed sources designed to emit alpha particles shall be tested for leakage and/or contamination at intervals not to exceed 3 months.
- C. In the absence of a certificate from a transferor indicating that a leak test has been made within 6 months prior to the transfer, a sealed source or detector cell received from another person shall not be put into use until tested.
- D. Each sealed source fabricated by the licensee shall be inspected and tested for construction defects, leakage, and contamination prior to any use or transfer as a sealed source.
- E. Sealed sources need not be leak tested if:
- (1) they contain only hydrogen-3; or
 - (2) they contain only a radioactive gas; or
 - (3) the half-life of the isotope is 30 days or less; or
 - (4) they contain not more than 100 microcuries of beta and/or gamma emitting material or not more than 10 microcuries of alpha emitting material; or
 - (5) they are not designed to emit alpha particles, are in storage, and are not being used. However, when they are removed from storage for use or transferred to another person, and have not been tested within the required leak test interval, they shall be tested before use or transfer. No sealed source or detector cell shall be stored for a period of more than 10 years without being tested for leakage and/or contamination.
- F. The leak test shall be capable of detecting the presence of 0.005 microcurie of radioactive material on the test sample. If the test reveals the presence of 0.005 microcurie or more of removable contamination, a report shall be filed with the Executive Secretary in accordance with R313-15-1208, and the source shall be removed immediately from service and decontaminated, repaired, or disposed of in accordance with Utah Radiation Control Rules. The report shall be filed within 5 days of the

UTAH DIVISION OF RADIATION CONTROL
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SUPPLEMENTARY SHEET

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date the leak test result is known with the Division of Radiation Control, P.O. Box 144850, Salt Lake City, Utah 84114-4850. The report shall specify the source involved, the test results, and corrective action taken.

- G. Tests for leakage and/or contamination shall be performed by the licensee or by other persons specifically authorized by the Division, Nuclear Regulatory Commission, or an Agreement State to perform such services.
15. In lieu of using the conventional radiation caution colors (magenta or purple on yellow background) provided in R313-15-203(1)(a), the licensee is hereby authorized to use detector cells and cell baths containing licensed material and used in gas chromatography devices, with conspicuously etched stamped radiation caution symbols without a color requirement.
16. Sealed sources or detector cells containing licensed material shall not be opened or sources removed from source holders or detector cells by the licensee.
17. A. Detector cells containing titanium tritide foil shall only be used in conjunction with a properly operating temperature control mechanism which prevents foil temperatures from exceeding 225 degrees Centigrade.
- B. Detector cells containing scandium tritide foil shall only be used in conjunction with a properly operating temperature control mechanism which prevents foil temperatures from exceeding 325 degrees Centigrade.
18. A. The licensee shall conduct a physical inventory every six months to account for all sealed sources received and possessed under the license. The records of the inventories shall be maintained for two years from the date of the inventory for inspection by the Division, and shall include the quantities and kinds of licensed material, location of sealed sources, and the date of the inventory.
- B. The licensee shall maintain records of receipt, possession, and disposal or transfer of all licensed materials. These records shall be maintained in a form that provides ready verification that the authorized possession limits are not exceeded.
19. The licensee may transport licensed material or deliver licensed material to a carrier for transport in accordance with the provisions of R313-19-100 "Transportation."
20. 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.

UTAH DIVISION OF RADIATION CONTROL
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License # UT 0200356
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21. In addition to the possession limits in Item 8, the licensee shall further restrict the possession of licensed material to quantities below the minimum limit specified in R313-22-35(4) for establishing decommissioning financial assurance.
22. The licensee possesses radioactive material contained in devices pursuant to the general license in R313-21-22(4). The devices are registered with the State of Utah Division of Radiation Control under general license registration certificate number G3-32. The registration certificate for the devices has an expiration date and must be renewed separately from this license.
23. Except as specifically provided otherwise, by 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 Utah Radiation Control Rules shall govern unless the statements, representations, and procedures in the licensee's application and correspondence are more restrictive than the rules.
- A. Application dated December 10, 1992
 - B. Letter dated February 4, 1993
 - C. Facsimile dated April 19, 1993
 - D. Letter dated January 9, 1995
 - E. Letter dated October 9, 1995
 - F. Letter dated November 15, 1995
 - G. Letter dated April 23, 1996
 - H. Letter dated September 5, 1996

UTAH RADIATION CONTROL BOARD

September 17, 1996
Date

Craig W Jones Acting for
William J. Sinclair, Executive Secretary

Thiokol CORPORATION

SPACE OPERATIONS

D. R. Trott

Radiation Safety Officer
Space Industrial Hygiene

5 May 1993
A912-FY93-DRT-M051

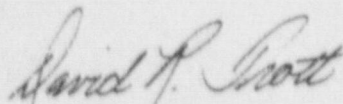
Craig W. Jones, Health Physicist
State of Utah Department of Environmental Quality
Division of Radiation Control
168 North 1950 West
P. O. Box 144850
Salt Lake City, UT 84114-4850

SUBJECT: TERMINATION OF UTAH RADIOACTIVE MATERIAL
 LICENSE 0200112

With the receipt of Utah License number UT 0200356, Thiokol Corporation, Space Operations, formally requests that Utah License number UT 0200112 be terminated. Under the conditions of the broad license, all material formerly covered by the license UT 0200112 has been transferred to the new Utah license UT 0200356.

I trust that this formal request is sufficient to terminate the previously issued license.

Sincerely,



D. R. Trott, CIH
Radiation Safety Officer
Thiokol Corporation, Space Operations

DRT/lah

CC: D. E. Brown
L. R. Jorgenson

CORRECTED
--- COPY ---

Attachment 3

UTAH BUREAU OF RADIATION CONTROL
RADIOACTIVE MATERIAL LICENSE

BRC-01
April 1986

Pursuant to Chapter 1, Title 26-1-27 of the Utah Code, and the Utah Department of Health Regulations for the Control of Ionizing Radiation, and in reliance of statements and representations heretofore made by the licensee designated below, a license is hereby issued authorizing such licensee to transfer, receive, possess and use the radioactive material designated below; and to use such radioactive material for the purpose(s) and at the place(s) designated below. This licensee is subject to all applicable rules, regulations, and orders now or hereafter in effect and to any conditions specified below.

Licensee		) 3. License Number
		) UT 0200113
1. Name	Morton/Thiokol, Corporation)
	Wasatch Division	) 4. Expiration Date
2. Address	P.O. Box 524	) April 30, 1991
	M/S 205A, Industrial Hygiene)
	Brigham City, Utah 84302	) 5. License Category
		) 3-1

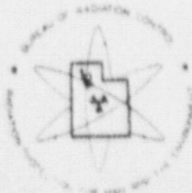
6. Radioactive material (element and mass number)	7. Chemical and/or physical form	8. Maximum quantity licensee may possess at any one time
A. Carbon 14	A. Electron Tubes (EG&G Type 343814)	A. Not to exceed 85 microcuries per tube
B. Nickel 63	B. Electron Tubes (EG&G Type 343812)	B. Not to exceed 40 microcuries per tube

9. AUTHORIZED

A. and B. For receipt, possession, and storage in components, for installation into missile testing and for distribution to persons authorized to receive the licensed material pursuant to the terms and conditions of specific licenses issued by the Bureau, NRC or an Agreement State.

CONDITIONS

10. Licensed material shall be used only at the licensee's Tactical Motor Plant, Brigham City, Utah and at the licensee's Wasatch Manufacturing Operations in Promontory, Utah.
11. The licensee shall comply with the provisions of Chapter URC-48 "Notices, Instructions and Reports to Workers, by Licensees or Registrants, Inspections" and Chapter URC-24, "Standards for Protection Against Radiation".



UTAH BUREAU OF RADIATION CONTROL
RADIOACTIVE MATERIAL LICENSE
SUPPLEMENTARY SHEET

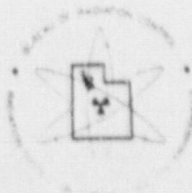
License # UT 0200113

Morton Thiokol, Inc.
P.O. Box 524
Brigham City, Utah 84302

In accordance with letter dated August 31, 1988, radioactive material license number UT 0200113 is hereby terminated:

Sept 12, 1988
Date

Larry F. Anderson
Larry F. Anderson, Director, Bureau of Radiation Control



MORTON THIOKOL, INC.

Aerospace Group

Support Services



31 August 1988
2051-FY89-M001

TO: Craig Jones, Health Physicist
Bureau of Radiation Control
P. L. Box 16690
Salt Lake City, Utah 84116-0690

FROM: A. J. Peart, Radiation Protection Officer
Industrial Hygiene

Dear Mr. Jones:

Please terminate Morton Thiokol Inc. license number UT.0200113, in as much as all material listed on this license has been transferred to license number UT. 0200112.

We also request amendments to license number UT.0200112 and Ut. 0200114. The Radiation Protection Officer for the above licenses will be Arnold J. Peart. Please see attachment 1 for training and experience.

If you have any questions please call Mr. Peart at 801-863-3097.

A. J. Peart

A. J. Peart

UTAH BUREAU OF RADIATION CONTROL
RADIOACTIVE MATERIAL LICENSE

BRC-03
April 1984

Pursuant to Chapter 1, Title 26-1-27 of the Utah Code, and the Utah Department of Health Regulations for the Control of Ionizing Radiation, and in reliance of statements and representations heretofore made by the licensee designated below, a license is hereby issued authorizing such licensee to transfer, receive, possess and use the radioactive material designated below; and to use such radioactive material for the purpose(s) and at the place(s) designated below. This licensee is subject to all applicable rules, regulations, and orders now or hereafter in effect and to any conditions specified below.

Licensee		) 3. License Number
		) UT 0200113
1. Name	Morton/Thiokol Corporation)
	Wasatch Division	) 4. Expiration Date
2. Address	P.O. Box 524	) April 30, 1986
	Brigham City, Utah 84302)
		) 5. License Category 3-e
		) Replaces License 43-03227-03

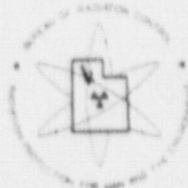
6. Radioactive material (element and mass number)	7. Chemical and/or physical form	8. Maximum quantity licensee may possess at any one time
A. Carbon 14	A. Electron tubes (EG&G Type 343814)	A. Not to exceed 85 microcuries per tube
B. Nickel 63	B. Electron tubes (EG&G Type 343812)	B. Not to exceed 40 microcuries per tube

9. AUTHORIZED USE

A. & B. For receipt, possession, and storage in components, for installation into missiles; testing and for distribution to persons authorized to receive the licensed material pursuant to the terms and conditions of specific licenses issued by the Bureau, NRC, or an Agreement State.

CONDITIONS

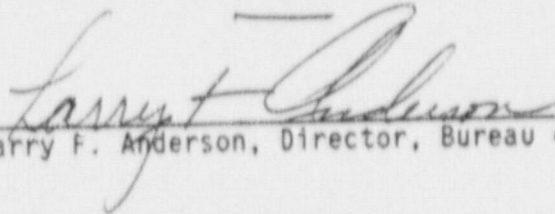
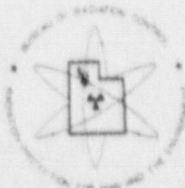
10. Licensed material shall be used only at the Morton/Thiokol Corporation, facilities in Promontory, Utah, 3350 Airport, Ogden, Utah.
11. The licensee shall comply with the provisions of Chapter URC-48 "Notices, Instructions and Reports to Workers, by Licensees or Registrants, Inspections" and Chapter URC-24, "Standards for Protection Against Radiation".
12. Licensed material shall be used by, or under the supervision of, Loren R. Jorgenson, Radiation Protection Officer.
13. Sealed sources containing licensed material shall not be opened.



UTAH BUREAU OF RADIATION CONTROL
RADIOACTIVE MATERIAL LICENSE
SUPPLEMENTARY SHEETLicense # UT 0200113

14. The licensee may transport licensed material or deliver licensed material to a carrier for transport in accordance with the provisions of URC-19-500 "Transportation".
15. Except as specifically provided otherwise by this license, the licensee shall possess and use licensed material described in Items 6, 7, and 8 of this license in accordance with statements, representations, and procedures contained in application dated March 10, 1981; and letter dated October 22, 1982. The Utah Radiation Control regulations shall govern the licensee's statements in applications or letters, unless the statements are more restrictive than the regulations.

Date

Nov. 19, 1984
Larry F. Anderson, Director, Bureau of Radiation Control

MATERIALS LICENSE
SUPPLEMENTARY SHEET

License number
43-03227-03
Docket or Reference number
030-19106
Amendment No. 02

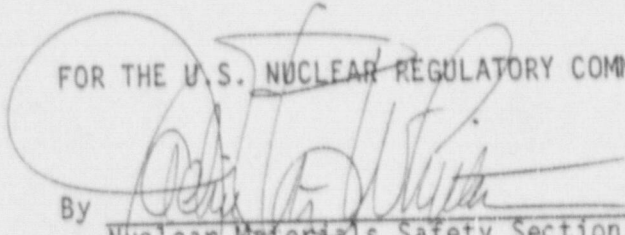
Thiokol Corporation
Wasatch Division
P. O. Box 524
Brigham City, Utah 84302

In accordance with letter dated March 19, 1986, License Number 43-03227-03 is hereby terminated.



Date APR 08 1986;

FOR THE U.S. NUCLEAR REGULATORY COMMISSION

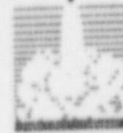
By 
Nuclear Materials Safety Section
Region IV
Arlington, Texas 76011

9711060247

MORTON THIOKOL, INC.

Wasatch Operations

19 March 1986
0206-FY86-SSS-L013



Joy Marshall
US Nuclear Regulatory Commission
611 Ryan Blaze Dr.
Suite 1000
Arlington TX 76011

RE: NRC License #43-03227-03

Dear Ms. Marshall:

We are enclosing the completed form, NRC-314 "Certificate of Disposition of Materials" in which we are transferring all materials covered under this license to the Morton Thiokol, Inc. Utah Bureau of Radiation Control (UBRC) License #UT 0200113, having an expiration date of 30 April 1986. A license application has been prepared and is being sent to the UBRC for a new license. Utah is now in an agreement state status with the NRC.

Please terminate our NRC License No. 43-03227-03, expiration date of 30 April 1986, Program Code 03212. We appreciate the notice of license expiration that you sent to us as well as the forms needed to either renew or discontinue the license.

Thank you for your help per our telephone conversations in helping us understand the licensing procedure. If you have any questions, please contact S. Sue Straatman, Industrial Hygiene, (801) 863-3097.

Sincerely,

S. Sue Straatman

S. Sue Straatman

J. W. Loosle
J. W. Loosle, Manager
Safety and Security

SSS/JWL/lmk

a/s

9711060257

CERTIFICATE OF DISPOSITION OF MATERIALS

(All items MUST be completed, please print)

LICENSEE NAME AND ADDRESS

Morton Thiokol, Inc.
Wasatch Operations
P.O. Box 524
Brigham City, UT 84302

LICENSE NUMBER

NRC #43-03227-03

LICENSE EXPIRATION DATE

30 April 1986

THE LICENSEE OR ANY INDIVIDUAL EXECUTING THIS CERTIFICATE ON BEHALF OF THE LICENSEE CERTIFIES THAT: (Check and/or complete the appropriate item(s) below.)

A. MATERIALS DATA (Check one and complete, as necessary)

1. NO MATERIALS HAVE EVER BEEN POSSESSED OR PROCURED BY THE LICENSEE UNDER THIS LICENSE.

OR
2. ALL MATERIALS PROCURED AND/OR POSSESSED BY THE LICENSEE UNDER THE LICENSE NUMBER CITED ABOVE HAVE BEEN TRANSFERRED ON

DATE TO WHICH HAS NRC LICENSE NUMBER

OR
X 3. ALL MATERIALS PROCURED AND/OR POSSESSED BY THE LICENSEE UNDER THE LICENSE NUMBER CITED ABOVE HAVE BEEN TRANSFERRED ON

DATE TO UT 0200113 State of Utah
WHICH HAS LICENSE NUMBER ISSUED BY THE STATE OF

1 April 1986

AN AGREEMENT STATE PURSUANT TO SECTION 274 OF THE ATOMIC ENERGY ACT OF 1954, AS AMENDED, AND THE ENERGY REORGANIZATION ACT OF 1974.

OR
4. MATERIALS HAVE BEEN DISPOSED OF IN THE FOLLOWING MANNER. (Describe specific disposal procedures—if additional space is needed, use the reverse of this form, or provide attachments)

B. OTHER DATA

- X 1. OUR LICENSE HAS NOT YET EXPIRED; PLEASE TERMINATE IT.
2. WAS A RADIATION SURVEY CONDUCTED TO CONFIRM THE ABSENCE OF LICENSED RADIOACTIVE MATERIALS AND TO DETERMINE WHETHER ANY CONTAMINATION REMAINS ON THE PREMISES COVERED BY THE LICENSE? (Check one)
☐ NO
☐ YES, THE RESULTS (Check one)
☐ ARE ATTACHED, OR
☐ WERE FORWARDED TO NRC ON (Date)

3. THE PERSON TO BE CONTACTED REGARDING THE INFORMATION PROVIDED ON THIS FORM

NAME S. Sue Straatman, Industrial Hygiene

TELEPHONE NUMBER 801 863-3097

4. MAIL ALL FUTURE CORRESPONDENCE REGARDING THIS LICENSE TO

S. Sue Straatman, Industrial Hygiene

%Morton Thiokol, Inc., P.O. Box 524, Brigham City, UT 84302

RETURN TO:

DIRECTOR, DIVISION OF FUEL CYCLE AND MATERIAL SAFETY
OFFICE OF NUCLEAR MATERIAL SAFETY AND SAFEGUARDS
U.S. NUCLEAR REGULATORY COMMISSION
WASHINGTON, DC 20535

CERTIFYING OFFICIAL

SIGNATURE

Loren R. Jorgenson

DATE

3/20/86

PRINTED NAME AND TITLE

Loren R. Jorgenson,
Radiation Protection Officer

9711060265