Depleted Uranium

UNIVERSITY OF OTTAWA

Office of Risk Management

Radiation Fact Sheet: Depleted Uranium

What is Depleted Uranium (DU)?

In order to produce fuel for certain types of nuclear reactors and nuclear weapons, uranium has to be "enriched" in the U-235 isotope, which is responsible for nuclear fission. During the enrichment process the fraction of U-235 is increased from its natural level (0.72% by mass) to between 2% and 94% by mass. The by-product uranium mixture (after the enriched uranium is removed) has reduced concentrations of U-235 and U-234. This by-product of the enrichment process is known as depleted uranium (DU).

The table below compares percentages of uranium isotopes by weight and activity in natural and depleted uranium.

Isotope	Relative isotopic abundance			
	Natural Uranium		Depleted Uranium	
	By weight	By activity	By weight	By activity
U-238	99.28%	48.8%	99.8%	83.7%
U-235	0.72%	2.4%	0.2%	1.1%
U-234	0.0057%	48.8%	0.001%	15.2%

Source: http://www.iaea.org/NewsCenter/Features/DU/du_qaa.shtml#q3

Challenges

- General Understanding

Depleted Uranium is used for a wide variety of purposes; the majority of its use is based on its chemical properties. For this reason and because of its generic name, “depleted uranium” there is a perception that this material is not radioactive. This belief is reinforced as the material is sold as a chemical and arrives in a package without radioactive labelling. Nor does the supplier require any proof of authorization, which is typical when ordering radioactive material.

- Regulatory Requirements

One of the key challenges associated with its use and disposal is to determine what federal and provincial bodies may regulate this material. The Canadian Nuclear Safety Commission (CNSC) regulates radioactive material, yet not all of its regulations apply to Depleted Uranium. The criteria used to determine which specific regulations apply depend on the activity associated with the depleted uranium and its intended use. Transport Canada (TC) will regulate this material during transport, through the application of the Transportation of Dangerous Good Regulation. Again, it is the specific activity that will determine if the Class 7 (Radioactive Material) category applies. The Province of Ontario regulates chemical waste disposal.

- Aggravating Factors

One of the first challenges encountered is the ability to determine the specific activity of this material. This information is not available in the catalogue or on the MSDS, only by contacting the technical department of the supplier and being persistent can this information be obtained.

Management Strategies

For these reasons, depleted uranium must be managed as radioactive material with detail monitoring of the activity and volume/mass of waste generated. With this knowledge, the Office of Risk Management is in a position to determine the appropriate waste disposal requirements. To facilitate the management of this waste, a "Statement of Authorization for CNSC Controlled Nuclear Substances" is issued by the Office of Risk Management. This identifies responsible parties, activities, and use and storage areas. A "Depleted Uranium Waste Log" allows for accurate recording of the activity associated with the waste generation. In addition, purchasing agents are informed of the need for ORM authorization prior to placing an order.

Contact Information

For further details contact the Office of Risk Management at ext 5892.

Links:

- Training Requirement- Register Here
- Depleted Uranium Inventory and Waste Log Sheet
- Record Of Contamination Monitoring Monthly Log
- Radioactive Materials- Purchasing
- Depleted Uranium - Health Canada
- Depleted Uranium - Fact Sheet
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