

UNITED STATES
ATOMIC ENERGY COMMISSION

WASHINGTON, D.C. 20545

JAN 4 1968

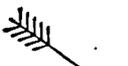
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REPLY REFER TO:

- ML:CEM
- 3-56
- NM-33, Amendments Nos. 71-7 through 71-12
- U-371
- NM-368, Amendments Nos. 71-8 through 71-13
- O-820
- NM-777, Amendments Nos. 71-7 through 71-12

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United Nuclear Corporation
 Post Office Box 1883
 365 Winchester Avenue
 New Haven, Connecticut 06508

Attention: Mr. D. F. Cronin
 Director of Licensing

Gentlemen:

Enclosed are Amendments Nos. 71-7 through 71-12 to Special Nuclear Material License No. SNM-33, Amendments Nos. 71-8 through 71-13 to Special Nuclear Material License No. SNM-368, and Amendments Nos. 71-7 through 71-12 to Special Nuclear Material License No. SNM-777, to authorize the delivery of special nuclear material to a carrier for transport in the UNC-2400, UNC-318, UNC-740, UNC-1001, UNC-1351, and UNC-1483 packages.

As requested in your letters dated October 23, and November 17, 1967, this will acknowledge that your applications dated November 16, 1966, NLS:REK-912, and November 19, 1966, NLS:REK-921, have been withdrawn and that no action will be taken on your applications requesting an amendment to your Special Nuclear Material Licenses for the delivery of special nuclear material in the UNC-1452 and UNC-2500 packages.

These amendments constitute a superseding license to deliver special nuclear material to a carrier for transport. The limited exemption granted by Section 71.12, 10 CFR 71, by filing an application within the 3 month period after the effective date of the regulation, expires upon the issuance of this superseding license. Please note that these amendments do not authorize the transport of special nuclear material. Such transport is normally subject to regulation by the Department of Transportation (DOT). Questions regarding their requirements should be directed to DOT.

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JAN 4 1968

Pending final determination by the Commission of the overall suitability of uninsulated packages for UF_6 , approval for the UNC-318 package has been granted until June 30, 1968. Your analysis did not take into account the interspersed moderation in the plywood packaging for the normal conditions of transport. Reducing the limits for normal conditions by a factor of 2.5 for interspersed moderation, we found the normal conditions controlling. However, based on density analog calculations and a maximum H/U atomic ratio of 0.088 (maximum H/U atomic ratio for UF_6 supplied by the Commission) we were able to conclude that your proposed limits are conservative. You may wish to refine the analysis in accord with the method in K-1716.

In regard to the UNC-1483 package, the approved contents and allowable number of packages for Fissile Class II and III are different from those requested in your application. The contents specified in 5(b)(1)(ii) for the UNC-1483 package are limited to uranium compounds with a density \leq 3.2g U-235/cc, since the equilateral hyperbola method in RFP-315 does not apply to metal-water mixtures. In addition, RFP-315 considers cylinders spaced on a square pitch. In using the hyperbola method, we have selected an equivalent square pitch such as the density of uranium in the array would be equal to the density in a triangular-pitch array. Following this procedure, we have determined 1.5 radiation units for Fissile Class II and 55 packages for Fissile Class III.

In regard to the UNC-2400 package, our letter of November 1, 1967, approving the LLW-1 package (latter designated UNC-2400) noted several nonconservative assumptions in your analysis. Your revised safety analysis did not consider our comments. To eliminate the nonconservative items identified in our letter of November 1, 1967, our approval of this package is based on the safety analysis for wet materials, viz. 2.5 radiation units for Class II packages and 40 packages for Fissile Class III shipment.

If you have any questions regarding these amendments or our comments, please feel free to communicate with us.

Very truly yours,

Donald A. Nussbaumer, Chief
Source & Special Nuclear Materials
Branch
Division of Materials Licensing

Enclosures:
As stated

cc: Mr. William A. Brobst
Department of Transportation

UNITED STATES
ATOMIC ENERGY COMMISSION

JAN 4 1968

LICENSE AMENDMENT
for
DELIVERY OF SPECIAL NUCLEAR MATERIAL
to a
CARRIER FOR TRANSPORT

Pursuant to the Atomic Energy Act of 1954 and Title 10, Code of Federal Regulations, Chapter 1, Part 70, and Part 71, the following amendment to the special nuclear material license identified below is hereby issued, authorizing the licensee to deliver special nuclear material to a carrier for transport, and is subject to the conditions specified in that license and to the conditions specified below.

Licensee	
1. Name: United Nuclear Corporation	3. License No. SNM- <u>33</u>
2. Address: P. O. Box 1883 365 Winchester Avenue New Haven, Connecticut 06508	Amendment No. <u>71-7</u>
	4. Docket No. <u>70-36</u>

CONDITIONS

5. (a) Packaging

(1) Model number	<u>UNC-2400</u>
(2) Description	<u>(See Page 2)</u>

(b) Contents

(1) Type and form of material	<u>Unirradiated uranium metal, alloys and/or compounds in any form. Uranium may be enriched to any degree in the U-235 isotope.</u>
(2) Maximum quantity of material per package	<u>Total contents shall not exceed 200 pounds and the U-235 content shall not exceed 350 grams.</u>

(c) Fissile Class

(1) Minimum number of radiation units to be shown on label for Class II	<u>2.5 radiation units</u>
(2) Maximum number of packages per shipment for Class III	<u>40 packages</u>

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PAGE 2

LICENSE NO.: SNM-33

AMENDMENT NO.: 71-7

DOCKET NO.: 70-36

5. (a)(2) New or reconditioned steel 55-gallon drum with minimum thickness 18-gage body and 16-gage head, with special nuclear material contained in plastic bottles or jars, metal cans or jars, plastic wrappers or heavy duty paper.
6. The outer container closure shall be accomplished by 12 gage bolt-locking ring clamp utilizing not less than 3/8 inch steel bolt and lock-nut, or equivalent device to prevent loosening of the bolt due to vibration, or 12 gage bolt-locking ring with drop forged lugs, one of which is threaded to receive a 5/8 inch bolt and lock-nut. Where a 3/8 inch steel bolt is used, the removable 16 gage steel head shall have one or more corrugations in the cover near the periphery.
7. This amendment supersedes, in its entirety, Amendment No. 71-2 to this license dated December 13, 1966.

REFERENCES

Licensee's application dated October 17, 1966, for an amendment to Special Nuclear Material Licenses Nos. SNM-33, SNM-368 and SNM-777 to deliver special nuclear material to a carrier for transport in the LLW-1 package.

Supplement dated November 21, 1966, to change designation from LLW-1 to UNC-2400, and supplement dated November 17, 1967.

FOR THE ATOMIC ENERGY COMMISSION

Date of Amendment 10: 4 1968

Donald A. Nussbaumer
Division of Materials Licensing

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----- JAN 4 1968

LICENSE AMENDMENT
for
DELIVERY OF SPECIAL NUCLEAR MATERIAL
to a
CARRIER FOR TRANSPORT

Pursuant to the Atomic Energy Act of 1954 and Title 10, Code of Federal Regulations, Chapter 1, Part 70, and Part 71, the following amendment to the special nuclear material license identified below is hereby issued, authorizing the licensee to deliver special nuclear material to a carrier for transport, and is subject to the conditions specified in that license and to the conditions specified below.

Licensee	
1. Name: United Nuclear Corporation 2. Address: P. O. Box 1883 365 Winchester Avenue New Haven, Connecticut 06508	3. License No. SNM- <u>33</u> Amendment No. <u>71-8</u> 4. Docket No. <u>70-36</u>

CONDITIONS

5. (a) Packaging

- (1) Model number UNC-318
- (2) Description (See Page 2)

(b) Contents

- (1) Type and form of material Uranium hexafluoride of any U-235 enrichment and a maximum H/U ratio of 0.088.
- (2) Maximum quantity of material per package Fifty-five pounds of uranium hexafluoride, with not more than 16.8 kilograms contained U-235.

(c) Fissile Class

- (1) Minimum number of radiation units to be shown on label for Class II 0.7 radiation units.
- (2) Maximum number of packages per shipment for Class III 111 packages


UNITED STATES
ATOMIC ENERGY COMMISSION

-----JAN 4 1968

LICENSE AMENDMENT
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Pursuant to the Atomic Energy Act of 1954 and Title 10, Code of Federal Regulations, Chapter 1, Part 70, and Part 71, the following amendment to the special nuclear material license identified below is hereby issued, authorizing the licensee to deliver special nuclear material to a carrier for transport, and is subject to the conditions specified in that license and to the conditions specified below.

<p style="text-align: center;">Licensee</p> <p>1. Name: <u>United Nuclear Corporation</u></p> <p>2. Address: <u>P. O. Box 1883</u> <u>365 Winchester Avenue</u> <u>New Haven, Connecticut 06508</u></p>	<p>3. License No. <u>SNM-33</u></p> <p>Amendment No. <u>71-9</u></p> <hr/> <p>4. Docket No. <u>70-36</u></p>
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CONDITIONS

5. (a) Packaging

(1) Model number UNC-740

(2) Description (See Page 2)

(b) Contents

(1) Type and form of material Dry uranium oxide pellets, enriched to a maximum 6.5 w/o in the U-235 isotope.

(2) Maximum quantity of material per package (See Page 2)

(c) Fissile Class II and III

(1) Minimum number of radiation units to be shown on label for Class II 5.7

(2) Maximum number of packages per shipment for Class III 17

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PAGE 2

LICENSE NO.: SNM-33

AMENDMENT NO.: 71-9

DOCKET NO.: 70-36

- 5. (a)(2) Containment vessel consists of a 7-gallon steel drum with bolt locking ring closure, centered and supported within a 65-gallon steel drum of DOT Specification 17H or better by top and bottom steel support inserts. Container constructed in accordance with United Nuclear Corporation Drawings Nos. 66008-105 and 66008-106. The top steel support insert shall be bolted to the outer container by at least three 1/4-inch bolts.
- 5. (b)(2) Total contents not to exceed 80 pounds and for the following w/o U-235, the U-235 content shall not exceed the following:

<u>Maximum w/o U-235</u>	<u>Maximum U-235</u>
3.0	920 grams
4.0	720 grams
5.0	590 grams
6.5	590 grams

REFERENCES

Licensee's application dated November 14, 1966, for an amendment to Special Nuclear Material Licenses Nos. SNM-33, SNM-368 and SNM-777 to deliver special nuclear material to a carrier for transport in the UNC-740 package.

Supplements dated September 21, and October 19, 1967.

FOR THE ATOMIC ENERGY COMMISSION

Date of Amendment

JAN 4 1968

Donald A. Nussbaumer
Division of Materials Licensing

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JAN 4 1968

LICENSE AMENDMENT
for
DELIVERY OF SPECIAL NUCLEAR MATERIAL
to a
CARRIER FOR TRANSPORT

Pursuant to the Atomic Energy Act of 1954 and Title 10, Code of Federal Regulations, Chapter 1, Part 70, and Part 71, the following amendment to the special nuclear material license identified below is hereby issued, authorizing the licensee to deliver special nuclear material to a carrier for transport, and is subject to the conditions specified in that license and to the conditions specified below.

Licensee		3. License No. <u>SNM-33</u>
1. Name:	United Nuclear Corporation	Amendment No. <u>71-10</u>
2. Address:	P. O. Box 1883 365 Winchester Avenue New Haven, Connecticut 06508	4. Docket No. <u>70-36</u>

CONDITIONS

5. (a) Packaging

(1) Model number

UNC-1001

(2) Description

(See Page 2)

(b) Contents

(1) Type and form of material

Dry uranium oxides, enriched to a maximum 10 w/o in the U-235 isotope.

(2) Maximum quantity of material per package

(See Page 2)

(c) Fissile Class

II and III

(1) Minimum number of radiation units to be shown on label for Class II

2.5

(2) Maximum number of packages per shipment for Class III

40

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LICENSE NO.: SNM-33

AMENDMENT NO.: 71-10

DOCKET NO.: 70-36

5. (a) (2) Containment vessel consists of a 5-gallon steel pail with bolt locking ring closure, centered and supported within an 85-gallon steel drum of DOT Specification 17H or better by top and bottom steel support inserts. Container constructed in accordance with United Nuclear Corporation Drawings Nos. 66008-109 and 66008-110. The top steel support insert shall be bolted to the outer container by at least three 1/4-inch bolts.
5. (b) (2) Total contents not to exceed 100 pounds and for the following w/o U-235, the U-235 content shall not exceed the following:

<u>w/o U-235</u>	<u>Maximum U-235</u>
2.0	800 grams
3.0	810 grams
4.0	848 grams
5.0	815 grams
6.0	732 grams
7.0	670 grams
8.0	636 grams
9.0	594 grams
10.0	574 grams

REFERENCES

Licensee's application dated November 14, 1966, for an amendment to Special Nuclear Material Licenses Nos. SNM-33, SNM-368 and SNM-777 to deliver special nuclear material to a carrier for transport in the UNC-1001 package.

Supplement dated October 19, 1967.

FOR THE ATOMIC ENERGY COMMISSION

Date of Amendment JAN 4 1968

Donald A. Nussbaumer
Division of Materials Licensing

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JAN 4 1968

LICENSE AMENDMENT
for
DELIVERY OF SPECIAL NUCLEAR MATERIAL
to a
CARRIER FOR TRANSPORT

Pursuant to the Atomic Energy Act of 1954 and Title 10, Code of Federal Regulations, Chapter 1, Part 70, and Part 71, the following amendment to the special nuclear material license identified below is hereby issued, authorizing the licensee to deliver special nuclear material to a carrier for transport, and is subject to the conditions specified in that license and to the conditions specified below.

Licensee	
1. Name: United Nuclear Corporation	3. License No. <u>SNM-33</u>
2. Address: P. O. Box 1883 365 Winchester Avenue New Haven, Connecticut 06508	Amendment No. <u>71-11</u>
	4. Docket No. <u>70-36</u>

CONDITIONS

5. (a) Packaging

(1) Model number

UNC-1351

(2) Description

Containment vessel consists of a 6-inch Schedule 40 steel pipe, 5 inches long, with welded bottom plate and bolted flange closure. Containment vessel is centered and supported within a 15-gallon DOT Specification 37A steel drum by top and bottom steel support inserts. Container constructed in accordance with United Nuclear Corporation Drawings Nos. 66008-103 and 66008-104. The top steel support insert shall be bolted to the outer container by at least three 1/4-inch bolts.

(b) Contents

(1) Type and form
of material

(i) Uranium metal of any U-235 enrichment, as whole metal biscuits.

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LICENSE NO.: SNM-33

AMENDMENT NO.: 71-11

DOCKET NO.: 70-36

- (ii) Uranium metal of any U-235 enrichment, as broken metal biscuits.
- (iii) Uranium metal, alloys, compounds, or mixtures provided the material is insoluble in water and will withstand a temperature of 800°C without pressure generating decomposition and the H/U-235 atomic ratio, including all hydrogenous material within the containment vessel does not exceed 2. Uranium may be enriched to any degree in the U-235 isotope.
- (iv) Uranium metal, alloys, compounds, or mixtures. Uranium may be enriched to any degree in the U-235 isotope.

(2) Maximum quantity of material per package

Total contents not to exceed 75 pounds and the U-235 content shall not exceed the following:

- (i) For the contents described in 5(b)(1)(i), 12.5 kilograms U-235.
- (ii) For the contents described in 5(b)(1)(ii), 10.0 kilograms U-235.
- (iii) For the contents described in 5(b)(1)(iii), 5.8 kilograms U-235.
- (iv) For the contents described in 5(b)(1)(iv), 350 grams U-235.

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LICENSE NO.: SNM-33

AMENDMENT NO.: 71-11

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(c) Fissile Class

II and III

(1) Minimum number of radiation units to be shown on label for Class II

(i) For the contents described in 5(b)(1)(i), 5(b)(1)(ii), and limited in 5(b)(2)(i), 5(b)(2)(ii), 8 radiation units.

(ii) For the contents described in 5(b)(1)(iii), 5(b)(1)(iv), and limited in 5(b)(2)(iii), 5(b)(2)(iv), 2.8 radiation units.

(2) Maximum number of packages per shipment for Class III

(i) For the contents described in 5(b)(1)(i), 5(b)(1)(ii), and limited in 5(b)(2)(i), 5(b)(2)(ii), 10 packages.

(ii) For the contents described in 5(b)(1)(iii), 5(b)(1)(iv), and limited in 5(b)(2)(iii), 5(b)(2)(iv), 28 packages.

REFERENCES

Licensee's application dated November 15, 1966, for an amendment to Special Nuclear Material Licenses Nos. SNM-33, SNM-368 and SNM-777 to deliver special nuclear material to a carrier for transport in the UNC-1351 package.

Supplement dated October 23, 1967.

FOR THE ATOMIC ENERGY COMMISSION

Date of Amendment JAN 4 1968

Donald A. Nussbaumer
Division of Materials Licensing

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JAN 4 1968

LICENSE AMENDMENT
for
DELIVERY OF SPECIAL NUCLEAR MATERIAL
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CARRIER FOR TRANSPORT

Pursuant to the Atomic Energy Act of 1954 and Title 10, Code of Federal Regulations, Chapter 1, Part 70, and Part 71, the following amendment to the special nuclear material license identified below is hereby issued, authorizing the licensee to deliver special nuclear material to a carrier for transport, and is subject to the conditions specified in that license and to the conditions specified below.

Licensee	
1. Name: United Nuclear Corporation	3. License No. <u>SNM-33</u>
2. Address: P. O. Box 1883 365 Winchester Avenue New Haven, Connecticut 06508	Amendment No. <u>71-12</u>
	4. Docket No. <u>70-36</u>

CONDITIONS

5. (a) Packaging

(1) Model number

UNC-1483

(2) Description

Containment vessel consists of a 5 1/4" ID x 36" long and 3/8" wall thickness steel pipe with welded bottom plate and bolted top flange closure. Containment vessel is centered and supported within a 65 gallon 16 gage or heavier steel drum by tubular steel spokes. The outer container closure shall be accomplished by a 12 gage bolted ring with drop forged lugs, one of which is threaded to receive a 5/8" bolt and nut. Container constructed in accordance with United Nuclear Corporation Drawing No. 66008-101.

(b) Contents

(1) Type and form of material

(i) Uranium metal, alloys, compounds, or mixtures with a density > 3.2g U-235/cc, provided the material is insoluble in water and will withstand a temperature of 800°C without

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PAGE 2

LICENSE NO.: SNM-33

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pressure generating decomposition and the H/U-235 atomic ratio, including all hydrogenous material within the containment vessel does not exceed 2. Uranium may be enriched to any degree in the U-235 isotope.

- (ii) Uranium compounds with a density ≤ 3.2 g U-235/cc, provided the material is insoluble in water and will withstand a temperature of 800°C without pressure generating decomposition and the H/U-235 atomic ratio, including all hydrogenous material within the containment vessel does not exceed 2. Uranium may be enriched to any degree in the U-235 isotope.
- (iii) Uranium metal, alloys, compounds, or mixtures. Uranium may be enriched to any degree in the U-235 isotope.

(2) Maximum quantity of material per package

Total contents shall not exceed 65 pounds and the U-235 content shall not exceed the following:

- (i) For the contents described in 5(b)(1)(i), 10 kilograms U-235.
- (ii) For the contents described in 5(b)(1)(ii), as restricted by the 65 pound loading requirement.

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PAGE 3

LICENSE NO.: SNM-33

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DOCKET NO.: 70-36

(c). Fissile Class

(1) Minimum number of radiation units to be shown on package for Class II

(iii) For the contents described in 5(b)(1)(iii), 350 grams U-235.

II and III

(i) For the contents described in 5(b)(1)(i) and limited in 5(b)(2)(i), 5.0 radiation units.

(ii) For the contents described in 5(b)(1)(ii), 5(b)(1)(iii), and limited in 5(b)(2)(ii), 5(b)(2)(iii), 1.5 radiation units.

(2) Maximum number of packages per shipment for Class III

(i) For the contents described in 5(b)(1)(i) and limited in 5(b)(2)(i), 16 packages.

(ii) For the contents described in 5(b)(1)(ii), 5(b)(1)(iii), and limited in 5(b)(2)(ii), 5(b)(2)(iii), 55 packages.

REFERENCES

Licensee's application dated November 15, 1966, for an amendment to Special Nuclear Material Licenses Nos. SNM-33, SNM-368 and SNM-777 to deliver special nuclear material to a carrier for transport in the UNC-1483 package.

Supplement dated October 26, 1967.

FOR THE ATOMIC ENERGY COMMISSION

Date of Amendment JAN 4 1968

Donald A. Nussbaumer
Division of Materials Licensing

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LICENSE AMENDMENT
 for
 DELIVERY OF SPECIAL NUCLEAR MATERIAL
 to a
 CARRIER FOR TRANSPORT

Pursuant to the Atomic Energy Act of 1954 and Title 10, Code of Federal Regulations, Chapter 1, Part 70, and Part 71, the following amendment to the special nuclear material license identified below is hereby issued, authorizing the licensee to deliver special nuclear material to a carrier for transport, and is subject to the conditions specified in that license and to the conditions specified below.

<p style="text-align: center;">Licensee</p> <p>1. Name: <u>United Nuclear Corporation</u></p> <p>2. Address: <u>P. O. Box 1883</u> <u>365 Winchester Avenue</u> <u>New Haven, Connecticut 06508</u></p>	<p>3. License No. <u>SNM- 368</u></p> <p style="padding-left: 40px;">Amendment No. <u>71-8</u></p> <hr/> <p>4. Docket No. <u>70-371</u></p>
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CONDITIONS

5. (a) Packaging

- | | |
|------------------|--------------|
| (1) Model number | UNC-2400 |
| (2) Description | (See Page 2) |

(b) Contents

- | | |
|--|--|
| (1) Type and form of material | Unirradiated uranium metal, alloys and/or compounds in any form. Uranium may be enriched to any degree in the U-235 isotope. |
| (2) Maximum quantity of material per package | Total contents shall not exceed 200 pounds and the U-235 content shall not exceed 350 grams. |
- (c) Fissile Class II and III

- | | |
|---|---------------------|
| (1) Minimum number of radiation units to be shown on label for Class II | 2.5 radiation units |
| (2) Maximum number of packages per shipment for Class III | 40 packages |

LICENSEE: United Nuclear Corporation

PAGE 2

LICENSE NO.: SNM-368

AMENDMENT NO.: 71-8

DOCKET NO.: 70-371

5. (a) (2) New or reconditioned steel 55-gallon drum with minimum thickness 18-gage body and 16-gage head, with special nuclear material contained in plastic bottles or jars, metal cans or jars, plastic wrappers or heavy duty paper.
6. The outer container closure shall be accomplished by 12 gage bolt-locking ring clamp utilizing not less than 3/8 inch steel bolt and lock-nut, or equivalent device to prevent loosening of the bolt due to vibration, or 12 gage bolt-locking ring with drop forged lugs, one of which is threaded to receive a 5/8 inch bolt and lock-nut. Where a 3/8 inch steel bolt is used, the removable 16 gage steel head shall have one or more corrugations in the cover near the periphery.
7. This amendment supersedes, in its entirety, Amendment No. 71-2 to this license dated December 13, 1966.

REFERENCES

Licensee's application dated October 17, 1966, for an amendment to Special Nuclear Material Licenses Nos. SNM-33, SNM-368 and SNM-777 to deliver special nuclear material to a carrier for transport in the LLW-1 package.

Supplement dated November 21, 1966, to change designation from LLW-1 to UNC-2400, and supplement dated November 17, 1967.

FOR THE ATOMIC ENERGY COMMISSION

Date of Amendment JAN 4 1968

Donald A. Nussbaumer
Division of Materials Licensing

LICENSE AMENDMENT
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Pursuant to the Atomic Energy Act of 1954 and Title 10, Code of Federal Regulations, Chapter 1, Part 70, and Part 71, the following amendment to the special nuclear material license identified below is hereby issued, authorizing the licensee to deliver special nuclear material to a carrier for transport, and is subject to the conditions specified in that license and to the conditions specified below.

<p style="text-align: center;">Licensee</p> <p>1. Name: United Nuclear Corporation</p> <p>2. Address: P. O. Box 1883 365 Winchester Avenue New Haven, Connecticut 06508</p>	<p>3. License No. SNM- <u>368</u></p> <p>Amendment No. <u>71-9</u></p> <hr/> <p>4. Docket No. <u>70-371</u></p>
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CONDITIONS

5. (a) Packaging

(1) Model number UNC-318

(2) Description (See Page 2)

(b) Contents

(1) Type and form of material Uranium hexafluoride of any U-235 enrichment and a maximum H/U ratio of 0.088

(2) Maximum quantity of material per package Fifty-five pounds of uranium hexafluoride, with not more than 16.8 kilograms contained U-235.

(c) Fissile Class

II and III

(1) Minimum number of radiation units to be shown on label for Class II 0.7 radiation units

(2) Maximum number of packages per shipment for Class III 111 packages

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PAGE 2

LICENSE NO.: SNM-368

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5. (a)(2) Five-inch uranium hexafluoride cylinder (cf. TID-7019, Section 4.2, Figure a (5)) supported in a 30 inch by 30 inch by 38 inch angle iron birdcage, totally enclosed with 3/8-inch thick plywood. Container constructed in accordance with United Nuclear Corporation Drawings 66008-107 and 66008-108.
6. The amendment shall expire June 30, 1968.

REFERENCES

Licensee's application dated November 9, 1966, for an amendment to Special Nuclear Material Licenses Nos. SNM-33, SNM-368, and SNM-777 to deliver special nuclear material to a carrier for transport in the UNC-318 package.

Supplement dated June 29, 1967.

FOR THE ATOMIC ENERGY COMMISSION

Date of Amendment JAN 4 1968

Donald A. Nussbaumer
Division of Materials Licensing

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Pursuant to the Atomic Energy Act of 1954 and Title 10, Code of Federal Regulations, Chapter 1, Part 70, and Part 71, the following amendment to the special nuclear material license identified below is hereby issued, authorizing the licensee to deliver special nuclear material to a carrier for transport, and is subject to the conditions specified in that license and to the conditions specified below.

Licensee		3. License No. SNM- <u>368</u>
1. Name:	United Nuclear Corporation	Amendment No. <u>71-10</u>
2. Address:	P. O. Box 1883 365 Winchester Avenue New Haven, Connecticut 06508	4. Docket No. <u>70-371</u>

CONDITIONS

5. (a) Packaging

- (1) Model number UNC-740
- (2) Description (See Page 2)

(b) Contents

- (1) Type and form of material Dry uranium oxide pellets, enriched to a maximum 6.5 w/o in the U-235 isotope.
- (2) Maximum quantity of material per package (See Page 2)

(c) Fissile Class

- II and III
- (1) Minimum number of radiation units to be shown on label for Class II 5.7
- (2) Maximum number of packages per shipment for Class III 17

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PAGE 2

LICENSE NO.: SNM-368

AMENDMENT NO.: 71-10

DOCKET NO.: 70-371

5. (a)(2) Containment vessel consists of a 7-gallon steel drum with bolt locking ring closure, centered and supported within a 65-gallon steel drum of DOT Specification 17H or better by top and bottom steel support inserts. Container constructed in accordance with United Nuclear Corporation Drawings Nos. 66008-105 and 66008-106. The top steel support insert shall be bolted to the outer container by at least three 1/4-inch bolts.
5. (b)(2) Total contents not to exceed 80 pounds and for the following w/o U-235, the U-235 content shall not exceed the following:

<u>Maximum w/o U-235</u>	<u>Maximum U-235</u>
3.0	920 grams
4.0	720 grams
5.0	590 grams
6.5	590 grams

REFERENCES

Licensee's application dated November 14, 1966, for an amendment to Special Nuclear Material Licenses Nos. SNM-33, SNM-368 and SNM-777 to deliver special nuclear material to a carrier for transport in the UNC-740 package.

Supplements dated September 21, and October 19, 1967.

FOR THE ATOMIC ENERGY COMMISSION

Date of Amendment JAN 4 1968

Donald A. Nussbaumer
Division of Materials Licensing

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UNITED STATES
ATOMIC ENERGY COMMISSION

JAN 4 1968

LICENSE AMENDMENT
for
DELIVERY OF SPECIAL NUCLEAR MATERIAL
to a
CARRIER FOR TRANSPORT

Pursuant to the Atomic Energy Act of 1954 and Title 10, Code of Federal Regulations, Chapter 1, Part 70, and Part 71, the following amendment to the special nuclear material license identified below is hereby issued, authorizing the licensee to deliver special nuclear material to a carrier for transport, and is subject to the conditions specified in that license and to the conditions specified below.

<p style="text-align: center;">Licensee</p> <p>1. Name: United Nuclear Corporation</p> <p>2. Address: P. O. Box 1883 365 Winchester Avenue New Haven, Connecticut 06508</p>	<p>3. License No. SNM- <u>368</u> Amendment No. <u>71-11</u></p> <hr/> <p>4. Docket No. <u>70-371</u></p>
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CONDITIONS

5. (a) Packaging

- (1) Model number UNC-1001
- (2) Description (See Page 2)

(b) Contents

- (1) Type and form of material Dry uranium oxides, enriched to a maximum of 10 w/o in the U-235 isotope.
- (2) Maximum quantity of material per package (See Page 2)

(c) Fissile Class II and III

- (1) Minimum number of radiation units to be shown on label for Class II 2.5
- (2) Maximum number of packages per shipment for Class III 40

LICENSEE: United Nuclear Corporation

PAGE 2

LICENSE NO.: SNM-368

AMENDMENT NO.: 71-11

DOCKET NO.: 70-371

5. (a)(2) Containment vessel consists of a 5-gallon steel pail with bolt locking ring closure, centered and supported within an 85-gallon steel drum of DOT Specification 17H or better by top and bottom steel support inserts. Container constructed in accordance with United Nuclear Corporation Drawings Nos. 66008-109 and 66008-110. The top steel support insert shall be bolted to the outer container by at least three 1/4-inch bolts.
5. (b)(2) Total contents not to exceed 100 pounds and for the following w/o U-235, the U-235 content shall not exceed the following:

<u>w/o U-235</u>	<u>Maximum U-235</u>
2.0	800 grams
3.0	810 grams
4.0	848 grams
5.0	815 grams
6.0	732 grams
7.0	670 grams
8.0	636 grams
9.0	594 grams
10.0	574 grams

REFERENCES

Licensee's application dated November 14, 1966, for an amendment to Special Nuclear Material Licenses Nos. SNM-33, SNM-368 and SNM-777 to deliver special nuclear material to a carrier for transport in the UNC-1001 package.

Supplement dated October 19, 1967.

FOR THE ATOMIC ENERGY COMMISSION

Date of Amendment JAN 4 1968

Donald A. Nussbaumer
Division of Materials Licensing

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UNITED STATES
ATOMIC ENERGY COMMISSION

JAN 4 1968

LICENSE AMENDMENT
for
DELIVERY OF SPECIAL NUCLEAR MATERIAL
to a
CARRIER FOR TRANSPORT

Pursuant to the Atomic Energy Act of 1954 and Title 10, Code of Federal Regulations, Chapter 1, Part 70, and Part 71, the following amendment to the special nuclear material license identified below is hereby issued, authorizing the licensee to deliver special nuclear material to a carrier for transport, and is subject to the conditions specified in that license and to the conditions specified below.

Licensee	
1. Name: United Nuclear Corporation	3. License No. <u>SNM-368</u>
2. Address: P. O. Box 1883 365 Winchester Avenue New Haven, Connecticut 06508	Amendment No. <u>71-12</u>
	4. Docket No. <u>70-371</u>

CONDITIONS

5. (a) Packaging

(1) Model number

UNC-1351

(2) Description

Containment vessel consists of a 6-inch Schedule 40 steel pipe, 5 inches long, with welded bottom plate and bolted flange closure. Containment vessel is centered and supported within a 15-gallon DOT Specification 37A steel drum by top and bottom steel support inserts. Container constructed in accordance with United Nuclear Corporation Drawings Nos. 66008-103 and 66008-104. The top steel support insert shall be bolted to the outer container by at least three 1/4-inch bolts.

(b) Contents

(1) Type and form
of material

(i) Uranium metal of any U-235 enrichment, as whole metal biscuits.

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LICENSE NO.: SNM-368

AMENDMENT NO.: 71-12

DOCKET NO.: 70-371

(ii) Uranium metal of any U-235 enrichment, as broken metal biscuits.

(iii) Uranium metal, alloys, compounds, or mixtures provided the material is insoluble in water and will withstand a temperature of 800°C without pressure generating decomposition and the H/U-235 atomic ratio, including all hydrogenous material within the containment vessel does not exceed 2. Uranium may be enriched to any degree in the U-235 isotope.

(iv) Uranium metal, alloys, compounds, or mixtures. Uranium may be enriched to any degree in the U-235 isotope.

(2) Maximum quantity of material per package

Total contents not to exceed 75 pounds and the U-235 content shall not exceed the following:

(i) For the contents described in 5(b)(1)(i), 12.5 kilograms U-235.

(ii) For the contents described in 5(b)(1)(ii), 10.0 kilograms U-235.

(iii) For the contents described in 5(b)(1)(iii), 5.8 kilograms U-235.

(iv) For the contents described in 5(b)(1)(iv), 350 grams U-235.

LICENSEE: United Nuclear Corporation

PAGE 3

LICENSE NO.: SNM-368

AMENDMENT NO.: 71-12

DOCKET NO.: 70-371

(c) Fissile Class

II and III

(1) Minimum number of radiation units to be shown on label for Class II

(i) For the contents described in 5(b)(1)(i), 5(b)(1)(ii), and limited in 5(b)(2)(i), 5(b)(2)(ii), 8 radiation units.

(ii) For the contents described in 5(b)(1)(iii), 5(b)(1)(iv), and limited in 5(b)(2)(iii), 5(b)(2)(iv), 2.8 radiation units.

(2) Maximum number of packages per shipment for Class III

(i) For the contents described in 5(b)(1)(i), 5(b)(1)(ii), and limited in 5(b)(2)(i), 5(b)(2)(ii), 10 packages.

(ii) For the contents described in 5(b)(1)(iii), 5(b)(1)(iv), and limited in 5(b)(2)(iii), 5(b)(2)(iv), 28 packages.

REFERENCES

Licensee's application dated November 15, 1966, for an amendment to Special Nuclear Material Licenses Nos. SNM-33, SNM-368 and SNM-777 to deliver special nuclear material to a carrier for transport in the UNC-1351 package.

Supplement dated October 23, 1967.

FOR THE ATOMIC ENERGY COMMISSION

Date of Amendment JAN 4 1968

Donald A. Nussbaumer
Division of Materials Licensing

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UNITED STATES
ATOMIC ENERGY COMMISSION

-----JAN 4 1968

LICENSE AMENDMENT
for
DELIVERY OF SPECIAL NUCLEAR MATERIAL
to a
CARRIER FOR TRANSPORT

Pursuant to the Atomic Energy Act of 1954 and Title 10, Code of Federal Regulations, Chapter 1, Part 70, and Part 71, the following amendment to the special nuclear material license identified below is hereby issued, authorizing the licensee to deliver special nuclear material to a carrier for transport, and is subject to the conditions specified in that license and to the conditions specified below.

Licensee	
1. Name: United Nuclear Corporation	3. License No. <u>SNM-368</u>
2. Address: P. O. Box 1883 365 Winchester Avenue New Haven, Connecticut 06508	Amendment No. <u>71-13</u>
	4. Docket No. <u>70-371</u>

CONDITIONS

5. (a) Packaging

(1) Model number

UNC-1483

(2) Description

Containment vessel consists of a 5 1/4" ID x 36" long and 3/8" wall thickness steel pipe with welded bottom plate and bolted top flange closure. Containment vessel is centered and supported within a 65 gallon 16 gage or heavier steel drum by tubular steel spokes. The outer container closure shall be accomplished by a 12 gage bolted ring with drop forged lugs, one of which is threaded to receive a 5/8" bolt and nut. Container constructed in accordance with United Nuclear Corporation Drawing No. 66008-101.

(b) Contents

(1) Type and form of material

(i) Uranium metal, alloys, compounds, or mixtures with a density > 3.2g U-235/cc, provided the material is insoluble in water and will withstand a temperature of 800°C without

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PAGE 2

LICENSE NO.: SNM-368

AMENDMENT NO.: 71-13

DOCKET NO.: 70-371

pressure generating decomposition and the H/U-235 atomic ratio, including all hydrogenous material within the containment vessel does not exceed 2. Uranium may be enriched to any degree in the U-235 isotope.

(ii) Uranium compounds with a density \leq 3.2g U-235/cc, provided the material is insoluble in water and will withstand a temperature of 800°C without pressure generating decomposition and the H/U-235 atomic ratio, including all hydrogenous material within the containment vessel does not exceed 2. Uranium may be enriched to any degree in the U-235 isotope.

(iii) Uranium metal, alloys, compounds, or mixtures. Uranium may be enriched to any degree in the U-235 isotope.

(2) Maximum quantity of material per package

Total contents shall not exceed 65 pounds and the U-235 content shall not exceed the following:

(i) For the contents described in 5(b)(1)(i), 10 kilograms U-235.

(ii) For the contents described in 5(b)(1)(ii), as restricted by the 65 pound loading requirement.

LICENSEE: United Nuclear Corporation

LICENSE NO.: SNM-368

AMENDMENT NO.: 71-13

DOCKET NO.: 70-371

(c) Fissile Class

(1) Minimum number of radiation units to be shown on package for Class II

(iii) For the contents described in 5(b)(1)(iii), 350 grams U-235.

II and III

(2) Maximum number of packages per shipment for Class III

(i) For the contents described in 5(b)(1)(i) and limited in 5(b)(2)(i), 5.0 radiation units.

(ii) For the contents described in 5(b)(1)(ii), 5(b)(1)(iii), and limited in 5(b)(2)(ii), 5(b)(2)(iii), 1.5 radiation units.

(i) For the contents described in 5(b)(1)(i) and limited in 5(b)(2)(i), 16 packages.

(ii) For the contents described in 5(b)(1)(ii), 5(b)(1)(iii), and limited in 5(b)(2)(ii), 5(b)(2)(iii), 55 packages.

REFERENCES

Licensee's application dated November 15, 1966, for an amendment to Special Nuclear Material Licenses Nos. SNM-33, SNM-368 and SNM-777 to deliver special nuclear material to a carrier for transport in the UNC-1483 package.

Supplement dated October 26, 1967.

FOR THE ATOMIC ENERGY COMMISSION

Date of Amendment

JAN 4 1968

Donald A. Nussbaumer
Division of Materials Licensing

UNITED STATES
ATOMIC ENERGY COMMISSION

JAN 4 1968

LICENSE AMENDMENT
for
DELIVERY OF SPECIAL NUCLEAR MATERIAL
to a
CARRIER FOR TRANSPORT

Pursuant to the Atomic Energy Act of 1954 and Title 10, Code of Federal Regulations, Chapter 1, Part 70, and Part 71, the following amendment to the special nuclear material license identified below is hereby issued, authorizing the licensee to deliver special nuclear material to a carrier for transport, and is subject to the conditions specified in that license and to the conditions specified below.

Licensee	
1. Name: United Nuclear Corporation	3. License No. SNM- <u>777</u>
2. Address: P. O. Box 1883 365 Winchester Avenue New Haven, Connecticut 06508	Amendment No. <u>71-7</u>
	4. Docket No. <u>70-820</u>

CONDITIONS

5. (a) Packaging

- | | |
|------------------|--------------|
| (1) Model number | UNC-2400 |
| (2) Description | (See Page 2) |

(b) Contents

- | | |
|--|--|
| (1) Type and form of material | Unirradiated uranium metal, alloys and/or compounds in any form. Uranium may be enriched to any degree in the U-235 isotope. |
| (2) Maximum quantity of material per package | Total contents shall not exceed 200 pounds and the U-235 content shall not exceed 350 grams. |

(c) Fissile Class

- | | |
|---|------------------------------------|
| (1) Minimum number of radiation units to be shown on label for Class II | II and III
2,5 radiation units. |
| (2) Maximum number of packages per shipment for Class III | 40 packages |

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PAGE 2

LICENSE NO.: SNM-777

AMENDMENT NO.: 71-7

DOCKET NO.: 70-820

5. (a)(2) New or reconditioned steel 55-gallon drum with minimum thickness 18-gage body and 16-gage head, with special nuclear material contained in plastic bottles or jars, metal cans or jars, plastic wrappers or heavy duty paper.
6. The outer container closure shall be accomplished by 12 gage bolt-locking ring clamp utilizing not less than 3/8 inch steel bolt and lock-nut, or equivalent device to prevent loosening of the bolt due to vibration, or 12 gage bolt-locking ring with drop forged lugs, one of which is threaded to receive a 5/8 inch bolt and lock-nut. Where a 3/8 inch steel bolt is used, the removable 16 gage steel head shall have one or more corrugations in the cover near the periphery.
7. This amendment supersedes, in its entirety, Amendment No. 71-2 to this license dated December 13, 1966.

REFERENCES

Licensee's application dated October 17, 1966, for an amendment to Special Nuclear Material Licenses Nos. SNM-33, SNM-368 and SNM-777 to deliver special nuclear material to a carrier for transport in the LLW-1 package.

Supplement dated November 21, 1966, to change designation from LLW-1 to UNC-2400, and supplement dated November 17, 1967.

FOR THE ATOMIC ENERGY COMMISSION

Date of Amendment

JAN 4 1968

Donald A. Nussbaumer
Division of Materials Licensing

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UNITED STATES
ATOMIC ENERGY COMMISSION

JAN 4 1968

LICENSE AMENDMENT
for
DELIVERY OF SPECIAL NUCLEAR MATERIAL
to a
CARRIER FOR TRANSPORT

Pursuant to the Atomic Energy Act of 1954 and Title 10, Code of Federal Regulations, Chapter 1, Part 70, and Part 71, the following amendment to the special nuclear material license identified below is hereby issued, authorizing the licensee to deliver special nuclear material to a carrier for transport, and is subject to the conditions specified in that license and to the conditions specified below.

<p style="text-align: center;">Licensee</p> <p>1. Name: United Nuclear Corporation</p> <p>2. Address: P. O. Box 1883 365 Winchester Avenue New Haven, Connecticut 06508</p>	<p>3. License No. SNM- <u>777</u></p> <p style="padding-left: 40px;">Amendment No. <u>71-8</u></p> <hr/> <p>4. Docket No. <u>70-820</u></p>
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CONDITIONS

5. (a) Packaging

- | | |
|------------------|--------------|
| (1) Model number | UNC-318 |
| (2) Description | (See Page 2) |

(b) Contents

- | | |
|--|---|
| (1) Type and form of material | Uranium hexafluoride of any U-235 enrichment and a maximum H/U ratio of 0.088. |
| (2) Maximum quantity of material per package | Fifty-five pounds of uranium hexafluoride, with not more than 16.8 kilograms contained U-235. |

(c) Fissile Class

- | | |
|---|----------------------|
| | II and III |
| (1) Minimum number of radiation units to be shown on label for Class II | 0.7 radiation units. |
| (2) Maximum number of packages per shipment for Class III | 111 packages |

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PAGE 2

LICENSE NO.: SNM-777

AMENDMENT NO.: 71-8

DOCKET NO.: 70-820

5. (a)(2) Five-inch uranium hexafluoride cylinder (cf. TID-7019, Section 4.2, Figure a (5)) supported in a 30 inch by 30 inch by 38 inch angle iron birdcage, totally enclosed with 3/8-inch thick plywood. Container constructed in accordance with United Nuclear Corporation Drawings 66008-107 and 66008-108.
6. This amendment shall expire June 30, 1968.

REFERENCES

Licensee's application dated November 9, 1966, for an amendment to Special Nuclear Material Licenses Nos. SNM-33, SNM-368, and SNM-777 to deliver special nuclear material to a carrier for transport in the UNC-318 package.

Supplement dated June 29, 1967.

FOR THE ATOMIC ENERGY COMMISSION

Date of Amendment JAN 4 1968

Donald A. Nussbaumer
Division of Materials Licensing

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LICENSE AMENDMENT
for
DELIVERY OF SPECIAL NUCLEAR MATERIAL
to a
CARRIER FOR TRANSPORT

Pursuant to the Atomic Energy Act of 1954 and Title 10, Code of Federal Regulations, Chapter 1, Part 70, and Part 71, the following amendment to the special nuclear material license identified below is hereby issued, authorizing the licensee to deliver special nuclear material to a carrier for transport, and is subject to the conditions specified in that license and to the conditions specified below.

Licensee	
1. Name: United Nuclear Corporation	3. License No. SNM- <u>777</u>
2. Address: P. O. Box 1883 365 Winchester Avenue New Haven, Connecticut 06508	Amendment No. <u>71-9</u>
	4. Docket No. <u>70-820</u>

CONDITIONS

5. (a) Packaging

(1) Model number UNC-740

(2) Description (See Page 2)

(b) Contents

(1) Type and form of material Dry uranium oxide pellets, enriched to a maximum 6.5 w/o in the U-235 isotope.

(2) Maximum quantity of material per package (See Page 2)

(c) Fissile Class

II and III

(1) Minimum number of radiation units to be shown on label for Class II 5.7

(2) Maximum number of packages per shipment for Class III 17

LICENSEE: United Nuclear Corporation

PAGE 2

LICENSE NO.: SNM-777

AMENDMENT NO.: 71-9

DOCKET NO.: 70-820

- 5. (a) (2) Containment vessel consists of a 7-gallon steel drum with bolt locking ring closure, centered and supported within a 65-gallon steel drum of DOT Specification 17H or better by top and bottom steel support inserts. Container constructed in accordance with United Nuclear Corporation Drawings Nos. 66008-105 and 66008-106. The top steel support insert shall be bolted to the outer container by at least three 1/4-inch bolts.
- 5. (b) (2) Total contents not to exceed 80 pounds and for the following w/o U-235, the U-235 content shall not exceed the following:

<u>Maximum w/o U-235</u>	<u>Maximum U-235</u>
3.0	920 grams
4.0	720 grams
5.0	590 grams
6.5	590 grams

REFERENCES

Licensee's application dated November 14, 1966, for an amendment to Special Nuclear Material Licenses Nos. SNM-33, SNM-368 and SNM-777 to deliver special nuclear material to a carrier for transport in the UNC-740 package.

Supplements dated September 21, and October 19, 1967.

FOR THE ATOMIC ENERGY COMMISSION

Date of Amendment JAN 4 1968

Donald A. Nussbaumer
Division of Materials Licensing

UNITED STATES
ATOMIC ENERGY COMMISSION

JAN 4 1968

LICENSE AMENDMENT
for
DELIVERY OF SPECIAL NUCLEAR MATERIAL
to a
CARRIER FOR TRANSPORT

Pursuant to the Atomic Energy Act of 1954 and Title 10, Code of Federal Regulations, Chapter 1, Part 70, and Part 71, the following amendment to the special nuclear material license identified below is hereby issued, authorizing the licensee to deliver special nuclear material to a carrier for transport, and is subject to the conditions specified in that license and to the conditions specified below.

Licensee	
1. Name: United Nuclear Corporation	3. License No. SNM- <u>777</u>
2. Address: P. O. Box 1883 365 Winchester Avenue New Haven, Connecticut 06508	Amendment No. <u>71-10</u>
	4. Docket No. <u>70-820</u>

CONDITIONS

5. (a) Packaging

(1) Model number UNC-1001

(2) Description (See Page 2)

(b) Contents

(1) Type and form of material Dry uranium oxides, enriched to a maximum 10 w/o in the U-235 isotope.

(2) Maximum quantity of material per package (See Page 2)

(c) Fissile Class II and III

(1) Minimum number of radiation units to be shown on label for Class II 2.5

(2) Maximum number of packages per shipment for Class III 40

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PAGE 2

LICENSE NO.: SNM-777

AMENDMENT NO.: 71-10

DOCKET NO.: 70-820

- 5. (a) (2) Containment vessel consists of a 5-gallon steel pail with bolt locking ring closure, centered and supported within an 85-gallon steel drum of DOT Specification 17H or better by top and bottom steel support inserts. Container constructed in accordance with United Nuclear Corporation Drawings Nos. 66008-109 and 66008-110. The top steel support insert shall be bolted to the outer container by at least three 1/4-inch bolts.
- 5. (b) (2) Total contents not to exceed 100 pounds and for the following w/o U-235, the U-235 content shall not exceed the following:

<u>w/o U-235</u>	<u>Maximum U-235</u>
2.0	800 grams
3.0	810 grams
4.0	848 grams
5.0	815 grams
6.0	732 grams
7.0	670 grams
8.0	636 grams
9.0	594 grams
10.0	574 grams

REFERENCES

Licensee's application dated November 14, 1966, for an amendment to Special Nuclear Material Licenses Nos. SNM-33, SNM-368 and SNM-777 to deliver special nuclear material to a carrier for transport in the UNC-1001 package.

Supplement dated October 19, 1967.

FOR THE ATOMIC ENERGY COMMISSION

Date of Amendment JAN. 47. 1968

Donald A. Nussbaumer
Division of Materials Licensing

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UNITED STATES
ATOMIC ENERGY COMMISSION

JAN 4 1968

LICENSE AMENDMENT
for
DELIVERY OF SPECIAL NUCLEAR MATERIAL
to a
CARRIER FOR TRANSPORT

Pursuant to the Atomic Energy Act of 1954 and Title 10, Code of Federal Regulations, Chapter 1, Part 70, and Part 71, the following amendment to the special nuclear material license identified below is hereby issued, authorizing the licensee to deliver special nuclear material to a carrier for transport, and is subject to the conditions specified in that license and to the conditions specified below.

Licensee	
1. Name: United Nuclear Corporation	3. License No. <u>SNM-777</u>
2. Address: P. O. Box 1883 365 Winchester Avenue New Haven, Connecticut 06508	Amendment No. <u>71-11</u>
	4. Docket No. <u>70-820</u>

CONDITIONS

5. (a) Packaging

(1) Model number

UNC-1351

(2) Description

Containment vessel consists of a 6-inch Schedule 40 steel pipe, 5 inches long, with welded bottom plate and bolted flange closure. Containment vessel is centered and supported within a 15-gallon DOT Specification 37A steel drum by top and bottom steel support inserts. Container constructed in accordance with United Nuclear Corporation Drawings Nos. 66008-103 and 66008-104. The top steel support insert shall be bolted to the outer container by at least three 1/4-inch bolts.

(b) Contents

(1) Type and form
of material

(i) Uranium metal of any U-235 enrichment, as whole metal biscuits.

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PAGE 2

LICENSE NO.: SNM-777

AMENDMENT NO.: 71-11

DOCKET NO.: 70-820

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- (ii) Uranium metal of any U-235 enrichment, as broken metal biscuits.
- (iii) Uranium metal, alloys, compounds, or mixtures provided the material is insoluble in water and will withstand a temperature of 800°C without pressure generating decomposition and the H/U-235 atomic ratio, including all hydrogenous material within the containment vessel does not exceed 2. Uranium may be enriched to any degree in the U-235 isotope.
- (iv) Uranium metal, alloys, compounds, or mixtures. Uranium may be enriched to any degree in the U-235 isotope.

(2) Maximum quantity of material per package

Total contents not to exceed 75 pounds and the U-235 content shall not exceed the following:

- (i) For the contents described in 5(b)(1)(i), 12.5 kilograms U-235.
- (ii) For the contents described in 5(b)(1)(ii), 10.0 kilograms U-235.
- (iii) For the contents described in 5(b)(1)(iii), 5.8 kilograms U-235.
- (iv) For the contents described in 5(b)(1)(iv), 350 grams U-235.

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PAGE 3

LICENSE NO.: SNM-777

AMENDMENT NO.: 71-11

DOCKET NO.: 70-820

(c) Fissile Class

II and III

(1) Minimum number of radiation units to be shown on label for Class II

(i) For the contents described in 5(b)(1)(i), 5(b)(1)(ii), and limited in 5(b)(2)(i), 5(b)(2)(ii), 8 radiation units.

(ii) For the contents described in 5(b)(1)(iii), 5(b)(1)(iv), and limited in 5(b)(2)(iii), 5(b)(2)(iv), 2.8 radiation units.

(2) Maximum number of packages per shipment for Class III

(i) For the contents described in 5(b)(1)(i), 5(b)(1)(ii), and limited in 5(b)(2)(i), 5(b)(2)(ii), 10 packages.

(ii) For the contents described in 5(b)(1)(iii), 5(b)(1)(iv), and limited in 5(b)(2)(iii), 5(b)(2)(iv), 28 packages.

REFERENCES

Licensee's application dated November 15, 1966, for an amendment to Special Nuclear Material Licenses Nos. SNM-33, SNM-368 and SNM-777 to deliver special nuclear material to a carrier for transport in the UNC-1351 package.

Supplement dated October 23, 1967.

FOR THE ATOMIC ENERGY COMMISSION

Date of Amendment JAN 4 1968

Donald A. Nussbaumer
Division of Materials Licensing

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UNITED STATES
ATOMIC ENERGY COMMISSION

JAN 4 1968

LICENSE AMENDMENT
for
DELIVERY OF SPECIAL NUCLEAR MATERIAL
to a
CARRIER FOR TRANSPORT

Pursuant to the Atomic Energy Act of 1954 and Title 10, Code of Federal Regulations, Chapter 1, Part 70, and Part 71, the following amendment to the special nuclear material license identified below is hereby issued, authorizing the licensee to deliver special nuclear material to a carrier for transport, and is subject to the conditions specified in that license and to the conditions specified below.

Licensee	
1. Name: United Nuclear Corporation	3. License No. <u>SNM-777</u>
2. Address: P. O. Box 1883 365 Winchester Avenue New Haven, Connecticut 06508	Amendment No. <u>71-12</u>
	4. Docket No. <u>70-820</u>

CONDITIONS

5. (a) Packaging

(1) Model number

UNC-1483

(2) Description

Containment vessel consists of a 5 1/4" ID x 36" long and 3/8" wall thickness steel pipe with welded bottom plate and bolted top flange closure. Containment vessel is centered and supported within a 65 gallon 16 gage or heavier steel drum by tubular steel spokes. The outer container closure shall be accomplished by a 12 gage bolted ring with drop forged lugs, one of which is threaded to receive a 5/8" bolt and nut. Container constructed in accordance with United Nuclear Corporation Drawing No. 66008-101.

(b) Contents

(1) Type and form of material

(i) Uranium metal, alloys, compounds, or mixtures with a density > 3.2g U-235/cc, provided the material is insoluble in water and will withstand a temperature of 800°C without

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JAN 4 1968

LICENSEE: United Nuclear Corporation

PAGE 2

LICENSE NO.: SNM-777

AMENDMENT NO.: 71-12

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pressure generating decomposition and the H/U-235 atomic ratio, including all hydrogenous material within the containment vessel does not exceed 2. Uranium may be enriched to any degree in the U-235 isotope.

- (ii) Uranium compounds with a density ≤ 3.2 g U-235/cc, provided the material is insoluble in water and will withstand a temperature of 800°C without pressure generating decomposition and the H/U-235 atomic ratio, including all hydrogenous material within the containment vessel does not exceed 2. Uranium may be enriched to any degree in the U-235 isotope.
- (iii) Uranium metal, alloys, compounds, or mixtures. Uranium may be enriched to any degree in the U-235 isotope. //

(2) Maximum quantity of material per package

Total contents shall not exceed 65 pounds and the U-235 content shall not exceed the following:

- (i) For the contents described in 5(b)(1)(i), 10 kilograms U-235.
- (ii) For the contents described in 5(b)(1)(ii), as restricted by the 65 pound loading requirement.

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(c) Fissile Class

II and III

(1) Minimum number of radiation units to be shown on package for Class II

(iii) For the contents described in 5(b)(1)(iii), 350 grams U-235.

(i) For the contents described in 5(b)(1)(i) and limited in 5(b)(2)(i), 5.0 radiation units.

(ii) For the contents described in 5(b)(1)(ii), 5(b)(1)(iii), and limited in 5(b)(2)(ii), 5(b)(2)(iii), 1.5 radiation units.

(2) Maximum number of packages per shipment for Class III

(i) For the contents described in 5(b)(1)(i) and limited in 5(b)(2)(i), 16 packages.

(ii) For the contents described in 5(b)(1)(ii), 5(b)(1)(iii), and limited in 5(b)(2)(ii), 5(b)(2)(iii), 55 packages.

REFERENCES

Licensee's application dated November 15, 1966, for an amendment to Special Nuclear Material Licenses Nos. SNM-33, SNM-368 and SNM-777 to deliver special nuclear material to a carrier for transport in the UNC-1483 package.

Supplement dated October 26, 1967.

FOR THE ATOMIC ENERGY COMMISSION

Date of Amendment

JAN 4 1968

Donald A. Nussbaumer
Division of Materials Licensing