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**MASTER**

# Nuclear Material Operations Manual

Richard P. Tyler



Sandia National Laboratories

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distributed to all custodians, alternate custodians, and using organizations and which provides a concise and comprehensive summary of the information and operating procedures relevant to custodians and users of radioactive and nuclear materials.

Numerous DOE, Federal, and Sandia documents supplement the information contained in this manual, and no attempt has been made to duplicate procedures or requirements which are fully documented elsewhere. Among the documents which should be considered as adjuncts to this manual are the following:

- DOE Manual Chapter 0502 -- Notification, Investigation, and Reporting of Occurrences.
- DOE Manual Chapter 0504 -- Operational Safety Program Appraisals.
- DOE Manual Chapter 0529 -- Safety Standards for the Packaging of Fissile and Other Radioactive Materials.
- DOE Manual Chapter 0530 -- Nuclear Criticality Safety.
- DOE Manual Chapter 5632.1 -- Physical Protection of Classified Matter and Information
- DOE Manual Chapter 5632.2 -- Physical Protection of Special Nuclear Material.
- DOE Order -- Safeguards Control.
- DOE Manual Chapter 7451 -- Management of Nuclear Materials.
- DOE Manual Chapter 7452 -- Disposition of Unirradiated Scrap Nuclear Material.
- DOE Manual AL Chapter 24XA -- The DOE transportation Safeguards System.

Code of Federal Regulations (CFR), Title 10, Part 71 --  
Packaging of Radioactive Material for Transport.

Code of Federal Regulations (CFR), Title 14, Part 103 --  
Hazardous Materials Regulations.

Code of Federal Regulations (CFR), Title 49, Parts 100  
through 189 -- Hazardous Materials Regulations.

Sandia Laboratories Security Handbook

SC-M-70-889 -- Sandia Laboratories Manual for Industrial  
Safety, Fire Prevention, and Environmental  
Health.

Sandia Laboratories Purchasing Instruction 6.05 --  
Routing of Shipments.

Sandia Laboratories Purchasing Instruction 8.06-13 --  
Procurement of Special Items.

SLI 1030-9 -- Sandia Nuclear Criticality Safety  
Committee.

SLI 2001 -- Industrial Safety, Fire Prevention, and  
Environmental Health.

SLI 2047 -- Nuclear Criticality Safety.

SLI 2048 -- Nuclear Explosive Safety.

SLI 6430 -- Procurement of Materials or Services by  
Purchase Requisition.

SLI 6950-2 -- Shipments.

Sandia Laboratories Engineering Manual -- Chapters 2.11  
"Nuclear Explosive Safety", and 2.11-1 "Control of  
Nuclear Explosive-Like Assemblies" (NELA).

The procedures contained in this manual are current as of the date of publication, and the manual will be updated as procedures are revised. In addition, at least once a year the entire manual will be reviewed and updated to ensure the accuracy of all of the procedures contained therein.

## CHAPTER II

### DEFINITIONS

Accountable materials -- a collective term which includes accumulations of nuclear materials reportable in specified units as follows:

<u>Nuclear Material</u>	<u>Reporting Unit</u>	<u>Reportable Qty.</u>	<u>Negligible Qty.</u>
MT-39 Depleted Uranium (U238)	Kilogram (kg)	>500 g	<500 g
MT-39 Enriched Uranium (U235)	Gram (g)	>0.5 g	<0.5 g
MT-40 Protactinium 242	Gram	>0.5 g	<0.5 g
MT-44 Americium 241	Gram	>0.5 g	<0.5 g
MT-45 Americium 243	Gram	>0.5 g	<0.5 g
MT-46 Curium	Gram	>0.5 g	<0.5 g
MT-47 Berkelium 249	Microgram (μg)	>0.5 μg	<0.5 μg
MT-48 Californium 252	Microgram	>0.5 μg	<0.5 μg
MT-50 Plutonium 239 240 241	Gram	>0.5 g	<0.5 g
MT-53 Lithium Enriched in Li 6	Kilogram	>500 g	<500 g
MT-70 Uranium (U233)	Gram	>0.5 g	<0.5 g
MT-81 Normal Uranium	Kilogram	>500 g	<500 g
MT-82 Neptunium 237	Gram	>0.5 g	<0.5 g
MT-83 Plutonium (Pu238)	Gram to Tenths	>0.05 g	<0.05 g
MT-86 Cesium	Kilogram to Tenths	>100 g	<100 g
MT-87 Erbium	Gram to Hundredths	>0.005 g	<0.005 g
MT-88 Thorium	Kilogram	>500 g	<500 g

Apparent loss -- the inability to locate physically or otherwise account for any nuclear materials, irrespective of the size, dimensions, or weight of the materials.

Beginning inventory -- the actual total element and isotope weights by material type, project, etc., for the immediate prior period such as month or fiscal year.

Category I quantities of special nuclear materials -- plutonium - 2 kg or more;  $^{233}\text{U}$  - 2 kg or more;  $^{235}\text{U}$  (contained in uranium enriched to 20% or more) - 5 kg or more. If plutonium or  $^{233}\text{U}$  is combined with  $^{235}\text{U}$ , the amounts of Pu or  $^{233}\text{U}$  shall be multiplied by 2.5 to arrive at the limits shown.

Category II quantities of special nuclear materials -- plutonium - 400 to 1999 g;  $^{233}\text{U}$  - 400 to 1999 g;  $^{235}\text{U}$  (contained in uranium enriched to 20% or more) - 1000 to 4999 g. If plutonium or  $^{233}\text{U}$  is combined with  $^{235}\text{U}$ , the amounts of Pu or  $^{233}\text{U}$  shall be multiplied by 2.5 to arrive at the limits shown.

Category III-A quantities of special nuclear materials -- plutonium - 220 to 399 g;  $^{233}\text{U}$  - 220 to 399 g;  $^{235}\text{U}$  (contained in uranium enriched to 20% or more) - 350 to 999 g. A plutonium and/or  $^{233}\text{U}$  content of less than 400 g may be combined with  $^{235}\text{U}$  when the total content is less than 1000 g.

Category III-B quantities of special nuclear materials -- plutonium - 1 to 219 g;  $^{233}\text{U}$  - 1 to 219 g;  $^{235}\text{U}$  (contained in uranium enriched to 20% or more) - 1 to 349 g;  $^{235}\text{U}$  (contained in uranium enriched to less than 20%) - all quantities above 0.99 g.

Continuous surveillance -- the observation of Category I and Category II special nuclear materials or their container when in use or in open storage by at least two authorized, Q-cleared persons who may be doing other work but who can give an alarm in time to prevent the unauthorized removal of the special nuclear materials.

Criticality-safe -- a condition in which fissionable materials are stored in a configuration which prevents an accidental nuclear criticality.

Custodian/alternate custodian -- the persons designated by using organizations (and approved by their Director) to control and account for all nuclear materials within a material balance area.

Draft number -- a numerical designation assigned by an ordering field office to an authorization for the withdrawal of nuclear materials, or transfer from one program to another.

Ending inventory -- the total inventory at the end of each fiscal year for a project, calculated by adding receipts to the beginning inventory and subtracting all removals.

Excess materials -- nuclear materials for which there are no planned and approved programmatic use during the near term.

Fissile materials -- a collective term which includes uranium-233, uranium-235, plutonium-238, plutonium-239, and plutonium-241.

Inventory -- a physical check of reportable-quantity items of accountable materials for serial number identification, condition, usage, and location.

Inventory Difference (ID) -- is the algebraic difference between the nuclear material book inventory (BI) and a physical inventory (PI); i.e.,  $ID = BI - PI$ .

Irradiated returns -- materials which, in their existing form, have been subjected to reactor irradiation.

Local shipments -- transfers or movements of materials between Sandia Laboratories technical areas and/or Kirtland AFB.

Loss -- the inability to locate physically or account for any accountable quantity of nuclear material.

Material access area (MAA) -- an area containing Category I quantities of special nuclear materials, specifically defined by physical barriers and located within a protected area, with access restricted to specified authorized personnel only.

Material balance area (MBA) -- a numerical designation assigned by the Safeguards and Technical Security Division to an organization, location, or specified area which is authorized to receive nuclear materials.

Normal operational losses (NOL) -- A loss of material determined by measurement or by estimate on the basis of measurement, which, whether in the form of solids, liquids, or gases, has been discarded.

Include material:

- a. Discarded to settling ponds, sewers, cribs, stacks, or burial grounds;
- b. Discarded in contaminated items such as equipment, laundry, and shoe covers. Quantities of NOL must be determined by measurement or by estimate on the basis of measurement.

Nuclear materials -- a collective term which includes source materials, special nuclear materials, and those other materials designated by the Assistant Secretary of Defense Programs for the DOE. All physical and chemical forms (including scrap) of the following materials are presently included:

<u>Accountable Nuclear Materials</u>		
<u>Source Materials</u>	<u>Special Nuclear Materials</u>	<u>Other Materials</u>
Enriched Uranium (Material Type 61)	Plutonium-239-240-241 (Material Type 50)	Enriched Lithium (Material Type 60)
Depleted Uranium (Material Type 70)	Plutonium-238 (Material Type 53)	Deuterium (Material Type 80)
Plutonium (Material Type 58)	Plutonium-242 (Material Type 40)	Tritium (Material Type 81)
	Uranium Enriched in the Isotope U-233 (Material Type 70)	Neptunium-237 (Material Type 82)
	Uranium Enriched in the Isotope U-235 (Material Type 20)	Americium-241 (Material Type 41)
		Americium-243 (Material Type 45)
		Curium-244 (Material Type 46)
		Berkelium-249 (Material Type 47)
		Californium-252 (Material Type 48)

Nuclear materials manager -- the designated employee in the Safeguards and Technical Security Division who is responsible for developing and directing the overall nuclear materials management program at Sandia National Laboratories and who serves as the DOE contact for coordinating materials management activities, such as materials management plan preparation, contractor materials management appraisals, forecasting of nuclear material requirements, material utilization programs, risks/contingency plans for meeting inventory targets, reduction of budget expenditures through materials management, excess and scrap disposition, and analytical studies.

Nuclear materials representative -- the designated employee in the Safeguards and Technical Security Division who is responsible for coordinating the receipt, shipment, control, and inventory of accountable



nuclear materials in the custody of Sandia National Laboratories and who is responsible for reporting to the DOE in accordance with the requirements specified in DOE Order 5630.

Protected area -- a specifically defined area (e.g., a fenced area, a building, or a segregated area within a building) enclosed by physical barriers, which may form a buffer zone around one or more material access areas.

Radioactive materials -- a collective term which includes all radioisotopes, byproduct materials, radium, radium compounds, and irradiated materials.

Removals -- a collective term which includes all deletions or decreases in the quantities of nuclear materials in the inventory resulting from shipments, decay, normal operational losses, routine test, material unaccounted for, and other adjustments authorized by the field office.

Reporting identification symbol (RIS) -- an alphabetic designation assigned by the Nuclear Regulatory Commission to identify licensed commercial suppliers and institutions as well as government contractors.

Routine test (RT) -- materials destroyed in weapon development activities associated with the use of high explosives, sled track tests, drop tower tests, etc.

Safeguards control -- a system of controls intended to guard against the diversion of nuclear materials from authorized uses.

Scrap -- nuclear materials that are not usable in their existing form, are mixed with other materials necessitating chemical treatment to be rendered useful, and which may or may not be recoverable in an economical and safe manner.

Source materials -- a collective term which includes normal uranium, depleted uranium, and thorium (see "nuclear materials").

Special nuclear materials (SNM) -- a collective term which includes all isotopes of plutonium, uranium enriched in the isotope uranium-233, and uranium enriched in the isotope uranium-235 (see "nuclear materials").

Special reactor materials -- a collective term which includes all physical and chemical forms composed wholly or largely of beryllium, boron-10, hafnium, or zirconium.

Specification-type containers -- containers whose specifications are designed (according to the type of material) to comply with Department of Transportation requirements.

Transfers in -- materials obtained for a project from another project, but excluding materials obtained as a result of withdrawals.

Transfers out -- materials removed from one project and provided to another project, but excluding materials moved as a result of returns.

Transport index -- the radiation level (in curies) measured at 36 inches from the outer surface of the shipping container.

Two-person concept -- a minimum of two authorized persons, each capable of detecting incorrect or unauthorized use or handling of nuclear materials with respect to the task to be performed and who are familiar with pertinent safety and security requirements.

Unirradiated returns -- materials which, in their existing form, have not been subjected to reactor irradiation.

Withdrawals -- materials obtained by DOE contractors from the DOE Production System for use in authorized programs.

## CHAPTER III

### GENERAL INFORMATION

#### 1. Activities

Sandia National Laboratories is a multiprogram laboratory of the Department of Energy, with facilities located in Albuquerque, NM and Livermore, CA and with a remote testing facility in Tonopah, NV. The programmatic responsibilities of Sandia are defined in Contract DE-AC04-76-NE00089 (Modification, dated October 1, 1978), Article II, "Statement of Work" (part of contract), which states:

"The programs of work to be carried on in these facilities will be principally those related to weapon research and development, weapon reproduction and production, preparation of weapon field procedures and manuals, weapon surveillance, weapon testing, and related technical and administrative work; but work programs may also include other work within the capabilities of Sandia [Laboratories] as may be agreed upon in writing from time to time."

Of these programs, many are performed in support of national security missions. These include basic research to generate new weapon concepts, design and development of nuclear warheads, assessment of safety and reliability to verify that the weapon stockpile remains a credible deterrent, modification of weapons (as necessary) to satisfy new requirements, and development and application of advanced technologies for the safeguarding of nuclear materials. Other programs are performed in support of national energy programs to increase the domestic energy supply and to develop methods of conservation of energy resources. Additional work is done for federal agencies other than the DOE, including the Department of Defense, the Arms and Services Review Commission, the Department of Transportation, the Arms

Control and Disarmament Agency, the National Aeronautics and Space Administration, the National Science Foundation, and the National Institutes of Health.

A substantial number of these programs involve the utilization of nuclear materials, which must be handled in accordance with regulations set forth by the DOE and other governmental agencies. Contract DE-AC04-76-DP-00789 (Modification, dated October 1, 1978), Article XVII, "Safeguards, Control and Management of 'SS Materials'" states the contractual responsibility of Sandia as follows:

"Sandia [National Laboratories] shall, in a manner satisfactory to the [DOE], establish accounting and measurement procedures, maintain current records, and institute appropriate control measures for 'SS Materials' in its possession commensurate with the national security and the economic value of the 'SS Materials.' Wherever a license is required by law or regulation, Sandia [National Laboratories] shall not transfer or receive possession of 'SS Materials' unless duly licensed by the [DOE] to do so, and shall not transfer 'SS Materials' to any person not duly licensed by the [DOE] to receive possession of such materials. Transfers of 'SS Materials' will not be made without prior written approval of the Contracting Officer.

"Except as otherwise authorized by the [DOE], 'SS Materials' in Sandia's possession, custody, or control, shall be used only for furtherance of the work under this Contract. Sandia shall be responsible for the control of such 'SS Materials' in accordance with Part 5630 of the [DOE] Manual and shall make a part of each purchase order, subcontract, and other commitment which it enters into under this Contract, where 'SS Materials' are involved, appropriate terms and conditions for the use of 'SS Materials' and the responsibilities of the subcontractor or vendor regarding control of 'SS Materials.' In the case of fixed price purchase orders, subcontracts or other commitments, the terms and conditions with respect to 'SS Materials' shall also include the financial responsibilities, if any, regarding such items as losses, scrap recovery, and product recovery."

Figure III-1 illustrates a simplified flowchart for Nuclear Materials. Figure III-2 illustrates the corresponding flowchart for the material records that accompany nuclear materials. Nuclear materials are utilized principally in engineering and research directly related to the design and development of nuclear weapons ordnance. The majority of enriched uranium is utilized in operations in the reactor area where weapon parts and component packages are irradiated in studies of radiation effects and material characteristics. Other (nonweapon) activities in which nuclear materials are utilized include metallurgical studies, transportation safety, electron-beam research, space power-systems development, and aerospace nuclear safety.

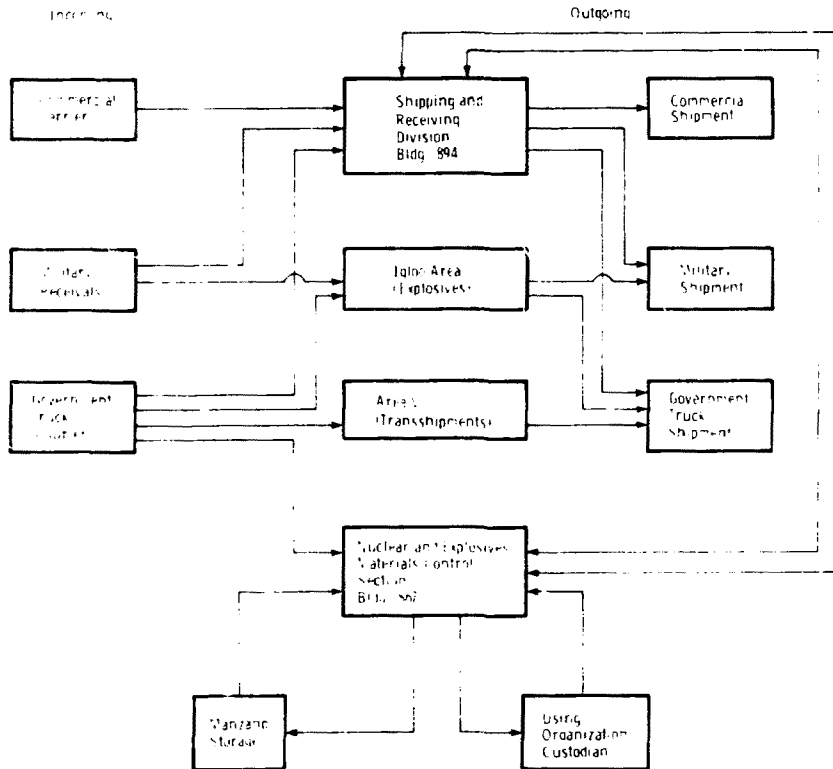


Figure III-1. Simplified Flowchart for Nuclear Materials



## 2. Operational Structure

### 2.1 General Organization

In support of these wide-ranging activities, Sandia maintains a staff with the scientific, engineering, and administrative expertise necessary to carry out the various programs. The technical capabilities of the Directorate reside in functional organizations that are dedicated to individual disciplines and technologies. Responsibility for individual projects is assigned to project organizations which rely upon the functional organizations for support. The project/functional relationship is advantageous because responsibility for a project is assigned to a single manager and his staff, and continuity of control over the assigned system is assured. This control is necessary to assure the integration of complex designs having stringent requirements for performance, reliability, safety, and longevity. The relationship also permits detailed technical direction to be concentrated at the level where primary technical competence exists.

Figure III-3 illustrates an overall organization chart for Sandia National Laboratories. Included in the figure is a listing of material balance areas (MBA's) by directorate, indicating the wide distribution within Sandia of activities involving nuclear materials. Table III-1 includes a complete listing of the MBA's by responsible organization and location.

### 2.2 Nuclear Materials Management Organizations

Within the overall organization, primary responsibility for the management, control, and accountability of nuclear materials is delegated to a Safeguards and Technical Security Division and a Nuclear and Explosives Materials Control Section. Figure III-4 illustrates the organization chart for these organizations, indicating the chains of responsibility and the partitioning of responsibilities within the organizations.

Table III-1  
Master Listing of MBAs

<u>MBA</u>	<u>Responsible Organization</u>	<u>Location</u>	<u>MBA</u>	<u>Responsible Organization</u>	<u>Location</u>
01	3423	Bldg. 867	17	4311	Bldg. 809
02	3423	Bldg. 867 and Igloo	18	1482	Bldg. 892
03	3423	Manzano-7055	19	1414	Bldg. 892
04	3423	Manzano-7049	21	1759	Bldg. 820
05	3423	Manzano-7048	22	4323	Bldg. 809
06	3423	Manzano-7047	23	4323	Bldg. 809
07	3423	Area I	24	4333	Bldg. 809
08	3423	Manzano-7063	25	1254	Bldg. 880
09	3423	Bldg. 867-con-structive receipts	28	2167	Bldg. 807
10	3423	Bldg. 867-material held for shipment	30	1587	MO 12
11	1545	Bldg. 892	31	1551	Bldg. 860
12	1535	Bldg. 6584, Area III	32	1766	MO 42-45
13	3313	Bldg. 869	33	5624	Bldg. 634
14	4314	Bldg. 809	34	2531	Bldg. 643
15	2552	Bldg. 805	35	4338	Bldg. 809
16	1213	Bldg. 892	36	5821	Bldg. 805
			37	1170	Tonopah Test. Range



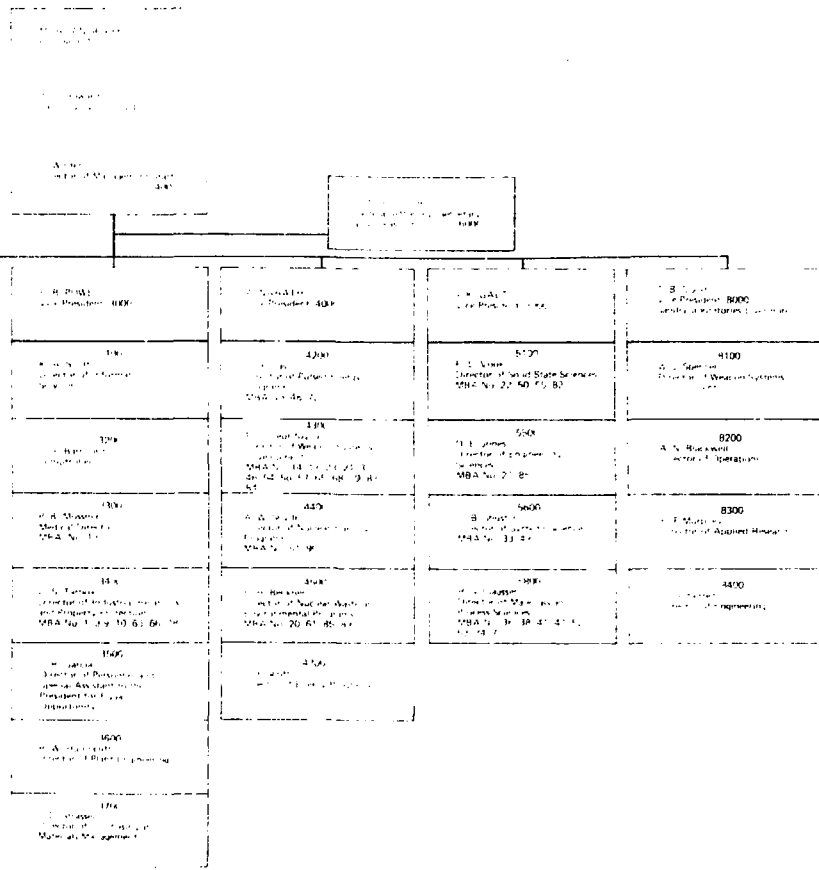
Table III-1 (cont)

<u>MBA</u>	<u>Responsible Organization</u>	<u>Location</u>	<u>MBA</u>	<u>Responsible Organization</u>	<u>Location</u>
38	5822	Bldg. 805	63	3423	Manzano-7118
39	1473	Bldg. 841	64	1587	Alice Springs Australia
40	1137	Bldg. 402/892	66	3417	Bldg. 894
41	5612	Bldg. 805	67	2141	Bldg. 870
42	1112	Bldg. 806	68	4363	Bldg. 835
43	1251	Bldg. 868	69	2354	Bldg. 802
45	2514	Bldg. 807	70	1244	Bldg. 880
47	5846	Bldg. 894	72	4221	Bldg. 9990
48	4216	MO 33	73	2355	Area II
49	5623	Bldg. 835	74	5846	Bldg. 892
50	5111	Bldg. 884	75	5836	Bldg. 6630, Area III
51	4453	Bldg. 6588, Area V	77	3423	Bldg. 867
52	5836	T4	78	3423	Igloo Area
53	5842	Bldg. 808	79	4341	Bldg. 809
55	5132	Bldg. 806	80	2164	Bldg. 807
56	4342	Bldg. 809	81	1112	T6
58	1552	Bldg. 860	82	5154	Bldg. 807
59	1727	Bldg. 880	84	4314	Cannon AFB
60	2352	Bldg. 802	86	4536	T4
61	4552	Bldg. 890	87	1485	Bldg. 840
62	2353	Bldg. 802			

Table III-1 (cont)

MBA	Responsible Organization	Location
88	3423	Igloo Area
89	4536	Woods Hole, Mass.
91	4536	Sea Bed Program Site
92	1554	MO 81
93	1543	Bldg. 860
94	1721	Bldg. 820
95	4422	Bldg. 892

SANDIA LABORATORIES STAFF



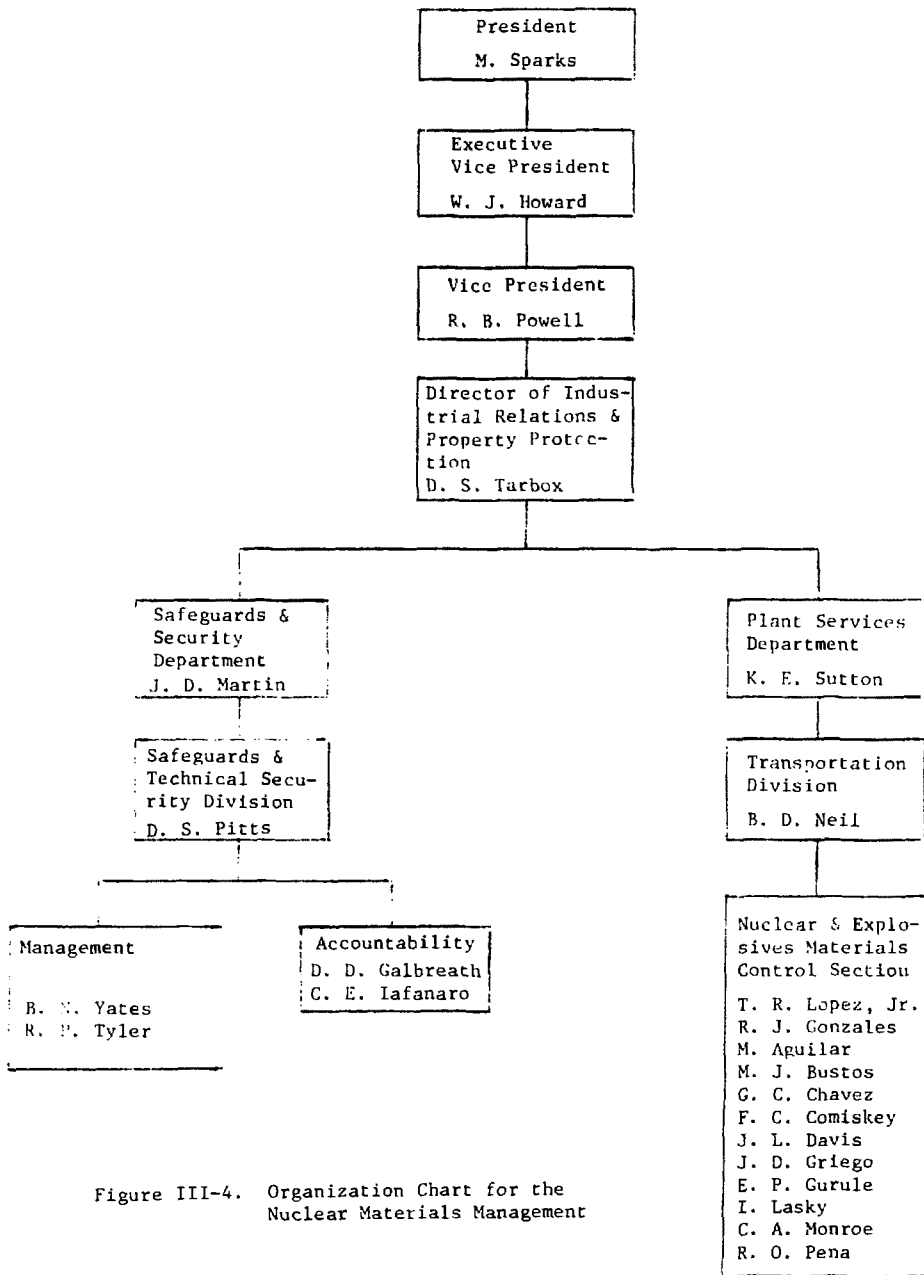


Figure III-4. Organization Chart for the Nuclear Materials Management

### 3. Responsibilities

#### 3.1 Nuclear Materials Management Organizations

The Safeguards and Technical Security Division assumes primary responsibility for the management and accountability of nuclear materials. Specific responsibilities are to:

- Maintain records of accountable nuclear materials.
- Report inventory changes to DOE/ALO and to the Nuclear Materials Management and Safeguards System (NMMSS) in Oak Ridge, TN.
- Review DOE-189 schedules and purchase requisitions for nuclear radioactive materials.
- Initiate analytical studies, when warranted.
- Perform continuous random sampling, 100-percent audits, and utilization and storage reviews.
- Reconcile custodians' inventories.
- Satisfy reporting requirements to the DOE.

The Nuclear and Explosives Materials Control Section assumes primary responsibility for the physical control of nuclear materials. Specific responsibilities are to:

- Receive all nuclear and radioactive materials.
- Measure the content of weighable nuclear materials.
- Verify the presence of nonweighable nuclear material utilizing nondestructive assay equipment (SAM II).

- Transport nuclear materials.
- Store nuclear materials being held for future use.

## 3.2 Support Groups

Several organizations internal and external to Sandia assist the nuclear materials management organizations in performing management, control, and accountability functions. Organizations that normally support the nuclear materials management organizations (along with their areas of responsibility) include the following:

### 3.2.1 Environmental Health Department

- Opens and monitors all sources.
- Physically moves all sources.
- Monitors all receipts containing plutonium.
- Monitors all receipts with questionable radiation.
- Checks all radioactive-material locations and advises using employees of potential hazards.
- Monitors all nuclear and radioactive shipments.
- Makes all burials in the Sandia burial grounds and records their locations.
- Checks activated criticality alarms and maintains alarms.
- Monitors continuous air monitor (CAM) and remote air monitor (RAM) indicators in Area V.

• Responds to all alarms and reports to the Security Control Section and the Security Control Section Chief.

• Performs all detection activities:

• Responds to Security Department:

- Establishes physical security standards/procedures.
  - Provides escort service for significant quantities of special nuclear materials.
  - Provides inside and outside guard services on a 24-hour basis for Bldg. 819 whenever significant quantities of special nuclear materials are stored.
  - Responds to all activated alarms.
  - Maintains constant radio communication with Bldg. 819 and Nuclear and Explosives Materials Control Section vehicles.
  - Signs for material onboard SST's parked in the Area V secured area during off-hours.
  - Receives the lost keys to Bldg. 819 during off hours.
- Responds to all alarms and reports to the Security Control Section during offloading of materials during off hours.

#### 4.2.2 Computing Directorate

- Performs system studies of nuclear material functions and provides data to the files of material records and inventories of computer output.

- Develops and maintains a computerized system with the capabilities required to meet DOE and Sandia requirements.
- Writes and maintains computer programs to implement the computerized system.
- Produces and transmits reports and messages.

#### 3.2.4 Shipping and Receiving Division

- Packages nuclear materials in accordance with federal regulations based on information on the shipper (property action form) and the hazardous material shipment form.
- Labels and stencils containers.
- Requests the Health Physics Division to monitor packaged materials.
- Ensures that DOT requirements are satisfied.
- Ships materials.
- Receives materials and notifies the Nuclear Materials and Explosives Control Section of radioactive and nuclear material receipts.

#### 3.2.5 Transportation Division

- Moves large and heavy materials accompanied by a control clerk from the Nuclear Materials and Explosives Control Section.



- Moves explosive materials as approved by the Safety Standards and Engineering Department.
- Provides trucks, forklifts, and other equipment for loading and unloading of materials at the Manzano Storage structures.
- Provides tiedown service on SST's.

#### 3.2.6 Traffic Management Division

- Arranges for transportation and courier support from the Transportation Safeguards Division of the DOE.
- Receives and conveys notification of expected material arrivals.

#### 3.2.7 Safety Standards and Engineering Department

- Checks pressure vessels.
- Checks facilities and equipment for unsafe conditions.
- Reviews, evaluates, and authorizes the presence of HE in the same physical location as nuclear materials.

#### 3.2.8 Physical Standards Division

- Provides certification and calibration of weighing equipment.

#### 3.2.9 Plant Engineering Planning Department

- Designs, builds, and modifies facilities.
- Provides fire protection.
- Maintains power, lights, heat, water, etc.

- Maintains liaison with the Air Force to provide telephone service.

2.10 Criticality Safety Committee

- Reviews Sandia storage facilities for the proper control of nuclear materials to avoid criticality situations. CSII 100-9 details the membership, duties, and responsibilities of this committee.

2.11 Classification Division

- Provides classification guidance on administrative practices.

2.12 Managers (Air Force)

- Provides structures for the storage and physical protection of materials.



- Prepare annual requests to using organizations to provide descriptions of proposed project activities for the 12-year forecast.
- Summarize the annual forecast requirements reported by the Directors of using organizations and submit the completed forecasts to DOE/ALO.
- Review and approve purchase requisitions for nuclear materials.
- Establish and maintain a program for appraising the status of purchase orders and contract activities involving nuclear materials.
- Establish and maintain a project control system for assessing the actual activity of nuclear materials as compared with the forecasted activity.
- Prepare materials management plan (MMP) submitted annually in May to DOE/ALO. DOE Appendix 7451 provides specific guidelines for preparation.
- Prepare the assessment report submitted annually in November to DOE/ALO. The report is a summary of the current inventory, how materials are being used and which materials are being held for specific purposes and projected disposition.
- Verify that custodians and users report project changes promptly in order to update the computer master records and to provide timely notification to the NMSS.
- Verify that using organizations comply with all procedural requirements.

- Indoctrinate new custodians and annually review the using organization's responsibilities with current custodians.
- Review and approve external transfer accountability forms (Form DOE-741).
- Assure that requests for material transfers between approved programs have been received and authorized prior to the physical movement of material and notification to NMSS of such transfers.
- Request authorization from DOE/ALO to remove materials which are anticipated to be expended in experiments or tests from the records.
- Establish and maintain procedures for the control and disposition of scrap and audit using organizations to ensure compliance with these procedures.
- Submit scrap evaluation reports to DOE/ALO and request disposition instructions from DOE/ALO for scrap and excess materials.
- Arrange shipping schedules for scrap or excess materials with reprocessing plants, based upon the disposition instructions issued by DOE/ALO.
- Provide liaison with suppliers, military agencies, and the DOE regarding activities involving nuclear and other accountable materials.

- Establish and maintain a continuous internal audit program to ensure that material control procedures are effective and that these procedures are being complied within daily operations.
- Conduct continuous utilization and storage reviews during audits to ensure that materials are being utilized properly and that the nuclear material inventory is being optimized.
- Assist DOE/ALO in conducting annual safeguards and security surveys and nuclear materials management appraisals.
- Initiate the necessary actions required to satisfy the recommendations made by internal or external audit teams.
- Review monthly MSR and project balance reports from ALO and Oak Ridge to verify balances with Sandia accountability records.
- Prepare reports of expended nuclear material based on the information supplied by using organizations on "Modification/Expenditure of Nuclear Materials" forms.

## 2. AUTHORIZATION OF MBAs

Major plant defense areas (MBA's) are assigned by the Safeguards and Technical Security Division on a functional basis. As a result, materials that are assigned to a single MBA may be used in more than one geographical location. However, whenever possible, the single geographical location-single custodian concept is followed. An MBA working group consisting of personnel from the Safeguards and Technical Security Division and the Nuclear and Explosives Materials Control Section meets periodically to review the MBA assignments in order to determine whether the current assignments are consistent with the needs of the laboratories.

### 2.1 Procedures for the Authorization of On-Site MBA's

<u>Responsible Organization</u>	<u>Action</u>
Plant Organization	1. Submits a request to the Safeguards and Technical Security Division for the authority to receive nuclear materials, justifying the need for such materials and indicating their intended use.
(Custodian/Alternate Custodian)	2. Designates a custodian and alternate custodian.
(Director)	3. Completes redelegation forms, Form SF 3004-C, "Authorization for Redlegation" (Exhibit 5, Chapter X).
	4. Approves the custodian and alternate custodian and signs the redelegation forms.
	5. Forwards the approved forms to the Safeguards and Technical Security Division

Responsible Organization	Action
Safeguards and Technical Security Division (NMR)	6. Signs the custodian and alternate custodian redelegation forms and assigns an MBA number to the new material balance area.
(Accountability Clerk)	7. Inputs to the computer the MBA number, inventory report format, inventory frequency, creation date, termination date, site type, location, custodian's and alternate custodian's name, organization, phone number, duty date, and briefing date in accordance with the Nuclear Materials Computer User's Guide.
(Internal Auditor)	<p>8. Files the redelegation forms.</p> <p>9. Schedules indoctrination meetings with new custodians and alternate custodians to:</p> <p>9.1 Provide them with a copy of the users' manual.</p> <p>9.2 Discuss responsibilities defined in the users' manual, especially regarding unique circumstances in the MBA.</p> <p>10. Schedules review meetings annually with all custodians and alternate custodians to:</p> <p>10.1 Review responsibilities and discuss problems encountered in or with the MBA, and any new requirements that require updating of the users' manual.</p>

Whenever changes in custodianship occur, the newly assigned custodian/alternate custodian is required to submit an approved redelegation form to the Safeguards and Technical Security Division as specified above. In addition, a 100% physical inventory is performed by Safeguards and Technical Security Division personnel and accompanied by both old and



new custodians. This ensures that the newly assigned custodians are cognizant of the material for which they are accountable and its location.

## 2.2 Procedures for the Authorization of Off-Site MBA's

<u>Responsible Organization</u>	<u>Action</u>
Using Organization	<ol style="list-style-type: none"><li>1. Submits a request to the Safeguards and Technical Security Division for authority to receive nuclear material at a designated off-site location. Justifying the need for such material and indicating intended use.</li><li>2. Designates a custodian and alternate custodian.</li><li>3. Provides date of shipment to the off-site location and date of return.</li><li>4. Follows procedures in 2.1-3 through 8 for custodian/alternate custodian approval.</li></ol>
Security Standards and Investigation Division	<ol style="list-style-type: none"><li>5. Provides security data for the off-site location regarding storage, alarm systems, and patrol frequency to the Safeguards and Technical Security Division.</li></ol>
Safeguards and Technical Division (NMR)	<ol style="list-style-type: none"><li>6. Prepares site plan for the Security off-site MBA.</li><li>7. Forwards site plan to DOE/ALO for approval prior to each shipment.</li><li>8. Authorizes shipment of material following receipt of DOE/ALO approval.</li></ol>

### 3. Review of Program and Budget Proposals

Program and budget proposals required by the DOE are submitted by using organizations involved in non-DMA programs, such as reactor research programs and programs funded by the Nuclear Regulatory Commission. These proposals, submitted on DOE Schedule 189 (Form SF 9211-F), "Program and Budget Proposal" (Exhibit 1, Chapter X), are intended to provide the DOE with a detailed description of the proposed program along with the budget allocations required for the program by fiscal year.

For those programs that require the utilization of nuclear materials, DOE Schedule 189a, "Program and Budget Proposal, Nuclear Regulatory Research Program" (Exhibit 2, Chapter X) is submitted in conjunction with DOE Schedule 189 in order to specify nuclear material quantity requirements for the proposed program. This schedule includes justifications, specifications, and final disposition plans for the materials along with the DOE project number to be charged.

Both documents are completed by the using organization and forwarded to the Budget and Financial Planning Department. A copy of each is sent to the Safeguards and Technical Security Division where the information is used in forecasting of materials and long-range planning.

Both forms are ultimately reviewed and approved through the vice-presidential level at Sandia and then forwarded to DOE/ALO for authorization.

#### 4. Analytical Studies, Risks, Contingencies, and Options

As a research and development laboratory, Sandia does not routinely perform analytical studies of nuclear material requirements. The Safeguards and Technical Security Division performs quarterly evaluations of material utilization by comparing material withdrawals with material forecasts. In addition, materials management options related to such matters as proposed programs, nuclear material requirements, computer data-base capabilities, safeguards, and internal procedures are continually reviewed and analyzed. Whenever warranted, analytical studies are initiated, and the results of such studies are utilized in improving the nuclear materials management program.

Using organizations are expected to perform the necessary assessment of risks associated with meeting programmatic objectives, health and safety standards, safeguards requirements, etc., and to formulate contingency plans consistent with sound program management. The Safeguards and Technical Security Division remains informed of such studies to be incorporated into the Materials Management Plan.

Risks, contingencies, and options are also provided to the Safeguards and Technical Security Division whenever materials being held for future use in a program are to be transferred to another contractor in response to an urgent requirement.

## 5. Forecasts

Annual forecasts are required for the following nuclear materials:

<u>Material Type</u>	<u>Material to be Forecast</u>	<u>Reporting Units</u>
Enriched Uranium	$^{235}\text{U}$ Isotope	Nearest whole kilogram
Normal Uranium	Total U	Nearest whole kilogram 100 kg
Plutonium	Total Pu	Nearest whole kilogram
$^{233}\text{Pu}$	$^{233}\text{U}$ Isotope	Nearest whole kilogram
Heavy Water ( $\text{D}_2\text{O}$ )	$\text{D}_2\text{O}$	Nearest whole kilogram
Boron-10	Total $^{10}\text{B}$	Nearest whole kilogram
Tritium	Tritium	Nearest whole gram
$^{238}\text{Pu}$	$^{238}\text{Pu}$ Isotope	Nearest whole gram
Krypton-85	Krypton	Nearest whole curie

\* Other materials designated by the DOE may also be added to this list from time to time.

Annual forecasts are submitted to DOE/ALO in early January on Form 408, "Forecast of Nuclear Material Requirements" (Exhibit 3, Chapter X):

### 5.1 Procedures for the Development of Annual Forecasts

<u>Responsible Organization</u>	<u>Action</u>
Safeguards and Technical Security Division (NM Manager)	<ol style="list-style-type: none"> <li>1. Prepares a letter in mid-October requesting the forecast.</li> <li>2. Issues the requests, along with Forms DOE 408 and DOE Appendix 7451, Part I (which provides guidelines for the preparation of the forms), to Directors of using organizations.</li> </ol>
Using Organization (Director)	<ol style="list-style-type: none"> <li>3. Reviews the nuclear material requirements for the next 12 fiscal years with using organizations.</li> <li>4. Prepares Forms DOE 408 in accordance with the instructions provided in DOE Order 5630.</li> </ol>

Responsible Organization	Action
Safeguards and Technical Security Division (NM Manager)	4.1 Requirements are reported by quarter for the first 2 years of the 12-year forecast and by year thereafter.
	4.2 Forecasts must reflect both firm and probable requirements and must include unirradiated returns, irradiated returns, and burnup and losses anticipated.
	5. Prepares a brief description of program objectives and of known risks/contingency plans related to the program.
	6. Submits the completed Forms DOE 408 along with the program description to the Safeguards and Technical Security Division in late November (by the date specified in the request letter).
	7. Reviews the forecasts and consults the originator when vague or inclusive data appear.
	8. Checks the forecasts against Program and Budget Proposals (for those programs for which DOE Schedules 189 and 189a have been submitted).
	9. Consolidates the requirements by project and material type.
	10. Prepares Forms DOE 408 in accordance with DOE Order 5630, Part I, reflecting the composite requirements of all Sandia programs.
	11. Files a copy of the completed forecasts and submits the forecasts to DOE/ALO in early January (by the date specified in their annual request letter).
	12. Prepares revised Form DOE 408 as changes to known requirements occur.

## 6. Procurement and Contract Activities

Using organizations are responsible for initiating purchase requisitions to obtain materials for approved programs. Purchase analysts prepare purchase requisitions based on information supplied by the using organization and guidelines provided in Purchasing Instructions, such as P.I. 6.05, "Routing of Shipments," and P.I. 8.06-13, "Procurement of Special Items." All requisitions for radioactive and nuclear materials are then routed through the Safeguards and Technical Security Division for special approval prior to the placement of a purchase order.

### 6.1 Procedures for the Requisition of Radioactive and Nuclear Materials

<u>Responsible Organization</u>	<u>Action</u>
Using Organization	<ol style="list-style-type: none"><li>1. Provides the purchase analyst with the information necessary to order the required materials.<ol style="list-style-type: none"><li>1.1 On orders where Sandia-ordered material is to be used by another contractor in a manufacturing process special instructions must be provided stating disposition instructions for the scrap, excess, and finished product, or stating that a request for such instructions will be submitted following processing.</li></ol></li></ol>
Purchasing, Stores, and Traffic Management Department (Purchase Analyst)	<ol style="list-style-type: none"><li>2. Prepares a purchase requisition on Form SA 6430-RD, "Purchase Requisition" (Exhibit 4, Chapter X).<ol style="list-style-type: none"><li>2.1 Building 819 is designated as the delivery point.</li></ol></li></ol>

Material Requisition Organization

1. The NM Manager and the Safeguards and Technical Security Division (S&T) purchase Analyst.

Safeguards and Technical Security Division (S&T)

Safeguards and Technical Security Division (NM Manager)

Action

2. The word "NM" is entered on the Inspection Code block, which puts the Safeguards and Technical Security Division on distribution for the purchase order.
3. The word "Nuclear Relative Material", "Nuclear Material" or "Fissile Material" is placed at the top of the Material or Service column to serve as a flag for the type of material.
4. In all orders, a statement is included requesting that project weights and chemical analyses be furnished with the material in order that accurate element and isotope weights may be entered in accountability records.
5. Submits the completed requisition to the Safeguards and Technical Security Division for special approval.
6. Reviews and approves the requisition, ensuring that the instructions for material disposition have been included.
7. Notes the DOE project number on the requisition in order to assist in the updating of computer records when the material is received.
8. For requisitions involving SNM or forecasted materials, the NM Manager submits a copy of purchase requisition along with a cover letter to DOE/ALO requesting a draft number.

<u>Responsible Organization</u>	<u>Action</u>
Safeguards and Technical Security Division (NMR)	<p>7. Upon reply from DOE/AEC, adds the assigned draft number to the requisition.</p> <p>8. Sends a copy of the approved purchase requisition to the Nuclear and Explosives Materials Control Section (Building 867 south) and a copy to the accountability clerk; retains a copy in the purchase order file.</p> <p>9. Returns the approved purchase requisition to the purchase analyst.</p>
Purchasing, Stores, and Traffic Management Department (Purchase Analyst)	<p>10. Forwards the approved purchase requisition to the buyer.</p>
Purchasing Department (Buyer)	<p>11. Prepares and places the purchase order on Form SF 6431-A, "Purchase Order" (Exhibit I, Chapter VIII).</p> <p>12. Distributes copy of purchase order to Safeguards and Technical Security Division.</p>

## 6.2 Ordering Nuclear Materials

In view of the high cost of nuclear materials production or purchase, it is important that nuclear materials used for DCE programs be effectively managed.

The degree of responsibility for managing nuclear materials under contract is related to the specific provisions applicable to materials management.

The purchasing department will, with articles or statements in the body of the order, ensure effective materials management.



### 6.2.1 Procedures for Ordering Nuclear Materials

<u>Responsible Organization</u>	<u>Action</u>
Purchasing Department (Buyer)	1. Place orders.
	1.1 All contracts placed on contractors supplying materials to a designated subcontractor for manufacturing finished products will include:
	1.1.1 Draft number assigned by DOE/MC authorizing withdrawal of materials.
	1.1.2 Requirement that Sandia be notified of materials shipped, quantities, and date. (Nuclear Material Control-TSCA).
	2. Place order on second manufacturing contractor in India:
	2.1 Requirement that Sandia be notified of materials received, quantities, and condition. (Nuclear Material Control-TSCA).
	2.2 Requirement for reporting monthly to Safeguards and Technical Security Division a physical inventory and material composition.
	2.3 Disposition procedures for the finished product and residual material not incorporated into product.
	2.4 Disposition procedures, for materials not to be returned to Sandia, must be authorized by DOE/ALO.

Responsible Organization	Action
Purchasing Department (Buyer)	2.5 Requirement that contractor notify Sandia Safeguards and Technical Security Division of quantity and composition of residual materials.
Safeguards and Technical Security Division (NM Manager)	3. Request disposition from DOE/ALO for residual materials reported. 4. Advise buyer of DOE/ALO disposition authorization.

9.3 Procurement Status Program

A program for reviewing the status of open orders is maintained by the Safeguards and Technical Security Division. The status of shipments of material from source supplier to a manufacturing-process supplier for use on a Sandia order is kept current by monthly reports from the manufacturing supplier. The procurement status program provides data for the evaluation of material forecasts and for the preparation of the quarterly Forecast-Actual report required by DOE/ALO.

### Scrap and excess Materials, by program

Because of the value of nuclear materials, the DOE has established a management system for excess nuclear materials to assure effective utilization or timely recovery of these materials as they become excess to current requirements. Since routine tests and experiments often result in accumulations of scrap and/or excess materials, management procedures have been established at Sandia to ensure that such materials are identified properly and reported promptly and that such materials are disposed of at the earliest practicable date. The Health Physics Division will notify the Safeguards and Technical Security Division of all nuclear material picked up for burial.

Each year using organizations are required to submit a memorandum to the Safeguards and Technical Security Division requesting approval of program expenditures for the following fiscal year and explaining (in tabular form) all scheduled tests and experiments in which nuclear materials are anticipated to be expended and/or scrap or excess materials are expected to be generated. Following such tests or experiments, the using organization submits Form SA6476-ME, "Modification/Expenditure of Nuclear Materials" (Exhibit 17, Chapter X), to the Safeguards and Technical Security Division describing the results of the test. Based on this information from the using organization, the Safeguards and Technical Security Division submits a request to DOE/ALO for authorization to remove the expended materials from the records and for disposition instructions for the scrap. Only special nuclear materials or heavy water are modified or expended. Depleted materials (i.e., depleted/normal uranium) are reported to DOE/ALO annually when modified or expended. Removals from the accountability records are performed during the month in which the action occurs.

Excess materials resulting from cancelled or completed programs are reported by memorandum from the using organization to the Nuclear Material Manager, who reviews the materials to determine availability for a new or current program, or request disposition from DOE/ALO for the material declared excess to current requirements.

Specific procedures governing the disposition and accountability of scrap are described later in Sections 7 and 8, Chapter V and Section 6, Chapter VI.

#### 7.1 Procedures for Obtaining DOE/ALO Authorization for Scheduled Nuclear Material Expenditures by Fiscal Year

DOE regulations require that approval be obtained in advance for any changes in size, shape, form, or weight of nuclear materials. This requirement applies to such activities as machining of nuclear materials, chemical action on nuclear materials, and destructive tests (either with or without explosives).

Blanket authorizations for estimated quantities of material types 10, 81, 87, and 88 are granted for a fiscal year upon request and the actual quantities expended are reported monthly by memorandum to DOE/ALO.

SNM expenditures must be requested and authorized on an individual basis.

<u>Responsible Organization</u>	<u>Action</u>
Using Organization	<ol style="list-style-type: none"><li>1. On or before September 1, prepares and submits a memorandum to the Safeguards and Technical Security Division, requesting approval of proposed activities for the following fiscal year and explaining (in narrative form) all scheduled tests or experiments.<ol style="list-style-type: none"><li>1.1 For each activity, the memorandum includes the nuclear material type, the quantities of scrap and/or excess material residues anticipated, the time frame in which the activity will be accomplished, the DOE-approved program and Sandia case number, and expected level of radiation at the surface of the materials (if the materials are to be subjected to radiation).</li></ol></li></ol>

Responsible Organization

Action

Safeguards and Technical  
Security Division (NM Manager)

- 1.2 The completed memorandum is signed by the division supervisor of the using organization.
- 1.3 The memorandum may be amended throughout the year but, for any proposed activity, approval must be obtained prior to conducting the tests or experiments.
- 2. Prepares and submits a memorandum to DOE/ALO, restating the justifications provided by the using organization and requesting authorization to remove the materials from the records.
  - 2.1 DOE/ALO determines the manner (routine test, normal operational loss, material unaccounted for, etc.) in which nuclear materials are removed from the records.

## 8. Utilization of Material

Materials are procured for specific programs or transferred from recently completed to new programs. Project numbers assigned define the area of activity. Transfers of material are reviewed by the Nuclear Materials Representative and Nuclear Materials Manager for program and project number changes. The internal auditor reviews usage during audits, questions inactive materials, and refers serial numbers of items inactive for two successive audit periods to the Nuclear Materials Manager for further investigation.

Serial numbers, descriptions and weights of materials no longer required are submitted to DOE/ALO as excess and disposition is requested.

## 9. Management Reports

Accurate and timely reporting to the DOE of material requirements and utilization are essential to effective nuclear materials management in optimizing the nuclear material inventories of competing programs, in allocating the total resources to meet program objectives, and in planning for production, processing, and procurement of additional resources, as needed. The Safeguards and Technical Security Division is assigned the primary responsibility for preparing and issuing reports required by the DOE based on the information obtained from using organizations and computerized accountability records. Additional reports are generated internally to assist the Safeguards and Technical Security Division in performing management functions.

### 9.1 External Reports

The following reports are prepared in compliance with DOE requirements:

Forecasts -- Annual forecasts of nuclear material requirements are developed and submitted to DOE/ALO in early January on Form DOE 408, "Forecast of Nuclear Material Requirements" (Exhibit 3, Chapter X). Forecasts include quarterly withdrawal requirements by material type and isotope weight for the 2 succeeding years, and annual requirements for 10 additional years. Forecasts also include scheduled returns.

Forecast vs. Actual -- A Quarterly Report by project number of the fiscal year beginning inventory plus forecasted withdrawals vs. actual inventory and explanation of difference.

Appraisal Utilization -- Annual Report prior to the appraisal date determined by DOE/ALO. The report consists of a review by DOE/ALO of materials management activities, policies, procedures, and performance effectiveness in complying with DOE materials management requirements.

Materials-Management Plan (MMP) -- A materials-management plan is submitted annually in May to DOE/ALO. This report contains a description of Sandia's overall materials-management program, along with a detailed material usage schedule and discussions of risks/contingency plans for meeting inventory targets, options to reduce budget expenditures through materials-management actions, options and risks involved in affecting target inventories, and analytical studies (if applicable) DOE Order 5630 provides specific guidelines for the preparation of this report.

Assessment Reports -- A materials assessment report is submitted annually in November to DOE/ALO. This report includes a summary of the current inventory, describes how materials are being used, and indicates which materials are being held for specific purposes.



Write Off -- A list of materials removed from the inventory records is submitted monthly to DOE. This report includes the material type and type of expenditure (ID, NCL, RT or decay) by project number, IAF number, 741 number, element, and isotope weights.

TABLE IV-1  
Management Reporting Requirements

<u>Report</u>	<u>Frequency of Reporting</u>	<u>Recipient</u>
Forecast	Annually in January	DOE/ALO
Forecast vs. Actual	Quarterly	DOE/ALO
MMP	Annually in May	DOE/ALO
Assessment	Annually in November	DOE/ALO
Write Off	Monthly	DOE/ALO

#### 9.2 Internal Computer-Generated Reports

A number of internal reports and listings are generated periodically to assist the Nuclear Materials Manager in the management of Sandia's nuclear material inventory and in the preparation of reports to the DOE. These listings are generated by sorting the computerized accountability records in various ways to provide information in the most effective format for specific purposes.

- Storage Report (by owner MBA)
- Scrap/Excess
- Items Awaiting Removal
- Material Profile
- Project Number Report (3 month)
- Strategic Area
- Alarm
- Management Summary
- Material Type (total element and isotope weights)
- SNM by MBA Report (for health physics)

## CHAPTER V

### CONTROL

#### 1. Responsibilities

The physical control of nuclear materials requires continuous surveillance from the time of initial receipt to the time of eventual disposition to ensure proper utilization and safeguards control of materials, provide safe and secure movement of materials, and maintain accurate accountability records. Because of the intrinsic value of nuclear materials, special consideration must be given to the prompt identification and timely processing of recoverable scrap and excess materials. The Nuclear and Explosives Materials Control Section assumes primary responsibility for the physical control of nuclear materials in the possession of Sandia National Laboratories. In fulfilling this responsibility, the Nuclear and Explosives Materials Control Section receives, processes, and ships all radioactive and nuclear materials, controls the physical movement of accountable materials within Sandia National Laboratories, and provides storage for accountable materials being held for future use or shipment. Specific responsibilities are to:

- Receive radioactive and nuclear materials.
- Weigh all materials (if appropriate) or (for Category I quantities of SNM) verify the presence of nuclear material by nondestructive assay methods upon receipt or prior to shipment.
- Contact suppliers regarding shipper-receiver weight differences or other discrepancies noted in materials received.

- Assign material descriptors to materials received or modified, when not found etched on material or referenced on the accompanying paperwork.
- Prepare nuclear materials receiving slips.
- Forward completed packages of receiving or shipping paperwork to the Safeguards and Technical Security Division.
- Prepare transfer documents for materials being issued to using organizations.
- Arrange with the Transportation Division, the Health Physics Division, and/or the Safeguards and Security Department (as necessary) for the physical transfer of materials between requesting/using organizations.
- Maintain processing and storage areas in Building 819 and at Manzano Base for accountable nuclear materials received, held for future use, or awaiting shipment.
- Verify the presence of nuclear material in all items containing Category I quantities of SNM which are being transferred from custodians for storage and (if appropriate) place verified materials in containers with tamper-indicating seals applied.
- Maintain records of tamper-indicating seal and container numbers along with the date applied.
- Provide identification tags for accountable materials received or being held in storage.

- Prepare packing slips for radioactive and nuclear materials being shipped.
- Monitor the radioactivity of materials being shipped.
- Observe all criticality, safety, and security regulations pertaining to the handling and shipping of radioactive and nuclear materials.
- Arrange for the packaging of radioactive and nuclear materials being shipped.
- Package SNM being shipped as well as scrap and excess materials being shipped for recovery.
- Prepare burial forms and arrange for the burial of scrap.
- Assist custodians in the weapon systems (Building 809) and the reactor area (Area V) in physically controlling accountable nuclear materials, in preparing required paperwork, and in maintaining appropriate records.

Figure V-1 includes a summary of the activities of the Nuclear and Explosives Materials Control Section, published by the Salary Administration and Position Evaluation Division.

**Sandia Laboratories**  
**POSITION DESCRIPTION**

CLASSIFICATION:  
\_\_\_\_\_  
\_\_\_\_\_

DATE: \_\_\_\_\_

TITLE: Lead Materials Control Section CODE: 4000-1000

Position Title: Lead Materials Control Section  
This position is responsible for the control of materials used in the laboratory. The position holder is responsible for the control of materials used in the laboratory. The position holder is responsible for the control of materials used in the laboratory.

1. Control of Materials

a. Control of Materials: This position is responsible for the control of materials used in the laboratory. The position holder is responsible for the control of materials used in the laboratory. The position holder is responsible for the control of materials used in the laboratory.

b. Control of Materials: This position is responsible for the control of materials used in the laboratory. The position holder is responsible for the control of materials used in the laboratory. The position holder is responsible for the control of materials used in the laboratory.

c. Control of Materials: This position is responsible for the control of materials used in the laboratory. The position holder is responsible for the control of materials used in the laboratory. The position holder is responsible for the control of materials used in the laboratory.

d. Control of Materials: This position is responsible for the control of materials used in the laboratory. The position holder is responsible for the control of materials used in the laboratory. The position holder is responsible for the control of materials used in the laboratory.

e. Control of Materials: This position is responsible for the control of materials used in the laboratory. The position holder is responsible for the control of materials used in the laboratory. The position holder is responsible for the control of materials used in the laboratory.

Figure A-1. Summary of the Activities of the Nuclear  
Materials Control Division (cont on next page)

9. The following inventories of this material in the Material Release Area, Washington, provide user material storage inventory procedures:

1. The following inventories of this material in the Material Release Area, Washington, provide user material storage inventory procedures:

2. The following inventories of this material in the Material Release Area, Washington, provide user material storage inventory procedures:

3. The following inventories of this material in the Material Release Area, Washington, provide user material storage inventory procedures:

4. The following inventories of this material in the Material Release Area, Washington, provide user material storage inventory procedures:

5. The following inventories of this material in the Material Release Area, Washington, provide user material storage inventory procedures:

Figure A-1 (continued)

## 2. Job Descriptions

The activities of the Nuclear and Explosives Materials Control Section are performed by one Management Aide along with several graded personnel. Job descriptions for these positions are published by the Job Classification Division and retained by the Nuclear and Explosives Materials Control Section and the Job Classification Division in their files. Figure V-2 provides the published description for the Nuclear Material Control Assistant, and Figure V-3 provides the comparable description for the NM Control Coordinators.

CLASSIFICATION:  
SECRET

Sandia Laboratories  
POSITION DESCRIPTION

DATE 4/77

TITLE: SS Material Control Assistant

CODE: 4500-50-65-4

FUNCTION:

Perform and direct the activities involved in physical control and internal accountability of all accountable SS and radioactive material in the custody of SLA; contact other contractors or suppliers as necessary to solve problems relating to shipment or receipt of accountable materials.

DUTIES AND RESPONSIBILITIES:

Direct the activities and check the work of employees who receive, weigh, assay, store, transport, package and ship radioactive and SS material. Assist with and coordinate the preparation of transaction documents and computer input on internal movements of material and outgoing shipments. Instruct the employees in established regulations and proper procedures and practices relative to these operations; assure that all such operations are performed properly and safely; and assist with the activities as necessary.

Coordinate activities relating to shipment of SS material with Packaging, Traffic, Health Physics, Security, and Shipping personnel.

Resolve problems concerning matters such as machining operations, expenditure and burial of material, and discrepancies in quantities received, identification of material, or procedures applied, contacting the involved custodians' suppliers as necessary.

Assure that material assigned to each custodian is packaged, stored, and transported in accordance with DOL and Department of Transportation regulations.

Troubleshoot problems relating to incoming shipments of materials. Visit other DOL contractors to discuss shipping procedures and paperwork and associated problems with a view to possible improvements. Prepare trip reports and memoranda setting forth findings and recommendations.

Figure V-2. Job Description for the SS Material Control Assistant



(Outline of general scope of work - No attempt made to include all associated detail duties)

OCCUPATION TITLE: CONTROL COORDINATOR (SS and RA Materials)

GRADE 7

JOB FUNCTION: Working from verbal and written instructions, perform various operations associated with the physical control of radioactive and special nuclear material.

REPRESENTATIVE PRODUCTS, MATERIALS AND PROCESSES: PRODUCTS: Variety of storage and shipping containers. MATERIALS: Variety of radioactive and special nuclear materials. PROCESSES: Receiving, identifying, storing, moving, shipping, weighing, measuring.

REPRESENTATIVE MACHINES, EQUIPMENT, TOOLS AND GAUGES USED:

	Operate	Change over	Adjust	Set-up
Voland precision balance	X		X	X
Standardized assay meter	X		X	X
Top load balance	X		X	X
Gamma survey meters, Alpha survey meters, Neutron survey meters	X			
Calculator	X			
Forklift (up to 7000 pounds), Light motor vehicle	X			
Electric hoist	X			
Computer terminal	X			
Hand jack	X			

TOLERANCES Requires special ability and practice to operate precision balances and tolerances which are not particularly difficult.

SOURCE AND TYPE OF JOB INFORMATION: Graziano Tariff, Hazardous Materials Department of Transportation Handbook, Los Alamos Handbook of Radiation Monitoring, Chart of Nuclides, Basic Radiological Health Handbook, Isotope License File, verbal and written instructions.

MAJOR DUTIES In accordance with applicable Sandia and federal agency requirements, receive, identify, store, assign material serial numbers where required, and move radioactive and special nuclear materials; make precision weight measurements and input data obtained for computer verification of measurement accuracy; and decontaminate containers using various cleaning solutions. Initiate special shipping documents; monitor and calculate radioactivity level of items shipped; arrange for appropriate containers for shipment; and assure that all procedures relating to handling, packaging, and securing of the items for shipment are followed, referring to appropriate manuals, tariffs, and similar information sources as required. Maintain perpetual inventory of all accountable materials, providing new information affecting inventory (quantities, serial numbers, storage locations, etc.) to personnel responsible for control records. Assist in periodic audits of accountable material in the custody of Material Balance Area Custodians. Participate in the nondestructive assay of items received to ascertain presence or absence of fissionable materials and type of such materials involved by operating specialized monitoring equipment and preparing graphic plots of instrument readings. Perform related duties involving similar skill and responsibility.

Figure V-3. Job Description for the NM Control Coordinators.

### 3. Control Flowcharts

To ensure that adequate control and proper accountability of nuclear materials are exercised at all times, Sandia Laboratories maintains a centralized receiving, processing, and shipping system in which radioactive and nuclear materials that are received or shipped are processed through the Nuclear and Explosives Materials Control Section.

Figure III-1 in Chapter III illustrates a simplified flowchart for the physical disposition of the nuclear materials utilized in Sandia programs. As indicated in that figure, the Nuclear and Explosives Materials Control Section acts as an intermediary in all nuclear material transactions involving using organizations, including receipts, internal transfers, and shipments.

Figure V-4 illustrates a simplified flowchart for the control records that accompany nuclear material transactions. Fundamental to the record-keeping system is the Nuclear and Radioactive Material Transfer document which accompanies all transfers of nuclear materials between MBA's (including those to or from the Nuclear and Explosives Materials Control Section) and allows the determination of the location of nuclear materials at all times.



#### 4. Receipts

The physical control of radioactive and nuclear materials is supported by a centralized receiving system in which all radioactive and nuclear materials received are processed through the Nuclear and Explosives Materials Control Section prior to being transferred to using organizations. In addition, all receiving paperwork (including that for explosives received in the Igloo Area) is processed through the Nuclear and Explosives Materials Control Section. This system provides for the verification of material quantities, permits any necessary resolution if discrepancies in shipping information, and ensures that records of all nuclear materials enter the computerized accountability system.

##### 4.1 Procedures for the Receipt of Radioactive and Nuclear Materials

<u>Responsible Organization</u>	<u>Action</u>
Shipping and Receiving Division	<ol style="list-style-type: none"><li>1. Receives materials (except those containing Category I or II quantities of SNM) in Building 894 and prepares a receiving report on either Form SA 6410-SB, "Material Receiving Report" (Exhibit 5, Chapter VIII) or on Form SA 6410-SC, "Material Variref Receiving Report" (Exhibit 6, Chapter VIII).<ol style="list-style-type: none"><li>1.1 Materials containing Category I or II quantities of SNM are couriered directly to Building 819.</li><li>1.2 Form SA 6410-SB is prepared for receipts which can be referenced by a purchase order number, and Form SA 6410-SC is prepared otherwise.</li></ol></li><li>2. Notifies the Nuclear and Explosives Materials Control section of the receipt of the materials.</li></ol>



Responsibility Organization

Action

Nuclear and Explosives Materials  
Control Section (NM Coordinator)

9. Consults the custodian of the authorized MBA about the assignment of existing descriptors to fit within a 15-character field.

9.1 If no descriptor exists on the materials or accompanying paperwork, the Nuclear and Explosives Materials Control Section assigns one.

9.2 Before transfer, the Nuclear and Explosives Materials Control Section obtains from the Safeguards and Licensing Security Division pre-printed labels containing the serial number, net weight, description, material type, description, and bar code serial number of the materials which are affixed to appropriate color-coded cards and labels and yellow form S/NM-100 attached to the materials, containers, or assemblies.

10. Receives delivery instructions from the custodian of the authorized MBA.

10.1 Materials that are immediately required for approved programs are transferred to using organizations in accordance with the procedures set forth in Section 5.4.

10.2 Materials that are not immediately required for approved programs are stored in accordance with the procedures set forth in Section 5.4.

Nuclear and Explosives Materials  
Control Section (NM Coordinator)

11. On the computer terminal, inputs the initial receipt data, for material weighed, on the terminal screen RCV051 titled "Build/Display Receipt (control)" in accordance with the nuclear materials computer user's guide.

Responsible Organization	Action
	<p>11.1 For nonweighable material, holds receiving paperwork and checks with the accountability clerk in the Safeguards and Technical Security Division for 741 data before entering on the RCV051 screen.</p>
	<p>12. Prepares a receiving slip on Form SA 2040-EA, "Radioactive and Nuclear Materials Receiving Slip" (Exhibit 7, Chapter VIII), listing all descriptors of materials and containers.</p>
	<p>12.1 As soon as practicable, the NM coordinator handcarries the original copy of the nuclear materials receiving slip along with two copies of the receiving report and one copy of the shipping papers to the accountability clerk in the Safeguards and Technical Security Division and forwards one copy of the nuclear materials receiving slip to the Shipping and Receiving Division.</p>
<p>Safeguards and Technical Security Division (Accountability Clerk)</p>	<p>13. Completes and distributes the incoming Form DOE-741 transfer accountability document and inputs data to the computer via terminal screen, titled "Initial Receipt-Step 1," in accordance with the nuclear materials computer user's guide.</p>

Temporary storage is provided for radioactive and nuclear materials initially received. Section 6.1 includes the procedures set forth for this temporary storage.

## 5. Internal Transfers

Stringent requirements have been established for the safety and security of nuclear materials. To ensure that adequate control and proper accountability of nuclear materials are being exercised at all times, internal transfers and physical movements of materials are made only to approved custodians in authorized material balance areas (MBAs). Internal transfers occur whenever:

- Materials are transferred from the Nuclear and Explosive Materials Control Section to using organizations.

NOTE: For the following materials, approval must be obtained from the Health Physics Division before they may be issued.

- Liquids
  - Plutonium
  - $^{235}\text{U}$
  - Containers for which the radiation level at the surface is above 5 mR/h.
  - Containers with materials whose radioactivity is above 10 millicuries
  - Toxic materials
  - Powders (oxides)
- Materials are transferred from the using organization to the Nuclear and Explosive Materials Control Section for storage, machining, or shipment.

NOTE: Materials for storage must have a completed form SA 6476-ND, "Nuclear Materials Storage Justification" (Exhibit 10, Chapter X), attached to the transfer document.

- Materials are transferred directly between MBAs.



All internal transactions of materials are documented in Form SA 2042-D, "Nuclear and Radioactive Material Transfer" (Exhibit 6, Chapter X). All transfer documents are reviewed by the Nuclear Materials Representative and Nuclear Materials Manager for material utilization and project budget purposes for updating SIA and DOE records.

#### Procedures for the Transfer of Nuclear Materials

Responsible Organization	Action
Sending Organization (Responsible Alternated)	<ol style="list-style-type: none"><li>1. Prepares a transfer document on Form SA 2042-D, "Nuclear and Radioactive Material Transfer" (Exhibit 6, Chapter X) for the materials being transferred.<ol style="list-style-type: none"><li>1.1 If the "Storage" block is checked on the SA 2042-D as the reason for transfer, the preparer attaches a completed Form SA 6476-ND, "Nuclear Materials Storage Justification" (Exhibit 10, Chapter X). Material will not be accepted for storage without the justification form.</li><li>1.2 If material is to be transferred as an assembly, the preparer completes the assembly number block on Form SA 2042-D; otherwise, the computer "disassembles" all assembled units at the time of transfer.</li><li>1.3 The Weapon Training Division uses their own storage form, in lieu of SA 2042-D, to move material to and from storage.</li></ol></li><li>2. Forwards green copy of SA 2042-D to Safeguards and Technical Security Division as a suspense copy.</li></ol>

<u>Responsible Organization</u>	<u>Action</u>
Safeguards and Technical Security Division Accountability Clerk	3. Phones the nuclear material accountability clerk, 844-7150, to provide the information required to complete Form SA 6496-NM, "Transfer Request" (Appendix 5, Chapter 2).
Nuclear and Explosives Material Control Section NM Coordinator	4. Records data on the "Transfer Request" Form. 5. <i>Inputs the transfer request data on the terminal screen titled "Request Display Transfer" to verify the data provided.</i> 6. Queries, via terminal, for any transfers. 6.1 If special instructions are for heavy equipment, health physics participation, category I or II quantities, or SNM or weapons requiring Security Guard Escort, arranges with the appropriate personnel for movement of this material. 7. When ready to physically move material, inputs data on the terminal screen titled "Initial Transfer." 8. Proceeds to sending MBA. 9. Checks item label serial numbers against those recorded on the transfer document. 9.1 If they agree, signs the transfer document, recording date and time. 9.2 If they disagree, requests custodian to correct the transfer document, then signs and records date and time on the corrected document.

Responsible Organization	Action
Sending Organization (custodian alternate)	10. Gives the goldenrod copy of the transfer document to the custodian of the MBA sending the material.
Nuclear and Explosives Material Control Section (NM coordinator)	11. Retains the goldenrod copy to relieve the sending MBA of accountability.
Receiving Organization (custodian alternate)	12. Moves the material, with the white, yellow, and pink copies of the transfer document, to the receiving MBA.
Receiving Organization (custodian alternate)	13. Checks the material to ensure that the transfer document accurately reflects the material label serial numbers.
Receiving Organization (custodian alternate)	14. Signs the remaining transfer document copies, recording date and time, and retains the white copy.
Receiving Organization (custodian alternate)	15. Ensures proper safeguards protection for the materials.
Nuclear and Explosives Material Control Section (NM coordinator)	16. Delivers the pink copy of the transfer document to the Safeguards and Technical Security Division.
Nuclear and Explosives Material Control Section (NM coordinator)	17. Retains the yellow copy of the transfer document and files in the Nuclear and Explosives Material Control Section office.

## 6. Storage

The Nuclear and Explosives Materials Control Section assumes primary responsibility for the temporary storage of radioactive and nuclear materials initially received and for the storage of nuclear materials being held for future use in approved programs or awaiting final disposition instructions from the DOE. These materials are stored in designated areas of Building 819 and in storage structures located at Manzano Base. All materials are stored in accordance with stringent safety and security requirements, as described in Chapter VII; accountable materials for storage must be accompanied by Form SA 6476-ND, "Nuclear Materials Storage Justification", approved at the appropriate supervisory level designated on the form for the storage time requested.

### 6.1 Procedures for the Storage of Nuclear Materials Initially Received

Section 4.1 of this chapter includes the procedures set forth for the receipt of nuclear materials.

<u>Responsible Organization</u>	<u>Action</u>
Nuclear and Explosives Materials Control Section (NM Coordinator)	1. Checks the nuclear materials justification form for approval level and verifies that the appropriate identification tag with the serial number assigned is attached to the materials.  1.1 Tags are color-coded according to the type of material as follows: Red -- SNM Yellow --- SS material White --- Radioactive material (used in storage only for nonreportable materials) Green --- Negligible quantity accountable materials

<u>Responsible Organization</u>	<u>Action</u>
Nuclear and Explosives Materials Control Section (NEMC/ENMCA)	<p>2. Stores the materials in suitable structures, designated according to the type of material, in the following:</p> <ul style="list-style-type: none"> <li>SNM Structure 7063 at Manzano Base</li> <li>SNM Structure 7055 at Manzano Base Building 819</li> <li>Structure 7047 at Manzano Base</li> <li>Structure 7046 at Manzano Base</li> <li>Structure 7045 at Manzano Base</li> </ul> <p>2.1 If appropriate, materials are placed in containers with tamper-indicating seals applied, and records are maintained of the seal and container number along with the date applied.</p> <p>2.2 Special safeguards requirements regarding access to the structures at Manzano Base are included in Section 6, Chapter VII.</p> <p>3. Records the storage and bin location on the nuclear materials receiving slip which is prepared on Form SA 2040-EA, "Radioactive and Nuclear Materials Receiving Slip" (Exhibit 7, Chapter VIII).</p> <p>3.1 The completed nuclear materials receiving slip is forwarded according to the procedures specified in Section 4.1.</p>

Procedures for the Storage of Nuclear Materials Acquired and Forwarded by Using Organizations

Nuclear materials which are not immediately required for approved programs are transferred to the Nuclear and Explosives Materials Control Section to be held in storage for future use. Using organizations are responsible for initiating the transfer of nuclear materials to the Nuclear and Explosives Materials Control Section storage in accordance with the procedures set forth in Section 5 of this chapter.

Responsible Organization

Action

Using Organization

Nuclear and Explosives  
Materials Control Section  
(NM coordinator)

1. Prepares a transfer document in accordance with the procedures set forth in Section 5.1.
  - 1.1 The transfer document must be accompanied by a nuclear materials storage justification, Form SA 6476-ND (Exhibit 10, Chapter X), which authorizes retention period for the materials and the program for which the materials are being held.
2. Turns in the materials to the Nuclear and Explosives Materials Control Section in accordance with the procedures set forth in Section 5.4.
3. Upon receipt of the materials, verifies that the appropriate identification tag with the serial number is attached to the materials.
  - 3.1 Tags are color-coded according to the type of material as follows:

Red	---	SNM
Yellow	---	Non-SNM material
Green	---	Neg. Qty. nuclear material
White	---	Radioactive
4. Stores the materials in available structures, designated according to the type of material as follows:

SNM Structure 7063	at Manzano Base
SNM Structure 7055	at Manzano Base
Building 819	
Structure 7047	at Manzano Base
Structure 7046	at Manzano Base
Structure 7045	at Manzano Base

Responsible Organization	Action
Nuclear and Explosives Materials Control Section (NM Coordinator)	<p>4.1 If appropriate, materials are placed in containers with tamper-indicating seals applied.</p> <p>4.2 Sealed container information is input to the computer on the terminal screen titled "Apply Seal-Initiate" which records each item serial number contained and generates an identification label for the container for inventory.</p> <p>4.3 Special safeguards requirements regarding access to the structures at Manzano Base are included in Section 5, Chapter VII.</p>

Using organizations may withdraw nuclear materials from storage by telephoning the Nuclear and Explosives Materials Control Section with the serial numbers of material requested. Upon receipt of this call, the Nuclear and Explosives Materials Control Section transfers the materials to the using organization in accordance with the procedures set forth in Section 5 of this chapter.

Storage Reports will be generated monthly showing those items with expired retention dates which will be investigated for rejustification of storage extension or declared excess.

## 7. Shipments

To ensure strict compliance with DOE and Department of Transportation regulations, all radioactive and nuclear materials requiring shipment off site are processed through the Nuclear and Explosives Materials Control Section. In addition, all shipping paperwork is processed through the same organization. SLI 6950-2, "Shipments," provides guidelines for the shipment of these materials, and SLI 6950-4, "Movement of Classified Material," provides supplementary information in the case of classified materials. In addition, shipments of scrap and excess materials for recovery and shipments to Rocky Flats or to the DOD require special procedures to be followed.

Handcarried materials require the same paperwork to be processed through the Nuclear and Explosives Materials Control Section and through the Packaging Engineer as for ordinary shipment. This is necessary in order to ensure compliance with DOE and DOT regulations, including the following:

- Radioactive materials cannot be handcarried on passenger-carrying aircraft.
- Radioactive materials cannot be carried or transported in personal vehicles; only government vehicles can be used for this purpose.

If shipment is going to a company or institution other than a license exempt DOE contractor, the organization responsible for shipment must obtain a copy of the recipient's license prior to shipment if the Nuclear and Explosives Materials Control Section does not have a current copy in file.



1.1 Procedures for the Shipment of Radioactive and Nuclear Materials  
(except to Rocky Flats or the DOD)

<u>Responsible Organization</u>	<u>Action</u>
Using Organization (Property Clerk or Control Clerk)	<p>1. The shipper must complete and submit the following information to the Property Account Executive (Chapter 8) (the record sheet on Form SA 6550-1A, "Information for Hazardous Material Shipments" (Exhibit 12), Chapter 11) and copy of the report to the appropriate control clerk of the material being shipped, and Form SA 2042-D, "Nuclear and Radioactive Material Form" (Exhibit 9), Chapter 8).</p> <p>1.1 The shipper must be marked "Radioactive material," "Irradiated," "Radioactive - SN Material," "Radioactive Material," or "Fissile Material" (see SA 2042 - "Nuclear and Radioactive") as appropriate.</p> <p>1.2 Using an attraction mat, determine whether the shipment requires a counter (see SA 6950-2, "Shipper's") and the statistics on the shipment.</p> <p>1.2.1 When a counter is required, a copy of the shipper's tag is to be furnished to the Traffic Management Division in an advance copy to allow the counter to be set up in advance.</p>
Using Organization (Property Clerk or Control Clerk)	<p>1.3 RM control clerks are assigned to the weapon systems divisions (Building 809) and to the reactor area (Area V) to prepare the shipping reports in these areas.</p>

Responsible Organization	Action
Nuclear and Explosives Materials Control Section (NSM Coordinator)	<ol style="list-style-type: none"> <li>2. Transfers the materials and paperwork to MBA 01 (assigned to the Nuclear and Explosives Materials Control Section) in accordance with the procedures set forth in Section 5 of this chapter.</li> <li>3. Prepares a packing slip on Form SF 6476-1, "SS/Radioactive Material Packing Slip" (Exhibit 8, Chapter VIII), based on the information contained in the shipping paperwork packet and the master file. <ol style="list-style-type: none"> <li>3.1 Distribution of the five copies of the packing slip is as follows: <ul style="list-style-type: none"> <li>Original -- Accompanies materials</li> <li>2nd copy -- Sent to the Health Physics Division</li> <li>3rd copy -- Sent to the Packaging Section</li> <li>4th copy -- Returned to the Nuclear and Explosives Materials Control Section at the time of shipment</li> <li>5th copy -- Retained by the Nuclear and Explosives Materials Control Section until the 4th copy is returned.</li> </ul> </li> </ol> </li> <li>4. Enters the level (in curies), material type, and type of radioactivity on the hazard sheet.</li> </ol>

Responsible Organization	Action
Nuclear and Explosives Materials Control Section (NM Coordinator)	5. Inserts Form DOE-740, "ADP Transcription Sheet, Nuclear Material Transaction Journal" (Exhibit 9, Chapter VIII), after entering the RIS and transaction number, into the shipping paper-work packet to be forwarded to the Packaging Section.
	5.1 Retains shipping packet consisting of Property Action Form SF 6951-A - 2nd copy Packing Slip Form SF 6476-1 - 4th copy Transfer Form SA 2042-D - 2nd & 5th copies.
	5.2 Prepares and delivers an accountability shipping packet to the Safeguards and Technical Security Division consisting of A copy of Property Action Form SF6951-A Assembly/Disassembly Form SC 6476-A Transfer Form SA 2042-D - 3rd and 4th copy.
	5.3 Prepares shipping packet consisting of Property Action Form SF 6951-A 1st, 2nd & 4th copy Hazard Sheet Form 6550-EA Packing Slip Form SF-6476-1 1st, 2nd, 3rd & 4th copy Criticality Evaluation statement (on all shipments containing fissile materials) Form DOE-740.
	6. Physically moves non-SNM materials and the shipping paperwork packet to the Packaging Section in accordance with the procedures set forth in Section 5 of this chapter.
Shipping and Receiving Division (Packaging Clerk) or Nuclear and Explosives Materials Control Section (for SNM) (NM Coordinator)	7. Packages the materials in accordance with DOE and DOT regulations, enclosing the green copy of the shipper and the packing slip.

<u>Responsible Organization</u>	<u>Action</u>
	<p>7.1 SNM is packaged by the Nuclear and Explosives Materials Control Section in specification-type containers to comply with criticality requirements (as specified in SLI 2047), and security seals are applied.</p> <p>8. Enters the packaging information (container, weight, etc.) on the Form DOE-740 and shipper's export declaration when shipment is made to a foreign recipient.</p> <p>9. Contacts the Health Physics Division for inspection of the packaged materials of radioactive materials.</p>
<p>Health Physics Division (Health Physicist)</p>	<p>10. Monitors the radiation level (in mR/h) at the surfaces of the packaged materials.</p> <p>11. Verifies that the correct radioactive labeling has been attached.</p> <p>12. Enters the transport index and other required data on the packing slip, signs, and retains one copy.</p>
<p>Shipping and Receiving Division (Packaging Engineer)</p>	<p>13. Forwards the shipping packet to the Traffic Management Division.</p> <p>13.1 Arranges for transportation of nuclear materials to Kirtland AFB West when shipped from Area 1.</p>
<p>Traffic Management Division (Traffic Clerk)</p>	<p>14. Reviews the packaged materials and shipping paperwork to determine the method of shipment needed to comply with DOE and DOT regulations.</p> <p>15. Enters the transportation information on the Form DOE-740.</p>

<u>Responsible Organization</u>	<u>Action</u>
Traffic Management Division (Traffic Clerk)	16. Retains one copy of the packing slip.
	17. Arranges appropriate carrier service for the shipment.
	18. Forwards the shipping packet to the Shipping and Receiving Division.
Shipping and Receiving Division (Shipping Clerk)	19. Moves the packaged materials to the holding area to await shipment.
	20. Upon shipment, notifies the Safeguards and Technical Security Division of the shipment of the Materials.
	20.1 Upon shipment from the Igloo Area, the NM Coordinator notifies the Shipping and Receiving Division clerk and Safeguards and Technical Security Division accountability clerk by telephone immediately following shipment.
	21. Distributes the remaining shipping paperwork.
Safeguards and Technical Security Division (Accountability Clerk)	21.1 The Safeguards and Technical Security Division picks up the paperwork to be distributed to the Nuclear and Explosives Materials Control Section and the Safeguards and Technical Security Division and handcarries it to those organizations.

Responsible Organization

Action

22. Provides by TWX to the NMR of the Receiving Contractor, on shipments of special nuclear material totaling more than 350 grams of contained U-235, U-233, plutonium, or any combination thereof, or 1 gram of tritium, the following information:

- Date and time of departure
- Method of transportation
- Route
- Name(s) of carrier(s)
- Estimated time of arrival (ETA)
- Sandia shipper number
- Nuclear Material Trans-  
action Report Series  
Number (DOE Form 741)

- Line Number
- Project Number
- Material Type
- Composition Code
- Owner Code
- Use Code
- Number of Items
- Element Weight
- Weight % Isotope
- Isotope Weight

23. Completes and distributes the outgoing Form DOE-741 transfer accountability document and updates the Sandia and NMSS computer records.

Procedures for the Shipment of Radioactive and Nuclear Materials to Rocky Flats

In addition to the standard paperwork, Rocky Flats requires Form RF-4940, "Authorization to Ship SS or Non-SS Material" (Exhibit 13, Chapter 3) to be forwarded by the using organization to the Nuclear Materials Representative prior to shipment. The Nuclear Materials Representative then submits this form to Rocky Flats for approval. This requirement applies to any nuclear materials as well as to any nonnuclear materials that have been exposed to radionuclides (such as fission products, other

actinides, or tritium). The requirement also applies to any materials being returned to Rocky Flats which have undergone change since they were shipped from Rocky Flats. Upon receipt of the authorization from Rocky Flats to ship, shipment of the materials proceeds in accordance with the procedures set forth in Section 7.1.

### 7.3 Procedures for the Shipment of Nuclear Materials to the DOD

Shipment of nuclear materials to the DOD must have prior authorization, as stipulated in Section 9 of Technical Manual TP 100-1, "Supply Management of Nuclear Weapons Material." Prior authorization may consist of one of the following:

- 7.3.1 A telecon from the project engineer to his counterpart in the DOD requesting him to initiate a requisition. This requisition provides definition of requirements (including authorized shipping channels and recipients) and is processed through Field Command, DNA (FCDNA) to DOE/ALO. FCDNA is the only DOD agency recognized by the DOE for the negotiation of transfer of nuclear weapons material between DOE and DOD activities, and final negotiations are made by FCDNA. The approved requisition and memorandum from the Weapons Production Division, DOE/ALO, must be received by the Safeguards and Technical Security Division prior to shipment.
- 7.3.2 A letter from the project engineer to the Weapons Production Division, DOE/ALO, (with a copy to the Safeguards and Technical Security Division) defining any change in requirements or supplying any supplementary information needed to support a Memorandum of Understanding, Joint Test Agreement, or Joint Operating Plan. A copy of the reply authorizing shipment must be received by the Safeguards and Technical Security Division prior to shipment.

Upon receipt of the authorization from DOE/ALO, shipment of the materials proceeds in accordance with the procedures set forth in Section 7.1.

#### 7.4 Procedures for the Shipment of Scrap and Excess Materials for Recovery

Since tests, experiments, and fabrication processes often result in accumulations of scrap and/or excess materials, procedures have been established to ensure that recoverable materials are identified accurately, reported promptly, and handled properly to permit disposition and recovery at the earliest practicable date. Procedures for conducting experiments or tests in which material expenditures and/or scrap or excess materials are anticipated are included in Section 7, Chapter IV and Section 6, Chapter VI.

Following tests or fabrication processes in which scrap and/or excess materials are generated, the using organization transfers these materials to the Nuclear and Explosives Materials Control Section along with a memorandum declaring the materials to be scrap or excess.

<u>Responsible Organization</u>	<u>Action</u>
Using Organization	1. Transfers the materials to the Nuclear and Explosives Materials Control Section in accordance with the procedures set forth in Section 5.1 along with a memorandum declaring the materials to be scrap or excess.
Nuclear and Explosives Materials Control Section (NM Coordinator)	2. Reweighs each item of material (if appropriate) and compares the weight with that recorded in the computer. 3. For nonweighable materials containing significant quantities of SNM, verifies the presence of nuclear material with a SAM-II non-destructive assay meter. 4. Requests disposition instructions for the materials from the Safeguards and Technical Security Division.



Responsible Organization

Action

Safeguards and Technical Security Division (EM) (00000)

7. Prepares a scrap evaluation report from Form OR-657A, "Request for Scrap Disposition" (Exhibit 1), Chapter VIII, Form OR-657B, "Plutonium Scrap Stripping Data" (Exhibit 1), Chapter VIII, Form OR-657C, "Plutonium Scrap Declaration" (Exhibit 1), Chapter VIII, Form OR-657D, "Description of Declared Plutonium Scrap" (Exhibit 1), Chapter VIII, and Form OR-657E, "Plutonium Scrap Declaration" (Exhibit 1), Chapter VIII, concerning disposition instructions for the scrap.

5.1 In the case of excess materials, prepares a memorandum regarding disposition instructions instead of the Scrap Evaluation Report.

8. Submits the Scrap Evaluation Report (or memorandum) to the Safeguards and Security Division, DOE/AIO.

6.1 Upon receipt of the reply from DOE/AIO, a copy of the approved disposition instructions is forwarded to the Nuclear and Explosives Materials Control Section.

6.2 Places scrap in excess materials line items in DOE project for recovery.

Nuclear and Explosives Materials Control Section (EM) (00000)

Temporarily stores the scrap or excess materials in a well for recovery in accordance with the procedures set forth in section 6.2.

Labels the scrap in a well with a plastic bag to await disposition.

9. Attaches the bar code identification label for the material to the plastic bag.

9.1 In the case of scrap in excess materials, prepares a "Request for Scrap Disposition" (Form OR-657A) and forwards it to the Safeguards

Responsible Organization

Action

10. Monitors the radiation level at the surface of the materials (in mR/h), which normally determines the recovery plant to which the materials are shipped.
  - 10.1 Materials whose radiation level is <100 mR/h are normally shipped to Oak Ridge.
  - 10.2 Materials whose radiation level is >100 mR/h are either held or shipped, depending on the disposition instructions received.
11. Packages the materials in shipping containers in accordance with DOE and DOT regulations.
  - 11.1 SNM is packaged by the Nuclear and Explosives Materials Control Section in specification-type containers to comply with criticality requirements for shipping (as specified in SLI 2047), and security seals are applied.
  - 11.2 Non-SNM is packaged by the Packaging Section of the Shipping and Receiving Division as specified in Section 7.1.
  - 11.3 All materials are monitored by the Health Physics Division prior to shipment.
12. Upon receipt of disposition instructions, ships the materials in accordance with the procedures set forth in Section 7.1.
  - 12.1 For shipments of Category I quantities of SNM, the Traffic Management Division arranges for courier service with DOE/ALO.

## 8. Scrap

In view of the value of nuclear materials, the DOE has established a scrap nuclear material disposition program to ensure that scrap containing recoverable nuclear material is processed in a timely and economical manner. DOE Order 5630, which sets forth the procedures to implement this program, states:

"Scrap nuclear material shall be processed when such action is technically feasible and economically justifiable or as may be required for programmatic use, or for safeguards, health, or safety considerations."

Section 7, Chapter IV of this manual includes the procedures for the management of scrap and excess materials; this section includes the corresponding procedures for the physical control of these materials.

### 8.1 Procedures for Machining Operations

Machining operations are performed on depleted uranium in order to meet the specifications required by individual projects.

<u>Respons</u>	<u>Action</u>
Using Org	<ol style="list-style-type: none"><li>1. Prepares Form SA 6476-ME, "Modification/Expenditure of Nuclear Materials", and sends to Org. 3434 and obtains approval prior to the transfer of the material.</li><li>2. Prepares a shop short order on Form SA 6505-WBA, "Process and Fabrication Request, Short/Sub Work Order."<ol style="list-style-type: none"><li>2.1 The work order includes the serial number of each item submitted, along with specifications for machining the item.</li></ol></li><li>3. Prepares Form SA 2042-D, "SS and Radioactive Material Transfer," Transferring the material to MBA 01, Bldg. 819.</li></ol>

Responsible Organization	Action	
Nuclear and Explosives Materials Control Section (NM Coordinator)	4. Transfers the material in accordance with Section 5 of this chapter.	
	5. Weighs material and prepares Form SA 2042-D Transferring Material to the Toxic Shop, MBA 18, Bldg. 869 in accordance with Section 5 of this chapter.	
	6. Deliver material to the Toxic Shop.	
Mechanical Processing Department	7. Performs the required machining, treating each serially numbered item as an individual job.	
	8. Upon completion of each individual job, places the finished part or parts in a plastic bag.	
	9. Places the scrap generated in a separate plastic bag, labeling it as scrap derived from the original serially numbered item.	
	9.1 Scrap from each completed job must be placed in separate plastic bags, and not commingled.	
	10. Prepares a transfer document to return the finished part, excess material, and scrap to the Nuclear and Explosives Materials Control Section in accordance with Section 5 of this chapter.	
	10.1 The original serial number will be used to return the material and the transfer form will be noted as to final configuration of the material, "one finished part," "one pc excess," "one bag scrap," etc.	
	Nuclear and Explosives Materials Control Section (NM Coordinator)	11. Weighs each finished part as well as the scrap.
		12. Prepares Form SA 2042-DA, "Nuclear Materials Machining Report", which provides the serial number and net weight of the original item, plus the net weight of each finished part and scrap.



anticipated scrap. Other nuclear materials may also be buried upon receipt of the appropriate disposition instructions from DOE/ALO. The following procedures have been established for the burial of scrap.

Responsible Organization	Action
Nuclear and Explosives Materials Control Section (NM Coordinator)	1. Prepares Part A of the burial form, Form SC 2040-L, "Radioactive and Toxic Material Disposal" (Exhibit 14, Chapter VIII).
	1.1 The burial form includes the serial number of the materials, material type and classification, material description (from the computer listing), Form DOE-741 reference number, quantity of material to be buried (in cubic feet and pounds), and total radioactivity (in curies).
	2. Forwards the burial form to the Safeguards and Technical Security Division for approval.
Safeguards and Technical Security Division (NM Manager)	3. Approves the disposal of the material, signing in Part C of the burial form.
	4. Forwards the signed burial copy to the Nuclear and Explosives Material Control Section.
Nuclear and Explosives Materials Control Section (NM Coordinator)	5. Arranges with the Health Physics Division for the pickup and burial of the materials.
	5.1 Health physicists bury materials each Friday or more often, if required.
Health Physics Division (Health Physicists)	6. Buries the materials.
	7. Completes Part B (which includes wastes categories) and Part D (which includes the date and location of burial and the signatures of the health physicists responsible for burying and witnessing the burial) of the burial form.

Responsible Organization	Action
Nuclear and Explosives Materials Control Section (NM Coordinator)	8. Forwards the completed burial forms to the NM Manager in the Safeguards and Technical Security Division.
Safeguards and Technical Security Division (NM Manager)	9. Prepares Form SA 6476-NF, "Inventory Adjustment Form" (IAF).  10. Writes the IAF number on a copy of the burial form and files.  11. Attaches a copy of the burial form to the IAF and gives to the accountability clerk.
Safeguards and Technical Security Division (Accountability Clerk)	12. Inputs the IAF data into the computer on the terminal screen titled "Burial", which adjusts the computer records.

## 9. Measurement Control Programs

To ensure consistent and accurate measurements of nuclear materials, measurement control programs are administered on a continuous basis. Such programs include scale and balance certification as well as the calibration of nondestructive assay equipment.

### 9.1 Certification of Uncontaminated Balances

The Physical Standards Division assumes the primary responsibility for calibrating and certifying uncontaminated balances on a semiannual basis. Table V-1 summarizes some of the balances certified by the Physical Standards Division under this program:

Table V-1

Summary of Balance Certification Program

<u>Location</u>	<u>Balance Type</u>	<u>Certification Level</u>	<u>Comments</u>
Bldg 819	Sartorius	<u>+ scale division</u> ( <u>+0.01 g</u> )	Meets DOE requirement ( $2\sigma$ -limit of <u>+0.02 g</u> for weights up to 1500 g)
Bldg 819	Digimetric Electronic	<u>+1 g</u> up to 25 g	Meets DOE requirements ( <u>+2 g</u> up to 10 kg; $2\sigma$ -limit of <u>+2 g</u> above 10 kg)
Area III (Bldg 6630)	Mettler Top-Loader		Certified up to 10 kg

### 9.2 Calibration and Weighing Procedures in Tech Area V

The responsibility for the calibration of balances in Tech Area V is shared by the Physical Standards Division and the Reactor Development and Applications Department. Balances in this area may be placed in one of three general categories as follows.



- (1) Balances in Open Laboratories in Normal Use -- These balances are potentially contaminated but have a low probability of being contaminated. For these balances, the Physical Standards Division applies the normal standardization and calibration procedures used in certifying uncontaminated balances.
  
- (2) Balances in Closed Laboratories Used for Weighing SS Materials (Unirradiated or Irradiated) or Activated and Contaminated Materials -- These balances are usually contaminated.
  
- (3) Balances in Glove Boxes and in Hot Cells -- These balances are always contaminated.

For balances in the latter two categories, the application of normal procedures would require the decontamination of the calibrated weights and could lead to a loss of these weights as a result of contamination. Consequently, special operating procedures have been developed by the Physical Standards Division and the Reactor Development and Applications Department for the weighing of accountable nuclear materials, based on the use of Class S\* weights over the applicable balance range.

For each balance that is placed in a glove box or hot cell, applicable Class S weights are obtained and remain associated with that balance throughout its service life. For all other balances (not in glove boxes), a set of Class S weights is maintained in Tech Area V for calibration checks.

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\*Class S weights are scientific standards precision analytical work. These weights are certified by the Physical Standards Division and supplied to the Reactor Development and Applications Department.

The balances in Tech Area V are maintained by the users for their own use (which normally requires greater than accountability weighings),\* so that only a spot check of the accuracy and sensitivity of the balances is necessary to verify their integrity prior to their use for accountability weighings. This check is made by (1) placing an appropriate Class S weight on the balance and verifying that the balance reading is within 1 scale division of the certified mass value of the Class S weight (e.g., with a 100-g balance, a 100-g weight should read within 1 mg of the certified weight); and (2) placing additional Class S weights on the balance and verifying that the balance reading is incremented by the corresponding weight.

### 9.3 Procedures for the Calibration and Use of Nondestructive Assay Meter

The Nuclear and Explosives Materials Control Section employs a SAM-II nondestructive assay meter in making qualitative measurements of the presence of nuclear material. The SAM-II stabilized assay meter is calibrated with a cesium-137 source. However, situations may arise in which normal calibration is unsuccessful and, in these instances, the SAM-II meter is returned to the manufacturer (Eberline Corp.) for calibration.

Calibrations with a cesium-137 source are compared and must agree with signature plottings used as universal standards.

Assays are performed on all strategic quantities of enriched uranium and plutonium at time of receipt and shipment. The material verified may be in various types of containers, birdcages, pits, or assemblies. Irradiated materials are not measured.

Other assays on weapon assemblies, weapon parts, or mockups are performed when requested by a weapon group.

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\*The accuracy prescribed for accountability weighings  $\pm 0.5$  g below 1 kg total and  $\pm 1$  g above 1 kg.

The assays are qualitative measurements only to verify the presence or absence of a specific material. No gamma quantitative measurements or certifications are made, and neutrons are not measured.

Each item assayed is moved to a shielded area, or area free of background interference and checked with a Geiger Counter to determine the exact location in the container of the material to be measured. The assay meter is then placed on the surface of the container at the designated location where a full spectrum measurement is taken. The measurement is plotted on graph paper and the plotting sheet which also includes serial number, date, location, type of material, and settings used is filed in the Nuclear and Explosives Materials Control Section office.

Future planning in the use of the nondestructive assay meter includes: (1) adequate staffing in the Nuclear and Explosives Materials Control Section to allow for measurements of previously measured items at time of internal movement which would be compared with the plot on file, and (2) schedule additional training at Los Alamos Scientific Laboratory in both gamma and neutron quantitative measurements for Nuclear and Explosives Materials Control, or Health Physics Personnel.

## 10. Seal Accountability and Control

A tamper-indicating seal program is employed by the Nuclear and Explosives Materials Control Section for use on nuclear material containers containing one or more serially numbered items. Sealed containers are considered as assemblies and are inventoried by container unless the seal has been broken since the previous inventory.

### 10.1 Procedures for Controlling, Issuing, and Applying Seals

Button type seals consisting of two metallic parts that, when snapped together form a numbered enclosure around the joined ends of a length of wire. The wire is attached to the container to be sealed in a manner that requires breaking the wire or destruction of the seal to open the container. The seals, with a 5 digit numerically sequenced serial number and "SLA" die stamped on each seal, are controlled and issued by the Nuclear and Explosives Materials Control Assistant.

Seals are used by the Nuclear and Explosives Materials Control Section for material in storage, in Area V for sealing accountable identification cards, for material in the ACRR, GIF Pool, GIF, Surwell, SPR, and material in safes in the MAA. (Sealing of cards instead of material has been accepted by the Nuclear Safeguards Branch, DOE/ALO, for all listed areas except the MAA because the material cannot be visually inspected and if material is moved the identification card is required to accompany the material.) Seals may be issued to other line organizations for other purposes.

<u>Responsible Organization</u>	<u>Action</u>
Nuclear and Explosives Materials Control Section (Nuclear Material Control Assistant)	<ol style="list-style-type: none"><li>1. Orders and maintains stock of serially numbered tamper-indicating seals in a combination-type lock safe.</li><li>2. Maintains a log book which contains each seal number, container number applied to (or employee to whom issued, if line org.), date applied, initials of employees applying seal, and the 741 Transaction Document, if being shipped.</li></ol>

Responsible Organization	Action
Nuclear and Explosives Materials Control Section (Nuclear Material Control Assistant)	<p>3. <u>Seal Installation</u> - Maintains a loose leaf document in container number sequence as a cross reference to the Seal Number Log Book which contains MBA number, container number, seal number, date sealed, 741 number, material serial number(s), MR/HR reading, and net weight.</p> <p>4. Weighs each item before placing it in a container to be sealed.</p> <p>5. Seals container and inputs the seal number, descriptor for the container, material type, accountable MBA, building, room, number of items, serial number and net weight of each item sealed on the terminal screen titled "Apply Seal - Initiate."</p> <p>6. Telephones the accountability clerk in the Safeguards and Technical Security Division and gives her the seal number.</p>
Safeguards and Technical Security Division (Accountability Clerk)	<p>7. Inputs the seal number on the terminal screen titled "Seal Apply - Complete" which adds the assembly data to the computer file and generates a bar code label for the sealed container.</p> <p>8. Forwards the bar code label for the sealed container to the Nuclear and Explosives Material Control Section assistant.</p>
Nuclear and Explosives Materials Control Section (NM Control Assistant)	<p>9. Attaches the bar code label to the sealed container for identification and inventory.</p> <p>10. If appropriate, prepares Form SA 2042-D, "Nuclear and Radioactive Material Transfer", in accordance with procedures in Section 5 of this chapter.</p> <p>11. <u>Seal Removal</u> - Breaks seals and removes material from containers as requested by using organizations and/or for shipment.</p>

<u>Responsible Organization</u>	<u>Action</u>
Safeguards and Technical Security Division (Accountability Clerk)	12. Cancels seal numbers as seals are broken by drawing through the seal number line in the log book.
	13. Explains a broken seal by recording the reason for breaking in the container cross reference document.
	14. Inputs the seal number and container serial number of the broken seal container on the terminal screen titled "Break Seal - Initiate".
	15. Telephones the accountability clerk and gives her the broken seal number.
	16. Inputs the seal number on the terminal screen titled "Seal Break - Complete" which disassembles the items in the computer file.

## 11. Exporting Accountable Nuclear Materials

### 11.1 Procedures for Exporting

NRC Authorization - If shipment is in conjunction with an NRC agreement, the sending organization will:

1. Complete form "Request for Foreign Contract Number" (available in the Safeguards and Technical Security Division) and mail to the Union Carbide Corp., Oak Ridge, Tenn.
2. Upon receipt of the contract number from Oak Ridge, complete Form NRC-7, "Application for License to Export Nuclear Material and Equipment" (Available in the Safeguards and Technical Security Division) and mail to the Assistant Director for Export/Import and International Safeguards, U.S. Nuclear Regulatory Commission, Washington, D.C. 20555.
3. Telephone the Department of Commerce to explain the shipment and obtain their authorization code which must be inserted in the "Authentication" block on Form 7525-V, "Shipper's Export Declaration" (prepared and approved by the Traffic Management Division, 3743).

DOE Authorization - The following procedures can be used for all exports, including NRC agreement shipments. The sending organization will:

1. Complete Form "Request for Foreign Contract Number" (available in the Safeguards and Technical Security Division) and mail to the Union Carbide Corp., Oak Ridge, Tenn.
2. Upon receipt of the contract number from Oak Ridge, prepare a memorandum addressed to D. L. Krenz, Special Programs Division Director, DOE/ALO, requesting authorization to ship the material, and include the following information.

- a. Description of material
  - b. How the material will be used
  - c. Will a Sandia scientist be at destination?
  - d. Length of time it will be used and benefits to be derived
  - e. Will the material be returned?
  - f. Is there a Sandia contract? If so, attach a copy
  - g. Any correlation to another contract, or international agreement?
3. Furnish the contract number and packaging information to the Traffic Management Division who prepares the Shipper's Export Declaration in 5 copies.
  4. Forward the memorandum to the Traffic Management Division to be forwarded with the approved Shipper's Export Declaration to D. L. Krenz, DOE/ALO.

<u>Responsible Organization</u>	<u>Action</u>
Sending Organization	<ol style="list-style-type: none"> <li>1. Prepares Form SF 6951-A, "Property Action," Form SA 6550-EA, "Information for Hazardous Material Shipments," Form SA 2042-D; "SS and Radioactive Material Transfer" transferring material to MBA 01, Bldg. 819 (see Exhibits 6, 11 and 12, Chapter X).</li> <li>2. Transfers material and shipping paperwork to MBA 01 in accordance with Section 5 of this chapter.</li> <li>3. Prepares memorandum addressed to D. L. Krenz, Special Programs Division Director, DOE/ALO, requesting authorization to ship material (for DOE authorization only).</li> <li>4. Forwards the memorandum and contract number to the Traffic Management Division.</li> </ol>
Nuclear and Explosives Materials Control Section (NM Coordinator)	<ol style="list-style-type: none"> <li>5. Prepares Nuclear/Radioactive Material Packing Slip, Form SF 6476-I, and adds to the shipping paperwork packet.</li> </ol>



Responsible Organization	Action
Nuclear and Explosives Materials Control Section (NM Coordinator)	6. Prepares Nuclear and Radioactive Material Transfer, Form SA 2042-D, transferring accountability for the material to the Packaging Section, MBA 66, in accordance with Section 5 of this chapter.
Shipping and Receiving Division	7. Packages material, completes paper- work, and forwards Form SF 6476-I, Nuclear/Radioactive Material Pack- ing Slip, and Form SF 6951-A, Property Action, Govt. Bill of Lad- ing and Hazardous Material Form to the Traffic Management Division.
Traffic Management Division	8. Determines carrier and routing of shipment, record data required for the Shipper's Export Declaration, and returns shipping paperwork to the Shipping and Receiving Division.
Shipping and Receiving Division (Packaging Engineer)	9. Completes 5 copies of the Shipper's Export Declaration, signed by the Traffic Management Division super- visor, and forwards to D. L. Krenz, DOE/ALO, with the memorandum from the sending organization, if DOE authorization is required.
Shipping and Receiving Division (Packaging Engineer)	10. Ships material if accompanied by NRC license and completed Shipper's Export Declaration.
Traffic Management Division (Traffic Clerk)	11. Transfers packaged material to MBA 01 in accordance with Section 5 pending DOE authorization to ship.
Traffic Management Division (Traffic Clerk)	12. Forwards a copy of the Shipper's Export Declaration authorizing shipment when returned from DOE.
Nuclear and Explosives Materials Control Section (NM Coordinator)	13. Upon receipt of the Shipper's Export Declaration, transfers packaged material and shipping paperwork to MBA 66 for shipment, in accordance with Section 5 of this chapter.

## 12. Special Procedures

Because of the diversity of operations involving nuclear materials, unique situations arise which require special operational procedures to be devised. The Safeguards and Technical Security Division and the Nuclear and Explosives Materials Control Section assist using organizations in the formulation and implementation of such special procedures. This section contains special procedures currently in use.

### 12.1 Procedures for the Verification of the Presence of SNM in Tech Area V

The principal use of SNM in large quantities in Tech Area V involves the SPR reactors. These reactors are used in the Kiva (Building 6590) and stored in a vault outside the Kiva in the breezeway; fissile reactor components may also be stored in the vault.

Occasionally, additional SNM is present in significant quantities in Tech Area V as part of an experiment (e.g., weapon components or reactor safety experiments). When such experiments are located in Tech Area V, they may be stored in the Kiva, the vault, or the instrument building. These areas are equipped with remote air monitors (RAM's) to monitor the radiation level at all times. These RAM's (one in the Kiva, three in the breezeway, and one in the instrument building) are set to trigger an alarm when radiation levels exceed 100 mR/h and may be monitored from remote readouts located at the console and in the health physicists' office. When not in storage, experiments may be secured in the ACRR reactor or in other prescribed areas of Tech Area V, although these other areas require 24-hour surveillance by two guards as an added security precaution.

<u>Responsible Organization</u>	<u>Action</u>
Reactor Development and Applications Department or Health Physics Division	1. When the Kiva is open, the reactor is shutdown, and personnel are present, checks the radiation field of the reactor with a portable gamma-sensitive radiation detector.

Responsible Organization	Action
Reactor Development and Applications Department or Health Physics Division	<p>1.1 A reading significantly above the background radiation level indicates that the materials are presents.</p> <p>2. When the Kiva is secured and the reactor is shutdown, checks the reactor visually from the SPR control room using the television monitoring system.</p> <p>3. When the Kiva is secured and the reactor is operating, is not required to make any checks.</p>
Reactor Development and Applications Department or Health Physics Division	<p>4. When the storage vault has been opened for any purpose, checks all of the SNM in the vault with a portable gamma-sensitive detector in order to verify the presence of SNM.</p> <p>4.1 A reading significantly above the background radiation level indicates that the materials are present.</p> <p>5. When SNM is located in experiments, checks (where possible) with a portable gamma-sensitive detector.</p> <p>5.1 A reading significantly above the background radiation level indicates that the materials are present.</p> <p>5.2 Whenever the gamma detection method cannot be used because of high-radiation environments or inaccessibility (such as when the experiment is located in the ACRR irradiation cavity), the experiment containment is visually checked to ensure that the materials have not been disturbed.</p> <p>5.2.1 If discrepancies are noted, the materials are removed to a location with low background radiation and checked with a portable gamma-sensitive detector.</p>

12.2 Procedures for the Performance of Emergency Inventories of SNM in Tech Area V

Upon request, MBA's are required to perform an emergency inventory of SNM in their possession. The Safeguards and Technical Security Division receives the initial notification of the requirement for such an inventory and instigates the performance of the emergency inventory.

<u>Responsible Organization</u>	<u>Action</u>
Safeguards and Technical Security Division	1. Notifies the Manager of the Reactor Development and Applications Department of the requirement for an emergency inventory of SNM in Tech Area V.
Reactor Development and Applications Department (Manager)	2. Notifies all custodians in Tech Area V that an emergency inventory of SNM's is required.
Using Organization (Custodian)	3. Performs the emergency inventory of all SNM's in its possession.  3.1 All locations where SNM is located are physically examined, and the materials are monitored in accordance with the procedures set forth in Section 12.1.
Reactor Development and Applications Department (Manager)	4. Reports the results of the emergency inventory to the Reactor Development and Applications Department.  5. Combines the results of all of the emergency inventories performed in Tech Area V.  6. Reports the combined results to the Safeguards and Technical Security Division.

CHAPTER VI  
ACCOUNTABILITY

1. Responsibilities

The accountability of nuclear materials requires rigid coordination and exact recordkeeping of all transactions and activities involving nuclear materials. The Safeguards and Technical Security Division is assigned primary responsibility for the accountability of nuclear materials in the possession of Sandia National Laboratories, Albuquerque. In fulfilling this responsibility, the Safeguards and Technical Security Division maintains records and issues reports reflecting nuclear material transactions and inventories. Corporate records of nuclear materials for which Sandia is accountable to the DOE are maintained in a comprehensive computer file which is supplemented by shipping and receiving logs that are maintained manually. Furthermore, all documents related to nuclear material transactions and expenditures are filed and held as necessary to satisfy the audit and retention requirements of the DOE and Sandia National Laboratories. DOE Order 5630 describes the reporting requirements specified by the DOE and provides a profile of the responsibilities incumbent upon contractors possessing accountable nuclear materials. Specific responsibilities which the Safeguards and Technical Security Division undertakes in order to fulfill the accountability function are to:

- From Form DOE-741 transfer accountability documents received by mail, input data into the computer before processing the physical receipt of materials.

- Maintain the corporate shipping and receiving logs in which transfer accountability data and adjustments to inventory are recorded.
- Maintain files of transaction documents, lists, and reports including:
  - Form DOE-741 transfer accountability documents.
  - DOE authorizations for shipments to the military.
  - Current classified mail channels.
  - Contractor and licensee Reporting Identification Symbols.
  - Assembly/Disassembly forms.
  - Burial reports.
  - MSR and status of inventory reports.
  - Financial reports.
- Report end-of-the-month inventory balances (by material type, project number, and VLA) to the DOE.
- Balance the nuclear material inventory monthly in conjunction with the Property Accounting Division.
- Direct the receipt, processing, and distribution of incoming Form DOE-741 transfer accountability documents.

- Prepare Form DOE-741 transfer accountability documents for all shipments of nuclear materials to or from the military.
- Compare incoming Form DOE-741 transfer accountability documents with the receiving paperwork and resolve any discrepancies which are noted.
- Prepare and distribute Form DOE-741 transfer accountability documents, via Sacnet or mail, for all shipments and disposals of nuclear materials.
- TWX pertinent shipping information to receivers of shipments made during the last 5 calendar days of a month.
- Prepare receipts for classified information to accompany Form 741, Nuclear Material Transaction Report, on shipments of nuclear materials which are classified Secret, and are sent by mail.
- Calculate the material decay for  $^{238}\text{Pu}$  materials at the time they are shipped, and monthly for other designated materials that remain in the inventory.
- Record calculated material decays in the computer file.
- Prepare input for daily update of Sandia's computer records and the periodic update of DOE/ALO and NMSS computer records.
- Distribute inventory computer listings to MBA custodians following each physical inventory and reconciliation, and upon request.

- Distribute, monthly or upon request, the alarm report to the Nuclear Materials Manager in the Safeguards and Technical Security Division, the sealed container report to the Nuclear and Explosives Materials Control Section, and the financial report to the Property Accounting Division.



## 2. Job Description

The accountability functions of the Safeguards and Technical Security Division are performed by accountability clerks. Job descriptions for these positions are published by the Position Evaluation and Job Classification Division and retained by the Safeguards and Technical Security Division and the Position Evaluation and Job Classification Division in their files. Figure VI-1 provides the published description for the Nuclear Material Accountability Control Clerks who carry out the accountability activities.

JOB GRADE CLASSIFICATION

OCCUPATION TITLE ACCOUNTABILITY CLERK (SS Material)

GRADE 37

JOB DESCRIPTION

(Outline of general scope of work - No attempt made to include all associated detail & tasks)

**JOB DUTIES:** Maintain the corporate accountability records of all General and Special (SS) materials in the custody of Sandia Laboratories. Allow computer operator to enter input for entry of SS material data into the Nuclear Material Information System and for issue inventory control purposes; participate in periodic physical inventories of SS materials in Sandia's possession and perform related clerical duties associated with SS material accountability functions.

**MAJOR REPRESENTATIVE DUTIES:** In accordance with DOE and the Laboratories regulations, control systems, general instructions, and practices maintain complete accountability records of all SS material in Sandia Laboratories' custody. Process all transaction-related documents, computing element and isotope weights, verifying completeness of information required for accountability records, and obtaining missing or supplementary information from sources within and outside the laboratories. Prepare journal and ledger entries to record and summarize nuclear materials transactions and associated information. Analyze material transactions to determine effect on material accounts. Make adjusting entries to account for material expended in tests, depreciated by decay, disposed of by burial, or scrapped as chips or shavings in fabrication processes. Close books at the end of each month; obtain and record information on transactions in process; and identify, trace, and reconcile discrepancies. Assure that records contain sufficient information to satisfy Sandia and DOE audit requirements. Summarize transactions by material types on SS transfer journal for input to the Nuclear Material Information System and transmission to AED via SACMS. Check listings versus data submitted to assure accuracy of data transmission.

Input SS material data to Sandia computer file for the nuclear material inventory control program and follow the processing of the data to assure accuracy of the input. Analyze computer-generated listings and reports to detect erroneous data, utilizing computer diagnostics and produce decision tables as required. Reconcile computer-generated data with manual records; trace all discrepancies to insure accuracy of reports. As required, prepare data retrieval programs to obtain special computer listings or reports.

Participate in conducting physical inventories of all special nuclear material in custody of SLA and reconcile with accountability records; as required, spot check inventories of various MBA's in accordance with a provided sampling procedure. Perform various clerical duties related to the material accountability functions and the Nuclear Materials Management Section's operations including activities such as typing, filing, document accountability, and occasional operation of EAM equipment.

Figure VI-1. Job Description for the SS Material Accountability Clerks

### 3. Accountability Records

To ensure the rigorous accountability of nuclear materials in accordance with DCE regulations, Sandia National Laboratories maintains an extensive computerized data base containing all information pertinent to nuclear material operations. This data base is updated daily to ensure that all data changes are recorded promptly and accurately. These data are sorted in various ways and recovered to generate the reports and listings discussed in Section 11 of this chapter. To supplement this data base, accountability clerks in the Safeguards and Technical Security Division maintain shipping and receiving logs which document all nuclear material transfers to or from Sandia National Laboratories. The Safeguards and Technical Security Division also keeps files of numerous transaction documents as required to satisfy the audit and retention requirements stipulated by the DOE and Sandia National Laboratories. Figure VI-2 illustrates a simplified flowchart for the nuclear material accountability records processed by the Safeguards and Technical Security Division.

At the heart of the DOE accountability system are Form DOE-741, "Nuclear Material Transaction Report" (Exhibit 15, Chapter VIII), and Form AL-131, "ADP Transcription Sheet, Nuclear Material Transfers" (Exhibit 16, Chapter VIII). Form DOE-741 accompanies all nuclear material transfers between Reporting Identification Symbols (RISs) and contains all pertinent information regarding the materials. Form AL-131 is the machine-readable form of 741 information used for transmitting data directly from the Sandia computer to DOE/ALO and NMSS computer systems.

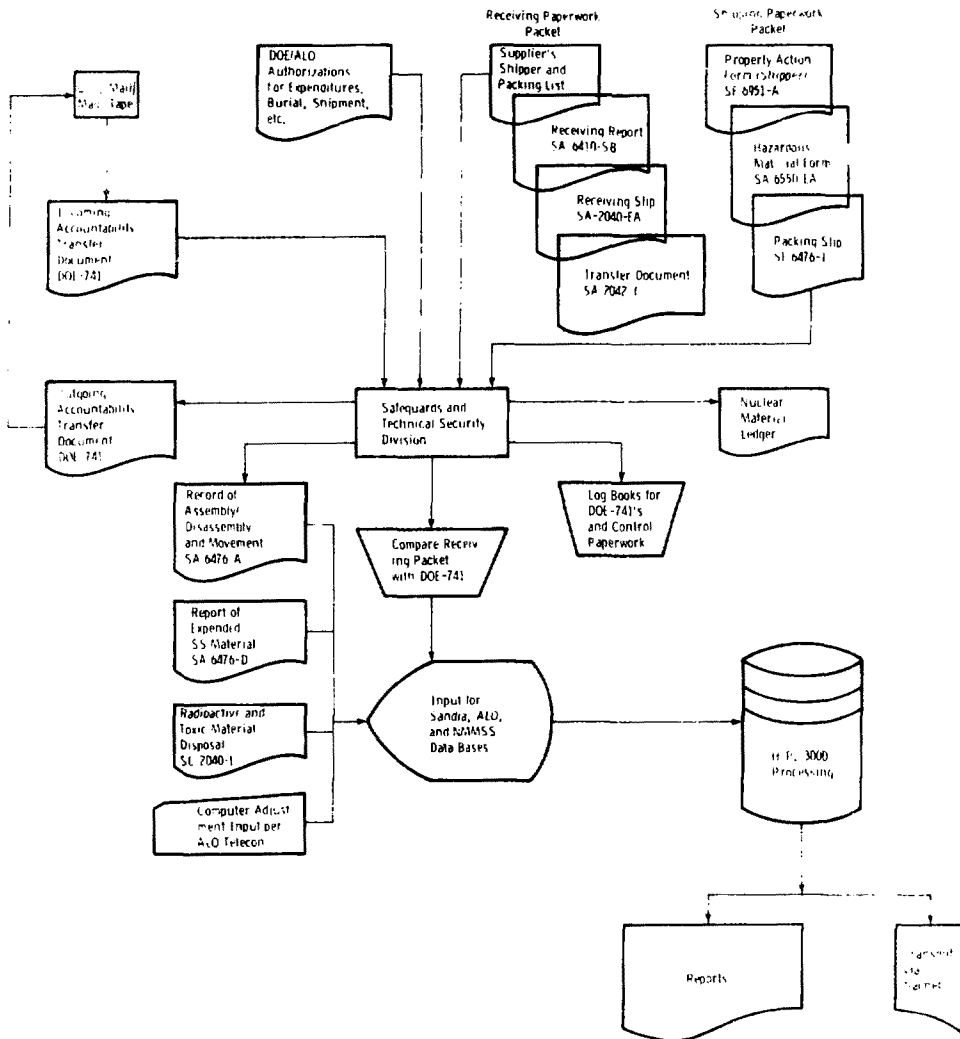


Figure VI-2. Simplified Flowchart for Nuclear Material Accountability Records

### 3.1 Procedures for Maintaining the Computer Corporate Ledger

<u>Responsible Organization</u>	<u>Action</u>
Safeguards and Technical Security Division (Accountability Clerk)	1. Maintains a log book in which 741s and IAFs are recorded to ensure accounting changes are made to the data base.
	2. Receives the material transfer information on Form DOE-741.
	2.1 Incoming Forms DOE-741 contain information on material receipts and outgoing information on material shipments.
	3. Receives adjustment and/or expenditure information on Form SA 6476-NF, "Inventory Adjustment Form" (Exhibit 19, Chapter VIII).
	3.1 The Nuclear Materials Manager prepares Form SA 6476-NF for adjustments resulting from machining, normal operational losses, and routine test expenditures.
	3.2 Generates Form SA 6476-NF for decay and weight-rounding activity.
	4. Queries open 741s in data base on the ALO menu via terminal.
5. Inputs 741s on terminal screen ALO 051 or ALO 052, depending upon whether the source input is from tape or hard copy.	
6. Queries terminal screen ITM 054 to check weights before inputting adjustment data from IAF.	
7. Inputs adjustment data on the appropriate IAF terminal screen (i.e., decay, loss, one too many, many to one, etc.).	

### 3.2 Procedures for the Update of Sandia's Computer Records

To ensure the correctness of Sandia's computerized nuclear material data base, daily updates are performed so that all data changes are recorded promptly and accurately.

<u>Responsible Organization</u>	<u>Action</u>
Safeguards and Technical Security Division (Accountability Clerk)	<ol style="list-style-type: none"><li>1. Queries open receipts, shippers, and 741 data to ALO that remains incomplete to start the day's activity.</li><li>2. Inputs daily transactions and updates information in accordance with Section 3.1 above.</li><li>3. Concludes each day's activity by generating a daily closing report from terminal screen CLS 051.<ol style="list-style-type: none"><li>3.1 Checks the daily closing report against the input source documents and the log book.</li><li>3.2 At month's end, performs monthly closing from terminal screen CLS 052.</li></ol></li></ol>

### 3.3 Procedures for the Update of the NMSS Computer Records

DOE regulations require that prompt notification be supplied to the Nuclear Materials Management and Safeguards System (NMSS) of all corections to the nuclear material inventory, including project number changes, receipts, shipments, and all other adjustments to inventory (such as expenditures, disposals, decay, etc.). Input internal project transfers (project number changes) on the terminal screen format of Form DOE-749, "ADP Transcription Sheet, Internal Project Transfers" (Exhibit 22, Chapter VIII). The Form AL-131, "ADP Transcription Sheet, Nuclear Material Transfers" (Exhibit 16, Chapter VIII) is used for transmitting all other data to the DOE/ALO and NMSS.

<u>Responsible Organization</u>	<u>Action</u>
Safeguards and Technical Security Division (Accountability Clerk)	<ol style="list-style-type: none"> <li>1. Determines the daily activity data that must be transmitted to ALO.</li> <li>2. On the terminal, selects from the ALO menu the appropriate reporting format for transmitting the required data.</li> <li>3. Generates daily, following close of business, output tapes for transmission to ALO.</li> <li>4. Classifies output tapes SRD and has a reference symbol number assigned and logged by the Safeguards and Technical Security secretary.</li> <li>5. Handcarries, at the end of each workday, the tapes with Form SC 2900-JC, "Record of Loaned Document and Routing Slip", to the computer communications section, and picks up incoming tapes for processing.</li> </ol>
Computer Communications Section	<ol style="list-style-type: none"> <li>6. Signs Form SC 2900-JC for receipt and returns it to the carrier for filing in the Safeguards and Technical Security Division office until the tapes are returned.</li> <li>7. Transmits tapes via Sacnet to ALO and required distribution.</li> </ol>
DOF/ALO	<ol style="list-style-type: none"> <li>8. Extracts data required for the ALO data base and transmits to Oak Ridge the data required for NMMSS.</li> </ol>

#### 4. Receipts

The accountability of nuclear materials received is supported by a receipt network packet which is processed through the Safeguards and Technical Security Division. These documents permit any necessary resolution of discrepancies in shipping information, ensure that all nuclear materials enter the computerized accountability system, and assist the Safeguards and Technical Security Division in fulfilling reporting requirements set forth in Part II of DOE Order 5630, which states:

"All transfers of special nuclear materials (DOE owned source material), and certain other DOE owned materials within the United States or between the United States and foreign entities shall be reflected on a Nuclear Material Transaction Report, Form [DOE]-741...

"In any instance where a facility subject to this part receives material from someone who is not required by this part to prepare a Form [DOE]-741..., the receiver must prepare and distribute the form promptly.

In addition, the Safeguards and Technical Security Division provides information regarding receipts of nuclear materials to the Materials Management and Safeguards System (NMSS) through the control unit instructions.

This section includes the accountability procedures for receipts of nuclear materials. The corresponding control procedures are included in Section 4, Chapter V.

##### 4.1 Procedures for the Accountability of Nuclear Material Receipts

<u>Responsible Organization</u>	<u>Action</u>
Nuclear and Explosives Materials Control Section (NM Coordinator)	1. On the terminal, inputs the initial receiving data on the RCVO51 screen titled "Build/Display Receipt (Control)" following the weighing of material.



Responsible Organization

Action

- 1.1 For nonweighable material, holds receiving paperwork and checks with the accountability clerk in the Safeguards and Technical Security Division for 741 data before entering on the RCV051 screen.
- 1.2 Assigns log number to incoming material.
2. Following input of data on the terminal, handcarries the completed receiving paperwork packet to the accountability clerk.
  - 2.1 The receiving packet consists of the shipper's packing list, two copies of the receiving report on either Form SA 6410-SB, "Material Receiving Report" (Exhibit 5, Chapter VIII), or on Form SA 6410-SC, "Material Varieref Receiving Report" (Exhibit 6, Chapter VIII), and the nuclear materials receiving slip on Form SC 2040-EA, "Radioactive and Nuclear Materials Receiving Slip" (Exhibit 7, Chapter VIII).
3. Files the receiving packet in a pending file until the Form DOE-741, "Nuclear Material Transaction Report" (Exhibit 15, Chapter VIII) is received.
  - 3.1 One copy of the receiving report is filed and maintained for audit purposes.
  - 3.2 For materials received from the military, the accountability clerk inputs Form DOE-741 data from the sender's paperwork in accordance with earlier Section 3.1 and transmits it to DOE/ALO in accordance with Section 3.3 above.

Safeguards and Technical Security Division (Accountability Clerk)

Responsible Organization

Action

Safeguards and Technical  
Security Division  
(Accountability Clerk)

- 3.3 If for some reason the content of the materials cannot be determined independently within 10 days of receipt, the accountability clerk prepares Form DOE-284, "SS Material Transfer Receipt" (Exhibit 24, Chapter VIII) as an interim document and distributes the original to the shipper with copies to DOE/ALO and to the shipper's field office (if different).
4. Upon its arrival, records the receipt of the Form DOE-741 in the log book.
  - 4.1 If the form is classified Secret, the accountability clerk must sign a receipt for the document at the time of delivery. (Copies received by mail only.)
5. Files the Form DOE-741 in a pending file until the receiving packet arrives.
  - 5.1 Queries open receipts on terminal screen.
  - 5.2 If DOE-741 is received by mail, inputs data to the computer on terminal screen ALO 052 titled "Build ALO Input From Terminal for NMS."
6. When both the receiving packet and the Form DOE-741 have arrived and been matched, transfers all of the documents to a work folder.
  - 6.1 Both a Form DOE-741 and a nuclear materials receiving slip are required in order to process the transaction.
  - 6.2 Gross weight, packaging, and transportation information are required on receipts from the DOD.

Responsible Organization

Action

7. Matches the data entries on the Form DOE-741 with those on the receiving paperwork.
  - 7.1 Discrepancies noted between the Form DOE-741 and the receiving paperwork are reconciled with the Nuclear and Explosives Materials Control Section or (if necessary) with the shipper's accountability personnel.
8. Completes the receiver's portion of the Form DOE-741 by assigning the appropriate project number and recording the material type, composition code, owner code, use code, number of items, serial numbers, element weight, weight percent isotope, and isotope weight for each line item, which are input to the computer on terminal screens RCV052, RCV054, and RCV057.
9. The data from the Form DOE-741 are input on the terminal format of Form AL-131, "ADP Transcription Sheet, Nuclear Material Transfers" (Exhibit 16, Chapter VIII), for processing to DOE/ALO and required distribution in accordance with earlier Section 3.3.
10. On copies received by mail, obtains the signature of the NM Representative on the Form DOE-741 and distributes the copies as required (including one copy to DOE/ALO and one copy to the shipper). Otherwise, copies are transmitted via Sacnet.
  - 10.1 If the form is to be mailed and is classified Secret, the accountability clerk prepares a "Receipt for Classified Information" on

Responsible Organization

Action

Safeguards and Technical  
Security Division  
(Accountability Clerk)

Form SA 2900-J (Exhibit 25,  
Chapter VIII) and also  
obtains the signature of the  
mailman picking up the form.

- 10.2 For shipments from the  
military, the distribution  
of the form DOE-741 is  
evaluated on a case-by-case  
basis, since the various  
branches of the service  
require distributions  
different (normally more  
extensive) than those for  
nonmilitary shipment.
11. Records the distribution of the  
completed Form DOE-741 in the  
log book.
12. Inputs Form 741 data into the  
computer in accordance with  
earlier Section 3.1.
- 12.1 Checks the transmitted data  
against the source document  
on the daily closing report.
- 12.2 Files the completed form  
DOE-741 and the receiving  
packet in the "Current  
Month's Business" working  
file.
13. Once a month, furnishes a monthly  
cost report and balance sheet  
code report to the Property Ac-  
counting Division of all trans-  
actions causing adjustments to  
the ledger during the month.
- 13.1 The cost report includes:  
shipping RIS, receiving  
RIS, 741 no., MT, ER, cost,  
element wt., % isotope,  
isotope wt., project no.,  
comp. code, MSR no., docu-  
ment no., action date,  
serial no., and reporting  
date.

Responsible Organization

Action

- 13.2 The cost report summarizes costs by material type on a monthly recap report which includes: material type, previous months inventory dollar value, changes in dollars, and current months inventory dollar value.
- 13.3 The balance sheet code report summarizes costs by project number, enrichment range, and material type within balance sheet codes. Also included on the report are composition code and element weight.
14. Files the Form DOE-741 numerically in the 741 receiving file.
15. Files the receiving packet chronologically in the receiving file.
16. Updates the Sandia and NMSS computer records in accordance with the procedures set forth in earlier Sections 3.2 and 3.3.

#### 4.2 Procedures for the Accountability of Nuclear Material Constructive Receipts

The following procedures have been established for the accountability of nuclear material not physically received by month end closing, but for which a DOE 741 transaction report has been received.

<u>Responsible Organization</u>	<u>Action</u>
Safeguards and Technical Security Division (Accountability Clerk)	<ol style="list-style-type: none"><li>1. Inputs 741 data in accordance with earlier Section 3.1.</li><li>2. Inputs DOE project no., comp. code, country control no., and wt., % isotope on terminal screen RCV055 titled "Build Constructive Receipt."<ol style="list-style-type: none"><li>2.1 On terminal ALO menu, selects DOE AL-131 format and transmits data to DOE/ALO.</li><li>2.2 Input to computer generates ALO transmission only and data are not entered in Sandia data base.</li></ol></li></ol>

## 5. Shipments

In addition to rigorous DOE and Department of Transportation safeguards requirements, shipments of nuclear materials are governed by accountability and reporting requirements established by the DOE. The Safeguards and Technical Security Division and the Traffic Management Division assume primary responsibility for fulfilling DOE reporting requirements set forth in Part II of DOE Order 5630, which states:

"The shipper [Safeguards and Technical Security Division] shall either include the copies of the transfer report intended for the receiver with each shipment of nuclear material, or, by other means dispatch the receiver's and other copies of the Form [DOE]-741 on the same day the material is shipped.

"Each shipper [Traffic Management Division] is responsible for providing the intended receiver with all pertinent information concerning a proposed shipment of nuclear material. For shipments of special nuclear material totaling more than 350 grams of contained U-235, U-233, plutonium, or any combination thereof, or more than one gram of tritium, the shipper shall, on the agreed day of shipment, provide such information to the receiver by telephone [if not classified] with confirmation by teletype or telegram."

In addition, the Safeguards and Technical Security Division transmits information regarding shipments of nuclear materials to the Nuclear Materials Management, Security, and Safeguards System (NMMSS) in accordance with the DOE instructions issued in 1972 and subsequent memorandum changes.

This section includes the accountability procedures for shipments of nuclear materials. The corresponding control procedures are included in Section 7, Chapter V.

## 5.1 Procedures for the Accountability of Nuclear Material Shipments

<u>Responsible Organization</u>	<u>Action</u>
Nuclear and Explosives Materials Control Section (NM Coordinator)	1. Inputs initial shipping data on terminal screen SHP051 titled "Build/Display Shipment."
Nuclear and Explosives Materials Control Section (NM Coordinator)	1.1 Assigns log number to outgoing shipment.
	1.2 If shipment is to DOD, inputs HD number in comments field.
	1.3 Records computer-generated "RIS" number on shipping paperwork.
	2. Forwards the completed shipping paperwork packet to the accountability clerk in the Safeguards and Technical Security Division.
	2.1 The shipping packet consists of the shipper on Form SF 6951-A, "Property Action" (Exhibit 11, Chapter X), the hazard sheet on Form SA 6550-EA, "Information for Hazardous Material Shipment" (Exhibit 12, Chapter X), the packing slip on Form 6476-I, Nuclear/ Radioactive Material Packing Slip" (Exhibit 8, Chapter VIII), Form DOE-740, "ADP Transcription Sheet, Nuclear Material Transaction Journal" (Exhibit 9, Chapter VIII), and the transfer document on Form SA 2042-D, "Nuclear and Radioactive Material Transfer" (Exhibit 6, Chapter X), with which the materials were turned in for shipment.
	3. Records the date, 741 no., and quantity in the shipping log book.



Responsible Organization	Action
Shipping and Receiving Section (Packaging Clerk) or Nuclear Materials Control Section (for SNM) (NM Coordinator)	<p>4. If the materials being shipped require a courier, handcarries the shipping packet to the Security Standards and Operations Department for recording of the RIS number and material weights in the security log.</p> <p>5. Handcarries the shipping packet to the Packaging Section of the Shipping and Receiving Division.</p> <p>6. Packages the materials in accordance with DOE and DOT regulations, based on information contained on the sheet.</p>
Health Physics Division (Health Physicist)	<p>6.1 SNM is packaged by the Nuclear and Explosive Materials Control Section in specification-type containers to comply with criticality requirements (as specified in SLI 2047), and security seals are applied.</p> <p>7. Records the container type and gross weight on the Form DOE-740.</p> <p>8. Contacts the Health Physics Division for inspection of the packaged materials.</p> <p>9. Monitors the radiation level (in mR/h) at the surface of the packaged materials.</p> <p>10. Verifies that the correct radioactive labeling has been attached.</p> <p>11. Enters the transport index and other required data on the packing slip, signs, and retains one copy.</p>
Shipping and Receiving Division (Packaging Engineer) or Nuclear Materials Control Section (for SNM) (NM Coordinator)	12. Forwards the shipping packet to the Traffic Management Division.
Traffic Management Division (Traffic Clerk)	13. Determines the method of shipment and completes the transportation portion of the Form DOE-740.

Responsible Organization	Action
Shipping and Receiving Division (Shipping Clerk)	14. Retains one copy of the packing slip.
	15. Arranges appropriate carrier service for the shipment.
	16. Forwards the shipping packet to the Shipping and Receiving Division.
	17. Ships the materials, enclosing the green copy of the shipper and the packing slip.
Safeguards and Technical Security Division (Accountability Clerk)	17.1 The white copy of the shipper is used as a gate pass.
	18. Notifies the Safeguards and Technical Security Division when shipment has been made.
	19. Picks up the completed copies of the shipper, the packing slip, Form DOE-740, and material identification labels of material shipped.
	20. Retains one copy of the shipper and one copy of the packing slip for the Safeguards and Technical Security files.
	21. Queries the computer on terminal screen SHP001 titled "Query Open Shipments" to obtain the required shipping log number.
	22. Inputs on terminal screen SHP055 titled "Build/Display Shipment" the shipping log no. and action code.
	23. Verifies serial numbers on material identification labels returned from the shipping org. against those entered into the computer for that shipping log number on terminal screen SHP053.
	23.1 Item number differences require that the data be reentered from Step 1 of this section.

<u>Responsible Organization</u>	<u>Action</u>
Safeguards and Technical Security Division (Accountability Clerk)	24. Completes shipping transaction by inputting on terminal screen SHPO54 titled "Complete Shipping" the shipping log number, process action code, miscellaneous information description, and action date (date shipped).
	24.1 If shipped to DOD or licensees, includes shipped for/to accounts, transportation, and packaging information.
	24.2 If exported to a non-U.S. location, includes the export license number on the 741 (see DOE Order 5630).
	25. Adds negligible quantity items on terminal screen SHPO56 titled "Add Negligible Quantity Items to NMS" which programmatically includes them on the DOE Form 741 with the accountable quantities.
	26. Generates Form DOE 741s on tape for Sacnet transmission and hard copy for file and for distribution to non-Sacnet recipients.
	26.1 Obtains signature of NM representative on copies to be mailed.
26.2 Distributes copies of the signed Form DOE-741 as required.	
26.3 If manually prepared and distributed, three copies of the Form DOE-741 are sent to the contractor or company to which the materials are being shipped, one copy is sent to DOE/ALO, and one copy is retained in a suspense file until a signed copy is returned from the recipient.	

Responsible Organization

Action

Safeguards and Technical  
Security Division  
(Accountability Clerk)

- 26.4 For shipments to the military, the distribution of the Form DOE-741 is evaluated on a case-by-case basis, since the various branches of the service require distributions different (normally more extensive) than those for nonmilitary shipments, and notification is supplied to DOE/ALO promptly (within 24-48 hours) so that weight data can be provided in a timely manner.
- 26.5 If the form being mailed is classified Secret, the accountability clerk prepares a "Receipt for Classified Information" on Form SA 2900-J (Exhibit 25, Chapter VIII) and also obtains the signature of the mailman picking up the form.
27. Files the completed Form DOE-741 and the shipping packet in the "Current Month's Business" working file.
28. Once a month, furnishes a monthly cost report and balance sheet code report to the Property Accounting Division of all transactions causing adjustments to the ledger during the month as described for receipts in previous Section 4, Step 14.
29. Files the Form DOE-741 numerically in the 741 shipping file.
30. Files the shipping packet chronologically in the shipping file.
31. Updates the Sandia and NMMSS computer records in accordance with the procedures set forth in Accountability Records Sections 3.2 and 3.3 in this chapter.

b. Adjustments to Inventory

Because of the dynamic nature of operations involving nuclear materials, frequent adjustments are made to the inventory of nuclear materials in the possession of Sandia National Laboratories. Procedures for adjustments to inventory resulting from the receipt or shipment of nuclear materials are included in Sections 4 and 5, respectively, and procedures for other adjustments to inventory are included in this section. Such adjustments may result from expenditures of materials in tests or experiments, from the disposal of scrap, from the radioactive decay of nuclear materials, from the assembly/disassembly or modification of materials, or from accidental losses of nuclear materials.

DOE regulations require that approval be obtained in advance for any changes in size, shape, form, or weight of nuclear materials. This requirement applies to such activities as machining of nuclear materials, chemical action on nuclear materials, and destructive tests (either with or without explosives) as described in Chapter IV, Section 7.1.

6.1 Procedures for the Accountability of Nuclear Material Expenditures

<u>Responsible Organization</u>	<u>Action</u>
Safeguards and Technical Security Division (NM Manager)	1. Upon receipt of the authorization, for removal of expenditures from the records, from DOE/ALO, files the authorization for future use in removing the expended materials from the records.
Using Organization	2. Performs the scheduled activities.  3. Recovers and measures the scrap and/or excess material residues remaining after the scheduled activities.  3.1 No nuclear material may be disposed of without prior authorization from the NM Manager.

Responsible Organization

Action

Using Organization

4. Turns the scrap and/or excess material residues in to the Nuclear and Explosives Materials Control Section for disposition in accordance with the procedures set forth in Sections 7 and 8, Chapter V.
5. Prepares and submits Form 6476-ME, "Modification/Expenditure of Nuclear Materials" (Exhibit 17, Chapter X) to the Safeguards and Technical Security Division reporting the actual quantities of accidental losses of materials, materials expended, the amount of materials converted to scrap, excess material residues, and/or a new accountable item and the method by which these quantities were determined.

Safeguards and Technical Security Division (NM Rep., NM Manager, Accountability Clerk)

6. Prepares Inventory Adjustment Form (IAF) from the Using Organization's Form 6476-ME which includes the date, MBA, material type, enrichment range, case number, activity that generated the adjustment, balancing debit and credit weight entries by serial number explaining the adjustment, MSR codes per line item entry, disposition code, NM manager's approval signature if routine test, clerks initials and date of action performed.
7. Writes the IAF number and date removed from the accountability records on Form 6476-ME, "Modification/Expenditure of Nuclear Materials", and returns a copy to the using organization.
8. Updates the Sandia and NMMSS computer records in accordance with the procedures set forth in earlier Sections 3.2 and 3.3 of this chapter.

<u>Responsible Organization</u>	<u>Action</u>
Safeguards and Technical Security Division (Accountability Clerk)	9. Files the IAF of expended nuclear material approved by the NM Manager in the "Current Month's Business" working file.
	10. Balances the working file against the updated computer records daily.
	10.1 Forwards adjustments in a monthly cost report and balance sheet code report, described in Section 4, Step 14, to the Property Accounting Division for financial reporting.
	11. Files the IAF of expended nuclear material and the expenditure memorandum in the IAF file.

#### 6.2 Procedures for the Accountability of Nuclear Material Disposals

Scrap and/or excess material residues recovered by using organizations are transferred to the Nuclear and Explosives Materials Control Section in accordance with the procedures set forth in Sections 7 and 8, Chapter V, and are disposed of according to the instructions issued by DOE/ALO. Although Sandia National Laboratories receives a blanket authorization from DOE/ALO to bury quantities of non-SNM scrap during the fiscal year, notification of disposal is still required to be submitted to DOE/ALO and to the NMSS.

<u>Responsible Organization</u>	<u>Action</u>
Safeguards and Technical Security Division (NM Manager)	1. Receives Form SA 6476-ME, "Modification/Expenditure of Nuclear Materials" (Exhibit 17, Chapter X), from the using organization reporting the actual quantities of materials expended and the amount of materials converted to scrap and/or excess material residues.
	2. Checks the files for the disposition authorization from DOE/ALO.
	3. Prepares Inventory Adjustment Form (IAF).

Responsible Organization	Action
Safeguards and Technical Security Division (NM Manager)	4. Receives the completed burial form prepared by the Nuclear and Explosive Materials Control Section on Form SC 2040-L, "Radioactive and Toxic Material Disposal" (Exhibit 14, Chapter VIII). For residue buried, completes and signs IAF, and gives to accountability clerk.
Safeguards and Technical Security Division (Accountability Clerk)	<p>5. Prepares Form DOE-741, "Nuclear Material Transaction Report" (Exhibit 15, Chapter VIII), transferring the material to the burial ground (RIS:VLA).</p> <p>6. Updates the Sandia and NMSS computer records in accordance with the procedures set forth in Sections 3.2 and 3.3.</p> <p>7. Distributes a copy of the Form DOE-741 to DOE/ALO (RIS:AAA).</p> <p>8. Files the completed Form DOE-741, the burial form, and the IAF from the using organization in the "Current Month's Business" working file.</p> <p>9. Balances the working file against the updated computer records daily.</p> <p>10. Files the Form DOE-741 numerically in the 741 shipping file.</p> <p>11. Files the IAF in the IAF file.</p>

### 6.3 Procedures for the Accountability of Nuclear Material Decays

Adjustments to the quantities of accountable nuclear materials recorded in the inventory are made based on material decay. Material decays are calculated for Material Type 83 materials whenever these materials are removed from the inventory by shipment to another facility. Decays are also calculated periodically for quantities of the other materials remaining in the inventory. Materials for which decay must be calculated along with the decay rates and reporting units used in these calculations are included in Table VI-I.



TABLE VI-1

## Summary of Data Used in Material Decay Calculations

<u>Material Type</u>	<u>Material</u>	<u>Decay Factor/Month</u>	<u>Reporting Units</u>
44	Americium-241	0.0001331	Grams
45	Americium-243	0.0001331	Grams
47	Berkelium-249	0.065885	Micrograms
48	Californium-252	0.021896	Micrograms
50	Plutonium-240	0.004011	Grams
83	Plutonium-238	0.0006583	Grams (to tenths)
87	Tritium	0.004687	Grams (to hundredths)

For all shipments of these materials, an accountability clerk in the Safeguards and Technical Security Division calculates and reports the decay through the last reporting period before shipment. For all receipts of these materials, the last decay date is reported on the 741 transfer document. In the event that a shipment to Sandia Laboratories is in transit at the reporting date, no decay is reported until the close of the month in which the materials are actually received.

Adjustments to the remainder of the nuclear material inventory are made periodically based on material decay whenever accumulations of accountable quantities of the designated materials have decayed. These calculations are made by an accountability clerk in the Safeguards and Technical Security Division and recorded on The Inventory Adjustment Form (IAF).

<u>Responsible Organization</u>	<u>Action</u>
Safeguards and Technical Security Division (Accountability Clerk)	1. Monthly, on terminal screen IAF 051 titled "Calculate Decay", inputs the IAF no., date, case no., material type, and action code "M" which calculates the decay for all serial numbers within the material type.

Responsible Organization	Action
Safeguards and Technical Security Division (Accountability Clerk)	<ol style="list-style-type: none"> <li>1.1 Programmatically decreases the element and isotope weights by the amount of decay.</li> <li>1.2 Generates a listing of serial numbers decayed, amount of decay, and adjusted inventory weights by serial number.</li> <li>2. Programmatically records the decay in the corporate ledger.</li> <li>3. Transmits updated data to DOE/ALO and NMSS in accordance with earlier Sections 3.2 and 3.3</li> <li>4. Files the completed IAF forms.</li> </ol>

#### 6.4 Procedures for the Accountability of Internal Transactions

In order to maintain the accuracy of the computerized nuclear material data base in a timely manner, accountability clerks in the Safeguards and Technical Security Division update the computer records for all transactions involving changes in the information contained in the data base. Such changes may involve changes in location or accountability (movements, transfers between accountable MBA's, authorized retention periods for stored materials, etc.) as well as changes in material quantities (resulting from assembly/disassembly or other modifications, expenditures, etc.). Transfers are reviewed for program application and DOE project number changes made as required.

Using organizations inform the Safeguards and Technical Security Division of changes in nuclear material information by means of various forms and memoranda. Form SA 2042-D "Nuclear and Radioactive Material Transfer" (Exhibit 6, Chapter X), documents all transfers of materials between accountable MBA's, and Form SA 6476-A, "Record of Assembly/Disassembly and Movement" (Exhibit 9, Chapter X), documents the assembly or disassembly of items in which nuclear materials are incorporated. In addition, using organizations supply memoranda to the Safeguards and

Technical Security Division to document material expenditures or other changes in the status of materials in their possession.

Accountability clerks in the Safeguards and Technical Security Division input internal transaction data via the appropriate terminal screen, depending upon the type of adjustment to be made, in accordance with the procedures specified in Section 3.2 for updating Sandia's computer records. Transfer documents, assembly/disassembly forms, and memoranda from using organizations are then retained in appropriate files in order to comply with DOE and Sandia audit and retention requirements.

## 7. Internal Audit Program

To assure that material control procedures are effective and that these procedures are being complied with in daily operations, the Safeguards and Technical Security Division administers a continuous internal audit program. Internal audits provide information on the adequacy and effectiveness of established policies and procedures and on the actions necessary to improve the nuclear materials management program.

Audits are performed bi-monthly in MBAs having SNM except for Area V which is inventoried monthly, quarterly or semi-annually in MFAs with non-SNM materials, and an annual inventory of all MBAs in the month of February. Utilization and storage reviews are also performed during these internal audits to identify excess materials and to assist in the optimization of nuclear material inventories.

### 7.1 Procedures for the Performance of Internal Audits

<u>Responsible Organization</u>	<u>Action</u>
Safeguards and Technical Security Division (Internal Auditor)	<ol style="list-style-type: none"><li>1. Verifies the custodian's "Authorization for Redelegation".</li><li>2. Conducts a physical inventory verification.</li><li>3. Checks material labels for legibility.</li><li>4. Checks that "Radioactive" and "Nuclear Material" caution labels have been properly affixed to storage cabinets and containers.</li><li>5. Checks scale and balance certification dates.</li><li>6. Verifies the weights of arbitrarily selected items.</li></ol>

Responsible Organization

Action

7. Reviews the custodian's records maintained in support of the inventory, including material transfer forms (both incoming and outgoing), material locations, and assembly/disassembly activity.
8. Reviews material utilization with respect to the programs being performed.
  - 8.1 For material in an inactive status, either a justification for retention or a declaration of excess is obtained.
9. Reports MBA audit results to the Custodian of the using organization, including total items audited, discrepancies found, general comments, and an overall assessment of "acceptable" or "unacceptable."
  - 9.1 Discrepancies reported will include missing items, missing serial-number identification, incorrect serial-number identification (as determined from the master file computer listing), modified and/or scrap materials which are not identified individually or not associated with the original materials, missing identification of SS parts in assemblies, materials inventoried which are accountable to another MBA, and materials inventoried which were previously reported as expended in tests.
  - 9.2 Corrections will be provided by the internal auditor to the accountability clerk for updating inventory records and the auditor verifies corrections made.

## 8. Inventory

Each material balance area (MBA) is scheduled by the Safeguards and Technical Security Division, for a monthly, quarterly, semiannual, or annual inventory -- depending upon the type and quantity of material. Inventories are conducted by Safeguards and Technical Security Division personnel, accompanied by the MBA custodian/alternate, using bar code readers. When the inventory is completed, the data inventoried are transmitted from the bar code memory unit to the computer for reconciliation with the master file. A printout results from the reconciliation which lists errors, or a statement that no errors exist. The errors are investigated and corrections retransmitted until the MBA is reconciled. Following the inventory reconciliation, a computer listing of the material charged and inventoried is forwarded to the MBA custodian.

### 8.1 Procedures for the Performance of Inventories

<u>Responsible Organization</u>	<u>Action</u>
Safeguards and Technical Security Division (Internal Auditor)	1. Maintains an MBA checklist for each month, indicating which MBAs are scheduled for inventory.
Safeguards and Technical Security Division (Inventory Team)	2. Telephones the MBA custodian to arrange and confirm an inventory date and time.  3. Before each inventory, removes fully charged memory pack(s) from the battery charger/transmitter unit in the Safeguards and Technical Security Division.  4. Upon arriving at MBA location:  4.1 Attaches memory pack to the bar code reader keyboard.  4.2 On keyboard, presses (1) clear key, (2) info key, and then (3) holds down enter key until numbers 8044 appear in upper left hand corner of the display area and the number 0 appears in the lower right hand corner.

<u>Responsible Organization</u>	<u>Action</u>
Safeguards and Technical Security Division (Inventory Team)	4.3 If these numbers do not appear, repeat steps (1) thru (3) until the memory pack is cleared.
Material Balance Area (Custodian/Alternate Custodian)	5. Directs the inventory team to the location of all items for which the MBA is accountable.
Safeguards and Technical Security Division (Inventory Team)	6. Enters data as follows: <ul style="list-style-type: none"> <li>6.1 Press clear key.</li> <li>6.2 Press info key once and one small letter o will appear in the display area. <ul style="list-style-type: none"> <li>6.2.1 Following letter o, enter MBA number and press the enter key.</li> <li>6.2.2 This step is repeated each time a new memory pack is inserted, or a new MBA is being inventoried.</li> </ul> </li> <li>6.3 Press info key twice and two small letter os will appear in the display area. <ul style="list-style-type: none"> <li>6.3.1 Following the two letter os, enter the building number and press the enter key.</li> <li>6.3.2 This step is repeated each time a different building within the same MBA is inventoried.</li> </ul> </li> <li>6.4 Press info key three times and three small letter os will appear in the display area. <ul style="list-style-type: none"> <li>6.4.1 Following the three letter os, enter the room number (if applicable) and press the enter key.</li> <li>6.4.2 This step is repeated each time a new room within the same building is inventoried.</li> </ul> </li> </ul>

Safeguards and Technical  
Security Division  
(Audit Team)

- 6.5 Proceeds to read each bar coded serial number on the identification label with the bar code light pen.
7. Visually inspects each accountable item during the inventory process and compares it with the identification label (except sealed containers in storage and sealed cards and safes in Area V which have only a "Father" card serial number to read).
8. Upon completion of the inventory removes memory pack(s) from the bar code keyboard and returns them to the Safeguards and Technical Security Division.
9. Inserts the memory pack(s) in the battery charger/transmitter (unit 27 or 28).
10. Signs on at terminal and selects inventory menu.
11. Enters No. 4 (inventory entry - memory pack).
  - 11.1 Input number of memory pack(s), unit being used to transmit, and whether the input is initial or an update.
  - 11.2 A message will appear on the screen to reply to the console request.
  - 11.3 After replying to the console, press the transmit button on the battery charger/transmitter.
  - 11.4 After data from the memory pack have been read into the computer an error listing will be generated on the line printer.
12. On the terminal, enters No. 7 on the inventory menu (physical inventory report). This generates a listing of all items entered from the memory pack.



Responsible Organization	Action
Safeguards and Technical Security Division (Audit Team)	13. On the terminal, enters No. 6 on the inventory menu (inventory reconciliation).
	13.1 The line printer prints a listing of any discrepancies found in the inventory.
	13.2 If there are no discrepancies, the printout will state "No Errors Found in MBA ____."
	13.3 If discrepancies are found, verification and reentering of the items in error must be accomplished.
	13.4 Following verification, entry may be made either manually on the terminal, or through the memory pack.
	14. On the terminal, enters No. 5 (Inventory Entry (manual)) for <u>Update</u> or <u>Initial</u> entry.
	14.1 Manual entry is normally an <u>Update</u> and adds data to the file.
	14.2 If there are existing inventory data on file and the <u>Initial</u> entry is selected, all inventory data will be lost.
	14.3 Changes may be made globally or by individual serial number for MBA, building, and room numbers.
	15. If discrepancies still exist following Step 14, repeat Steps 13 and 14 until the inventory is reconciled and a printout is received from the line printer stating "No Errors Found in MBA ____."
	16. Generates inventory reports as MBAs are reconciled, and forwards to the appropriate custodian.

<u>Responsible Organization</u>	<u>Action</u>
	17. Files all copies of the reconciliation output for audit purposes.
Safeguards and Technical Security Division (Auditor)	18. Telephones the custodian/alternate of off-site MBAs to verify serial numbers of material at the site.
Off-Site Material Balance Area (Custodian/Alternate Custodian)	19. Confirms, in writing, the serial numbers of material at the site.
Safeguards and Technical Security Division (Accountability Clerk)	20. Enters data received on the keyboard of the bar code reader and follows procedures in Steps 9 through 17.

## 8.2 Supplemental Inventory Instructions

When DOE audits are scheduled, the Safeguards and Technical Security Division issues a memorandum to all custodians with special instructions stating the period of time required for the DOE physical inventory and requesting that materials not be moved during this period unless absolutely necessary.

The Safeguards and Technical Security Division conducts internal audits continually throughout the year. Periodically, a statistical random sampling technique is used on all of the MBAs and, once a year, a 100% physical inventory of each MBA is conducted.

## 9. DOE Audits

The DOE conducts surveys or inspections periodically to assure that effective control of nuclear materials is maintained and that the management of nuclear materials is proper. DOE Order 5630.2 provides guidelines, procedures, and instructions which are applicable to the conduct of these surveys. As stated in that order:

"The nuclear material survey may be considered to consist of three major phases of activity: procedural review, records audit, and inventory verification. These three phases are a part of each survey whether the survey is to evaluate safeguards control or both safeguards control and inventory management."

DOE/ALO reviews the safeguards control and management of nuclear materials at Sandia during two annual surveys, described below.

### 9.1 Safeguards and Security Survey

DOE/ALO conducts annual surveys of Sandia's safeguards control programs and practices. A DOE/ALO evaluation team performs an onsite inspection of Sandia's material inventory, records, and procedures with the main objective being the reconciliation of the records inventory with the physical inventory. The records audit evaluates the results of the data generating, collecting, reporting, and recording procedures in order to determine the quantities of material that should be on hand. Inventory verification consists of independently testing the physical inventory in order to verify the quantities of material actually on hand.

Following the onsite inspection, the DOE/ALO evaluation team issues a survey report which includes the basis for acceptance (or nonacceptance) and certification of the inventory, an evaluation of control indicators (such as normal operational losses, material unaccounted for, shipper-receiver differences, etc.) regarding the effectiveness of safeguards control, and recommendations for actions necessary to correct deficiencies disclosed during the survey.

## 9.2 Nuclear Materials Management Appraisal

DOE/ALO conducts annual appraisals of Sandia's nuclear materials management programs and practices. The appraisal is a formal review of major aspects of Sandia's materials management activities by a DOE/ALO evaluation team, beginning with an analysis of the records at DOE/ALO which document material movements, utilization, scrap generation, scrap recovery, and overall inventory size. Upon request, Sandia submits a material utilization review (Exhibit 2, Chapter VIII) to DOE/ALO, indicating the current status of nuclear materials in the inventory. The appraisal concludes with an on-site examination of Sandia's nuclear materials activities by the evaluation team.

Following the on-site inspection, the DOE/ALO evaluation team issues a report summarizing the findings of the appraisal, exemplary practices or deficiencies noted, and proposed follow-up actions.

## 10. Accountability Reports

DOE requires that inventory balance reports and 741 transfer data plus adjustment data which affect the inventory be reported on a frequency schedule ranging from daily to semiannually as described in the following description of reports.

### 10.1 External Reports

The following computer-generated reports are prepared in compliance with DOE requirements:

741-Nuclear Material Transaction Report -- Transmission via Sacnet is made daily to DOE/ALO and NMSS/Oak Ridge. Data transmitted update the data bases at both locations regarding receipts, shipments, and inventory adjustments.

749-Internal Project Transfers -- Transmission via Sacnet is made daily to DOE/ALO and NMSS/Oak Ridge. Data transmitted update the data bases at both locations to reflect changes in material utilization and assignment of the corresponding project number.

#### End-of-Month Balances:

NT/ALA -- Inventory balances by material type, element weight, and isotope weight are submitted monthly to DOE/ALO. Table VI-III summarizes the major reporting requirements:

MT/VLA -- Inventory balances by material type, element weight, and isotope weight are submitted monthly to DOE/ALO.

ER/VLA -- Inventory balances by enrichment range, element weight, and isotope weight are submitted monthly to DOE/ALO and NMSS/Oak Ridge.

Project Number -- Inventory balances by project number, element weight, and isotope weight within material type.

Status of Inventory -- Computer-generated reports are submitted monthly to DOE/ALO and quarterly to the NMMSS in Oak Ridge in the format of Form AL-974-A, "SS Material Quarterly Composition of Ending Inventory" (Exhibit 3, Chapter VIII). These reports provide a summary of the inventory as of the date reported to DOE project number, material type, enrichment range code, composition of ending inventory code, element weight, and isotope weight.

Material Status Report (MSR) -- Computer-generated material status reports, signed by a corporate official, are submitted semiannually in April and October to DOE/ALO and to DOE headquarters in Washington, DC in the format of Form AL-713, "Material Status Report--Summary" (Exhibit 4, Chapter VIII). These reports provide a summary by material type of beginning inventory, receipts by Reporting Identification Symbol (RIS), removals by RIS, other expenditures or losses (e.g., decay, normal operational losses, routine test, material unaccounted for, etc.) and ending inventory for both the current month of the report and for the year to date for the 6-month period ending in the month of the report, including negligible quantities reported with asterisks. DOE Order 5630 provides specific guidelines for the preparation of the report.

TABLE VI-II

## Accountability Reporting Requirements

<u>Report</u>	<u>Facility</u>	<u>Frequency</u>	<u>Report Mode</u>
741	DOE/ALO GDP/Oak Ridge Addressee	Daily	Sacnet and/or Hard copy
749	DOE/ALO GDP/Oak Ridge	Daily	Sacnet
MT	DOE/ALO	Monthly	Sacnet
MT/VLA	DOE/ALO	Monthly	Sacnet
ER/VLA	DOE/ALO GDP/Oak Ridge	Monthly Monthly	Sacnet Sacnet
Project No.	DOE/ALO	Monthly	Sacnet
SOI (COEI)	DOE/ALO GDP/Oak Ridge	Quarterly	Sacnet
MSR	DOE/ALO US DOE/OSS	Semiannually	Hard copy

10.2 Internal Computer-Generated Reports

A number of internal reports and listings are generated periodically in order to assist the Accountability Clerks to account for Sandia's nuclear material inventory and in the preparation of reports to the DOE. These listings are generated by sorting the computerized accountability records in various ways to provide information in the most effective format for specific purposes.

## 11. Computer Listings

Each item of accountable material in Sandia's computerized nuclear material data base is identified by a unique serial number which is the primary file identification control field for the item. Information contained in the data base for each item of accountable material includes:

- Serial Number
- Descriptor
- Country Control Number
- Owner MBA
- Owner RIS
- Weighable Flag
- Level Entity
- Part Security Classification
- SLA Program Number
- Storage Retention Date
- Item Description
- Disposition Status
- Accountable Date
- Building Number
- Room Number
- Accountable MBA
- Container Number
- Container Type
- DOE Project Number
- Material Type
- Inventory Date
- Random Inventory Date
- Owner Code
- Composition Code
- Item Cost
- RIS Code
- 741 Document Number
- Element Weight
- Decay Date
- Isotope Weight
- Net Weight
- Weight Percent Isotope
- Enrichment Range

Information in the data base is sorted in various ways to generate reports and listings for use by the Safeguards and Technical Security Division and the Nuclear and Explosives Materials Control Section in the management and physical control of accountable nuclear materials.



## CHAPTER VII

### SAFEGUARDS

#### 1. General Requirements

Because of the strategic value and inherent hazards associated with nuclear materials, stringent safeguards and security requirements are imposed on the storage, handling, processing, and utilization of these materials. Using organizations having nuclear materials in their custody are responsible for maintaining adequate physical controls and for complying with established security procedures to protect against theft, diversion, sabotage, or vandalism. These procedures are described in various DOE, Federal, and Sandia reference documents, including:

- DOE Manual Chapter 2401 -- Physical Protection of Classified Matter and Information.
- DOE Order 5632.2 -- Physical Protection of Special Nuclear Material.
- DOE Manual AL Chapter 24XA -- The DOE Transportation Safeguards System.
- Code of Federal Regulations (CFR), Title 49, Parts 100 thru 199 -- Hazardous Materials Regulations.
- Sandia Laboratories Engineering Manual (Chapters 2.11 "Nuclear Explosive Safety", and 2.11-1 "Control of Nuclear Explosive-Like Assemblies (NELA)."
- Sandia Laboratories Security Handbook.
- SLI 6950-2 -- Shipments.
- SLI 6950-4 -- Movement of Classified Materials.

Additional procedures to establish safety standards associated with radioactive and nuclear materials are described in other reference documents, including:

- DOE Manual Chapter 0504 -- Operational Safety Program Appraisals.
- DOE Manual Chapter 0524 -- Standards for Radiation Protection.
- DOE Manual Chapter 0529 -- Safety Standards for the Packaging of Fissile and Other Radioactive Materials.
- DOE Manual Chapter 0530 -- Nuclear Criticality Safety.
- SC-M-70-889 -- Sandia Laboratories Manual for Industrial Safety, Fire Prevention, and Environmental Health.
- SLI 2001 -- Industrial Safety, Fire Prevention, and Environmental Health.
- SLI 2048 -- Nuclear Explosive Safety.
- SLI 2047 -- Nuclear Criticality Safety.
- SLI 1030-9 -- Sandia Nuclear Criticality Safety Committee.

The procedures described in this chapter are intended to provide specific information on safeguards and security requirements for special nuclear materials (SNM) as a supplement to the reference documents cited above. Source and other designated nuclear materials are handled and stored in accordance with procedures stipulated by the Environmental Health Department and the Physical Security Standards and Investigations Division. Category I and II quantities of SNM require special security protection. Special security procedures are also established for any room, building, or portion of a building in which accumulations of SNM (by one or more MBAs) are of Category I or II quantities.

Table VII-i includes a listing of materials and quantities by category.

The Safeguards and Technical Security Division assumes the responsibility for informing using organizations of the proper classification of SNM, and both the Safeguards and Technical Security Division and the using organization remain aware at all times of the quantities and locations of SNM accountable to the authorized MBAs. In the event that any accumulation of SNM within a specified location exceeds the quantities defined in Table VII-1, either the Safeguards and Technical Security Division or the using organization immediately notifies the Health Physics Division and the Physical Security Standards and Investigations Division of this condition to provide for adequate safety and security protection.

Since personnel involved in operations using radioactive and nuclear materials are expected to know and comply with all safeguards requirements in the relevant reference documents, descriptions of those requirements have not been duplicated here.

Table VII-1

Physical Protection Categorization of Nuclear Material

Special Nuclear Material	Category I*	Category II*	Category III-A**	Category III-B
Plutonium	2 kg or more	400-1999 grams	220-399 grams	1-219 grams
$^{233}\text{U}$	2 kg or more	400-1999 grams	220-399 grams	1-219 grams
$^{235}\text{U}$ (Contained in uranium enriched to 20% or more)	5 kg or more	1000-4999 grams	350-999 grams	1-349 grams
$^{235}\text{U}$ (Contained in uranium enriched to less than 20%)	-	-	-	All quantities above 0.99 grams

\*If plutonium or  $^{233}\text{U}$  is combined with  $^{235}\text{U}$ , the amounts of Pu or  $^{233}\text{U}$  shall be multiplied by 2.5 to arrive at the limits shown.

\*\*A plutonium and/or  $^{233}\text{U}$  content of less than 400 grams may be combined with  $^{235}\text{U}$  when the total content is less than 1000 grams.

## 2. Storage of SNM

Due to their possible theft by terrorist groups, their intrinsic value, and the hazards which they pose to the public health, special nuclear materials (SNM) require diligent physical protection and rigorous administrative controls. During nonoperational hours and at all other times when not in use, SNM (including scrap) is stored in approved repositories, unless such an arrangement is not feasible because of size, weight, or continuous experiments. When such an arrangement is not possible, the responsible supervisor consults with the Safeguards and Technical Security Division and the Physical Security Standards and Investigations Division to provide for appropriate safeguards and security protection. For Category I quantities of special nuclear materials, approved repositories consist of vaults or vault-type rooms within a Material Access Area (MAA) which is, in turn, located within a protected area. A protected area is an area which is enclosed by physical barrier and which is subject to access controls established by the Physical Security Standards and Investigations Division, approved by the Health Physics Division, the Planning Division, the Safety Engineering Division and administered by the Safeguards and Security Department. An MAA is an area which is located within specifically defined regions inside a protected area and to which access is restricted to specified authorized individuals. Other prescribed areas may serve as approved repositories for Category I quantities of SNM, but such areas require 24-hour surveillance by two guards as well as special advance security approval and procedures.

Category II quantities of SNM are also stored in approved repositories. Approved repositories for quantities of Category II consist of DOE-approved, intrusion-alarmed containers, vaults, or vault-type rooms with access restricted to specified authorized personnel only.

Less than Category II quantities of SNM are stored either in a locked DOE-approved security container (safe-file cabinets or safes) or in a locked room located within a protected area.

SNM scrap (which is packaged in appropriate containers) is stored in a security-approved, separately fenced area within a larger protected area.

All approved repositories should provide a secondary (emergency) means of egress (in conjunction with existing building codes) and should be constructed in such a manner that there is no possibility of flooding. Additional procedures which are followed to provide for adequate safeguards and security protection of SNM include the following:

- The operating supervisor of an MAA provides the Safeguards and Security Department with a list of employees who are authorized to have access to the area. Under normal conditions, access controls to the MAA are administered by the operating organization.
- Written records are maintained of all persons not on the access list who enter the MAA and of all persons who enter the area during nonoperational hours.
- Personal vehicles are excluded from protected areas and MAAs.
- Government vehicles are admitted to protected areas or MAAs only when on official business and operated by a Q-cleared driver.
- All packages, briefcases, and similar items as well as all vehicles are subject to search upon entering a protected area and upon leaving an MAA.

Nuclear materials are issued to using organizations only upon evidence of adequate approved storage within the area to which the materials will be assigned, and criticality-safe conditions are coordinated through the Environmental Health Department. Custodians are responsible for ensuring adequate safeguards for all personnel involved in the

handling and storage of nuclear materials by labeling materials as to the type of material, necessary precautions, and security classification. Personnel handling nuclear materials observe all health and safety procedures stipulated in the Environmental Health section of SC-M-70-889, "Sandia Laboratories Manual for Industrial Safety, Fire Prevention, and Environmental Health."

### 3. SNM in Use

When in use or in process, Category I and II quantities of SNM are kept under surveillance by at least two persons, one of whom must have a Q-clearance and the other at least an "S" or "L" access authorization. Category I quantities of SNM are used or processed only within specified areas, and access to these areas is limited to those personnel required to perform official duties. Category II quantities of SNM are used or processed only within a protected area. Less than Category II quantities of SNM also require adequate safety and security protection, and the additional procedures described in Section 2 above would normally be followed.

#### 4. On-Site Shipments of SNM

The movement of special nuclear materials between Sandia National Laboratories Security areas (protected areas) is arranged in advance by the Nuclear and Explosives Materials Control Section with the desk lieutenant in the Safeguards and Security Department. Category I and II quantities of SNM must be transported in either locked and sealed safe secure trailers (SST) or enclosed lockable vehicles equipped with a two-way radio and driven by Q-cleared operators. To ensure that the concept of two-person access control is followed, DOE/ALO requires that a method of double-locking be established to secure the cargo area of vehicles which transport Category I and II quantities of SNM between security areas. The SNM vehicle is equipped with a second hasp and two DOE-approved combination padlocks to fulfill the double-locking function. One of these locks will be maintained by the Nuclear Materials Control Section, and the other will be maintained by the desk lieutenant of the Safeguards and Security Department. Each organization will be responsible for controlling the lock combination of their respective locks and for changing those combinations when compromise is suspected. The two-lock system will be applied at all times when Category I and II quantities of SNM are being transported. The two locks will be supplied by the respective organizations at the time that the local shipment of Category I and II quantities of SNM is scheduled, and each of the organizations will also provide one individual to escort the shipment.

Local shipments of Category I quantities of SNM are also escorted by two separate vehicles manned by armed personnel from the Safeguards and Security Department. The security lieutenant in charge of this security team is also responsible for ensuring that the double locks are in place and secured before transport.

Less than Category II quantities of SNM must also be transported in an enclosed lockable vehicle equipped with a two-way radio and driven by a Q-cleared operator, but these movements do not require a security escort.



### 5. Loss of Accountable Nuclear Material

Inventory items that cannot be physically located or accounted for by the MBA custodian or the Safeguards and Technical Security Division audit team are immediately reported to the Security Operations Division.

The Security Operations Division conducts an investigation and reports to the Safeguards and Technical Security Division. If the material has not been found, the Safeguards and Technical Security Division telephones the Safeguards and Security Department Manager, Director of Industrial Relations and Property Protection, DOE/ALO Sandia Area Office Manager, and DOE/ALO Safeguards and Security Division Director to report the loss.

The telephone report is followed within 24 hours by confirmation in writing by teletype, memorandum, or report which contains:

- Location where missing material was last seen
- Description by chemical and physical form
- Material type and quantity
- Classification
- Any indication of willful diversion
- Dollar value
- Circumstances under which loss was detected
- How material may have left facility location
- Steps being taken to locate missing material
- Planned corrective action.

## 6. Special Procedures for Access to the Manzano Storage Structures

In conjunction with nuclear material operations at Sandia National Laboratories, the Nuclear and Explosives Materials Control Section utilizes five structures at Manzano Base for the storage of accountable nuclear materials. Two of these structures (Structures 7055 and 7063) are used for the storage of special nuclear materials (SNM) and are designated as Priority "A" security structures. The other three structures (Structures 7046, 7047, and 7049) are used for the storage of other nuclear materials and are considered to be nonpriority structures. Access to all of these storage structures is restricted to the authorized individuals specified on a list maintained by the Nuclear and Explosives Materials Control Section.

### 6.1 Procedures for Access to the Manzano Storage Structures During Operational Hours

<u>Responsible Organization</u>	<u>Action</u>
Nuclear and Explosives Materials Control Section	<ol style="list-style-type: none"><li>1. Designates a group of three authorized employees to obtain access to the required structure.<ol style="list-style-type: none"><li>1.1 One member of the group acts as the authorizing official, while the other two members open, enter, and secure the structure.</li><li>1.2 Access to nonpriority structures requires only an authorizing official and one other authorized employee.</li></ol></li></ol>
(Authorizing Official)	<ol style="list-style-type: none"><li>2. Calls CSC (the military control center), requesting authorization for access to the structure.</li><li>3. Provides his name, Sandia National Laboratories identification, slot number, structure number, approximate ETA, and the names and slot numbers of the two authorized employees who will enter the structures along with their respective key assignment responsibilities (upper or lower).</li></ol>

Responsible Organization	Action
(Authorized Employee(s))	<p>3.1 For nonpriority structures, only one authorized employee (other than the authorizing official) is required, since only the lower keys are needed.</p>
<p>Nuclear and Explosives Materials Control Section (Authorizing official and Authorized Employee(s))</p>	<p>4. Pick(s) up a set of keys for the security locks.</p> <p>4.1 For Priority "A" structures, a set of keys for the upper locks is secured in a three-combination safe file in Building 801S, and a set of keys for the lower locks is secured in a three-combination safe file in Building 867 south.</p> <p>4.2 For nonpriority structures, only a set of lower keys is needed to gain access to the structure.</p>
(Authorizing Official)	<p>5. Proceed to Manzano Base.</p> <p>6. Upon arrival at the structure to be opened, calls CSC on the jack phone, provides his name, Sandia National Laboratories identification, slot number, number of the structure to be opened, identifies the two authorized employees who will enter the structure, and answers the daily code.</p>
(Authorized Employee #1)	<p>7. Hands the jack phone to the first authorized employee.</p> <p>8. Provides his name, Sandia National Laboratories identification, and slot number, states that he is removing security from Structure # _____, and answers the daily code.</p> <p>9. For Priority "A" structures, hands the jack phone to the second authorized employee.</p>

<u>Responsible Organization</u>	<u>Action</u>
	9.1 For nonpriority structures, only one authorized employee (other than the authorizing official) is required to enter the structure.
(Authorized Employee #2)	10. Provides his name, Sandia National Laboratories identification, and slot number, states that he is removing security from Structure #_____, and answers the daily code.
(Authorized Employee(s))	11. Open(s) the security lock(s) and proceed(s) into the structure.  11.1 For Priority "A" structures, one of the authorized employees opens the upper lock and the other opens the lower lock.  11.2 For nonpriority structures, only a lower lock is required to be opened.
(Authorizing Official)	12. Remains outside the structure and maintains radio and security contact.
(Authorized Employee(s))	13. Upon completion of the required operation, lock(s) and monitor(s) the door.  14. Calls CSC, using the same identification procedure as before and stating that Structure #_____ is being secured.
(Authorizing Official and Authorized Employee(s))	15. Wait until the alarm sounds, signifying that the structure is set up, and return to Sandia National Laboratories.
(Authorized Employee(s))	16. Return(s) the keys for the security locks to the appropriate safe files.

## 6.2 Procedures for Access to the Manzano Storage Structures During Nonoperational Hours

Whenever an open structure is found or damage to the protective system is discovered at one of the storage structures located at Manzano Base, authorized personnel from Sandia National Laboratories are dispatched to the structure and a physical inventory of its contents is taken.

<u>Responsible Organization</u>	<u>Action</u>
USAF (Manzano Base)	1. Notifies the desk lieutenant of Security Standards and Operations Department that an alarm system has malfunctioned or been tampered with or that a structure has been found unsecured.
Security Standards and Operations Department (Desk Lieutenant)	2. Dispatches an area lieutenant to the scene.
(Area Lieutenant)	3. If it is necessary to enter a structure, notifies the desk lieutenant, requesting that an authorized employee be sent to the structure to conduct an inventory of its contents.
(Desk Lieutenant)	4. Calls one of the authorized employees, requesting that he proceed to the required structure to conduct an inventory of its contents.
Nuclear and Explosives Materials Control Section (Authorized Employee)	5. Upon arrival at Sandia National Laboratories (Area 1), picks up the daily code, a set of keys for the lower lock, and an inventory list for the structure.
	6. Proceeds to the structure, where he is met by the Sandia area lieutenant on the scene and one military guard (who remain at the site during the opening and closing of the structure).

Responsible Organization

Action

Nuclear and Explosives  
Materials Control Section  
(Authorized Employee)

7. Opens the structure in accordance with the procedures specified in Section 5.1.
  - 7.1 For the Priority "A" structures (Structures 7063 and 7055), the area lieutenant provides the set of keys for the upper lock.
8. Conducts a physical inventory of the contents of the structure.
9. Secures the structure in accordance with the procedures specified in Section 5.1 and returns to Sandia National Laboratories.
10. Returns the keys for the lower lock to the appropriate safe file.

CHAPTER VIII  
COMPENDIUM OF RELEVANT NUCLEAR MATERIALS  
MANAGEMENT AND CONTROL FORMS

- Exhibit 1. Form SF 6431-A --- Purchase Order
- Exhibit 2. (No Form Number) --- Material Utilization Review
- Exhibit 3. Form AL-974-A --- SS Material Quarterly Composition of Ending Inventory
- Exhibit 4. Form AL-713 --- Material Status Report --- Summary
- Exhibit 5. Form SA 6410-SB --- Material Receiving Report
- Exhibit 6. Form SA 6410-SC --- Material Variref Receiving Report
- Exhibit 7. Form SA 2040-EA --- Radioactive and Nuclear Materials Receiving Slip
- Exhibit 8. Form SF 6476-I --- SS/Radioactive Material Packing Slip
- Exhibit 9. Form DOE-740 --- ADP Transcription Sheet, Nuclear Material Transaction Journal
- Exhibit 10. Form OR-658A --- Request for Uranium Scrap Disposition
- Exhibit 11. Form OR-658B --- Uranium Scrap Shipping Data
- Exhibit 12. Form OR-658C --- Uranium Scrap Declaration
- Exhibit 13. Form OR-658D --- Description of Declared Uranium Scrap
- Exhibit 14. Form SC 2040-L --- Radioactive and Toxic Material Disposal
- Exhibit 15. Form DOE-741 --- Nuclear Material Transaction Report
- Exhibit 16. Form AL-131 --- ADP Transcription Sheet, Nuclear Material Transfers
- Exhibit 17. Form SR-95 --- <sup>238</sup>Pu Scrap Declaration
- Exhibit 18. Form SA 6476-NF --- Inventory Adjustment Form
- Exhibit 19. Form SA-2042-DA --- Nuclear Materials Machining Report

- Exhibit 20. (No Form Number) --- ADP Transcription Sheet, Sealed  
Source Registration Data
- Exhibit 21. Form DOE-749 --- ADP Transcription Sheet, Internal Project  
Transfers
- Exhibit 22. Form SF 1811-ABA --- Telecommunication Data Message Form
- Exhibit 23. Form DOE-284 --- SS Material Transfer Receipt
- Exhibit 24. Form SA 2900-J --- Receipt for Classified Information
- Exhibit 25. Form SA 2042-D --- Nuclear and Radioactive Material Transfer
- Exhibit 26. Inventory Adjustment Form



Form SF 6431-A --- Purchase Order

Purpose: To purchase radioactive and nuclear materials.

Prepared by: Purchasing Department.

Submitted to: Supplier.  
A copy of this form is also sent to the Safeguards and  
Technical Security Division.

Exhibit 1

PURCHASE ORDER				SANDIA LABORATORIES			
ORIGINATOR	ORG	PHONE	CONSULTANT	ORG	PHONE	ALBUQUERQUE, NEW MEXICO 87115 LIVERMORE, CALIFORNIA 94550	
CONTRACTOR CODE		SECURITY CLASS		DATE		PAGE NUMBER	CHG
SHIP TO				INSP CODE		SHIP CODE	PLANT NO
SANDIA LABORATORIES				REC REPORT		4 SSMR	
<input type="checkbox"/> KIRTLAND AFB EAST, ALBUQUERQUE N.M. 87115				BUYER			
RECEIVING DIVISION BLDG 8M				DIST			
<input type="checkbox"/> KIRTLAND AFB EAST, ALBUQUERQUE N.M. 87115				EXPEDITER			
BLDG				MAIL PROPERTY			
<input type="checkbox"/> LIVERMORE CALIFORNIA 94550 BLDG 918							
<input type="checkbox"/> NO SHIPMENT INVOLVED							
<input type="checkbox"/> USE SHIPPING INSTRUCTIONS SHOWN BELOW							
ITEM NO	QUANTITY AND UNIT OF MEAS	DESCRIPTION			PRICE	ITEM PRICE	

TOTAL PRICE  
GOVERNMENT PRIORITY D O E 2

SIGNATURE						DATE	
SANDIA CONTRACTING REPRESENTATIVE						ORG	
CASE NO	SUB	ORG	ITEM	QUANTITY	EST \$ UNIT	COST FORECAST DATE(S)	
FEE AMOUNT	FEE BASE		OBLIGATED FUNDS		COMPLETION DATE	PHONE	
000000	000000		000000				
BUYER APPROVAL			BUYER COMMAND CLASS			0000000	
		SP	LR	SP	LR	LEA	END

SERVICE

**Material Utilization Review**

**Purpose:** To indicate the current status of nuclear materials in the inventory.

**Prepared by:** Safeguards and Technical Security Division.

**Submitted to:** DOE/ALO.



Form AL-974-A4 --- SS Material Quarterly Composition of Ending  
Inventory

Purpose: To provide a summary of the inventory by COEI line  
number within project number and material type.

Prepared by: Safeguards and Technical Security Division.

Submitted to: DOE/ALO monthly and to the NMSS, Oak Ridge,  
quarterly.



Form AL-713 --- Material Status Report - Summary

Purpose: To provide a summary by material type of receipts and removals.

Prepared by: Safeguards and Technical Security Division.

Submitted to: DOE/ALO and DOE Headquarters semiannually in April and October.

Exhibit 4.

AL-713  
1-77

U.S. Energy Research and Development Administration  
ALBUQUERQUE OPERATIONS

FORM NO. 100-1 (REV. 1-77)  
MAY 1977 EDITION

# MATERIAL STATUS REPORT - SUMMARY

PC	DATE											RIS				MT
1	2	3	4	5	6	7	8	9	10	11						
R																
S																

CONTRACTOR \_\_\_\_\_

ADDRESS \_\_\_\_\_

CURRENT MONTH		LINE NO.	LINE DESCRIPTION	YEAR TO DATE FOR SIX-MONTH PERIOD ENDING																									
TOTAL ELEMENT	ISOTOPE			TOTAL ELEMENT						ISOTOPE																			
				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
		0 8	BEGIN G. INV. - ERDA OWNED																										
		0 9	BEGIN G. INV. NOT ERDA OWNED																										
			RECEIPTS																										
		1 1	PROCUREMENT FROM ERDA																										
		1 3	PROCUREMENT - OTHER																										
		1 4	DOD RETURNS - USE A																										
		1 5	DOD RETURNS - USE B																										
		1 6	DOD RETURNS - OTHER USE																										
		2 1	PRODUCTION																										
		2 2	FROM OTHER MATERIALS																										
		3 0	RECEIPTS REPORT'D TO NRC																										
			ERDA ON FORM NRC-ERDA 741 (See Attached Sheet)																										
		4 0	TOTAL TO ACCOUNT FOR																										
			REMOVALS																										
		4 1	EXPENDED IN SPACE PGMS																										
		4 2	SALES TO ERDA																										
		4 3	SALES TO DTHS ACCT ERDA																										
		4 4	DOD - USE A																										
		4 5	DOD - USE B																										
		4 6	DOD - OTHER USES																										
		4 7	EXPENDED IN ERDA TESTS																										
		4 8	ROUTINE TESTS																										
		4 9	SHIPPER RECEIVER DIFF																										
		5 1	SHIPMENTS REPTD TO NRC																										
			ERDA ON FORM NRC-ERDA 741 (See Attached Sheet)																										
		7 1	DEGRAD. TO OTH MATLS																										
		7 2	DECAY																										
		7 3	FISSION & TRANSMUTATION																										
		7 4	NORMAL OPERATIONAL LOSS																										
		7 5	ACCIDENTAL LOSSES																										
		7 6	APPROVED WRITE-OFFS																										
		7 7	MATL UNACCOUNTED FOR																										
		8 0	ENDG INVEN. ERDA OWNED																										
		8 1	ENDG INVEN. NOT ERDA OWNED																										
		8 2	TOTAL																										



Form SA 6410 --- Material Receiving Report

Purpose: To record material receipts for materials which are referenced by a purchase order number.

Prepared by: Shipping and Receiving Division.

Submitted to: Nuclear and Explosives Materials Control Section (3 copies) and then forwarded to the Safeguards and Technical Security Division.



Form SA 6410-SC --- Material Varietf Receiving Report

Purpose: To record material receipts for materials which are not referenced.

Prepared by: Shipping and Receiving Division.

Submitted to: Nuclear and Explosives Materials Control Section (2 copies) and then forwarded to the Safetguards and Technical Security Division.



Form SA 2040-EA --- Radioactive and Nuclear Materials Receiving Slip

Purpose: To supplement the receiving report with serial numbers, part security classifications, assembly information, and weight data.

Prepared by: Nuclear and Explosives Materials Control Section.

Submitted to: Safeguards and Technical Security Division.

Exhibit 7.

RADIOACTIVE & NUCLEAR MATERIALS RECEIVING SLIP					
RECEIVED FROM		RADIOISOTOPE IRRADIATED SS MATERIAL		SHIPPER'S REFERENCE SANDIA RECEIVER REF (P.O. & REC. NO.)	
				FORMERDA #& NO	
				DATE	
QUANTITY	MATERIAL DESCRIPTION	INDIVIDUAL PART SERIAL NOS	PART SECURITY CLASS	if Assembly	Ass'y S/W/Part
					Assembled in
REMARKS					
Accepted on individual part basis		Accepted on assembly basis		Countered	
Weights verified by		Weights verified by 3414		Weights verified by other org.	
ACCOUNTABILITY PROCEDURES TO BE FOLLOWED					
NO ACCOUNTABILITY REQUIRED					
FULL ACCOUNTABILITY					
DISPOSITION OF MATERIAL					
RECEIVED FOR (name)		ORG	OWNER MSA	LOCATION	
DELIVER TO (name)		ACCOUNTABLE ORG	ACCOUNTABLE MSA	BLDG /ROOM	APPLICATION
REMARKS					DATE

Form SF 6476-1 - - US/Radioactive Material Packing

Purpose: To provide information for materials being shipped.

Prepared by: Nuclear and Explosives Materials Control Section.

Submitted by: Original - Carrier  
2nd copy - Health Physics Division  
3rd copy - Packaging Section  
4th copy - Nuclear and Explosives Materials Control  
Section (via Packaging Section)  
5th copy - Nuclear Materials Control Section (duplicate  
copy)

Exhibit B

Special Permit No. \_\_\_\_\_  
 Class of Shipment \_\_\_\_\_  
 Material \_\_\_\_\_  
 Form No. 1222 (2)

Special Permit No. \_\_\_\_\_  
 Class of Shipment \_\_\_\_\_  
 Material \_\_\_\_\_  
 Form No. 1222 (2)

Special Permit No. \_\_\_\_\_  
 Class of Shipment \_\_\_\_\_  
 Material \_\_\_\_\_  
 Form No. 1222 (2)

Special Permit No. \_\_\_\_\_  
 Class of Shipment \_\_\_\_\_  
 Material \_\_\_\_\_  
 Form No. 1222 (2)

No contamination in excess of permissible levels indicated by instrument check or by wipe analysis taken in package. Permissible limit 2200 dpm/100 cm<sup>2</sup> dry or 222 dpm/100 cm<sup>2</sup> dry.  
 The above shipment is properly described and is packed, marked, and is in proper condition for transportation in accordance with regulations prescribed by Department of Transportation.

SPECIAL PERMIT NO.	CLASS OF SHIPMENT	MATERIAL		FORM NO. 1222 (2)		
		ISS.	RADIOACTIVE	BOTH	DATE	TIME
DOT CONTAINER NO.	REUSABLE CONTAINER	INSPECT	MONITORED BY	DATE	TIME	TIME
	INITIALS	DATE	REMARKS			



Form DOE-740 --- ADP Transcription Sheet, Nuclear Material  
Transaction Journal

Purpose: To provide accountability information on receipts,  
removals, and inventory adjustments to be accounted  
for transmittal to DOE/AEO and the NMSS.

Prepared by: Safeguards and Technical Security Division.

Submitted to: DOE/AEO and the NMSS, Oak Ridge.

Exhibit 9.

FORM ERDA-740  
REV. (3-76)  
FDAM 7401  
PREVIOUS EDITIONS  
ARE OBSOLETE

POSTED BY  
JOB NAME  
FIELD OFFICE

U.S. ENERGY RESEARCH AND DEVELOPMENT ADMINISTRATION  
AND  
U.S. NUCLEAR REGULATORY COMMISSION

INPL SHEET NO.  
PAGE  
DATE

ADP TRANSCRIPTION SHEET  
NUCLEAR MATERIAL TRANSACTION JOURNAL

TRANSACTION IDENTIFICATION

TR CODE	SHIPPER	RECEIVER	TRANSFER NO	CH
PC AC	RIS	RIS		
13	5	7	8	9

CARD NO.	GENERAL INFORMATION		IDENTIFICATION NUMBER	ACTION DATE
	NO. OF RIS	RIS FOR ACCT.		
1	20	21	22	23

CARD NO.	TRANSPORTATION INFORMATION		TRANSPORTATION PROFILE									
	EXPORT OR IMPORT TRANSFERS		TRIP SEGMENT NO. 1		TRIP SEGMENT NO. 2		TRIP SEGMENT NO. 3		TRIP SEGMENT NO. 4		TRIP SEGMENT NO. 5	
	LICENSE NUMBER	U.S. PORT OF ENTRY OR EXIT	CARRIER IDENT.	TRANSFER POINT	CARRIER IDENT.	TRANSFER POINT	CARRIER IDENT.	TRANSFER POINT	CARRIER IDENT.	TRANSFER POINT	CARRIER IDENT.	TRANSFER POINT
1	20	21	22	23	24	25	26	27	28	29	30	31

CARD NO.	PACKAGING INFORMATION										TOTAL GROSS WEIGHT	TOTAL VOLUME
	MODEL IDENT.	NO.	MODEL IDENT.	NO.	MODEL IDENT.	NO.	MODEL IDENT.	NO.	MODEL IDENT.	NO.		
1	20	21	22	23	24	25	26	27	28	29	30	31

CARD NO.	DETAIL INFORMATION													
	LINE NO.	PROJECT NO.	MT	COMP CODE	DU	UC	NO. OF ITEMS	ELEMENT WEIGHT	WEIGHT % ISOTOPE	ISOTOPE WEIGHT	ELEMENT LIMIT OF ERROR	ISOTOPE LIMIT OF ERROR		
1	20	21	22	23	24	25	26	27	28	29	30	31	32	33

Form OR-658A --- Request for Uranium Scrap Disposition

Purpose: To request disposition instructions for uranium scrap from DOE/ALO (Part 1 of the 4-part Scrap Evaluation Report).

Prepared by: Safeguards and Technical Security Division.

Submitted to: DOE/ALO.

Exhibit 10.

U.S. ENERGY RESEARCH AND DEVELOPMENT ADMINISTRATION OAK RIDGE OPERATIONS OFFICE		REQUEST NO.
<b>REQUEST FOR URANIUM SCRAP DISPOSITION</b>		
(USE FOR THE SCRAP GENERATOR)		
INSTRUCTIONS	(OPERATOR QUANTITIES) RETAIN 4TH COPY AND FORWARD THE ORIGINAL AND 2 COPIES TO THE WDA OFFICE OF THE SCRAP GENERATOR ADMINISTERING THE SCRAP GENERATOR CONTRACT. (AN ADDITIONAL COPY SHOULD BE PREPARED & FORWARDED BY THE SCRAP OFFICE HAVING JURISDICTION OVER THE GENERATING SS ACCOUNTABILITY STATION WHEN DIFFERENT FROM THE CONTRACTING OFFICE.)	
	(1) IT IS IMPERATIVE THAT A COMPLETE AND CONCISE DESCRIPTION OF THE SCRAP BE FURNISHED ON EACH REQUEST. FORMS OR-65-A AND OR-65-B MUST BE UTILIZED FOR THIS PURPOSE. COMPLETED FORMS OR-65-A AND OR-65-B SHOULD BE ATTACHED TO, AND IDENTIFIED BY DECLARATION NUMBER IN BLOCK 10 ON, THIS FORM. FORM OR-65-B, URANIUM SCRAP SHIPPING DATA, SHOULD ALSO BE COMPLETED AND ATTACHED TO THIS REQUEST FORM. (4) IN HOLDING SCRAP DECLARATIONS MAY BE MADE BY UTILIZING THE SAME FORMS OR-65-A AND OR-65-B. (2) IF A NEGATIVE STATEMENT IS INDICATED FOR ITEM 4 BELOW, GIVE FULL DETAILS ON THE REVERSE SIDE OF THIS FORM.	
1. TO: U.S. ENERGY RESEARCH AND DEVELOPMENT ADMINISTRATION OAK RIDGE OPERATIONS OFFICE POST OFFICE BOX 700 OAK RIDGE, TENNESSEE 37830 ATTN: CENTRAL SCRAP MANAGEMENT OFFICE		2. FROM:
3. ATTACHMENT NUMBERS ATTACHED:		
4. SCRAP IS AVAILABLE FOR IMMEDIATE DELIVERY TO A REPROCESSOR. <input type="checkbox"/> YES <input type="checkbox"/> NO		
REQUESTED BY: (SEE NOTE THAT THE SCRAP COVERED BY THIS REQUEST WILL BE SHIPPED IN CONFORMANCE WITH ALL APPLICABLE REGULATIONS AND THAT THE REQUIRED SHIPPING DATA ARE DETAILED ON FORM OR-65-B WHICH HAS BEEN ATTACHED HERETO.)		
5. DATE	6. SIGNATURE OF REQUESTOR	7. NAME AND TITLE
8. OPERATOR QUANTITIES AND OTHER DATA ON ATTACHED FORMS OR-65-B, OR-65-C AND OR-65-D HAVE BEEN CHECKED AND REVIEWED FOR COMPLETENESS AND ACCURACY. THIS OFFICE HEREBY CERTIFIES THAT IT HAS THE FINANCIAL RECORDS IN SUPPORT OF THE REQUEST AND A 30-DAY DISPOSITION OF THE SCRAP WILL BE FILED BY THE REQUESTOR.		
9. DATE	10. SIGNATURE	11. ERDA OPERATIONS OFFICE
12. THIS REQUEST IS SUBJECT TO THE REGULATIONS GOVERNING THE SHIPMENT AND RECEIPT OF SCRAP AS SPECIFIED IN THE SCRAP GENERATOR CONTRACT.		
DATE	SIGNATURE	TITLE

FORM OR-65-A (Rev. 3/75)

Form OR-658B --- Uranium Scrap Shipping Data

Purpose: To provide shipping data for uranium scrap (Part 2 of 4-part Scrap Evaluation Report).

Prepared by: Safeguards and Technical Security Division.

Submitted to: DOE/ALO.



Form OR-658C --- Uranium Scrap Declaration

Purpose: To provide packaging and weight information for uranium scrap (Part 3 of 4-part Scrap Evaluation Report).

Prepared by: Safeguards and Technical Security Division.

Submitted to: DOE/ALO.

Exhibit 12.

UNITED STATES ENERGY RESEARCH AND DEVELOPMENT ADMINISTRATION OAK RIDGE OPERATIONS OFFICE				1. LOCATION OF SCRAP					7. DECLARATION NO.				
URANIUM SCRAP DECLARATION				3. SECURITY CLASSIFICATION OF SCRAP					SHEET _____ OF _____				
4. SHIPPING CONTAINER DATA (LOADED)				5. PRIMARY (INNER) CONTAINER DATA					6. SCRAP CODE, U-235, U-238, U-234, U-236, U-237, U-238, U-239, U-240, U-241, U-242, U-243, U-244, U-245, U-246, U-247, U-248, U-249, U-250, U-251, U-252, U-253, U-254, U-255, U-256, U-257, U-258, U-259, U-260, U-261, U-262, U-263, U-264, U-265, U-266, U-267, U-268, U-269, U-270, U-271, U-272, U-273, U-274, U-275, U-276, U-277, U-278, U-279, U-280, U-281, U-282, U-283, U-284, U-285, U-286, U-287, U-288, U-289, U-290, U-291, U-292, U-293, U-294, U-295, U-296, U-297, U-298, U-299, U-300, U-301, U-302, U-303, U-304, U-305, U-306, U-307, U-308, U-309, U-310, U-311, U-312, U-313, U-314, U-315, U-316, U-317, U-318, U-319, U-320, U-321, U-322, U-323, U-324, U-325, U-326, U-327, U-328, U-329, U-330, U-331, U-332, U-333, U-334, U-335, U-336, U-337, U-338, U-339, U-340, U-341, U-342, U-343, U-344, U-345, U-346, U-347, U-348, U-349, U-350, U-351, U-352, U-353, U-354, U-355, U-356, U-357, U-358, U-359, U-360, U-361, U-362, U-363, U-364, U-365, U-366, U-367, U-368, U-369, U-370, U-371, U-372, U-373, U-374, U-375, U-376, U-377, U-378, U-379, U-380, U-381, U-382, U-383, U-384, U-385, U-386, U-387, U-388, U-389, U-390, U-391, U-392, U-393, U-394, U-395, U-396, U-397, U-398, U-399, U-400, U-401, U-402, U-403, U-404, U-405, U-406, U-407, U-408, U-409, U-410, U-411, U-412, U-413, U-414, U-415, U-416, U-417, U-418, U-419, U-420, U-421, U-422, U-423, U-424, U-425, U-426, U-427, U-428, U-429, U-430, U-431, U-432, U-433, U-434, U-435, U-436, U-437, U-438, U-439, U-440, U-441, U-442, U-443, U-444, U-445, U-446, U-447, U-448, U-449, U-450, U-451, U-452, U-453, U-454, U-455, U-456, U-457, U-458, U-459, U-460, U-461, U-462, U-463, U-464, U-465, U-466, U-467, U-468, U-469, U-470, U-471, U-472, U-473, U-474, U-475, U-476, U-477, U-478, U-479, U-480, U-481, U-482, U-483, U-484, U-485, U-486, U-487, U-488, U-489, U-490, U-491, U-492, U-493, U-494, U-495, U-496, U-497, U-498, U-499, U-500, U-501, U-502, U-503, U-504, U-505, U-506, U-507, U-508, U-509, U-510, U-511, U-512, U-513, U-514, U-515, U-516, U-517, U-518, U-519, U-520, U-521, U-522, U-523, U-524, U-525, U-526, U-527, U-528, U-529, U-530, U-531, U-532, U-533, U-534, U-535, U-536, U-537, U-538, U-539, U-540, U-541, U-542, U-543, U-544, U-545, U-546, U-547, U-548, U-549, U-550, U-551, U-552, U-553, U-554, U-555, U-556, U-557, U-558, U-559, U-560, U-561, U-562, U-563, U-564, U-565, U-566, U-567, U-568, U-569, U-570, U-571, U-572, U-573, U-574, U-575, U-576, U-577, U-578, U-579, U-580, U-581, U-582, U-583, U-584, U-585, U-586, U-587, U-588, U-589, U-590, U-591, U-592, U-593, U-594, U-595, U-596, U-597, U-598, U-599, U-600, U-601, U-602, U-603, U-604, U-605, U-606, U-607, U-608, U-609, U-610, U-611, U-612, U-613, U-614, U-615, U-616, U-617, U-618, U-619, U-620, U-621, U-622, U-623, U-624, U-625, U-626, U-627, U-628, U-629, U-630, U-631, U-632, U-633, U-634, U-635, U-636, U-637, U-638, U-639, U-640, U-641, U-642, U-643, U-644, U-645, U-646, U-647, U-648, U-649, U-650, U-651, U-652, U-653, U-654, U-655, U-656, U-657, U-658, U-659, U-660, U-661, U-662, U-663, U-664, U-665, U-666, U-667, U-668, U-669, U-670, U-671, U-672, U-673, U-674, U-675, U-676, U-677, U-678, U-679, U-680, U-681, U-682, U-683, U-684, U-685, U-686, U-687, U-688, U-689, U-690, U-691, U-692, U-693, U-694, U-695, U-696, U-697, U-698, U-699, U-700, U-701, U-702, U-703, U-704, U-705, U-706, U-707, U-708, U-709, U-710, U-711, U-712, U-713, U-714, U-715, U-716, U-717, U-718, U-719, U-720, U-721, U-722, U-723, U-724, U-725, U-726, U-727, U-728, U-729, U-730, U-731, U-732, U-733, U-734, U-735, U-736, U-737, U-738, U-739, U-740, U-741, U-742, U-743, U-744, U-745, U-746, U-747, U-748, U-749, U-750, U-751, U-752, U-753, U-754, U-755, U-756, U-757, U-758, U-759, U-760, U-761, U-762, U-763, U-764, U-765, U-766, U-767, U-768, U-769, U-770, U-771, U-772, U-773, U-774, U-775, U-776, U-777, U-778, U-779, U-780, U-781, U-782, U-783, U-784, U-785, U-786, U-787, U-788, U-789, U-790, U-791, U-792, U-793, U-794, U-795, U-796, U-797, U-798, U-799, U-800, U-801, U-802, U-803, U-804, U-805, U-806, U-807, U-808, U-809, U-810, U-811, U-812, U-813, U-814, U-815, U-816, U-817, U-818, U-819, U-820, U-821, U-822, U-823, U-824, U-825, U-826, U-827, U-828, U-829, U-830, U-831, U-832, U-833, U-834, U-835, U-836, U-837, U-838, U-839, U-840, U-841, U-842, U-843, U-844, U-845, U-846, U-847, U-848, U-849, U-850, U-851, U-852, U-853, U-854, U-855, U-856, U-857, U-858, U-859, U-860, U-861, U-862, U-863, U-864, U-865, U-866, U-867, U-868, U-869, U-870, U-871, U-872, U-873, U-874, U-875, U-876, U-877, U-878, U-879, U-880, U-881, U-882, U-883, U-884, U-885, U-886, U-887, U-888, U-889, U-890, U-891, U-892, U-893, U-894, U-895, U-896, U-897, U-898, U-899, U-900, U-901, U-902, U-903, U-904, U-905, U-906, U-907, U-908, U-909, U-910, U-911, U-912, U-913, U-914, U-915, U-916, U-917, U-918, U-919, U-920, U-921, U-922, U-923, U-924, U-925, U-926, U-927, U-928, U-929, U-930, U-931, U-932, U-933, U-934, U-935, U-936, U-937, U-938, U-939, U-940, U-941, U-942, U-943, U-944, U-945, U-946, U-947, U-948, U-949, U-950, U-951, U-952, U-953, U-954, U-955, U-956, U-957, U-958, U-959, U-960, U-961, U-962, U-963, U-964, U-965, U-966, U-967, U-968, U-969, U-970, U-971, U-972, U-973, U-974, U-975, U-976, U-977, U-978, U-979, U-980, U-981, U-982, U-983, U-984, U-985, U-986, U-987, U-988, U-989, U-990, U-991, U-992, U-993, U-994, U-995, U-996, U-997, U-998, U-999, U-1000				
CONTAINERS			WEIGHT	CONTAINERS			NET WT.		TOTAL U		AVERAGE	TOTAL 235	
TOTAL				TOTAL									
SHIPPING CONTAINER TYPE			CODE	PRIMARY CONTAINER TYPE			CODE		7. REMARKS				
DOT-6L (5 GAL)			A	1 QT. PLASTIC BOTTLE			1						
DOT-6L (110 GAL)			B	1 QT. PLASTIC BOTTLE			1						
DOT-6M (55 GAL)			C	PLASTIC BAG OR WRAPPING			1						
DOT-6M (110 GAL)			D	2" SEALED METAL CAN			1						
DOT-3A (SPECIFY IN BLOCK 7)			E	1 1/2" LARGER SEALED METAL CAN			1						
OTHER (SPECIFY IN BLOCK 7)			F	OTHER (SPECIFY IN BLOCK 7)			0		CSMS LOT NO.				



Form OR-658D --- Description of Declared Uranium Scrap

Purpose: To provide descriptions and shipping container numbers for uranium scrap (Part 4 of 4-part Scrap Evaluation Report).

Prepared by: Safeguards and Technical Security Division.

Submitted to: DOE/ALO.

Exhibit 1.

SHIPPING CONT. SERIAL NO.		PRIMARY CONT. I. D. NO.	SCRAP DESCRIPTION	
<p>UNITED STATES ENERGY RESEARCH AND DEVELOPMENT ADMINISTRATION GAS REFINING OPERATIONS OFFICE</p> <p>DECLARATION NO. _____</p> <p>SHEET _____ OF _____</p> <p>DESCRIPTION OF DECLARED URANIUM SCRAP</p>				
<p><b>INSTRUCTIONS:</b> THE DECLARATION NUMBER SHOWN IN THE UPPER RIGHT HAND CORNER OF THIS FORM SHOULD BE THE SAME NUMBER AS THAT SHOWN ON THE CORRESPONDING FORM DR-658C. THE SHIPPING AND PRIMARY CONTAINERS SHOULD BE LISTED IN THE SAME SEQUENCE AS LISTED ON THE CORRESPONDING FORM DR-658C. THE SCRAP DESCRIPTION MUST IDENTIFY ALL KNOWN CONSTITUENTS BY NAME AND AMOUNTS PRESENT AND MUST IDENTIFY THE PHYSICAL DIMENSIONS OF ALL ITEMS OTHER THAN POUNDS OR LITERS.</p>				<p>REMARKS</p>
			<p>CS#0 LGT NO.</p>	

FORM DR-658D (3/75)

Form SC 2040-L -- Radioactive and Toxic Material Disposal

Purpose: To record burials of nuclear materials.

Prepared by: Nuclear and Explosives Materials Control Section.

Approved by: NMR and Health Physics Division.

Submitted to: Safeguards and Technical Security Division. A copy is also retained by the Health Physics Division.

Exhibit 14.

**RADIOACTIVE & TOXIC MATERIAL DISPOSAL**

**A. TO BE COMPLETED BY REQUESTER**

Type of material	Radioactive	SS	Toxic		
Classification	UMC	CFRD	CRD	SFRD	SRD Other
Disposal Area	Area V	Other	Other	Room	
Weight in Pounds	Contaminated Equipment			Drum	
	Decontamination Debris			Other	
Nuclides:	Volume	% Waste Combustion			

*Instructions for disposal of the above discarded material*

7	SCENT PROPERTY NUMBER	SIGNATURE	ORG	DATE
---	-----------------------	-----------	-----	------

**B. TO BE COMPLETED BY HEALTH PHYSICS DIVISION**

Waste Categories	C, F, H, K, R, S	C, F, H, K, R, S
1. 238U and/or 235U		1. 238U and/or 235U
2. 235U and/or 238U		2. 235U and/or 238U
3. 232Th and/or 232Th		3. 232Th and/or 232Th
4. 238U and/or 235U		4. 238U and/or 235U

Disposal Reference:

**C. TO BE COMPLETED BY NUCLEAR MATERIALS MANAGEMENT DIVISION**

Nuclear Materials Management Approval  
 SS Material Disposal Authority Reference

_____	_____	_____	_____
NMM CODE	SIGNATURE	ORG	DATE

**D. TO BE COMPLETED BY HEALTH PHYSICS DIVISION**

Disposal	Date
Buried by _____	Witnessed by _____
Classified Hole Number _____	
Unclassified Trench _____	
Uranium Pit _____	

SA 2043 2-7-74

Form DOE-741 --- Nuclear Material Transaction Report

Purpose: To record accountability transfer of nuclear materials.

Prepared by: Safeguards and Technical Security Division.

Submitted to: Shipping and receiving suppliers, with copies to DOE/ALO and other DOE and/or military agencies (as required).



Form AL-131 --- ADP Transcription Sheet, Nuclear Material Transfers

Purpose: To record shipping and receiving data from transfer accountability documents (DOE-741), for transmission via Sacnet

Prepared by: Safeguards and Technical Security Division

Submitted to: Shipping and receiving suppliers having Sacnet communication system, with copies to DOE/ALO and other DOE and/or military agencies (as required).





Form SR-95 ---  $^{238}\text{Pu}$  Scrap Declaration

Purpose: To provide material, cost, and shipping container data  
for  $^{238}\text{Pu}$  scrap.

Prepared by: Safeguards and Technical Security Division.

Submitted to: DOE/ALO



Form SA 6476-NF --- Inventory Adjustment Form

Purpose: To record weight adjustments of nuclear materials

Prepared by: Safeguards and Technical Security Division.

Approved by: Nuclear materials manager or nuclear materials  
representative

Submitted to: Retained in the inventory adjustment file.



From SA 2042-DA --- Nuclear Materials Machining Report

Purpose: To record inventory adjustment source data resulting from machining.

Prepared by: Safeguards and Technical Security Division.

Submitted to: Retained in the inventory adjustment form (IAF) file.



ADP Transcription Sheet, Sealed Source Registration Data

Purpose: To provide information on receipts of sealed sources on magnetic tape for transmittal to DOE/ALO and to the NMMSS.

Prepared by: Safeguards and Technical Security Division.

Submitted to: Key punch and Communications Section.

EXHIBIT 20

POSTED BY \_\_\_\_\_

U. S. ATOMIC ENERGY - 1991-1992  
 AND TRANSCRIPTION SHEET  
 SEALED SOURCE REGISTRATION DATA

DATE \_\_\_\_\_

PAGE \_\_\_\_\_ OF \_\_\_\_\_

MFR	SOURCE SERIAL NUMBER	MFL TYPE	TAGG. ELEMENT
0102050405060708091011121314151617			



CARD CODE	DATE OF MANUFACTURE	CAPSULE			MODEL NUMBER	ELEMENT WEIGHT	ISOTOPE WEIGHT
		ENCLOS	INNER	OUTER			
1	19202122334	2	262	262	362	1323334353637383940414243444546474849505152535455565758596061626364	



CARD CODE	RIS CODE	POSSESSED	LICENSE NUMBER	OWNER CODE	AEC PROJECT NUMBER	STATUS	DATE OF STATUS CHANGE	WRITE-OFF



SEALED SOURCE INTEGRITY DATA

RIS CODE	MFR	SOURCE SERIAL NUMBER	USE	RESULTS OF TEST	DATE OF TEST
0102050405060708091011121314151617181920212223242526272829					





Form DOE-749 --- ADP Transcription Sheet, Internal Project Transfers

Purpose: To provide information on internal project transfers  
(project number changes) on magnetic tape for  
transmittal to DOE/ALO and to the NMSS.

Prepared by: Safeguards and Technical Security Division.

Submitted to: Keypunch and Communications Section.



Form SF 1811-ABA -- Telecommunication Data Message Form

Purpose: To provide information for the transmittal of data to DOE/ALO, the NMSS, and other contractors (as required).

Prepared by: Safeguards and Technical Security Division.

Submitted to: Key punch and Communications Section.

Exhibit 22

SP 1811-ABA(2-74)

**TELECOMMUNICATION DATA MESSAGE FORM**

Incoming  
 Outgoing

R) FOR COMMUNICATION CENTER USE MESSAGE IDENTIFICATION NR DTG	PRECEDENCE DESIGNATION <i>(Enter R or P in appropriate box)</i> <input type="checkbox"/> Routine <input type="checkbox"/> Priority	TYPE OF MESSAGE <i>(Enter S or M)</i> <input type="checkbox"/> Single Address <input type="checkbox"/> Multiple Address
	OFFICIAL BUSINESS <i>(Signature of Certifying Official)</i>	(TIME) AM PM
FRM Org Ext	TO DATE	

1. DATA IS

<input type="checkbox"/> Unclassified	<input type="checkbox"/> Restricted Data	<input type="checkbox"/> SIGMA	<input type="checkbox"/> NONWD/NATO
<input type="checkbox"/> Confidential	<input type="checkbox"/> Formerly Restricted Data	<input type="checkbox"/> NONWD/RES	<input type="checkbox"/> NONWD/DATA
<input type="checkbox"/> Secret	<input type="checkbox"/> National Security Information	<input type="checkbox"/> NONWD/PROD	<input type="checkbox"/> ENG DATA

CONTENT INDICATOR

II NSI  Subject to General Declassification Schedule. Declassify on December 31, \_\_\_\_\_  
 Excluded from General Declassification Schedule. Exemption category 5(B) ( ) \_\_\_\_\_  
*(Cite Authority)*

2. Classified by \_\_\_\_\_ *(Title)* \_\_\_\_\_ *(Org. Name and Number)*  
*(if different from originator)*

3. DATA LOCATION  
 Attached  Tape Library  Other \_\_\_\_\_

4.a INPUT DATA MEDIA  
 Mag. Tape  
 Cards  
 Paper Tape

4.b OUTPUT DATA MEDIA  
 Mag. Tape  Paper Tape  
 Line Printer  Teletype H/C  
 Cards

5. DESCRIPTION

Job Name \_\_\_\_\_

Reel No. \_\_\_\_\_ Job No. \_\_\_\_\_ File Number(s) \_\_\_\_\_ Date \_\_\_\_\_

Tape Density:  200 BPI  556 BPI  800 BPI Parity  Even  Odd Internal Labels:  Yes  No

Record Description \_\_\_\_\_ Count \_\_\_\_\_ Length \_\_\_\_\_ Blocking Factor \_\_\_\_\_

6. SPECIAL HANDLING INSTRUCTIONS

7. DELIVER THIS FORM TO

\_\_\_\_\_  
*(Name)* *(Ext)* *(Box No.)* *(Org.)* *(Bldg.)* *(Room)*

Form DOE-284 --- SS Material Transfer Receipt

Purpose: To inform shippers of a delay in completing the transfer accountability document (DOE-741) for material receipts.

Prepared by: Safeguards and Technical Security Division.

Submitted to: Shipping supplier and applicable field offices.

Exhibit 23

FORM AEC-24 (11 57) AECM 740			<b>UNITED STATES ATOMIC ENERGY COMMISSION</b>		
<b>SS MATERIAL TRANSFER RECEIPT</b>					
<b>SS MATERIAL ON TRANSFER</b>		FROM (STATION SYMBOL)	TO (STATION SYMBOL)	NO	
SHIPPING DATE		DATE RECEIVED			
MATERIAL HAS BEEN VERIFIED AS FOLLOWS (CHECK ONE):					
PIECE COUNT <input type="checkbox"/>		CONTAINER COUNT <input type="checkbox"/>		GROSS WEIGHT CHECK <input type="checkbox"/>	
OTHER: _____					
SHIPPER'S WEIGHTS AND SS CONTENTS ARE ACCEPTED PENDING FINAL VERIFICATION MEASUREMENTS AND COMPLETION OF FORM AEC-101.					
BY _____ <small>(ACCOUNTABILITY REPRESENTATIVE)</small>					

Form SA 2900-J --- Receipt for Classified Information

Purpose: To verify the receipt of classified documents.

Prepared by: Safeguards and Technical Security Division.

Submitted to: Accompanies the classified document.

SA 2900 (12 77)

RECEIPT FOR CLASSIFIED INFORMATION

TO	MAIL CHANNEL CODE	FROM
		SANDIA LABORATORIES ATTN: MAIL SERVICES SECTION ALBUQUERQUE, NEW MEXICO 87115

(AVOID ANY REFERENCE BELOW WHICH MIGHT REQUIRE CLASSIFICATION OF THIS RECEIPT)

Document Control No.			Series or Issue	Print or Copy No.	Class.	Identification (Short Title)	Doc. Date		Additional Descriptive Information (Leave blank if information is not essential for identification.)
Prefix	Origin	Basic No.							

**IMPORTANT**  
PLEASE SIGN AND RETURN IMMEDIATELY

**NOTE FOR SANDIA CONSULTANTS AND SUPPLIERS** If this receipt transmits Weapon Data or Research and Development Reports, protect in accordance with ERDA Manual Chapter 2105 or 2106.

**CERTIFICATE:** I have personally received the material including enclosures and attachments, as identified above. I assume full responsibility for the safe handling, storage and transmittal elsewhere of this material in full accordance with existing regulations.

POSTAL REGISTRY NO.	CLASSIFICATION CODES SR - Secret Restricted Data SN - Secret National Security Information SF - Secret Formerly Restricted Data CR - Confidential Restricted Data CN - Confidential National Security Information CF - Confidential Formerly Restricted Data	RECIPIENT'S (or authorized delegate's) SIGNATURE
		TITLE OR POSITION
		DATE RECEIVED

- WHITE:** To be signed by recipient or his authorized delegate & returned to mail services section.
- YELLOW:** For recipient's file.
- PINK:** To be retained by Mail Services Section in suspense until signed original is returned.
- BLUE:** To be retained by sender.

RECEIPTED WHITE COPY MUST BE RETURNED TO SANDIA LABORATORIES MAIL SERVICES SECTION



Form SA 2042-D --- Nuclear and Radioactive Material Transfer

Purpose: Accountability transfer between MBA's

Prepared by: Custodian/Alternate Custodian

Submitted to: White Copy - Receiving Custodian  
Yellow Copy - Nuclear Materials Control Section  
Green Copy - Safeguards and Technical Security Division  
Pink Copy - Safeguards and Technical Security Division  
Goldenrod Copy - Sending Custodians

Exhibit 25

SA 2002-O (12-79)

**NUCLEAR AND RADIOACTIVE MATERIAL  
TRANSFER**

No. **05109**

<p><b>FROM</b></p> <p>MBA <input type="text"/> BLDG <input type="text"/></p> <p>ORG <input type="text"/> RM/BIN <input type="text"/></p>	<p><b>TO</b></p> <p>MBA <input type="text"/> BLDG <input type="text"/></p> <p>ORG <input type="text"/> RM/BIN <input type="text"/></p>
--	--

- Check one
- Internal Storage
  - Burial
  - Machining
  - Shipping

Assembly Number (if applicable)		Description	Description
0.1	Serial Number	Description	Description
0.2			
0.3			
0.4			
0.5			
0.6			
0.7			
0.8			
0.9			
1.0			
1.1			
1.2			
1.3			
1.4			

Remarks: \_\_\_\_\_

\_\_\_\_\_

Transferred from \_\_\_\_\_ SIGNATURE \_\_\_\_\_ MO DA YR \_\_\_\_\_ TIME \_\_\_\_\_

Accepted by \_\_\_\_\_ SIGNATURE \_\_\_\_\_ MO DA YR \_\_\_\_\_ TIME \_\_\_\_\_

Moved by \_\_\_\_\_ SIGNATURE \_\_\_\_\_ MO DA YR \_\_\_\_\_ TIME \_\_\_\_\_

DISTRIBUTION: WHITE - RECEIVING CUSTODIAN, YELLOW - N.M. CONTROL DIV., GREEN/PINK - N.M. MANAGEMENT DIV., GOLDENROD - ORIGINATING CUSTODIAN

Form SA 6476-NF --- Inventory Adjustment Form

Purpose: To record the data required for adjusting inventory master records and provide backup for audit purposes

Prepared by: Safeguards and Technical Security Division

Submitted to: Retained in the inventory adjustment form (IAF) file.



CHAPTER IX  
USERS' MANUAL

The information contained in this chapter and the succeeding chapter (Chapter X) has been compiled from the previous chapters to provide a concise and comprehensive summary of operating procedures for custodians and users of radioactive and nuclear materials. These chapters contain only the information and procedures relevant to custodians and users of radioactive and nuclear materials, and the two chapters are combined and issued separately as a document entitled "Operating Procedures for Custodians and Users of Nuclear Materials" which is distributed to all custodians, alternate custodians, and using organizations. Chapter IX forms the body of that document exactly as it appears in the separate issue, and Chapter X, "Compendium of Relevant Nuclear Materials User Forms," contains the forms which are included in the appendix of that document. Both chapters are included in this manual for the sake of completeness.

OPERATING PROCEDURES FOR CUSTODIANS AND USERS  
OF RADIOACTIVE AND NUCLEAR MATERIALS

I. Definitions

Accountable materials -- a collective term which includes accumulations of nuclear materials above specified quantities (after rounding) and reportable in specified units as follows:

<u>Nuclear Material</u>	<u>Reporting Unit</u>	<u>Reportable Qty.</u>	<u>Negligible Qty.</u>
MT-10 - Depleted Uranium (U238)	Kilogram (kg)	>500 g	<500 g
MT-20 - Enriched Uranium (U235)	Gram (g)	>0.5	<0.5
MT-40 - Plutonium 242	Gram	>0.5	<0.5
MT-44 - Americium 241	Gram	>0.5	<0.5
MT-45 - Americium 243	Gram	>0.5	<0.5
MT-46 - Curium	Gram	>0.5	<0.5
MT-47 - Berkelium 249	Microgram (mg)	>0.5 mg	<0.5 mg
MT-48 - Californium 252	Microgram	>0.5 mg	<0.5 mg
MT-50 - Plutonium 239	Gram	>0.5 g	<0.5 g
MT-60 - Lithium Enriched in Li 6	Kilogram	>500 g	<500 g
MT-70 - Uranium (U233)	Gram	>0.5 g	<0.5 g
MT-81 - Neptunium 237	Kilogram	>500 g	<500 g
MT-82 - Neptunium 237	Gram	>0.5 g	<0.5 g
MT-83 - Plutonium	Gram to Tenths	>0.05 g	<0.05 g
MT-86 - Deuterium	Kilogram to Tenths	>0.10 kg	<0.10 kg
MT-87 - Tritium	Gram to Hundredths	>0.005 g	<0.005 g
MT-88 - Thorium	Kilogram	>500 g	<500 g

Category I quantities of special nuclear materials -- Plutonium - 2 kg or more;  $^{233}\text{U}$  - 2 kg or more;  $^{235}\text{U}$  (contained in uranium enriched to 20% or more) - 5 kg or more. If plutonium or  $^{233}\text{U}$  is combined with  $^{235}\text{U}$ , the amounts of Pu or  $^{233}\text{U}$  shall be multiplied by 2.5 to arrive at the limits shown.

Category II quantities of special nuclear materials -- Plutonium - 400 to 1999 g;  $^{233}\text{U}$  - 400 to 1999 g;  $^{235}\text{U}$  (contained in uranium enriched

to 20% or more) - 1000 to 4999 g. If plutonium or  $^{233}\text{U}$  is combined with  $^{235}\text{U}$ , the amounts of Pu or  $^{233}\text{U}$  shall be multiplied by 2.5 to arrive at the limits shown.

Category III-A quantities of special nuclear materials -- Plutonium - 220 to 399 g;  $^{233}\text{U}$  - 220 to 339 g;  $^{235}\text{U}$  (contained in uranium enriched to 20% or more) - 350 to 999 g. A plutonium and/or  $^{233}\text{U}$  content of less than 400 g may be combined with  $^{235}\text{U}$  when the total content is less than 1000 g.

Category III-B quantities of special nuclear materials -- Plutonium - 1 to 219 g;  $^{233}\text{U}$  - 1 to 219 g;  $^{235}\text{U}$  (contained in uranium enriched to 20% or more) - 1 to 349 g;  $^{235}\text{U}$  (contained in uranium enriched to less than 20%) - all quantities above 0.99 g.

Continuous surveillance -- the observation of Category I and II special nuclear materials or their container when in use or in open storage by at least two authorized, O-cleared persons who may be doing other work but who can give an alarm in time to prevent the unauthorized removal of the special nuclear materials.

Custodian/alternate custodian -- the persons designated by using organizations (and approved by their Director) to control and account for all nuclear materials within a material balance area.

Excess materials -- nuclear materials for which there is no planned and approved programmatic use during the near term.

Fissile materials -- a collective term which includes uranium-233, uranium-235, plutonium-238, plutonium-239, and plutonium-241.

Inventory -- A physical check of reportable-quantity items of accountable materials for serial number, identification, weight, condition, usage, and location.

Material access area (MAA) -- an area containing Category I quantities of special nuclear materials, specifically defined by physical

barriers and located within a protected area, with access restricted to specified authorized personnel only.

Material balance area (MBA) -- a numerical designation assigned by the Safeguards and Technical Security Division to an organization, location, or specified area which is authorized to receive nuclear materials.

Nuclear materials -- a collective term which includes source materials, special nuclear materials, and those other materials designated by the Assistant Secretary of Defense Programs for the DOD. All physical and chemical forms (including scrap) of the following materials are presently included:

<u>Accountable Nuclear Materials</u>		
<u>Source Materials</u>	<u>Special Nuclear Materials</u>	<u>Other Materials</u>
Normal Uranium (Material Type 51)	Plutonium-239 (Material Type 50)	Enriched Lithium (Material Type 60)
Depleted Uranium (Material Type 52)	Plutonium-238 (Material Type 83)	Deuterium (Material Type 86)
Thorium (Material Type 53)	Plutonium-242 (Material Type 40)	Tritium (Material Type 87)
	Uranium Enriched in the isotope U-233 (Material Type 70)	Neptunium-237 (Material Type 82)
	Uranium Enriched in the isotope U-235 (Material Type 20)	Americium-241 (Material Type 44)
		Americium-243 (Material Type 45)
		Curium-244 (Material Type 46)
		Berkelium-249 (Material Type 47)
		Californium-252 (Material Type 48)

Nuclear materials manager -- the designated employee in the Safeguards and Technical Security Division who is responsible for developing



and directing the over-all nuclear materials management program at Sandia National Laboratories and who serves as the DOE contact for coordinating materials management activities, such as materials management plan preparation, contractor materials management appraisals, forecasting of nuclear material requirements, material utilization programs, risks/contingency plans for meeting inventory targets, reduction of budget expenditures through materials management, excess and scrap disposition, and analytical studies.

Nuclear materials representative -- the designated employee in the Safeguards and Technical Security Division who is responsible for coordinating the receipt, shipment, control, and inventory of accountable nuclear materials in the custody of Sandia National Laboratories and who is responsible for reporting to the DOE in accordance with the requirements specified in DOE Order 5630.

Protected area -- a specifically defined area (e.g., a fenced area, a building, or a segregated area within a building) enclosed by physical barriers, which may form a buffer zone around one or more material access areas.

Radioactive materials -- a collective term which includes all radioisotopes, byproduct materials, radium, radium compounds, and irradiated materials.

Removals -- a collective term which includes any activities that result in deletions or decreases in the quantities of nuclear materials in the inventory.

Scrap -- unirradiated nuclear materials that are not usable in their existing form, are mixed with other materials necessitating chemical treatment to be rendered useful, and which may or may not be recoverable in an economical and safe manner.

Source materials -- a collective term which includes normal uranium, depleted uranium, and thorium (see "nuclear materials").

Special nuclear materials (SNM) -- a collective term which includes all isotopes of plutonium, uranium enriched in the isotope U-233, and uranium enriched in the isotope U-235 (see "nuclear materials").

Special reactor materials -- a collective term which includes all physical and chemical forms composed wholly or largely of beryllium, boron-10, hafnium, or zirconium.

## 2. Responsibilities of Users and Custodians

All organizations involved in activities which utilize nuclear materials assume certain responsibilities with regard to the management, physical control, accountability, and safeguards and security protection of nuclear materials in their possession. Specific responsibilities which using organizations undertake are to:

- Prepare Program and Budget Proposals (DOE Schedules 189 and 189a) for specified programs (as required).
- Provide detailed material requirements to Directors for the 12-year forecast submitted annually.
- Perform analytical studies of nuclear material requirements and make assessments of risks, contingencies, and options (as necessary)
- Inform the Safeguards and Technical Security Division promptly of any changes in nuclear material requirements or removals.
- Initiate purchase requisitions for radioactive and nuclear materials and provide the necessary information to purchase analysts.
- Designate and approve custodians and alternate custodians for authorized material balance areas (MBAs).
- Furnish justifications (in memorandum form) to the Safeguards and Technical Security Division for the retention of nuclear materials turned in for storage.
- Submit a memorandum annually to the Safeguards and Technical Security Division explaining all scheduled tests and experiments in which nuclear materials are

anticipated to be expended and/or scrap or excess materials are expected to be generated.

- Submit Form SA 6476-ME, "Modification/Expenditure of Nuclear Materials (Exhibit 17, Chapter X) to the Safeguards and Technical Security Division reporting the actual results of tests and experiments in which nuclear materials were expended and/or scrap or excess materials were generated.
- Prepare shipping paperwork packets for radioactive and nuclear material shipments.
- Provide the requested material usage information to the Safeguards and Technical Security Division to satisfy DOE reporting requirements.

All organizations or locations which utilize source, special, or other nuclear materials (as defined in Section 1) are required to designate a custodian and alternate custodian to control and assist in the inventory of nuclear materials within their material balance areas (MBA's). Specific responsibilities which custodians and alternate custodians undertake are to:

- Establish procedures within the MBA to ensure that all personnel comply with security, safety criticality, assembly/disassembly, modification, expenditure, scrap, transfer, shipment, and accountability requirements.
- Meet individually with the Safeguards and Technical Security Division staff once a year to discuss updated requirements and any problems encountered during the year.
- Provide delivery instructions and receive nuclear materials transferred to the MBA.

- Ensure proper safeguards and security protection for materials accountable to the MBA.
- Remain aware at all times of the quantities and locations of special nuclear materials (SNM) accountable to the MBA.
- Maintain records (by serial number and location) of all materials accountable to the MBA.
- Perform monthly physical inventories of materials accountable to the MBA.
- Ensure that transfer documents accompany all transfers of radioactive and nuclear materials to or from the MBA.

### 5. Program and Budget Proposals

Program and budget proposals required by the DOE are submitted by using organizations involved in non-DMA programs, such as reactor research programs and programs funded by the Nuclear Regulatory Commission. These proposals, submitted on DOE Schedule 189 (Form SF 9211-F), "Program and Budget Proposal" (Exhibit 1, Chapter X), are intended to provide the DOE with a detailed description of the proposed program along with the budget allocations required for the program by fiscal year.

For those programs that require the utilization of nuclear materials, DOE Schedule 189a, "Program and Budget Proposal, Nuclear Regulatory Research Program" (Exhibit 2, Chapter X), is submitted in conjunction with DOE Schedule 189 in order to specify nuclear material quantity requirements for the proposed program. This schedule includes justifications, specifications, and final disposition plans for the materials along with the DOE project number to be charged.

Both documents are completed by using organizations and forwarded to the Budget and Financial Planning Department, with a copy to the Safeguards and Technical Security Division. Both schedules are ultimately reviewed and approved through the vice-presidential level at Sandia and then forwarded to DOE/ALO for authorization.

4. forecasting for Selected Nuclear Materials, Boron-10, and Krypton-85

On or before December 1 of each year, Directors of using organizations are required to submit forecasts for selected nuclear and special reactor materials to the Safeguards and Technical Security Division.

Materials for which annual forecasts are required are:

<u>Material Type*</u>	<u>Material to be Forecast</u>	<u>Reporting Units</u>
Enriched Uranium	$^{235}\text{U}$ Isotope	Nearest whole kilogram
Normal Uranium	Total U	Nearest whole kilogram >100 kg
Plutonium	Total Pu	Nearest whole kilogram
$^{233}\text{U}$	$^{235}\text{U}$ Isotope	Nearest whole kilogram
Heavy Water ( $\text{D}_2\text{O}$ )	$\text{D}_2\text{O}$	Nearest whole kilogram
Boron-10	Total $^{10}\text{B}$	Nearest whole kilogram
Tritium	Tritium	Nearest whole gram
$^{238}\text{Pu}$	$^{238}\text{Pu}$ Isotope	Nearest whole gram
Krypton-85	Krypton	Nearest whole curie

\*Other materials designated by the DOE may also be added to this list from time to time.

These forecasts, submitted on Form DOE 408, "Forecast of Nuclear Material Requirements" (Exhibit 3, Chapter X), will include probable and firm estimates of requirements for each of the materials for 12 years, including anticipated losses, excess materials, and scrap, along with a narrative description of the program for which the materials are required.

Using organizations are expected to perform the necessary assessment of risks associated with meeting programmatic objectives, health and safety standards, safeguards requirements, etc., and to formulate contingency plans consistent with sound program management. Analytical studies of nuclear material requirements, along with these assessments of risks, contingencies, and options, are reported to the Safeguards and Technical Security Division in conjunction with the annual forecasts.

Whenever it becomes apparent that forecasted requirements or removals will not occur as scheduled, using organizations are required to inform the Safeguards and Technical Security Division promptly of such changes. On or before the 15th of the month following each quarter, Directors of using organizations shall submit to the Safeguards and Technical Security Division a narrative describing the circumstances which precluded obtaining or removing the forecasted materials for that quarter and explaining the effect such changes will have on requirements and removals for each of the following quarters in the fiscal year.

<u>Responsible Organization</u>	<u>Action</u>
Safeguards and Technical Security Division (NM Manager)	1. Prepares a letter in mid-October, requesting the forecasts and submits the requests, along with Forms DOE 408 and DOE Appendix 7451, Part I (which provides guidelines for the preparation of the forms), to Directors of using organizations.
Using Organization (Director)	2. Reviews the nuclear material requirements for the next 12 fiscal years with using organizations.
	3. Prepares Forms DOE 408 in accordance with the instructions provided in DOE Appendix 7451, Part I.
	3.1 Requirements are reported by quarter for the first 2 years of the 12-year forecast and by year thereafter.
	3.2 The project number, project title, forecasted beginning inventory, receipts, and removals from the prior year (as modified during the year) are furnished by the Nuclear Materials Manager in the Safeguards and Technical Security Division.



Responsible Organization	Action
Using Organization (Director)	<p>3.3 Forecasted requirements are reported, including the composition of such requirements and (in the case of items which must be fabricated off site) the total amount of material required for the fabrication as well as the amount of product to be supplied to Sandia.</p> <p>3.4 Forecasted removals are reported, including the composition of such removals along with anticipated losses, irradiated and unirradiated scrap, and excess material (each identified separately).</p> <p>3.5 A probability estimate is included for each requirement or removal, identified with an "F" for firm or a "P" for probable.</p>
Safeguards and Technical Security Division (NM Manager)	<p>4. Prepares a brief description of program objectives and of known analytical studies and risks/contingency plans related to the program.</p> <p>5. Submits the completed Forms DOE 408 along with the program description to the Safeguards and Technical Security Division in late November (by the date specified in the request letter).</p> <p>6. Consolidates the forecasts by material type and submits the composite forecast to DOE/ALO in early January.</p>

Changes in forecasted requirements or removals must be coordinated with the Nuclear Materials Manager in the Safeguards and Technical Security Division. In particular, any use of forecasted materials in a project or program other than that for which they were originally intended requires prior authorization from the Nuclear Materials Manager.

## 5. Procurement of Nuclear Materials

Using organizations are responsible for initiating purchase requisitions to obtain radioactive and nuclear materials for approved programs. All nuclear materials procured by Sandia (including those procured for transshipments to another contractor/supplier for use in a manufacturing process) are subject to the reporting requirements specified in DOE Manual Chapter 7451, and selected nuclear and special reactor materials must be forecasted in accordance with the procedures set forth in Section 4 prior to the preparation of a purchase order. In addition, all forecasted materials procured must be accompanied by a nuclear material draft number assigned by DOE/ALO. Accordingly, all requirements for the purchase of nuclear materials are processed through the Nuclear Materials Representative in the Safeguards and Technical Security Division. Purchase requisitions are prepared by purchase analysts in the Purchasing, Stores, and Traffic Management Department based on information supplied by using organizations and in accordance with SLI 6430, "Procurement of Materials or Services by Purchase Requisition."

<u>Responsible Organization</u>	<u>Action</u>
Using Organization	<ol style="list-style-type: none"><li>1. Provides the purchase analyst with the information necessary to obtain the required materials.<ol style="list-style-type: none"><li>1.1 On orders where Sandia-ordered materials are to be used by another contractor in a manufacturing process, special instructions must be included for the disposition of the scrap or a statement included specifying that a request for such instructions will be submitted following processing.</li></ol></li></ol>
Purchasing, Stores, and Traffic Management Department (Purchase Analyst)	<ol style="list-style-type: none"><li>2. Prepares a purchase requisition on Form SA 6430-RD, "Purchase Requisition" (Exhibit 4, Chapter X).</li></ol>

Responsible Organization	Action
Purchasing, Stores, and Traffic Management Department (Purchase Analyst)	<p>2.1 Building 819 is designated as the delivery point.</p> <p>2.2 The letter "N" is entered in the Inspection Code block, which puts the Safeguards and Technical Security Division on distribution for the purchase order.</p> <p>2.3 The designation "Radioactive Material", "Nuclear Material", or "Fissile Material" (see SLI 2047, "Nuclear Criticality Safety") is placed at the top of Material or Service column to serve as a flag for the type of materials.</p> <p>2.4 On enriched uranium orders, a statement is included requesting that piece-part weights and chemical analyses be furnished with the materials in order that accurate element and isotope weights may be entered in accountability records.</p>
Safeguards and Technical Security Division (NM Rep./NM Manager)	<p>3. Submits the completed requisition to the Safeguards and Technical Security Division for special approval.</p> <p>4. Reviews and approves the requisition, obtains a draft number from DOE/ALO (if required), and forwards the approved requisition through the purchase analyst to the Purchasing Department for placement of a purchase order.</p>

## 6. Authorization for Custodian Delegation

All organizations or locations using nuclear materials (as defined in Section 1) are required to designate a custodian and alternate custodian to control and assist in the inventory of nuclear materials within their material balance area. The custodian and alternate custodian are approved by the Director of the using organization, and notification of these assignments is sent to the NMR in the Safeguards and Technical Security Division.

Newly assigned custodians/alternate custodians are briefed by the Safeguards and Technical Security Division regarding material accountability and safeguards responsibilities. In addition, all custodians meet individually with the Safeguards and Technical Security Division staff once a year to discuss updated requirements and any problems encountered during the year.

<u>Responsible Organization</u>	<u>Action</u>
Using Organization (Custodian/Alternate Custodian)	1. Designates a custodian and/or alternate custodian.
(Director)	2. Completes redelegation forms, Form SF 3004-C "Authorization for Redelegation" (Exhibit 5, Chapter X).
	3. Approves the custodian and alternate custodian and signs the redelegation forms.
	4. Forwards the approved forms to the Safeguards and Technical Security Division.
Safeguards and Technical Security Division (Auditor)	5. Signs and files the approved redelegation forms.
	6. Briefs the newly assigned custodian/alternate custodian regarding material accountability and safeguards responsibilities.

Whenever changes in custodianship occur, the newly assigned custodian/alternate custodian is required to submit an approved redelegation form to the Safeguards and Technical Security Division as specified above. In addition, a 100-percent physical inventory of the materials accountable to the MBA is taken by Safeguards and Technical Security Division personnel accompanied by both old and new custodians. This ensures that newly assigned custodians are cognizant of the material for which they are accountable and its physical location.

## 7. Receipt of Materials

All radioactive and nuclear materials received (except for explosives received in the Igloo Area) are processed through Building 819 by the Nuclear and Explosives Materials Control Section; direct receipt of radioactive and nuclear materials by the ordering organization is not permitted. This system allows for the verification of material quantities, permits any necessary resolution of discrepancies in shipping information, and ensures that records of all nuclear materials enter the computerized accountability system.

After the initial processing of radioactive and nuclear material receipts, the Nuclear and Explosives Materials Control Section notifies the using organization of the receipt of the materials and requests disposition and delivery instructions. Materials required for immediate use in approved programs are then transferred to the custodian of the authorized MBA for the using organization. Transfers are made only to the authorized custodian/alternate custodian approved by the Director of the requesting organization, although another person may assume temporary custodianship in the absence of both the custodian and alternate custodian. Upon receipt of the materials, the custodian becomes accountable for the materials and responsible for safeguards and security protection for the materials (as outlined in Section 8).

Materials received by using organizations are intended to be used in the program for which they were obtained; custodians shall contact the Safeguards and Technical Security Division to determine whether a change in project numbers is required whenever materials are to be used in a program other than that for which they were obtained.

<u>Responsible Organization</u>	<u>Action</u>
Nuclear and Explosives Materials Control Section (NM Coordinator)	1. Receives and processes the radioactive or nuclear materials.

<u>Responsible Organization</u>	<u>Action</u>
Nuclear and Explosives Materials Control Section (NM Coordinator)	<ol style="list-style-type: none"> <li>2. Notifies the custodian of the authorized MBA for the using organization of the receipt of the materials, discusses the assignment of serial numbers, and requests delivery or storage instructions.</li> <li>3. Prepares a transfer document on Form SA 2042-D, "Nuclear and Radioactive Material Transfer" (Exhibit 6, Chapter X) for the materials being issued.               <ol style="list-style-type: none"> <li>3.1 Phones the nuclear materials accountability clerk, 844-7150, to provide the information required to complete Form SA 6476-NC, "Transfer Request" (Exhibit 18, Chapter X).</li> </ol> </li> </ol>
Using Organization (Custodian/Alternate Custodian)	<ol style="list-style-type: none"> <li>4. Arranges for the physical transfer of the materials and transfer document to the authorized MBA.</li> <li>5. Checks the serial numbers on the material identification labels against the serial numbers listed on the transfer document.</li> <li>6. Ensures that the materials have appropriate identification tags attached.               <ol style="list-style-type: none"> <li>6.1 The Safeguards and Technical Security Division provides preprinted labels containing the serial number of the materials, net weight, descriptor, material type, description, and bar code serial number which are affixed to appropriate color-coded cards (red for SNM, yellow for non-SNM and green for negligible quantities of accountable materials) and attached to the materials, containers, or assemblies.</li> </ol> </li> </ol>

<u>Responsible Organization</u>	<u>Action</u>
	7. Verifies that the description of the materials given on the transfer document is definitive.
	8. Ensures proper safeguards protection for the materials.
	9. Records the date and actual time at which materials are received and signs the transfer document on the Accepted by line.
	10. Files the white copy of the transfer document with the accountability records for the MBA.
	10.1 If another person assumes temporary custodianship in the absence of both the custodian and alternate custodian, that person is responsible for turning the transfer document over to the custodian as soon as possible.



## 8. Safeguards

Using organizations having nuclear materials in their custody are responsible for maintaining adequate physical controls and for complying with established security procedures to protect against theft, diversion, sabotage, or vandalism. These procedures are described in various DOE, Federal, and Sandia reference documents, including:

- DOE Manual Chapter 5632.1 -- Physical Protection of Classified Matter and Information.
- DOE Order 5632.2 -- Physical Protection of Special Nuclear Material.
- DOE Manual AL Chapter 24XA -- The DOE Transportation Safeguards System.
- Code of Federal Regulations (CFR), Title 49, Parts 100 thru 189 -- Hazardous Materials Regulations.
- Sandia Laboratories Engineering Manual (Chapters 2.11 "Nuclear Explosive Safety", and 2.11-1 "Control of Nuclear Explosive-Like Assemblies (NELA)").
- Sandia Laboratories Security Handbook.
- SLI 6950-2 -- Shipments.

Additional procedures to establish safety standards associated with radioactive and nuclear materials are described in other reference documents, including:

- DOE Manual Chapter 0504 -- Operational Safety Program Appraisals.
- DOE Manual Chapter 0524 -- Standards for Radiation Protection.
- DOE Manual Chapter 0529 -- Safety Standards for the Packaging of Fissile and Other Radioactive Materials.
- DOE Manual Chapter 0530 -- Nuclear Criticality Safety.
- SC-M-70-889 -- Sandia Laboratories Manual for Industrial Safety, Fire Prevention, and Environmental Health.

- SLI 2001 -- Industrial Safety, Fire Prevention, and Environmental Health.
- SLI 2048 -- Nuclear Explosive Safety.
- SLI 2047 -- Nuclear Criticality Safety.
- SLI 1030-9 -- Sandia Nuclear Criticality Safety Committee.

Source and other designated materials are handled and stored in accordance with procedures stipulated by the Environmental Health Department and the Physical Security Standards and Investigations Division. Category I and II Quantities of SNM require special security protection. Special security procedures are also established for any room, building, or portion of a building in which accumulations of SNM (by one or more MBA's) are of category I or II Quantities.

\*Category I: Plutonium - 2 Kgs. or more; U-233-2 Kgs. or more; U-235 (enriched 20% or more) - 5 Kgs. or more

\*Category II: Plutonium-400 through 1,999 grams; U-233-400 through 1,999 grams; U-235 (enriched 20% or more) - 1000 through 4,999 grams or U-233

\*If plutonium or U-233 is combined with U-235, the amounts of Pu or U-233 shall be multiplied by 2.5 to arrive at the limits shown.

The Safeguards and Technical Security Division assumes the responsibility for informing using organizations of the proper classification of SNM, and both the Safeguards and Technical Security Division and the using organization remain aware at all times of the quantities and locations of SNM accountable to the authorized MBA's. In the event that any accumulation of SNM within a specified location exceeds the quantities defined above and in Section 1 of this chapter, either the Safeguards and Technical Security Division or the using organization immediately notifies the Health Physics Division and the Safeguards and Security Department of this condition in order to provide for adequate safeguards and security protection.

During nonoperational hours and at all other times when not in use, SNM (including scrap) is stored in approved repositories, unless such an arrangement is not feasible because of size, weight, or continuous experiments. When such an arrangement is not feasible, the responsible supervisor consults with the Safeguards and Technical Security Division and the Physical Security Standards and Investigations Division to provide for appropriate safeguards and security protection. For Category I quantities of SNM, approved repositories consist of vaults or vault-type rooms within a material access area (MAA) which is, in turn, located within a protected area. A protected area is an area which is enclosed by physical barriers and which is subject to access controls established by the Physical Security Standards and Investigations Division, approved by the Health Physics Division, the Planning Division, the Safety Engineering Division and administered by the Safeguards and Security Department. Access to a material access area is restricted to specified authorized individuals. Other prescribed areas may serve as approved repositories for Category I Quantities of SNM, but such areas require 24-hour surveillance by two guards as well as advance security approval and procedures.

Category II Quantities of SNM are also stored in approved repositories. Approved repositories for Quantities of Category II consist of DOE-approved intrusion alarmed containers, vaults, or vault-type rooms with access restricted to specified authorized personnel only.

Less than Category II Quantities of SNM are stored either in a locked DOE-Approved Security Container (safe-file cabinets or safes) or in a locked room located within a protected area.

SNM scrap (which is packaged in appropriate containers) is stored in a security-approved, separately-fenced area within a larger protected area.

All approved repositories should provide a secondary (emergency) means of egress (in conjunction with existing building codes) and should be constructed in such a manner that there is no possibility of flooding.

Additional procedures which are followed to provide for adequate safeguards and security protection of SNM include the following:

- The operating supervisor of a material access area (MAA) provides to the Safeguards and Security Department a list of employees who are authorized to have access to the area. Under normal conditions, access controls to the MAA are administered by the operating organization.
- Written records are maintained of all persons not on the access list who enter the MAA and of all persons who enter the area during nonoperational hours.
- Personal vehicles are excluded from protected areas and material access areas.
- Government vehicles are admitted to protected areas and material access areas only when on official business and operated by a Q-cleared driver.
- All packages, briefcases, and similar items as well as all vehicles are subject to search upon entering a protected area and upon leaving a material access area.

Nuclear materials are issued to using organizations only upon evidence of adequate approved storage within the area to which the materials will be assigned, and criticality-safe conditions are coordinated through the Environmental Health Department. Custodians are responsible for ensuring adequate safeguards for all personnel involved in the handling and storage of nuclear materials by labeling materials as to the type of material, necessary precautions, and security classification. Personnel handling nuclear materials observe all health and safety procedures stipulated in the Environmental Health section of SC-M-70-889, "Sandia Laboratories Manual for Industrial Safety, Fire Prevention, and Environmental Health."

When in use or in process, Category I and II Quantities of SNM are kept under surveillance by at least two persons, one of whom must have a Q-clearance and the other at least an "S" or "L" Access Authorization. Category I quantities of SNM are used or processed only within specified areas, and access to these areas is limited to those personnel required to perform official duties. Less than Category II Quantities of SNM also require adequate safeguards and security protection, and the additional procedures described earlier in this section would normally be followed.

## 9. Records of Accountable Materials

All custodians are required to maintain a file of internal transfer documents prepared on Form SA 2042-D, "Nuclear and Radioactive Material Transfer" (Exhibit 6, Chapter X). These transfer documents accompany all transfers of radioactive and nuclear materials both into and out of the MBA and establish the accountability of the materials. Transfer documents for materials transferred into the MBA record the materials which are accountable to the MBA and should be retained as long as the materials remain in the inventory; transfer documents for materials transferred out of the MBA relieve the custodian of accountability and should be retained for one year subsequent to the transfer of the materials out of the MBA.

To assist custodians in material control, the Safeguards and Technical Security Division makes available Form SF 6476-N, "Nuclear Material Custodian Inventory Status Card" (Exhibit 7, Chapter X). Use of this card is optional but, regardless of the control system employed, custodians are required at all times to maintain an inventory by serial number and location of all materials which are accountable to the MBA. As a result, records of all movements, assembly, or disassembly of nuclear materials must be kept so that location control can be maintained at all times.

## 10. Inventory of Accountable Materials

Each Material Balance Area (MBA) is physically inventoried by Safeguards and Technical Security Division personnel assisted by the Custodian/Alternate Custodian of the MBA. The frequency of inventory for each MBA varies depending upon the types and quantities of materials. MBAs with accountable SNM are inventoried monthly as required by the DOE. MBAs with non-SNM materials only are scheduled quarterly or semiannually, depending upon accountable quantities. Two annual inventories are conducted of all MBAs, one by the Safeguards and Technical Security Division and one by DOE/ALO.

Inventories are conducted using bar code readers. Each item of accountable material has a bar-coded serial number on the identification label which is read with a light pen, recorded in a memory unit, and, following the inventory, transmitted into the computer for reconciliation with the data base records for the MBA (the only exception to individual item identification is sealed containers in storage. Also, in Area V, identification card boxes for material that cannot be visually inspected (Serwell, ACRR, SPR, GIF, and GIF Pool), and material in the MAA safe-files are optionally sealed. Sealed containers or card boxes are identified with an identification card consisting of a "Father" bar-coded serial number which, in the computer, references each item serial number sealed in a specific container or box.

The custodian and alternate-custodian are responsible for knowing the exact location of materials for which they are accountable.

<u>Responsible Organization</u>	<u>Action</u>
Safeguards and Technical Security Division (Internal Auditor)	<ol style="list-style-type: none"><li>1. Checks the master inventory schedule for MBAs to be inventoried during a specific month.</li><li>2. Telephones the custodians of the MBAs scheduled to arrange a date and time to conduct the inventory.</li></ol>

Responsible Organization	Action
Using Organization (Custodian/Alternate)	3. Directs the Safeguards and Technical Security Division inventory team to each item of material for which the MBA is accountable.
Safeguards and Technical Security Division (Audit Team)	<p>4. Visually inspects each accountable item, verifying that the item has the appropriate identification tag attached.</p> <p>4.1 Material identification labels are affixed to appropriate color-coded cards (red for SNM, yellow for non-SNM, and green for negligible quantity items).</p> <p>5. Reads the bar-coded serial number on the identification labels using a light pen which records the serial numbers in a memory pack.</p> <p>6. Transmits the inventory recorded on the memory pack into the computer to reconcile against the master file.</p> <p>7. Errors may require the audit team to return to the MBA to locate any missing items, or to check transfer documents for items inventoried but not yet transferred on the master file.</p> <p>8. Reports any unauthorized moves to the director of industrial relations and property protection who then prepares a memorandum for distribution to the appropriate directors.</p> <p>9. Verifies material located at off-site MBAs by telephone, followed by written confirmation from the custodian/alternate.</p>



Responsible Organization	Action
Safeguards and Technical Security Division (Audit Team)	<p>10. Reports losses immediately by telephone to the Safeguards and Security Department, Director of Industrial Relations and Property Protection, Manager DOE/SAO, and Director of Safeguards and Security Division DOE/ALO.</p> <p>10.1 Reports by telephone are followed by a written report the next day containing: location of material when last seen, a description by chemical and physical form, material quantity, whether material is hazardous, classification, possibility of diversion, dollar value, how loss was detected, how material may have left facility, and steps taken to locate the missing material.</p>

Materials in the inventory are intended to be used in the program for which they were obtained; custodians shall contact the Safeguards and Technical Security Division to determine whether a change in project numbers is required whenever materials are to be used in a program other than that for which they were obtained.

When DOE audits are scheduled, the Safeguards and Technical Security Division issues a memorandum to all custodians with special instructions stating the period of time required for the DOE physical inventory and requesting that materials not be moved during this period unless absolutely necessary.

The Safeguards and Technical Security Division conducts internal audits continually throughout the year. Once a year, a statistical random sampling technique is used on all of the material balance areas and, once a year, a 100% physical inventory of each MBA is conducted. Utilization and storage reviews are also performed during these internal audits, at which time either a justification for retention or a declaration of excess is obtained.

11. Expenditure, Modification, and Loss of Materials;  
Disposition of Scrap

DOE regulations require that approval be obtained in advance for any changes in size, shape, form, or weight of nuclear materials. This requirement applies to such activities as machining of nuclear materials, chemical action on nuclear materials, and destructive tests (either with or without explosives). Once a year using organizations are required to submit a memorandum to the Safeguards and Technical Security Division requesting approval of proposed activities for the following fiscal year and explaining (in narrative form) all scheduled tests and experiments in which nuclear materials are anticipated to be expended and/or scrap or excess materials are expected to be generated. Following such tests or experiments, the using organization submits Form SA 6476-ME, "Modification/Expenditure of Nuclear Materials" (Exhibit 17, Chapter X) to the Safeguards and Technical Security Division describing the results of the test.

Based on this form from the using organization, the Safeguards and Technical Security Division submits a request to DOE/ALO for authorization to remove the expended materials from the records and for disposition instructions for the scrap.

<u>Responsible Organization</u>	<u>Action</u>
Using Organization	<ol style="list-style-type: none"><li>1. On or before September 1, prepares and submits a memorandum to the Safeguards and Technical Security Division, requesting approval of proposed activities for the following fiscal year and explaining (in narrative form) all scheduled tests or experiments.<ol style="list-style-type: none"><li>1.1 For each activity, the memorandum includes the nuclear material type, the quantities of scrap and/or excess material residues anticipated, the time frame in which the activity will be accomplished, the DOE-approved program and Sandia case number, and the expected level of radiation at the</li></ol></li></ol>

<u>Responsible Organization</u>	<u>Action</u>
Using Organization	<p>surface of the materials (if the materials are to be subjected to radiation).</p> <p>1.2 The completed memorandum is signed by the division supervisor of the using organization.</p> <p>1.3 The memorandum may be amended throughout the year but, for any proposed activity, approval must be obtained prior to conducting the tests or experiments.</p>
Safeguards and Technical Security Division (NM Manager)	<p>2. Submits a memorandum to DOE/ALO, restating the justifications provided by the using organization and requesting authorization to remove the materials from the records.</p>
(Accountability Clerk)	<p>3. Upon receipt of the reply from DOE/ALO, files the authorization for future use in removing the expended materials from the records.</p>
Using Organization	<p>4. Performs the scheduled activities.</p> <p>5. Recovers and measures the scrap and/or excess material residues remaining after the scheduled activities.</p> <p>5.1 No nuclear material may be disposed of without prior authorization from the Nuclear Materials Manager in the Safeguards and Technical Security Division.</p> <p>5.2 All scrap and/or excess material residues must be measured with acceptable equipment to determine the weight of nuclear material in the residues.</p>

<u>Responsible Organization</u>	<u>Action</u>
Using Organization	<p>6. Transfers the scrap and/or excess material residues to the Nuclear and Explosives Materials Control Section in accordance with the procedures set forth in Section 14 for disposition in accordance with the instructions issued by DOE/AEO.</p> <p>7. Prepares and submits Form SA 6476-ME, "Modification/Expenditure of Nuclear Materials" (Exhibit 17, Chapter X) to the Safeguards and Technical Security Division reporting the actual quantities of materials expended, the amount of materials converted to scrap and/or excess material residues, and the method by which these quantities were determined.</p> <p>7.1 This form should include the DOE-approved program and Sandia case number for the activity and must be signed by the division supervisor of the using organization.</p>
Safeguards and Technical Security Division (NM Manager)	<p>8. Returns a copy of Form SA 6476-ME reporting expended nuclear material to the using organization with a hand-written notation that the materials have been removed from the accountability records.</p> <p>9. Prepares an internal adjustment form to update the master records to reflect the changes reported in the expenditure form from the using organization.</p>

Following authorization from the Safeguards and Technical Security Division Nuclear Materials Manager, nuclear materials may be modified by using organizations, but no nuclear material may be disposed of without prior authorization from the Nuclear Materials Manager or nuclear materials representative in that division. Scrap and/or excess material residues generated from such operations must be collected and measured

with acceptable measurement equipment to determine the weight of the nuclear material in the residues. For enriched uranium items, all chips, turnings, and residues resulting from a machining operation must be collected by thoroughly cleaning the machine used and the area surrounding the machine (including the gloves and filters). Scrap and/or excess materials generated in this manner are transferred to the Nuclear and Explosives Materials Control Section in accordance with the procedures set forth in Section 14 and disposed of in accordance with the instructions issued by DOE/ALO.

For Depleted uranium which requires machining, using organizations may prepare a shop short order on Form SA 6505-WBA, "Process and Fabrication Request, Short/Sub Work Order" (Exhibit 8, Chapter X), and then transfer the materials to the Nuclear and Explosives Materials Control Section (who transfers them to the Toxic Shop for the required machining operations). After the required machining has been performed, the finished pieces are reissued to the using organization in accordance with the procedures specified in Section 7, and the scrap which has been generated is processed by the Nuclear and Explosives Materials Control Section for burial or other disposition authorized by DOE/ALO.

Accidental losses of nuclear materials must be reported immediately by telephone to the Safeguards and Technical Security Division and followed by a memorandum (signed by the division supervisor responsible for the materials) which explains the circumstances resulting in the loss and provides serial number identification of the materials involved.

## 12. Assembly/Disassembly and Movement

In order to adjust accountability records, using organizations are required to complete Form SA 6476-A, "Record of Assembly/Disassembly and Movement" (Exhibit 9, Chapter X), whenever parts comprised of or containing nuclear material are assembled or whenever assemblies containing nuclear material are disassembled. One copy of the completed form is forwarded to the Safeguards and Technical Security Division where accountability clerks update the serial number, assembly serial number, and other information for the materials, and one copy is retained by the authorized custodian to update the accountability records for the MBA.

### 13. Storage of Materials

Nuclear materials which are required by using organizations for approved programs are issued only upon evidence of adequate approved storage within the area to which the materials will be assigned. Approved repositories for the storage of nuclear materials as well as safeguards and security requirements for the protection of nuclear materials are described in Section 8.

Nuclear materials which are not immediately required for approved programs are turned in to the Nuclear and Explosives Materials Control Section to be held in storage for future use. Using organizations are responsible for initiating the transfer of nuclear materials to the Nuclear and Explosives Materials Control Section for storage in accordance with the procedures set forth in Section 14. Nuclear materials are stored for a specific retention period which is justified by the using organization at the time of storage on Form SA 6476-ND, "Nuclear Materials Storage Justification."

<u>Responsible Organization</u>	<u>Action</u>
Using Organization	<ol style="list-style-type: none"><li>1. Prepares a Form SA 6476-ND justifying the need for retention of the nuclear materials to be stored, and obtains the required approval level stated on the form for the retention period requested.</li><li>2. Prepares a transfer document on Form SA 2042-D, "Nuclear and Radioactive Material Transfer" (Exhibit 6, Chapter X), for the nuclear materials being transferred for storage.<ol style="list-style-type: none"><li>2.1 The preparer records the date and actual time at which the request for transfer is made and signs the transfer document on the Transferred From line.</li></ol></li></ol>

Responsible Organization	Action
Nuclear and Explosives Materials Control Section (NM Coordinator)	<p>2.2 The transfer document and 2 copies of the approved Nuclear Materials Storage Justification Form must accompany the materials moved to the Nuclear and Explosives Materials Control Section</p> <p>3. Transfers materials to the Nuclear and Explosives Materials Section for storage in accordance with Section 14.</p> <p>4. Arranges for the physical transfer of the nuclear materials, the transfer document, and the justification form.</p> <p>5. Stores the nuclear materials.</p> <p>6. Forwards the pink copy of the transfer document and 1 copy of the justification form to the Safeguards and Technical Security Division.</p>
Safeguards and Technical Security Division (Internal Auditor)	<p>7. During internal audits, reviews the status of nuclear materials in storage with the using organization and obtains either a justification for continued retention or a declaration of excess.</p>

Using organizations may withdraw nuclear materials from storage by telephoning the Nuclear and Explosives Materials Control Section. Upon receipt of this call, the Nuclear and Explosives Materials Control Section transfers the materials to the using organization in accordance with the procedures specified in Section 14.



#### 14. Internal Transfer and Movement of Materials

In order to ensure that adequate control and proper accountability of radioactive and nuclear materials are being exercised at all times, internal transfers and physical movements of materials are coordinated through the Safeguards and Technical Security Division. Internal transfers occur whenever:

- Materials are transferred by the Nuclear and Explosives Materials Control Section to using organizations.
- Materials are transferred by using organizations to the Nuclear and Explosives Materials Control Section for storage, machining, or shipment.
- Materials are transferred directly between MBA's.

All internal transfers of materials must be documented on Form SA 2042-D, "Nuclear and Radioactive Material Transfer" (Exhibit 6, Chapter X).

Nuclear material transfers are requested by telephoning the accountability clerk, ext. -7150, following completion of the transfer document. To initiate the transfer, the accountability clerk requires the information on Form SA 6476-NG, "Transfer Request" (Exhibit 18, Chapter X). The accountability clerk queries the computer file to verify that the receiving organization is authorized to receive nuclear materials and whether or not the quantity of material being transferred will create a Category I or II situation which will require the two-man rule and 24-hour guard service.

The transfer request data is input to the computer via terminal and the Nuclear Materials and Explosives Control Section periodically queries the computer for open transfers on a terminal in their office. A nuclear material coordinator schedules the material transfer after telephoning both the sending and receiving custodians.

A nuclear materials coordinator must either physically move the material, or arrange with the transportation division and accompany the movement.

Transfers are made only to authorized custodians approved by the director of the receiving organization, although another person may assume temporary custody in the absence of both the custodian and alternate custodian. Upon receipt of the materials and the transfer document, the receiving custodian becomes accountable for the materials and responsible for safety and security protection for the materials (as outlined in Section 8).

<u>Responsible Organization</u>	<u>Action</u>
Sending Organization (Custodian)	<ol style="list-style-type: none"><li>1. Prepares a transfer document on Form SA 2042-D, "Nuclear and Radioactive Material Transfer" (Exhibit 6, Chapter X), for the materials being transferred.<ol style="list-style-type: none"><li>1.1 The preparer records the date and actual time at which the request for transfer is made and signs the transfer document on the Transferred From line.</li><li>1.2 If the "Storage" block is checked on the SA 2042-D as the reason for transfer, the preparer attaches a completed Form SA 6476-ND, "Nuclear Materials Storage Justification" (Exhibit 10, Chapter X). Material will not be accepted for storage without the justification form.</li><li>1.3 If material is to be transferred as an assembly, the preparer completes the assembly number block on Form SA 2042-D, otherwise the computer disassembles all assembled units at the time of transfer.</li></ol></li></ol>

Responsible Organization	Action
Sending Organization (Custodian)	1.4 The Weapon Training Division uses their own storage form, in lieu of SA 2042-D, to move material to and from storage.
Safeguards and Technical Security Division (Accountability Clerk)	2. Forwards green copy of SA 2042-D to Safeguards and Technical Security Division as a suspense copy.  3. Phones the nuclear materials accountability clerk, ext. -7150, to provide the information required to complete Form SA 6476-NG, "Transfer Request" (Exhibit 18, Chapter X).  4. Records data on the "Transfer Request" form.  5. Inputs the transfer request data on the terminal screen titled "Request/Display Transfer" to verify the data provided.
Nuclear and Explosives Materials Control Section (NM Coordinator)	6. Queries, via terminal, for open transfers.  6.1 If special instructions call for heavy equipment, health physics participation, Category I or II quantities of SNM, or weapons requiring security guard escort, arranges with the appropriate personnel for movement of the material.
Moving Organization (Material Handler)	7. When ready to physically move material, inputs data on the terminal screen titled "Initiate Transfer."  8. Proceeds to sending MBA.  9. Checks item label serial numbers against those recorded on the transfer document.  9.1 If they agree, signs the transfer document, recording date and time.

Responsible Organization	Action
	<p>9.2 If they disagree, requests custodian to correct the transfer document, then signs and records date and time on the corrected document.</p> <p>10. Gives the goldenrod copy of the transfer document to the custodian of the MBA sending the material.</p>
<p>Sending Organization (Custodian/Alternate)</p>	<p>11. Retains the goldenrod copy to relieve the sending MBA of accountability.</p>
<p>Nuclear and Explosives Material Control Section (NM Coordinator)</p>	<p>12. Moves the material, with the white, yellow, and pink copies of the transfer document, to the receiving MBA.</p>
<p>Receiving Organization (Custodian/Alternate)</p>	<p>13. Checks the material to ensure that the transfer document accurately reflects the material label serial numbers.</p> <p>14. Signs the remaining transfer document copies recording date and time, and retains the white copy.</p>
<p>Nuclear and Explosives Material Control Section (NM Coordinator)</p>	<p>15. Ensures proper safeguard's protection for the materials.</p> <p>16. Delivers the pink copy of the transfer document to the Safeguards and Technical Security Division.</p> <p>17. Retains the yellow copy of the transfer document to file in the Nuclear and Explosives Material Control Section office.</p>

Transfers of materials to the Nuclear and Explosives Materials Control Section for storage, machining, or shipment and transfers to offsite MBA's are accomplished by the same procedures as set forth earlier for transfer between MBA's. Offsite MBA's are established prior to transfers of materials through discussions with the Nuclear Materials Representative in the Safeguards and Technical Security Division and with the prior approval of DOE/ALO.

Military flights originating from Kirtland AFB normally require the transfer of materials to the military in accordance with the procedures set forth in Section 15; the owning MBA retains accountability of materials on short-term (48 hrs) military flights only. Drop tests at Tonopah Test Range require a transfer of materials to Tonopah (MBA 37) from where the drop test materials are subsequently transferred back to the Nuclear and Explosives Materials Control Section. Other drop tests or military flights not originating from Kirtland AFB require a transfer of materials to the military in accordance with the procedures set forth in Section 15.

## 15. Shipment of Materials

In order to ensure strict compliance with DOE and Department of Transportation regulations, all radioactive and nuclear materials requiring shipment off site are processed through the Nuclear and Explosives Materials Control Section. SLI 6950-2, "Shipments," provides guidelines for the shipment of these materials, and SLI 6950-4, "Movement of Classified Material," provides supplementary information in the case of classified materials. In addition, shipments to Rocky Flats or to the DOD require special procedures to be followed which are explained in this section.

Handcarried materials require the same paperwork to be processed through the Nuclear and Explosives Materials Control Section as for ordinary shipments. This is necessary in order to ensure compliance with DOE and DOT regulations, including the following:

- Radioactive materials cannot be handcarried on passenger-carrying aircraft.
- Plutonium cannot be transported on any aircraft.
- Radioactive materials cannot be carried or transported in personal vehicles; only government vehicles can be used for this purpose.

If shipment is going to a company or institution other than a License Exempt DOE Contractor, the organization responsible for shipment must obtain a copy of the Recipients License prior to shipment if the Nuclear and Explosives Materials Control Section does not have a copy in file.

Responsible Organization

Action

Using Organization (Property Clerk or Control)

1. Prepares a shipping paperwork packet, consisting of the shipper on Form SF 6951-A, "Property Action" (Exhibit 11, Chapter X), the hazard sheet on Form SA 6550-EA, "Information for Hazardous Material Shipments" (Exhibit 12, Chapter X). Form SA 2042-D, "Nuclear and Radioactive Material Transfer, and a copy of the recipients license authorizing receipt of the material being shipped.
  - 1.1 The shipper must be marked "Radioactive Material -- Irradiated," "Radioactive -- SS Material," "Radioactive Material," or "Fissile Material" (see SLI 2047, "Nuclear Criticality Safety"), as appropriate.
  - 1.2 Using organizations must determine whether the shipment requires a courier (see SLI 6950-2, "Shipments") and must state this on the shipper.
    - 1.2.1 When a courier is required, a copy of the shipper is forwarded to the Traffic Management Division as an advance copy to allow courier service to be arranged.
  - 1.3 Nuclear material control clerks are assigned to the weapon systems divisions (Building 809) and to the reactor area (Area V) to prepare the shipping paperwork in those areas.

Responsible Organization	Action
Nuclear and Explosives Materials Control Section (NM Coordinator)	<p>2. Transfers the materials and paperwork to MBA 01 (assigned to the Nuclear Materials Control Section for materials being held for shipment) in accordance with procedures set forth in Section 14.</p> <p>3. Completes the required paperwork and arranges for the packaging and shipment of the materials in conjunction with the Shipping and Receiving Division, the Health Physics Division, and the Traffic Management Division.</p>

In addition to the standard paperwork, shipments to Rocky Flats require Form RF-43940, "Authorization to Ship SS or Non-SS Material" (Exhibit 13, Chapter X) to be forwarded by the using organization to the SSMR in the Safeguards and Technical Security Division prior to shipment. The SSMR then submits this form to Rocky Flats for approval. This requirement applies to any nuclear materials as well as to any nonnuclear materials that have been exposed to radionuclides (such as fission products, other actinides, or tritium). The requirement also applies to any materials being returned to Rocky Flats which have undergone change since they were shipped from Rocky Flats. Upon receipt of authorization to ship from Rocky Flats, shipment of the materials proceeds in accordance with the procedures set forth earlier in this section.

Shipments of nuclear materials to the DOD must have prior authorization, as stipulated in Section 9 of Technical Manual TP 100-1, "Supply Management of Nuclear Weapons Material." Prior authorization may consist of one of the following:

- A telecon from the project engineer to his counterpart in the DOD requesting him to initiate a requisition. This requisition provides definition of requirements (including authorized shipping channels and recipients) and is processed through Field Command, DNA (FCDNA) to DOE/ALO. FCDNA is the only DOD agency recognized by the



DOE for the negotiation of transfers of nuclear weapons materials between DOE and DOD activities, and final negotiations are made by FCDNA. The approved requisition and memorandum from the Weapons Production Division, DOE/ALO, must be received by the Safeguards and Technical Security Division prior to shipment.

- A letter from the project engineer to the Weapons Production Division, DOE/ALO, (with a copy to the Safeguards and Technical Security Division) defining any change in requirements or supplying any supplementary information needed to support a Memorandum of Understanding, Joint Test Agreement, or Joint Operating Plan. A copy of the reply authorizing shipment must be received by the Safeguards and Technical Security Division prior to shipment.

## 16. Exporting Accountable Nuclear Materials

### 16.1 Procedures for Exporting

Materials may be shipped to a non-U.S. location in conjunction with a NRC agreement, or by DOE authorization.

### 16.2 NRC Agreement

The sending organization will (1) complete form "Request for Foreign Contract Number", available in Division 3434, and mail to Union Carbide Corp., Oak Ridge, Tenn. (mailing address on form), (2) upon receipt of the foreign contract number from Oak Ridge, complete Form NRC-7, "Application for License to Export Nuclear Material and Equipment", available in Division 3434 (instructions for completing and mailing on form), and (3) telephone the Department of Commerce (FTS No. 202-377-4777) to explain the shipment and obtain the authorization code which must be inserted in the authentication block of Form 7525-V, "Shipper's Export Declaration", prepared by the Traffic Management Division.

When the contract number, license number, and authorization code have been received, follow the procedures in Section 16.4.

### 16.3 DOE Approval

The sending organization will (1) complete form "Request for Foreign Contract Number", available in Division 3434, and mail to Union Carbide Corp., Oak Ridge, Tenn. (mailing address on form), (2) prepare a memorandum addressed to D. L. Krenz, Special Programs Division Director, DOE/ALO, requesting authorization to ship material. The memorandum, must include the following: Description of material, how it will be used, length of time it will be used and benefits to be derived, and whether it will be returned. Attach a copy of the Sandia Contract, or reference any correlation to another contract or international agreement.

When the contract number has been received and the memorandum prepared, follow the procedures in Section 16.4.

#### 16.4 Internal Procedures

<u>Responsible Organization</u>	<u>Action</u>
Sending Organization	<ol style="list-style-type: none"><li>1. Prepares Form SF 6951-A, "Property Action", Form SA 6550-EA, "Information for Hazardous Material Shipments", Form SA 2042-D, "Nuclear and Radioactive Material Transfer" transferring material to MBA 01, Bldg. 867 south.</li><li>2. Attaches a copy of the contract number, NRC License, and Dept. of Commerce authorization code, if shipment is NRC agreement, or a copy of the contract number and memo to DOE, if DOE authorized, to the paperwork in Step 1.</li><li>3. Follows transfer procedures in Section 14 of this chapter.</li></ol>
Nuclear and Explosives Materials Control Section (NM Coordinator)	<ol style="list-style-type: none"><li>4. Picks up material and paperwork from sending organization.</li><li>5. Signs on the "Transferred By" line of the Radioactive and Nuclear Materials Transfer Document.</li><li>6. Returns material and paperwork to the Nuclear and Explosives Materials Control Section for processing.</li><li>7. Prepares Nuclear/Radioactive Material Packing Slip, Form SF 6476-I, and adds to the shipping paperwork packet.</li><li>8. Prepares Nuclear and Radioactive Material Transfer, Form SA 2042-D, transferring accountability for the material to the Packaging Section, MBA 66.</li></ol>

Responsible Organization	Action
Shipping and Receiving Division	<p>9. Prepares Form SA 6550-E, "Hazardous Material Packing and Shipping Instructions." Packages material, completes paperwork, and forwards Form SF 6476-1, "Nuclear/Radioactive Material Packing Slip", Form SA 6550-E, "Hazardous Material Packing and Shipping Instructions", Form SF 6951-A "Property Action", copy of the foreign contract number, NRC license, Department of Commerce authorization code if NRC agreement, or foreign contract number and memo to DOE/ALO if DOE authorized, to the Traffic Management Division.</p>
Traffic Management Division	<p>10. Completes five copies of the Shipper's Export Declaration signed by the Traffic Management Division Supervisor.</p> <p>11. Forwards the Shipper's Export Declaration requiring DOE authorization to D. L. Krenz, DOE/ALO, with the memorandum from the sending organization requesting authorization to ship.</p> <p>12. Upon receipt of approved Shipper's Export Declaration from DOE, prepares Government Bill of Lading, Air Bill (if required) Hazardous Material Certification, Certificate of Registration, and returns shipping paperwork to the Shipping and Receiving Division.</p> <p>12.1 If NRC licensed shipment, and DOE approved, sends the following documentation to the Shipping and Receiving Division for immediate shipment:</p> <ol style="list-style-type: none"> <li>a. Government Bill of Lading</li> <li>b. Air Bill (if required)</li> <li>c. Hazardous Material Certification</li> <li>d. Shipper's Export Declaration</li> <li>e. Certificate of Registration</li> <li>f. NRC license.</li> </ol>

Responsible Organization	Action
Shipping and Receiving Division (Packaging Engineer)	13. If awaiting DOE authorization, calls Nuclear and Explosives Materials Control Section when packaging is completed.
Nuclear and Explosives Materials Control Section (NM Coordinator)	14. Picks up packaged material and stores pending DOE authorization to ship.
Traffic Management Division	15. Upon receipt of approval from DOE, forwards the Government Bill of Lading, Air Bill (if required), Hazardous Material Certification, Export Declaration, Certificate of Registration, and copy of DOE approval letter to the Nuclear and Explosives Materials Control Section to authorize shipment.

## 17. DOE Reports

The Safeguards and Technical Security Division assumes the primary responsibility for preparing and issuing reports required by the DOE, based on the information obtained from using organizations and computerized accountability records. Brief descriptions of the reports requiring input from using organizations along with the information needed from these organizations are as follows:

Appraisal utilization (annual report prior to the appraisal date determined by DOE/ALO) -- consists of a review by DOE/ALO of materials management activities, policies, procedures, and performance effectiveness in complying with DOE materials management requirements.

Information required from using organizations includes:

- Justifications for materials being used and for materials being held in storage for future use in DOE-approved projects.

Materials management plan (annual report due May 15) -- consists of a report based upon material resources required and annual nuclear material allotments.

Information required from using organizations includes:

- Material usage schedules by project.
- Forecast changes (to be reported to the Safeguards and Technical Security Division as soon as they are known).
- Documented analyses of using organization considerations in arriving at decisions regarding current inventory levels, percentage of spares required, etc., including the considerations given to anticipated risks, contingency plans to combat significant risks, options

considered to reduce material budget expenditures, and options and risks that could be taken to reduce target inventories.

Assessment report (annual report due December 15 based on the September 30 inventory) -- consists of a report of material element and isotope weights by composition code, enrichment range, and project number, with comments regarding current usage, intended usage, and subsequent disposition of materials.

Information required from using organizations includes:

- Explanations of current programs (with a breakdown of material inventory usage) and of future programs (with breakdown of materials being held in storage for each program)
- Justification for any materials being held in storage for which usage is not firm.

Status of Inventory (quarterly report) -- consists of a report of inventory quantities by material type, COEI line number, and project number.

Information required from using organizations includes:

- Changes in material composition.
- Changes in material usage requiring a project number change.

Excess/Scrap Declarations (periodic reports, as required) -- consists of a memorandum declaration of excess/scrap reported by material type, description, quantities, and irradiation level or else consists of a uranium scrap evaluation report (on appropriate forms).

Information required from using organizations includes:

- Declarations of excess/scrap requiring disposition.

Forecasts -- Annual forecasts of nuclear material requirements are developed and submitted to DOE/ALO in early January on Form DOE 408, "Forecast of Nuclear Material Requirements." Forecasts include quarterly requirements by material type and isotope weight for the two succeeding years, and annual requirements for 10 additional years. Forecasts also include scheduled returns.

Information required from using organizations includes:

- Organizational material requirements.

Write Off -- Materials removed from the inventory records are submitted monthly to DOE. This report includes the material type and type of expenditure (ID, NOL, RT or DECAY) by project number, IAF number, 741 number, element and isotope weights.

Information required from using organizations includes:

- Itemized expenditure and modification losses reported on Form SA 6476-ME, "Modification/Expenditure of Nuclear Materials."



## 18. Special Procedures

### 18.1 Procedures for the Receipt of Radioactive and Nuclear Materials in Tech Area V.

All radioactive and nuclear materials received in Area V must be processed through the material access area (Bldg. 6592) by the custodian/alternate custodian or the Control Coordinator. Direct receipt of materials by using personnel is not permitted.

<u>Responsible Organization</u>	<u>Action</u>
Area V Control Division (Custodian/Control Coordinator)	<ol style="list-style-type: none"><li>1. Checks serial numbers on the material identification labels against the numbers recorded on the transfer document.</li><li>2. Signs transfer document for receipt of material and retains white copy in area V records file.</li><li>3. Stores material in Material Access Area (MAA) until requested by user.</li><li>4. Transfers material within Area V as required and records transfer in accordance with Section 10.</li></ol>

### 18.2 Procedures for the Transfer and Record Keeping of Radioactive and Nuclear Materials in Tech Area V.

Records of Internal and External transfers of material are maintained on the monthly inventory listing issued by the Safeguards and Technical Security Division, and a file of Form SA 2042-D, transfer documents, for transfers in and out of Tech Area V.

<u>Responsible Organization</u>	<u>Action</u>
Area V Control Division (Custodian/Control Coordinator)	<ol style="list-style-type: none"> <li>1. Maintains a file of Form 2042-D white copies which represent all items transferred into the Area V inventory, and a file of Form 2042-D, goldenrod copies which represents material transferred out of the Area V inventory, with a separate file of material transferred to storage.               <ol style="list-style-type: none"> <li>1.1 Requests, as required, storage inventory listings from the Safeguards and Technical Security Division of all items the MBA has in storage.</li> </ol> </li> <li>2. Files a copy of the previous months inventory listing and notes the following information of the serial number lines of material transferred internally:               <ol style="list-style-type: none"> <li>2.1 Name and organization of accountable user, location- building and room, issue date.</li> </ol> </li> <li>3. Users become accountable for material transferred to them, and responsible for keeping the custodian apprised of any subsequent material movement, modification, or expenditure.</li> </ol>

18.3 Procedures for Inventory of Accountable Nuclear Materials in Tech Area V

Inventory procedures in Section 10 of this chapter are followed.

18.4 Tech Area V Reporting Procedures for Anticipated Losses During Experiments or Machining

DOE regulations require that approval be obtained in advance for any changes in size, shape, form, or weight of nuclear materials.

<u>Responsible Organization</u>	<u>Action</u>
Using Organization	1. Prepares Form SA 6476-ME, "Modification/Expenditure of Nuclear Materials" (Exhibit 17, Chapter X) which explains the scheduled test or experiment and the types and quantities of materials anticipated to be expended, for the Safeguards and Technical Security Division.
Safeguards and Technical Security Division (SM Manager)	2. Prepares and forwards a memorandum to DOE/ALO, restating the justification provided by the using organization and requesting authorization to remove the materials from the record.

18. Tech Area V Accountability Procedures for Postmortem Examination of Experiments Containing SNM

Cutting and sectioning of special nuclear material is periodically required in the preparation of experiments.

The following procedures have been established for the cutting and sectioning operations and postmortem examinations:

<u>Responsible Organization</u>	<u>Action</u>
Area V Control Division (Custodian)	1. Transfers material from the Material Access Area (MAA) to experimenter and notes experimenter's name and location change.
(Experimenter)	2. Maintains a log by serial number of materials received.
	3. If material is cut, measures weight of remaining parts and residue cleaned from saw area or glove box and saw blade.
	4. If modified material is not weighable due to the condition of the sample, estimates weights of the various pieces, based upon the width of the saw blade.

<u>Responsible Organization</u>	<u>Action</u>
	5. Sketches material in log book illustrating location of saw cuts.
	6. Reports actual expenditures on Form SA 6476-ME, "Modification/Expenditure of Nuclear Materials", to the Safeguards and Technical Security Division through the custodian.
	7. Weights of new items and residue plus loss must equal beginning weight of original serially numbered item.
	8. Items will be placed in plastic bags, or other suitable containers, with the identifying serial number clearly visible on the outside, with measured or estimated weights.
Safeguards and Technical Security Division (NM Manager)	9. Prepares inventory adjustment form (IAF) to modify and update computer records.
(Accountability Clerk)	10. Updates the computer records and generates new identification labels.
Using Organization (Custodian)	11. Transfers residue to custodian subsequent to reporting changes to Safeguards and Technical Security Division and applying labels to new items.
	12. Transfers material to custodian following postmortem examination.
	13. Collects residue from several experiments in a single container if the enrichment is the same, and requests serial number label change by reporting the consolidation in a memorandum to the Safeguards and Technical Security Division.

Responsible Organization	Action
Using Organization (Custodian)	14. Accountability records for materials in experiments must be detailed and explain modifications, weight changes, identification labels, residue generated, and physical location.

18.6 Balance Procedures for Tech Area V Contaminated Balances

18.6.1 This procedure applies only to balances used in Tech Area V, which are contaminated and/or in a contaminated environment. (Contaminated = radioactive contamination.) Health Physics regulations preclude normal procedures used by the Measurement and Standards Department (2559) for calibration. For those balances not contaminated and/or in a contaminated environment, the normal calibration procedures will be in effect.

18.6.1.1 For each Balance that will be placed in a glove box, glove box line or steel containment box (hot cell), a set of Class S Standards (See ATTACHMENT I for definition) shall be obtained and shall remain associated with that balance through its services life.

18.6.1.2 For all other balances which may be contaminated but are not in glove boxes, etc., a set of calibrated Class "S" weights (see ATTACHMENT II) will be maintained in Tech Area V for calibration checks.

18.6.2 The balances will be maintained by users for their own use, which normally requires greater accuracy than accountability weighing. (For accountability purposes, it is understood that the accuracy required is to be +0.5 gram below 1 kg total and +1 gram above 1 kg.) Therefore, a spot check of accuracy and sensitivity of the balances just prior to their use for accountability weighing will verify their integrity.

18.6.3 Weighing procedure for each weighing or series of weighings.

- a. Check balance zero point and adjust if necessary.
- b. Obtain approximate weight of material.
- c. Remove sample.

18.6.4 Check balance in the range of the approximate weight obtained in "b" above. For example, if weight obtained in "b" above is 25.6 grams.

- a. Use one Class "S" weight(s), place 25 g on balance.
- b. Record balance reading and check calibration values of weights.
- c. Add a 1-g weight and record balance reading. (Steps b and c are an accuracy check.)
- d. To the weights already on the balance, add a 50 mg weight and record balance reading. In particular, record the change due to addition of the 50 mg weight. (This is the check of the balance sensitivity.)
- e. Sum calibration values of the weights used and compare to balance readings. These values should be the same within  $\pm 2$  mg.
- f. Weigh samples accurately and record weight.
- g. Recheck balance zero on completion of weighing.

#### 18.7 Addenda I - Weight Classification

Weights may be divided into four groups according to their use. These are listed below together with the class of adjustment as prescribed by the National Bureau of Standards. An example given in each case shows how the tolerance varies for a 10-g weight in each class. Henry Troemner, Inc., manufactures weights in every class listed except class J.

Specifications for all commonly used laboratory and trade weights are covered in National Bureau of Standards circulars. Class M, S, S-1,

P, Q, and T specifications are detailed in NBS circular 547, section 1. Class A, B, and specifications are covered in NBS circular No. 3, issued in 1918, now out of print but under revision. Class F specifications are contained in NBS handbook 105.1. All Troemer weights are manufactured in strict accordance to the specifications outlined in these circulars. For specific information about construction, adjustment, marking, etc. of any weights in these series, write or phone us.

#### 1. PRECISION LABORATORY STANDARDS

- CLASS J      Microweight standards (metric only) used in micro balance work.  
Example: 10 g  $\pm$ 0.003 mg.
- CLASS M      High-precision scientific standards (metric only) used as reference, and in high-constancy work.  
Example: 10 g  $\pm$ 0.050 mg.
- CLASS S      Scientific standards used for reference, calibration and precision analytical work in physical and chemical laboratories and in assay work. Available in metric system only.  
Example: 10 g  $\pm$ 0.074 mg.
- CLASS S-1    Laboratory standards used for routine analytical and precision, nonmetric work with balances using quick-weighing devices, such as a chain. This class bridges the gap between the best laboratory weights (Class P) and the precision laboratory standards. Available in metric system, or in other systems on special order.  
Example: 10 g  $\pm$ 0.25 mg.

18.8 Addenda 2 - Metric Weights

One Set (18) Metric Weights

File No. 5228A

Troemner, Class S

F/N S-248 470

Assumed Density: 7.84 g/cm<sup>3</sup>

<u>Nominal Mass</u>	<u>True Mass Correction Milligrams</u>
10 kg	+124.939
10	+ 86.785
5	+ 44.061
3	+ 34.800
2	+ 18.922
1	+ 11.766
500 g	+ 5.373
300	+ 3.666
200	+ 1.868
100	+ 1.008
50	+ 0.532
30	+ 0.326
20	+ 0.162
10	+ 0.070
5	+ 0.013
3	+ 0.051
2	+ 0.002
1	+ 0.033



### 18.9 Area V Hot Cell Facility

The Hot Cell Facility consists of two laboratories, the hot-cell laboratory and the glovebox laboratory, which are used for assembly and disassembly of experiments containing SNM. The choice of location within these facilities depends on the radiation level of the material and the sensitivity of the material to water vapor and/or oxygen.

A detailed description of the two laboratories can be found in the Safety Analysis Report (SAR) approved by DOE/ALO.

A hardback, bound log book containing individual experiment information will be filed in each laboratory for tracking materials through the various processes so that weights of modified parts, scrap, and loss can be balanced with beginning weights.

Area V control of materials to be modified, as authorized by the *Safeguards and Technical Security Division, 3434*, will be maintained in accordance with the following procedures:

<u>Responsible Organization</u>	<u>Action</u>
Area V Control Division (Experimenter)	1. Prepares request portion of Form SA 6476-ME, "Modification/Expenditure of Nuclear Materials,"
	2. Sends Form SA 6476-ME to the Nuclear Materials Manager, 3434, for approval.
Safeguards and Technical Security Division (NM Manager)	3. Reviews materials and explanation of modification/expenditure to be performed.
	4. Approves form by signing and dating.
	4.1 Files copy in separate Area V modification/expenditure file.
	5. Returns approved copy to Area V.

Responsible Organization	Action
Area V Control Division (Experimenter/Control Coordinator)	6. Experimenter files copy of Form SA 6476-ME and the Control Coordinator moves authorized material, when necessary, in approved shielded cask to the hot-cell facility.
Hot-Cell Facility (Experimenter/Control Coordinator/Technician)	<p>7. Control Coordinator inputs the change in location of materials to the Nuclear Materials Accountability system</p> <p>8. Experimenter/technician verifies weight of materials, if weighable, by following balance procedures in paragraph 18.6.</p> <p>9. Experimenter/technician records the following data in laboratory log book during modification.</p> <p>9.1 Modification form number</p> <p>9.2 Experiment number</p> <p>9.3 Glovebox number/location</p> <p>9.4 Experimenter's/Technician's name</p> <p>9.5 Date procedure starts and finishes</p> <p>9.6 Description of modification (Drawings, sketches, etc., will be kept in a separate file cross-referenced to the log book entry)</p> <p>9.7 Weights:</p> <ul style="list-style-type: none"> <li>Parts</li> <li>Scrap</li> <li>Loss</li> <li>Cleaning materials (If not weighable, calculate approximate weights)</li> </ul> <p>9.8 Records parts, scrap, etc., location (by cask/container)</p> <p>9.9 Records all of the above data in paragraph 9 each time material is processed through the Hot Cell</p>

<u>Responsible Organization</u>	<u>Action</u>
Area V Control Division (Control Coordinator)	10. Returns materials in approved cask/ container to the appropriate location for final disposition.
(Experimenter)	11. Completes the final portion, "Notice of Modification/Expenditure of Nuclear Material", on the approved Form SA 6476-ME and forwards to the Nuclear Materials Manager, 3434.
Safeguards and Technical Security Division (NM Manager)	12. Writes memorandum to DOE/ALO request- ing authorization to remove from records any losses or expended mate- rial and disposition of scrap or excess material.
	13. Prepares internal adjustment form (IAF) Form SA 6476-NF, from data returned on Form SA 6476-ME.

## 19. Safety

Safety Engineering is responsible for the industrial safety portion of nuclear material storage and transport. The Plant Engineering Planning division is responsible for the fire safety aspects of nuclear materials.

Fissile materials and other radioactive material shall be packaged and prepared for shipment in a manner that provides assurance of protection of the public health and safety during the transportation of such materials.

Fissionable materials shall be processed, stored, transferred, or handled in such a manner that the probability of fissionable materials reaching accidental criticality is very low, and the protection of government and private personnel and public and private property against damaging effects and undue hazards that may arise from a criticality accident is assured.

The Sandia fire protection engineers in the Plant Engineering Planning division should be consulted regarding the adequacy of facilities for nuclear materials operations.

- Consideration should be given to fire prevention, fire protection and fire fighting because of the possible consequences of a fire adjacent to nuclear materials.
- Ignition sources and fuel available should be reduced to the lowest practical level. Materials of the building construction should not introduce fuel sources and fire resistive construction should separate areas of unacceptable fuel loading from nuclear material operations.
- Consideration should be given to the installation of automatic fire alarm and suppression systems. Prefire planning should include familiarizing the fire response

crews (fire department, brigade, and fire team) with radiological hazards.

Sandia Laboratories establishes and maintains an effective nuclear explosive safety program which will prevent nuclear explosives from producing a detonation (high explosive or nuclear) as the result of accidental or unauthorized actions. The program is coordinated and monitored by the Nuclear Safety Department, 1230 (at SLL, Systems Science Department, 8340). The organization controlling or performing operations involving a nuclear explosive is responsible for assuring nuclear explosive safety. In conjunction with the System Studies Division, 1231 (at SLL, Nuclear Safety Division, 8345), the concerned organization assures that all procedures and equipment are reviewed and approved prior to implementation.

For effective safety control of non-reactor SNM materials, Sandia Laboratories has established the Sandia Nuclear Criticality Safety Committee (at SLL, the SNCSC subcommittee) for the purpose of auditing Sandia's activities having nuclear criticality safety significance and advising the responsible management on such matter. The role of these committees does not reduce the direct responsibility for criticality safety delegated to Laboratories line management.

CHAPTER X

COMPENDIUM OF RELEVANT NUCLEAR MATERIALS USER FORMS

- Exhibit 1. Form SF 9211-F --- Program and Budget Proposal (DOE Schedule 189)
- Exhibit 2. Schedule DOE 189a --- Program and Budget Proposal, Nuclear Regulatory Research Program
- Exhibit 3. Form DOE 408 --- Forecast of Nuclear Material Requirements
- Exhibit 4. Form SA 6430-RD --- Purchase Requisition
- Exhibit 5. Form SF 3004-C --- Authorization for Redlegation
- Exhibit 6. Form SA 2042-D --- Nuclear and Radioactive Material Transfer
- Exhibit 7. Form SF 6476-N --- Nuclear Material Custodian Inventory Status Card
- Exhibit 8. Form SA 6505-WBA --- Process and Fabrication Request, Short/Sub Work Order
- Exhibit 9. Form SA 6476-A -- Record of Assembly/Disassembly and Movement
- Exhibit 10. Form SA 6476-ND --- Nuclear Materials Storage Justification
- Exhibit 11. Form SF 6951-A --- Property Action (Shipper)
- Exhibit 12. Form SA 6550-EA --- Information for Hazardous Material Shipments
- Exhibit 13. Form RF-43940 --- Authorization to Ship SS or Non-SS Material
- Exhibit 14. Request for Foreign Contract Number and End Purpose Code Table
- Exhibit 15. Form NRC-7 -- Application for License to Export Nuclear Material and Equipment
- Exhibit 16. Form 7525-V -- Shipper's Export Declaration
- Exhibit 17. Form SA 6476-ME -- Modification/Expenditure of Nuclear Materials
- Exhibit 18. Form SA 6476-NG -- Transfer Request

Form SF 9211-F --- Program and Budget Proposal (DOE Schedule 189)

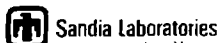
Purpose: To define the scope of work and budget for a proposed program

Prepared by: Requesting Organization:

Submitted to: Budget and Management Information Department. Copy of this form should also be sent to the Safeguards and Technical Security Division.

Line Instructions: Appear on the back of the form.

Exhibit 1



PROGRAM AND BUDGET PROPOSAL

SCHEDULE 189

PROGRAM

1 CONTRACTOR SANDIA LABORATORIES		CONTRACT CODE NO. (29 1) 789	
2 PROJECT TITLE		189 NO	
3 BUDGET ACTIVITY NO		4 DATE PREPARED	
5 FREQUENCY OF PROGRESS REPORTING MONTHLY                      SEMI ANNUAL  QUARTERLY                      ANNUAL		6 WORKING LOCATION ALBUQUERQUE                      TUCUMPH  OTHER	
7 PERSON IN CHARGE  PRINCIPAL INVESTIGATOR(S)		8 PROJECT TERM FROM                                      TO	
		NEW WORK                      ESTABLISHED PROGRAM	
9 MAN YEARS (NO FRACTIONS)		FY 19	FY 19
a. SCIENTIFIC			
b. OTHER DIRECT			
<i>TOTAL DIRECT</i>			
10 FUNDING (DOLLARS IN THOUSANDS)			
a. OPERATING COSTS (BUDGET OUTLAYS)			
(1) LOADED SALARIES*			
(2) MATERIALS SERVICES SUBCONTRACTS			
(3) OTHER DIRECT CHARGES			
4) TOTAL OPERATING COSTS (BO)			
b. OBLIGATIONAL (BUDGET) AUTHORITY FOR OPERATIONS			
(1) FORWARD FINANCING (1 - SUBSEQUENT YEAR COSTS)			
(2) EST. OPEN COMMITMENTS - END OF 1 <sup>st</sup> QTR. OF SUBSEQUENT YEAR			
(3) TOTAL PRE FINANCING (1 + 2)			
14. LESS UNJUSTIFIED BA CARRYOVER FROM PRIOR YEAR			
15. NET CHANGE IN PRE FINANCING (3 - 14)			
16) OBLIGATIONAL AUTHORITY (BA) REQUIRED (a/4) + b/15)			
OBLIGATIONS FOR CAPITAL EQUIPMENT NOT RELATED TO CONSTRUCTION			
APPROVALS:	CASE MANAGER	ORG 1240 BUDGET	DIRECTOR
INITIALS DATE			SPECIAL APPROVAL (DESIGNATE)
			VICE PRESIDENT

\* INCLUDES INDIRECT EXPENSE ALLOCATION

NOTE: BA - BUDGET AUTHORITY; AUTHOR. TY. 15 - NEAR CAPITAL AND COMMIT. PURCHASE ORDERS.  
BO - BUDGET OUTLAYS, OPERATING COSTS.

SI 4211-F (6-77)



Instructions for preparing Schedule 189 (Item No.)

- 1 Preprinted
- 2 189 number assigned by ERDA through Organization 3240
- 3 Budget activity no. assigned by ERDA through 3240
- 4 10 a Self explanatory.

10b The amount of budget authority obligational authority (BA) required by a case during a fiscal year is the arithmetic addition of two components: (1) costs for the budget year (10a(4)), and (2) the net change in *prefinancing requirements* from one year to the next (10b(5)). The net change in prefinancing is determined by following steps one through five under item 10b.

(Use continuation sheet for following items no. 13-20)

- 11 Where the work clearly has application to a specific reactor concept, the reactor concept shall be noted, regardless of the budget activity number.
- 12 This item should be completed only when the work consists of materials research and the information should include the principal material or alloy under investigation.
- 13 List all publications published or submitted and papers presented during the preceding 12 month period (FY 19PY), and all proposed publications including books, monographs, and symposia planned for FY 19CY and FY 19BY. This is to be exclusive of topical or progress reports submitted to ERDA.
- 14 The scope should be written by the principal investigator and describe the project in specific terms in approximately 400 words. It should describe the objectives of the project, the technical approach and the applications of the results.
- 15 Indicate the relationships to other projects under way by the contractor as well as projects being conducted by others.
- 16, 17, and 18. Describe briefly the actual and expected results in each of the three years concerned.
- 19 Where the project requires expenditures for materials, subcontracts or equipment which is major in cost or unusual in nature, such items should be described, the cost estimate given and an explanation of the reasons for and users of such items submitted.
- 20 If the project is expected to provide information leading to a proposed construction project, describe such project and list the estimated dates and amounts of funds to be obligated.

NOTE Use 189a for Reactor Development Program  
Use 189c for Waste Management and Waste Transportation Programs  
Refer to ERDA Manual 1301, Part II, Section D.12, for further detailed instructions.

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Schedule DOE 189a --- Program and Budget Proposal,  
Nuclear Regulatory Research Program

Purpose: To supplement DOE Schedule 189 with detailed material requirements.

Prepared by: Requesting organization.

Submitted to: Budget and Financial Planning Department. A copy of this form should also be sent to the Safeguards and Technical Security Division.

Line Instructions: Refer to the line instructions on the back of DOE Schedule 189 (Form SF 9211-F).

Exhibit 2.

PROGRAM AND BUDGET PROPOSAL  
**NUCLEAR REGULATORY RESEARCH PROGRAM**

FIN/189# NO:

DATE:

1. BUDGET ACTIVITY NO.:	2. OFFICE:	3. PROJECT TITLE:	
4. METHOD OF REPORTING: <input checked="" type="checkbox"/> 1. MONTHLY LTR. <input type="checkbox"/> 4. ANNUAL <input checked="" type="checkbox"/> 2. QUARTERLY <input type="checkbox"/> 5. OTHER: <input type="checkbox"/> 3. SEMIANNUAL		5. PERSON IN CHARGE:    PRINCIPAL INVESTIGATOR(S):	
6. CONTRACTOR:		7. WORKING LOCATION CITY:	8. STATE:
9. TYPE: <input type="checkbox"/> 1. INDUSTRIAL <input type="checkbox"/> 4. GOVERNMENT <input type="checkbox"/> 2. ERDA LAB <input type="checkbox"/> 5. OTHER NONPROFIT <input type="checkbox"/> 3. EDUCATIONAL		10. CONTRACT NO.:	11. TASK NO.:
12. CONTRACT TERM BEGIN: MONTH    DAY    YEAR FROM <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/>		13. CONTRACT TERM END: MONTH    DAY    YEAR TO <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/>	
14. TERMINATION DATE OF FUNDING MONTH    DAY    YEAR <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/>			
15. MAN YEARS	FY 1977	FY 1978	FY 1979
Scientific			
Other Direct			
Total Direct (No Fractions)			
16.a PROGRAM SUPPORT OBLIGATIONS			
a) Direct Salaries			
b) Materials & Services			
c) Subcontracts			
d) Other Direct			
Total Direct Costs			
16.b EQUIPMENT			
e) Indirect Costs			
f) Fee			
Total (in Thousands)			
Equipment Obligations (in Thousands)			
Equipment Costs (in Thousands)			

Form DOE 408 --- Forecast of Nuclear Material Requirements

Purpose: To provide forecasts required by the DOE for selected nuclear materials and boron-10. Materials to be forecast and the reporting units as follows:

<u>Material Type</u>	<u>Material To Be Forecast</u>	<u>Reporting Units</u> <sup>3</sup>
Enriched uranium	$^{235}\text{U}$ Isotope	
Normal uranium	Total U <sup>1</sup>	
Plutonium	Total Pu	Nearest whole kilogram
$^{233}\text{U}$	$^{233}\text{U}$ Isotope	
Heavy Water ( $\text{D}_2\text{O}$ )	$\text{D}_2\text{O}$ <sup>1,2</sup>	
$^{10}\text{B}$	$^{10}\text{B}$	
$^{238}\text{Pu}$	$^{238}\text{Pu}$ Isotope	Nearest whole gram
Tritium	Tritium	

<sup>1</sup>Quantities of less than 100 kilograms on a project need not be forecast

<sup>2</sup>Conversion of  $\text{D}_2\text{O}$  equivalent is accomplished by multiplying  $\text{D}_2$  weight by 5.

<sup>3</sup>Do not make entries for any amount of material rounding to less than one reporting unit.

Prepared by: Director of using organization on or before December 1 of each year.

Submitted to: Nuclear Materials Manager, Safeguards and Technical Security Division.

Exhibit 3.

FORM NEC 408  
(REV 9-73)

U.S. ATOMIC ENERGY COMMISSION

FORECAST OF NUCLEAR MATERIAL REQUIREMENTS

PAGE \_\_\_\_\_

IBR NO. 

1	2	3	4	5
---	---	---	---	---

 PROJECT NO. 

6	7	8	9	10	11	12	13	14	15
---	---	---	---	----	----	----	----	----	----

MATERIAL TYPE 

1	2	3	4	5	6	7	8	9	10
---	---	---	---	---	---	---	---	---	----

 U 236 2 Pu 3 U 233 4 Pu 238 5 U 235 6 U (Normal) 7 Tritium

DATE \_\_\_\_\_

PROJECT TITLE \_\_\_\_\_

QUARTERLY FORECASTS

REPORTING ORGANIZATION \_\_\_\_\_

ENTRY TYPE	CODE	WT% OR PPM RANGE				SPEC. ABBV. CODE	RETURNING FORM CODE	ESTIMATED BEGINNING INVENTORY FIRST FY	FY				FY				P OR F	FC																																															
		LOWER	UPPER	OR SINGLE	RANGE				QTR 1	QTR 2	QTR 3	QTR 4	QTR 1	QTR 2	QTR 3	QTR 4																																																	
		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

ANNUAL FORECASTS

ENTRY TYPE	CODE	WT% OR PPM RANGE				SPEC. ABBV. CODE	RETURNING FORM CODE	FY				FY				P OR F	FC																																																
		LOWER	UPPER	OR SINGLE	RANGE			FY	FY	FY	FY	FY	FY	FY	FY																																																		
		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

Line Instructions:

189 No.: Applies only to Division of Reactor Research and Development projects for which Schedule 189a has been submitted to Headquarters.

Project No.: Furnished by the Nuclear Materials Manager.

Project Title: Furnished by the Nuclear Materials Manager.

Reporting Organization: Requesting organization.

Entry Type, Code:

<u>Type</u>	<u>Code</u>
Beginning Inventory	1
Withdrawals	2
Unirradiated Returns	3
Irradiated Returns	4
Transfers In	5
Transfers Out	6
Burnup and Losses	7
Formation	8
Launch	9
Ending Inventory	0

The following are the definitions of the entry types to be included in block 17:

Beginning inventory -- The estimated inventory assigned to the project number as of the first fiscal year in the forecast period. All quantities assigned to the project should be included in this inventory irrespective of location.

Withdrawals -- The movement of material from Production Program (-BXXXX- projects) to non-Production Program (non -BXXXX- projects) when looked at from the side of the receiver. Material to be obtained by DOE contractors under DOE lease agreements are considered to be withdrawals.

Returns -- A transaction looked at from the side of the shipper which reflects the movement of material from non-Production Program (non -BXXX- projects) to Production Program (-BXXXX- projects). Includes processed scrap

to be sent to Production Program by DOE contractors generating the scrap under DOE lease agreements.

Unirradiated returns -- Material which in its existing form has not been subjected to reactor irradiation.

Irradiated returns -- Material which in its existing form has been subjected to reactor irradiation.

Transfers in -- Material obtained for a project from another project but excludes material obtained as a result of "withdrawals". Includes materials obtained from other federal agencies, foreign countries, or private ownership. Material obtained from another location without a change in project number is not considered to be a transfer in.

Material obtained by DOE from a licensee holding the material under a DOE lease agreement is a "transfer in" if the material was not obtained by the licensee for DOE contract work; if the material was obtained by the licensee for DOE contract work, the movement of material is not a transfer in.

Transfer out -- Material removed from one project and provided to another project but excludes materials moved as a result of "returns". Includes materials provided to other federal agencies, foreign countries, or to domestic companies for private use. Material sent to another location or another contractor without a change in project number is not a transfer out.

Burnup and losses -- Consists of processing losses, fabrication losses, test losses, discards, burials, losses due to recovery, irradiation, and decay, whether occurring at DOE operating contractors or under lease agreement where the material is held for DOE contract work.

Formation -- Material produced as a result of irradiation of other materials, e.g., U-233 or Pu produced in non-Production Program reactors.

Launch -- Material removed from inventory as a result of rocket launch into space, e.g., Pu-238 SNAP units.



Ending inventory -- Inventory at the end of each fiscal year in total for project (irrespective of assay) calculated by adding receipts to the beginning inventory and subtracting all removals. For the first two fiscal years, enter the ending inventory in 4th quarter data field.

Weight Percent or PPM Range:

Enter assay for each entry type, except for the ending inventory (Code 0). With the exception of Entry Type Code 0 (Ending Inventory), assays shall be entered for each type, i.e., beginning inventory, withdrawals, returns, etc., as follows:

<u>Material Reported</u>	<u>Assay Data</u>
U-235	Wt % U-235 to nearest 0.1%
Pu	Wt % Pu-240 to nearest 0.1%
U-233	Ppm U-232 in uranium <sup>1</sup>
Pu-238	Wt % Pu-238 to nearest 0.1%
Normal U	Do not enter assay data
D <sub>2</sub> O	Do not enter assay data
Tritium	Do not enter assay data

<sup>1</sup>Column 23 does not indicate tenths when assay is in parts per million (ppm) U-232; therefore, last digit of ppm should appear in column 23.

Single assays shall be shown in blocks (21-23). Ranges of assays may be shown by using blocks (18-20) for the lower assay and blocks (21-23) for the upper assay. Ranges of assays should be avoided unless absolutely necessary. In particular, they should be avoided to describe beginning inventories (Entry Type Code 1). Use of assay ranges for withdrawals during the first two fiscal years will be interpreted as meaning that any material within the indicated assay range is acceptable. Weight percent should be shown for entries identified as burnup and losses (Entry Type Code 7). For material consumed in a reactor, enter the weight percent of the material loaded into the reactor prior to irradiation. Assays should be right adjusted, i.e., entries start at

right and work left. A range of 5 to 50 ppm U-232, for example, would be shown as:

Withdrawals Form Code:

<u>Code</u>	<u>Form</u>
1	Hexafluoride
2	Nitrate
3	Metal
4	Dioxide
5	Other

Spec. Assay Code:

To be entered for irradiated U-235 returns, Pu withdrawals and returns, and D<sub>2</sub>O withdrawals and returns as follows:

Irradiated U-235

<u>Code</u>	<u>% U-236</u>	<u>Code</u>	<u>% Pu-241</u>	<u>% Pu-238</u>
01	< 1	22	2 < 3	< .05
02	1 < 2	23	3 < 4	< .05
03	2 < 3	24	4 < 5	< .05
04	3 < 4	25	5 < 10	< .05
05	4 < 5	26	10 < 15	< .05
06	5 < 6	27	15 & above	< .05
07	6 < 7	28	< 1	.05 - .10
08	7 < 8	29	1 < 2	.05 - .10
09	8 < 9	30	2 < 3	.05 - .10
10	9 < 10	31	3 < 4	.05 - .10
11	10 < 11	32	4 < 5	.05 - .10
12	11 < 12	33	5 < 10	.05 - .10
13	12 < 13	34	10 < 15	.05 - .10
14	13 < 14	35	15 & above	.05 - .10
15	14 & above	36	< 1	> .10
		37	1 < 2	> .10
		38	2 < 3	> .10
		39	3 < 4	> .10
		40	4 < 5	> .10
		41	5 < 10	> .10
		42	10 < 15	> .10
		43	15 & above	> .10

Pu Withdrawals and Returns

<u>Code</u>	<u>% Pu-241</u>	<u>% Pu-238</u>
20	< 1	< .05
21	1 < 2	< .05

D<sub>2</sub>O Withdrawals and Returns

<u>Code</u>	<u>µCi Tritium/ml</u>
50	< .00005
51	.00005-30
52	> 30

Returns Form Code:

For returns of irradiated and unirradiated U-235, normal uranium, PU, U-233, and Pu-238, enter the three-character classification code established by American National Standards Institute (ANSI) to designate major grade and subgrade. (Although the ANSI codes were established for unirradiated scrap, in this instance, they should be applied to irradiated materials also.)

Estimated Beginning Inventory First FY:

On the line reflecting beginning inventory (Entry Code 1), enter the estimated inventory for the project, regardless of location, as of the first day of the first fiscal year to which the forecast applies. Include material being processed or fabricated for the project which is held under Lease Agreements. Judgment should be used so that materials of only slight differences in assay, say with one percent U-235, Pu-240, or Pu-238, may be combined and reported as a single quantity with a single assay rather than a range. All entries of quantities shall be right-adjusted.

Remaining forecasts (Qtr. 1, Qtr. 2, etc.) are to be entered similarly. Enter appropriate quantities for each entry type (with the exception of beginning inventories which are entered in blocks 30-34) for each quarter for the first two fiscal years and annually for the remaining 10 fiscal years. In the blank next to "FY" insert the two-character number reflecting the appropriate fiscal year, e.g., 75, 76, 77, etc. Twelve entries should be made to reflect consecutive fiscal years of the forecast period. All entries of quantities shall be right-adjusted.

P or F:

Enter P (probable - probability 50%) or F (firm) to indicate the degree of probability of the forecast for withdrawals or returns only.

Column 76:

For "transfers in" (Code 5) and "transfers out" (Code 6) only, enter "1" if the transfer is to occur within the allotment, or "2" if the transfer is to occur between two different allotments.

Columns 77-79:

No entries are to be made in these blocks for quarterly forecasts.

NOTE:

The original of materials identified as "transfers in" and the destination of materials identified as "transfers out" should be noted at the bottom of the back of each applicable page. For materials identified as "transfers in," show the project number from which the material is to be obtained. For "transfers out," show the project number to which the material will be provided.

Form SA 6430-RD --- Purchase Requisition

Purpose: To procure radioactive and nuclear materials.

Prepared by: Requesting organization.

Submitted to: Safeguards and Technical Security Division for special approval. This form must include the total amount of accountable material required (which must also have been forecast), as well as the disposal procedures for scrap generated during processing.

Line Instructions: Appear on the back of the form.



## INSTRUCTIONS FOR PREPARATION OF PURCHASE REQUISITION

1. Security Class. - Applicable security classification abbreviation (e.g., U for unclassified). If not applicable (e.g., *etc.*), enter "N".
2. Code Designator - Bldg 1 code as assigned by Purchase Service organization.
3. *Initial* - The initial of *first* name and last name, omitting spaces between initials (e.g., JOPotter).
4. Supply Source - Unit code for changes, small value orders, orders under RDA's, purchase requisitions, or contract Schedule, and specialty designated documents. Include complete mailing address. When more than one address is required, place information at end of requisition as a note to the buyer.
5. Supply Requirement - If needed, insert "C" in block.
6. Receiving Code and Receiving Report Distribution - See SLI 6410, App. A.
7. Receiving Material - Insert number corresponding to correct address shown in the Destination Code box. If not known to Portland AFB, use other than Receiving Section, Bldg. 894, use code 2 and insert proper location. If location is other than those listed, use code 5 and insert complete address at end of requisition.  
*Example:*  
Material to Mason & Hanger - Spas Mason Co.  
Pantex Plant  
St. Francis (Amarillo), Texas
8. Description - Organization, building, room, and name.
9. Item Number - Sequentially number each item, 1, 2, 3, etc.
10. Quantity - Quantity or 1 Unit of Case.
11. Material Services - Description of the item (include S.N., serial number, S-number, D-number, etc.).
12. Accounting Priority - Cross out DD-E-2 and insert applicable priority, as necessary.
13. Special Project - Insert special code such as Program title.
14. Case Number - Insert 7-digit case to be charged.
15. Subclass - Insert sub-item accounting subclass (See SLI 9014).
16. Org. Number - Charging organization (Precede with zero as 01215).
17. Item & Qty - Item and quantity to which case applies. Insert "all" if only one case is being charged.
18. C.C. - Enter 0 (zero) for new amounts and increases, enter "M" for decrease.
19. Est. \$ Amount - Dollar amount must contain 7 digits with leading zeros (e.g., 0001565).
20. Cost Forecast Date(s) - Estimated payment date for each line of classification. The date is to be the last day of month for estimated delivery date(s). E.g., 06/30/74, 08/31/74.
21. Routing Approval - Supervisor initials prior to releasing requisition for routing.
22. Accounting Certification - Approval of accounting classification performed after requisition has received all applicable approvals and has been forwarded to Accounting.
23. Accounting Title - To be completed by accounting organization after requisition is approved and forwarded.
24. Supplier Code - Insert 6-digit supplier code when supplier is known.
25. Buyer Code - Insert 3-digit buyer code.
26. Equip. Subcase - For plant equipment requisitions only. Insert 3-digit plant equipment code (sub-subcase).
27. Description - Brief description or title for each equipment job number. Maximum of 23 characters.
28. Preliminary Approvals - Enter appropriate organization numbers.
29. Special Approval - See SLI 6430.4 and/or 6550.
30. Executive Approval - See SLI 9041.
31. Total \$ Amount - Total \$ value of order (in cents, e.g., 1565). Must equal all amounts entered in item 19 above.

NOTES - Completion of shaded areas (ship via, buyer's name, commodity class, etc.) by the originator is not required.

When completed, forward to Purchase Service Section or other applicable Supervisor.

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Form SF 3004-C --- Authorization for Redelegation

Purpose: To designate a custodian and alternate custodian to control and inventory materials within a material balance area.

Prepared by: Designated custodian/alternate custodian.

Submitted to: Safeguards and Technical Security Division.

Line Instructions:

Nature of Authority: Nuclear Materials Custodian/  
Alternate Custodian.

Limit: Not required

Approval for Redelegation: Director's signature.

Signature Accepted: To be signed by Nuclear  
Materials Representative,  
Safeguards and Technical  
Security Division.

Exhibit 5,

SF 3004-C(2-74) **AUTHORIZATION FOR REDELEGATION**

NAME (Print or Type)	DEPT	TEL EXT	DATE
ORGANIZATION		TITLE	
SIGNATURE (MUST BE FULLY WRITTEN)		INITIALS (Signed)	
NATURE OF AUTHORITY		LIMIT	
APPROVAL FOR REDELEGATION	SIGNATURE ACCEPTED BY		
DATE	DATE		
OFFICE (CERTIFICATE NUMBER) ORGANIZATION ACCEPTING SIGNATURE			

Form SA2042-D --- Nuclear and Radioactive Material Transfer

Purpose: To issue, turn in, or otherwise transfer radioactive and nuclear materials.

Prepared by: Sending organization.

Submitted to: Nuclear and Explosives Materials Control Section.

Distribution: White (original - Receiving custodian (if received by an employee other than the custodian/alternate custodian, that employee is responsible for remitting the original copy to the custodian).

Yellow - Nuclear Materials Control Section

Green/Pink - Safeguards and Technical Security Division

Goldenrod - Originating Custodian

Exhibit B.

SA 2042 0112 74

NUCLEAR AND RADIOACTIVE MATERIAL  
TRANSFER

No. 05450

FROM MBA <input type="checkbox"/> BLDG <input type="checkbox"/> ORG <input type="checkbox"/> RM/BIN <input type="checkbox"/>	TO MBA <input type="checkbox"/> BLDG <input type="checkbox"/> ORG <input type="checkbox"/> RM/BIN <input type="checkbox"/>
--	--

- Check one:  
 Internal  
 Storage  
 Binial  
 Material  
 Shipping

Assembly Number (if applicable)				
Line No.	Serial Number	Descriptor	Description	
01				
02				
03				
04				
05				
06				
07				
08				
09				
10				
11				
12				
13				
14				

Remarks: \_\_\_\_\_

Transferred from \_\_\_\_\_ SIGNATURE \_\_\_\_\_ MO. / DA. / YR. \_\_\_\_\_ TIME \_\_\_\_\_

Accepted by \_\_\_\_\_ SIGNATURE \_\_\_\_\_ MO. / DA. / YR. \_\_\_\_\_ TIME \_\_\_\_\_

Moved by \_\_\_\_\_ SIGNATURE \_\_\_\_\_ MO. / DA. / YR. \_\_\_\_\_ TIME \_\_\_\_\_

DISTRIBUTION: WHITE - RECEIVING CUSTODIAN, YELLOW - N.M. CONTROL DIV., GREEN/PINK - N.M. MANAGEMENT DIV., GOLDENROD - ORIGINATING CUSTODIAN

Form SF 6476-N --- Nuclear Material Custodian Inventory Status Card

**Purpose:** To control material within a material balance area.

**Prepared by:** Custodian.

**Comment:** Use of this form by the custodian is optional.

**Submitted to:** Maintained by custodian as a record of accountable material.



Form SA 6505-WBA --- Process and Fabrication Request,  
Short/Sub Work Order

Purpose: To provide specifications for machining of depleted uranium.

Prepared by: Requesting organization.

Submitted to: Mechanical Processing Department (Toxic Shop).





Form SA 6476-A --- Record of Assembly/Disassembly and Movement

Purpose: To document transactions in which parts comprised of or containing SS material are assembled, in which assemblies containing SS material are disassembled, or in which assemblies are being shipped.

Prepared by: Using organization personnel (and signed by the division supervisor)

Submitted to: Safeguards and Technical Security Division (to update the computer master file).

NOTE: Originator is also responsible for supplying a completed copy of this form to the accountable custodian in order to update material balance area records.

Line Instructions:

Computer Reference: 741 Reference as stated on transfer document (Form SA 2042-D).

Comment:

This form must accompany the shipper (Form SF 6951-A whenever assemblies are being shipped

Exhibit 9.

SA 6476 A(6 77)

DATE SUBMITTED: \_\_\_\_\_

RECORD OF ASSEMBLY/DISASSEMBLY AND MOVEMENT \_\_\_\_\_

TO: NUCLEAR MATERIALS MANAGEMENT SECTION - 3414/BLDG. 892

NUCLEAR MATERIAL IN MY CUSTODY HAS BEEN ASSEMBLED OR DISASSEMBLED AS FOLLOWS.

A. ASSEMBLY

1. ASSEMBLY NUMBER AND UNIT DESCRIPTION \_\_\_\_\_

2. SERIAL NUMBERS OF CONTAINED NUCLEAR MATERIAL PARTS	DESCRIPTION	COMPUTER REFERENCE (EXAMPLE: AUA 000170 02)
---	-------------	---

B. DISASSEMBLY

1. DISASSEMBLED FROM (ASSY NUMBER AND UNIT DESCRIPTION) \_\_\_\_\_

2. SERIAL NUMBERS OF DISASSEMBLED NUCLEAR MATERIAL PARTS	DESCRIPTION	
--	-------------	--

3. COMPUTER REFERENCE OF ASSY. \_\_\_\_\_

\_\_\_\_\_  
NUCLEAR MATERIALS RESPONSIBLE DIVISION SUPERVISOR

C. MOVEMENT

1. THIS MATERIAL WILL BE MOVED FROM \_\_\_\_\_ TO \_\_\_\_\_

2. DEPARTURE DATE \_\_\_\_\_

3. RETURN DATE \_\_\_\_\_

4. REMARKS \_\_\_\_\_

Form SA 6476-ND -- Nuclear Materials Storage Justification

Purpose: Owner MBA justification for material transferred to storage.

Prepared by: Owner MBA division supervisor requesting storage.

Approved by: Owner MBA division supervisor, department manager, or director,  
depending upon the length of storage.

Submitted to: Nuclear and Explosives Materials Control Section supervisor.



Form SF 6951-A --- Property Action (Shipper)

Purpose: To ship radioactive and nuclear materials.

Prepared by: Requesting organization.

Submitted to: Nuclear and Explosives Materials Control Section.

This form, along with "Information for Hazardous Material Shipments" (Form SA 6550-EA) and, when assemblies are shipped, "Record of Assembly/Disassembly and Movement" (Form SA 6476-A), must accompany all materials transferred to the Nuclear Material Section, Building 867 south, for shipment.

Distribution: Indicated on individual copies of form.

Line Instructions: Appear on the back of the form.



**INSTRUCTIONS FOR PREPARATION OF PROPERTY ACTION FORM (PAF)**

**DETERMINING THE TYPE OF MOVE (See lower left corner)**

**WITHIN TECH AREA** For moves with no gate exit involving calibration or repair, storage in a method, Return Designator Code, place Gate Pass (trip ply) in mail to Property Management Org. Remaining plus go with material. (If number to check, Within Tech Area Check 1)

**PROPERTY PASS** Use when full property is moving to another Control Location, but the property is to remain under the control of the individual authorized to remove it and be returned within 30 days. Follow instructions on label in 1. For the property involved in a Sandia property for which Sandia is not accountable, the user's personal name and contact information do not require a Property Pass. Return Designator Code, complete by signing property to gate. (Send U1 to Copy (Ply 3) to gate) when items are returned to an SLA area. (Check Property Pass Box 1)

**SHIPMENTS** - Removals not meeting the above criteria are to be processed as shipments which may require a pass and should be referred to the Property Support Section or Purchase Analyst upon receipt to the location. (Check Shipment Box 1)

**SPECIAL NOTES**

- On hand - any shipments, the shipment authorization (yellow ply 3) is to be forwarded to the shipping organization by the originator prior to gate exit.
- For further information on movement of property see SLTs 6950, 6940 1, 6950 2, 6950 3, 6940 4.
- A sample shipping document appears below.

For non Sandia destination insert supplier code or 3 to 6 character alphanumeric for site.

Consultant's name when used (i.e. contractor)

If not SLA, address of and insert proper prefix

Supplement Request (See the Home of Contract's Prefix Code for the Contract's Prefix Code) For Example: 101 for the Property, 101 for the Property, and 101 for the Property. Request Number is assigned by Ship organization prior to gate exit.

Address required for shipments and non Sandia destination only

PROPERTY ACTION

AD1765

J Allen

200058 C 138507

2701 2936

AMIAN PRODUCTS CORP. 19409 SAN LUCIE RD CAMEL, NEW JERSEY 08109

1/880/A9 1912 BANNER 3058 1 5 78 6 5 78 0031200 75 4421

Identify Hazardous and special materials by inserting proper box here

Insert "Y" if hazardous item

Insert "N" if non-hazardous item

Insert "Y" if an armed security guard escort is required for movement of items in local security areas, and "N" (No.) if escort not required (See SLT 6950 4)

Reference memorandum, division request, or other authority for shipment

Shipment Request (See the Home of Contract's Prefix Code for the Contract's Prefix Code) For Example: 101 for the Property, 101 for the Property, and 101 for the Property. Request Number is assigned by Ship organization prior to gate exit.

Amount reflecting a security rate, and not being within any of the other at front

For storage at front, see SLT 6978 and 6971

Movement of non Sandia property items (not for other) for which Sandia is not accountable

Anticipated date of return (1) to be returned per contract with storage with check date

Cumulative qty. shipped over total duration contract related shipment

If courses is required, show material category code

If shipment also fill in this portion

Or contract related shipment buyer approval

Hazardous and other special material require special approval. See SLT 6950-2

The authorized shipping representative's signature is required on all shipments

NOTE: PLEASE USE ORIGINAL SHIPPING CRATES WHEN RETURNING TO SANDIA.

PROPERTY ACTION

AD1765

J Allen

200058 C 138507

2701 2936

AMIAN PRODUCTS CORP. 19409 SAN LUCIE RD CAMEL, NEW JERSEY 08109

1/880/A9 1912 BANNER 3058 1 5 78 6 5 78 0031200 75 4421

CORROSIVE MATERIAL

1 U N 2EA Y BATTERY, ELECTRIC STORAGE WGT 10/100 \$500 \$1000

2 S173426 U N 1EA N CAMERA, PHOTOSONIC \$1500

LAST ITEM

NOTE: PLEASE USE ORIGINAL SHIPPING CRATES WHEN RETURNING TO SANDIA.

U 1 15 78 PER CONTRACT \$2500

TRUCK 015 22367531 2 crates 1035# 100.00

GATE PASS 1

This page intentionally left blank.



Form SA 6550-EA --- Information for Hazardous Material Shipments

Purpose: To accompany shipper (Form SF 6951-A) for shipment of radioactive and nuclear materials.

Prepared by: Organization requesting shipment.

Submitted to: Nuclear and Explosives Materials Control Section.

Line Instructions:

Consultant-Org.-Phone: Employee in the requesting organization responsible for shipment.

Exhibit 12.

SA 656 (A-10-73) INFORMATION FOR HAZARDOUS MATERIAL SHIPMENTS

Date \_\_\_\_\_

REG. NO. (SEE 49 CFR 171.15)	CONSULTANT (OR PHONE)
ITEM NO. (SEE 49 CFR 171.15)	TOTAL QUANTITY
SECURITY CLASS	

Complete the Following Applicable Section.

EXPLOSIVE:  
EXACT NAME OR DESIGNATION \_\_\_\_\_

WEIGHT OR QUANTITY PER UNIT	SELF-CONTAINED?	NET QUANTITY (SEE 49 CFR 171.15)	TYPE OF CONTAINER
	YES NO		

FLAMMABLE LIQUID:  
EXACT NAME OR DESIGNATION \_\_\_\_\_

NET QUANTITY (gal., qt., etc.)	FLASH POINT (determined by std. tests)	TYPE OF CONTAINER (metal can, glass, etc.)
--------------------------------	--	--

FLAMMABLE SOLIDS & OXIDIZING MATERIAL:  
EXACT NAME OR DESIGNATION \_\_\_\_\_

NET QUANTITY (weight or volume)	TYPE OF CONTAINER
---------------------------------	-------------------

ACIDS & OTHER CORROSIVE LIQUIDS:  
EXACT NAME OR DESIGNATION \_\_\_\_\_

NET QUANTITY (gal., qt., etc.)	TYPE OF CONTAINER
--------------------------------	-------------------

BATTERIES, ELECT. STORAGE:  
UNIT WEIGHT \_\_\_\_\_

WET	DRY	SPILLABLE	NON-SPILLABLE	KIND OF ELECTROLYTE
PROTECTED FROM SHORT CIRCUITS?		CHARGED	NON-CHARGED	TYPE OF CONTAINER
YES NO				

COMPRESSED GAS:  
EXACT NAME OR DESIGNATION \_\_\_\_\_

FLAMMABLE?	PRESSURE	TYPE OF CONTAINER	VOLUME OF CONTAINER
YES NO			

POISONOUS ARTICLES: (Poisons, tear gases, irritating substances, radioactive material)  
EXACT NAME OR DESIGNATION \_\_\_\_\_

TYPE OF CONTAINER \_\_\_\_\_

SS MATERIAL?	TYPE OF RADIATION	NET QUANTITY (curies, millicuries, etc.)	RADIATION LEVEL AT SURFACE OF CONTAINER
YES NO	$\alpha$		

MAGNETIC MATERIAL OR DEVICES:  
WOULD THE MAGNETISM HAVE A SIGNIFICANT EFFECT ON AN AIRCRAFT COMPASS? YES NO

SUPPLEMENTARY INFORMATION: \_\_\_\_\_

Form RF-43940 --- Authorization to Ship SS or Non-SS Material

Purpose: To ship materials to Rocky Flats.

Prepared by: Organization requesting shipment.

Submitted to: Nuclear Materials Representative, Safeguards and Technical  
Security Division.

Line Instructions:

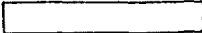
Station: Contractor name.

RIS: Reference identification symbol of contractor.

Signature of Authorized Representative: To be signed by  
the Nuclear Materials Representative Safeguards and  
Technica. Security Division.

Exhibit 13.

CLASSIFICATION



ROCKY FLATS PLANT  
GOLDEN, COLORADO

AUTHORIZATION TO SHIP SS OR NON-SS MATERIAL

DATE \_\_\_\_\_ NO. \_\_\_\_\_

SHIPPER

STATION \_\_\_\_\_ RIS \_\_\_\_\_  
ADDRESS \_\_\_\_\_

REQUESTED SHIPPING DATE \_\_\_\_\_

SIGNATURE OF AUTHORIZED REPRESENTATIVE \_\_\_\_\_

GENERAL MATERIAL DESCRIPTION

SS MATERIAL (CHEMICAL ELEMENT) \_\_\_\_\_ GROSS QUANTITY \_\_\_\_\_

PHYSICAL DESCRIPTION \_\_\_\_\_

CHEMICAL DESCRIPTION \_\_\_\_\_

PRINCIPAL IMPURITIES \_\_\_\_\_

MATERIAL ORIGINATION (PLEASE CHECK)  RF:  SR:  ARHCO:  BNWL:  
 LASL:  LLL:  OTHER \_\_\_\_\_

MATERIAL HISTORY

ARE THERE ANY KNOWN HAZARDS CONNECTED WITH THE HANDLING OF THE MATERIAL? (YES OR NO) \_\_\_\_\_

IF YES, DESCRIBE IN DETAIL ON A SEPARATE SHEET.

HAS THE MATERIAL BEEN EXPOSED TO ANY RADIONUCLIDES, SUCH AS FISSION PRODUCTS, OTHER ACTINIDES, TRITIUM, ETC.? (YES OR NO) \_\_\_\_\_

IF YES, DESCRIBE IN DETAIL ON A SEPARATE SHEET THE CONDITIONS IN WHICH THE MATERIAL WAS EXPOSED. INCLUDE CONCENTRATIONS OF CONTAMINANTS AND METHODS OF ANALYSIS.

HAS THE MATERIAL COME IN CONTACT WITH ANY HAZARDOUS MATERIAL OR UNDERGONE UNUSUAL PROCESSING OR TESTS? (YES OR NO) \_\_\_\_\_

IF YES, DESCRIBE IN DETAIL ON A SEPARATE SHEET THE HAZARDOUS MATERIAL, PROCESSING OR TESTS. DETAIL RADIATION OR CONTAMINANT LEVELS.

WHAT IS THE FORM OF THE MATERIAL? \_\_\_\_\_

SIGNATURE AND PHONE NUMBER OF SHIPPER'S CONTACT  
REGARDING CONTAMINANT OR RADIATION LEVELS \_\_\_\_\_  
SIGNATURE \_\_\_\_\_ PHONE \_\_\_\_\_

METHOD OF PACKAGING

OUTSIDE CONTAINER TYPE \_\_\_\_\_ APPROX. NO. \_\_\_\_\_

INSIDE CONTAINER TYPE \_\_\_\_\_ APPROX. NO. \_\_\_\_\_

OTHER CONTAINER INFORMATION \_\_\_\_\_

SPECIAL PRECAUTIONS TO BE OBSERVED WHEN OPENING THE CONTAINER(S) \_\_\_\_\_

RF RECEIVING APPROVAL

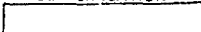
REVIEWED FOR PROCESS COMPATIBILITY \_\_\_\_\_ AUTHORIZED TECHNICAL REPRESENTATIVE \_\_\_\_\_ DATE \_\_\_\_\_

REVIEWED FOR HEALTH, SAFETY & ENVIRONMENT \_\_\_\_\_ RADIATION MONITORING REPRESENTATIVE \_\_\_\_\_ DATE \_\_\_\_\_

APPROVED FOR SHIPMENT ON \_\_\_\_\_ BY \_\_\_\_\_ AUTHORIZED SS REPRESENTATIVE \_\_\_\_\_ DATE \_\_\_\_\_

ROCKY FLATS  
RESPONSIBLE PERSON \_\_\_\_\_

CLASSIFICATION



Form --- Request for Foreign Contract Number

Purpose: To ship materials to a non-U.S. location.

Prepared by: Organization requesting shipment.

Submitted to: Union Carbide Corporation  
CSD/ORGDP  
Nuclear Materials Control  
Mail Stop 19  
P.O. Box P  
Oak Ridge, Tennessee 37830

Line Instructions:

Signed: Supervisor of organization requesting shipment.

Exhibit 14

Subject: REQUEST FOR FOREIGN CONTRACT NUMBER FOR \_\_\_\_\_  
(Name of Foreign Agreement Entity)

Date Prepared: \_\_\_\_\_

To be completed by Data Input Staff at Oak Ridge	
Assigned Contract No.	_____
Date Assigned	_____
End-User RIS Code	_____
Receiver RIS Code	_____

To: Union Carbide Corporation  
CSD/ORGD P Site  
Nuclear Materials Control  
Mail Stop 19  
P. O. Box P  
Oak Ridge, Tennessee 37830

From:

1. Name and Address of Receiver of Material:
2. Type of Transaction (Sale, Lease, etc.):
3. End User (if different from Receiver):
4. End-Use Statement Code \_\_\_\_\_ (Refer to attached End Purpose Code Table)

Exhibit C

5. Material Type(s) and Description (Refer to attached Table):

<u>Material</u>	<u>Code</u>	<u>Element Wt.</u>	<u>Wt. % Isotope</u>	<u>Isotope Wt.</u>
-----------------	-------------	--------------------	----------------------	--------------------

6. Authorization for shipment (Check one):

Export License (NRC)

U.S. Department of Commerce License

DOE - Approved Shipper's Export Declaration

Method of Export Approval Unknown at this Time

General Licensed Material - No Export License or DOE Approval Required.

7. Has contract already been executed? Yes  No   
If yes, on what date?

Signed: \_\_\_\_\_

Date: \_\_\_\_\_

Material Type Codes and Reporting Weight Required

<u>Material</u>	<u>Code</u>	<u>Element Wt.</u>	<u>Wt. % Isotope</u>	<u>Isotope Wt.</u>
Depleted U	10	Total U	U-235	U-235
Enriched U	20	Total U	U-235	U-235
Plutonium-242	40	Total Pu	Pu-242	Pu-242
Americium-241	44	Total Am	-	Am-241
Americium-243	45	Total Am	-	Am-243
Curium	46	Total Cm	-	Cm-246
Berkelium	47	-	-	Bk-249
Californium	48	Total Cf	-	Cf-252
Plutonium	50	Total Pu	Pu-240	Pu-239 + Pu-241
Enriched Li	60	Total Li	Li <sup>6</sup>	Li <sup>6</sup>
Uranium-233	70	Total U	U-232(ppm)	U-233
Normal U	81	Total U	-	-
Neptunium-237	82	Total Np	-	-
Plutonium-238	83	Total Pu	Pu-238	Pu-238
Deuterium	86	D <sub>2</sub> O	-	D <sub>2</sub>
Tritium	87	Total Tritium	-	-
Thorium	88	Total Th	-	-
U in Cascade	89	Total U	U-235	U-235



\*END PURPOSE CODE TABLE

<u>Code</u>	<u>Description</u>
00	Reactor Operations 01 Use as fuel 02 Use as coolant 03 Use in fission counters
10	Critical Facilities 11 Assembly loading of critical and subcriticals 12 Use in subcritical facility 13 Use in critical facility
20	Manufacturing 21 Special material production 22 General manufacturing (non-fuel) 23 Fission counters 24 Materials blending 25 Process development 26 Product evaluation
30	Fuel 31 Fuel test, LWR 32 Fuel test, EBR 33 Fuel test, other 34 Fuel examination 35 Fuel fabrication 36 Fuel enrichment 37 Conversion 38 Reprocessing
40	Instrumentation 41 For instrument material 42 Instrument testing 43 Instrument devices
50	Medical 51 Pacemaker parts 52 Other uses
60	Research & Development 61 Basic research 62 Medical research 63 Enrichment research 64 Reactor operations research

---

\*Use detail code if possible. Otherwise, use general code such as 10, 20, 30, etc.

- 65 Fuel research
- 66 Instrument research
- 67 Conversion research
- 68 Reprocessing research
- 69 Fuel fabrication research
  
- 70
  - 71 General nuclear experiments
  - 72 Physical measurements
  - 73 Irradiation experiments
  - 74 Post irradiation examination
  - 75 Material testing (non-fuel)
  - 76 EBR program development
  - 77 LWR program development
  - 78 Reference material
  - 79 Measurement method evaluation material
  
- 80
  - Material Transfer
    - 81 Return of spare test material
    - 82 Return of previously leased material
    - 83 For later resale/lease
    - 84 Safeguards inspection sample
  
- 90
  - Others
    - 91 Disposal (final waste)
    - 92 Storage (temporary)

Form NRC-7 --- Application for License to Export Nuclear Material and  
Equipment

Purpose: To obtain license for shipment of materials to a  
non-U.S. location in conjunction with a NRC agreement.

Prepared by: Organization requesting shipment.

Submitted to: Assistant Director for Export/Import and  
International Safeguards  
U.S. Nuclear Regulatory Commission  
Washington, D.C. 20555

Line Instructions:

Applicant's reference: NRC agreement name/number.

Authorized Official: Department Manager of organization  
applying for license.

Exhibit 15

FORM NRC-7  
(7-78)  
18 CFR 110

U.S. NUCLEAR REGULATORY COMMISSION

APPROVED BY GAO  
B-188225(R0362)

**APPLICATION FOR LICENSE TO EXPORT NUCLEAR MATERIAL AND EQUIPMENT**  
*(See Instructions on Reverse)*

1. APPLICANT'S USE		e. DATE OF APPLICATION		d. APPLICANT'S REFERENCE		2. NRC USE		e. LICENSE NO.		b. DOCKET NO.	
3. APPLICANT'S NAME AND ADDRESS						4. SUPPLIER'S NAME AND ADDRESS <i>(Complete if applicant is not supplier of material)</i>					
a. NAME						a. NAME					
b. STREET ADDRESS						b. STREET ADDRESS					
c. CITY				STATE		ZIP CODE		c. CITY			
d. TELEPHONE NUMBER <i>(Area Code - Number - Extension)</i>						STATE		ZIP CODE			
5. FIRST SHIPMENT SCHEDULED		6. FINAL SHIPMENT SCHEDULED		7. APPLICANT'S CONTRACTUAL DELIVERY DATE		8. PROPOSED LICENSE EXPIRATION DATE		9. U.S. DEPARTMENT OF ENERGY CONTRACT NO. <i>(If Known)</i>			
10. ULTIMATE CONSIGNEE						11. ULTIMATE END USE <i>(Include plant or facility name)</i>					
a. NAME						11a. EST. DATE OF FIRST USE					
b. STREET ADDRESS											
c. CITY - STATE - COUNTRY											
12. INTERMEDIATE CONSIGNEE						13. INTERMEDIATE END USE					
a. NAME						13a. EST. DATE OF FIRST USE					
b. STREET ADDRESS											
c. CITY - STATE - COUNTRY											
14. INTERMEDIATE CONSIGNEE						15. INTERMEDIATE END USE					
a. NAME						15a. EST. DATE OF FIRST USE					
b. STREET ADDRESS											
c. CITY - STATE - COUNTRY											
16. NRC USE	17. DESCRIPTION <i>(Include chemical and physical form of nuclear material; give dollar value of nuclear equipment and components)</i>					18. MAX. ELEMENT WEIGHT	19. MAX. WT. %	20. MAX ISOTOPE WT.	21. UNIT		
22. COUNTRY OF ORIGIN - SOURCE MATERIAL				23. COUNTRY OF ORIGIN - SNM WHERE ENRICHED OR PRODUCED				24. COUNTRIES WHICH ATTACH SAFEGUARDS <i>(If Known)</i>			
25. ADDITIONAL INFORMATION <i>(Use separate sheet if necessary)</i>											
26. The applicant certifies that this application is prepared in conformity with Title 10, Code of Federal Regulations, and that all information in this application is correct to the best of his/her knowledge.											
27. AUTHORIZED OFFICIAL						a. SIGNATURE			b. TITLE		

U.S. NUCLEAR REGULATORY COMMISSION

INSTRUCTIONS FOR PREPARATION OF APPLICATION FOR LICENSE TO EXPORT NUCLEAR MATERIAL AND EQUIPMENT FORM (NRC-7)

One signed, original of Form NRC-7 must be submitted by the applicant to the Assistant Director for Export/Import and International Safeguards, U.S. Nuclear Regulatory Commission, Washington, D. C., 20555, or delivered in person to the Commission's Offices at 7735 Old Georgetown Road, Bethesda, Maryland or 1717 H Street, N. W., Washington, D. C. All items on this form should be completed, to the extent the information is available at the time the application is submitted.

An applicant for an export license must make full disclosure of all recipients of the proposed export so that a decision on the application may be made with full knowledge of all relevant facts. The name(s) and address(es) of the plant, facility, firm or location where the material may be handled, stored, converted or fabricated and where the material ultimately will be used, together with precise facts concerning the use that will be made of the items to be exported by each intermediate and ultimate consignee must be stated. The materials or equipment to be exported must be fully and accurately described in detail. If more space is needed, attach an additional sheet of paper.

The following is excerpted from the Nuclear Regulatory Commission regulations prescribing procedures and standards for the export and import of nuclear equipment and nuclear material. For the complete codification of NRC's export and import regulations applicants for licenses should refer to Part 110 of Title 10, Chapter 1, Code of Federal Regulations.

Subpart D-Applications for Specific Licenses

§ 110.30 Filing a license application.

(a) A license application shall be filed with the Assistant Director for Export/Import and International Safeguards, U.S. Nuclear Regulatory Commission, Washington, D. C., 20555, or delivered in person to the Commission's offices at 1717 H Street N.W., Washington, D.C. or 7735 Old Georgetown Road, Bethesda, Md.

(b) Except for production or utilization facilities, export license application should be filed on form NRC-7.

(c) An application for a license to export a production or utilization facility or to import nuclear equipment or nuclear material should be filed by letter.

(d) An applicant may file a consolidated license application involving two or more proposed exports of similar equipment or material destined for the same country, provided all the exports will be made within 2 years or other time period as approved by the Commission, and under reasonably similar circumstances.

(e) If an import license application involves equipment or material which is intended for subsequent export, the applicant may simultaneously apply for the appropriate export license. The issuance of an import license does not imply approval of a subsequent export.

(f) Information contained in a previous application may be incorporated by reference.

§ 110.31 General requirements for an export license application.

Each application for an export license shall state:

- (a) Name and U.S. address of applicant;
- (b) Name and address of supplier of equipment or material, if different from the applicant;
- (c) Name and address of ultimate consignee(s);
- (d) Name and address of intermediate consignee(s);
- (e) Date of proposed first shipment;
- (f) Date of proposed completion of final shipment;
- (g) Contractual delivery dates, if established;
- (h) Proposed expiration date of export license; and

(i) End-use of material or equipment by all consignees, intermediate and ultimate, with sufficient detail to permit accurate evaluation of the justification for the proposed export.

§ 110.32 Additional requirements for a nuclear equipment export license application.

An application for a license to export nuclear equipment shall state the following, in addition to the general information specified in § 110.31.

- (a) General description of the equipment;
- (b) For nuclear reactors, the design power level in thermal or electrical watts;
- (c) Name of installation, if known, in which the equipment is to be used;
- (d) Location where the equipment is to be used;
- (e) Date when equipment is needed, broad;
- (f) Total dollar value of all items to be exported under the requested license; and
- (g) A list of the items proposed to be exported. Such list need only identify the items by the categories listed in paragraphs a through e of appendix A.

§ 110.33 Additional requirements for a nuclear material export license application.

Each application for a license to export nuclear material shall state the following, in addition to the general requirement in § 110.31.

- (a) The applicable contract number, if known, of any material supplied under a Department of Energy enrichment lease, or sale contract;
- (b) Where materials are intended for use in production or utilization facility, estimated date of first use, by ultimate or intermediate consignee;
- (c) Chemical and physical form, including, for enriched uranium, the weight percentage of isotopic enrichment, and, for plutonium, the sum of the percentages of Pu-239 content and Pu-241 content;
- (d) Quantity in grams or kilograms (curies for byproduct material) of (1) the material in the form exported, (2) any contained uranium or plutonium, and (3) the contained U-235 in enriched uranium; and
- (e) If known, the country of origin of source and special nuclear material including the country where any special nuclear material was produced.

§ 110.34 Requirements for an import license application.

Each application for an import license shall state:

- (a) Name and U.S. address of applicant;
- (b) Country and installation from which the nuclear equipment or material is being imported;
- (c) Name and address of supplier of the nuclear equipment or material;
- (d) Destination and ultimate use of the nuclear equipment or material;
- (e) Date of proposed first shipment;
- (f) Date of proposed completion of final shipment;
- (g) Chemical and physical form of nuclear material, including, for enriched uranium, the weight percentage of enrichment, and for plutonium, the sum of the percentages of Pu-239 content and Pu-241 content;
- (h) Quantity in grams or kilograms of: (1) the nuclear material in the form imported, (2) any contained uranium or plutonium, and (3) the contained U-235 in enriched uranium;
- (i) Mode of transport of nuclear material and package identification (including IAEA Certificate of Competent Authority number); and
- (j) If known, the country of origin of nuclear material including the country where any special nuclear material was produced.

§ 110.35 Further information for a license applicant.

- (a) The Commission may require further information from the license applicant, if necessary to complete review of the application.
- (b) Each applicant shall file an amendment to his license application whenever there is any substantive change in the information described in his application.

§ 110.36 Withdrawal of a license application.

- (a) An applicant may withdraw his application at any time.
- (b) An applicant shall withdraw an application when it is superseded by a new application or when he no longer intends to use his license or issued.
- (c) The withdrawal of a license application does not authorize the removal of any NRC record from Commission files.

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Form 7525-V --- Shipper's Export Declaration

Purpose: To obtain authorization for shipment of materials  
to a non-U.S. location.

Prepared by: Traffic Management Division.

Submitted to: D. L. Krenz, Director  
Special Programs Division  
DOE/ALO

Exhibit 16

FORM 11C U.S. DEPARTMENT OF COMMERCE - BUREAU OF THE CENSUS - BUREAU OF EAST-WEST TRADE  
7525-V  
4-16-76

**SHIPPER'S EXPORT DECLARATION**  
**OF SHIPMENTS FROM THE UNITED STATES**

Export Shipments Are Subject To Inspection By U.S. Customs Service and/or The Office of Export Control  
**READ CAREFULLY THE INSTRUCTIONS ON BACK TO AVOID DELAY AT SHIPPING POINT**

Form Approved O.M.B. No. 41-10377

**CONFIDENTIAL** - For use solely for official purposes authorized by the Secretary of Commerce. Use for unauthorized purposes is not permitted (Title 15, Sec. 30.91 (a) C.F.R., Sec. 1(c) Export Administration Act of 1969, as amended, P.L. 91-184)

Authentication (When required)

Declarations Should be Typewritten or Prepared in Ink

<b>DO NOT USE THIS AREA</b>			DISTRICT	PORT	COUNTRY (For Customs use only)
1. FROM (For goods exported)		2. METHOD OF TRANSPORTATION (Check one)			
		<input type="checkbox"/> RAIL <input type="checkbox"/> TRUCK <input type="checkbox"/> AIR <input type="checkbox"/> OTHER (Specify)			
2b. EXPORTING CARRIER: If vessel, give name of ship, flag and port number. If air, give name of airline.					

File No. For Customs use only

3. EXPORTER (Principal or agent, if agent)	ADDRESS (Number, street, place, State)
4. AGENT (If applicable) Forwarding agent	ADDRESS (Number, street, place, State)
5. ORIGINATE CONSIGNEE	ADDRESS (Place, country)
6. INTERMEDIATE CONSIGNEE	ADDRESS (Place, country)
7. FOREIGN PORT OF UNLOADING (For vessel and air shipments only)	8. PLACE AND COUNTRY OF DESTINATION (For vessel and air shipments only)

MARKS AND NUM	NUMBERS AND KIND OF PACKAGES, DESCRIPTION OF COMMODITIES, EXPORT LICENSE NUMBER OR GENERAL LICENSE SYMBOL (If useable commodities in sufficient detail to permit verification of the Schedule H commodity numbers assigned. Do not use general terms.)	GROSS WEIGHT IN POUNDS REQUIRED FOR TARE AND AIR SHIPMENTS ONLY	U.S. COMMODITY NO. (Include Commodity Control List date, when required)	SCHEDULE H COMMODITY NO. (When required)	NET WEIGHT IN POUNDS (When required)	CLASSIFICATION SYMBOL	RATE OF DUTY (When required)

9. VALIDATED LICENSE NO.	OR GENERAL LICENSE SYMBOL
10. BILL OF LADING OR AIR WAYBILL NUMBER	11. DATE OF EXPORTATION (Not required for shipments by vessel)

12. THE UNDERSIGNED HEREBY AUTHORIZES TO ACT AS FORWARDING AGENT FOR EXPORT CONTROL AND CUSTOMS PURPOSES (Name and address - Number, street, place, State)

EXPORTER (Name and address - Number, street, place, State) BY (Name and address - Number, street, place, State) SOLELY AUTHORIZED OFFICER OR EMPLOYEE

13. I CERTIFY THAT ALL STATEMENTS MADE AND ALL INFORMATION CONTAINED IN THIS EXPORT DECLARATION ARE TRUE AND CORRECT. I AM AWARE OF THE PENALTIES PROVIDED FOR FALSE REPRESENTATION. (See paragraphs 11(c) and (e) on reverse side.)

SIGNATURE (Duly authorized officer or employee of exporter or named forwarding agent) FOR (Name of corporation or firm, and capacity of signer, e.g. president, export manager, etc.)

**ADDRESS**  
 Declaration should be made by duly authorized officer or employee of exporter or of forwarding agent named by exporter.  
 If shipping weight is not available for each Schedule H item listed in column (11) included in one or more packages, insert the approximate gross weight for each Schedule H item. The total of these estimated weights should equal the actual weight of the entire package or packages.  
 Identify foreign merchandise (freighters) with an "F" and exports of domestic merchandise produced in the United States or changed in condition in the United States with a "D." (See instructions on reverse side.)

**DO NOT USE THIS AREA**





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Form SA 6476-ME --- Modification/Expenditure of Nuclear Materials

Purpose: To obtain prior authorization for modification or expenditure and to provide notice of the actual modification or expenditure.

Prepared by: Using Organizations.

Submitted to: Nuclear Materials Manager in the Safeguards and Technical Security Division.

To: 3434

Date \_\_\_\_\_

MODIFICATION/EXPENDITURE OF NUCLEAR MATERIALS

- A. All modification/expenditure of nuclear materials must have prior approval of DOE/ALO.
    - 1. A yearly authorization to modify/expend nuclear material is obtained in September for the next fiscal year.
    - 2. All nuclear material to be modified/expended that is not included in your yearly authorization must have prior approval by completing section I and returning this form to Org. 3434 (a copy of this form will be returned to you after approval).
  - B. Section II must be completed and returned to Org. 3434 after each modification/expenditure of nuclear material (this section is used to account for, adjust and/or dispose of scrap material).
- Ref: Operating procedures for custodians and users of radioactive and nuclear materials, SAND 77 1936, CH. IX, Sect. 11.

Name \_\_\_\_\_ Org. \_\_\_\_\_ MBA \_\_\_\_\_ Phone \_\_\_\_\_

I. REQUEST TO MODIFY/EXPEND NUCLEAR MATERIAL Case No. \_\_\_\_\_

Approx. Date for modification/expenditure \_\_\_\_\_

Material to be used \_\_\_\_\_

<u>SERIAL NUMBER</u>	<u>DESCRIPTION OF MODIFICATION/EXPENDITURE</u>
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DOE/ALO Approval \_\_\_\_\_ Date \_\_\_\_\_

II. NOTICE OF MODIFICATION/EXPENDITURE OF NUCLEAR MATERIAL

Date of modification/expenditure \_\_\_\_\_

Material used \_\_\_\_\_

<u>SERIAL NUMBER</u>	<u>DESCRIPTION</u>	<u>NO. OF PIECES</u>	<u>SCRAP QTY. ISO. WT.</u>	<u>METHOD QTY. DETERMINED</u>
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Form SA 6476-NG --- Transfer Request

Purpose: To record data received by telephone from custodian's transferring material to another material balance area

Prepared by: Accountability Clerk in the Safeguards and Technical Security Division.

Submitted to: Destroyed following computer input.

Date      /      /     

**TRANSFER REQUEST**

Custodian Requesting Transfer: \_\_\_\_\_

Phone Ext. \_\_\_\_\_

Transfer Document Number: \_\_\_\_\_

Date to be Transferred:      /      /     

Transfer From MBA: \_\_\_\_\_ Bldg.: \_\_\_\_\_ Room: \_\_\_\_\_

Transfer To MBA: \_\_\_\_\_ Bldg.: \_\_\_\_\_ Room: \_\_\_\_\_

Type of Transfer I (Internal), S (Storage), B (Burial), M (Machining), R (Shipment): \_\_\_\_\_

Special Instructions (Size/Weight requiring Special Equipment/Damaged container or Hazardous Material requiring Health Physics Participation, Etc.):

\_\_\_\_\_  
\_\_\_\_\_

Serial Numbers of Material to be Transferred:

_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____