The R83 type B(U) transport package for used LEU fuel: a versatile package

Natalia Zolnikova, PhD
18th of September, 2018
Helsinki
Presentation summary

1. SUMMARY
2. PRESENTATION OF ROBATEL INDUSTRIES
3. OUR FIELDS OF EXPERTISE
4. LEU ISSUE
5. NRG PROJECT
6. DESIGN PROGRESS
7. INNOVATIONS and PERFORMANCES
8. CONCLUSIONS
9. NEW CHALLENGE
Set up in 1830
In the nuclear field since 1953

ROBATEL technologies in USA

130 employees
Turnover > 20 M€
Our fields of expertise
LEU issue

IAEA tries to minimize the use of HEU

conversion from HEU to LEU fuel

Remplacement of CASTOR MTR-2

currently transports are made under special arrangement

NRG

No transport cask available/licensed to transport LEU
In 2019 the B(U)F package needs to be available to guarantee the transportation of LEU material to the HABOG at COVRA.
NRG project

Transportation short storage of HEU and LEU fuel from the NRG research reactor and the future PALLAS research reactor.

- Design, licensing and manufacturing of 2 new “spent fuel” type B(U) fissile packages R83
- Simple handling at both the HOR and the HFR, at the HABOG
- Comply with the latest IAEA regulations
R83 design

<table>
<thead>
<tr>
<th>Project start</th>
<th>12.2017</th>
<th>Manufacturing of 2 packagings</th>
<th>12.2018</th>
</tr>
</thead>
<tbody>
<tr>
<td>01.2016</td>
<td>Package design safety file submittal (ANSV)</td>
<td>2018</td>
<td>CoC expected</td>
</tr>
</tbody>
</table>

**Dimensions**

- **Overall Height**: ≈ 2 140 mm
- **Outside diameter with shock absorbers**: ≈ 2 050 mm
- **Cavity height**: 950 mm
- **Cavity diameter**: 743 mm
- **Loaded package mass**: ≈ 16 200 kg
### Properties

<table>
<thead>
<tr>
<th></th>
<th>Values</th>
</tr>
</thead>
<tbody>
<tr>
<td>Content maximum mass</td>
<td>1 000 kg</td>
</tr>
<tr>
<td>Shielding materials</td>
<td>Refine pure lead</td>
</tr>
<tr>
<td></td>
<td>Compound PNT7™</td>
</tr>
<tr>
<td></td>
<td>Stainless steel</td>
</tr>
<tr>
<td></td>
<td>Borated stainless steel</td>
</tr>
<tr>
<td>Thermal protection</td>
<td>Compound PNT7™</td>
</tr>
<tr>
<td></td>
<td>FENOSOL™ phenolic foam</td>
</tr>
<tr>
<td>Containment</td>
<td>EPDM double O-ring system</td>
</tr>
<tr>
<td>Closure system</td>
<td>36 x M24 bolts</td>
</tr>
</tbody>
</table>
Conclusions

Type B casks: core business and expertise
More than 80 approved designs

Innovations:
- thermal and neutron shield compounds
- shock absorbing foam material

Best technical and economical requirements for type Replacement of current
CASTOR MTR-2 cask in view of the conversion of fuel from HEU to LEU
- 2016 Project start
- 2018 Type B(U) fissile license obtained
- Very positive customer’s feedback from NRG

What’s next? New challenge with INS
New challenge with INS

INS 3578, a B(U)F type cask

“in-house” alternative to the package currently used by NDA estate

- small quantities of PuO2 powder
- plutonium contaminated waste
- highly enriched uranium pellets and residues
- MOX pellets and residues

INS and Robatel are looking to combine their strengths & experience to revive this cask and to develop a flexible solution, in various sizes ranging from a small cask which can be handled manually through to a larger version for those utilities with greater lifting capacity.

INS & Robatel are keen to receive comments and suggestions from industry in order to tailor the design to the needs of the operators.
Thank you for your attention!

Capitalizing on the long term

Natalia Zolnikova
Export Sales Engineer
n.zolnikova@robatel.fr
www.robatel.fr