

VOID SHEET

03030945

TO: License Fee Management Branch
Region I
FROM: _____
SUBJECT: VOIDED APPLICATION

Control Number: 123684
Applicant: Smithsonian Institute
Date Voided: 10/23/96
Reason for Void: Licensee withdrew request for amendment to Lic.
08-05938-13(030-30945) in letter dated 10/11/96.
After review.

M.A. Perkins 10/24/96
Signature Date

Attachment:
Official Record Copy of
Voided Action

FOR LFMB USE ONLY

Final Review of VOID Completed:

Refund Authorized and processed

No Refund Due

Fee Exempt or Fee Not Required

Comments: _____

Log completed

Processed by: _____

OFFICIAL RECORD COPY

ML 10

9611050045 961024
PDR ADOCK 03030945
C PDR

SMITHSONIAN INSTITUTION

WASHINGTON, D. C. 20560

October 11, 1996

United States Nuclear Regulatory Commission
Nuclear Materials Safety Branch
Division of Radiation Safety and Safeguards
Region I
475 Allendale Road
King of Prussia, PA 19406-1415

ATTN: Licensing Assistance Branch
Michael Perkins

Re: License No. 08-05938-13
Docket No. 030-30945
Mail Control No. 123684

Dear Mr. Perkins:

The Smithsonian Institution wishes to withdraw its amendment request of September 12, 1996. This request was submitted to authorize increased possession limits for Iron-55 and Cadmium-109 as sealed sources. Upon receipt of these sources from the manufacturer, they were to be transferred to the Marshall Space Flight Center as part of a coordinated project with the Smithsonian Astrophysical Observatory.

The byproduct material referenced in the amendment request was identified as sealed sources. Upon further review of the fabrication process, it has been determined that these materials will be manufactured as *plated* sources. These sources will be procured and transferred directly from the manufacturer, Isotope Products Laboratories, Inc., to the Marshall Space Flight Center. A copy of the Marshall Space Flight Center byproduct material license, which authorizes possession of these sources, was included in my September 12, 1996, letter. The Smithsonian Astrophysical Observatory will not take physical possession of these byproduct materials.

Thank you, in advance, for your assistance in this matter. You may contact David Peters or Rachel Gregory, at (202) 287-3615, should you require additional information.

Sincerely,

Rachel L. Gregory

for F. William Billingsley, Director
Office of Environmental Management and Safety

MNSB TELEPHONE CONVERSATION RECORD

Person Called: Dave Peters Phone No.: (202) 287 3615
Person Calling: Sattar Lodhi Date: 9/24/96
Facility Name: Smithsonian Institution Time: 10:00 a.m.
Washington, DC
License No. 08-05938-13 Docket No. 030-30945

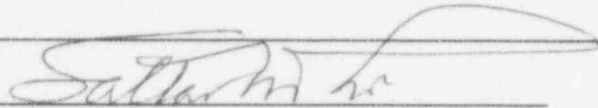
Subject: Additional Information for amendment request

Summary: Mr. Peters returned my call that I had made to Ms. Gregory on 9-17-96 requesting information about the sealed sources. He stated that they will not take possession of sealed sources, he did not know if the design of the sources was registered, and that the material will be put on board the space flight.

He stated that the sources will be delivered directly to Marshall Space Flight Center. I informed him that according to Condition 23 of its license, Marshall Space Flight Center can not acquire unregistered sealed sources. He was not aware of this condition and had thought that they had the authorization.

He promised to call Marshall Space Flight Center to get an explanation and will call me back to let me know what action they want to take with regard to this request.

Action Required/Taken: Document/wait for his call

Signature:  Mail Control No. 123684

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ML 10

MNSB TELEPHONE CONVERSATION RECORD

Person Called: Rachel Gregory Phone No.: (202) 287 3615
Person Calling: Sattar Lodhi Date: 9/17/96
Facility Name: Smithsonian Institution Time: 2:30 p.m.
Washington, DC
License No. 08-05938-13 Docket No. 030-30945

Subject: Additional Information for amendment request

Summary: I called Ms. Gregory to request the following:

1. Will the get the possession of the requested materials;
2. Is the design of the proposed sealed sources registered;
3. Will this material be on board the flight

She did not know the answers to these questions, and will call me back either later this afternoon or tomorrow.

Action Required/Taken: Document/wait for response

Signature: Sattar Lodhi Mail Control No. 123684

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ML 10

SMITHSONIAN INSTITUTION

WASHINGTON, D. C. 20560

September 12, 1996

United States Nuclear Regulatory Commission
Nuclear Materials Safety Branch
Division of Radiation Safety and Safeguards
Region I
475 Allendale Road
King of Prussia, PA 19406-1415

030-30945

ATTN: Licensing Assistance Branch
Michael Perkins

Re: License No. 08-05938-13
Docket No. 030-30945

Dear Mr. Perkins:

The Smithsonian Institution wishes to amend its present NRC Materials License to increase the possession limits of our license.

The sealed source license limits we request are as follows:

Iron 55	Not to exceed 3 millicuries per source and 48 millicuries total activity
Cadmium 109	Not to exceed 5 millicuries per source and 94 millicuries total activity

The Smithsonian Astrophysical Observatory, in coordination with the National Aeronautics and Space Administration's Marshall Space Flight Center, is engaged in the final assembly and calibration of the Advanced X-ray Astrophysics Facility, one of NASA's four Great Observatories. A component of the facility, the x-ray optics assembly, must be monitored while in orbit for any evidence of contamination build-up on the mirror elements that would alter the calibration performed prior to launching. This will be accomplished by flying on-board x-ray sources that can periodically be placed in the vicinity of the optical elements to measure any change in their reflectivity. The sources listed in this amendment request will be used for this purpose.

The Marshall Space Flight Center is responsible for the design and fabrication of these sources and has been working with a number of potential suppliers in an attempt to develop the sources required. They have determined that Isotope Products Laboratories, Inc., of Burbank, CA, is capable of producing the necessary sources.

OFFICIAL RECORD COPY

ML 10

123684

SEP 16 1996

The Marshall Space Flight Center procurement process, which entails the complete government bid process, will not allow delivery of these sources within the schedule requirements. To avoid any additional delays, the Marshall Space Flight Center has modified its contract with the Smithsonian Astrophysical Observatory, provided as an enclosure, to purchase these sources for transfer and delivery to the Marshall Space Flight Center.

Delivery of the sources by Isotope Products Laboratories, Inc., is needed by October 15, 1996, to allow installation on the flight optics assembly prior to the start of calibration at the Marshall Space Flight Center on October 21, 1996. Any delays in the receipt of the sources by this date will adversely affect the program schedule. In order to avoid additional delays, we are requesting authorization to purchase these sources for immediate transfer and delivery to the Marshall Space Flight Center.

I have also enclosed a copy of the Marshall Space Flight Center's materials license, which authorizes possession of the sealed sources, a cost quote from Isotope Products Laboratories for fabrication of the sources, and a statement which certifies that the fabrication and testing process used by Isotope Products Laboratories, Inc., to produce these sources is within the scope of their current California Radioactive Materials License.

Due to severe time constraints, we ask that this amendment be expedited to ensure that the project schedule is met. You may contact Rachel Gregory, at (202) 287-3615, should you have further questions concerning this matter.

Sincerely,



F. William Billingsley, Director
Office of Environmental Management and Safety

Enclosures

CC: F. COCUEZU
P. SOZANSKI

[Handwritten signatures and initials]
TOM

AUG 8 0 1996

GP54C-96

Smithsonian Institution
Astrophysical Observatory
Attn: George Dick
60 Garden Street
Cambridge, MA 02138

RECEIVED

SEP 3 1996

SAC
CONTRACTS OFFICE

Subject: Contract NAS8-40224, Modification No. 25
(Change Order)

Enclosed is one executed copy and two unexecuted copies of
subject document.

Please acknowledge receipt of this contractual document in
the space provided on the attached copy of this letter.
ORIGINAL SIGNED BY
RICHARD W. MCCLEAREN

Richard W. McClearen
Contracting Officer

Enclosures

CC:
GP54C/OF/RF

OPTIONAL FORM NO. 10 (7-89)

FAX TRANSMITTAL	
To: JOHN HARRIS	From: MICHAEL HARRIS
Dept./Agency: SPO	Phone: 205-544-0721
Fax: 205-544-6125	Fax: 205-544-6125

FORM 70-10-01-917-7200 8000-101 GENERAL SERVICES ADMINISTRATION

ATTACHMENT 1

CNS Approval #: 2700-0042

AMENDMENT OF SOLICITATION/MODIFICATION OF CONTRACT

1. CONTRACT ID CODE
05PAGE OF PAGES
1 2

2. AMENDMENT/MODIFICATION NO.

3. EFFECTIVE DATE

AUG 30 1998

4. REQUISITION/PURCHASE REQ. NO.

402240025 (1P)

5. PROJECT NO. (if applicable)

6. ISSUED BY

25

CODE

GP54-C

7. ADMINISTERED By (if other than item 6)

CODE

Procurement Office
George C. Marshall Space Flight Center
National Aeronautics and Space Administration
Marshall Space Flight Center, AL 35812

GP54C/Meris Masters/205-544-0431

8. NAME AND ADDRESS OF CONTRACTOR (Name, street, county, State, and Zip Code)

Smithsonian Institution
Astrophysical Observatory
80 Garden Street
Cambridge, MA 02138

()

9A. AMENDMENT OF SOLICITATION NO.

9B. DATED (SEE ITEM 11)

X

10A. MODIFICATION OF CONTRACT/ORDER NO.

NAS8-40224

10B. DATED (SEE ITEM 13)

8-1-94

CODE

28286

FACILITY CODE

11. THIS ITEM ONLY APPLIES TO AMENDMENTS OF SOLICITATIONS

☐ The above numbered solicitation is amended as set forth in item 14. The hour and date specified for receipt of offers ☐ is extended, ☐ is not extended. Offers must acknowledge receipt of this amendment prior to the hour and date specified in the solicitation or as amended, by one of the following methods:

(a) By completing items 8 and 15, and returning _____ copies of the amendment; (b) By acknowledging receipt of this amendment on each copy of the offer submitted; or (c) By separate letter or telegram which includes a reference to the solicitation and amendment numbers. FAILURE OF YOUR ACKNOWLEDGMENT TO BE RECEIVED AT THE PLACE DESIGNATED FOR THE RECEIPT OF OFFERS PRIOR TO THE HOUR AND DATE SPECIFIED MAY RESULT IN REJECTION OF YOUR OFFER. If by virtue of this amendment you desire to change an offer already submitted, such change may be made by telegram or letter, provided each telegram or letter makes reference to the solicitation and this amendment, and is received prior to the opening hour and date specified.

12. ACCOUNTING AND APPROPRIATION DATA (if required)

N/A

13. THIS ITEM APPLIES ONLY TO MODIFICATIONS OF CONTRACTS/ORDERS.

IT MODIFIES THE CONTRACT/ORDER NO. _____

() A. THIS CHANGE ORDER IS ISSUED PURSUANT TO: (Specify authority) THE CHANGES SET FORTH IN ITEM 14 ARE MADE IN THE CONTRACT ORDER NO. IN ITEM 10A.

X THE "CHANGES" CLAUSE

B. THE ABOVE NUMBERED CONTRACT/ORDER IS MODIFIED TO REFLECT THE ADMINISTRATIVE CHANGES (such as changes in paying office, appropriation data, etc.) SET FORTH IN ITEM 14, PURSUANT TO THE AUTHORITY OF FAR 43.10300.

C. THIS SUPPLEMENTAL AGREEMENT IS ENTERED INTO PURSUANT TO AUTHORITY OF:

D. OTHER (Specify type of modification and authority)

E. IMPORTANT: Contractor ☒ is not, ☐ is required to sign this document and return _____ copies to the issuing office.

14. DESCRIPTION OF AMENDMENT/MODIFICATION (Organized by UCF source headings, including solicitation/contract subject matter where feasible.)

This change order amends the contract statement of work to direct the contractor to acquire/purchase a set of 28 contamination monitors to be delivered to MSFC not later than October 21, 1998.

EXECUTED COPY
OFFICIAL FMO
KOR

Except as provided herein, all terms and conditions of the document referenced in item 8A or 10A, as heretofore changed, remains unchanged and in full force and effect.

15A. NAME AND TITLE OF SIGNER (Type or print)

15B. NAME AND TITLE OF CONTRACTING OFFICER (Type or print)

Richard W. McClearen

16B. CONTRACTOR/OFFEROR

16C. DATE SIGNED

16B. UNITED STATES OF AMERICA

16C. DATE SIGNED

BY Richard W. McClearen
(Signature of Contracting Officer)

8/30/96

(Signature of person authorized to sign)

NAS8-40224
Mod 25
Page 2 of 2

1. In order to reflect the changes resulting from this action, delete the following and substitute revised/added pages therefor. Changed portions of the substitute pages from corresponding original pages are identified by a vertical mark in the right hand margins.

Delete

Section J

J-1 Statement of Work
Page J-1-4 (MOD 20)

J-3 Deliverables
Pages J-3-4 & J-3-5 (MOD 20)

J-4 Government-Furnished Property
Page J-4-2 (MOD 20)

Substitute/Add

Section J

J-1 Statement of Work
Page J-1-4 (MOD 25)

J-4 Deliverables
Pages J-3-4 & J-3-5 (MOD25)

J-4 Government-Furnished Property
Page J-4-2 (MOD 25)

2. The contractor is authorized to perform the changes directed thereunder up to a not-to-exceed amount of \$150,000.

3.2.6 Systems Software

SAO shall be a member of the Software Systems Working Group and shall provide technical expertise to support MSFC in the review of software designs, data flow, and verification planning as required to assure compatibility between overall AXAF-I ground test and flight software. Analysis of hardware and software architecture shall be provided as required.

3.2.7 Contamination Monitors

SAO shall fabricate twenty-eight radioactive sources on GFE gold substrates.

3.3 System Level Assembly, Test, and Verification

SAO shall provide planning support, and technical assistance in the x-ray and optical systems areas during assembly, test, and verification of the AXAF-I observatory, including the primary optical system, aspect system, and science instruments.

3.4 XRCF Support

SAO shall support the definition of requirements, construction, and activation of the Phase II modification to the XRCF, with emphasis on the x-ray generator assembly (XGA) requirements. SAO shall provide technical support for the procurement and development of XGA equipment, and for the integration and verification of this equipment into the XRCF. In addition support shall be provided for developing and evaluating all test planning, procedures and reports for XRCF verification activities, and integration and verification of the HXDS with the Master Control Computer (MCC). Following the integration, verification, and acceptance of the HXDS, SAO shall conduct training sessions at the XRCF on the operation of the HXDS for the MSFC, TRW, EKC, and SAO members of the AXAF-I HRMA/SI calibration team and shall provide a software users manual, DR 784SW-003, and a version of an HXDS Operations Handbook which will be comprised of a compilation of existing pertinent information such as procedures/operating instructions, drawings, equipment manuals, and test/calibration data.

3.4.1 HRMA and HRMA/SI Calibration Test Procedure Support

SAO shall provide support as required for the preparation of the x-ray elements of the HRMA and HRMA/SI calibration test procedures.

g. Simulator

Software to provide the test team with predictions of test times for a proposed test schedule. The function provides the test team with the ability to respond to test data in a planned way.

h. Procedure Generation

Software to automatically generate test procedures from the test schedule. The tool allows the operator to run from a complete hard copy procedure when test schedules are revised in response to recent test data.

i. Software for use in the near time analysis and reduction of the HRMA and HRMA/SI calibration data during the ongoing AXAF calibration activities at the XRCF. It will consist of commercial off the shelf (COTS) software and selected software packages available on the program at SAO.

4.0 CONTAMINATION MONITORS

The twenty-eight radioactive sources will constitute the flight unit subassemblies with spares. The radioactive subassemblies will be mounted on the inside of AXAF aperture door by MSFC to form the flight contamination monitors subsystem.

DELIVERY DATES

1.0 DOCUMENTATION

The schedule for delivery of deliverable documentation will be in accordance with the requirements of the DPD.

2.0 HXDS HARDWARE

Delivery of the Guide Tube Source Mapper (GTSM) hardware will occur at MSFC on November 4, 1994.

Delivery of the HXDS hardware will occur at MSFC on April 30, 1996.

3.0 HXDS SOFTWARE

Delivery of the HXDS software will occur at MSFC on April 30, 1996.

4.0 TMA ALIGNMENT SCANNER

Delivery of the TMA Alignment Scanner will occur at MSFC on March 4, 1996.

5.0 TMA GRATING SUPPORT STRUCTURE

The TMA Grating Support Structure (TGSS) will be shipped for arrival at MSFC on June 1, 1996. The TGSS is not a deliverable item and will be returned to SAO following the completion of the testing supported by this equipment at the XRCF.

6.0 INTEGRATED PRESSURE TIGHT ENCLOSURE (PTE)/ACIS-2C

The integrated PTE/ACIS-2C will be shipped for arrival at MSFC on August 1, 1996. The PTE/ACIS-2C is not a deliverable item and will be returned to SAO following the completion of the testing supported by this equipment at the XRCF.

7.0 CONTAMINATION MONITORS

Delivery of the radioactive sources will occur at MSFC on October 21, 1996.

ATTACHMENT J-4 (Cont'd)

<u>ITEM</u>	<u>QTY</u>	<u>ACQ. COST</u>	<u>DATE TO BE FURNISHED TO THE CONTRACTOR</u>
MIT-ACIS PROVIDED:			
ACIS-2C COMPONENTS INCLUDING:		\$800k	TBD
Analog Electronics	1		
Line Driver/Receiver	1		
Power Supply	1		
Detector Assembly Cables	Misc1		
Fluid Lines	Misc1		
MIT-BETG PROVIDED:			
TMA OBJECTIVE GRATING ASSEMBLY	1	\$ 95k	TBD
GOLD SUBSTRATE MATERIALS INCLUDE:			
1. Gold Substrate buttons, 0.623 in diameter, 0.040 inch thick.	50	\$ 20k	One Week ARO
2. Plating cells, two for each isotope	4		
3. Photomasking services as required.			

NRC FORM 374
(7-84)

U.S. NUCLEAR REGULATORY COMMISSION

PAGE 1 OF 5 PAGES

CORRECTED COPY

MATERIALS LICENSE

Amendment No. 26

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.

Licensee		Is in accordance with letter dated March 15, 1996	
1. National Aeronautics and Space Administration		3. License Number	01-06571-10
2. George C. Marshall Space Flight Center Huntsville, Alabama 35812		4. Expiration Date	October 31, 2005
		5. Docket or Reference Number	030-03575
6. Byproduct, Source, and/or Special Nuclear Material	7. Chemical and/or Physical Form	8. Maximum Amount that Licensee May Possess at Any One Time Under This License	
A. Americium 241	A. Foils, plated sources, and/or sealed sources	A. Not to exceed 370 megabecquerels (10 millicuries) per source	
B. Barium 133	B. Foils, plated sources, and/or sealed sources	B. Not to exceed 74 megabecquerels (2 millicuries) per source	
C. (1) Carbon 14	C. (1) Foils, plated sources, and/or sealed sources	C. (1) Not to exceed 370 megabecquerels (10 millicuries) per source	
(2) Carbon 14	(2) Liquid, labeled/tagged compounds	(2) 185 megabecquerels (5 millicuries)	
D. Cadmium 109	D. Foils, plated sources, and/or sealed sources	D. Not to exceed 185 megabecquerels (5 millicuries) per source	
E. Chromium 51	E. Liquid, labeled/tagged compounds	E. Not to exceed 185 megabecquerels (5 millicuries) per source	
F. Curium 244	F. Foils, plated sources, and/or sealed sources	F. Not to exceed 185 megabecquerels (5 millicuries) per source	
G. Cobalt 60	G. Foils, plated and/or sealed sources	G. Not to exceed 185 megabecquerels (5 millicuries) per source	
H. Cesium 137	H. Foils, plated and/or sealed sources	H. Not to exceed 3.7 gigabecquerels (100 millicuries) per source	
I. Iron 55	I. Foils, plated and/or sealed sources	I. Not to exceed 370 megabecquerels (10 millicuries) per source	

NRC FORM 374A
(7-94)

U.S. NUCLEAR REGULATORY COMMISSION

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MATERIALS LICENSE
SUPPLEMENTARY SHEET
CORRECTED COPY

License Number 01-06571-10

Docket or Reference Number 01-03575

Amendment No. 26

6. Byproduct, source, and/or special nuclear material	7. Chemical and/or physical form	8. Maximum amount that licensee may possess at any one time under this license
J. Iodine 125	J. Liquid, tagged/labeled compounds	J. 185 megabecquerels (5 millicuries)
K. Iodine 131	K. Liquid, tagged/labeled compounds	K. 185 megabecquerels (5 millicuries)
L. Gadolinium 153	L. Foils, plated and/or sealed sources	L. Not to exceed 370 megabecquerels (10 millicuries) per source
M. Nickel 63	M. Foils, plated sources, and/or sealed sources	M. Not to exceed 740 megabecquerels (20 millicuries) per source
N. Promethium 147	N. Foils, plated and/or sealed sources	N. Not to exceed 37 megabecquerels (1 millicurie) per source
O. Uranium 238	O. Depleted Uranium Metal	O. 60 kilograms
P. Sulfur 35	P. Liquid, tagged/labeled compounds	P. 185 megabecquerels (5 millicuries)
Q. Hydrogen 3	Q. Liquid, tagged/labeled compounds	Q. 185 megabecquerels (5 millicuries)
R. Cadmium 115m	R. Metal	R. 37 megabecquerels (1 millicurie) per foil

9. Authorized Use

- A. through Q. For possession and use in calibration and testing of radiation detection equipment.
R. Impurities in plated sources

CONDITIONS

10. Licensed material shall be used only at the licensee's facilities located at the George C. Marshall Space Flight Center, Huntsville, Alabama.
11. The Radiation Protection Officer for the activities authorized by this license is John W. Noblin.

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(7-84)

U.S. NUCLEAR REGULATORY COMMISSION

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MATERIALS LICENSE
SUPPLEMENTARY SHEET
CORRECTED COPY

License Number 01-06571-10

Docket or Reference Number 89-03575

Amendment No. 26

CONDITIONS

Continued -

12. Licensed materials shall be used by, or under the supervision of, Brian D. Ramsey, John W. Noblin, Robert B. Wilson, Fred A. Berry, Jr., David L. Edwards, John M. Davis, Robert A. Austin, Mark J. Christl, B. Alan Harmon, John M. Horack, Charles R. Sisk, Laurel J. Karr, or James H. Perkins (for gas chromatography).
13. Sealed sources or detector cells containing licensed materials shall not be opened by the licensee.
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 10 CFR 32.210.
- 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 six 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:
- (i) they contain only hydrogen-3; or
 - (ii) they contain only a radioactive gas; or
 - (iii) the half-life of the isotope is 30 days or less; or
 - (iv) 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
 - (v) 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. Records of leak test results shall be kept in units of microcuries and shall be maintained for inspection by the Commission. If the test reveals the presence of 0.005 microcurie or more of removable contamination, a report shall be filed with the U.S. Nuclear Regulatory Commission and the source shall be removed immediately from service and decontaminated, repaired, or disposed of in accordance with Commission regulations. The report shall be filed within 5 days of the date the leak test result is known with the U.S. Nuclear Regulatory Commission, Region II, ATTN: Chief, Nuclear Materials Licensing/Inspection Branch, 101 Marietta Street, N.W., Suite 2900, Atlanta, Georgia 30323. The report shall specify the source involved, the test results, and corrective action taken. Records of leak test results shall be kept in units of microcuries and shall be maintained for inspection by the Commission. Records may be disposed of following Commission inspection.

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(7-94)

U.S. NUCLEAR REGULATORY COMMISSION

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MATERIALS LICENSE
SUPPLEMENTARY SHEET
CORRECTED COPY

License Number 01-06571-10

Docket or Reference Number 86-03575

Amendment No. 26

CONDITIONS

Continued -

14. G. The periodic leak test required by this condition does not apply to sealed sources installed and maintained in readiness in spaceflight hardware or backup hardware prior to launch.
- H. Tests for leakage and/or contamination shall be performed by the licensee or by other persons specifically licensed by the Commission or an Agreement State to perform such services.
15. Licensed material shall not be used in or on human beings or in products distributed to the public.
16. The licensee is authorized to transport licensed material only in accordance with the provisions of 10 CFR Part 71, "Packaging and Transportation of Radioactive Material."
17. The licensee shall conduct a physical inventory every 6 months to account for all sources and/or devices received and possessed under the license.
18. This license does not authorize the launch of licensed materials.
19. The licensee shall maintain records of information related to decommissioning at the licensee's facilities located at the George C. Marshall Space Flight Center, Huntsville, Alabama as specified in 10 CFR 30.35(g) until this license is terminated by the Commission.
20. In addition to the possession limits in condition 8, the licensee shall further restrict the possession of licensed material to quantities below the minimum limit specified in 10 CFR 30.35(d) for establishing decommissioning financial assurance.
21. Maintenance, repair, cleaning, replacement and disposal of foils contained in detector cells shall be performed only by the device manufacturer or other persons specifically authorized by the Commission or an Agreement State to perform such services.
22. The licensee is authorized to hold radioactive material with a physical half-life of less than 65 days for decay-in-storage before disposal in ordinary trash provided:
- A. Radioactive waste to be disposed of in this manner shall be held for decay a minimum of 10 half-lives.
- B. Before disposal as ordinary trash, byproduct material shall be surveyed at the container surface with appropriate survey meter set on its most sensitive scale and with no interposed shielding to determine that its radioactivity cannot be distinguished from background. All radiation labels shall be removed or obliterated.
- C. A record of each disposal permitted under this license condition shall be retained for three years. The record must include the date of disposal, the date on which the byproduct material was placed in storage, the radionuclides disposed, the survey instrument used, the background dose rate, the dose rate measured at the surface of each waste container, and the name of the individual who performed the disposal.

NRC FORM 374A
(7-94)

U.S. NUCLEAR REGULATORY COMMISSION

MATERIALS LICENSE
SUPPLEMENTARY SHEET
CORRECTED COPY

PAGE 5 OF 5 PAGES

License Number 01-06571-10

Docket or Reference Number 880-03575

Amendment No. 26

CONDITIONS

Continued -

23. The licensee shall not acquire licensed material in a sealed source or device that contains a sealed source unless the source or device has been registered with the Nuclear Regulatory Commission under 10 CFR 32.210 or with an Agreement State.
24. 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. Letter dated July 28, 1995 with revised application [Applicant has revised its renewal application dated September 6, 1994 to request a limited scope rather than a broad scope license.]
- B. Letter dated September 29, 1995 [Additional information about the licensee's Radiation Safety Program.]
- C. Letter dated January 22, 1996 [Increase Item 8.F, possession limits]
- D. Letter dated March 15, 1996 [Correct quantity of iron 55 sources, add cadmium 115m]
- E. Reference to March 1, 1996 NRC letter extending expiration date of license per 10 CFR 30.36(2).

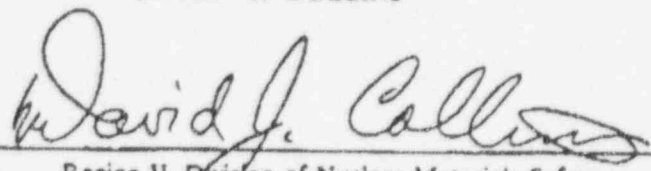
FOR THE U.S. NUCLEAR REGULATORY COMMISSION

DAVID J. COLLINS

DATE

JUN 1 8 1998

BY

Region II, Division of Nuclear Materials Safety
101 Marietta Street, N.W., Suite 2900
Atlanta, Georgia 30323-0199

N:\MLICENSE\01-06571.e26



September 5, 1996

Keith Walter
Smithsonian Astrophysics Lab

REF: IPL Quotation N1074-A

Dear Mr. Keith,

Please find attached specifications and drawings for
IPL's quotation number N1074-A.

Please note that terms of sale are as follows:

1. Any change to the procedure after the award of the contract will result in re-negotiation of the price of the award.
2. Forty percent (40%) of the total price will be required as a pre-paid payment.

Sources are to be received on site October 15, 1996.

If you have any questions please feel free to contact me at (818) 843-7000 x115. For technical issues please call Michel Gensini at x111.

Sincerely yours,

Ruth Amiauer

Manager, Technical and Customer Service

ATTACHMENT 2

(1)

PROJECT / INSTITUTIONAL REQUIREMENTS SHEET		REFERENCE NUMBER:			
ITEM NO.	DESCRIPTION OF ITEM, FEDERAL STOCK NO., NRC IDENTIFICATION NO., MODEL NO., SERIAL NO.	QTY.	UNIT	UNIT COST	
	Fabricate radioactive sources on MSFC-supplied gold substrates (22K), as follows:				
1	Shell-1 sources, 9 mm +/- 0.2 mm active diameter, Cadmium-109 activity = 4.3 +/- 0.6 mCi, Iron-55 activity = 1.9 +/- 0.3 mCi	7	ea	\$4970	
2	Shell-3 sources, 7.25 +/- 0.2 mm active diameter, Cadmium-109 activity = 2.8 +/- 0.4 mCi, Iron-55 activity = 1.2 +/- 0.2 mCi	7	ea	\$4507	
3	Shell-4 sources, 6.40 +/- 0.2 mm active diameter, Cadmium-109 activity = 2.2 +/- 0.3 mCi, Iron-55 activity = 0.95 +/- 0.2 mCi	7	ea	\$4320	
4	Shell-6 sources, 4.78 +/- 0.2 mm active diameter, Cadmium-109 activity = 1.20 +/- 0.2 mCi, Iron-55 activity = 0.52 +/- 0.1 mCi	7	ea	\$4014	
For each source, the Cadmium will be plated first, in the center of the source disk. The Cadmium thickness (which should be same for every source as the source activities scale with active diameter) shall not exceed 4000 Angstrom. The Cadmium will then be overcoated with 1000 Angstroms of gold. On top of this will be the Iron, of thickness not to exceed 2000 Angstroms.					
AS HAND RECEIPT NUMBER:		AS PROPERTY ACCOUNT NUMBER:		GRAND TOTAL	
				\$124,677	
20 DELIVER To Brian Ramsey		21 ORG. SYM.: ES84	22 PHONE NO.: 4-7743	23 BLDG.: 4481	24 ROOM: 226-A
25 SOURCE:					
Isotope Products Laboratory 1800 N. Keystone Route Burbank CA 91504					
Tel 818-843-7000, Arth Ruth ANSWER					
TOTAL ACTIVITY: Cd109 73.5 mCi Fe55 32 mCi					

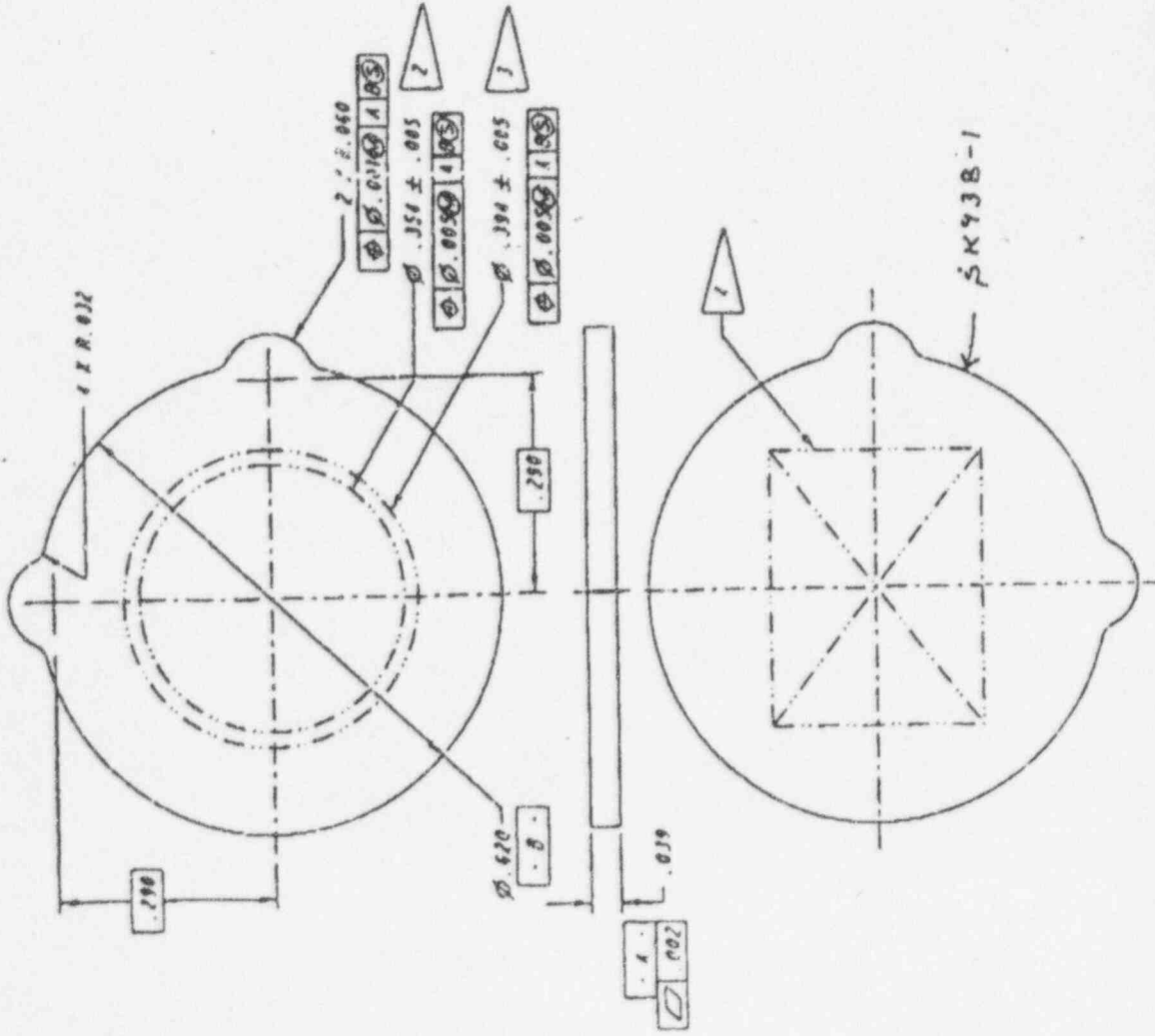
(2)

PROJECT / INSTITUTIONAL REQUIREMENTS SHEET		REFERENCE NUMBER:			
ITEM NO.	DESCRIPTION OF ITEM, FEDERAL STOCK NO., NBS IDENTIFICATION NO., MODEL NO., RETAIL NO.	QTY.	UNIT	UNIT COST	
	A final topcoat of gold, of diameter 10 +/- 0.2 mm and				
	thickness 50 micrograms / cm ² , will be coated on all sources				
	to prevent oxidation of the iron.				
	After each of the above steps, each substrate shall be rinsed				
	in an ultrasonic cleaner to remove any loose particles.				
	A uniformity of 10% (1 sigma) in activity, over any 1 mm ² area				
	shall be achieved for each unit.				
	Leakage from the substrate, as measured by the alcohol				
	flushing method, must be at a level below 10 nCi for each				
	finished source.				
	Isotope Products will ship the finished sources back to MSFC				
	containers provided by MSFC.				
	To assist with this fabrication, MSFC will provide :				
	1) Approximately 50 identical gold substrate buttons, 0.623				
	inch diameter and 0.040 inch thick.				
	2) Plating cells, 2 for each isotope (4 total)				
	3) Photomasking services if appropriate				
	Items (1) and (2) will be furnished within 1 week of order.				
35 HAND RECEIPT NUMBER:		36 PROPERTY ACCOUNT NUMBER:		GRAND TOTAL \$	
39 DELIVER To Brian Ramsey		81 ORG. SYMB. ES84	38 PHONE NO. 4-7743	39 BLDG. 4481	34 ROOM 226-A
35 SOURCE:					

REV. NO.		REVISIONS	
NO.	DATE	DESCRIPTION	BY

NOTES:

1. MATERIAL: FINE SILVER, 99.999% PURE.
2. THIS AREA ONLY TO BE PLATED WITH CARBON 109, $100 \pm 10\%$, OVERCOATED WITH IRON SS, $2.1 \text{ MIC} \pm 10\%$ ACTIVITY.
3. THIS AREA ONLY TO BE GOLD PLATED, $100 \pm 10 \text{ MICRO gm/cm}^2$.
4. ENGRAVE SERIAL NUMBER, SOURCE MATERIAL, ACTIVITY, AND DATE. SOURCE ACTIVITY SHALL BE MEASURED TO $\pm 5\%$.
5. BEFORE PLATING: REMOVE ALL BURRS AND BREAK EDGES, FINISH ALL SURFACES $\sqrt{2}$.



~~25~~
3/4 X 3/4 X-039

SK938 SHOWN

RADIATION SOURCE		SK938	
DATE	10/1/96	BY	10/1/96
REVISIONS	1	DATE	10/1/96
DESCRIPTION	RADIATION SOURCE		
ACTIVITY	0.002 ± 30%	DATE	10/1/96
SOURCE	1	DATE	10/1/96
REVISIONS	1	DATE	10/1/96
DESCRIPTION	RADIATION SOURCE		



REQUISITION A26049

September 9, 1996

Addendum to Attachment A, Statement of Work

The Statement of Work describes the methods by which the radioactive sources will be prepared.

This letter is to certify that these methods are typical of methods used to manufacture catalog items routinely sold by Isotope Products Laboratories.

The primary method used is electroplating, a common one for catalog items. The concentration of some chemicals in the plating baths to be used to make these products required by Requisition A26049 have been changed from standard formulations in order to obtain the desired product. Much of the work resulting in this formulation of plating baths has been accomplished in consultation with experts from NASA, Marshall Space Flight Center. However, the basic technique is a standard one to obtain such radioactive sources.

There is also a gold sputtering step which is a standard practice at Isotope Products Laboratories.

There are no unusual radiochemistry processes used for these materials.

Isotope Products Laboratories State of California Radioactive Materials License 1509-70, which covers the work we will perform.

For ISOTOPE PRODUCTS LABORATORIES


Leonard M Hendrickson
President

BETWEEN:

LICENSE FEE MANAGEMENT BRANCH, ARM
AND
REGIONAL LICENSING SECTIONS

(FOR LFMS USE)
INFORMATION FROM LTS

PROGRAM CODE: 03620
STATUS CODE: 0
FEE CATEGORY: EX 3M 3P 2B
EXP. DATE: 20040930
FEE COMMENTS: 1/4/93 TELECON
DECOM FIN ASSUR REQD: Y
.....

LICENSE FEE TRANSMITTAL

A. REGION I

1. APPLICATION ATTACHED

APPLICANT/LICENSEE: SMITHSONIAN INSTITUTION
RECEIVED DATE: 960916
DOCKET NO: 3030945
CONTROL NO.: 123684
LICENSE NO.: 08-05938-13
ACTION TYPE: AMENDMENT

2. FEE ATTACHED

AMOUNT: -----
CHECK NO.: -----

3. COMMENTS

SIGNED M. A. Perkins
DATE 9/16/96

B. LICENSE FEE MANAGEMENT BRANCH (CHECK WHEN MILESTONE 03 IS ENTERED /__/))

1. FEE CATEGORY AND AMOUNT: -----

2. CORRECT FEE PAID- APPLICATION MAY BE PROCESSED FOR:

AMENDMENT -----
RENEWAL -----
LICENSE -----

3. OTHER -----

SIGNED -----
DATE -----