



Factory Manufacture of DUCRETE Spent Nuclear Fuel Storage Casks

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U.S./Russian Depleted Uranium Workshop:
Review of ISTC Projects

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OAK RIDGE NATIONAL LABORATORY
U. S. DEPARTMENT OF ENERGY

Assessment of Situation

- **Storage casks design objective is to contain as many spent nuclear fuel (SNF) assemblies as possible, because of economy of large scale. Decay heat transfer limit the size and age of the SNF.**
- **Convention concrete storage casks are fabricated in the field**
 - Steel forms shipped to field from factory
 - Concrete poured in-situ
 - Weight ~300 tons
- **No utility will accept the additional radioactivity control issues associated with fabricating DUCRETE casks in the field**
 - Radioactivity containment
 - Health physics issues
- **Solution**
 - Factory manufacture of complete storage casks
 - Ship empty casks via rail to nuclear utility site
 - Off-load cask from rail and position in storage area
 - SNF transferred to, loaded into storage cask

Issues with Factory Manufacture of Casks

- **Weight limits on railcars (standard cars ~100 tons cargo, spur rail lines, e.g., bridges, may be weight limited)**
- **Move heavy, empty casks from railcar to storage final resting site**
- **Transfer SNF from present storage and loading into new storage casks**
- **Cargo width limit on rail car (~11 feet)**

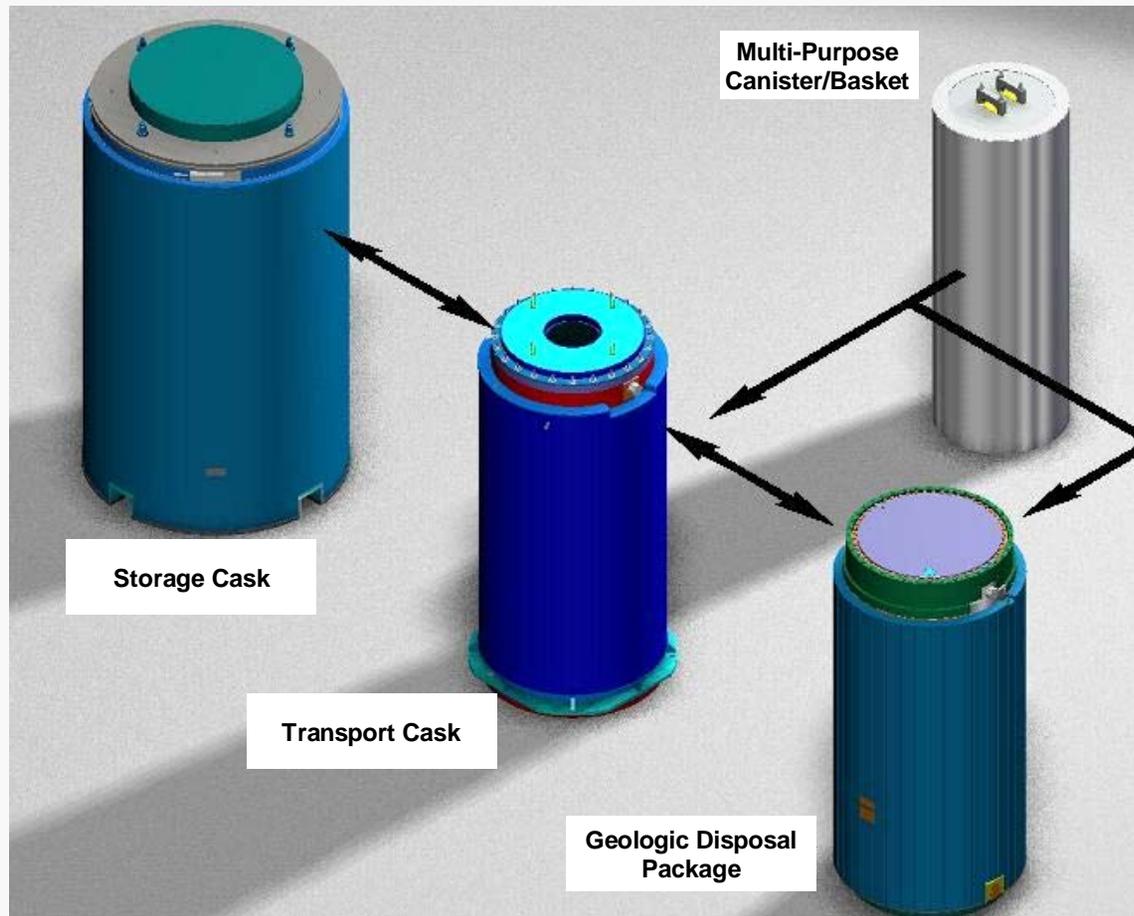
Advantages of Factory Manufacture of Casks

- **Trained, dedicated workers**
- **Better quality control**
- **Minimize the influence of weather**
- **Urania containment and control**

Consider Cask Manufacture in Russia

- **Large (~\$35M) capital plant investment cost if depleted uranium (DU) casks manufactured in U.S.**
- **Low Russian capital and labor costs**
- **Ocean transport via ship for 100 t cask is ~\$50K**
- **Issues**
 - **DU is a controlled nuclear material**
 - **U.S. regulatory authority requires site audit**
 - **Quality control**
 - **U.S. must provide DU to Russia for U.S. casks**
- **Would this be profitable?**

A CRADA Has Been Signed Between Holtec International and ORNL to Develop Next Generation Spent Nuclear Fuel Casks*

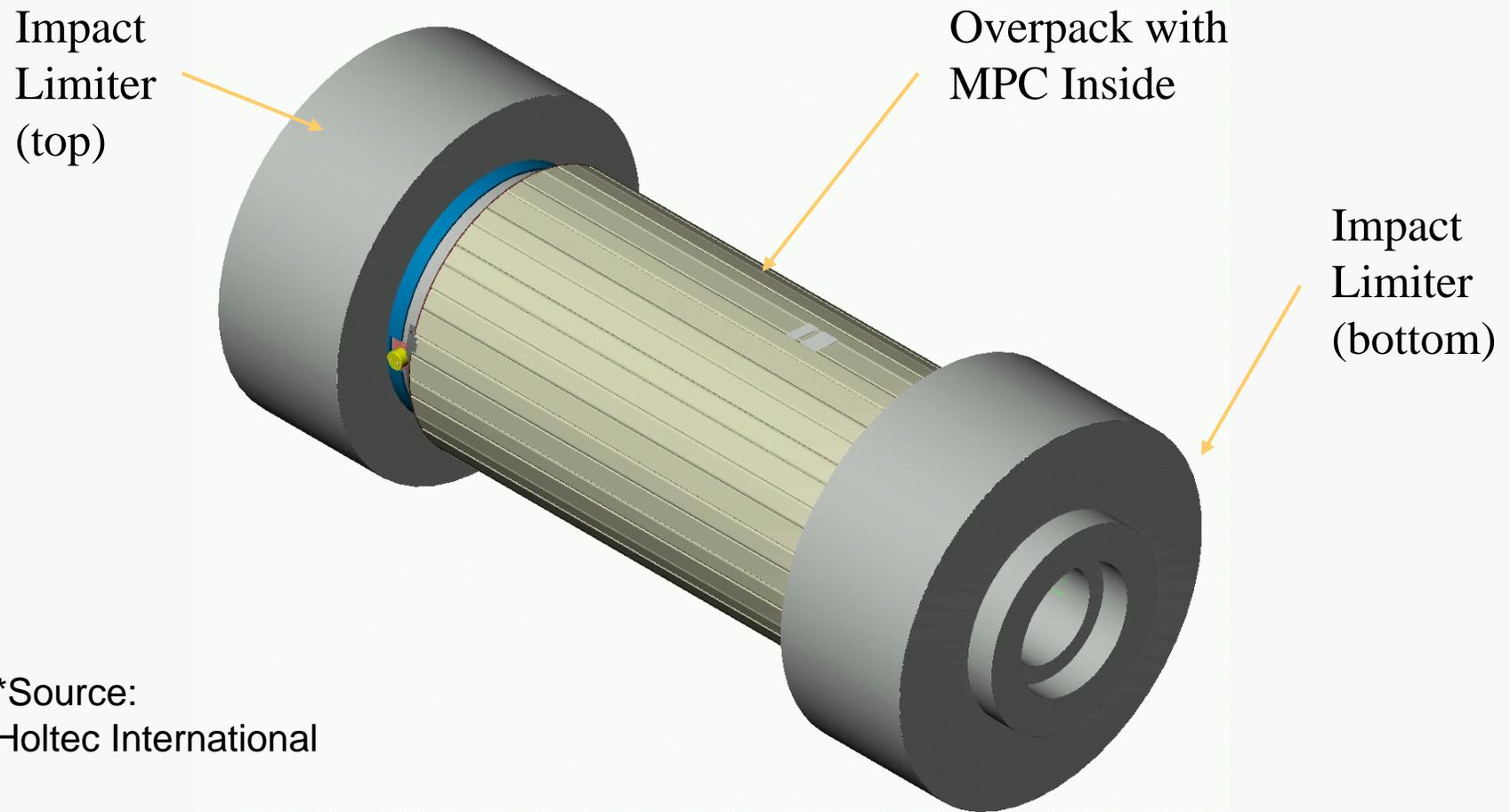


*Source:
Holtec International

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UT-BATTELLE

HI-STAR Package with Impact Limiters Installed*



*Source:
Holtec International

HI-STAR Rail Transport Cask with Impact Limiters Installed*



*Source:
Holtec International

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Holtec International's Design Transporter Moves ~220 ton Storage Cask



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Holtec HI-STAR Storage Cask at Dresden ISFSI



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