

4-29-67

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FUELS DIVISION - CHEMICAL PRODUCTS
HEMATITE PLANT

PROCEDURE MANUAL
FOR CONTROL OF
SOURCE AND SPECIAL NUCLEAR MATERIALS

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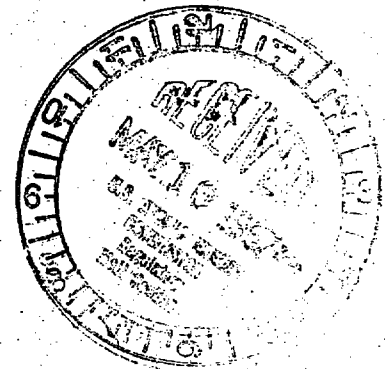
UNITED NUCLEAR
C O R P O R A T I O N

FUELS DIVISION - CHEMICAL PRODUCTS
HEMATITE PLANT

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DATE: APRIL 29, 1967



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A. INTRODUCTION

THIS PROCEDURE MANUAL FOR CONTROL OF SOURCE AND SPECIAL NUCLEAR MATERIALS DESCRIBES THE ORGANIZATION, OPERATIONS, RECEIVING AND SHIPPING, INVENTORY, STORAGE, MEASUREMENTS, AND RECORDS AND REPORTS USED IN AN EFFORT TO MAINTAIN CONTROL OF SOURCE AND SPECIAL NUCLEAR MATERIALS AT THE UNITED NUCLEAR CORPORATION HEMATITE FACILITY AT HEMATITE, MISSOURI, AND IS ISSUED UNDER THE APPROVAL OF THE CHEMICAL PRODUCTS MANAGER.

B. FACILITY ORGANIZATION

THE HEMATITE PLANT IS OPERATED AS PART OF THE FUELS DIVISION, WHICH ALSO INCLUDES PLANTS IN NEW HAVEN AND MONTVILLE, CONNECTICUT, AND WOOD RIVER JUNCTION, RHODE ISLAND. BECAUSE OF THEIR SIMILAR TECHNOLOGIES, THE HEMATITE AND WOOD RIVER JUNCTION PLANTS ARE COMBINED, FOR ADMINISTRATIVE PURPOSES, INTO "CHEMICAL PRODUCTS" HEADED BY A MANAGER REPORTING TO THE DIVISION VICE-PRESIDENT.

THE ORGANIZATIONAL CHART IS SHOWN IN EXHIBIT 1-1.

I. ASSIGNMENT OF RESPONSIBILITY

- A. THE VICE-PRESIDENT OF THE FUELS DIVISION HAS GENERAL OVERALL RESPONSIBILITY FOR THE HEMATITE PLANT.
- B. THE CHEMICAL PRODUCTS MANAGER IS RESPONSIBLE TO THE VICE-PRESIDENT OF THE FUELS DIVISION FOR ALL PLANT OPERATIONS AND ORGANIZATIONAL DEVELOPMENT.
- C. THE DIRECTOR OF LICENSING IS RESPONSIBLE TO THE VICE-PRESIDENT OF THE FUELS DIVISION FOR ESTABLISHING OPERATIONAL POLICY AND THE ADEQUACY OF NUCLEAR SAFETY AND HEALTH PHYSICS CONTROL.
- D. THE PRODUCTION (HEMATITE) MANAGER IS RESPONSIBLE FOR CONTINUED SAFE AND EFFICIENT PLANT OPERATION AND MAINTENANCE IN CONFORMANCE WITH ESTABLISHED POLICIES AND PROCEDURES. THE RECEIVING AND SHIPPING DEPARTMENT IS UNDER HIS CONTROL.
- E. THE PRODUCTION ENGINEERING MANAGER IS RESPONSIBLE FOR ESTABLISHING OPERATIONAL POLICY AND EFFECTIVE CONTROLS IN THE AREAS OF HEMATITE SCRAP RECOVERY AND ALL PHASES OF PROCESS ENGINEERING.
- F. THE QUALITY CONTROL MANAGER IS RESPONSIBLE FOR ESTABLISHING OPERATIONAL POLICY IN QUALITY CONTROL AND IN THE ANALYTICAL LABORATORY.

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- G. THE TECHNICAL DEPARTMENT MANAGER IS RESPONSIBLE FOR THE DEVELOPMENT, DESIGN, CONSTRUCTION, PLANT RENOVATION AND START-UP OF NEW PROCESSES.
 - H. THE ADMINISTRATION MANAGER IS RESPONSIBLE FOR PURCHASING, INDUSTRIAL RELATIONS, PLANT SECURITY, COST AND GENERAL ACCOUNTING, PAYROLL, OFFICE MANAGEMENT, AND NUCLEAR MATERIAL CONTROL (MMC).
 - A. THE NUCLEAR MATERIALS CONTROL REPRESENTATIVE (NMCR) IS RESPONSIBLE TO THE ADMINISTRATION MANAGER FOR ESTABLISHING AND ADMINISTERING A SYSTEM OF MEASUREMENT, RECORDING, AND REPORTING OF ALL SS NUCLEAR MATERIAL. THE SYSTEM COVERS ALL PHASES OF OPERATION - RECEIPT, TRANSFER, PRODUCTION, MATERIAL CONTROL, SHIPMENT, AND LOSS.
 - I. THE FUELS RECOVERY PLANT (RHODE ISLAND) SUPERINTENDENT IS RESPONSIBLE TO THE CHEMICAL PRODUCTS MANAGER FOR ALL ACCOUNTABILITY AND RECOVERY AND PRODUCTION ACTIVITIES AT THE WOOD RIVER JUNCTION PLANT.
-

C. FACILITY OPERATIONS

THE HEMATITE PLANT IS LICENSED BY THE AEC, DIVISION OF MATERIALS LICENSING, FOR RECEIVING, PROCESSING, STORAGE AND SHIPMENT OF SOURCE AND SPECIAL NUCLEAR MATERIALS OF ALL ENRICHMENTS. IT IS AN ESTABLISHED ACCOUNTABILITY STATION UNDER THE OAK RIDGE OPERATIONS OFFICE. IT IS ALSO ESTABLISHED AS AN AEC SUPPLY AGREEMENT FACILITY.

THE HEMATITE PLANT IS ENGAGED IN THE CHEMICAL AND CERAMIC PROCESSING OF SOURCE AND SPECIAL NUCLEAR MATERIALS OF ALL U-235 ENRICHMENTS. THIS INCLUDES THE CONVERSION OF UF_6 TO URANIUM (METAL), URANIUM COMPOUNDS AND URANIUM SOLUTIONS. URANIUM COMPOUNDS SUCH AS UO_2 ARE FURTHER PROCESSED TO THE FORM OF PELLETS AND OTHER CERAMIC SHAPES, AS SPECIFIED BY VARIOUS CUSTOMERS. THIS ALSO INCLUDES THE BLENDING OF URANIUM WITH OTHER MATERIALS SUCH AS ZrO_2 , ThO_2 , ETC. SCRAP AND RESIDUES GENERATED IN THE COURSE OF PROCESSING ARE REPROCESSED FOR RECYCLE OR RETURN TO THE AEC. SCRAP AND RESIDUES ARE ALSO REPROCESSED UNDER CONTRACT BETWEEN UNITED NUCLEAR AND OTHERS.

IN ADDITION, RESEARCH AND DEVELOPMENT IS CARRIED ON FOR THE PURPOSE OF DEVELOPING NEW PRODUCTS AND NEW AND IMPROVED PROCESSES.

THE PLANT IS DIVIDED INTO TWO MAIN PRODUCTION FACILITIES. ONE FACILITY IS USED FOR THE CONVERSION OF UF_6 TO THE REQUIRED COMPOUNDS AND FOR THE CHEMICAL RECOVERY OF SCRAP. THE SECOND FACILITY IS USED FOR THE PROCESSING OF MATERIAL INTO REQUIRED CERAMIC SHAPES. EACH PRODUCTION AREA IS EQUIPPED FOR IN-PROCESS STORAGE. ADDITIONAL STORAGE IS PROVIDED IN A WAREHOUSE AND TWO STORAGE VAULTS. IN ADDITION, THERE IS AN ANALYTICAL LABORATORY AND A RESEARCH AND DEVELOPMENT AREA.

A MORE DETAILED DESCRIPTION OF THE PROCESSING AND FACILITIES IS INCLUDED IN "GENERAL INFORMATION AND PROCEDURES APPLICABLE TO THE HANDLING OF SPECIAL NUCLEAR MATERIAL" ON FILE WITH THE AEC, DIVISION OF MATERIALS LICENSING, UNDER SPECIAL NUCLEAR MATERIAL LICENSE NUMBER SNM-33.

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D. RECEIVING AND SHIPPING

I. RECEIVING PROCEDURES:

A. THE RECEIVING DEPARTMENT

1. INSPECTS CONTAINERS RECEIVED FOR DAMAGE AND/OR MATERIAL LEAKAGE.
2. MAKES A PIECE COUNT.
3. MAKES A GROSS WEIGHT MEASUREMENT OF EACH UNIT.
4. PREPARES A RECEIVING REPORT (EXHIBIT 1-2).
5. FORWARDS THE RECEIVING REPORT AND PACKING LIST TO NMC CLERK.
6. ATTACHES TAGS PROVIDED BY NMC CLERK AND TRANSFERS THE MATERIAL TO STORAGE.
7. MAKES ANY RE-INSPECTION OF THE SHIPMENT, AS REQUESTED BY NMC.

B. NUCLEAR MATERIALS CONTROL (NMC)

1. REVIEWS THE RECEIVING REPORT, PACKING LIST, APPLICABLE ORDERING DATA (OR PURCHASE ORDER OR CONTRACT), AND THE SS MATERIAL TRANSFER FORM.
2. IF THE SHIPMENT IS TO BE ACCEPTED,
 - (A) PREPARES A TAG FOR EACH CONTAINER
 - (B) ENTERS DATA FROM SS MATERIAL TRANSFER FORM INTO THE NMC RECORDS.
3. IF SHIPMENT IS NOT TO BE ACCEPTED,
 - (A) NOTIFIES THE RECEIVING DEPARTMENT AND REQUESTS REINSPECTION.

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- (b) IF A SHIPPER/RECEIVER DIFFERENCE IS VERIFIED,
NOTIFIES THE SHIPPER'S NMC REPRESENTATIVE.
- (c) FURTHER PROCESSING OF THE MATERIAL IS NOT
PERMITTED UNTIL RESOLUTION OF THE S/R DIFFERENCE.

II. SHIPPING PROCEDURES

A. THE PRODUCTION DEPARTMENT

1. UPON PRODUCT QUALITY ACCEPTANCE, THE PRODUCTION
FOREMAN HAS MATERIAL PACKAGED IN ACCORDANCE WITH
STANDARD PACKAGING PROCEDURES.
2. APPLIES A NUCLEAR MATERIALS LABEL TO EACH CONTAINER.
3. PREPARES SHIPMENT REQUEST (EXHIBIT 1-3) AND OBTAINS
APPLICABLE MANUFACTURING ORDER (EXHIBIT 1-4).
4. DELIVERS MATERIAL, SHIPMENT REQUEST AND MANUFACTURING
ORDER TO THE SHIPPING DEPARTMENT.

B. THE SHIPPING DEPARTMENT

1. PREPARES THE PACKING LIST (EXHIBIT 1-5) FROM DATA
OBTAINED FROM THE CONTAINER LABEL(S).
2. AS AN INDEPENDENT CHECK, GROSS WEIGHS EACH CONTAINER.
3. COMPARES PACKING LIST AND SHIPMENT REQUEST. THE TWO
RECORDS MUST AGREE BEFORE THE SHIPMENT IS RELEASED.
4. PACKAGES CONTAINERS IN BIRDCAGES (OR OTHER OUTER
CONTAINERS, IF APPLICABLE), AND COMPLETES ALL ADMIN-
ISTRATIVE REQUIREMENTS INVOLVED IN MAKING A SHIPMENT,
INCLUDING NOTIFYING THE RECEIVER.
5. AFTER DEPARTURE OF SHIPMENT, DISTRIBUTES ALL PAPER
WORK TO NMC.

C. NUCLEAR MATERIAL CONTROL (NMC)

1. CHECKS CORRECTNESS OF PACKING LIST.

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2. ENTERS SHIPMENT DATA INTO NMC RECORDS.
 3. PREPARES APPLICABLE SS MATERIAL TRANSFER DOCUMENT AND DISTRIBUTES ACCORDING TO AEC SPECIFIED DISTRIBUTION.
-

E. INVENTORY

A COMPLETE PLANT PHYSICAL INVENTORY IS TAKEN AT LEAST ONCE EACH YEAR. AT THAT TIME, ALL PRODUCTION ACTIVITIES ARE CURTAILED. A STANDARD OPERATING PROCEDURE (SIMILAR TO EXHIBIT 1-6) IS ISSUED BY THE NUCLEAR MATERIALS CONTROL REPRESENTATIVE TO THE PLANT PERSONNEL, GIVING INVENTORY ASSIGNMENTS AND SPECIFIC INVENTORY INSTRUCTIONS FOR THAT INVENTORY.

ALL CONTAINERS OF SS MATERIAL ARE INVENTORIED. A TAGGING SYSTEM IS EMPLOYED TO VERIFY THAT NO ITEM IS MISSED.

URANIUM ASSAYS ARE DETERMINED BY TYPE OF MATERIAL. IN THE CASE OF PURE MATERIALS, SUCH AS UO_2 , METAL, ETC., STANDARD ASSAYS ARE USED. FOR OTHER TYPES OF MATERIAL, CHEMICAL ASSAY DATA, GAMMA COUNT DATA, PRODUCTION DATA, OR AN ENGINEERING JUDGMENT IS APPLIED TO OBTAIN U AND U-235 CONTENTS OF MATERIAL INVENTORIED.

ALL ITEMS AND TAGS ARE SUMMARIZED, RECORDED AND EXTENDED ON AN INVENTORY DATA SHEET FOR FINAL TABULATION OF THE INVENTORY.

ALL MATERIAL, AT TIME OF INVENTORY, WILL HAVE WEIGHTS, WHEN APPLICABLE. A STATISTICAL PLAN FOR CHECK WEIGHING PROVIDES VERIFICATION.

THE PHYSICAL INVENTORY IS COMPARED WITH THE LEDGER ACCOUNTS TO DETERMINE THE DIFFERENCES BETWEEN THE PHYSICAL INVENTORY AND THE BOOK INVENTORY. MAJOR DISCREPANCIES ARE RECONCILED TO SUBSIDIARY AREA RECORDS TO DETERMINE CAUSE OF DIFFERENCE. THE NUCLEAR MATERIALS CONTROL REPRESENTATIVE WILL REVIEW ALL MAJOR DIFFERENCES TO ASSURE THAT THEY ARE WITHIN CONTROL LIMITS.

F. STORAGE

A LIMITED-ACCESS-CONTROL STORAGE AREA (SOUTH VAULT) IS PROVIDED, AND IS UNDER THE CONTROL OF THE NMC GROUP. ITEMS COMPLETED BY PRODUCTION FOR ENRICHMENTS IN EXCESS OF 6% U-235, CAN BE TRANSFERRED TO THIS LIMITED-ACCESS-CONTROL STORAGE AREA. THE NMC CUSTODIAN OF THE LIMITED-ACCESS-CONTROL STORAGE AREA REPORTS TO THE NMC REPRESENTATIVE.

ALL TRANSFERS IN OR OUT OF THE LIMITED-ACCESS-CONTROL STORAGE AREA ARE RECORDED ON A TRANSFER TICKET (EXHIBIT I-7), AND A LOG IS MAINTAINED OF THE INVENTORY. ALL CONTAINERS ENTERING THE AREA ARE TAGGED, LABELLED WITH WEIGHTS (WHEN APPLICABLE), JOB SYMBOL, ENRICHMENT, AND MATERIAL DESCRIPTION, IN ACCORDANCE WITH PLANT OPERATING PROCEDURES.

G. MEASUREMENTS

THE MEASUREMENT PROGRAM FOR DETERMINING U AND U-235 QUANTITIES IS IMPLEMENTED BY EMPLOYING WEIGHING AND ACCEPTABLE ANALYTICAL TECHNIQUES.

THE PROCESSING POINTS WHERE WEIGHING IS TO BE ACCOMPLISHED ARE DESCRIBED IN THE PROCESS CONTROL SECTION.

SAMPLING PROCEDURES ARE ESTABLISHED BY THE QUALITY CONTROL DEPARTMENT. THE NMCR, IN CONJUNCTION WITH THE QUALITY CONTROL DEPARTMENT, ESTABLISHES THE POINTS DURING PROCESSING AT WHICH SAMPLING AND ASSAYING ARE TO BE ACCOMPLISHED. THESE POINTS ARE DESCRIBED IN THE OPERATING PROCEDURE FOR EACH AREA. STATISTICAL CONTROL AND MEASUREMENT RELIABILITY ARE MAINTAINED AND DETERMINED BY QUALITY CONTROL.

THE ANALYTICAL LABORATORY MAKES ROUTINE EVALUATIONS ON BALANCES IN THE PROCESS AREAS AND DETERMINES IF BALANCES NEED REPAIR FROM OUTSIDE REPRESENTATIVES.

PERIODIC CROSS CHECKS ARE MADE WITH OTHER LABORATORIES.

H. RECORDS AND REPORTS

THE NUCLEAR MATERIALS CONTROL CLERK REPORTS TO THE NUCLEAR MATERIALS CONTROL REPRESENTATIVE. RECORDS MAINTAINED ARE:

I. DAILY JOURNAL (EXHIBIT I-8)

DIVIDED BY MATERIAL HELD IN THE FOLLOWING CATEGORIES:

- A. UNITED NUCLEAR - LICENSE SNM-33
- B. CUSTOMER LICENSE
- C. STATION
- D. ENRICHED URANIUM SUPPLY AGREEMENT - STATION TAN
- E. DEPLETED - LICENSE SMB-293
- F. NATURAL - LICENSE SMB-293
- G. THORIUM

EACH RECEIPT, SHIPMENT, OR IN-PLANT TRANSFER TO ANOTHER REPORTING RESPONSIBILITY OR PROJECT IS RECORDED IN CHRONOLOGICAL ORDER SHOWING BOTH URANIUM AND ISOTOPE. AT THE END OF EACH MONTH, URANIUM AND ISOTOPE TOTALS ARE OBTAINED FOR THE MONTH'S ACTIVITIES, AND REMAINING BALANCES ARE DETERMINED. THESE MUST AGREE WITH MONTHLY BALANCES IN THE URANIUM LEDGER.

II. URANIUM LEDGER (EXHIBIT I-9)

DIVIDED BY MATERIAL HELD IN THE FOLLOWING CATEGORIES:

- A. UNITED NUCLEAR - LICENSE SNM-33
- B. CUSTOMER LICENSE
- C. STATION
- D. ENRICHED URANIUM SUPPLY AGREEMENT - STATION TAN

RECORDS ARE MAINTAINED SHOWING URANIUM, ISOTOPE AND DOLLAR VALUE, ON A JOB BASIS. RECEIPTS, SHIPMENTS, AND IN-PLANT TRANSFERS BETWEEN JOBS, LICENSES OR PROJECTS ARE ENTERED CHRONOLOGICALLY. MONTHLY BALANCES ARE OBTAINED FOR EACH JOB, AND ARE SUMMARIZED ON A CHART OF JOBS OPEN IN EACH SECTION. THE MONTHLY TOTALS (URANIUM AND ISOTOPE) MUST AGREE WITH THE MONTHLY TOTALS IN THE JOURNAL.

III. PROJECT RECORDS (EXHIBIT I-10)

MAINTAINED ON THE BASIS OF INDIVIDUAL PROJECT (AND/OR PURCHASE ORDER) NUMBERS. URANIUM AND ISOTOPE BALANCES BY PROJECT (AND/OR PURCHASE ORDER) OBTAINED MONTHLY AND ALL BALANCES SUMMARIZED MONTHLY ON A CHART OF PROJECTS AT THE BEGINNING OF EACH SECTION. THESE SECTIONS ARE (1) DEPLETED, (2) NATURAL, (3) ENRICHED. THESE BALANCES MUST AGREE WITH THE MONTHLY STATION BALANCES OF URANIUM AND ISOTOPE AS SHOWN IN THE STATION SECTIONS OF THE JOURNAL AND URANIUM LEDGER.

IV. URANIUM BOOK (SOURCE MATERIAL SMB) (EXHIBIT I-11)

SAME AS THE URANIUM LEDGER, EXCEPT THAT THIS BOOK IS DIVIDED INTO SECTIONS COVERING ONLY DEPLETED AND NATURAL URANIUM AND THORIUM PURCHASED AND HELD UNDER LICENSE SMB-293. RECORDS ARE COMPILED FOR URANIUM (AND ISOTOPE, WHERE APPLICABLE) AND THORIUM ON A JOB BASIS SHOWING RECEIPTS, SHIPMENTS AND IN-PLANT TRANSFERS BETWEEN JOBS, LICENSES, AND PROJECTS.

POSTING DOCUMENTS FOR THE ABOVE RECORDS ARE:

FORM AEC-101 (EXHIBIT I-12)

FORM AEC-388 (EXHIBIT I-13)

FORM UNC-7153 (EXHIBIT I-14)

PRODUCTION BURIAL AND DISCARD RECORDS (EXHIBIT I-15A & B)

V. AEC REPORTS

A. STATION

SEPARATE AEC-577 (EXHIBIT I-16) REPORTS ARE MADE FOR THORIUM, DEPLETED, NATURAL AND ENRICHED URANIUM. THESE ARE SUBMITTED MONTHLY TO THE OAK RIDGE OPERATIONS OFFICE. BACK-UP SHEETS USED ARE:

1. A SEPARATE SHEET FOR EACH PROJECT ACTIVE DURING THE MONTH. THIS SHOWS BEGINNING URANIUM AND ISOTOPE BALANCES, CHANGES DURING THE MONTH AND ENDING BALANCES.
2. A SUMMARY OF ALL STATION MATERIAL WITH ENDING BALANCES LISTED SEPARATELY BY PROJECT (AND/OR PURCHASE ORDER).
3. ON MONTHLY REPORTS WHICH ALSO MARK THE END OF A QUARTER, AN ADDITIONAL SHEET IS ATTACHED SHOWING INVENTORY BREAKDOWN BY MATERIAL TYPE (USING THE AEC DESIGNATED CODE).

B. LICENSE

FORM AEC-578 (EXHIBIT I-17A & B) IS SUBMITTED SEMI-ANNUALLY TO THE AEC LEASING OFFICE COVERING ALL ENRICHED LICENSE MATERIAL FOR WHICH UNITED NUCLEAR IS RESPONSIBLE.

THIS REPORT IS PREPARED IN THREE SERIES. SERIES ONE FOR MATERIAL HELD AT HEMATITE AND ELSEWHERE AGAINST LICENSE SNM-33 AND MATERIAL HELD AT HEMATITE FOR OTHER LICENSES. SERIES TWO FOR MATERIAL HELD AGAINST LICENSE SNM-33 OR OTHER LICENSES BUT NOT SUBJECT TO LEASES. SERIES THREE FOR LICENSED MATERIAL NOT INCLUDED IN SERIES ONE OR TWO.

C. ENRICHED URANIUM SUPPLY AGREEMENT

SEMI-ANNUAL REPORTS ARE SUBMITTED TO THE AEC AS SPECIFIED IN THE SUPPLY AGREEMENT. AN ADAPTION (EXHIBIT I-17C) OF FORM AEC-578 IS USED FOR THIS PURPOSE. BACK-UP DATA, AS INCORPORATED IN THE LICENSE REPORT, IS ALSO INCORPORATED IN THIS REPORT.

VI. ORDERING URANIUM COMPOUNDS

A. LICENSE

SOURCE MATERIAL IS ORDERED ON "SOURCE MATERIAL ORDER FORM".

SPECIAL NUCLEAR MATERIAL IS ORDERED ON FORM AEC OR-640.

THE ORDER IS PREPARED BY NUCLEAR MATERIALS CONTROL AND ASSIGNED A PURCHASE ORDER NUMBER OBTAINED FROM PURCHASING. THE AEC PRESCRIBED NUMBER OF COPIES ARE SENT.

B. STATION

WHILE UNITED NUCLEAR INFORMS ITS CUSTOMERS OF THE AMOUNT OF URANIUM REQUIRED TO PRODUCE AN ORDER QUANTITY, IT IS THE RESPONSIBILITY OF THE CUSTOMER TO ARRANGE FOR AVAILABILITY TO UNITED NUCLEAR. THE CUSTOMER IS REQUESTED TO PROVIDE UNITED NUCLEAR WITH A COPY OF THE APPLICABLE MATERIAL DRAFT.

C. SUPPLY AGREEMENT MATERIAL

MATERIAL TO BE RECEIVED BY UNITED NUCLEAR IS ORDERED ON FORM AEC OR-640 AS FOR LICENSE MATERIAL.

VII. MATERIAL CONTROL AND RECORDS

A. GENERAL

THE HEMATITE PLANT IS A "MIXED FACILITY", IN THAT LICENSE, STATION, AND SUPPLY AGREEMENT URANIUM ARE ALL INVENTORIED AND PROCESSED IN THE PLANT. SEGREGATION OF THE MATERIALS IS MAINTAINED BY ASSIGNING A DIFFERENT TWO LETTER JOB SYMBOL TO THE MATERIAL RECEIVED FOR EACH ORDER. IF THE ORDER INCLUDES MORE THAN ONE TYPE OF MATERIAL OR PRODUCT, A DIFFERENT JOB SYMBOL IS ASSIGNED TO EACH TYPE. FOR COST CONTROL PURPOSES, A DIFFERENT JOB SYMBOL IS ASSIGNED AT NATURALLY OCCURRING SEPARATIONS IN THE PROCESS.

THE JOB SYMBOL RELATES THE MATERIAL TO THE CUSTOMER, PROJECT, ENRICHMENT, AND PRODUCT ORDERED. A RADIOACTIVE MATERIAL TAG SHOWING THE JOB SYMBOL, ENRICHMENT, TYPE OF

MATERIAL, AND GROSS, TARE, AND NET WEIGHTS IS ATTACHED TO EVERY CONTAINER OF SS MATERIAL.

THE JOB SYMBOL ALSO PROVIDES THE CONTROL AGAINST MIXING BETWEEN LICENSE, STATION, AND SUPPLY AGREEMENT MATERIAL AND BETWEEN JOBS, SINCE MATERIALS BEARING DIFFERENT JOB SYMBOLS ARE NOT MIXED UNLESS MANAGEMENT APPROVAL IS OBTAINED.

THE JOB SYMBOL ALSO PROVIDES A NATURAL BREAK FOR RUNNING A DETAILED MATERIAL CONTROL LEDGER WHILE THE JOB IS RUNNING THROUGH A PLANT AREA. MANAGEMENT IS PROVIDED WITH DATA FROM THE MATERIAL CONTROL LEDGER FOR AN IN-PROCESS CHECK ON LOSSES, YIELD, SALES DOLLARS, PRODUCTION RATES, AND SIMILAR PERTINENT POINTS.

B. IN PROCESS CONTROL

THE PROCESS AREAS AND OPERATIONS PERFORMED WITHIN THEM ARE DESCRIBED IN DETAIL IN THE SNM-33 LICENSE MANUAL.

1. RECEIVING AND SHIPPING

SEE SECTION D.

2. UF₆ STORAGE AREAS

THE MMC CLERK COMPARES THE RECEIVING REPORT WITH THE PACKING DOCUMENT. IF A SHIPPER/RECEIVER DIFFERENCE EXISTS IN EXCESS OF .1%, MMC PLACES A "HOLD" ON THE MATERIAL PENDING RESOLUTION.

MATERIAL WEIGHING WITHIN THIS LIMIT IS RELEASED TO THE PRODUCTION FOREMAN FOR PROCESSING.

REMOVALS FROM THE AREA ARE RECORDED ON A DAILY PRODUCTION ACTIVITY REPORT (EXHIBIT I-18A & B) PREPARED BY A PRODUCTION MATERIALS CONTROL CLERK. A COPY IS SENT TO A MMC CLERK, WHO CHECKS THE REPORT AND ENTERS THE DATA IN THE MATERIALS CONTROL LEDGER.

3. UF_6 CONVERSION (RED ROOM AND GREEN ROOM)

RECEIPTS OF UF_6 CYLINDERS ARE DESCRIBED IN THE PREVIOUS SECTION. INPUT AND OUTPUT OF THIS OPERATION ARE RECORDED AS FOLLOWS ON THE PRODUCTION ACTIVITY REPORT:

- A) WEIGHT OF EACH UF_6 CHARGE.
- B) WEIGHT OF EACH UO_2 OR UF_4 RUN OUTPUT.
- C) WEIGHT OF BLENDED UO_2 LOTS OR OF U (METAL) PRODUCED.
- D) WEIGHT OF SAMPLES REMOVED.
- E) RESIDUES GENERATED (WEIGHTS WHEN APPLICABLE).

THE PRODUCTION ACTIVITY REPORT IS CHECKED AND RECORDED BY MMC, THE DATA BEING ENTERED IN THE MATERIALS CONTROL LEDGER. THE MMC REPRESENTATIVE REVIEWS THE DATA TO ASSURE THAT DIFFERENCES ARE WITHIN ESTABLISHED CONTROL LIMITS. IF THERE IS QUESTION, THE DATA IS RECHECKED AND, IF NECESSARY, A PHYSICAL VERIFICATION PERFORMED.

4. SCRAP RECOVERY (RED ROOM AND GREEN ROOM)

THIS OPERATION CONSISTS OF DISSOLVING SCRAP INTO SOLUTION FORM AND PRODUCING UO_2 THEREFROM FOR SHIPMENT OR RECYCLE. THE OUTPUT OF UO_2 (WEIGHT AND CONTAINER IDENTITY) IS RECORDED ON THE DAILY PRODUCTION ACTIVITY REPORT WHICH IS FORWARDED TO MMC AND POSTED IN THE MATERIALS CONTROL LEDGER.

5. KNOWN LOSSES

PROCESS WASTE STREAMS (SUCH AS FILTRATES, RAFFINATES, SOLID RESIDUES, ETC.) ARE SAMPLED AND ASSAYED OR GAMMA COUNTED FOR URANIUM CONTENT. IF THE CONCENTRATION IS WITHIN THE ESTABLISHED LIMITS FOR DISCARD, THE MATERIAL IS DISCARDED. QUANTITIES SO DISCARDED ARE LISTED ON DATA SHEETS WHICH ARE FORWARDED TO THE MMC GROUP FOR MONTHLY POSTINGS TO THE URANIUM LEDGER.

THE LAUNDRY WATER IS SAMPLED FOR TOTAL URANIUM CONTENT, AND A REPORT IS SENT TO THE MMC GROUP MONTHLY.

6. PELLET PLANT

CURRENTLY NOT OPERATING. PROCEDURES FOR THIS OPERATION WILL BE INCORPORATED INTO STANDARD OPERATING PROCEDURES WHEN THE PELLET PLANT IS STARTED UP AGAIN.

7. ITEM PLANT

REFER TO STANDARD OPERATING PROCEDURE, ITEM 51 (CLASSIFIED) FOR DETAILED PROCESS AND DATA SHEETS USED IN RECORDING MATERIAL ACTIVITY. THE DATA SHEETS ARE FORWARDED TO THE NMC GROUP FOR DAILY POSTING IN THE MATERIALS CONTROL LEDGER.

TRANSFERS OF MATERIAL INTO AND OUT OF THIS AREA ARE ACCOMPLISHED BY MEANS OF A TRANSFER TICKET OR DATA SHEET.

MATERIAL IN PROCESS IS WEIGHED AFTER EACH OPERATION WHERE A WEIGHT CHANGE OCCURS.

THE COMPLETE OPERATION IS SUB-DIVIDED INTO STATIONS. INPUT AND OUTPUT AT EACH STATION IS DETERMINED BY WEIGHING. THE WEIGHTS ARE RECORDED IN THE MATERIALS CONTROL LEDGER, AND THE MATERIAL TO ACCOUNT FOR (MTF) CALCULATED FOR EACH STATION. IF DIFFERENCES AT ANY STATION ARE OUTSIDE ESTABLISHED CONTROL LIMITS, A PHYSICAL VERIFICATION IS PERFORMED AT THAT STATION BY THE NMC GROUP.

8. ANALYTICAL LABORATORY

THE WEIGHT OF SAMPLES REMOVED FROM PROCESS AREAS ARE RECORDED WITHIN THE AREA. THE LABORATORY ACTS AS A CENTRAL CLEARING AREA FOR ALL SAMPLES, HANDLING THE DISPOSITIONING OF THEM. SAMPLES RETURNED TO PROCESS AREAS ARE RE-ENTERED ON DATA SHEETS FOR THE AREA. SAMPLES TRANSFERRED TO THE SOUTH VAULT ARE MOVED ON A TRANSFER TICKET. SAMPLES SHIPPED OFF-SITE ARE TRANSFERRED TO THE SHIPPING DEPARTMENT, AND SHIPMENT IS HANDLED IN ACCORDANCE WITH STANDARD SHIPPING PROCEDURES.

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9. RESEARCH AND DEVELOPMENT AREA

NATURAL AND DEPLETED MATERIAL ARE ROUTINELY HANDLED IN THIS AREA.

10. GENERAL WAREHOUSE

THIS AREA IS USED FOR STORAGE OF PRODUCTION MATERIAL LESS THAN 6% ENRICHED. THE NMC GROUP MAINTAINS A LOG OF MATERIAL STORED IN THIS WAREHOUSE. TRANSFER TICKETS ARE USED FOR RECEIPTS AND REMOVALS.

11. WEST VAULT

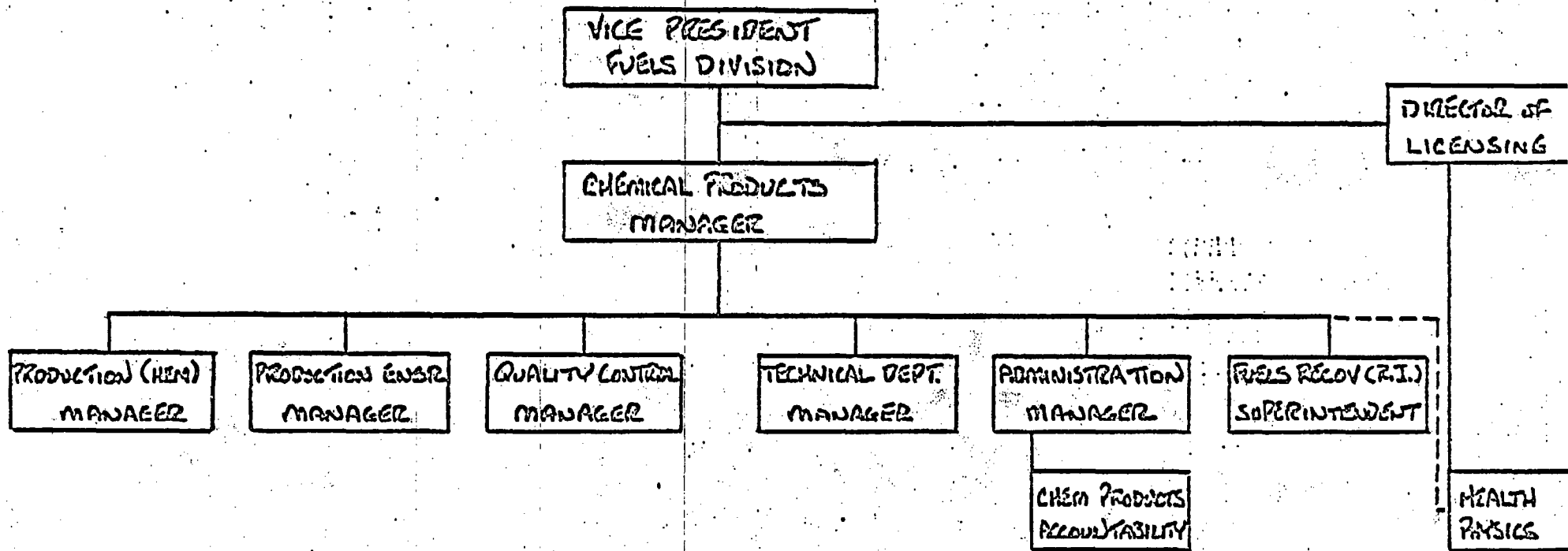
THIS IS A STORAGE AREA FOR PRODUCTION GENERATED SCRAP. ALL MATERIAL ON HAND IS RECORDED IN A LOG BOOK BY THE NMC GROUP. THE AREA IS USED PRIMARILY FOR STORAGE OF MATERIALS FOR WHICH THERE IS INSUFFICIENT ROOM IN THE PROCESS AREA.

PROCEDURE MANUAL
FOR CONTROL OF
SOURCE AND SPECIAL NUCLEAR MATERIALS

APRIL 29, 1967
PAGE 70 OF 70 PAGES
JMS/JF

I. EXHIBITS

- 1 ORGANIZATIONAL CHART
- 2 URANIUM RECEIVING REPORT
- 3 SHIPMENT REQUEST
- 4 MANUFACTURING ORDER
- 5 PACKING LIST
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- 11 URANIUM BOOK
- 12 FORM AEC-101
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- 15B CHECK SHEET #1 (GAMMA COUNTED MATERIAL FOR BURIAL)
- 16 FORM AEC-577
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- 17C MATERIAL STATUS REPORT FOR ENRICHED URANIUM HELD
UNDER A SUPPLY AGREEMENT
- 18A RED ROOM PRODUCTION (UO_2)
- 18B RED ROOM PRODUCTION (METAL)



URANIUM RECEIVING REPORT

From

Material.....

Job Symbol.....

Sales Order No. (P.O. No.).....

101 Form No.

Date Received.....

Via.....

Date Weighed.....

Enrichment.....

Scale Used.....

Received by.....

[illegible]

Exhibit I-2

MANUFACTURING ORDER

№

DATE _____

~~3800 NORTH SECOND STREET~~
~~ST LOUIS 7 MISSOURI USA~~

ROUTE 21A, HEMATITE, MISSOURI

SOLD TO:

CUSTOMER ORDER # _____ DATE _____

LICENSE NO. _____ STATION _____

JOB SYMBOL_____

PROPOSAL NUMBER _____

SHIP TO:

SHIPPING INSTRUCTIONS:

F. O. B. _____

PREPAID ☐ OURS ☐ ADD ☐ COLLECT ☐

[illegible]

UNITED NUCLEAR CORPORATION

CHEMICALS DIVISION

PACKING LIST

No

DATE _____

SALES OFFICE: ~~3800 NORTH SECOND STREET~~
~~ST. LOUIS 7, MISSOURI, U.S.A.~~

PLANT: ROUTE 21A, HEMATITE, MISSOURI

SOLD TO:

CUSTOMER ORDER # _____ DATE _____

LICENSE NO. _____ STATION _____

JOB SYMBOL _____

PROPOSAL NUMBER _____

SHIP TO:

SHIPPING INSTRUCTIONS:

F. O. B. _____

PREPAID ☐OURS ☐ADD ☐COLLECT ☐

DESCRIPTION

QUANTITY
ORDERED

UNIT

UNIT
PRICE

EXTENSION

DATE SHIPPED

LOT NUMBER

QUANTITY SHIPPED

UNIT

GROSS WT.

CONTAINERS
SHIPPEDB. E.
NO.

HOW SHIPPED

QUANTITY
BACK ORDERED

PROCEDURE MANUAL
FOR CONTROL OF
SOURCE AND SPECIAL NUCLEAR MATERIALS

INVENTORY S.O.P.

FOR FEBRUARY 20 THROUGH 26, 1967

UNITED NUCLEAR CORPORATION

TO	DISTRIBUTION	AT	HEMATITE	DATE	FEBRUARY 13, 1967																						
FROM	J. M. SCOFFIN	AT	HEMATITE	COPY TO																							
SUBJECT	ANNUAL FISCAL INVENTORY (PLANNED FOR WEEK OF FEB. 20 - 26) REVISED PROCEDURE (FEB. 13)			<table border="0" style="width: 100%;"> <tr> <td style="width: 50%;">F. G. STENGEL</td> <td style="width: 50%;">A. T. KAVLICK</td> </tr> <tr> <td>D. C. ALLEN</td> <td>R. C. MILLER</td> </tr> <tr> <td>P. L. BAUMAN</td> <td>R. A. NELSON</td> </tr> <tr> <td>T. J. COLLOPY</td> <td>J. A. RODE</td> </tr> <tr> <td>J. P. COLTON</td> <td>J. P. ROSSER</td> </tr> <tr> <td>D. G. DARR</td> <td>E. F. SANDERS</td> </tr> <tr> <td>H. A. DUGAN</td> <td>L. J. SWALLOW</td> </tr> <tr> <td>M. J. DUGAN</td> <td>A. G. SWARINGIN</td> </tr> <tr> <td>L. R. GARLAND</td> <td>W. H. TAYLOR</td> </tr> <tr> <td>P. W. HUBERT</td> <td>F. L. WYNN</td> </tr> <tr> <td>D. J. LAJCAK</td> <td></td> </tr> </table>		F. G. STENGEL	A. T. KAVLICK	D. C. ALLEN	R. C. MILLER	P. L. BAUMAN	R. A. NELSON	T. J. COLLOPY	J. A. RODE	J. P. COLTON	J. P. ROSSER	D. G. DARR	E. F. SANDERS	H. A. DUGAN	L. J. SWALLOW	M. J. DUGAN	A. G. SWARINGIN	L. R. GARLAND	W. H. TAYLOR	P. W. HUBERT	F. L. WYNN	D. J. LAJCAK	
F. G. STENGEL	A. T. KAVLICK																										
D. C. ALLEN	R. C. MILLER																										
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L. R. GARLAND	W. H. TAYLOR																										
P. W. HUBERT	F. L. WYNN																										
D. J. LAJCAK																											

INTRODUCTION

A PHYSICAL INVENTORY WILL BE TAKEN FROM MONDAY, FEBRUARY 20, THROUGH SUNDAY, FEBRUARY 26, AND WILL INCLUDE ALL NUCLEAR RAW MATERIAL, WORK IN PROGRESS, FINISHED GOODS, AND RESIDUES. INCLUDED IS DEPLETED, NORMAL, AND ENRICHED MATERIAL.

FOR THIS INVENTORY, THE PLANT WILL BE DIVIDED INTO SECTIONS, AND SUPERVISORS DESIGNATED FOR EACH SECTION. APPENDIX A, ATTACHED, IS A LISTING OF SECTIONS AND SUPERVISORS.

THE SUPERVISORS WILL BE RESPONSIBLE FOR THE CARRYING OUT OF ALL INVENTORY INSTRUCTIONS.

REPRESENTATIVES OF THE MATERIALS CONTROL GROUP WILL BE PRESENT TO SUPPLY MATERIALS FOR INVENTORY TAKING, AND THEY WILL BE RESPONSIBLE FOR THE FINAL COMPILATION OF THE NUCLEAR MATERIAL INVENTORY.

REPRESENTATIVES OF THE NUCLEAR MATERIALS CONTROLS BRANCH OF THE ATOMIC ENERGY COMMISSION WILL BE PRESENT DURING THE INVENTORY AS PART OF THEIR ANNUAL SURVEY. ALSO, PEAT MARWICK MITCHELL & Co. WILL BE NOTIFIED IN TIME TO HAVE A REPRESENTATIVE PRESENT.

CRITICALITY AND INSPECTION

CRITICALITY CONTROLS APPLICABLE TO EACH AREA MUST BE OBSERVED AT ALL TIMES. INSPECTION OF ANY MATERIAL SHALL BE MADE ONLY WHEN DEEMED NECESSARY, AND, THEN, ONLY IN A PROPER AREA.

WEIGHTS

ALL CONTAINERS IN THE FOLLOWING CATEGORIES MUST HAVE A NET WEIGHT:

- 1) UO_2 - POWDER, PELLETS, HARD SCRAP, SWEEPINGS, SAMPLES
- 2) ADU - PURE, IMPURE
- 3) U_3O_8
- 4) UF_4
- 5) UF_6
- 6) UO_2ZrO_2 - POWDER, PELLETS, HARD SCRAP, SWEEPINGS
- 7) ITEM - MASTER BLEND, SUBSTRATE, FINISHED
- 8) U METAL
- 9) ANY CONTAINER THAT HAS TO HAVE A WET CHEMICAL ANALYSIS

EXCEPTION: IF γ COUNT RESULT IS ON THE CONTAINER.

ACCEPT TAGGED WEIGHTS AS ACCURATE UNLESS, IN YOUR JUDGMENT, THERE IS AN OBVIOUS MISTAKE.

ALL CONTAINERS OF LIQUIDS MUST HAVE AN ESTIMATE OF ACTUAL VOLUME, STATED IN LITERS, OF THE CONTENTS.

CHECK WEIGHTS

THE RESULTS OF THE AEC STATISTICAL SAMPLING AND MEASURING WILL BE USED BY UNC TO CHECK THE ACCURACY OF THE INVENTORY VALUES.

CONTAINERS

EACH CONTAINER CONTENT TAG MUST SHOW:

JOB SYMBOL
ENRICHMENT
TYPE OF MATERIAL

GROSS WT.)
TARE WT.) WHERE APPLICABLE
NET WT.)

U ASSAY

FOR PURE PRODUCT, SEE APPENDIX C.

WHEN CONTAINER DATA INCLUDES γ COUNT OR OTHER RELIABLE U CONTENT DATA, THE RECORDED DATA SHALL BE USED.

WHEN MATERIAL IS NOT LISTED IN APPENDIX C, NOR DOES IT INCLUDE γ COUNT OR OTHER RELIABLE U CONTENT DATA, IT WILL BE UP TO THE SUPERVISOR OF THAT SECTION TO PROVIDE AN ENGINEERING ESTIMATE, AND DESIGNATE IT AS SUCH.

INVENTORY STICKERS

INVENTORY STICKERS, PRENUMBERED AND DATED, WILL BE PROVIDED BY THE MATERIALS CONTROL GROUP. USE ONLY STICKERS ISSUED TO YOU, AND, IF YOU NEED ADDITIONAL STICKERS, OBTAIN THEM ONLY FROM THE MATERIALS CONTROL GROUP.

ALL MATERIAL CONTAINING URANIUM MUST BEAR A STICKER AT THE END OF THE INVENTORY.

STICKERS ARE TO BE PLACED ON THE BACK OF THE CONTAINER TAG, EXCEPT WHEN IMPOSSIBLE. IF ANY OUTER CONTAINER HOLDS MORE THAN ONE INNER CONTAINER, PLACE ONE STICKER ON THE OUTSIDE CONTAINER FOR EACH INNER CONTAINER. INVENTORY ALL MATERIAL IN HOODS, ETC. (EXCEPTION: IT IS NOT NECESSARY TO INVENTORY "IN PROCESS" FILTERS.)

INVENTORY DATA SHEET

AN INVENTORY DATA SHEET WILL BE PROVIDED BY THE MATERIALS CONTROL GROUP. COPY IS ATTACHED.

RECORD EACH JOB ON A SEPARATE INVENTORY DATA SHEET.

THE INVENTORY DATA SHEET CONTAINS THIRTEEN COLUMNS ACROSS THE PAGE. RESPONSIBILITY FOR CORRECTLY COMPLETING THE DATA SHEET WILL REST WITH THE INVENTORY TEAM. THE FOLLOWING GUIDE IS PROVIDED:

<u>COLUMN</u>	<u>COLUMN HEADING</u>	<u>INSTRUCTIONS FOR COMPLETING</u>
FIRST	INVENTORY STICKER	WRITE INVENTORY STICKER NUMBER.
SECOND	SHELF	WRITE LOCATION NUMBER.
THIRD	DESCRIPTION	WRITE LOT NUMBER, BATCH NUMBER, ETC., AND ANY OTHER PERTINENT DATA.
FOURTH	MAT'L. CODE	RECORD CODE DESIGNATING MATERIAL TYPE (SEE APPENDIX B).
FIFTH	NET LOW LEVEL RESIDUE	IF MEASUREMENT OF INVENTORY ITEM IS BY VOLUME, WRITE MEASURED QUANTITY HERE.
SIXTH	LT./ML./GA.	RECORD VOLUME MEASUREMENT USED: "LT." FOR LITERS "ML." FOR MILLILITERS "GA." FOR GALLONS
SEVENTH	NET PRODUCT TYPE	IF MEASUREMENT OF INVENTORY ITEM IS BY WEIGHT, WRITE WEIGHT HERE.
EIGHTH	#/GMS.	RECORD WEIGHT MEASUREMENT USED: "#" FOR POUNDS "GMS." FOR GRAMS

NOTE: EITHER THE FIFTH OR THE SEVENTH COLUMN MUST BE FILLED OUT (BUT NOT BOTH). THE DOTTED LINE IN EACH OF THESE COLUMNS IS TO REPRESENT THE DECIMAL POINT (CARRY VOLUME OR WEIGHT ONLY TO TENTHS)

<u>COLUMN</u>	<u>COLUMN HEADING</u>	<u>INSTRUCTIONS FOR COMPLETING</u>
NINTH	U ASSAY	U VALUE
TENTH	Av./E./ γ	MANNER OF ACHIEVING U ASSAY: "Av." FOR AVERAGE "E." FOR ENGINEERING ESTIMATE " γ " FOR GAMMA COUNT
ELEVENTH	URANIUM NET GRAMS	URANIUM VALUE BY EXTENSION IF AN AVERAGE (Av.) U ASSAY IS PROVIDED.
TWELFTH	URANIUM ENGR. GRAMS	URANIUM VALUE BY EXTENSION IF AN ENGINEERING ESTIMATE (E.) IS PROVIDED, OR IF URANIUM HAS BEEN DETERMINED BY GAMMA (γ) COUNT.
THIRTEENTH	ENR. %	USE THIS COLUMN ONLY IF THE TAG OF A CONTAINER LISTS A DIFFERENT ENRICHMENT THAN THE NOMINAL JOB ENRICHMENT.

THE NUMBERS PRINTED BENEATH THE COLUMN HEADINGS (AND IN THE BLOCK AT THE TOP, RIGHT) OF THE INVENTORY DATA SHEET ARE FOR COMPUTER PURPOSES ONLY.

1 - 2 JUD

3 - 4 AREA

INVENTORY DATA SHEET

VENTORY TICKER	5 - 9	WRITE INVENTORY STICKER NUMBER.									
SHELF		WRITE LOCATION NUMBER.									
DESCRIPTION		WRITE LOT NUMBER, BATCH NUMBER, ETC., AND ANY OTHER PERTINENT DATA.									
MAT'L. CODE	10 - 12	RECORD CODE DESIGNATING MATERIAL TYPE (SEE APPENDIX B).									
NET LOW LEVEL RESIDUE	13 - 18	IF MEASUREMENT OF INVENTORY ITEM IS BY VOLUME, WRITE QUANTITY HERE. (THE DOTTED LINE IS TO REPRESENT THE DECIMAL POINT. CARRY VOLUME ONLY TO TENTHS.)									
LT. ML. GA.		RECORD VOLUME MEASUREMENT USED: "L." FOR LITERS, "ML." FOR MILLILITERS, "GA." FOR GALLONS.									
NET PRODUCT TYPE	13 - 18	IF MEASUREMENT OF INVENTORY ITEM IS BY WEIGHT, WRITE WEIGHT HERE. (THE DOTTED LINE IS TO REPRESENT THE DECIMAL POINT. CARRY WEIGHT ONLY TO TENTHS.)									
# GMS.		RECORD WEIGHT MEASUREMENT USED: "LBS." FOR POUNDS, "GMS." FOR GRAMS.									
U ASSAY		U VALUE									
AV. E. %		MANNER OF ACHIEVING U ASSAY: "AV." FOR AVERAGE, "E." FOR ENGINEERING ESTIMATE, "G." FOR GAMMA COUNT									
URANIUM NET GRAMS	23 - 28	URANIUM VALUE BY EXTENSION OF AN AVERAGE (AV.) U ASSAY IS PROVIDED.									
URANIUM ENGR. GAS	29 - 34	URANIUM VALUE BY EXTENSION OF AN ENGINEERING ESTIMATE (E.) IS PROVIDED, OR IF URANIUM HAS BEEN DETERMINED BY GAMMA (G) COUNT.									
ENR %	35 -	USE THIS COLUMN ONLY IF THE TAG OF A CONTAINER LISTS A DIFFERENT ENRICHMENT THAN THE NOMINAL JOB ENRICHMENT.									

COMPLETION OF INVENTORY

IT WILL BE NECESSARY FOR THE SUPERVISOR OF EACH SECTION TO OBTAIN MATERIALS CONTROL CONCURRENCE THAT THE PHYSICAL PORTION OF THE INVENTORY OF THE SECTION HAS BEEN COMPLETED.

COMPILING DATA

IT IS UP TO THE SUPERVISOR TO PERSONALLY POST ALL U ASSAYS ON THE INVENTORY DATA SHEETS. HIS GROUP IS THEN TO EXTEND THE URANIUM VALUES. AFTER THIS IS COMPLETE, THE INVENTORY DATA SHEETS ARE THEN TO BE TURNED OVER TO MATERIALS CONTROL.

DEFINITIONS OF RESPONSIBILITIES

- A) SUPERVISOR - REQUIRED TO SUPERVISE PHYSICAL INVENTORY IN HIS AREA(S), AND BE SURE THAT ALL ASPECTS OF THE WRITTEN PROCEDURE ARE FOLLOWED.
 - B) ASSISTANT - REQUIRED TO SEE THAT ALL MATERIAL IS TAGGED, RECORDED AND EXTENDED.
 - C) OPERATORS - TO ASSIST IN TAGGING, WEIGHING, READING, ETC.
-

APPENDIX A

<u>SECTION CODE</u>	<u>SECTION</u>	<u>DAY</u>	<u>SUPERVISOR</u>	<u>ASSISTANT</u>	<u>OPERATORS</u>
1	RED ROOM	SAT. - SUN.	SANDERS	M. DUGAN	3
2	WEST VAULT	SAT. - SUN.	SWALLOW	T. MURRAY	2
3	LAB.	SAT. - SUN.	LAJCAK	P. BAUMAN	-
4	GREEN ROOM	SAT. - SUN.	COLLOPY	F. WYNN	2
5	ITEM PLANT	SAT. - SUN.	COLTON	H. DUGAN	3
6	PELLET PLANT	SAT. - SUN.	ROSSER	D. ALLEN	2
7	PRODUCT WAREHOUSE	SAT. - SUN.	ROSSER	D. ALLEN	-
8	UF ₆ WAREHOUSE/BLENDING ROOM/FILTER STORAGE	SAT. - SUN.	MILLER	SWARINGIN	2
9	R & D AREA	SAT. - SUN.	RODE	TAYLOR HUBERT	2
10	SOUTH VAULT	MON. - SUN.	SCOFFIN	KAVLICK ALLEN	-
11	YARD	SAT. - SUN.	COLLOPY	F. WYNN	4
AEC TEAM					2

APPENDIX B

- | | |
|--|--|
| 1. UO_2 POWDER | A. VIRGIN OK PRODUCT |
| 2. UO_2 PELLETS | B. VIRGIN REJECT PRODUCT |
| 3. UO_2 SUBSTRATE | C. PRODUCT FROM RECOVERY |
| 4. UO_2ThO_2 POWDER | D. LOT RETAINER SAMPLES |
| 5. UO_2ThO_2 PELLETS | E. SAMPLES |
| 6. UO_2ZrO_2 POWDER OR GREEN SUBSTRATE | F. DECLAD SUBSTRATE |
| 7. UO_2ZrO_2 FIRED SUBSTRATE | G. PELLET GRINDER SLUDGE CAKE |
| 8. UO_2ZrO_2 MASTER BLEND | H. PELLET GRINDER SLUDGE SLURRY |
| 9. UO_2ZrO_2 PELLETS | J. HOOD SWEEPINGS, CLEAN |
| 10. UO_2ZrO_2 FINISHED | K. HOOD SWEEPINGS, DIRTY |
| 11. U_3O_8 POWDER | L. GREEN PELLETS AND/OR
AGGLOMERATED PRESS FEED |
| 12. UO_2Nb | N. DEWAXED PELLETS AND POWDER |
| 13. UF_4 | |
| 14. UF_6 | |
| 15. U METAL | |
| 16. ThO_2 POWDER | |
| 17. ThO_2 PELLETS | |
| 18. UO_2F_2 | |

EACH NUMBER 1 - 18 MUST HAVE A
CORRESPONDING LETTER A - N.

25. PURE ADU
26. IMPURE ADU
27. SCRAP RECOVERY FEED SOLUTIONS
28. LOW LEVEL ORGANIC LIQUIDS
29. LOW LEVEL AQUEOUS LIQUIDS
30. LOW LEVEL COMBUSTIBLES (RAGS, PAPER)
31. ACID INSOLUBLES
32. MSA FILTERS, REUSABLE
33. MSA FILTERS, SCRAP
34. PRE-FILTERS
35. GLASS WOOL
36. MOP WATER
37. FILTERS FROM ITEM PLANT WASH STATIONS
38. ANALYTICAL LAB RESIDUES, SOLID
39. ANALYTICAL LAB RESIDUES, LIQUID
40. LECO CRUCIBLES
41. METALLOGRAPHIC MOUNTS
42. BOMB SLAG
43. OIL
44. LOW LEVEL NON-COMBUSTIBLES
45. INCOMING STORAGE
46. OTHER
47. DECLAD FILTER CAKE
48. POT CLEAN-UP

APPENDIX C

STANDARD ASSAY VALUES:

<u>TYPE</u>	<u>% U</u>
UF ₆	(ACTUAL CYL.)
UO ₂ (93% KZ)	87.87
UO ₂ (97%)	87.80
UO ₂ (OTHER)	87.80
UO ₂ PELLETS	88.10
UF ₄	75.8
U ₃ O ₈	84.8
U METAL	100.0

ITEM MATERIALS

NO1EN	88.20
NO1EY	69.38
NO2EY	65.13
PO2GK	60.26
PO4GK	61.36
PO6GK	61.67
OTHER FINISHED (W ZR.)	60.1
OTHER FINISHED (WO ZR)	68.5

136

JA	74.97
HY BEFORE FIRING	76.74
HY AFTER FIRING	77.0
HZ	60.1
JC	77.0

STANDARD CONVERSION FACTORS

1	GALLON	=	3.785	LITERS
5	GALLON DRUM	=	24	LITERS BRIM FULL
15	GALLON DRUM	=	61	LITERS BRIM FULL
30	GALLON DRUM	=	125	LITERS BRIM FULL
55	GALLON DRUM	=	223	LITERS BRIM FULL
1	POUND	=	453.59	GRAMS

AVERAGE TARE WEIGHTS

55	GALLON DRUM	63.7 POUNDS	28,894 GRAMS
15	GALLON DRUM	17.0 POUNDS	7,711 GRAMS
5	GALLON DRUM	4.7 POUNDS	2,132 GRAMS
1	GALLON BOTTLE	0.35 POUNDS	159 GRAMS
2	QUART SS CAN	1.06 POUNDS	481 GRAMS
1	QUART SS CAN	0.52 POUNDS	236 GRAMS
125	ML. SAMPLE BOTTLE	0.05 POUNDS	23 GRAMS



MANUFACTURED BY BERNADETTE BUSINESS FORMS, 7306 N. BROADWAY, ST. LOUIS, MO. COLFAX 1-7082

TRANSFER DATE		DEBIT	CREDIT	TRANSFER TICKET FORM 39-REV. 12-58		No. 039335	
WEIGHT & UNIT		CODE	ITEM				
		NO. CONT.		SIZE	KIND	LOT MARK	
T O	BLDG.	DEPT.	JOB/ACCT.	PRODUCT OR ACCOUNT			
F R O M	BLDG.	DEPT.	JOB/ACCT.	PRODUCT OR ACCOUNT			
DELIVER BY DATE		ORIGINATED BY		DATE	FILLED BY	DATE	RECEIVED BY DATE
TYPE		UNIT COST					
		LABOR	BURDEN	TOTAL			
LABOR		EXTENSION					
		BURDEN	TOTAL				

1

[illegible]

CUSTOMER _____

TRANSIT INS.

— OUT

MAL

FINANCIAL RESP.

LEASE

MAL

[illegible]

27-24	11		12		13		14		15		16		17		18		19		20		21		22		23		24				
	DATE		DATE		FIN. RESP.		UNC						LOT NO.		% %				WEIGHT (Grams)												
	SHIPPED	REC'D.	TRANSF.	ORDER NO.	SHIPPED TO	SHIPPED FOR	REC'D. FOR	TYPE MAT'L	U	U-235	NET	WT.	ELEMENT	ISOTOPE	UNIT CHG.	VALUE															
1																															
2																															
3																															
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EXHIBIT 1-9

U.S. ATOMIC ENERGY COMMISSION MATERIAL BALANCE REPORT

(SS Material)		(SS Station or Field Office Name)	(Symbol)	(Unit)
MONTH OF	19		FISCAL YEAR TO DATE	
(Total Element)	(Isotope)		(Total Element)	(Isotope)
		1. Beginning Inventory		
		RECEIPTS		
		2. Procurement—Raw Materials		
		3. —Other		
		4. Production		
		5. DOD Returns—Use A		
		6. —Use B		
		7. —Other Uses		
		8. From Other SS Material Balances		
		9.		
		10. Field Office —Albuquerque		
		11. —Brookhaven		
		12. —Chicago		
		13. —Cleveland SNPO		
		14. —Division of International Affairs		
		15. —Division of Nuclear Materials Mgt.		
		16. —Division of Raw Materials		
		17. —Grand Junction		
		18. —Idaho		
		19. —Materials Leasing Office, ORO		
		20. —New York		
		21. —Oak Ridge		
		22. —Pittsburgh Naval Reactors		
		23. —Richland		
		24. —San Francisco		
		25. —Savannah River		
		26. —Schenectady Naval Reactors		
		27.		
		28. TOTAL RECEIVED		
		29. TOTAL TO ACCOUNT FOR		
		REMOVALS		
		30.		
		31. Expended in Space Programs		
		32. Sales		
		33. DOD—Use A		
		34. —Use B		

21.	—Oak Ridge		
22.	—Pittsburgh Naval Reactors		
23.	—Richland		
24.	—San Francisco		
25.	—Savannah River		
26.	—Schenectady Naval Reactors		
27.			
28.	TOTAL RECEIVED		
29.	TOTAL TO ACCOUNT FOR		
REMOVALS			
30.			
31.	Expended in Space Programs		
32.	Sales		
33.	DOD—Use A		
34.	—Use B		
35.	—Other Uses		
36.	Expended in AEC Tests		
37.	Routine Tests (Albuquerque and San Francisco)		
38.	Nuclear Loss		
39.	Decay		
40.	Shipper-Receiver Difference		
41.	To Other SS Material Balances		
42.			
43.	Field Office—Albuquerque		
44.	—Brookhaven		
45.	—Chicago		
46.	—Cleveland SNPO		
47.	—Division of International Affairs		
48.	—Division of Nuclear Materials Mgt.		
49.	—Division of Raw Materials		
50.	—Grand Junction		
51.	—Idaho		
52.	—Materials Leasing Office, ORO	EXHIBIT 1-30	
53.	—New York		
54.	—Oak Ridge		
55.	—Pittsburgh Naval Reactors		
56.	—Richland		
57.	—San Francisco		
58.	—Savannah River		
59.	—Schenectady Naval Reactors		
60.	Accidental Losses, Normal Oph. Losses, Write-offs & MUF		
61.	TOTAL REMOVALS		
62.	ENDING INVENTORY		
63.	TOTAL ACCOUNTED FOR		

Prepared by (Signature)

Date

Approved by (Signature)

Date

MATERIAL STATUS REPORT

FOR SPECIAL NUCLEAR MATERIALS HELD UNDER LICENSE
PREPARE A SEPARATE REPORT FOR EACH LICENSE

1. REPORTING LICENSEE:			
a. Name _____		c. License No. _____	
b. Address _____ (INCLUDE ZIP CODE)		d. Period Ending _____	
2. MATERIAL: <i>(Prepare separate report for each material)</i>	3. WEIGHT UNIT	4. TOTAL QUANTITY AND ISOTOPE DATA	
		a. ELEMENT	b. ISOTOPE
5. BEGINNING INVENTORY:			
6. RECEIPTS:			
From _____	Shipper's License No. _____		
_____	_____		
_____	_____		
_____	_____		
7. TOTAL RECEIPTS			
8. PRODUCTION			
9. MATERIAL TO BE ACCOUNTED FOR <i>(Total of lines 5, 7, and 8).</i>			
10. SHIPMENTS:			
To _____	Consignee's License No. _____		
_____	_____		
_____	_____		
_____	_____		
11. TOTAL SHIPMENTS			
12. PROCESSING LOSSES, DISCARDS, ETC.:			
a. MATERIAL FOR WHICH THE REPORTING LICENSEE IS FINANCIALLY RESPONSIBLE			
b. MATERIAL FOR WHICH THE REPORTING LICENSEE IS NOT FINANCIALLY RESPONSIBLE			
13. BURN-UP			
14. ENDING INVENTORY			
15. MATERIAL ACCOUNTED FOR <i>(Total of lines 11, 12a, 12b, 13 and 14).</i>			
16. DETAIL OF ENDING INVENTORY:			
a. MATERIAL ON HAND FOR WHICH REPORTING LICENSEE IS FINANCIALLY RESPONSIBLE TO THE AEC UNDER ABOVE LICENSE.			
b. MATERIAL ON HAND FOR WHICH SOMEONE OTHER THAN REPORTING LICENSEE IS FINANCIALLY RESPONSIBLE TO THE AEC <i>(Detail below)</i>			
Name _____	License No. _____		
_____	_____		
_____	_____		
_____	_____		
c. Total of a. and b.			
17. MATERIAL IN POSSESSION OF OTHERS FOR WHICH REPORTING LICENSEE IS FINANCIALLY RESPONSIBLE TO THE AEC UNDER ABOVE LICENSE <i>(Detail below)</i>			
Name _____	Possessor's License No. _____		
_____	_____		
_____	_____		
_____	_____		
TOTAL			

COMPOSITION OF BINDING INVENTORY

FORM OF MATERIAL	ELEMENT	% OF ISOTOPE CONTAINED	ISOTOPE	REMARKS
18. COMPOSITION OF ITEM 16a.				
TOTAL				
19. COMPOSITION OF ITEM 16b.				
TOTAL				
20. TOTAL INVENTORY ON HAND (Total of Items 18 and 19).				
21. COMPOSITION OF ITEM 17.				
TOTAL				
22. TO THE BEST OF MY KNOWLEDGE AND BELIEF THE INFORMATION GIVEN ABOVE AND IN THE ATTACHED SCHEDULES, IF ANY, IS TRUE, COMPLETE, AND CORRECT.				
(Date)		(Signature and Title)		

18 U.S.C., SECTION 1001; ACT OF JUNE 25, 1948; 62 STAT. 749; MAKES IT A CRIMINAL OFFENSE TO MAKE A WILLFULLY FALSE STATEMENT OR REPRESENTATION TO ANY DEPARTMENT OR AGENCY OF THE UNITED STATES AS TO ANY MATTER WITHIN ITS JURISDICTION.

GPO 903-236

EXHIBIT I-17A

UNITED STATES ATOMIC ENERGY COMMISSION

MATERIAL ACTIVITY SCHEDULE

For Government-Owned Special Nuclear Material Handled for the Account of Another License to Support
Item 16b. on Form AEC-578, Material Status Report
(Prepare a Separate Schedule for Each License)

1. REPORTING LICENSEE: (Physical possessor)

A. NAME _____
B. ADDRESS _____
C. LICENSE NO. _____

2. LICENSEE: (Responsible under a lease)

A. NAME _____
B. ADDRESS _____
C. LICENSE NO. _____

3. MATERIAL (A separate schedule by material type)

4. WEIGHT UNITS

5. TOTAL QUANTITY

A. ELEMENT B. ISOTOPE

6. BEGINNING INVENTORY:

7. RECEIPTS FROM: (Name, license and document number)

8. TOTAL RECEIPTS

9. MATERIAL TO BE ACCOUNTED FOR (Total lines 6 and 7)

10. SHIPMENTS TO: (Name, license and document number)

11. TOTAL SHIPMENTS

12. PROCESSING LOSSES, DISCARDS, ETC.

13. BURN-UP

14. ENDING INVENTORY

15. MATERIAL ACCOUNTED FOR (Total lines 11, 12, 13 and 14)

16. PREPARED BY: _____
(Accountable Officer)

ACCEPTED BY: _____
(Accountable Officer)

DATE: _____

DATE: _____

COMPOSITION OF ENDING INVENTORY

17. COMPOSITION OF ITEM 14:

DESCRIPTION	ELEMENT	% OF ISOTOPE CONTAINED	ISOTOPE	REMARKS
TOTAL				

INSTRUCTIONS

The Material Activity Schedule in most part is self-explanatory with general instructions as follows:

- a. Three (3) copies of the Material Activity Schedule should be prepared by the licensee having physical possession and forwarded to each licensee listed under Item 16(b) of the Material Status Report, Form AEC-578.
- b. The Material Activity Schedule should be prepared shortly after the end of a report period (June 30 and December 31 of each year) so that the financially responsible licensee can correctly complete Item 17 of his Material Status Report within the 30 day limit.
- c. Licensees receiving a Material Activity Schedule from a physical holder of their material should review the schedule for accuracy, then sign and distribute as follows:
 1. Return the signed original to the sender.
 2. Forward one signed copy to the U.S. Atomic Energy Commission, Post Office Box E, Oak Ridge, Tennessee, Attention: Production Division.
 3. May be retained for receiver's files.

Distribution of these Activity Schedules should be made in advance of or no later than dispatch of the Material Status Report. The completed copy of the Activity Schedule submitted to the AEC will serve a dual purpose, viz: As a supporting schedule for Item 16(b) of the Material Status Report, Form AEC-578, submitted by the licensee who has physical possession of the material and Item 17 of the Material Status Report submitted by the organization that is financially responsible for the material.

For Enriched Uranium Held Under a Supply Agreement

Exhibit I-17c

REVIEW OF HINDING INFORMATION RECEIVED ON THE MO'EE

W.C. Calkins

Communists

[illegible]

RED ROOM PRODUCTION (METAL)

JOB

DATE

CLERK

CYLINDER IN PROCESS

DF₆ IN PROCESS

DF₆ CHARGES

DF₆ RUNS

#

#

#

CYL
RUNS

CYL
RUNS

CYL
RUNS

RUN WT

RUN WT

RUNS

WT

RUNS

WT

BISCUITS

#

RUNS

WT

#

RUNS

WT

TOTAL

TOTAL

#

#

TOTAL

TOTAL

SAMPLES

#

WT

#

WT

#

WT

RESIDUES

DESCRIPTION

DESCRIPTION

COMMENTS

**UNITED NUCLEAR
CORPORATION**



365 WINCHESTER AVE.
NEW HAVEN, CONN. 06508
(203) 777-5361

J.A. LINDBERG
VICE PRESIDENT
MANUFACTURING