After months of delay, U.S. officials announced recently that a team led by the Lawrence Livermore National Laboratory won the first design competition in roughly two decades for a new nuclear warhead. The news received a tepid greeting from U.S. lawmakers, who will need to fund the design if it is ever to be built.

The competition's origins date back to 2004 when Congress allocated $9 million to explore making existing nuclear warheads last longer without diminishing their explosive power. This Reliable Replacement Warhead (RRW) program soon morphed into a more ambitious effort to produce new warheads that ostensibly would be safer, more reliable, and easier to maintain than the nine types populating the current stockpile of approximately 10,000 nuclear warheads. In early 2006, Livermore in California and the Los Alamos National Laboratory in New Mexico submitted competing designs for the inaugural RRW warhead.

The Department of Energy's semi-autonomous National Nuclear Security Administration (NNSA), which runs the nuclear weapons complex, recently reported to Congress that existing warheads are safe and reliable. The agency, however, also says that small maintenance changes made to the explosive devices might someday corrupt them. Almost all the warheads are more than 20 years old, but recent studies found that the plutonium core of the warheads will last at least 85 years without degrading performance. (See ACT, January/February 2007.)

Thomas D'Agostino, the acting administrator of the NNSA, hailed the rival RRW designs March 2 as “brilliant.” But D'Agostino said agency experts and Pentagon officials had greater confidence that the Livermore design could be assessed to work without resorting to underground nuclear testing, which the United States suspended in 1992.

Washington subsequently signed the Comprehensive Test Ban Treaty, outlawing nuclear testing, in 1996, although the Senate three years later rejected the accord's ratification. Still, Congress has stipulated that the RRW program should avoid a return to nuclear testing.

Officials described the Livermore design as more conservative and closely linked to concepts validated by past testing than the more novel Los Alamos alternative. Teams from the Sandia National Laboratories contributed to both designs.

A winning design had been expected to be unveiled last November, but the decision slipped as officials debated the proposals. Earlier this year, media reports said that a hybrid design had emerged as the front-runner.

Although the NNSA ultimately selected the Livermore design, the agency described the Los Alamos warhead as “highly innovative.” This description reportedly pertained to mechanisms to render a warhead useless if it fell into the wrong hands. The NNSA said the Los Alamos features would be developed in parallel with and possibly incorporated into the Livermore project.

Working with the other laboratories and the U.S. Navy, Livermore will now seek to perfect its design as a future replacement for the W76 warhead that arms the Navy's 14-boat ballistic missile submarine fleet. If all proceeds accordingly, the NNSA hopes to field the first replacement warhead
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by 2012.

Longer-term plans call for possibly swapping all current warhead types for RRW models, a process that could take 30 years or more. The Livermore design currently is slated to replace W76 warheads only, and the NNSA stated in its budget documents earlier this year that it wanted to study “additional RRW options.”

Sen. Pete Domenici (R-N.M.), whose state is home to Los Alamos, would like that process started sooner than later. “One system is not equivalent to a transformation and we need to move on a second [RRW] design competition,” Domenici said in a March 2 press statement.

Other lawmakers appear less eager to plunge ahead. Indeed, some are questioning the entire RRW approach.

Rep. Pete Visclosky (D-Ind.), who chairs the House Appropriations Energy and Water Development Subcommittee, which takes the lead on funding for the NNSA, blasted the RRW announcement. Panning the program as having a “make-it-up-as-you-go-along character,” Visclosky said there appeared to be “little thought” on why new nuclear warheads are needed and asserted that the agency should be “reconfiguring the old Cold War complex and dismantling obsolete warheads.”

NNSA officials contend that the RRW program is essential to both of Visclosky’s priorities. The agency envisions that the RRW effort will make warhead production, maintenance, and storage easier, enabling the agency by 2030 to significantly streamline the entire cradle-to-grave process as well as the infrastructure that supports it. With shorter bomb-production timelines, the United States, according to the NNSA, would be able to safely scrap thousands of stored warheads knowing that more could be produced quickly on an as-needed basis.

But the whole notion strikes Visclosky and Rep. David Hobson (R-Ohio), the subcommittee’s ranking member and former chair, as dubious. Speaking at a March 6 hearing, Hobson said that the agency was “focusing too much on [the RRW program] and not paying enough attention to dismantlement and consolidation of the weapons complex.”

Visclosky warned in his March 2 statement that RRW funding could be eliminated. In its latest annual budget request to Congress submitted Feb. 5, the Bush administration requested nearly $119 million for the program. (See ACT, March 2007.)

In a joint statement March 2, Reps. Ellen Tauscher (D-Calif.) and Terry Everett (R-Ala.) also indicated the RRW program faces scrutiny. “Today's announcement is only an early step in what will be a long evaluation process,” they stated.

Tauscher, chair of the House Armed Services Strategic Forces Subcommittee, noted at a March 8 hearing that Congress had yet to authorize actual engineering work on the RRW design. She further implied that phase would not be reached if the design were to have capabilities different from existing warheads, declaring “the last time” the administration proposed a new nuclear weapon, the Robust Nuclear Earth Penetrator, “I helped kill it.” (See ACT, December 2005.)

Although the RRW program is only supposed to replicate existing warhead capabilities, the NNSA also maintains that the related overhaul of the weapons complex has as one objective the ability to produce weapons with new military capabilities. In an October 2006 report, the agency stated that a revamped complex would “improve the capability to design, develop, certify, and complete production of new or adapted warheads in the event of new military requirements.”

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