



U.S. Department
of Transportation
**Pipeline and
Hazardous Materials
Safety Administration**

East Building, PHH-23
1200 New Jersey Avenue Southeast
Washington, D.C. 20590

**COMPETENT AUTHORITY CERTIFICATION
FOR A TYPE B(U)F FISSILE
RADIOACTIVE MATERIALS PACKAGE DESIGN
CERTIFICATE USA/0811/B(U)F-96, REVISION 0**

**REVALIDATION OF ARGENTINIAN COMPETENT AUTHORITY
CERTIFICATE RA/0103/B(U)F-96**

This certifies that the radioactive material package design described is hereby approved for use within the United States for import and export shipments only. Shipments must be made in accordance with the applicable regulations of the International Atomic Energy Agency¹ and the United States of America².

1. Package Identification - LEUPA.
2. Package Description and Authorized Radioactive Contents - as described in Argentine Certificate of Competent Authority RA/0103/B(U)F-96, Revision 0 (attached).
3. Criticality - The minimum criticality safety index is 0.7. The maximum number of packages per conveyance is determined in accordance with Table X of the IAEA regulations cited in this certificate.
4. General Conditions -
 - a. Each user of this certificate must have in his possession a copy of this certificate and all documents necessary to properly prepare the package for transportation. The user shall prepare the package for shipment in accordance with the documentation and applicable regulations.
 - b. Each user of this certificate, other than the original petitioner, shall register his identity in writing to the Office of Hazardous Materials Technology, (PHH-23), Pipeline and Hazardous Materials Safety Administration, U.S. Department of Transportation, Washington D.C. 20590-0001.
 - c. This certificate does not relieve any consignor or carrier from compliance with any requirement of the Government of any country through or into which the package is to be transported.

¹ "Regulations for the Safe Transport of Radioactive Material, 1996 Edition (Revised), No. TS-R-1 (ST-1, Revised)," published by the International Atomic Energy Agency (IAEA), Vienna, Austria.

² Title 49, Code of Federal Regulations, Parts 100-199, United States of America.

CERTIFICATE USA/0811/B(U)F-96, REVISION 0

- d. Records of Quality Assurance activities required by Paragraph 310 of the IAEA regulations¹ shall be maintained and made available to the authorized officials for at least three years after the last shipment authorized by this certificate. Consignors in the United States exporting shipments under this certificate shall satisfy the applicable requirements of Subpart H of 10 CFR 71.
5. Special Conditions -
 - a. Plastic in all forms is prohibited in the package contents.
 - b. Before each shipment the packaging must be inspected to insure that:
 - (1) There are no signs of corrosion
 - (2) Package labels are legible
 - (3) There are no cracks in any weld.
 - c. For contents that include uranium metal powder, granules, swarf (chips, turnings, filings, or shavings), pieces and/or chunks:
 - (1) Each "inner container" (inner can) must be maintained in a vacuum dry and inert atmosphere, to prevent the presence of oxygen or flammable gas prior or during shipment.
 - (2) The "container of the inner containers" must be maintained in a vacuum dry and inert atmosphere to prevent the presence of oxygen or flammable gas during shipment.
 6. Marking and Labeling - The package shall bear the marking USA/0811/B(U)F-96 in addition to other required markings and labeling.
 7. Expiration Date - This certificate expires on May 31, 2020.

CERTIFICATE USA/0811/B(U)F-96, REVISION 0

This certificate is issued in accordance with paragraph 814 of the IAEA Regulations and Section 173.472 and 173.473 of Title 49 of the Code of Federal Regulations, in response to the June 23, 2015 petition by Edlow International Company, Washington, DC, and in consideration of other information on file in this Office.

Certified By:



Mar 14 2017

(DATE)

 William Schoonover

Acting Associate Administrator for Hazardous Materials Safety

Revision 0 - Issued to revalidate Argentine Certificate of Approval No. RA/0103/B(U)F-96, Original Version, Addenda 1.

The Nuclear Regulatory Authority (Autoridad Regulatoria Nuclear)
Under The Authority of the National President's Office

**COMPETENT AUTHORITY'S APPROVAL CERTIFICATE
CONCERNING THE DESIGN OF B(U)-TYPE PACKAGE FOR
FISSIONABLE SUBSTANCE CONTENTS, IN SOLID FORM,
MODEL LEUPA
RA/0103/B(U)F-96 (Original Version - Addenda 1)**

It is hereby certified that the MODEL LEUPA package, as described in the next paragraphs, complies with the regulatory requirements related to B(U)-Type Packages for fissionable substance contents set forth by AR 10.16.1 Standard, Revision 2⁽¹⁾, "Transportation of Radioactive Materials", issued by the Nuclear Regulatory Authority, for its being transported by sea, land, and air.

1. COMPETENT AUTHORITY'S IDENTIFICATION MARK: **RA/0103/B(U)F-96**
2. EFFECTIVE TERM OF THIS CERTIFICATE: From **November 16, 2016** until **May 31, 2020**
3. PACKAGE IDENTIFICATION: Model: **LEUPA**. Series Numbers: **02, 03, 04, 05**

4. PACKAGING DESCRIPTION:

The LEUPA B(U) Type package design has been intended for transportation and storage of fissionable substances (U enrichment lower than 20% in U²³⁵ atoms, in solid form (metallic) or into known solid compounds, i.e. U₃O₈, UO₂, U₃Si₂, UN, U_xAl_y).

The fissionable substances are packed inside non air-tight steel containers called "internal containers". Each of said containers is of 1.56 dm³ internal volume. The LEUPA package can hold up to four of these internal containers which, on their turn, are fitted inside said package. This package has been designed according to ASME code and its usable internal volume is of approximately 8.25 dm³. The package consists of a main body and a standard flange, both of them made in stainless steel. The flange is fitted to the main body with 8 UNC 3/4" screws. The joint between the flange and the main body has been sealed with a spiraled graphite seal that is suitable for operating up to a limit temperature of 450 °C. The flange is fitted with a folding gripper of ergonomic design for its handling.

Rubber supplements offset the free space between the internal containers and the package, in order to reduce the dynamic effects under normal transportation or accident conditions.

Attached to the package is a water-tight double-wall stainless steel cylindrical component. The space between both walls (of approximately 17 mm) is filled with high purity cast cadmium. The flanged cover of the package has a double wall inside which cadmium is cast, so that the cargo of fissionable substances is practically fully surrounded by neutron absorbent material. This set constitutes a central compact non-deformable cell.

Outside the central cell described in the foregoing section are fitted, radially, eight (8) welded

⁽¹⁾ "Regulations for the Safe Transport of Radioactive Materials", 2009 Edition, Collection of Safety Standards N° TS-R-1 from the International Atomic Energy Agency (IAEA)

stainless steel structural plates that fit that cell to the external wall of the package. Besides, the package has four rings of cylinder-angle profile, i.e. one ring at each end of the package and the other two rings at approximately one third (1/3) and two third (2/3) portion distance from the package height, respectively, for strengthening purposes. Each ring is welded to the radial plates. These plates, on their turn, are welded to the central cell, constituting an integrated unit. The external wall of the package is a stainless steel cylindrical plate. At its ends, the package has welded circular covers, which together with the external wall and the central cell define a volume into which the thermal insulating material is fitted, with the central cell resulting to be surrounded by thermal insulating material of approximately 150 mm thickness.

The package has an intermediate dismountable cover consisting of a welded construction made-up of stainless steel cylinder plate and circular covers, which in a way similar to the foregoing define a volume suitable to be filled with the insulating material, which results to be approximately 150 mm thick.

The dismountable intermediate cover is fitted to the remainder of the package with six (6) M12 screws, there being an elastomeric joint between both parts.

Externally to the dismountable intermediate cover there is another cover, solely consisting of a circular stainless steel plate, fitted to the remainder of the package also with six (6) M12 screws. Between both parts is also fitted a 5 mm thick elastomeric joint for preventing dirty or moisture entry.

The external dimensions of the package are approximately 1155 mm height and 532 mm diameter. The total mass of model LEUPA package, as empty, is of approximately 430 Kg, with the maximum allowable total mass of model LEUPA package being of 435 Kg. See diagram in Annex 1.

5. AUTHORIZED RADIOACTIVE CONTENTS:

The design of the package is authorized for transporting Uranium enriched up to 20 % (19.75 (±), 0.25 %) in U²³⁵ atoms of the total content of U to be transported (50 Kg.). The total mass of U²³⁵ should not be higher than 10000 g.

The fissionable substance to be transported can be:

| Substance | Form |
|--------------------------------|---------------------------------|
| Metallic U | Powder - Grains - Chips - Other |
| UO ₂ | Powder - Pellets - Other |
| U ₃ Si ₂ | Powder - Chips - Other |
| UN | Powder - Pellets - Other |
| U _x Al _y | Powder - Chips - Other |
| U ₃ O ₈ | Powder - Pellets - Other |

The whole of the material to be transported should be presented in its solid state, under normal pressure and temperature conditions.

6. CRITICALITY SAFETY INDEX (CSI): For the authorized radioactive contents, as indicated in paragraph 5 above, the value of the CRITICALITY SAFETY INDEX (CSI) is 0.69

7. SHIPPING, TRANSPORT, AND MAINTENANCE CONDITIONS:

7.1 The package should be inspected and maintained according to the Inspection and Maintenance Manual for MODEL LEUPA Package, 0908-LE00-3BEIN-026 LEUPA - INSPECTION AND MAINTENANCE MANUAL and pursuant to AR 10.16.1 Standard, "Transportation of Radioactive Materials" Revision 2⁽¹⁾

7.2 The package should be prepared for its being transported by land, sea or air, according to the Operation Manual for MODEL LEUPA Package, 0908-LE00-3BEIN-017 LEUPA - OPERATION MANUAL and pursuant AR 10.16.1 Standard, "Transportation of Radioactive Materials" Revision 2⁽¹⁾.

7.3 With regard to each shipment, the sender should give the Nuclear Regulatory Authority notice of: a) the details of the pertinent shipment, at least 2 working days' in advance, by means of form F-TMR-09 or such other form as may replace it, and b) any event or accident that might take place throughout the transportation.

7.4 Each package manufactured according to the package design, as well as the vehicle that transports the package, shall comply with all of the pertinent requirements contained in AR 10.16.1 Standard "Transportation of Radioactive Materials" Revision 2⁽¹⁾.

7.5 The sender shall provide to the carrier with the specific instructions to comply with. The carrier shall appropriately know the instructions to follow for emergency cases and shall hold Intervention File No. 127 as set forth in the applicable regulations.

8. QUALITY ASSURANCE

The package should be inspected, maintained, prepared for shipment and transported in compliance with 0908-LE00-EDEIN-019 "PROGRAM FOR LEUPA PROJECT QUALITY MANAGEMENT" document, the INVAP S.E.'S pertinent quality documentation, and all of the applicable requirements contained in AR 10.16.1 Standard "Transportation of Radioactive Materials" Revision 2⁽¹⁾.

9. This certificate does not exempt either the sender or the transporter from complying with any other requirement set forth by the Government of any country through/whereto the package is transported.

10. This certificate is issued according to AR 10.16.1 Standard, "Transportation of Radioactive Materials", Revision 2⁽¹⁾, and as requested by INVAP S. E.

Note: the Original Version - Addenda 1, modifies the Original Version - Addenda with regard to the total mass of the package model and the issue Date

Call System of Intervention in Radiological Emergencies

(Sky Tel) TEL. 4597-9000 mentioning PIN number 1110886

CERTIFIED BY: SIGNATURE AND NAME: Ana María LARCHER. First Deputy Chairman to the Board of Directors.

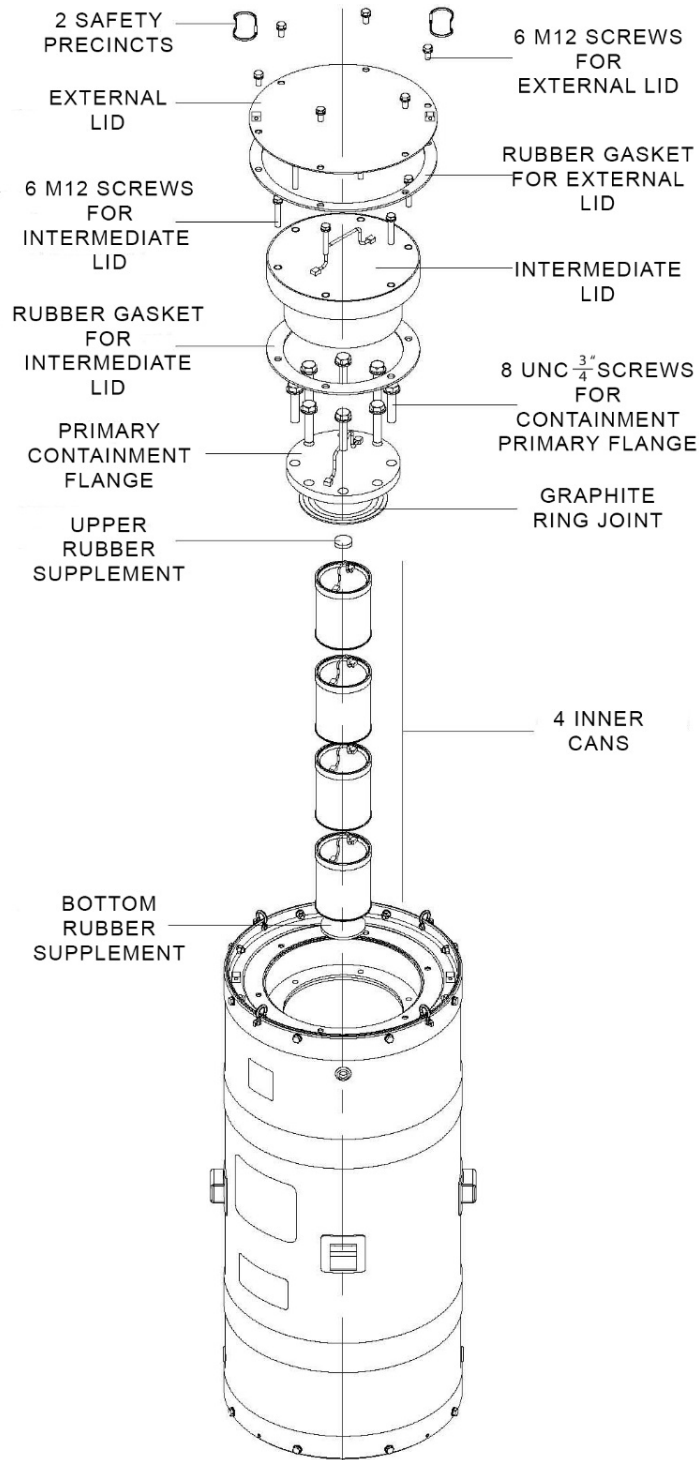
DATE: November 14, 2016

NUCLEAR REGULATORY AUTHORITY (AUTORIDAD REGULATORIA NUCLEAR (ARN)).

Av. Del Libertador 8250 - (1429) - Buenos Aires - Republic of Argentina.

TEL.: (54 11) 6323-1722/1708. FAX: (54 11) 6323-1771/1798

ANNEX 1





Autoridad Regulatoria Nuclear
DEPENDIENTE DE LA PRESIDENCIA DE LA NACION

**CERTIFICADO DE APROBACION DE LA AUTORIDAD COMPETENTE
PARA EL DISEÑO DE BULTO DEL TIPO B(U) PARA CONTENIDO DE
SUSTANCIAS FISIONABLES EN FORMA SÓLIDA, MODELO LEUPA**

RA/0103/B(U)F-96 (Versión Original – Adenda 1)

El presente certifica que el modelo de bulto LEUPA, tal como se describe en los párrafos siguientes, cumple con los requisitos correspondientes a los Bultos del Tipo B(U) para contenido de sustancias fisionables establecidos en la Norma AR 10.16.1 "Transporte de materiales radiactivos", Revisión 2⁽¹⁾, de la Autoridad Regulatoria Nuclear de Argentina, para su transporte por vía terrestre, aérea y acuática.

1. **MARCA DE IDENTIFICACION DE LA AUTORIDAD COMPETENTE:**

RA/0103/B(U)F-96

2. **VIGENCIA DEL CERTIFICADO:**

Desde: **16 de noviembre de 2016**

hasta: **31 de mayo de 2020**

3. **IDENTIFICACION DEL EMBALAJE:**

Modelo: **LEUPA**

Números de Serie: **02, 03, 04, 05**

4. **DESCRIPCION DEL EMBALAJE:**

El diseño de bulto del Tipo B(U) LEUPA es un bulto diseñado para el transporte y almacenamiento de sustancias fisionables (U de enriquecimiento menor al 20% en átomos de U²³⁵) en forma sólida (metálico) o en compuestos sólidos conocidos: U₃O₈, UO₂, U₃Si₂, UN, U_xAl_y.

Las sustancias fisionables se encuentran contenidas en envases de acero no herméticos denominados recipientes internos. Cada uno de ellos tiene un volumen interno de 1,56 dm³. El bulto LEUPA puede cargar hasta cuatro de estos recipientes internos, que a su vez se encuentran alojados en el denominado contenedor. Este es un recipiente diseñado según código ASME, con un volumen interno utilizable de aproximadamente 8,25 dm³. El contenedor se compone del cuerpo principal y una brida normalizada, ambos de acero inoxidable. La brida se encuentra unida al cuerpo principal por medio de 8 tornillos UNC 3/4". La unión entre ambos está sellada por medio de una junta de grafito espiralada apta para trabajar hasta una temperatura límite de 450°C. La brida cuenta con una agarradera rebatible de diseño ergonómico para su manipulación.

Suplementos de goma eliminan el huelgo entre los recipientes internos y el contenedor con la finalidad de disminuir efectos dinámicos en casos de condiciones de transporte normal o de accidente.

Unido al contenedor se encuentra un componente cilíndrico estanco de doble pared de acero inoxidable. El espacio entre ambas paredes (17 mm aproximadamente) está relleno de cadmio de alta pureza colado. La tapa bridada del contenedor también cuenta con una doble pared dentro de la cual se cuela cadmio, de modo que la carga de sustancias fisionables se encuentra rodeada casi por completo por material absorbente de neutrones. Este conjunto constituye una celda central compacta e indeformable.

(1) "Reglamento para el transporte seguro de materiales radiactivos", Edición de 2009, Colección de Normas de Seguridad N° TS-R-1 del Organismo Internacional de Energía Atómica (OIEA).

JUAN JOSE LEZICA
ESCRIBANO

Mat. 4980

Por fuera de la celda central descrita en la sección anterior se disponen radialmente ocho (8) chapas estructurales soldadas, de acero inoxidable, que vinculan dicha celda con la pared exterior del embalaje. Además, el embalaje cuenta con cuatro anillos de perfil ángulo cilindrado, uno en cada extremo del embalaje y los otros dos a aproximadamente a un tercio (1/3) y dos tercios (2/3) de la altura del embalaje respectivamente, a modo de refuerzo. Cada anillo se suelda a las chapas radiales y éstas a su vez a la celda central conformando una unidad integrada. La pared exterior del embalaje es una chapa cilindrada de acero inoxidable. El embalaje cuenta con tapas soldadas circulares en sus extremos, que definen conjuntamente con la pared exterior y la celda central un volumen en donde se coloca el aislante térmico, quedando la celda central rodeada de un espesor de aproximadamente 150 mm de aislante térmico.

El embalaje cuenta con una tapa intermedia desmontable que es una construcción soldada realizada con chapa cilindrada de acero inoxidable y tapas circulares, que de similar modo a lo dicho anteriormente, definen un volumen apto para llenarse con el aislante, resultando un espesor aproximado de este último de 150 mm.

La tapa intermedia desmontable está vinculada al resto del embalaje por medio de seis (6) tornillos M12, existiendo una junta elastomérica entre ambas partes.

Externamente a la tapa intermedia desmontable existe otra tapa consistente exclusivamente por una chapa circular de acero inoxidable, fijada al resto del embalaje también por medio de seis (6) tornillos M12. Entre ambas partes también se dispone de una junta elastomérica de 5 mm de espesor para evitar la entrada de suciedad o humedad.

Las dimensiones externas aproximadas del bulto son: altura 1155 mm y diámetro 532 mm. La masa total del modelo de bulto LEUPA vacío es aproximadamente 430 kg, con un máximo permitido de 435 kg. Véase esquema en el Apéndice 1.

5. *CONTENIDO RADIATIVO AUTORIZADO:*

El diseño de bulto se autoriza para transportar:

- Uranio enriquecido como máximo al 20% ($19,75 \pm 0,25$ %) en átomos de U^{235} del total del contenido de U a transportar (50 kg). La masa total de U^{235} no debe ser superior a 10000 g.

La sustancia fisionable a transportar puede consistir en:

| Sustancia | Forma |
|--------------------------------|------------------------------------|
| U metálico | Polvo - Granallas - Trozos - Otras |
| UO ₂ | Polvo - Pellets - Otras |
| U ₃ Si ₂ | Polvo - Trozos - Otras |
| UN | Polvo - Pellet - Otras |
| U _x Al _y | Polvo - Trozos - Otras |
| U ₃ O ₈ | Polvo - Pellets - Otras |

Todo el material a transportar debe estar en estado sólido en condiciones normales de presión y temperatura.

6. *INDICE DE SEGURIDAD CON RESPECTO A LA CRITICIDAD (ISC):*

Para los contenidos radiactivos autorizados indicados en el punto 5 de este certificado, el Índice de Seguridad con respecto a la Criticidad (ISC) es 0,69.

7. *CONDICIONES DE EXPEDICIÓN, TRANSPORTE Y MANTENIMIENTO:*

7.1. El bulto debe ser inspeccionado y mantenido de acuerdo al Manual de Inspección y Mantenimiento del Modelo de Bulto LEUPA, 0908-LE00-3BSIN-026 LEUPA - MANUAL DE INSPECCION Y MANTENIMIENTO y a la Norma AR 10.16.1 "Transporte de materiales radiactivos" Revisión 2⁽¹⁾.

⁽¹⁾ "Reglamento para el transporte seguro de materiales radiactivos", Edición de 2009, Colección de Normas de Seguridad N° TS-R-1 del Organismo Internacional de Energía Atómica (OIEA).

- 7.2. El bulto debe ser preparado para su transporte por vía terrestre, aérea y acuática, de acuerdo al Manual de Operación del Modelo de Bulto LEUPA, 0908-LE00-3BSIN-017 LEUPA - MANUAL DE OPERACIÓN y a la Norma AR 10.16.1 "Transporte de materiales radiactivos" Revisión 2⁽¹⁾.
- 7.3. En cada expedición, el remitente deberá comunicar a la ARN: a) los detalles de la expedición mediante el formulario F-TMR-09, o el que lo reemplace, con una anticipación no menor a 2 días hábiles, y b) cualquier incidente o accidente que ocurriere durante el transporte.
- 7.4. Cada embalaje fabricado conforme al diseño de bulto, así como el vehículo que lo transporte, deberá cumplir con todos los requisitos pertinentes de la Norma AR 10.16.1 "Transporte de materiales radiactivos" Revisión 2⁽¹⁾.
- 7.5. El remitente deberá suministrar al transportista las instrucciones especiales a cumplir. El transportista tendrá un conocimiento adecuado de las instrucciones a seguir en casos de emergencia y portará la Ficha de Intervención N° 127 que figura en la reglamentación vigente.

8. GARANTIA DE CALIDAD

El bulto debe ser inspeccionado, mantenido, preparado para la expedición y transportado de acuerdo con el documento 0908-LE00-EDSIN-019 "PROGRAMA PARA LA GESTIÓN DE CALIDAD DEL PROYECTO LEUPA", con la documentación de calidad pertinente de INVAP S.E. y con los requisitos aplicables de la Norma AR 10.16.1 "Transporte de materiales radiactivos" Revisión 2⁽¹⁾.

9. El presente certificado no exime al remitente ni al transportista del cumplimiento de cualquier otro requisito impuesto por el Gobierno de cualquier país a través del cual o al cual se transporte el bulto.

10. Este certificado se emite teniendo en cuenta la Norma AR 10.16.1 "Transporte de materiales radiactivos", Revisión 2 y en respuesta al pedido formulado por INVAP S.E..

Nota: la Versión Original – Adenda 1, modifica a la Versión Original - Adenda en lo atinente a la masa total del modelo de bulto y a la fecha de emisión.

Sistema de Intervención en Emergencias Radiológicas
(Sky Tel) TE 4597-9000 mencionando el número de PIN 1110886

CERTIFICADO POR:


Lic. Ana María LARCHER
Vicepresidente 1° del Director

FIRMA Y ACLARACION

14 NOV 2016

FECHA

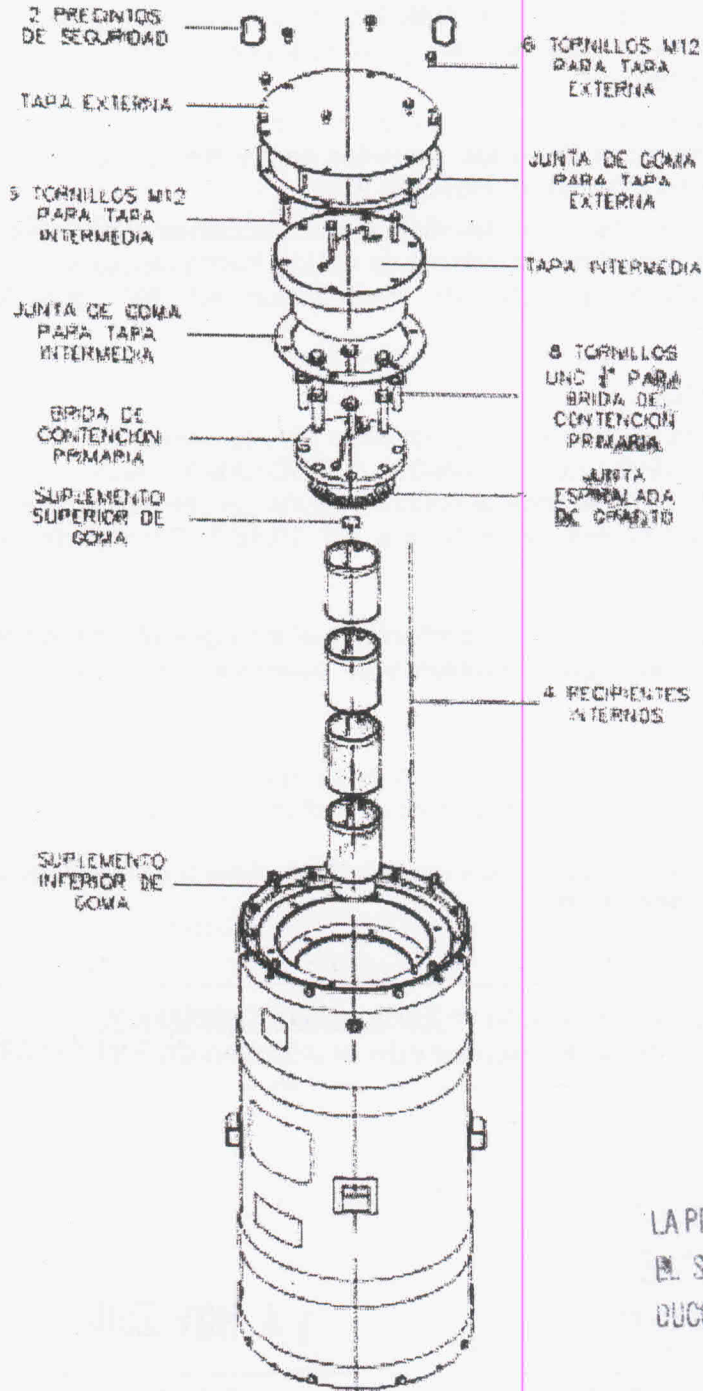
AUTORIDAD REGULATORIA NUCLEAR (ARN)
Av. Del Libertador 8250- (1429) Buenos Aires
República Argentina
Te: (54 11) 6323-1722/1708 Fax: (54 11) 6323-

⁽¹⁾ "Reglamento para el transporte seguro de materiales radiactivos", Edición de 2009, Colección de Normas de Seguridad N° TS-R-1 del Organismo Internacional de Energía Atómica (OIEA).

SILVIA SUSAN
TRADUCTORA P
INGLÉS
Mat. T° VII - F° 401
Inscripción C.T.P.C

APÉNDICE I

ESQUEMA DEL DISEÑO DE BULTO MODELO LEUPA



JUAN JOSE LE
ESCRIBANO

Mat. 1990

LA PRESENTE FOTOCOPIA SE AUTENTICA EN
EL SELLO DE CERTIFICACION DE REPRO-
DUCCIONES (LEY 404) N° T178981/5

JUAN JOSE LEZICA
ESCRIBANO

Mat. 1990



U.S. Department
of Transportation

East Building, PHH-23
1200 New Jersey Avenue SE
Washington, D.C. 20590

**Pipeline and
Hazardous Materials
Safety Administration**

CERTIFICATE NUMBER: USA/0811/B(U)F-96, Revision 0

ORIGINAL REGISTRANT(S):

Ms. Franchone Oshinowo
Vice President of Operations
Edlow International Company
1666 Connecticut Ave, N.W.
Suite 201
Washington, 20009
USA

Ms. Marilena Conde
Vice President, Marketing and Administration
Edlow International Company
1666 Connecticut Ave, N.W
Suite 201
Washington, 20009
USA