Deciding Not to Build It

The Bomb Plant We Don't Even Need Could Become the Most Expensive Bomb Plant in US History Unless Old-Fashioned Common Sense Is Applied

In the face of massive federal deficits, an analysis of the evaporating need, skyrocketing cost estimates, and incoherent design process of the Uranium Processing Facility in Oak Ridge, Tennessee, suggests the best common-sense decision is not to build a new plant, but to modernize in place—consolidating and right-sizing operations for a smaller, more secure and efficient operation.

The Oak Ridge Environmental Peace Alliance
December 2010

Summary

Since it was first presented just five years ago with a $600 million pricetag, the Uranium Processing Facility in Oak Ridge has become a project that knows no bounds. The latest construction estimates range as high as $6.5 billion dollars, an almost unparalleled increase of 1000% over the most conservative initial estimate. Even as the proposed UPF moves toward the title "The Most Expensive Bomb Plant Ever," the actual need for and the proposed size of the new bomb plant has diminished, leading to the announcement in October 2010 by Secretary of Energy Steven Chu of an independent review of the UPF project.

This paper examines three pieces of the UPF discussion: the skyrocketing costs of the UPF, the rapidly diminishing justifications for the UPF, and the almost incoherent reports of design progress of the UPF. These three pieces are linked, and together they raise deeply troubling doubts about the wisdom of spending $6.5 billion on a new bomb plant when the mission can be accomplished for a fraction of the cost.

Need and Cost

There is no doubt the facilities used to produce highly enriched uranium components for thermonuclear weapons in Oak Ridge are in need of attention if they are to continue to meet DOE/NNSA mission requirements. The fundamental questions facing decision-makers are simple and straightforward:

1. Can DOE/NNSA meet mission requirements in existing, modernized facilities [modernized = upgraded to meet current environmental, safety and security standards and consolidated and downsized to meet diminishing production capacity demands and maximize security and other efficiencies], or is a new, from-the-ground-up Uranium Processing Facility required?

2. If DOE can meet mission requirements in existing, modernized facilities, what savings might be realized over the cost of a new Uranium Processing Facility (now estimated to cost as much as $6.5 billion dollars)?

These questions can not be answered with information currently available to the public. While DOE/NNSA has provided a recent cost estimate for the Uranium Processing Facility (accurate to within two billion dollars), DOE/NNSA has not yet released, and likely not prepared, a corresponding cost estimate for the modernization of existing facilities.

The enormous pricetag for the UPF—it is on track to be the most expensive nuclear bomb plant in history—may be part of the reason for Secretary of Energy Stephen Chu's October announcement of a special independent commission to review the need for the Uranium Processing Facility; the commission began its work in November and may have a report out as early as this month.

When it was first proposed, the UPF was a "must have" facility. In 2001, in a satellite speech to the Nuclear Decision-Makers Forum in Albuquerque, New Mexico, then-Senator Pete Domenici told of touring the Oak Ridge Y12 facilities where workers wore hardhats because pieces of concrete were falling from the ceiling.[1] In 2005, DOE/NNSA published a Notice of Intent to prepare a Site-Wide Environmental Impact Statement for the Y12 National Security Complex that would include a Uranium Processing Facility. At the time, the estimated cost of the facility was $600 million – $1.5 billion.[2] It's mission was to do what Y12 has always done, produce thermonuclear secondaries for the US stockpile which, at that time, contained 6,000 warheads.

DOE/NNSA did not complete the Y-12 Site-Wide Environmental Impact Statement because it was compelled to first prepare a programmatic environmental impact statement on the entire US weapons production complex. In issuing a Record of Decision for its Programmatic Environmental Impact Statement in December 2008, the NNSA said the UPF was "essential to its ability to meet national security requirements regarding the nation's nuclear deterrent," and "needed for NNSA to maintain its basic nuclear weapons capabilities."[3]

By 2010, some of the fundamental premises on which that statement of need was based changed. The size of the stockpile dropped dramatically with the conclusion of the new START Treaty—the deployed stockpile dropped by more than two thirds—Congress had repeatedly rejected proposals for new warhead design and production, and a JASON report suggested the stockpile can be reliably maintained for decades[4]—a longer period than DOE/NNSA had expected.

DOE's Stockpile Stewardship and Management Plan, released in May 2010, downgraded the need for a new UPF from an essential status to something less. "Given the risks of intermittent shutdown associated with current facilities…" says the SSM Plan[5], "immediate investments are needed in uranium capabilities and therefore, a new Uranium Processing Facility is planned." The language of the SSM Plan steers a wide berth around say the UPF is required or even desired, and it does not address whether the "immediate investments needed" refers to the $120,000,000 currently being spent to modernize existing facilities or the billions slated to be spent over the next fourteen years to build the UPF.

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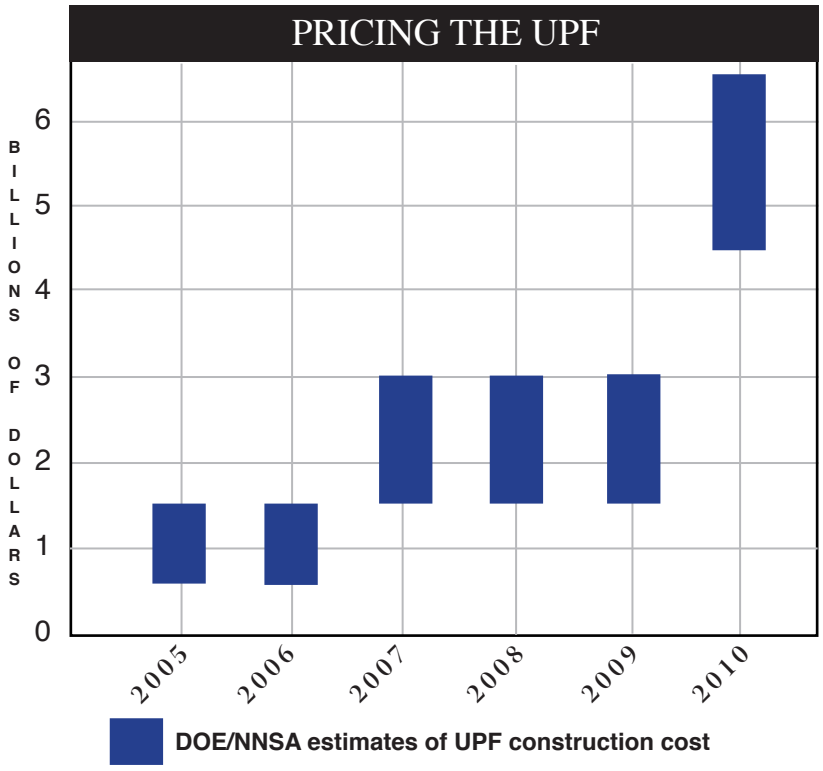
One central question is simple: "What does it take to do the job?" In 2009, the National Nuclear Security Administration released the Draft Y12 Site-Wide Environmental Impact Statement. The Draft SWEIS reduced the size of DOE/NNSA's planned UPF; the "preferred option" dropped from a full-size UPF, with a capacity to produce 125 warheads/year to a "Capability-sized" UPF, with a maximum capacity of 80 warheads/year. And

the SWEIS included as a reasonable alternative, a minimum-sized "No Net Production" UPF with the capacity to produce less than a dozen warheads/year. The Draft SWEIS also included an "Upgrade-in-Place" alternative that would, in the words of DOE/NNSA, achieve modernization of production facilities.[6]

The Y12 Ten Year Site Plan, published in March 2009[7] says seismic, ventilation and other upgrades estimated at $100 million to Building 9212 will keep the building operating safely. This number corresponds roughly to a 2007 table indexing current facilities[8] which says total NNSA mission critical building deferred maintenance cost is $121,528,000. The Ten Year Plan provides no comprehensive overview of what the upgrades will cover, or how long the renovated 9212 complex could function safely, but at $100 million, it seems likely the renovations would be substantial and provide ES&H assurances beyond 2018.

DOE's comparison, in the Y12 SWEIS, of the costs of modernizing existing facilities to meet current environmental, safety and security standards ($120 million) to the UPF ($3.5 billion at that time) elicits a modest acknowledgement that the Upgrade-in-Place alternative "could potentially require smaller upfront capital expenditures that the UPF."

The one thing the SWEIS Upgrade-in-Place option does not do is "right size" the production complex, which is a stated goal of the Stockpile Stewardship and Management Plant released in May 2010. The SWEIS "Upgrade-in-Place" option would maintain a throughput capacity of 125 warheads/year, more than ten times the capacity DOE says is required by its current mission. DOE/NNSA declined to analyze in its Draft SWEIS a common-sense alternative—consolidate, downsize and upgrade-in-place—which would reduce the security footprint, provide production efficiencies, minimize environmental impacts, meet mission requirements, protect worker safety and public health, preserve jobs for the Oak Ridge workforce and likely save more than $5 billion taxpayer dollars.



Designing for Dollars?

ALONG WITH THE DOWNSIZING of the plant's physical size and its justification came an up-size in the plant's estimated cost. The price estimate in 2007 suddenly became $1.5-3 billion.[9] According to some critics, this is when things began to come unmoored. Funding for the bomb plant's design was included in the FY 2010 budget, enough, according to DOE spokesmen at the time, to achieve about 90% of the design by the end of 2010.[10]

As NNSA moves forward with the planning process for the UPF, the price continues to grow, the timetable continues to stretch out, the environmental impact of the facility expands, and the design planning team falls farther and farther behind. Throughout the process, NNSA has announced improvements in technology that will permit the physical size and cost of the UPF to be reduced significantly. In March 2010, a Y-12 official declared the UPF was in its final design stages[11]. Eight months later, DOE's spokesman now says the design of the UPF will be 45% complete[12] by the end of the year—half the progress promised a year ago, and only 10% farther along than the October 2009 level of 35%

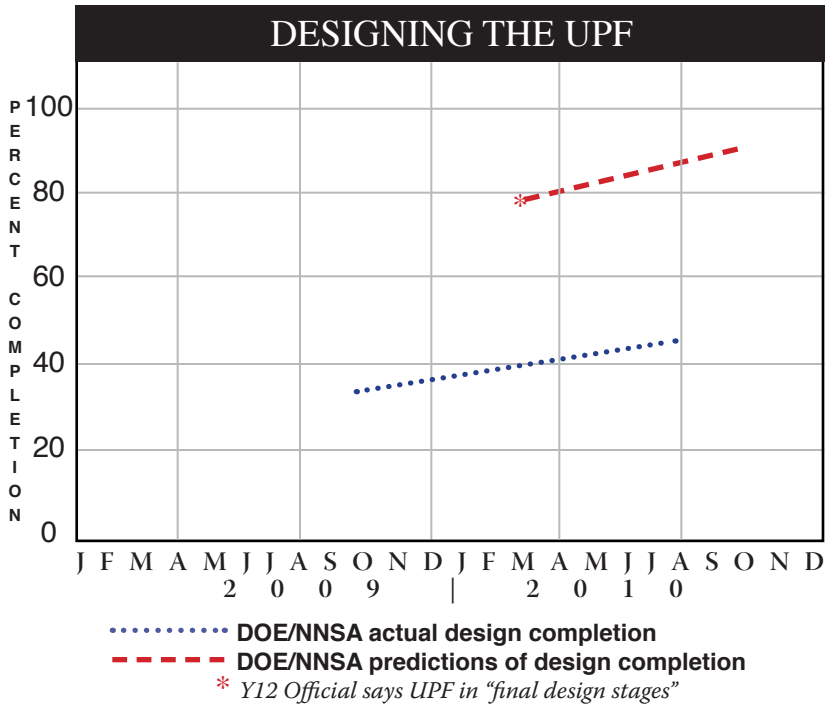
complete[13].

Compounding this paradox is the fact that, the SWEIS, which is to provide the Record of Decision on the size of the facility, has not been released. So more than $200 million dollars has been spent on the design of a facility even though:

- The size of the facility has not yet been determined; and
- The need for the facility is under review.

Meanwhile, the nonpartisan General Accounting Office has released a report on the cost estimates for the UPF that calls even this level of design premature and makes two significant points:

- DOE/NNSA has an abysmal track record for making realistic cost estimates.
- Critical, technology-dependent design decisions are slated to be made before DOE/NNSA has proven the technologies will work. The GAO review found that UPF design work violates DOE and industry standards for best practices planning. Of ten new technologies, six will not have completed Technology Readiness demonstrations (to TRL 6) before construction decisions (cost and performance baselines) for UPF are made. In at least one case, agile machining, optimal assurances of the new technology will not be available for more than a year after the cost and performance baselines are established (if then). Should these unproven technologies fail to materialize, redesign at higher costs will be required. [14]



Rationality appears to have no home in DOE-land, for in the face of all the downsizing, one thing continues to go up—the cost estimate for the Uranium Processing Facility. Current estimates place the pricetag at $6 – 6.5 billion dollars—a whopping 1000% growth from the original estimate of just five years ago.

Conclusion

THE ANSWERS TO THE QUESTIONS posed at the outset of our discussion are now clearer. It does appear, from DOE/NNSA's documents, that mission requirements can be met in modernized existing facilities, and that significant efficiencies in process and security can be achieved with additional efforts to right-size the facility (a production capacity of less than 10 warheads/year) and consolidate operations. It is also clear that modernizing existing facilities will realize more than modest savings over construction of a new UPF.

Should DOE/NNSA persist in its assertions that a new, $6.5 billion UPF is necessary, the independent review commission should, at the very least, require DOE/NNSA to document what operations and facilities will remain substandard after the current, ongoing modernization efforts are complete and which operations and facilities, if any, would remain substandard if a more thorough modernization, aimed at extending the life of existing facilities another 40 years and seeking to maximize efficiencies, were undertaken.

Notes

1. Domenici's tale, still repeated as part of the story used to justify the UPF, is an example of a myth outliving the truth from which it sprang. The facility of which he spoke, Building 9606, is no longer in use and has been razed.

2 "LANL Complex Price Increasing," John Fleck, *Albuquerque Journal*, December 5, 2010.

3. Record of Decision for the Complex Transformation Supplemental Programmatic Environmental Impact Statement—Operations Involving Plutonium, Uranium, and the Assembly and Disassembly of Nuclear Weapons, National Nuclear Security Administration. *Federal Register*, Vol. 73, No. 245, Friday, December 19, 2008, pp. 77648.

4. *Lifetime Extension Program, Executive Summary*, the JASON, JSR-09-334, September 9, 2009, p.2

5. *FY 2011 Stockpile Stewardship and Management Plan*, National Nuclear Security Administration, May 2010

6. *Draft Site-Wide Environmental Impact Statement for the Y-12 National Security Complex* [DOE/EIS-0387], National Nuclear Security Administration, p. S-13.

7. *Y12 Ten Year Site Plan*, 2009, p. 19. Net cost of modernization is $80 million; $100 million in FIRP funding minus $20 million in deferred maintenance saved.

8. *Y12 Ten Year Site Plan*, 2007, p.61

9. "New Cost Range for Uranium Processing Facility in Works," Frank Munger, *Knoxville News-Sentinel*, October 7, 2010

10. "Funding to Aid Uranium Project at Y-12," Frank Munger, *Knoxville News-Sentinel*, October 17, 2009 [Darrel Kohlhorst, President and General Manager of B&W, Y-12 said FY 2010 funding would "keep us on schedule to have the design probably in the neighborhood of 90% complete by the end of 2010."]

11. "UPF Design Update," Frank Munger, Knoxville *News-Sentinel*, October 7, 2010. [DOE spokesperson Steve Wyatt confirms UPF design was 45% complete at the end of August 2010.]

12. "New Y-12 Production Facility Important for National Security, Official Says," Frank Munger, *Knoxville News-Sentinel*, March 18, 2010. [Dennis Grove, Y12 Official, describes the UPF as the "crown jewel" of Y-12 and says it is in "the final design stages."]

13. "Funding to Aid Uranium Project at Y-12," Frank Munger, *Knoxville News-Sentinel*, October 17, 2009 [Darrel Kohlhorst, President and General Manager of B&W, Y-12 says design is "only about 35% complete."]

14. *National Nuclear Security Administration's Plans for Its Uranium Processing Facility Should Better Reflect Funding Estimates and Technology Readiness: Report to the Subcommittee on Energy and Water Development, Committee on Appropriations*, U.S. Senate, General Accounting Office, November 2010: "NNSA does not expect to have optimal assurance as defined by best practices that 6 of the 10 new technologies being developed for UPF will work as intended before key project decisions are made." (p.14)