

Cover story originally published in the July 11, 2005 issue of *The Ux Weekly*.

July 11, 2005

Volume 19

Issue 28

A weekly publication of

UxC



## The Myth of Excess SWU Capacity

One of the more pervasive myths about enrichment capacity is that there is an excess of it. This largely results from a misunderstanding of the nature of SWU demand and the dynamic interrelationship between the enrichment and uranium markets. Below we will examine the nature of SWU demand, its dynamic nature, and the ramifications that the excess SWU capacity question has on the future of the market and industry.

We can identify three sources of enrichment demand. One is the normal demand by utilities to make fuel. The second is the production of blendstock for HEU. The third is the enrichment of tails to create equivalent feed, either directly or through underfeeding. Blendstock and tails stripping are similar because they both involve enriching tails, but are different due the final product as well as the motivations for enrichment. Thus, the SWU demand in the first instance is for enrichments of 4.5-5w/o,

The demand for SWU to create HEU blendstock and to enrich tails increases to the extent that tails assays used to feed the process decline. That is, the lower the tails assays, the more SWU it takes to produce an equivalent amount of blendstock or uranium output. A decrease from 0.30w/o to 0.29w/o in the assay of the feedstock requires almost a 5% increase in the amount of enrichment to produce the same amount of feed (with enrichment occurring at a final 0.15w/o tails assay). Also, USEC is now enriching high-assay tails that DOE has transferred to Energy Northwest (see story page 3), further increasing this type of demand for SWU.

There are strong indications that there is little or no surplus SWU capacity. Enrichment prices have been under upward pressure, and are likely to continue to be under upward pressure for some time. Moreover, in the recent WNFM meeting in Prague, Tenex's Alexander Pavlov stated that the perception that Russia had excess SWU capacity was wrong, and capacity was closely balanced with needs. Further, there are indications that enrichers are limiting the *downward* tails assay flexibility in new contracts, clearly an indication of a capacity

The question of excess SWU capacity also may have some relevance to the Russian Suspension Agreement and the Sunset Review that is being conducted with respect to restrictions on the import of Russian uranium to the United States. There is essentially no uranium to export from Russia in any case, but as long as the HEU deal continues, there is likely little SWU to export either. The Suspension Agreement review has been linked by some to the current SWU trade case between USEC and the European enrichers.

In the SWU trade case, the Department of Justice has argued that a finding of SWU being a service and not a product would endanger the current HEU deal since it might allow Russia to contend that its commercial SWU should not be restricted. This, in turn, the argument goes, might lead Russia to favor selling commercial SWU over making blendstock for HEU and precipitate an early end to the HEU deal.

What would happen if the HEU deal ended? First, there could be a small

the second is to 1.5w/o, constraint. reduction in SWU supply of and the third is to perhaps one million SWU 0.711w/o. The last two of The lack of surplus SWU per year, since this is the these account for capacity has a number of difference between the perhaps 8-10 million implications for the market and SWU contained in blended-SWU worldwide. industry going forward. First, this down HEU and the SWU lack indicates that a moratorium required to make

To account for this on the construction of new SWU blendstock. But the larger additional SWU demand capacity, or even a temporary effect is from the loss of in a SWU supply/demand shutdown of existing plants, as about 6,000 tonnes per year comparison, one must suggested in some of uranium from HEU. Such either add it to the nonproliferation circles, makes a loss would lead to a demand side of the no sense at all. The moratorium dramatic increase in equation or subtract it idea was based on the premise uranium prices, which, in from the supply side. In that there was sufficient excess turn, would cause utilities to this respect, it is capacity to eliminate motives for further reduce tails assay and increase demand for inappropriate to add the anyone building a new plant and to supply Iran and other potential SWU. It is likely that neither SWU content in EUP to supply new entrants to the SWU the uranium nor SWU Russian SWU capacity, business from existing sources markets would "clear" under since a comparable instead. such circumstances.

amount of primary Russian capacity is Related to this is the contention Of course, the HEU deal devoted to making in various regulator proceedings also is of crucial importance blendstock for HEU. involving LES and USEC that from a nonproliferation Some industry analyses there is no need for new SWU standpoint, and thus more add HEU SWU (and capacity. There is clearly a need than the nuclear fuel market SWU used to upgrade for substantial additional would suffer if it ended. Perhaps the best solution nameplate capacity, production. from the standpoint of future when, in reality, it Another implication is that the nuclear fuel supply (both subtracts from the prospects for an accelerated enrichment and feed) as well effective capacity or at HEU program are dim. With little as furthering nonproliferation best double counts. The or no capacity to produce goals is to make any SWU fairly is not going to additional blendstock, it now Russian commercial SWU magically supply the appears that it is the ability to sales to the U.S. contingent additional demand create blendstock that would on a continuation of HEU associated with represent the likely physical SWU sales in the current blendstock production limitation of any acceleration of deal. Additional SWU is and tails enrichment. the existing program. needed to support the future growth of nuclear power, including that on the part of Not only is total The blendstock constraint is countries which may be enrichment demand also relevant to the amount of convinced to forgo building notably higher than what HEU that is blended down in their own enrichment would be suggested by Russia after the current HEU facilities if economic ordinary utility purchases, deal ends. By the time the supplies are forthcoming but the extra demand is existing HEU deal ends in 2013, from dependable sources. increasing. The "normal" growing world demand for SWU, These supplies have to demand for enrichment especially from China and India, come from somewhere, and increases to the extent seems likely to absorb the Russia is as good a source that the demand for Russian capacity currently as any. enriched product dedicated to making HEU The relationship between increases and to the blendstock. Once the current enrichment and uranium is extent that utilities opt for deal ends, it can be argued that Russia would rather make

Clearly, both of these things have been happening, which results in a compound growth in enrichment demand. Reactors are operating at higher capacities, some of which have been uprated, and utilities have opted for lower tails assays as the price of feed has jumped.

commercial sales (especially in connection with reactor sales) than use its SWU capacity to make blendstock for more HEU.

extremely complex and dynamic. But, this does not mean that it should be ignored when making procurement and production decisions, and especially when making policy decisions, which in the end may be incredibly wrongheaded.

*Copyright © UxC, All Rights Reserved.*