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TN International transport solution: supporting non proliferation efforts

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TN INTERNATIONAL

Introduction

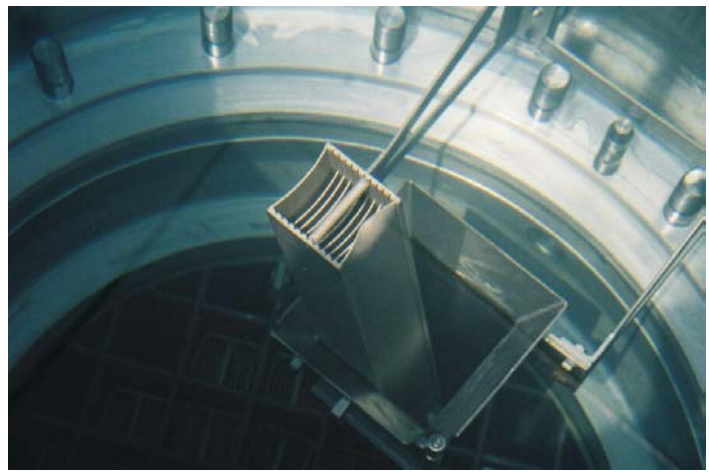
- **For more than 40 years, TN International has supported the Research Reactor community in the various steps of the Research Reactor cycle.**

Introduction

- **TN International can propose various casks for the :**
  - **FRR and RRRFR programs:**
    - **Until 1998, using of the IU 04 casks, now replaced by the TN™ MTR cask.**
  - **RERTR and GAP Material programs:**
    - **Non irradiated nuclear and radiological materials with:**
      - **TN™ BGC1**
      - **FS 47cask**
      - **TN™ UO2 cask**
    - **Irradiated fuels with the TN™ 106 cask or TN™ MTR**

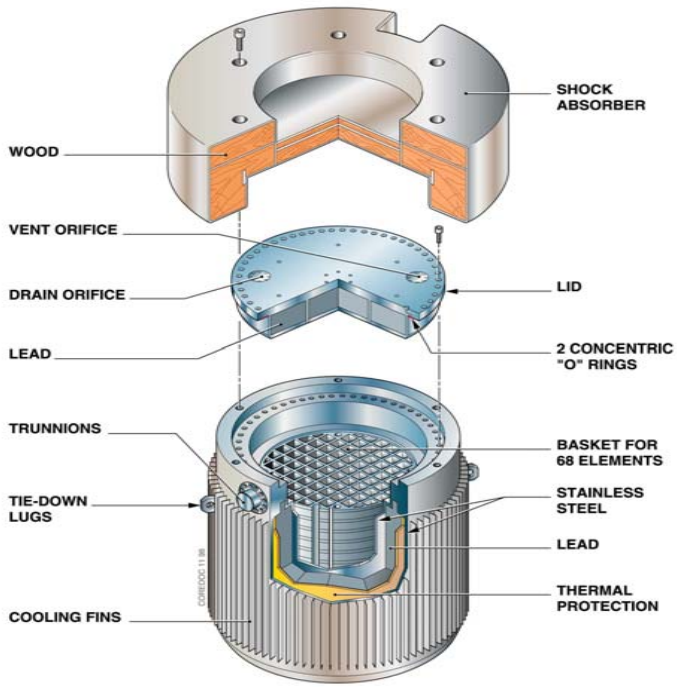
Spent fuel shipments

- **Before the end of 90s, TN International proposed the IU 04 cask:**
  - **Transports completed from the Research Reactors in: Belgium, Denmark, Portugal, Italy, Venezuela, Uruguay, Taiwan… to USA or La Hague plant.**



Spent fuel shipments

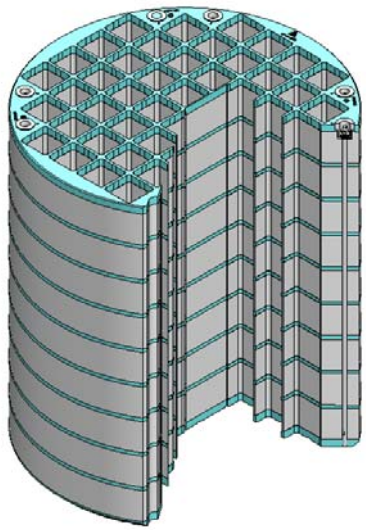
- **Replacement in 1999 of the IU04 by the TN™ MTR**
  - **The IU04 did not meet the new international regulations.**
  - **The TN™ MTR a B(U)F, IAEA 96 package developed for shipments of spent fuel from research reactors.**
  - **It accommodates up to 68 RTR spent fuel assemblies. It offers many internal configurations, using different baskets adapted to a large variety of contents.**



Spent fuel shipments

- 4 TN™ MTR has been manufactured
- A large variety of baskets has been developed and manufactured in order to transport maximum spent fuel due to the different possible geometries

  - MTR 68 basket : up to 68 fuel elements
  - MTR 52 basket : up to 52 fuel elements
  - MTR 44 basket : up to 44 fuel elements

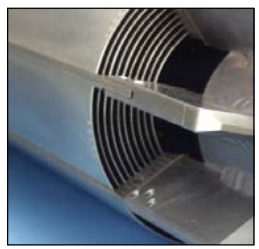


SQUARE

FLAT PLATES

CURVED PLATES

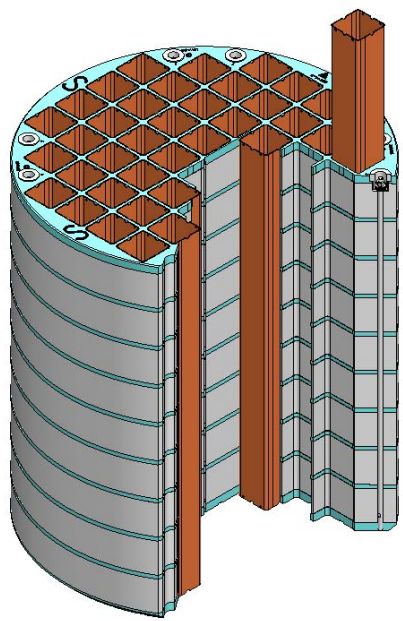
TUBULAR



TN™ MTR casks and shipments

- **For transportation in the USA, a specific basket has been developed to fulfill the US requirements**

  - **MTR 52S basket : up to 52 fuel elements**
  - **TN MTR package design with MTR52S basket validated in the USA since 2002**
  - **Transport performed from RISOE in Denmark to Savannah River**

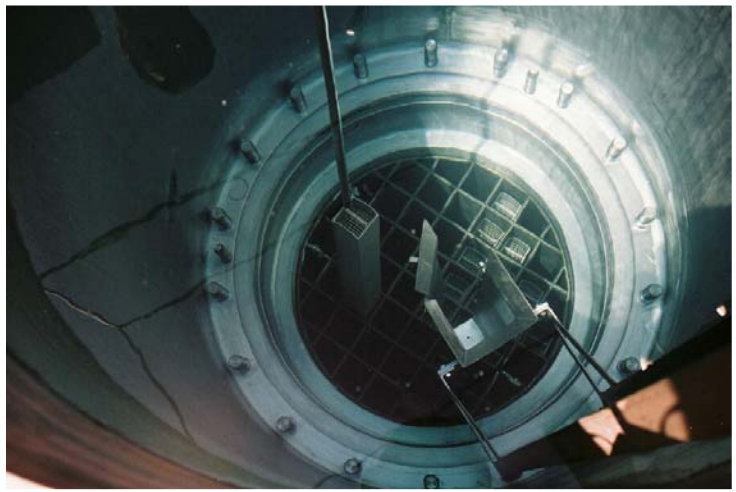


TN™ MTR for RRRFR

- Russian origin fuel have been studied and can be integrated in the TN™ MTR approval certificate.
- Reception at MAYAK facility has been studied and an evolution of the MTR 68 basket can be proposed to unload directly the basket in the hot cell.

TN™ MTR transfer system

- For research reactors unable to handle the mass of TN MTR (23,8 tons), TN International has developed a transfer system allowing to load the TN MTR outside of the pool.



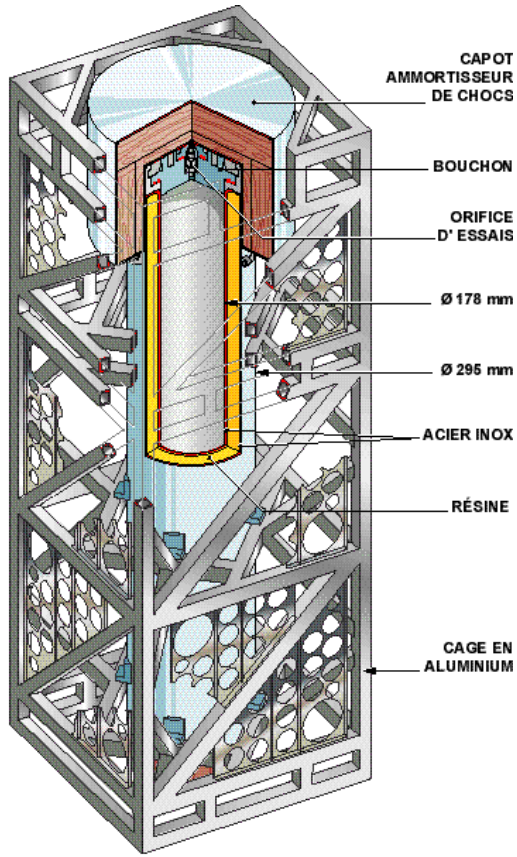
- Transfer system already used in France (CEA facility in Cadarache and school reactor in Strasbourg) and will be used in CEA Saclay in the beginning of 2007
- Identical system to the one of IU04 largely used in the world (Portugal, Taiwan…).

RERTR : Transport of fresh fuel

- Via CERCA, TN International performs fresh fuel transports in the world for reactors converted to LEU.
- Most of these transports are completed with TNBGC-1 casks.

TNBGC-1 package

- The TN ™ BGC-1 package can be used for the shipment of fresh material and fuel elements enriched up to 95 %.
- The package is in compliance with the IAEA 96 TSR-1 regulation for air and surface transportation. This package is used in Europe, North America, Russia...



A tool for Gap materials transportation

- Through AREVA's collaboration within, TN International can undertake the transport of different types of materials: HEU, separated plutonium and spent fuels.

- TN International has long experience of the international road, sea and air transport in conformity with the international safety and physical protection regulations.

Conclusion

- Based on the extensive experience gained during the last 40 years, TN International can provide:
  - customized solutions for almost all types of Research Reactors Fuel transportation

- TN International is ready:
  - to contribute to all the GTRI programs
  - to participate to other international initiatives
  - to collaborate with others industrial partners

TN International transport issue : supporting non proliferation efforts

If you have any question, please, do not hesitate to contact:

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