

The Disposition of Excess US and Russian Military Highly Enriched Uranium (HEU)

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Both the United States and Russia have declared a portion of their military HEU stocks excess to defense requirements. Table 1 estimates the disposition of US and Russian excess military HEU stocks declared in the mid-1990s. The down-blending of about 650 tonnes of HEU to low enriched uranium is expected to be completed by 2018. About 21 tonnes of US excess HEU are not suitable for down-blending and are expected to be disposed as spent fuel.

The civil HEU returned from other countries to the United States under a “take-back” program is added to the US declared excess, although it is ignored in Table 1, which deals only with the originally declared excess military HEU. The HEU in these returns is not expected to be down-blended but disposed as spent fuel. In total, about 2 tonnes of HEU are expected to be returned to the US through the take-back program, from its inception in 1996 until its completion, currently scheduled for 2019, bringing the total to 23 tonnes of HEU that must be disposed as spent fuel.

The US excess HEU is included in civil inventories in ISIS reports and estimates because it has been isolated from the primary military stock and committed to peaceful uses. However, Russian excess HEU is not included because it is not isolated from the primary military stock until it is blended down. Although Russia had blended down 200 tonnes of excess HEU by the end of 2003, the remaining 300 tonnes remained in its military stock, probably in nuclear weapons. As a result, this stock is assigned to the military stock. As HEU from this category is blended down to LEU, it is removed from this total.

Table 1 Current and Projected US and Russian Stocks of Excess Highly Enriched Uranium (HEU) based on Plans of the Department of Energy (DOE) and United States Enrichment Corporation (USEC), (in tonnes)

	Total Declared	Disposition Scheduled to End	End 2003	2010	2018
Russia	500	2013	298	88	0
United States					
Transferred to USEC	64	2006	16	0	0
Research reactor fuel	10	2010	9.5	0	0
To be blended and sold by DOE	28	2018	28	28	0
Off-spec fuel program (TVA)	33	2015	30	17 ^a	0
Other off-spec HEU	18	2018	18	4.8 ^a	0
Spent fuel and other waste	21	2018	21	21 ^b	21 ^b
US totals	174		123	71	21
Total	674		421	159	21

^a ISIS projections based on assumption of a linear decrease in the values. The actual rate of decrease may differ significantly. Six additional tonnes of off-spec HEU were assigned to the Tennessee Valley Authority (TVA) program in 2004. This HEU is to be transferred to TVA by 2007 for use by 2015. For the purpose of these calculations, it is arbitrarily assumed that transfer of all six tonnes from 'Other off-spec HEU' to the TVA program occurs in 2007, the last year given by the DOE for such a transfer.

^b This HEU is in forms that are not suitable for down-blending and use. It will likely be held in its current state until disposal can be arranged.