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## **“If It’s Not One Thing, It’s Another”** *Overcoming Adversity in Conversion*

James J. Graham

The root cause of the events that took place at the Metropolis Works conversion facility in 2003 began over a decade ago, driven by market conditions that were the unintended result of well-meaning government actions. The lessons learned from these events will serve to change the manner of how at least one conversion company will do business in the future.

In the past, conversion has been referred to as the weak link in the nuclear fuel chain, being the pivot point between uranium concentrates and enrichment. An analogy to an hour glass by one utility seems appropriate, with conversion being the point of constriction. Earlier this year, many of you may have been wondering if ConverDyn might become the missing link. Certainly, that is not our intention and we are working hard to ensure the success of our business. But the incidents that shut down Metropolis were only a continuation of the adversities faced by our industry, each one impacting our financial health, and ultimately our facility’s physical health. We all know the events of the past as we look forward but we cannot forget the past.

### **One Thing....**

Inventories everywhere you look - cutbacks in civilian nuclear programs in the late 70s and 80s, the end of the Cold War and government-ordered utility deregulation resulted in huge quantities of uranium inventories becoming available to meet world demand in the late 80s and through the 90s.

Russian HEU Agreement - government-to-government agreement laid out the schedule for some 150 000 mtU as UF<sub>6</sub> contained in EUP to be delivered into the U.S. beginning in 1995.

Privatization of U.S. Enrichment Corporation - this “smaller government” idea resulted in USEC receiving the equivalent of over 23 000 mtU of UF<sub>6</sub> in 1998, all of which would displace primary conversion.

This tsunami of secondary supply resulted in the conversion market falling to levels well below any conversion facility’s operating costs. To limit financial damage at Metropolis, production was cutback and the work force was reduced. Other conversion facilities followed suit. Eventually one could no longer hold on.

In February 2001, BNFL announced the Springfield plant would be closed in early 2006.

**And Another....**

Continued growth of lower cost gas centrifuge enrichment capacity in Europe attracted many traditional North American enrichment customers. Combined with the gradual reduction in production from BNFL, the pressure to deliver North American conversion to Europe grew rapidly. Adding to that pressure has been the HEU feed program which required significant quantities of UF<sub>6</sub> be delivered back to Russia. The demand for cross Atlantic transport of UF<sub>6</sub> created new concerns and issues, all of which ultimately add to the cost of conversion.

Deliveries from ConverDyn no longer are simply trucked across the Ohio River a few miles to the Paducah enrichment facility. Shipments now require several months of scheduled transport time to assure on-time deliveries. In addition to shippers’ costs, more man-hours must be spent scheduling, permitting, licensing and tracking shipments.

Additional transportation regulations (TSR-1) must be met - requiring capital investment and additional man-hours. Are we any safer with the thermal protection?

**And Another.....**

Security Issues - September 11. Mandatory security requirements add capital and labour costs at our facility. More time and planning are required for nearly every activity. We now operate under a new security regime that affects all levels of our operations.

With heightened concerns over terrorism, shipping companies and port facilities worldwide are rethinking policies regarding nuclear materials. As the number of shippers and ports willing to take nuclear material declines, more time and man-hours must be spent in scheduling and tracking trans-Atlantic shipments.

Although the costs related to security and transportation issues can be built into new contracts, most conversion is sold under term contracts that can extend out several years. Converters usually must absorb these new costs under older contracts.

**And, Finally, Another.....**

While nuclear utilities were enjoying unprecedented low market conditions and seemingly endless abundant supply, ConverDyn’s corporate partners were looking for ways to stop the losses. Yes, the Metropolis plant was beginning to show its age, but major plant improvements and upgrades were delayed due to the uncertain future of the conversion industry.

During July and September of 2003, several minor chemical releases occurred in the plant. On September 12, Honeywell ceased all production in order to carry

out an extensive review of plant equipment and procedures and to repair or replace certain equipment.

Honeywell spent the next ten weeks rebuilding both physically and mentally the plant at Metropolis, bringing production back up on November 21. But in hindsight it is clear that the procedural issues ran deeper than recognized and had not yet been resolved.

### **And The Event....**

On December 22, 2003, while preparing to start up a second fluorination train in the UF6 building, another release occurred, this time resulting in fluorine compounds travelling off-site. Immediately, production was shut down and the rest is history!

What happened? In terms of health and environmental impact, the event was minor. But the impact on the plant was major as far as we now do business.

Prudent and responsible corporate management dictates that each business division be an asset to the corporation, not a drain to other divisions. Any current losses must be offset by anticipated future profits. The task for ConverDyn became one of impressing on Honeywell management the strong future forecast for nuclear power and the need for the Metropolis facility to meet growing fuel demand while emphasizing how tight supply had become and how essential MTW production was to the industry. Only a few short years ago, some utilities were asking the question: “Conversion! Who needs it?” From the events of 2003 and 2004, we as an industry soon found out who needs conversion!

Honeywell made the quick and firm decision to, as they say, “Just Do It”. Metropolis worked hand in hand with the NRC to design a phased restart program that encompassed:

- overhauling policies, procedures, training
- establishing a “management of change” for process changes
- ensuring mechanical integrity
- installing and upgrading engineering controls
- strengthening the Corrective Action Program
- strengthening and clarifying the emergency response plan and community communication

Metropolis had to overcome problems that had grown during the past five years out of a dismal market and a cloudy future. Every phase of the restart plan required a chain of review and approvals, starting with team leader certification to quality assurance audits to project manager review to plant manager approval to corporate approval and finally NRC approval.

As you know, ore preparation received NRC approval for restart on March 27 and to date production continues smoothly. But ConverDyn will be feeling the impact of the event for several years to come, a fact that we have openly shared with the entire industry.

A year ago, the conversion business was developing a robustness not seen since the mid 1990’s. The shock of secondary supplies had been absorbed. Non-strategic inventories were reaching low levels. Demand was increasing and the market was stable. Converters were looking at nearly full order books in the near term.

Losing seven months of production would not have been a problem in 2000. There were abundant secondary supplies to fill the production gap. Today it is a real problem. Those who hold inventories are gripping them tighter. Those who are expecting deliveries have felt desperate at times, wondering if they would actually ever see their material, and if they should find some to hoard, just in case.

All of our customers have been extremely understanding and helpful, delaying deliveries or facilitating changes in delivery location. ConverDyn has worked diligently to assist customers in covering their requirements. We have worked with utilities and enrichers for loans. We have purchased cover material, arranged other third party loans, and even appealed (unsuccessfully) to the U.S. Department of Energy for a UF6 loan. And thus far in the long road to recovery, we have not failed to meet the agreed upon delivery schedule of our customers.

The Metropolis facility, now at nearly full production, has a limited production rate, and our customer needs must be made to fit that schedule. Previously delayed deliveries will bump into current deliveries. Should no workable solution be available, deliveries may be missed, but we are optimistic that the next two years will be similar to the past two in working with the industry and all deliveries will be made.

### **The Future....**

Looking at the conversion market supply-demand through 2015, we see some excess of supply in the next few years as converters move to take advantage of the much-improved market, allowing for some inventory buildup. With converters at maximum sustainable capacity after 2006, however, there is limited upward flexibility available to cover a future production “hiccup.” After 2008, current supply will struggle to meet demand.

Nuclear utilities must understand that investment in upgrades, equipment and training are absolutely necessary to keep conversion facilities operating in a smooth and dependable manner. But those investments will only be made if there is sufficient cash flow and a projected strong future.

Is there a projected strong future demand for conversion? The supply/demand picture suggests that converters should have smooth sailing into the next decade. Those of us in the conversion boat, however, see some dark swells building out to sea. Waves that may form and come crashing down on the remaining converters include:

- Russian HEU II
- increased U.S. HEU down blending

- and reduction in enrichment contractual tails.

Surely, adversity is not a thing of the past for the conversion industry.

**“A bend in the road is not the end of the road ..... unless you fail to make the turn.”**

- *Author Unknown*

With the support of our customers, ConverDyn intends to stay on the road, no matter what twists and turns lie ahead.

## Conversion Supply/Demand After MTW Restart

Assumptions: Major Western primary converters at sustainable capacity  
(90% of nameplate or other) after 2006

