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When the November 1990 issue was published, the Doomsday Clock remained at 10 minutes to midnight, where it had been since April 01, 1990 when with democratic movements in Eastern Europe shattering the myth of monolithic communism, the Cold War ends.

BEATING SWORDS INTO SWORDS

By ROBERT S. NORRIS and WILLIAM M. ARKIN

To give the Energy Department something to do, nuclear warheads from missiles eliminated under INF are being repackaged as B61 bombs.

Nuclear warheads from Pershing II missiles being eliminated under the Intermediate-Range Nuclear Forces (INF) Treaty are being converted into new nuclear bombs. These first repackaged nuclear weapons came off the Energy Department's production line in May, and the new bombs are scheduled to return to air bases in Europe.

The converted Pershing warheads are returning to the arsenal at a time when the future of U.S. nuclear weapons in Europe looks increasingly cloudy. Most of the European arsenal is close to 20 years old; President Bush canceled two of three new nuclear weapons in NATO's modernization program in May; and the West German government quietly rejected the third. The pace of European change continues to overwhelm and undermine nuclear planners.

But now the very weapons that were the subject of such angry public controversy in the early 1980s threaten to sneak back in secret, with no discussion and no justification. While not prohibited, the recycling of nuclear warheads was a

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contentious issue for the Reagan administration during the Senate ratification hearings. Still, no one wanted to place obstacles in the way of rapid ratification of the INF treaty, and relatively few U.S. warheads were involved.

The reuse question has returned, though, in the strategic arms reduction (START) talks in Geneva, which upon completion will "eliminate" thousands of weapons over a seven-year period. The United States is aware that Soviet warheads are more generic in design than their U.S. counterparts and could be reused to an even greater extent.

While defense planners may concoct esoteric "needs" and characteristics to justify new nuclear weapons requirements, no justification has been offered for these new nuclear bombs entering the stockpile. The hard truth is that the Energy Department needs the work.

The production complex has been tainted by its scandalous environmental and safety record, which has brought the assembly line to a virtual halt. Defense spending reductions and new attitudes dawning about nuclear weapons in the post-Cold War world are further eroding the nuclear business. Using nuclear weapons eliminated in the arms reduction process, and repackaging them as new weapons, provides convenient nuclear "busywork" for an otherwise underemployed enterprise.

Soon after the INF Treaty was signed in December 1987, Energy officials told Congress that the W85 Pershing II warheads and the W84 warheads on the ground-launched cruise missiles would be considered for use on future missiles such as the tactical air-to-surface missile and the follow-on to Lance. But the department concluded that the weight of the INF missile warheads would restrict the range of the new missiles, and the idea was dropped. Even if the INF warheads had been chosen for the Lance successor, there were not enough of them to meet army program goals.

Warheads began returning to the United States as their missiles were eliminated, and the reuse issue resurfaced with more urgency because of the Energy Department's problems. Neither weight nor number was a liability in converting the warheads to gravity bombs, and a decision was made to use the W85 for this purpose.

The warhead had in fact been adapted originally from the B61 Mod (modification) 4, which was introduced to the stockpile in 1979. The B61 bomb design is one of the more versatile and prolific nuclear warheads in the stockpile. Since initial production of early B61 prototypes in October 1966, the bomb has been manufactured in 11 modifications, each with progressively improved characteristics and safety features.

The bomb is used by both strategic bombers and tactical fighter aircraft in the air force, navy, and marine corps, and it is the primary weapon held in custody for NATO air forces in Europe. The warhead has been in near continuous production for 25 years; no other U.S. nuclear warhead has been produced for even a decade.

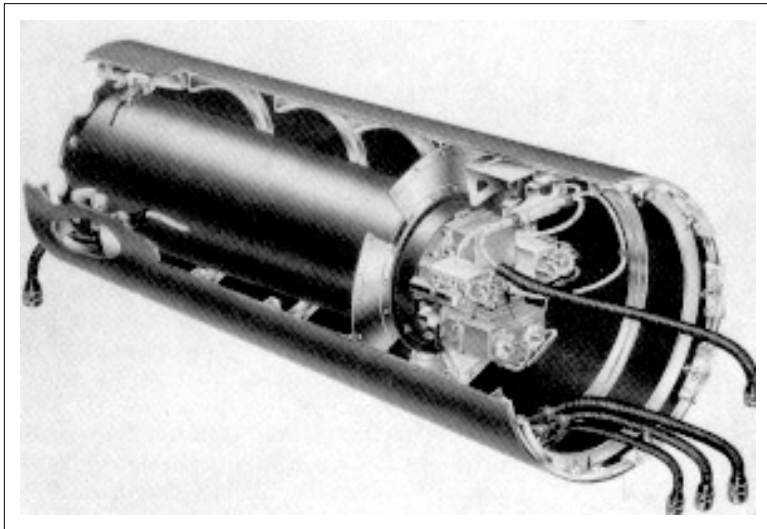
The B61 is the bread and butter of the Los Alamos National Laboratory in New Mexico, which designed it. The B61 served as the basic design for three important warheads produced in the 1980s: the W80-0 sea-launched cruise missile warhead, the W80-1 air-launched cruise missile warhead, and the W85 Pershing II warhead. The W80-1 warhead will reenter production next year to arm new advanced cruise missiles.

The B61's W85 cousin has been easily transformed. Its "physics package"—the guts of the nuclear explosive device—has been removed and reworked, placed inside a modified B61 bomb case, and named B61 Mod 10. The new B61 Mod 10 bombs replace older bombs, particularly those without the safety feature of insensitive high explosives. Another new feature of the Mod 10 is its internal "category F" permissive action link (PAL), a 12-digit electronic code device needed to arm the warhead. This PAL was specifically designed for weapons deployed to Europe and is found only on the INF warheads and the B61 Mods 3 and 4. It is the most sophisticated PAL, with a microprocessor that, upon continued insertion of incorrect numbers by an unauthorized user, effectively disables the warhead.

The first public hint that Pershing II warheads would be reused as bombs came in March 1990 when Energy Department testimony to Congress mentioned the "B61-4/10" bomb. Then, a department letter to Greenpeace last summer referred to the "B61/W85," pairing the two warheads for the first time. Another letter stated that the first B61 Mod 10 was produced on May 7, 1990, that quantity production would begin in June, and that the new bomb's yield was higher than the B61 Mod 4 and lower than the B61 Mod 3. The W85's variable yield is known to range from below one kiloton to 80 kilotons.

If all the W85s are converted, some 200 new B61 Mod 10s will supplement the air force inventory of approximately 1,900 tactical nuclear bombs. That inventory was already significantly modernized during the 1980s and now consists mainly of B61 Mod 3 and 4 bombs. The Senate Armed Services Committee report on the fiscal 1991 defense budget authorizations concluded that "the committee believes that there are a sufficient quantity of B61s in stock to meet current needs," and suggested that no more bombs of the B61 family were needed by the air force.

The committee's July report called for reduced



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"funding for production of the B61 bomb to reflect commensurate reduction in air wings by the Air Force. These reductions reflect the eroded target base for the B61 as well as the decreased production capacity at the Rocky Flats [nuclear weapons production facility] for fiscal 1991."

The "physics package" of the retired Pershing II missile (below) is removed and reworked . . .

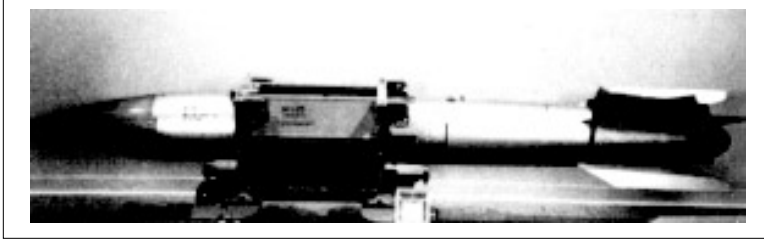
Beyond the potential controversy of the W85's return to Europe in a new guise, the reuse of INF warheads raises new questions about the future of the nuclear weapons design laboratories, continued nuclear testing, and the need for new weapons.

■ **Why two laboratories?** If a single warhead design can be the basis for a wide variety of nuclear weapons, the need for two large nuclear weapons design laboratories is called into question. Los Alamos, founded in 1943, was the sole lab until Lawrence Livermore National Laboratory in California was established in 1952, partly in order to stimulate greater creativity and competition among nuclear scientists, and to guard against catastrophic design failures which could harm U.S. security.

The competition between the laboratories remains fierce, but its main product has been duplication. Over the years, each laboratory has perfected at least one of each basic weapon in the arsenal—large-yield bombs, ballistic missile warheads, and small, versatile artillery and missile warheads. This duplication was acceptable when both laboratories were kept busy designing esoteric warheads and gadgetry for the myriad weapons that entered the stockpile during the Cold War. But by the end of the 1980s the nuclear horizon looked bleaker: fewer warheads were anticipated and new design challenges, such as third-generation Star Wars warheads, were dead in the water. With the completion of the INF Treaty and the cancella-



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... into another B61 bomb.

tion of numerous nonstrategic programs such as naval antisubmarine weapons, new artillery projectiles, and the follow-on to Lance, the permissive era has ended and two gigantic weapons laboratories have become an expensive luxury.

■ **Why nuclear testing?** If the military can be satisfied with using a warhead design first chosen in 1963, even if updated and improved, for current weapons, the need for nuclear testing in developing future designs becomes questionable. In this sense the reuse of the W85 is good news to test ban advocates. As exotic projects have gone by the wayside due to budget constraints, political decisions, and technical impossibilities, the arguments for continued nuclear testing have become more strained. One must wonder whether pressure to continue testing simply represents a desire to perpetuate the testing and design machine.

■ **Why any new weapons?** When nuclear warhead production resumes, the Energy Department will produce three warhead types for new weapons: the W80-0 for the Tomahawk sea-launched cruise missile, the W80-1 for the advanced cruise missile, and the W88 for the Trident II missile. Only the W88 is new, however; both W80 warheads are identical to the warheads on the air-launched cruise missiles first delivered to the air force a decade ago. The navy and air force could have argued for greater yield, different characteristics, or newer designs on the cruise missile warheads but, for whatever reasons, they were satisfied with the existing design—incidentally a derivative of the B61.

On the other hand, the navy has been adamant about needing a higher-yield warhead for the Trident II. While the W88 will supplant the W76 Trident I warhead, both are compatible with the Trident II missile. The navy originally planned to arm its force of Trident submarines entirely with Trident II missiles and W88 warheads. But in the mid-1980s it was decided that about half of the Trident II missiles would be armed with lower-yield W76 warheads. The reason given was that targets in the Soviet Union did not call for an all-W88 force.

Delivery of the W88 is said to be a main force driving the nuclear weapons production complex, including pressure to restart the troubled Rocky Flats plant [see June 1990 *Bulletin*]. But the need for the W88 has not been reevaluated.

The navy has already made it clear that if W88 warheads are unavailable, its third Trident submarine, the *West Virginia*, will go to sea next year with W76 warheads cannibalized from existing stockpiles. With the demise of the Soviet threat, even nuclear advocates may find the W76 adequate for deterrence in the coming years. The repercussions of such a decision, of course, would be devastating to the nuclear weapons industry.

The reuse of nuclear warheads, whether collected from arms reductions or borrowed from older cousins, opens a Pandora's box of challenges to the nuclear weapons enterprise. At the same time, it exposes what may be the real reason for the W85 recycling project: to give the complex something to do.

Energy Department facilities are at an all-time low rate of activity. Production of new warheads has more or less ground to a halt, and anticipated workloads, even if the problems at Rocky Flats and elsewhere are solved, are lower than ever. At the moment, the Pantex assembly and disassembly facility in Texas is spending more time retiring weapons than producing them. If a warhead coming through for retirement is not disposed of but reappears in a new configuration, the workload is doubled. Modifying existing warheads has long been known to occupy a large part of the weapons complex workload, and reusing the W85 increases that activity, filling an otherwise empty order book.

Both congressional armed services committees have criticized the overall B61 program. Although the air force evidently thinks it needs new bombs, Congress so far doubts it. The committees also recognize that the complex is sized for a workload that no longer exists, but they have been incapable of directing the machine to cease operations. Instead, they have endorsed Energy chief James Watkins's proposal to create a refurbished complex in the future—smaller, to be sure, but at a cost of \$100 billion. This plan begs the question of whether billions of dollars should be invested to produce nuclear warheads 50 years in the future.

Meanwhile, spending millions of dollars to convert 200 nuclear warheads into bombs, with absolutely no discernible effect on U.S. security or even military capability, is tantamount to nuclear busywork. Without new weapons to design, without large warhead production programs on line, the Energy Department, its laboratories, and the production factories are resorting to junkyard operations to maintain the semblance of important activity. After all, 100,000 people in facilities in 13 states, with an \$8 billion annual budget, have to do something. ■