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The Nuclear Fuel Industry: Turning Change Into Opportunity

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This paper will look at the changes, opportunities and challenges which the entire nuclear industry is facing. My own company, the US Enrichment Corporation (USEC) has been in the middle of this. Many of the challenges the nuclear industry faces could be overcome with a resurgence of nuclear power, and I look to everyone in the industry to work towards this.

First I would like to look at what is going on in the United States in the way of restructuring of nuclear utilities, because I think that this is probably the area that most dramatically demonstrates the consolidation and change that the nuclear industry is facing. It is a situation which gives me great heart in looking to the future.

The rapid consolidation that is going on among US utilities really shows the value of nuclear power. We are seeing the initial 42 different utilities or nuclear management organisations being reduced dramatically in number, with many speculating that the final total will be somewhere in the range of 5 to 10. When I suggested such a number several years ago, people looked at me as if I had two heads. I think that with the pace of consolidation that we have seen already it is now easy to believe that this might very well be correct.

Figure 1 illustrates the extent of the consolidation that has happened in the industry, and what nuclear fuel suppliers face in adapting to the changes that their customers are going through. What at one time were 20 entities have now become six: Exelon, AmerGen, Dominion Resources, Nuclear Management Corporation, STARS, and the recently announced FPNL and Entergy merger. These six entities control over half of the nuclear fuel demand in the United States. That is quite a dramatic development.

With such developments nuclear fuel suppliers face questions such as, what do they do to face this, to help their customers face the challenges, and to look for opportunities themselves? What suppliers are faced with is customers with much more buying power: that is, ever more demanding customers. Rightfully, these customers are looking to their suppliers to make the effort to be creative and innovative.

In the United States, as all over the world, I think that the price or the bottom line will always be the major determinant of who the supplier is. But these can be evaluated in many different ways, and I think that we are going to see suppliers tested to see what they can do to be innovative and creative, and come up with ways to make the fuel cycle more efficient. Suppliers will need to help their customers meet their own challenges and to make nuclear as competitive as possible. The rewards will be for the ones who are the leaders in this process, the ones who can look forward and see the opportunities and be prepared to meet them.

The United States is not the only area that is undergoing changes such as this. Consolidation in the nuclear industry has happened in Europe, and it is even happening across continents as you see British Energy establish a presence in North America, through AmerGen and also with its acquisition in Canada.

Consolidation is happening on the supplier side as well. The uranium industry has been going through consolidation for a number of years. Fabricators provide probably the most dramatic recent evidence of consolidation and what suppliers have to do to face the pressures in the market place. Enrichment will also see changes as we see the sale of the German and Dutch shares in Urenco.

Changes such as these are not unique to the nuclear industry, we can see similar changes every single day in a variety of industries, including the banking, oil, telecommunications and auto (motor) industries.

What is USEC doing about these changes? I will group them into a number of categories:

- Cost control — How can we make sure that we are as competitive as possible going forward? How can we be prepared to be the lowest cost supplier and be a competitive supplier for our customers?
- Innovation — What are we doing to anticipate the needs of our customers, to understand their business as well as we can, and to be ready to help them meet the challenges?
- Preparation — The long term look at what are we going to do to make sure that we are prepared for the resurgence of nuclear when it occurs. And I do believe it will occur.

Let me now deal with some of USEC's activities in more detail. My first comments are on the contract negotiations for SWU deliveries under the US–Russia HEU agreement. Right now USEC and the Russian executive agent Tenex have a tentative agreement on market-related prices, and for delivery of SWUs to make up for those which were not delivered while the agreement went through a variety of interruptions due to negotiations on the HEU uranium component.

We have also at the request of the Russian side included a certain limited quantity of commercial SWUs in this agreement. This will help the Russian industry as it continues its transition to the market economy. It will help them to preserve the revenues that they desperately need for their economy.

Final agreement is pending US and Russian government approval, and we look forward to that occurring. It is something that does not have to happen within the next day or the next week or even the next month. The market-based pricing will begin in January 2002, and we feel there is ample time to address this with the two governments prior to that time.

The next subject I will address is one which was very difficult for USEC, but one which we really had to face. That is the closure of the Portsmouth gaseous diffusion plant (GDP). Production levels of 25% of capacity at our two GDPs were the main driver that led us to this decision. I think anyone operating production facilities of any kind can imagine the difficulties of the economics of operating two facilities at 25% capacity. In today's market it was a difficult decision, but one which absolutely had to be made.

The power cost situation in the United States is also something which led us to this decision. The volatility of electricity prices in the US market can be an opportunity for USEC, but it also proved to be a challenge when we saw power prices spike during the summer months to levels which no-one would have imagined. I think we will continue to see volatility, as the Californian market has demonstrated in the last several months.

Further reasons for the closure are the drop in SWU and uranium market prices, and the increase in the purchase cost of the SWUs from HEU which are supplied under USEC's contract with Tenex.

Based on all that, USEC's Board reached the difficult decision to close Portsmouth and hand it back to the government as of June 2001. USEC will continue to operate the shipping and handling facilities at Portsmouth, but we will by then be in a position to rely on the Paducah facility to meet the needs of customers.

Figure 2 shows what USEC's sources of supply are. The Paducah GDP is number one, with a nameplate capacity of about 11 million SWU. We can have efficient operations in 8 to 9 million SWU range and we have the ability, if power prices are attractive and if our customer demands dictate it, to ramp up to 11 million SWUs. Thus we can be sure that we can meet customer demands in any situation.

We also have the SWUs from Russian HEU, which is a nominal supply of about 5.5 million SWUs. It will be more than that in the coming years as the quantities which were not delivered in the past are made up, and also as we hopefully incorporate some commercial SWUs from Russia.

In addition, USEC will also maintain an inventory. One of the reasons for this is seasonal operation, where we have high production during the spring, winter and autumn, and low production during the summer. We need a buffer of inventory to carry us through that, and also a buffer to allow us to handle any supply disruptions we might see on the HEU deal (although that is something we do not expect to see).

One of the things that I have learned in the enrichment business is that there is no way to just stockpile SWUs. The way we do it is to carry it as enriched uranium product. USEC looks to this to use up a certain amount of its uranium inventory, to be able to maintain an inventory of enriched uranium product to increase our reliability of supply.

With the closing of the Portsmouth facility we have looked carefully at the enrichment supply demand picture worldwide, and Figure 3 shows it as we see it. I will first admit that this is subject to different interpretations about what different suppliers have in the way of supply capacity. However, USEC feels that the decision to close Portsmouth is really a very large step towards supply-demand balance.

As USEC made the decision to transfer production to the Paducah facility we had to be sure that we knew what electricity costs at Paducah would be, as this is one of the major factors in our production costs. So USEC entered into a deal with the Tennessee Valley Authority to provide reliable, competitively-priced electricity for Paducah starting in September 2000. This is an

agreement that runs for 10 years, and it goes a long way to reducing our exposure to electricity price volatility. It also allows USEC to take advantage of market prices for electricity if we want to and if we need to ramp up production.

One other aspect of this deal, which I think is very positive for the nuclear industry as a whole as we push for new nuclear plants in the context of climate change, is that USEC will now be receiving power for the Paducah operation strictly from nuclear power. The nuclear industry has been criticised because of emissions from coal-fired plants used to provide power for enrichment. We now have an arrangement in place which will allow us to provide the electricity for Paducah from nuclear plants. This is something that we hope nuclear industry organisations can use in arguments about the environmental benefits of nuclear power.

In the general area of creativity and innovation, USEC has developed an alliance with Enron for a power-for-SWU programme. In the past USEC has done power-for-SWU deals with some of its electricity suppliers, but in such deals there has always been direct delivery of power to our plants. However, the concept started us thinking that with all of our customers being major electricity suppliers they might like the option of being able to pay for SWUs or enriched uranium product through electricity deliveries instead of through a cash transaction.

It has been fascinating to work with Enron on this as it is a very creative and innovative organisation which has a worldwide presence, which makes it a good ally in this project. We have now structured a programme which we are currently testing in the United States to see if it is of interest to our customers. Under this scheme, USEC delivers SWUs, the utility delivers electricity to Enron, and then Enron makes a payment to USEC for the SWUs.

While we are initially testing this in the US market, we do think it also has international possibilities. This is something that we will be looking at and we will be interested to hear from non-US customers if they think it would be of value. It would give them the opportunity to take existing or new SWU contracts and to pay for them with electricity, giving them increased financial flexibility.

USEC considers that this could really be a win-win for all parties. For utilities, it could give them an improved cash position, it could stabilise earnings, and it could optimise their generating capacity if they have seasonal over supply or seasonal power needs. It would allow utilities to shed market risk. For example, if a utility acquired a new plant such a deal would allow it to supply a certain proportion of its output at a known price, which might be attractive. This would also allow utilities to diversify their power market position, as Enron can take delivery of power in any number of markets and move it around to fit the needs of its customers.

For USEC, we see such deals as giving us a differentiated product, and it gives us a relationship with Enron as a global power marketing organisation. Enron benefits by getting increased market liquidity, which gives it more potential trading opportunities. Enron takes the risk on the power that is delivered, and then also might get the benefits of what it can do with the power.

As I have described, we now have a ten year contract with TVA for supply of power which puts us in a good position to continue our gaseous diffusion operations going into the future. But we acknowledge that diffusion technology is something that at some point must be replaced. It is proven, it works, it is very good, but we are looking to new technologies for the future.

The options are many, which is a good position to be in, and USEC's need is not immediate, so we have time to step back and look at all the options and carefully evaluate them. US centrifuge technology is something which I have learned more about since joining USEC and which really holds more promise than one might imagine. It is a technology which works, which has operated in the United States, and which needs to be more closely examined as to whether or not it can pass the economic test.

We are also looking at European and Russian centrifuge technology. Of course, we are also investing in the Australian Silex laser technology that we think holds promise.

Finally, I will make some comments on the "Sunset Reviews" of the suspension agreements which have recently been conducted in the USA. This was something very important to USEC. We are already accepting a good deal of material from Russia by way of the HEU deal, and we were encouraged that the International Trade Commission (ITC) and the Department of Commerce decided to maintain the barriers to Russia selling further into the US market.

In summary, while we are seeing a lot of consolidation in the nuclear industry, we do believe this brings opportunities. We see the SWUs from HEU contract undergoing a realignment to bring it more in line with market realities. In the enrichment market, we see demand and supply moving more into balance. The power-for-SWU concept developed with Enron is just one example of what USEC needs to do to make sure it can serve its customers' needs.

What we are doing is taking the steps necessary to ensure that USEC remains a long-term, strong supplier of enrichment services into the future.

Figure 1. Recent examples of consolidation of the nuclear industry.

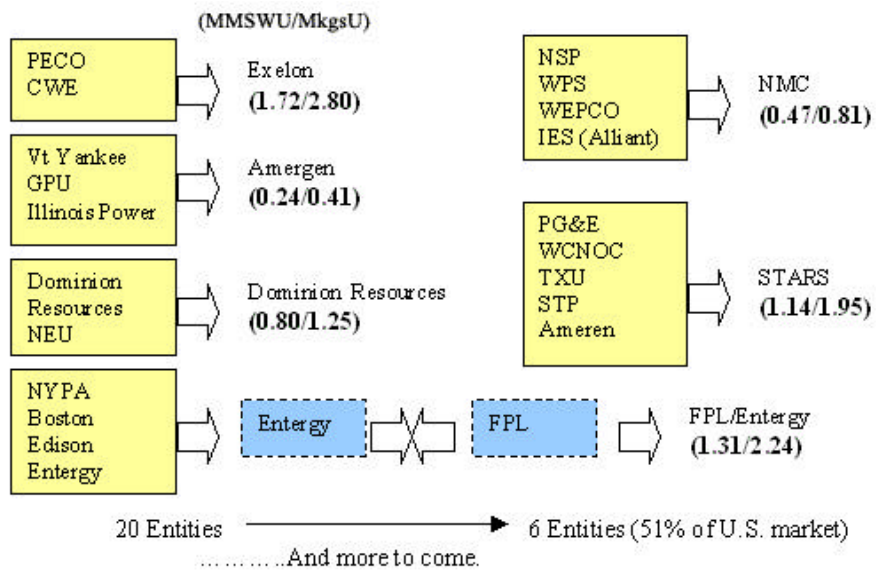


Figure 2. Closure of a GDP facility - USEC has planned for adequate supplies to meet all customer requirements.

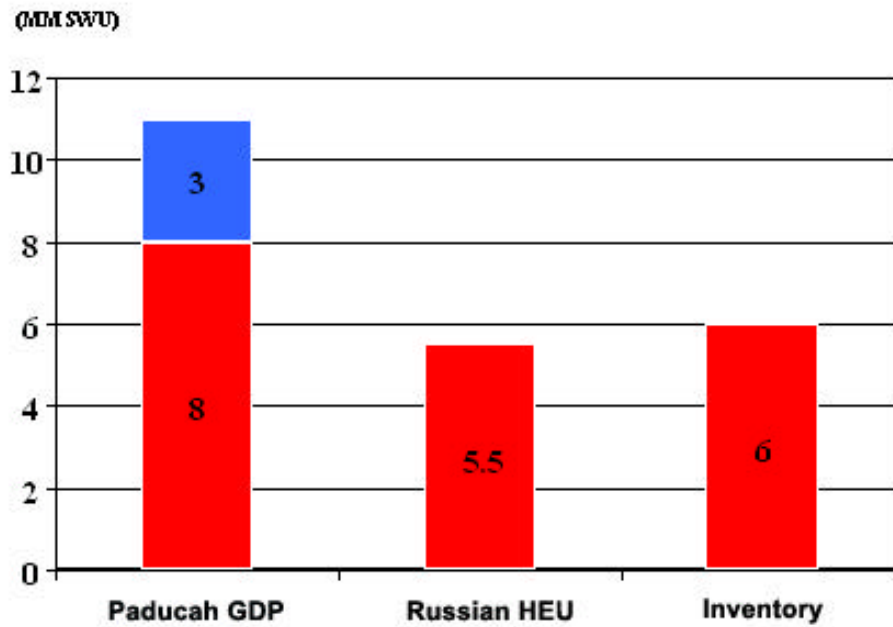
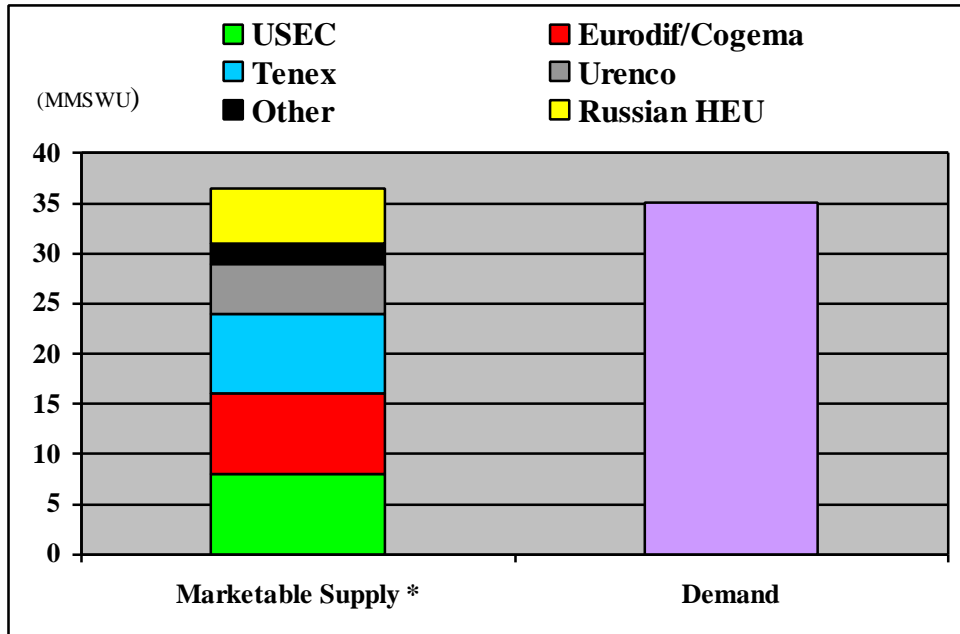


Figure 3. Closure of a GDP facility — enrichment supply and demand are coming into balance.



* Given existing trade restrictions and national preferences