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Russia's Future Role in the U.S. Enrichment Market

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Introduction

Good afternoon. I'd like to thank the WNA for the opportunity to speak to you again about issues related to the nuclear fuel cycle. The topic for today is Russia's future role in supplying enrichment services to the U.S. market. Russia has had a long and rather complicated history of supplying SWU to U.S. utilities, and I would like to outline a vision of what is hopefully a simpler, more straightforward future both for Russian suppliers and U.S. utilities.

Let me first qualify this by stating that these views are my own – they are not necessarily shared by Russian suppliers, their competitors, or American utilities. My conclusions are based on my own experience marketing Russian SWU in the U.S. over the years, both with Nuexco and GNSS, and are designed to stimulate some thought and some advance planning by parties on all sides of this debate. As we have seen, trade restrictions, HEU and other factors have created a very complex environment for Russian SWU supply to the U.S.

Going forward, there are many uncertainties regarding the future supply of enrichment services. Among the most important questions is whether or not there will be a second HEU deal to follow the first. But there are others – will the current trade restrictions persist? How can western enrichers properly plan for new capacity without knowing the extent of Russia's role, either with ex-military or commercial SWU, after the current HEU deal expires? What can be done to provide some certainty for U.S. consumers, especially since the procurement decisions regarding 2013 supply will need to be taken within the next five or so years?

These are difficult questions, and I don't have all of the answers. The main point I would like to get across today is that the industry needs to start exploring these issues sooner rather than later. If there is to be no HEU-2, then other arrangements will have to be made to ensure a stable supply of enrichment services in the coming decade.

Before we get to that, let's briefly review the history of Russian SWU in the U.S. market.

History of Russian SWU in the U.S.

In the old days, by which I mean the start of my career in the early 1980s, most U.S. utilities still considered enrichment procurement to be somehow different from uranium procurement. There was no problem with sourcing uranium from such distant lands as South Africa, Australia, Niger, and even that exotic neighbor to the north, Canada. But enrichment was different – the U.S. government monopoly had ended, but the mentality remained that only U.S. enrichment supply was secure and reliable for U.S. buyers.

A few pioneering utilities, namely the innovative Yankee Atomic Group in New England, began to look at things differently once the European enrichers began marketing efforts in the U.S. Yankee, with four reactors, was the first to sign up with a foreign supplier, Cogema, for all of their needs. Soon after, Boston Edison abandoned domestic supply in favor of Urenco. These buyers found that going offshore made good economic sense, and did not impinge on security of supply. As always, cost savings were the main driver for these strategic moves.

When the U.S. Department of Energy (DOE) introduced the Utility Services Contract in 1984, this requirements-type contract allowed for up to 30% of requirements to be purchased elsewhere. While some buyers procured this balance on the spot market, a number of utilities signed up 30% of their needs with either Cogema or Urenco, giving those suppliers a larger, but still modest, foothold in the U.S. market. By this time, the Soviet Union, through its foreign-trade company Technobexport (Tenex), had been supplying SWU to European utilities for more than a decade. But in the U.S., Soviet supply was still considered too risky, for reasons political as well as parochial.

This parochialism began to break down when the spot SWU market took off in the mid-1980s. Traders and brokers such as Nuexco, Nukem, UG, SWUCO and Nynco liberated millions of SWU from utility and government inventories, causing buyers to reserve ever-greater volumes of requirements for spot purchases. Some utilities, AEP the most notable example, even eschewed term contracts entirely, sourcing all of their supply in the form of spot EUP purchases.

The first spot sale of SWU delivered from the USSR to a U.S. utility, Northern States Power, was arranged by SWUCO in 1986. (Some secondary-market Soviet EUP previously owned by a European utility had been sold to Rochester Gas & Electric in 1980, in a deal also put together by SWUCO.) These were small volumes, but it opened the door for more acceptance of Soviet SWU. At about the same time, Nuexco was increasing its purchases of natural and enriched uranium from Tenex and began to import some of that Soviet EUP directly into the U.S., rather than using it solely to replace loans from European utilities. As these volumes increased, they were sold in the market in competition with other inventories, such as the German government stockpile sold by Nukem. As a result of this competition, spot SWU was available at a deep discount to then-current long-term prices, and Soviet material made up a big part of that supply.

Nuexco also marketed long-term SWU contracts on behalf of Tenex, and in 1990 it was once again the Yankee Group that pioneered the acceptance of the USSR as a long-term enrichment supplier in the U.S. Although European utilities had held term contracts with Tenex since the early 1970s, this was the first time a U.S. utility signed a long-term contract with the USSR. Yankee committed to 100% of its requirements from Tenex, and soon other utilities followed with term contracts for a smaller portion of their requirements.

So a barrier had been broken, but another one was soon to be erected.

The Anti-dumping Case

As a result of the huge volumes of uranium entering the U.S. market from the Soviet Union during the period 1988 to 1991, a group of uranium producers with U.S. operations lodged an antidumping petition against the Soviet Union. A critical decision affecting enrichment occurred early in the case. DOE, as the lone domestic enricher, supported the miners' case, and was certainly aware that Soviet EUP and SWU were also making inroads into both the spot and term markets in the U.S. DOE and the miners' attorneys managed to convince the Commerce Department that enriched uranium should be included in any restrictions against Soviet uranium, because without such a finding, Soviet uranium could simply be enriched prior to entering the country. This was a logical assumption, but it led to a less logical one – that SWU sales alone should also be prohibited, since there was no physical way to bring the SWU into the U.S. except in the form of enriched uranium.

Thus the first blow was struck against the notion of SWU as a service. With the high duty rates applied to Russian uranium and EUP in 1992, Russia was to be deprived of access to the largest market for perhaps its most high-technology export, at the exact time that the Soviet Union was collapsing. The 1992 Suspension Agreement replaced the duties in favor of other means of restraint, but Russia's ability to market its SWU to U.S. buyers was effectively gone. The U.S. government's pledges of support for Russia's transition to a market economy somehow fell short when it came to uranium enrichment, an area in which the government itself competed.

In retrospect, most observers would probably agree that the USSR dumped a lot of uranium below its cost during those years of instability and transition. But at the same time, it is ludicrous to suggest that Russia's centrifuge-based enrichment services were sold unfairly when their cost of production was a mere fraction of DOE's. A clear separation of the commodity and service could have been made, but it wasn't, largely due to DOE's fear of losing more market share. It is understandable, then, that American lectures about the benefits of free-market economics were often met with a wry smile by Russians familiar with the enrichment treatment under the dumping case. They had seen the first lesson of so-called "free" markets, courtesy of the Commerce Department's protectionism, and they were not impressed.

In the end, of course, the five existing long-term SWU contracts were grandfathered, and so deliveries were allowed to commence in 1994. Over the next five years, roughly 10% of U.S. SWU demand was filled by this commercial

Russian supply, administered by GNSS. Notably, the uranium feed from these contracts was subject to workable sales restrictions in the U.S. market, demonstrating that the uranium could be handled differently than the SWU if necessary. More importantly, Tenex and the Russian enrichment plants were able to demonstrate that they could deliver as reliably as any other primary enricher. But no new sales were permitted, except those made at USEC's discretion under the short-lived SWU-matching program.

Entry of HEU SWU

The situation changed again in the mid-1990s with the advent of the intergovernmental agreement to blend down Russian nuclear warheads. Through the HEU deal, Russia was able to significantly increase its U.S. market share, at least in an indirect sense. Over the past ten years, this highly successful program has supplied 5.5 million SWU annually, about half of U.S. demand, and has resulted in the elimination of some 9,000 nuclear warheads. There have been bumps in the road, as would be expected in such a large and complicated arrangement, but it has been a success for the Russian treasury, for USEC, and for international cooperation in non-proliferation policy.

It is ironic, however, that the mechanics of this program serve to maintain the isolation of Russia from a direct role with U.S. customers. USEC receives a rather attractive margin for its handling and short-term financing services, a point which is not lost on many in Moscow. Speculation that Rosatom may have little interest in a follow-on "HEU-2" deal is no doubt based on a number of factors, but that perceived inequity is an important one. Others include Russia's increased export revenue from oil and other commodities, from the somewhat chillier political relationship between the U.S. and Russia compared to the Yeltsin-Clinton era, and Russia's desire to play a more direct role in world nuclear business.

Clearly, Tenex desires to move beyond the image of Russia as, in essence, a wholesale supplier and subsidizer of USEC. Tenex officials have stated that they would like to increase their worldwide market share to something approaching Russia's share of worldwide capacity. The company is making inroads into Japan after many years of minimal progress, and has opened representative offices in Japan and Korea. Before the end of the current HEU deal, Russia will demand an equal place at the table along with USEC, Urenco and Areva.

The Status Quo Today

Which brings us to the situation today. For Tenex as well as its prospective customers in the U.S., the market is in limbo. Technically, the Russian suspension agreement has expired, but the Commerce Department still considers it in effect, and would block attempts to import non-HEU Russian SWU. Other changes have occurred – Russia has been declared a "market economy," which would make a new dumping investigation much harder for plaintiffs to win. As part of the USEC antidumping case against Eurodif and Urenco, the Court of International Trade has finally determined that SWU is indeed a service, and not a product, as most of us in the industry have always believed. This ruling remains under appeal, but the direction of the case is now clear, and USEC's days of using trade laws to shelter itself from competition are probably numbered.

Nevertheless, exactly how Tenex could use this finding in its favor is not yet apparent. Finally, the five-year Sunset Review in the Russian case has just begun. The outcome of this proceeding is also unclear, but just five years ago it was determined that the threat of dumping still existed.

One thing is relatively assured, however. Since Russia already has fifty percent of the U.S. market share via the HEU SWU, it would be hard for anyone to argue that Tenex should be granted additional access to the market right now. Fair or not to the Russian enrichment plants when it comes to dividing HEU revenues versus commercial SWU revenues, some might consider that any further increases in Russian market share above the 50% level would be irresponsible from a U.S. energy-security point of view. I believe Russian officials understand this, which is why there has not been a strong push for terminating the Suspension Agreement or otherwise trying to force the issue of commercial SWU sales in the U.S. The ability of USEC and LES to finance and build new domestic enrichment plants, something the U.S. clearly needs, is not helped by an unfettered influx of Russian commercial SWU on top of that received from HEU.

But that is the situation *today*. The world will be much different in a few years when the HEU SWU no longer flows to the U.S. market, if that is what occurs. So let's examine what that might mean for the industry.

Looking Forward

Let's take a quick look at the world supply-demand picture for enrichment over the next decade. As shown in *Figure 1*, we are fairly in balance until 2013. The three western enrichers are building new centrifuge capacity that will, in the case of USEC and Areva, only partly replace current GDP capacity. Urenco is building expansion capacity via its LES venture in the U.S. All three of these new plants will have the opportunity to expand to meet new demand in the future. And all three are necessary investments – USEC and Areva to maintain cost competitiveness against more efficient centrifuge suppliers, and Urenco to take advantage of a clear market opportunity for a domestic alternative to USEC.

This picture illustrates my previous point – that the U.S. market does not really need additional Russian commercial SWU until the HEU deal ends. But as you can see, it quickly needs an influx of SWU once deliveries cease in 2013. That SWU could theoretically come from several different places – LES's National Enrichment Facility could expand beyond currently planned levels, as could USEC's American Centrifuge. The same goes for Areva's Georges Besse II centrifuge plant. But in practice, this is not realistic because of the nature of centrifuge capacity expansion.

To assume this volume can be made up so quickly without the help of Russian commercial SWU not only ignores Russia's record as a stable supplier and desire to compete for a larger role, but also assumes that the new plants could add over five million SWU of additional capacity overnight. This simply has not been the case historically, if we look at Urenco as an example. Urenco's expansions have been gradual and measured, based on firm commitments from customers. Moreover, at the end of this decade, Urenco will be manufacturing new centrifuge

machines for both the LES and Areva projects, and may be constrained in how quickly capacity at either plant could be increased.

In short, it is foolish to assume that all of the HEU SWU can disappear and be replaced immediately by expansions at the new plants. Instead, the best answer from a market-clearing perspective is to replace a significant portion of the lost HEU SWU with Russian commercial SWU. To that end, the industry needs to start working soon to remove the obstacles to making this happen. The trade barriers erected almost fifteen years ago have proven remarkably resilient, as evidenced by the fact that Russia remains under an embargo for natural uranium despite not having exported any for sale for at least five years (other than HEU feed, which is quota-controlled). In other words, if we wait until 2012 to start addressing this problem, it may be too late.

Again, I would like to stress that this is my own opinion, and it may not reflect any of the parties' intentions. Tenex may indeed hope to sell commercial SWU in the U.S. prior to 2013. USEC no doubt hopes to retain its lucrative role as intermediary in a second HEU deal, and perhaps a follow-on deal will make sense to the Russian government after all. So the future is quite unpredictable as always. But for my part, I believe it is most realistic to assume that current HEU volumes will preclude new commercial sales for now, that there will be no second HEU deal, and that USEC and possibly even LES may try to constrain Russia in some form for as long as possible. Thus, Tenex and U.S. consumers interested in stable supply in 2013 should start looking at this issue soon.

A Vision of Free Trade?

So what then shall be done to address this looming supply uncertainty? What will serve the interests of a) U.S. consumers who want a freer market with more competition, b) Russian aims for direct access to the U.S. market, and c) LES and USEC's ability to finance new enrichment plants without fear that the market will have no potential for growth? Can all of this be accomplished in a market with this history of hardball protectionist tactics?

I believe it can, but I think it requires some compromise on the part of all players.

The good news is that the size of the pie is growing for all suppliers (*Figure 2*). A newly optimistic outlook for nuclear power plant construction will increase SWU requirements, just as higher uranium prices have done through tails assay adjustments. The end of the HEU deal, and the reduction of nameplate capacity as USEC shifts toward centrifuge technology, means that we will have a serious gap in supply in the next decade. We will need additional SWU, probably from several sources.

And what do I mean by compromise by the players? One, Russia needs to be realistic about its chances to sell more SWU in the U.S. before 2013. The supply-demand fundamentals show that more SWU in this period is not needed, and falling SWU prices could harm LES and/or USEC's chances to finance new plants. Fifty percent of the U.S. market, regardless of the source of supply or allocation of the proceeds, is about as much as any one producer can expect in a market with four major suppliers.

Two, USEC needs to acknowledge that Tenex wants to control its own destiny in the world market and it does not need USEC to market its SWU. USEC's best hope is through developing a competitive, low-cost centrifuge technology, not through continued (and increasingly futile) exercises in blocking the competition from the market. USEC's trade case against the Europeans was widely derided as blatant protectionism. It did provide a short-term boost to USEC, but it provided a much bigger long-term boost to its major competitor, Urenco, by making LES a critically important issue for U.S. buyers to support. LES now looks to be almost a certainty, in large part thanks to USEC's short-sighted tactics.

Three, U.S. utilities need to get involved early, and in a constructive way, as some have done in the case of supporting LES. I personally was involved in trying to rally support among utilities to oppose Russian sanctions during the 1992 dumping case, and I found it hard to convince them what was at stake for them. All of us have learned a lot since then about the perils of protectionism, and no doubt utilities are better prepared today. They will need to exercise their political and market influence to ensure that they have access to all four enrichers for the future.

History shows that a free market in enrichment is not a foregone conclusion. To assume that U.S. utilities will have a free hand in choosing from four or five suppliers in 2013 is to ignore the lessons of the last fifteen years. And not only utilities are taking a risk – Russian suppliers would be gambling to assume that all restrictions will simply go away by then. Even if the dumping argument no longer works, there will be other political excuses that could be used to justify protectionism, such as Russia's involvement in Iran's nuclear program.

There might even be a rationale for attempting to negotiate a solution in advance. Say, for example, that Tenex agreed to a voluntary restraint that would limit them to a significant portion of the 5.5 million SWU deficit once HEU deliveries cease: Something like a voluntary quota of four million SWU per year for a several-year transition period. This would leave some room for gradual expansion by LES and/or USEC in the early years of their new projects, and it would allow Tenex to compete for business on its own terms. By doing so, Tenex would give up the opportunity to capture all of the post-HEU volumes in the U.S., but in exchange, it would obtain the certainty of not having to spend more money and time fighting the protectionist forces. USEC and LES would be assured the opportunity to expand their new facilities moderately without the specter of competition from Tenex for that portion. Would this be enough for the domestic suppliers? Who knows? No one gets everything they want, but, for consumers and the market as a whole, it would be an improvement over the status quo.

That's just one idea, and frankly it suffers from the weakness of still being a type of government-managed trade. All else being equal, I would prefer to let the market decide. Let free-market forces, not bureaucrats at the Commerce or State Departments, decide what new capacity gets built and what the competitive balance between four producers should be. Let fuel managers decide what diversification and security of supply mean to their particular companies. That is what we should all be striving for.

Time will tell if that outcome is realistic. But I would encourage industry to start talking about this issue now and working together to plan for the future, because it will be here sooner than you think. It would not be good for the industry if the enrichment market were to take the same volatile path as uranium has over the last year because not enough stakeholders were looking to the future and planning accordingly.

Thank you.

Figure 1

SWU Supply vs. Demand, 2005-2020
(economic/marketable production levels)

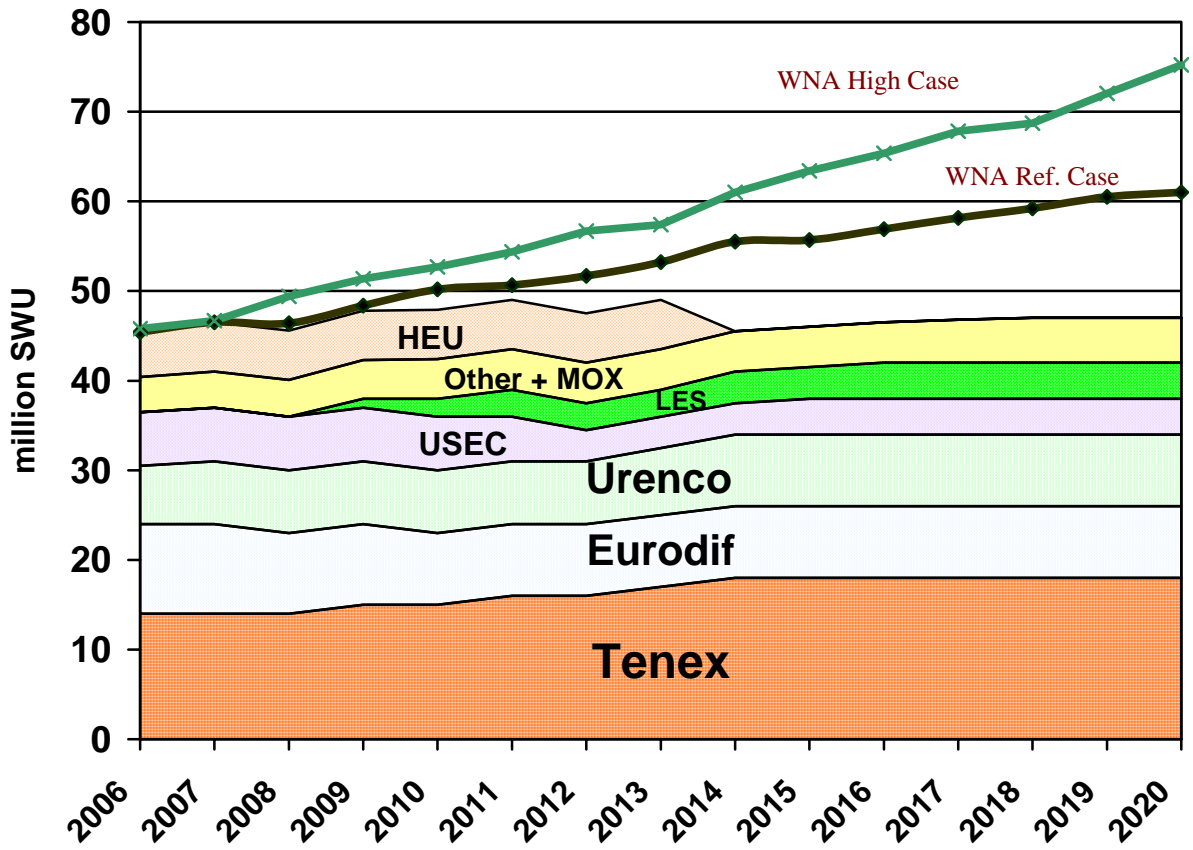


Figure 2

**Projected SWU World Market Share
2005 vs. 2015**

