



Overview of U.S. Depleted Uranium (DU) Uses Research and Development (R&D) Program

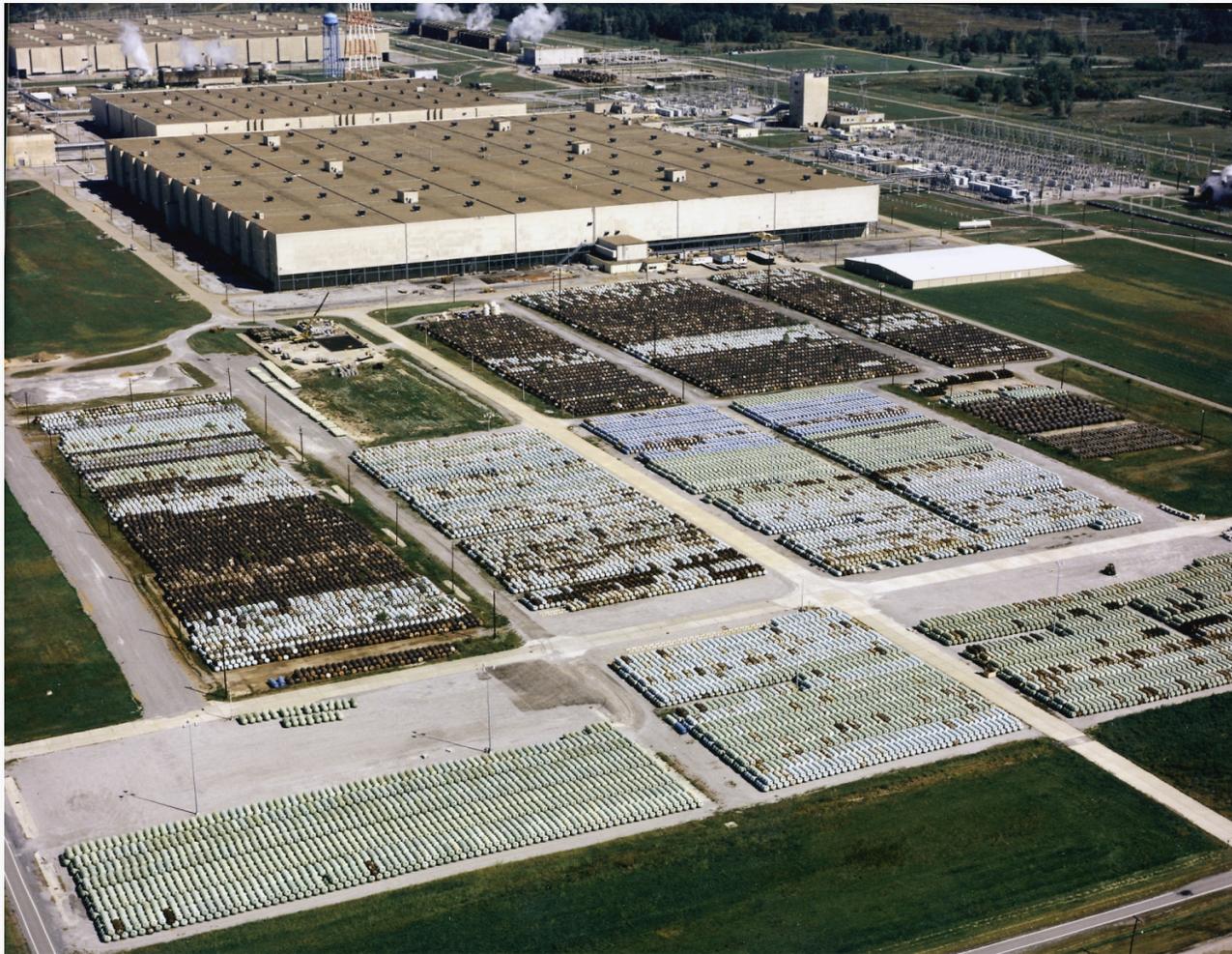
M. Jonathan Haire
Program Manager

U.S./Russian Depleted Uranium Workshop:
Review of International Science and Technology
Center (ISTC) Projects

Oak Ridge National Laboratory
Oak Ridge, Tennessee
May 17–21, 2004

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Approximately 500,000 tons of DU Stored at Uranium Enrichment Sites



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Current DUO₃ Disposal at EnviroCare

Drums of Envirocare that have been roughly placed in the Disposal Embankment bending grout or CLSM (Control Low Strength Material).



Unloading DUO₃ drums from Gondola at Envirocare's Clive Facility.



Reference DU Disposal Costs at the Nevada Test Site (NTS)

Disposition Cost Components	Estimated Range of Costs*
Packaging	\$95 – \$170 M
Transportation	\$88 – \$160 M
Disposal*	<u>\$60 – \$100 M</u>
	\$241–\$430 M

*Assuming near surface disposal

If the U.S. Nuclear Regulatory Commission prohibits near surface disposal, costs could be \$1.5–2.5B.

Potential Beneficial Uses

1. High Volume Uses Consume the Entire DU Inventory

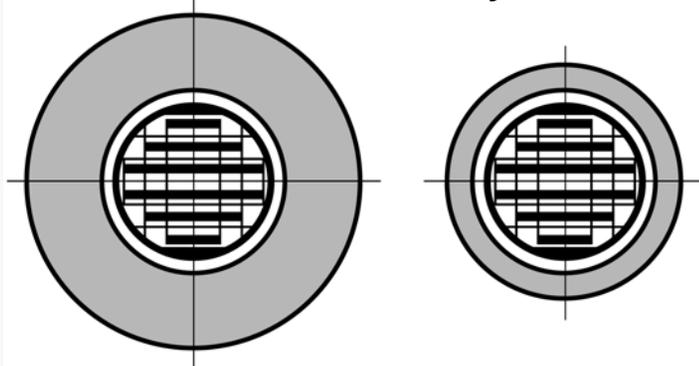
- **Repository**

- Backfill, invert, waste package fill, waste package cermet

- **Shielding applications**

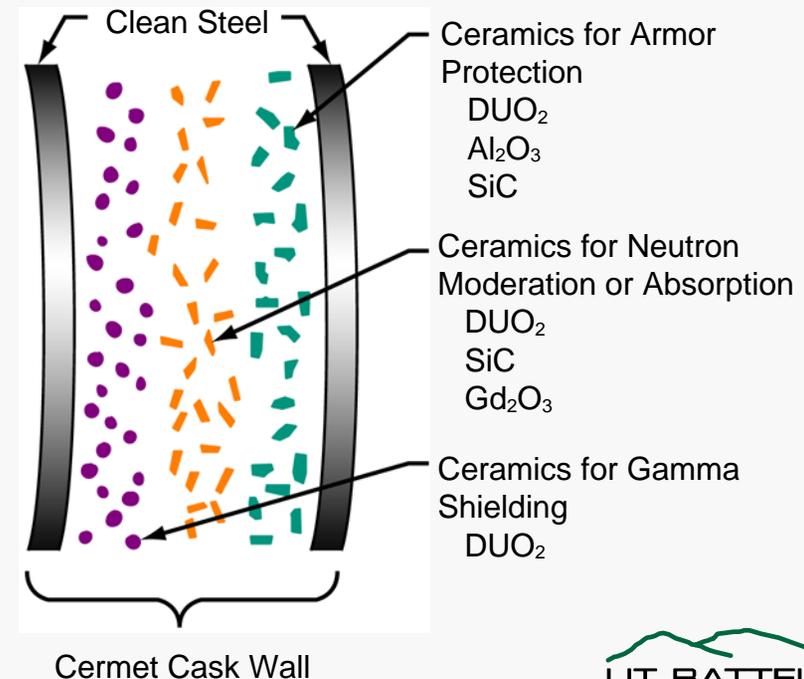
- U.S. market 150 casks/year

The DUCRETE cask is 35 tons lighter and 100 cm smaller in diameter than casks made from ordinary concrete.



Comparison of conventional and DUCRETE spent-fuel dry storage casks

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Potential Beneficial Uses *(continued)*

2. High Value Uses:

A niche in one of these markets could fund the entire DU Disposition Program

- **Catalysts**
 - the U.S. market is ~\$9 B/year
- **Semiconductors**
 - U.S. market ~\$0.05 B/year from sale of DU
- **Fuel cells**
 - U.S. market ~\$12.5 B/year
- **Hydrogen production**
 - U.S. market ~\$2.5 B/year, growing at ~10%/year



Research Concerning High Value Uses was Terminated October 1, 2003 Because of Lack of Funding

Status of U.S./Russia Research Collaboration on Beneficial Uses of DU

- **The U.S. Department of State has funded three projects on DU research, \$800/3 yr. Funding received, work began in December 2003. This meeting will review the progress of those projects**
- **Implementing Agreement #3—Depleted Uranium—was signed by DOE's Undersecretary R. Card and Academician N. P. Laverov at the Joint Coordinating Committee for Science and Technology (JCCST)**
- **The JCCST asked that the Russian Academy of Science submit three proposals to DOE for consideration. This meeting will review these proposals**
- **Proposals have been submitted to the ISTC and DOE's International Proliferation Prevention to fabricate and test 1/4 scale DU-steel cermet and DUCRETE prototype casks. This meeting will review the status of these proposals and the designs of these prototypes**

International Collaboration with Russia

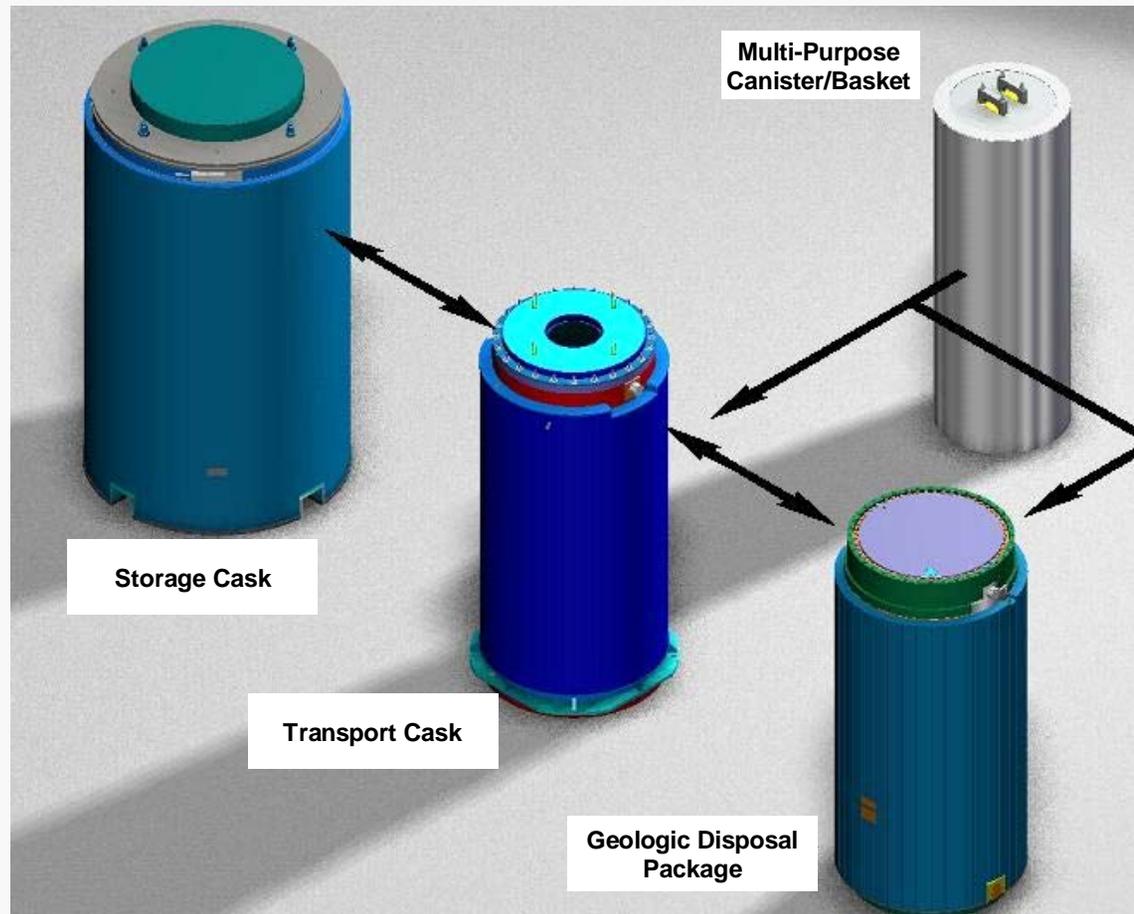


***Obtains lower cost or
cost shared research results***

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



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Holtec's HI-STAR Rail Transport Cask with Impact Limiters Installed



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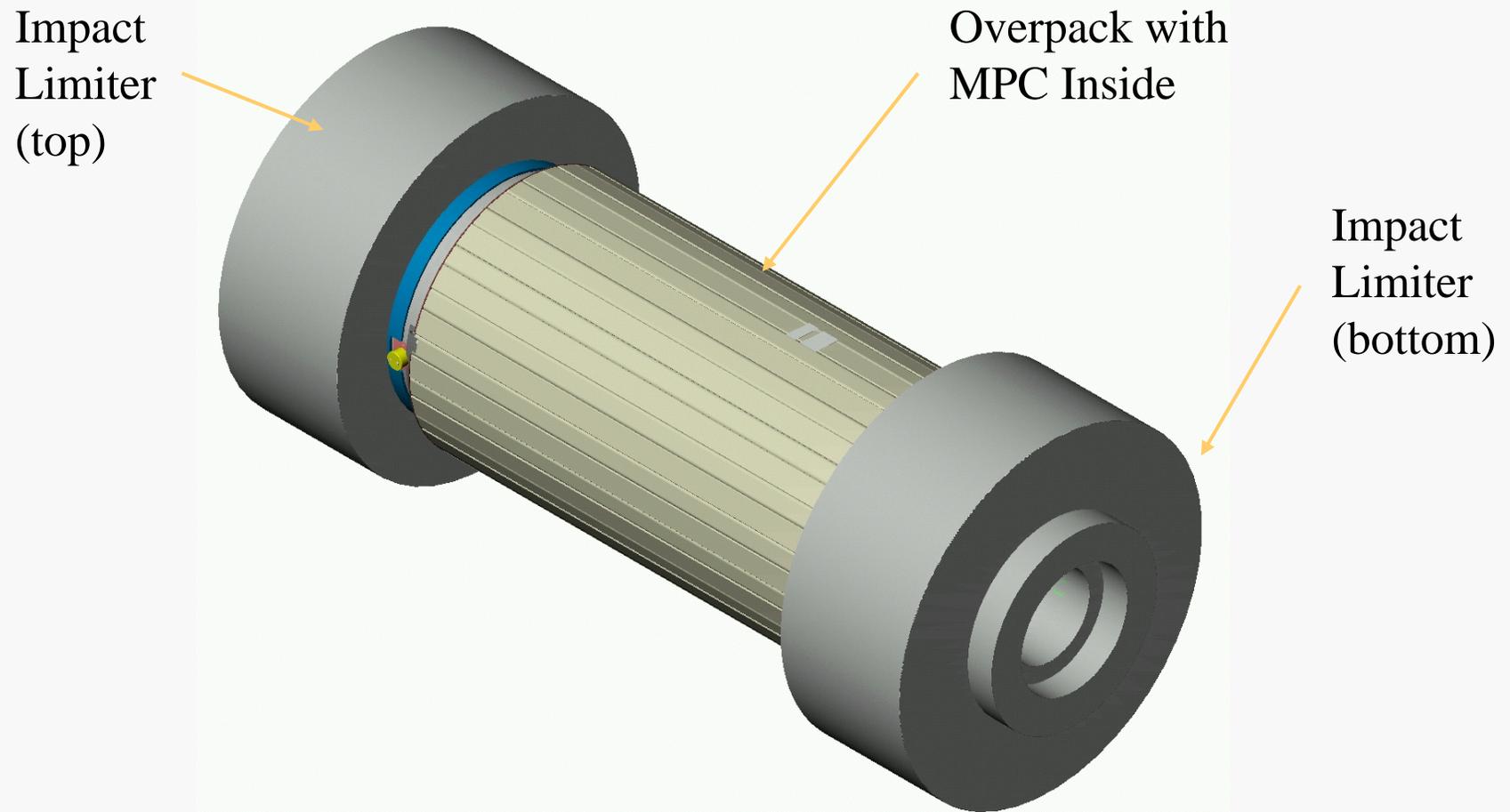

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HI-STAR Package with Impact Limiters Installed



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



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Several Organizations Contribute to a Single Objective

