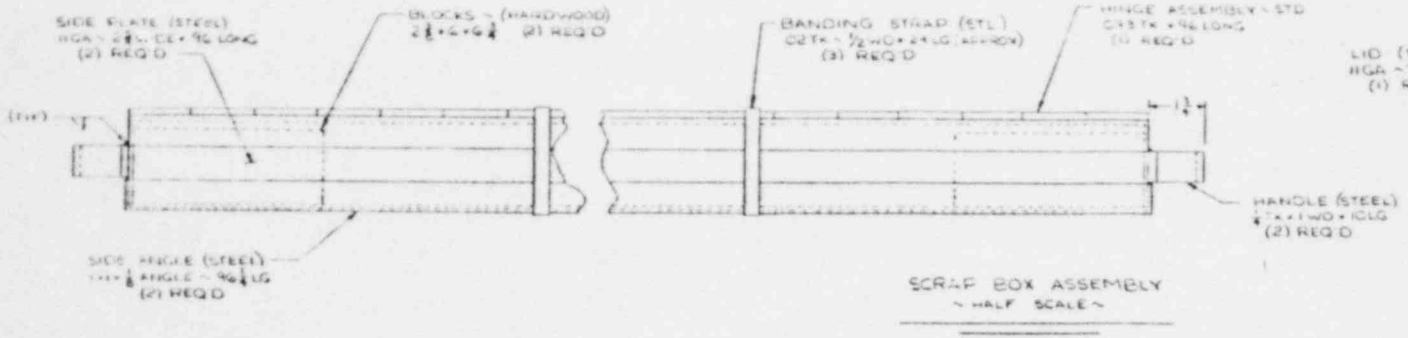
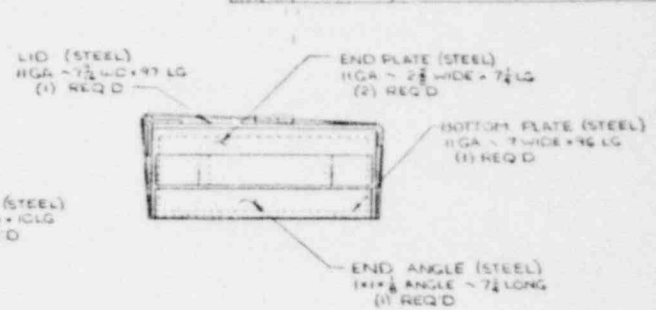
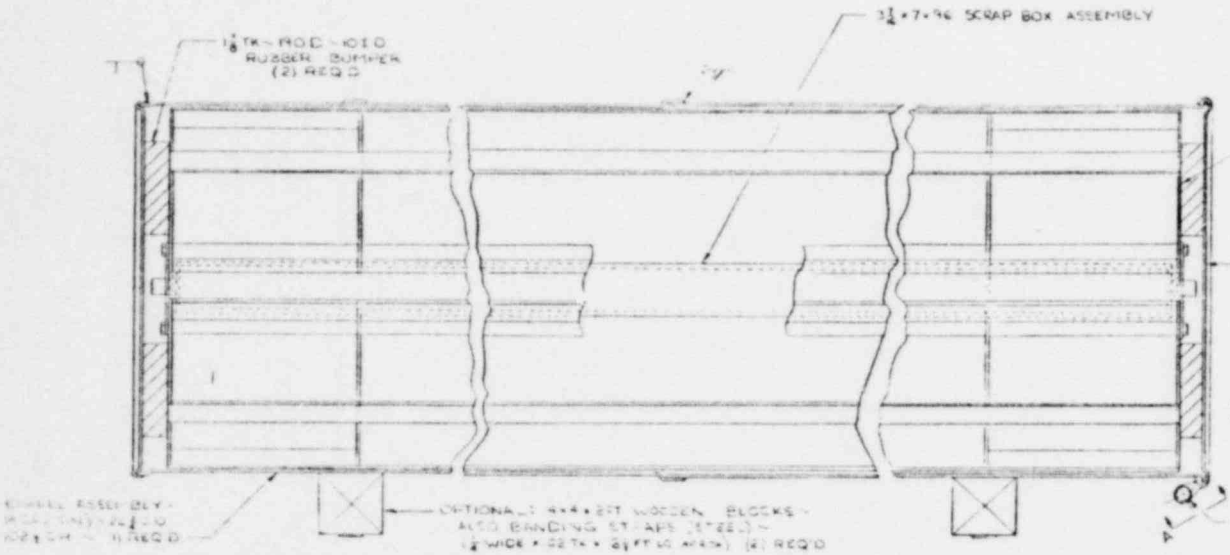
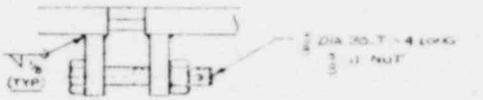


SCRAP BOX ASSEMBLY
~ HALF SCALE ~

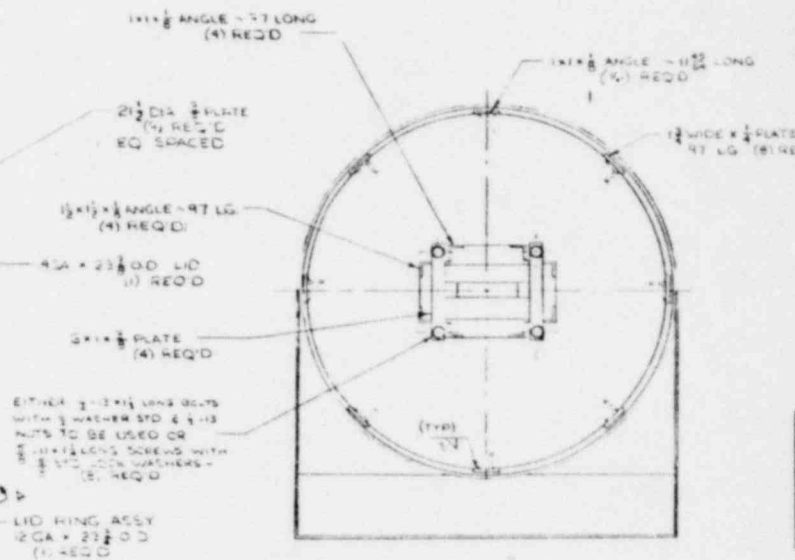




SIDE VIEW
QUARTER SCALE



VIEW A-A



END VIEW COVER RING & RUBBER REMOVED
QUARTER SCALE

D-20354-6

UNC	UNITED NUCLEAR		
~ UNC 2600 CONTAINER ~			
D-20354-6	4		

SHEET 1 OF 1

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C

1.2.2 Operational Features - Use of the package is simple and no discussion is provided.

1.2.3 Contents Of Package:

(1) Type And Form Of Material:

(i) Dry uranium-zirconium, uranium-aluminum alloys and compounds with densities not exceeding 1 kg U235 per liter in the form of solids. Uranium may be enriched to any degree in the U235 isotope.

(ii) Dry uranium oxide pellets encapsulated in stainless steel, aluminum or zircaloy rods. Uranium may be enriched to a maximum 5.0 w/o in the U235 isotope.

(iii) All materials are unirradiated.

(2) Maximum Quantity Of Material Per Package:

Ten (1) kilograms U235 and the net weight of the contents not to exceed 308 lbs.

(3) The cross section of the inner container shall be limited to a maximum 19.6 square inches for the contents specified in 1.2.3 (1)(i) where the ratio of the weight of U235 to the weight of U235 plus zirconium exceeds 0.074 or the ratio of the weight of U235 to the weight of U235 plus aluminum exceed 0.22.

2. Structural Evaluation:

2.1 Structural Design:

2.1.1 Discussion - Paragraph 1.2.1(3) identified the principal constructional details. Rubber bumpers are used at either end to distribute any impacts from the cage assembly to the ends of the container. Due to the simplicity of the design, the minimum loads to be carried, the 30 ft. drop testing/40" penetration test acceptability testing, and long-time acceptable use, detailed design evaluation is not being made.

2.2 Weights And Center Of Gravity:

The C.G. is essentially the center of the package and applies to loaded or unloaded condition.

2.3 Mechanical Properties Of Materials:

Structural material is mild steel for which a minimum yield point of 25,000 psi and minimum tensile of 50,000 psi would be typical.

2.4 General Standards For All Packages:

2.4.1 Chemical And Galvanic Reactions - No reactions of concern would occur during shipment or accident conditions for reasonable exposures.

2.4.2 Positive Closure - The inner container is held closed by steel banding and the geometry restrictions of the retainer slot in the cage assembly of the outer container. Retainer plates are bolted to the cage assembly to hold both ends of the inner container in the cage. The outer container lid is held closed by a lid ring which is bolted closed, with a tamper proof seal inserted in the end of the bolt.

2.4.3 Lifting Devices - Only minor lifting is performed with hand trucks to place on hand truck or dolly to roll on or off transportation vehicle.

2.4.4 Tiedown Devices - Practice is as per 49 CFR 177.842(d).

2.5 Standards For Type B And Large Quantity Packaging:

Not applicable.

2.6 Normal Conditions Of Transport:

2.6.1 Heat and 2.6.2 Cold:

No problems would be expected due to exposures to temperatures between -40 and +130°F. The rubber bumper would harden at the low temperature but still perform the distribution of stresses from movement of the cage assembly. Due to improvements in the quality of mild steel and the lack of appreciable stresses, no brittle fracture conditions would occur.

2.6.3 Pressure - Gradually, application would result in leakage through the lid seal and pressure equalization. Sudden application would result in dimpling of the walls of the outer container. There would be no loss in the geometry control or inner container retention of material.

2.6.4 Vibration - No effect.

2.6.5 Water Spray - No basic effect. Criticality control considers full moderation from in-leakage.

2.6.6 Free Drop, 2.6.7 Corner Drop, and 2.6.8 Penetration:

See later results of 30 ft. drop test and 40" penetration test.

2.6.9 Compression - The application of a 6,000 lb. load uniformly to the "top" and "bottom" of the horizontal cylinder would not result in any compression as the nine (9) 3/8" steel plates distributed in the cage assembly would easily support this load.

2.7 Hypothetical Accident Condition .

2.7.1 Free Drop and 2.7.2 Puncture Test:

b. Prototype testing:

(1) Date of Test or Evaluation - October 27, 1966.

(2) Location - UNC Fuels Division - New Haven Facility - New Haven, Connecticut.

(3) Weights - Drum (Tare) - 804 lbs.
Load (Net) - 308 lbs.
Total (Gross) - 1,112 lbs.

(4) Description of Test or Evaluation - The ability of the subject container to withstand the hypothetical accident conditions as specified by Title 10 CFR 71, effective August 22, 1966 has been evaluated by performing actual tests. The sealed inner container was loaded with a solid Inconel bar to simulate the weight of the SNM bearing material for which this container would be used. The inner container was then inserted into the inner container support (birdcage) and the inner container and its supports were inserted into the outer container. The outer container was then sealed in the same manner as planned for shipment. The outer container then was dropped from 30 ft. onto a concrete driveway in such a manner as to cause maximum deformation. The container initially hit on the edge of the lid with the remainder of the container continuing in a downward direction causing top, bottom, and side deformation. Following the free fall test, the container was dropped 40" onto a 6" diameter spike in such a manner as to cause maximum damage to the container. Thermal and water immersion tests were not performed. The attached figures show several aspects of these tests (previously submitted in our January 3, 1967 submittal).

Figure No.	Description
1.	Container and internal supports prior to assembly.
2.	Container, inner supports and inner container during assembly.
3.	Container at free fall test position.
4.	Container showing damage after free fall test.
5.	Container with lid removed showing maximum damage after free fall test.
6.	Container and lid showing maximum damage after free fall test.
7.	Container during puncture test.
8.	Container showing maximum damage after puncture test.
9.	Inner container during disassembly after free fall and puncture tests showing negligible damage.

2.7.3 Thermal Test and 2.7.4 Water Immersion:

These tests were not performed since only materials that will not thermally decompose are shipped in these containers. The charing of the wood spacers and rubber bumper after 30 minutes at 1475°F would not affect the integrity of the package.

The nuclear safety of the individual containers and array has been evaluated with the assumption of inleakage of water.

2.7.5 Summary Of Damage - The extent of damage after the 30 ft. free fall test is best shown on Figure 6. This test caused a total deformation of approximately one inch at both ends and less than one inch along the length of the diameter. Damage caused by the puncture test is best shown on Figure 8. The deformation to the outer container was approximately 1/2" and there was no evidence of tearing or puncture after this test. Total damage to the container after these tests is shown on Figure 9.

Conclusions - The container was subjected to the test conditions specified by Title 10 CFR 71 with no resultant loss of contents and only minor deformation evident. The nuclear safety evaluation of this container has been performed assuming the above-noted amounts of deformation.

2.8 Special Form:

Although most all the materials and items that would be shipped in the package would meet the requirements of special form, there is not a shipping advantage to be obtained since U235 has such a low relative radioactivity.

2.9 Fuel Rods:

While contributing containment due to cladding is present in many cases, the prime attribute is the material is in solid form, having no dimension less than 0.5 mm, and at least one dimension greater than 5 mm.

2.10 Appendix:

Pictures referred to in Paragraph 2.7.1 above should be placed in this Appendix.

3. Thermal Evaluation:

Not required, as materials are not irradiated.

4. Containment:

4.1 Containment Boundary:

While partial containment is associated with the outer container and inner container, primary retention is associated with the material being a solid phase, generally clad, with no piece having a dimension less than 0.5 mm and at least one dimension greater than 5 mm.

4.2 Requirements For Normal Conditions Of Transport:

As indicated in Paragraph 2.6, the outer and inner container would withstand the test conditions of Appendix A to 10 CFR Part 71.

4.2.1 Release of Radioactive Material - As indicated in Paragraph 4.1 and 2.9 above, the form of the material to be transported, in addition to the integrity of the package would prevent the direct release of radioactive material from the containment vessel.

4.2.2 Pressurization of Containment Vessel — Not Applicable

4.2.3 Coolant Containment — Not Applicable

4.2.4 Coolant Loss — Not Applicable

4.3 Containment Requirements For The Hypothetical Accident Conditions:

Prototype testing to requirements of Appendix B of 10 CFR 71 was indicated in Paragraph 2.7 above.

4.3.1 Fission Gas Products - Not applicable.

4.3.2 Release of Contents - There would be no release of radioactive materials exceeding the maximum quantities defined in Paragraph 71.36(a)(2) of 10 CFR 71.

5. Shielding Evaluation:

Not required due to low radioactivity of material to be transported.

6. Criticality Evaluation:

Evaluation was made to the requirements of Table 6.1 of Regulatory Guide 7.9, Rev. 1 for Fissile Class II and III shipments (as per Paragraphs 71.39 and 71.40 of 10 CFR 71.

6A. Conditions:

A. Each container will be limited to 10 kgs U235.

B. The allowable number of containers will be subcritical under normal and accident transport conditions.

C. Under normal transport conditions, the array and its individual containers will be evaluated assuming:

1. Individual Containers -

a. Undamaged container
b. Container not internally moderated
c. Reflected

2. Array -

a. Undamaged containers
b. Containers not internally moderated
c. Array reflected

D. Under accident transport conditions, the array and its individual containers will be evaluated assuming:

1. Individual Containers -

a. Damaged container
b. Container internally moderated
c. Reflected

2. Array -

a. Damaged containers
b. Containers internally water moderated
c. Interspersed moderation between containers
d. Array reflected

6A. (Continued):

E. The nuclear safety of the array under normal transport conditions will be evaluated using the density analog method. Accident transport conditions will be evaluated using the density analog and K-∞ methods.

6B. CALCULATIONS

A. Individual Containers

The structural evaluation tests show that individual containers should sustain minimum damage due to the impact results of an accident. Also, minimum damage should occur due to a subsequent fire since both the inner and outer container are steel. The inleakage of water to cause optimum water moderation within the container is assumed for the accident conditions. The inner container will have a cross sectional area of 25 sq. inches or less.

Uranium-zirconium alloys or compounds where the ratio of the weight of U-235 to the weight of U-235 plus zirconium exceeds 0.074 will be packaged in inner containers with cross-sections limited to 19.6 sq. inches or less. The 25 sq. inch cross section is safe for weight ratios not exceeding 0.074 as shown on the attached figure. The 19.6 sq. inch cross section is equivalent to a 5 inch diameter cylinder which is safe for U-235 densities not exceeding 1 kg U-235/liter as shown on Fig. 3, TID-7016, Rev. 1.

Uranium-aluminum alloys or compounds where the ratio of the weight of U-235 to the weight of U-235 plus aluminum exceed 0.22 will be packaged in inner containers with cross sections limited to 19.6 sq. inches or less. The 25 sq. inch cross section is safe for weight ratios not exceeding 0.22 as shown on the attached figure. The 19.6 sq. inch is safe for U-235 densities not exceeding 1 kg U-235/liter as shown above.

Using Table VIII, DP-1014, the safe diameter for 5% enriched uranium oxide is

$$\text{Safe Diameter} = \frac{\text{Critical Diameter} + \text{"Safe" Diameter}}{2} \times \text{Safety Factor}$$

$$= \frac{\left(\frac{23.4 + 22.3}{2}\right) \text{cm} \times .38}{2.45 \text{ cm/in}} = 8.2 \text{ in}$$

And the equivalent safe cross section is

$$\text{Safe Cross Section} = \frac{\pi d^2}{4} = \frac{\pi (8.2 \text{ in})^2}{4} = 52.8 \text{ sq. inches}$$

Therefore, the 25 sq. inch cross section is safe for 5% enriched uranium oxide materials.

B. Array of Containers

During transportation, handling and storage, these containers could come into close proximity to each other. Therefore, the closest arrangement would be a triangular pitch. Under normal transport conditions, the undamaged container dimensions were used. So,

d = 22.5", h = 101"

The unit volume (V_u) for the triangular pitch arrangement was obtained using

$$V_u = 3.46\ r^2\ h = 3.46\ (11.25")^2 \times 101" = 724.46\ \ell$$

The volume of the inner container is,

V_{IC} = cross sectional area x height = 25 in^2 x 96" = 39.31 ℓ

After the hypothetical accident and the resultant deformation, the container could come into closer proximity to each other again forming a triangular pitch. So,

d = 22.5" - 0.5" = 22", h = 101"

The unit volume under accident conditions was obtained using

$$V_u = 3.46\ r^2 h = 3.46\ (11")^2 \times 101" = 693.42\ \ell$$

For the shipment under normal transport conditions, $H/X \leq 2$ is assumed. From Table 1 and Fig. 8 of TID-7028,

$M_{c,}$ = 48 kgs U-235, $\rho_{c,b}$ = 7.48 kgs U-235/ℓ

Actual Mass = 10 kg U-235

$$V_s = \frac{\text{Actual Mass}}{\rho_{c,b}} = \frac{10 \text{ kgs U-235}}{7.48 \text{ Kgs U-235}/\ell} = 1.34\ \ell$$

$$f = \frac{\text{Actual Mass}}{M_{c,b}} = \frac{10 \text{ kgs U-235}}{48 \text{ kgs U-235}} = 0.208$$

$$S = 2\ (1-f) = 1.584$$

R = 13 (from attached Array Reflection Curve)

$$N_c = \frac{1}{fR}\left(\frac{V_u}{V_s}\right)^S = \frac{1}{.208 \times 13}\left(\frac{724.46\ \ell}{1.34\ \ell}\right)^{1.584} = 0.37\ (540.6)^{1.584} =$$

$$0.37\ (21000) = 7770$$

The allowable number of containers would be,

Class II = 1554, Class III = 3885

For H/X $\leq$ 2 under accident conditions, from the attached interspersed Moderation Curve,

$$L_M = 2.5$$

$$N_c = \frac{1}{fR\ L_M}\left(\frac{V_u}{V_s}\right)^S = \frac{1}{.208 \times 13 \times 2.5}\left(\frac{693.42\,\ell}{1.34\,\ell}\right)^{1.584} = 0.148(517.5)^{1.584}$$

$$= 0.148\ (20000) = 2960$$

For H/X = 10 under accident conditions, from Table 1 and Fig. 8 of TID-7028

$$M_{c,b} = 25 \text{ kg U-235},\ \rho_{c,b} = 2.27 \text{ kg U-235}/\ell$$

$$V_s = \frac{\text{Actual Mass}}{\rho_{c,b}} = \frac{10 \text{ kgs U-235}}{2.27 \text{ kgs U-235}/\ell} = 4.41\,\ell$$

$$f = \frac{\text{Actual Mass}}{M_{c,b}} = \frac{10 \text{ kgs U-235}}{25 \text{ kgs U-235}} = 0.4$$

For a 25 sq. in. cross section, the equivalent diameter would be,

$$d = \sqrt{\frac{4 \times \text{cross sectional area}}{\pi}} = 5.64\text{" (7.16 cm radius)}$$

With a 5.64" diameter (7.16 cm radius) and a $V_s = 4.41\,\ell$, the system height would be,

$$h = \frac{V_s}{\pi r_s^2} = \frac{4410 \text{ cc}}{\pi (7.16 \text{ cm})^2} = 27.38 \text{ cm}$$

$$h/d = \frac{27.38 \text{ cm}}{14.32 \text{ cm}} = 1.91$$

Assuming a nominal reflector to describe the inner container wall, from Fig. 17, TID-7016, Rev. 1

Shape allowance factor = 1.2

Adjusting the actual mass to account for other than optimum h/d ratio,

$$\text{Equivalent Mass } (M_E) = \frac{\text{Actual Mass}}{\text{Shape Allowance Factor}} = \frac{10 \text{ Kg U-235}}{1.2} = 8.33 \text{ Kg U-235}$$

$$f' = \frac{M_E}{M_{c,b}} = \frac{8.33 \text{ kg U-235}}{25 \text{ kg U-235}} = 0.334$$

$$S = 2(1-f) = 1.332$$

$R \times I_M = 9.6 \times 2.33 = 22.1$ (from attached Array Reflection Curve and Interspersed Moderation Curve)

From Fig. F-1.1, Y-1272

$\bar{\Omega}_f = .039$

Ω_t (each unit of 2 containers end-to-end) $= 4\pi \bar{\Omega}_f = 0.49$ steradians

$= 0.245$ steradians/container

The allowable number of containers would be

$$N_A = \frac{2.42 \text{ steradians}}{0.245 \text{ steradians container}} = 9.87 + 2 \text{ (center unit)} = 11.87 \text{ containers}$$

Under accident conditions for 3 layers, the outer container diameter, inner container diameter and edge-to-edge separation remain the same as for 2 layers. Thus, also is the same

$$\lambda = \frac{3 \times 101"}{5.64"} = \frac{303"}{5.64"} = 53.7$$

From Fig. F-1.1, Y-1272

$\bar{\Omega}_f = .04$

Ω_T (each unit of 3 containers end-to-end) $= 4\pi \bar{\Omega}_f = 0.5$ steradians

$= 0.167$ steradians/container

The allowable number of containers would be

$$N_A = \frac{2.42 \text{ steradians}}{0.167 \text{ steradians/container}} = 14.49 + 3 \text{ (center unit)} = 17.49 \text{ containers}$$

Therefore, 17 containers as 3 layers subtends approximately the same solid angle as 11 containers 2 layers high. So the 2 layer case will be the limiting case.

For H/X = 30 under accident conditions assuming 2 layers of containers

Inner Container Diameter = 5.64", Height = 2 x 101" = 202"

Using K-1380,

$\eta f = 2.06$ (Fig. I-5)

$B^2_{fast} = 0.0619 + 0.0001 = 0.0620$ (Fig. I-6)

$U_f = 0.322$ (Fig. I-7)

$B^2_{thermal} = 0.1024 + 0.0001 = 0.1025$ (Fig. I-8)

$U_T = 0.987$ (Fig. I-10)

$K = \eta f \, U_f U_T = 2.06 \times 0.322 \times 0.987 = 0.655$

$$N_c = \frac{1}{fRI_M}\left(\frac{V_u}{V_s}\right)^s = \frac{1}{.4 \times 22.1}\left(\frac{693.42\ell}{4.41\ell}\right)^{1.332} = 0.113(157.24)^{1.332} =$$

$0.113 \times 840 = 95$

Since the density analog method is overly conservative for long cylinders, additional iterations at higher H/X values will be performed using the k - Ω technique.

For H/X = 20 under accident conditions assuming 2 layers of containers,

Inner Container Diameter = 5.64", Height = 2 x Inner Container Height = 2 x 101" = 202"

Using K-1380

$\eta_f = 2.07$ (Fig. I-5)

$B^2_{fast} = 0.0619 + 0.0001 = 0.0620$ (Fig. I-6)

$U_f = 0.322$ (Fig. I-7)

$B^2_{thermal} = 0.1024 + 0.0001 = 0.1025$ (Fig. I-8)

$U_t = 0.987$ (Fig. I-10)

$k = \eta f\ U_f\ U_t = 2.07 \times 0.322 \times 0.987 = 0.658$

The allowable Ω is determined using

Allowable $\Omega = 9 - 10\ k = 2.42$ steradians

If 3 layers of containers are assumed, the height contribution to the Buckling values will decrease slightly. Therefore, both the thermal and fast utilization values should remain approximately the same for either 2 or 3 layers.

Under accident conditions for 2 layers,

Outer Container Dia. = 22", Height = 101"

Inner Container Dia. = 5.64"

Assuming the units form a close packed array with a triangular pitch, there are up to six units surrounding the center unit and the edge to edge separation is,

e - e = 22" - 5.64" = 16.36"

$$\lambda = \frac{2 \times h}{d} = \frac{2 \times 101"}{5.64"} = \frac{202"}{5.64"} = 35.8$$

$$\sigma = \frac{e-e}{d} = \frac{16.36"}{5.64"} = 2.9$$

Therefore, for H/X values greater than 20, k will decrease, the allowable Σ increase and the number of containers also will increase. Thus, 11 containers will be the limiting case. Assuming 11 containers to be the number critical, the allowable number of containers would be

Class II = 5, Class III = 10

The accident conditions will be the limiting case and determine the allowable number of containers.

References:

1. TID-7016, Rev. 1 - Nuclear Safety Guide, 1961.
   Revised by: Subcommittee 8 of the American Standards Association Sectional Committee #6 and Project 8 of ANS Committee.

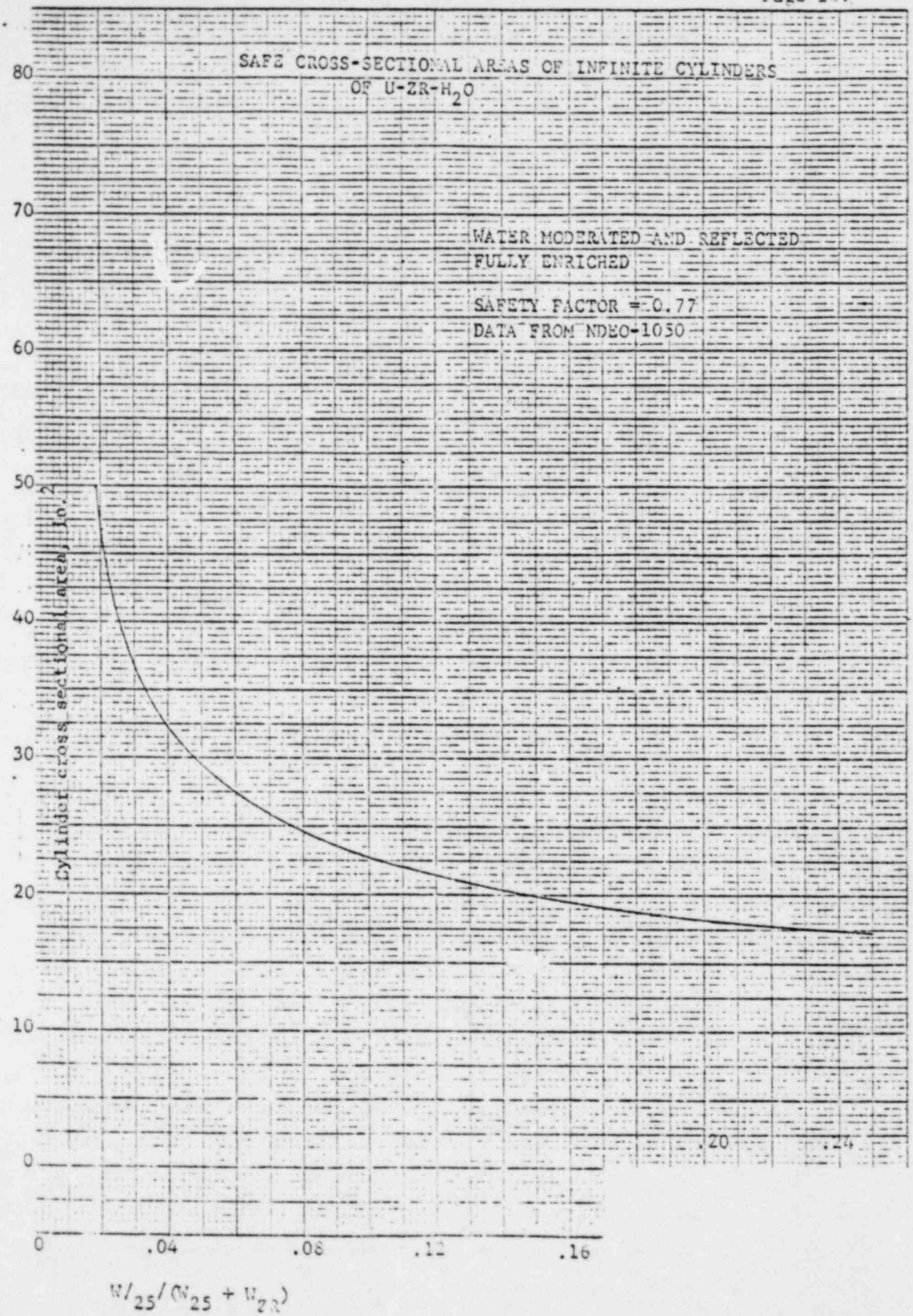
2. DP-1014 - Critical & Safe Masses & Dimensions of U & UO_2 Rods in Water (H. K. Clark, 2/66)

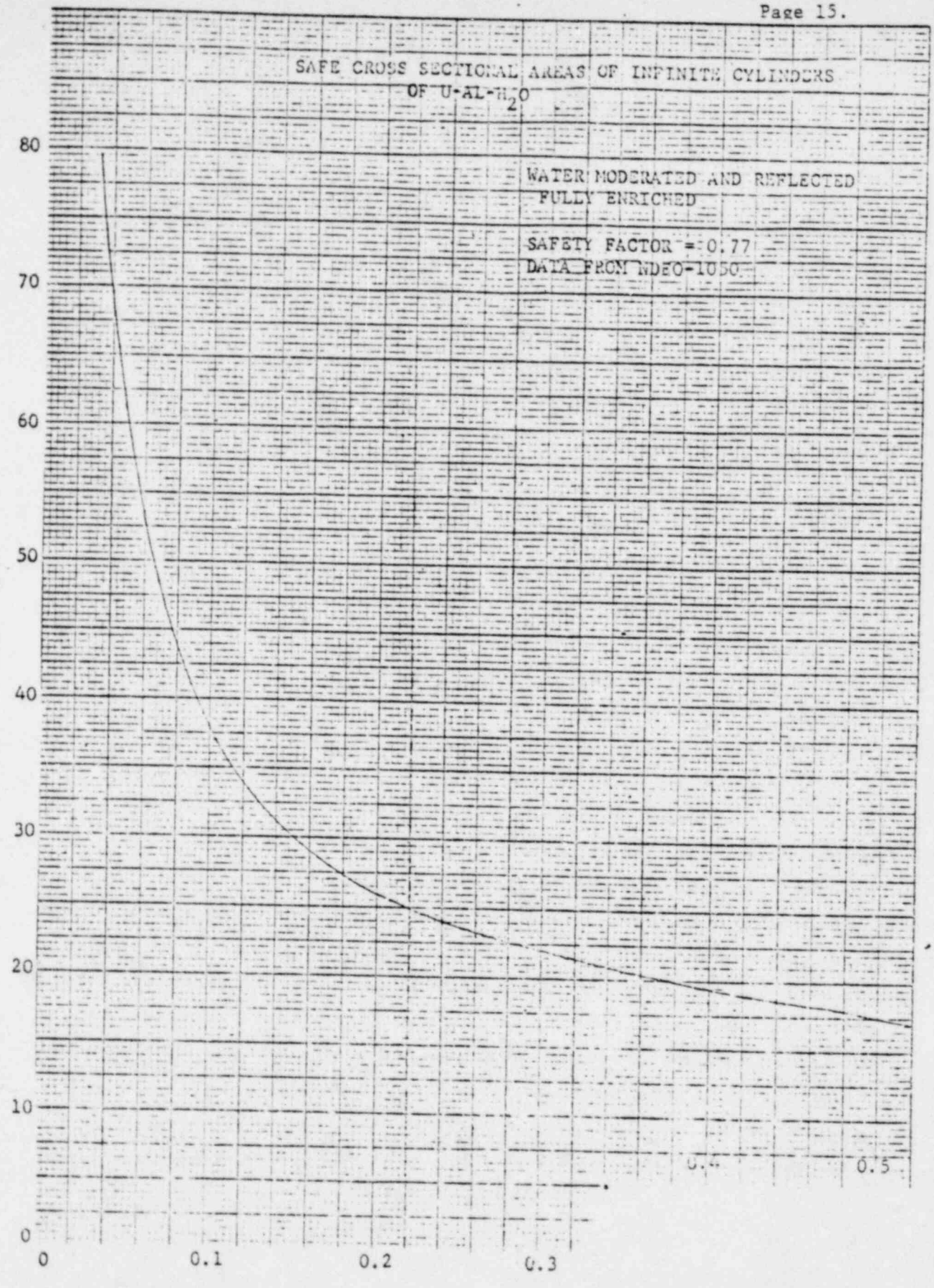
3. TID-7028 - Critical Dimensions of Systems Containing U235, Pu239 & U233, 6/64 (Paxton, Thomas, Callihan, Johnson)

4. K-1380 - Studies in Nuclear Safety (H. F. Henry, August, 1958)

5. Y-1272, Y-12 Plant Nuclear Safety Handbook (Criticality Studies (TID 4500 (20th Edition)), 3/27/63

6. NDEO-1050 - Criticality Safety Calculation Method for Enriched Uranium - Water Systems, UNC, Research & Engineering Center, Elmsford, New York by M. Raber, J. R. Tomonto, August 22, 1967


SAFE CROSS-SECTIONAL AREAS OF INFINITE CYLINDERS
OF U-ZR-H2O
WATER MODERATED AND REFLECTED
FULLY ENRICHED
SAFETY FACTOR = 0.77
DATA FROM NDEO-1050
Cylinder cross sectional area, in.2
80
70
60
50
40
30
20
10
0
0
.04
.08
.12
.16
.20
.24
W25/(W25 + WZR)


SAFE CROSS SECTIONAL AREAS OF INFINITE CYLINDERS OF U-AL-H2O
WATER MODERATED AND REFLECTED
FULLY ENRICHED
SAFETY FACTOR = 0.77
DATA FROM NDEO-1050
Cylinder Cross Sectional Area - In.2
80
70
60
50
40
30
20
10
0
0
0.1
0.2
0.3
0.5
W25/(W25 + WAl)

7. Operating Procedures:

7.1 Procedures For Loading The Package:

Procedures for packaging, labeling, inspection and release for shipping are given in our SNM Shipping Guide, Section 14.

An example of this procedure, together with associated route cards and inspection records, is in Appendix 7.4.

7.2 Procedures For Unloading The Package:

Procedures for receiving and unloading are given in our SNM Shipping Guide, Section 13 (see example in Appendix 7.4).

7.3 Preparation Of An Empty Package For Transport:

See 7.1 above.

8. Acceptance Tests And Maintenance Program:

8.1 Acceptance Tests:

New packages would be subject to SNM Shipping Guide, Section 16 on Procurement or Modification of Shipping Containers (example given in Appendix 8.3) and our approved Q.A. program.

For these packages, only visual and dimension inspection would be performed.

8.2 Maintenance Program:

Our SNM Shipping Guide Section 14 in Appendix 7.3 covers this program.

TITLE: SNM SHIPPING GUIDE	NUMBER: Section 14	REV. 0

SUBJECT

UNC-NPD Packaging, labeling, Inspection and Release for Shipping.

PURPOSE

To establish and define the requirements for packaging, labeling, inspection and releasing radioactive materials for transport.

APPLICABILITY

All radioactive materials to be transported off the premises of the Naval Products Division to other facilities either by UNC vehicles, common carriers or postal service. Product shipment to customer (ERDA) is handled as required by contract.

RESTRICTIONS

1. No radioactive materials are to be transported in UNC employee's privately owned vehicles.
2. Only MBA Custodians or their delegates are authorized to release materials for transfers.

RESPONSIBILITIES

1. MBA Custodians or their delegates are responsible for directing the activities relating to packaging of radioactive materials as required in this procedure.
2. The Plant Services Department is responsible for final overchecks and release of packages to carriers or UNC trucks.
3. Health Physics (NIS) will perform required contamination and radiation survey.

PREPARED BY: F. L'Heureux/WAK 7/12/76

NUCLEAR MATERIALS MANAGER: John F. L'Heureux 7/16/76

NIS MANAGER: W.F. Kush 7/19/76

PROCEDURE

1. External Shipments To Other Licensees

   a. Verification

      Verify that the recipient is authorized to receive the type, form and quantity of SNM to be transferred (See Para. 70.42 of 10 CFR 70).

   b. Packaging and Inspection (By NMC Personnel)

      1. For shipment in excess of exempt or small quantities of enriched U (see SNM Shipping Guide Section 2,3 and 4) only DOT specification or NRC/DOT approved containers are to be used which have been authorized by the NIS Department via a "Container Specification and Inspection Report."

      2. Select the containers which are authorized for the items and quantities to be packaged.

      3. Inspect, package, and document in accordance with Attachment A, "Instructions for Completing Container Specification and Inspection Report (CSIR)". Place tamper seals on containers immediately after packaging and closing containers.

      4. Forward completed report to Nuclear Material Control (NMC) office, notify NIS of pending shipment, and request contamination and radiation survey of container.

   c. Survey and Release (By NMC Personnel)

      1. NMC obtain prior approval to make the shipment from the Consignee in accordance with his requirements, (e.g., SNM-KAPL requires a request by TWX and a TWX approval prior to releasing the shipment).

      2. NMC Foreman audit the CSIR to assure that the inspection is completed, quantities, and items are in compliance with the authorization.

      3. Determine type of labels required, and other special controls required. See SNM Shipping Guide, Sections 8 & 11.

      4. Initiate and prepare the following:
         a. Radioactive labels (two for each container) and enter required data on the labels.

         b. Type A or Type B, Fissile Radioactive or Radioactive Material.

         c. "Corrosive" label if necessary.

         d. Factory Shipping Order (FSO) - Record required information for internal control purposes.

         e. Vehicle Placards.

b. Obtains and prepare the following:

1. Straight Bill of Lading - Enter the following information:

(1) Number, type and weights of packages
(2) - Radioactive - Material N.O.S.
(3) - Transport Group III - No. Curies

(4) Physical and Chemical Form - Reg. 1035
(5) Type Label applied - Fissile Class, Transport Index

2. Address labels for each container

c. Forward labels to NMC Packager for applying to container and forward TSO, Bill of Lading to the Shipping Department. NMC Office retains one copy of each of FSO and CSIR.

4. Count and Test/Radiation Survey

NDS (Health Physics) shall perform required surveys noted on route card/CSIR.

5. Final Release to Carrier

1. Shipping (Plant Services) Department upon receipt of all documents listed in c.6 will arrange for the transfer of container to the loading dock and will arrange for a move.

2. Each container will be final checked by Shipping Department for labels, seal numbers, markings, etc. as shown on the NNM Shipment Route Card. No containers will be released to a carrier unless an authorized signature appears on Operation 130 of the Route Card and all labels, markings, seal numbers are as shown on NNM Shipment Route Card.

3. The individual who releases the packages to the carrier will sign the "Released By" Operation 150 of the NNM Shipment Route Card. A signature here denotes that the final check has been made and all was found to be acceptable.

4. The carrier to whom the containers were released will be entered on the Route Card. The Shipping Department will immediately notify the NMC Office of the time of departure, carrier or carriers, and estimated time of arrival at destination.

5. Security arrangements will be made as required by NMC.

6. Notification to Consignee

The NMC Office will notify by phone or TWX the consignee of the time of departure, carrier or carriers, mode of shipment, and estimated time of arrival. The individual's name who was notified will be shown in Operation 060 "Notified" to denote that notification was been made.

c. Document Retention

The NMC Control Office will file a copy of the Card and [illegible] Card with the official NMC transfer document [illegible] of Special Nuclear Material and will be retained for a minimum of [illegible] year.

2. Small Quantities Shipments

a. Shipments of packages containing small quantity of enriched U (See SNM Shipping Sections 2 & 4) are exempt from Specification Packaging, Marking, and Labeling and other requirements provided for in this procedure if the following conditions are met:

1. The materials are packaged in strong, tight packages such that there will be no leakage of radioactive materials under conditions normally incident to transportation.

NOTE: Metal drums used for packaging low level combustibles and other materials are to be closed with the standard locking closure with a bolt and nut.

2. The dose rate at any point on the external surface of the package does not exceed 0.5 MR/hr. and there is no significant removable radioactive surface contamination on the exterior of the package. Limits are 2.2DPM/cm^2 alpha and 22 DPM/cm^2 Beta-Gamma when averaged over any 300 cm^2 of any part of package surfaces.

Limits of 22 DPM/cm^2 alpha and 220 DPM/cm^2 Beta-Gamma would apply for exclusive use shipments.

3. The outside of the inner container must bear the marking "Radioactive".

4. NMC will package these shipments and prepare an SNM Shipment Route Card for the small shipments of samples. Production and Plant Services handle the combustibles (paper and wood) SNM using the SNM Shipment Route Card.

5. Small packages of small quantities of enriched U (See SNM Shipping Guide, Sections 2 & 4) are authorized to be mailed. (See U.S. Postal Publication #6). A label containing the following information is required on the outside of the package:

   "Radioactive material, gamma radiation at surface of parcel less than 10 milliroentgens for 24 hours. No significant alpha, beta, or neutron radiation".

   The packages must meet the requirements of 2.a.1,2, and (a) the outside of the inner container must bear the marking "Radioactive Material - No Label Required".

(b) Liquid radioactive material must additionally be packaged within a leak and corrosion resistant inner container, surrounded by sufficient absorbent material to absorb at least twice the volume of liquid contents.

(a) Material classified as non-radioactive can be mailed (See SNM Shipping Guide, Section 1).

3. Empty Containers

Empty containers bearing radioactive markings or labels on the outside must be labeled with an "empty" label. The label is six inches square with white background and letters in black at least one inch high. The labels should be weather-resistant and avoid peeling.

TITLE: ATTACHMENT A SNM SHIPPING GUIDE INSTRUCTIONS FOR COMPLETING "CONTAINER SPECIFICATION AND INSPECTION REPORT" (CSIR)	NUMBER: Section 14	REV. 0

A. INTRODUCTION

This instruction is to be followed for all containers used to package radioactive materials (in excess of small quantities of enriched U [See SNM Shipping Guide, Sections 2&4]) which will be transported off the premises of NPD, unless otherwise exempted.

Separate CSIR's for each shipping container are provided (attached) Each form specifies the items to be inspected and the authorized contents

B. PACKAGING PROCEDURE (To be performed by "packager")

1. Verify that the Specification Number and other markings required (as shown on the form) are plainly and durably marked. For Standard Specification Containers this will be on the bottom of drum. For DOT Cert. containers, this may be on a separate plate welded to the container or may be painted on. Record the serial number assigned to assign a number to identify each container.

2. Inspect the container to assure it is unimpaired, i.e., that there are no dents, tears, holes, cracks, etc., which may contribute to structural weakness or cause leakage. Superficial marks such as minor dents, chipped paint, scratches, etc., are not to be considered rejectable.

3. Inspect all closure devices, gaskets, lids, bolt rings to insure that the integrity of these have been maintained.

   NOTE: Any container which is damaged must be removed from use.

PREPARED BY: J. L. Heuerman 7/12/76	
NUCLEAR MATERIALS MANAGER: John P. Heuerman 7/16/76	
NIS MANAGER:	

3.5 Containers requires repair:
Mark the container as "Under Repair - Do not use" by painting it directly on the drum or affixing a permanent type tag. Issue a work order for the repair needed. The means used to repair shall be recorded. If the container is damaged such that it cannot be re-used, then paint on the drum "Damaged - Not Re-Usable" and remove the container to a scrap disposal area for disposal.

4. Prior to packaging any Radioactive Materials, verify that the items and quantities are authorized for loading into the container.

5. Package only those items as authorized on the CSIR.

NOTE: All items which have exposed fuel must be wrapped, or placed in containers to prevent unnecessary contamination within the container. Suitable cushioning and blocking of items should also be placed in the container to prevent inner packages or items from shifting during handling and transporting.

6. Record the weights and items packaged as required on the form.

7. Carefully inspect and affix all required closure devices to assure proper and secure closures. Use and complete the step-by-step overcheck items shown on the CSIR.

8. Record the gross weights on drums and check against allowable for container.

9. All containers must have a seal affixed to the container which is attached such that the seal would have to be broken to open the container. Affixing the seal and recording of the number on the CSIR denotes that all overchecks have been completed and the container meets all the requirements listed and is, therefore, ready for shipment.

10. Sign and date the form when all has been completed.

11. Forward completed forms to the designated office.

NOTE: For all items which are inspected, enter your initials to denote it was acceptable. If an item was rejected and repaired, enter "Rej-Rep." File a written explanation of what was damaged and how repaired along with the CSIR.

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	NAME - OUTGOING SNM SHIPMENT (OTHER THAN FINAL PRODUCT)	SHIPMENT IDENTITY	SERIAL/LOT NUMBER OF PACKAGES	PAGE: 1 of 6 CONT. ON: 2
REQ CONTRACT OR P.O. #	QUANTITY		1	REVISION NO. 0

OPER.NO. & WORK UNIT	OPERATION DESCRIPTION	DRAWING, DOCUMENTS REMARKS AND STAMPS	OPERATOR SIGNATURE/DATE/ SHIFT
010 9722	NMC OFFICE Determine for shipment material Type _____ (Enriched U235) Transport Group III Quantity _____ kg _____ curies Small Quant. ☐ Low S.A. ☐ (Concent.) Type A ☐ Quantity Type B ☐ Quantity Large ☐ Quantity Form: Normal ☐ Special ☐ Liquid ☐ Solid ☐		
020 9722	NMC OFFICE Method Of Shipment Comm. Truck ☐ Postal ☐ Non-Exclusive ☐ UNC Vehicle ☐ Exclusive ☐ DPS ☐		
030 9722	NMC OFFICE Security Requirements Material Classified YES ☐ NO ☐ SNM Security Quantities YES ☐ NO ☐ NOTE: Any Special Security Requirements		

APPROVALS:

PLANT SERVICES: Joseph Bueno 7-20-76

NUCLEAR MATERIAL CONTROL: J. L. Pickering 7/19/76

NUCLEAR & INDUSTRIAL SAFETY: W. Fitch 7/19/76

NOTE: THE RECORDING OF FALSE, FICTITIOUS OR FRAUDULENT STATEMENTS OR ENTRIES ON THIS DOCUMENT MAY BE PUNISHED AS A FELONY UNDER FEDERAL STATUTES.

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T. Garcia 7/20/76
AUTHORIZED CLASSIFIER DATE

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	NAME - OUTGOING SNM SHIPMENT (OTHER THAN FINAL PRODUCT)	SHIPMENT IDENTITY	SERIAL/LOT NUMBER OF PACKAGES	PAGE: 2 of 6 CONT. ON: 2
MFG CONTRACT OR P.O. #	QUANTITY			REVISION NO. 0

OPER. NO. & WORK UNIT	OPERATION DESCRIPTION	DRAWING, DOCUMENTS REMARKS AND STAMPS	OPERATOR SIGNATURE/DATE/ SHIFT
040 9722	NMC OFFICE Choose shipping containers or packaging material to be used. Note requirements that must be met from appropriate section of SNM Shipping Guide. Guide No. _____ Paragraph _____ Specification Container No. _____ UNC Model No. _____ DOT NO.# _____ Specify Fissile Class ☐ H/X Ratio ☐ Transport Index ☐ No. of Containers per Shipment ☐		

	NAME - OUTGOING SNM SHIPMENT (OTHER THAN FINAL PRODUCT)	SHIPMENT IDENTITY	SERIAL/LOT NUMBER OF PACKAGES	PAGE: 3 of 6 CONT. ON: 2
MFG CONTRACT OR P.O. #	QUANTITY			REVISION NO. 0

OPER. NO. & WORK UNIT	OPERATION DESCRIPTION	DRAWING, DOCUMENTS REMARKS AND STAMPS	OPERATOR SIGNATURE/DATE/ SHIFT
050 9722	UNC - B-SOUTH Clean and inspect shipping containers prior to use per specific applicable CSIR Form DOT 6M - Type B ☐ DOT 7A - Type A ☐ DOT 6L ☐ DOT 6J ☐ DOT 17H ☐ Small Quantity (No Specific Container) ☐ L.S.A. Exclusive use (No Specif. Cont.) ☐ UNC Model 1484 DOT ☐ 2400 ☐ 2500 DOT/USA/5641/ ☐ 2600 ☐ Other _____ ☐ Attach completed Inspection Form to the route card when completely accepted. Record any specific means of repairs performed on the inspection report together with final acceptibility Means to prevent their recurrence should be investigated.	☐ Accept ☐ Reject ☐ Accept After Repair ☐ Reject After Repair	

	NAME - OUTGOING SNM SHIPMENT (OTHER THAN FINAL PRODUCT)	SHIPMENT IDENTITY	SERIAL/LOT NUMBER OF PACKAGES	PAGE: 4 of 6 CONT. ON: 2
NFO CONTRACT OR P.O. #	QUANTITY			REVISION NO. 0

OPER. NO. & WORK UNIT	OPERATION DESCRIPTION	DRAWING, DOCUMENTS REMARKS AND STAMPS	OPERATOR SIGNATURE/DATE/ SHIFT
	NMC - B-SOUTH		
060	Package to requirements		
9722	1. Material placed in inner container is identified and authorized on CSIR.		
	2. All items which have exposed fuel must be wrapped prior to placing in container.		
	3. Cushion and block items in inner container to prevent shifting during shipment/		
	4. The H/X ratio of internal packaging is not exceeded (See Operation 040).		
	5. Liquids are packaged as required.		
	6. Complete CSIR Form		
065	NMC Notify Consignee Name of Individual _____	Notified By _____	_____
070	NFS Inspect for:		
9412	1. Surface contamination	☐ Accept ☐ Reject	
	2. Internal Radiation	☐ Accept ☐ Reject	
	Record Containers/packages inspected		

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	NAME - OUTGOING SNM SHIPMENT (OTHER THAN FINAL PRODUCT)	SHIPMENT IDENTITY	SERIAL/LOT NUMBER OF PACKAGES	PAGE: 5 of 6 CONT. ON: 2
NRO CONTRACT OR P.O. #	QUANTITY			REVISION NO. 0

OPER. NO. & WORK UNIT	OPERATION DESCRIPTION	DRAWING, DOCUMENTS REMARKS AND STAMPS	OPERATOR SIGNATURE/DATE/ SHIFT
080 9722	NMC OFFICE NMC Foreman Audit CSIR to assure that inspection is completed, quantities and items are in compliance.		
090 9722	NMC OFFICE Determine type of labeling required and prepare labels. 1. Radioactive Class _____ with data on contents/ curies filled in. (2 per container). 2. Type A [ ] Type B [ ] 3. Fissile Radioactive [ ] or Radioactive Material [ ] 4. Corrosive (if required) [ ] 5. Vehicle placards. (Record type and number) required. 6. Address Lable		
100 9722	NMC OFFICE Fill out Factory Shipping Order (FSO) and Bill of Lading, Form 741.		
110 9722	NMC- B-SOUTH Affix Required Labels to each container		

	NAME - OUTGOING SNM SHIPMENT (OTHER THAN FINAL PRODUCT)	SHIPMENT IDENTITY	SERIAL/LOT NUMBER OF PACKAGES	PAGE: 6 of 6 CONT. ON: 2
NFO CONTRACT OR P.O. #	QUANTITY			REVISION NO. 0

OPER. NO. & WORK UNIT	OPERATION DESCRIPTION	DRAWING, DOCUMENTS REMARKS AND STAMPS	OPERATOR SIGNATURE/DATE/ SHIFT
120 9132	Shipping (Plant Services) Inspect Shipping Containers 1. Proper labeling (See Operation 090) 2. Seal Numbers (See CSIR) 3. NIS Release (Operation 070) 4. Container Quality (Visual)	☐ Accept ☐ Reject	
130 9132	Shipping Department Release for Shipment	Released By	
140 9132	Shipping Department check internal bracing/blocking/ tiedown on vehicle to ensure that the containers are firmly positioned for shipment.		
150 9132	Shipping Department Record Carrier _____ and that proper placards were affected to outside of vehicle.	Released By	
160 9132	Shipping Department Security complied with	Security Released By	
170 9132	Shipping Department send completed Route Card and attached completed forms to NMC. These records are to be retained for at least two (2) years by NMC.		

(2668)

CONTAINER SPECIFICATION AND INSPECTION REPORT - RADIOACTIVE MATERIAL

REV. _____ DATE _____

IDENTIFICATION NO. AND MARKINGS
(U.A./SOR/P ( ) FA DOC 2668)
FISSILE RADIOACTIVE MATERIAL

CONTAINER DESCRIPTION

1. Inner Container: 11 gage steel box approx. 2-1/2" x 7" x 96" with fastening straps.
2. Outer Container: 14 gage steel drum approx. 22" I.D. x 101" with insertable steel cage and channel for box insertion to be constructed as per UNC Dwg. E-20354.

CONTAINER AUTHORIZED CONTENTS

1. Fillers (in cans), max. density 1 kg. U235/liter.
2. Elements } Assemblies } in whole form.
3. Hydrogeneous material and/or pieces not in whole form to be controlled to meet NRC-DOT specifications.
4. Max.net weight of box contents = 308 lbs.(139.7 kg.) and 10 kg. U235.

INSPECT FOR: SERIAL NO. OF CONTAINER	DEPT #										
1. NAME AND ADDRESS OF MAKER	9132										
2. DRUM PLAINLY AND DURABLY MARKED	9722										
3. OUTER CONTAINER UNDAMAGED	9722										
4. INNER STEEL BOX UNDAMAGED	9722										
5. CONTENTS PROPERLY PACKAGED	9722										
6. NET WT. (WITHOUT PACKAGED MATERIAL)	9722										
7. NET WT. (WITH PACKAGING MATERIAL)	9722										
8. U-235 WEIGHT	9722										
9. TYPE OF MATERIAL PACKAGED	9722										
10. 2 STRAPS FASTENED ON INNER BOX	9722										
11. CLOSURE BAR FASTENED AND BOLTED	9722										
12. LID AND LOCKING RING UNDAMAGED	9722										
13. LID WITH RUBBER PAD ATTACHED	9722										
14. BOLT (5/8"dia.)& LOCKING RING SECURED	9722										
15. AFFIX SEAL NO.	9722										
16. GROSS WT. IF KG'S ON DRUM (505 Kg.MAX.)	9722										
17. BIS INSPECTED 1. SURFACE CONT.(Smear) 2. EXT.RAD.(Ext.Rad.Meter Reading)	9412										
18. FINAL INSPECTION BY AND DATE	9132										
19. NRC APPROVAL TO SHIP	9722										
20. DATE SHIPPED	9722										
21. NRC REVIEW FOR SECURITY CLASSIFICATION OF DATA ON FORM	9722										

FISSILE CLASS II TRANSPORT INDEX = 10 (i.e. 5 containers/shipment)
FISSILE CLASS III = MAX. 10 CONTAINERS PER SHIPMENT

	BY/DATE
NRC APPROVAL OF FORM	
BIS AUTH. OF CONT. & APPROVAL OF FORM	

TITLE: SNM SHIPPING GUIDE	NUMBER: Section 13	REV. 1

SUBJECT

Procedure for receiving radioactive shipments from other licensees.

PURPOSE

To establish and define area of responsibility for the administration of an effective problem to assure full compliance with regulatory requirements for receiving shipments of radioactive material from other licensees.

PROCEDURE

1. Upon receipt of containers of radioactive material or empty containers from other licensees, the Receiving Department shall inspect the container for damage, signs of tampering, broken seals, and assure handling in accordance with any special instructions provided by shipper. Ascertain that estimated and actual arrival times were in good agreement. Check integrity of tamper seals within 24 hours of receipt time.

2. A radiation/contamination survey of each package and truck (where applicable) received is to be performed by NIS within 3 hours of receipt of shipment if received during normal working hours or no later than 18 hours if received after normal working hours.

   NPD acceptance limits are: 300 DPM/100cm^2 for removable surface contamination: 20 mR/hr at surface FROM INSIDE sources. NRC and carrier must be immediately notified if above: 22,000 DPM/100cm^2 for removable surface contamination; 200 mR/hr. at surface or 10 mR/hr at 3 ft. distance from external surface of package.

3. If any irregularities exist or damage is evident, set containers aside and notify NIS and/or Security Department(s) for special instructions.

PREPARED BY: [signature] 7/22/77

NUCLEAR MATERIALS MANAGER: [signature]

NIS MANAGER: [signature] 7/22/77

a. If any of the tamper-safing devices have been disturbed in a way that may indicate an attempt to render the device inoperable or if the device has been accidentally damaged, the following actions should be taken:

(1) The affected containers should immediately be resealed with another tamper-safing device, and the resealing should be witnessed and attested to by the personnel delivering the containers.

(2) The containers should be weighed and a determination made as to whether any of the contents have been removed.

(3) If the contents of the containers appear to be in order, the shipper should be notified and given the option of witnessing a quantitative assessment of the containers' contents within 48 hours following receipt of the shipment. If the shipper does not respond to this offer, the contents of the container should be assessed as soon as possible but in no case later than 48 hours after receipt.

(4) If the contents of the containers appear to have been removed, the shipper and the Director of the appropriate NRC Inspection and Enforcement Regional Office listed in Appendix A of 10 CFR Part 73 should be notified and given the option of witnessing a quantitative assessment of the containers' contents within 24 hours following receipt. If neither responds to this offer, the contents of the container should be quantitatively assessed immediately and witnessed and attested to by personnel from at least two different groups within the receiver's organization.

4. Acceptable containers of radioactive materials received are to be transferred to (and unpackaged by) the Nuclear Material Control Group.

5. Prior to unpackaging, the NMC Group will check the shipping papers accompanying the package for special instructions provided by the shipper for safe opening of the container and handle accordingly.

6. Prior to unpacking, the U-235 content shall be obtained from the shipper if not shown on packing list and handled in accordance with NTS authorization.

7. Confirm weight of material received with shipping documents. Fill out Form NRC-284 when NRC-741 cannot be completed within 10 days; report on NRC-741 within 30 days after receipt.

	PART NAME Incoming SNM Containing Shipment/Pkg. or Empty Fuel Shipping Cont.	SHIPMENT IDEN-TIFICATION	SERIAL/LOT NUMBER OF PACKAGES	PAGE: 1 CONT. ON:

NFO CONTRACT OR P.O. #	QUANTITY	NOTE OPERATIONS 50, 60 & 80 ARE NOT PERFORMED FOR EMPTY CONTAINERS		REVISION NO.

OPER NO. & WORK UNIT	OPERATION DESCRIPTION	DRAWINGS, DOCUMENTS REMARKS & STAMPS	OPERATOR SIGNATURE/DATE SHIFT
010 9132	Receipt Date _____ Receipt Time _____ By _____	ACC REJ. COMMENTS	
020 9132	Receiving (Plant Services) Inspect Truck and Bill of Lading: A. Proper Placarding ☐ ☐ B. Shipment Firmly Held On Truck ☐ ☐ C. No Visible Damage ☐ ☐ D. Any Special Handling Instructions ☐ ☐		
030 9132	NIS Survey/Smear External Surfaces of Containers, TRUCK FLOOR A. Removable Surface Contamination NPD Limits 300 DPM/100cm^2 ☐ ☐ B. Internal Radiation NPD Limits 20mR/H at external surfaces of pkg. ☐ ☐ NRC must be notified immediately via NIS if in excess of 22,000 DPM/100cm^2 or 200 mR/H at surface 10 mR/H at 3 ft.	ACC. REJ. COMMENTS	

APPROVALS:

PLANT SERVICES: Joseph Bundy 7-20-76

NUCLEAR MATERIAL CONTROL: John F. Kilgore

NUCLEAR & INDUSTRIAL SAFETY W. F. Kirk 7/19/76

NOTE: THE RECORDING OF FALSE, FICTITIOUS OR FRAUDULENT STATEMENTS OR ENTRIES ON THIS DOCUMENT MAY BE PUNISHED AS A FELONY UNDER FEDERAL STATUTES.

INFORMATION CATEGORY

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J. W. Alexander 7-21-76

AUTHORIZED CLASSIFIER DATE

	PART NAME Incoming SNM Containing Shipment/Pkg. or Empty Fuel Shipping Cont.	SHIPMENT IDENTIFICATION	SERIAL/LOT NUMBER OF PACKAGES	PAGE: 2 CONT. ON:
P.O CONTRACT OR P.O. #	QUANTITY	NOTE OPERATIONS 50,60 & 80 ARE NOT PERFORMED FOR EMPTY CONTAINERS		REVISION NO.

OPER.NO. & WORK UNIT	OPERATION DESCRIPTION	DRAWING, DOCUMENTS REMARKS AND STAMPS	OPERATOR SIGNATURE/DATE/ SHIFT
040 9412	Unload Vehicle. Check Each Container For: A. Tamper Proof Seal Intact. Verify as soon as possible, but within 24 hours of receipt time of Oper.010 above. B. Shipping Damage C. Transfer to NMC Area	ACC. ☐ REJ. ☐ YES ☐ NONE ☐	
050 9722	NMC Prepare to unpackage A. Check for Special Shipper Instructions for Safe Opening B. Obtain U235 content, type of material and other shipping information. C. Handle according to NIS authorization.	YES ☐ NO ☐ ☐ ☐ ☐ ☐	
060 9722	NMC unpackage material. Clean outside as necessary and weigh. Store in specified area, and handle in accordance with NIS authorization. Confirm that shipment is complete and quantity is correct.	YES ☐ NO ☐	
070 9412	NIS sample for external contaminant on inside fuel package. Sample inside for empty containers. NPD Limits 300 DPM/100 cm^2 RECORD SPECIFIC PACKAGES SMEARED	ACC. ☐ REJ. ☐	
080 9722	NMC complete required NRC-284 and/or NRC-741.		

TITLE: PROCUREMENT OR MODIFICATION OF SHIPPING CONTAINERS (INCLUDING INNER CONTAINER AND SUPPORTING STRUCTURE)	NUMBER: Section 16	REV. 0

PURPOSE:

To define requirements for procurement of new shipping containers or modification of existing shipping containers.

LIMITATION:

This procedure does not apply to shipping containers ordered by customers of UNC (i.e., contract item shipping containers).

REQUIREMENTS:

1. Obtain NIS approval of any new modified container design. NIS shall obtain any NRC/DOT licensing approval required.

   This requirement applies to standard DOT or special UNC containers.

2. The purchase requisition/order shall include:

   a. Sufficient detail to completely describe the container.

   b. Test and inspection requirements.

   c. Certification requirement

   d. Any field/receipt inspections by UNC and consequences of rejection. Review DOT -49 CFR and 10 CFR 71 for some requirements.

3. The purchase requisition shall include approval by NMC and NIS.

4. Vendor certification/inspection data and any UNC field/receipt inspection data shall be retained on file by NMC.

5. Any requirement for field/receipt inspection (sample, partial or complete) shall be set forth by NMC personnel.

PREPARED BY: W F Kirk

NUCLEAR MATERIALS MANAGER: [illegible] 2/4/77

NIS MANAGER: W F Kirk 2/4/77

16130