

U.S. nuclear forces, 2008

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THE PAST YEAR WAS AN important one for nuclear developments in the United States. In 2007, it restarted small-scale production of nuclear weapons for the first time in 15 years, though reduction of the stockpile continues; nuclear weapons were flown across the country accidentally; and Congress rejected administration plans for new warheads, asking instead for a far-reaching review of U.S. nuclear deterrence policy and strategy.

In 2002, the United States signed an agreement with Russia to reduce “operationally deployed” strategic warheads to between 1,700 and 2,200 by the end of 2012. The United States passed the halfway mark in 2007 toward implementing this agreement, the Moscow Treaty (also known as the Strategic Offensive Reductions Treaty, or SORT). Accordingly, reduction of U.S. interconti-

ental ballistic missiles (ICBMs) and nuclear cruise missiles continued, as did the readjustment to deployments of nuclear-powered ballistic missile submarines (SSBNs).

As of January 2008, the U.S. stockpile contained an estimated 5,400 nuclear warheads: approximately 4,075 operational warheads comprised of 3,575 strategic and 500 nonstrategic warheads; and about 1,260 additional warheads held in

the responsive force or inactive stockpile.¹ The Defense Department removed an additional 5,150 warheads from the stockpile for future dismantlement, a consequence of the administration’s December 18, 2007 announcement to reduce the stockpile by “nearly 50 percent” by the end of 2007.² An additional 15-percent reduction will be achieved by 2012, leaving a stockpile of nearly 4,500 warheads.

The requirement for this many weapons arises from National Security Presidential Directive 14, signed by President George W. Bush on June 28, 2002, and the Nuclear Weapons Employment Policy, signed by then-Defense Secretary Donald Rumsfeld in 2004. The latter states: “U.S. nuclear forces must be capable of, and be seen to be capable of, destroying those critical war-making and war-supporting assets and capabilities that a potential enemy leadership values most and that it would rely on to achieve its own objectives in a post-war world.”³

The military translation of this guidance is Operations Plan (OPLAN) 8044 Revision 05, the national nuclear war plan from October 2004. This differs from the Cold War-era Single Integrated Operational Plan (SIOP) because it includes “a family of plans applicable in a wider range of scenarios” and “provides more flexible options to assure allies, and dissuade, deter, and if

necessary, defeat adversaries in a wider range of contingencies.”⁴ It also includes executable, scenario-based strike options against regional states, including North Korea and Iran, that were originally added to the March 2003 OPLAN 8044 Revision 03.⁵

ICBMs. Reduction of the Minuteman III missile force began on July 12, 2007, with the deactivation of the first of 50 ICBMs (and five launch control centers) of the 564th Missile Squadron of the 341st Space Wing at Malmstrom Air Force Base (AFB) in Montana. The air force plans to reduce the ICBM force from 500 to 450 by mid-2008. The 1994 Nuclear Posture Review (NPR) established an ICBM force of “450/500 Minuteman III missiles, each carrying a single warhead,” but the air force was not ordered to implement the decision until the 2006 Quadrennial Defense Review.

Six years after SORT was signed, the air force is gradually reducing the number of warheads on ICBMs from roughly 1,600 in 2003 to approximately 764 today, with a goal of 500 warheads on 450 missiles by the end of 2012. This means that there will be multiple warheads on some ICBMs, a reversal of the single-warhead decision stated in the 1994 Nuclear Posture Review. Hundreds of additional warheads will be kept in reserve for redeployment if necessary.

To compensate for the lost capability, the air force is upgrading some ICBMs with new warheads. Beginning in October 2006, the more powerful W87 warhead (from retired MX Peacekeeper ICBMs) replaced W62 warheads at Warren AFB in Wyoming. (See January/February 2007 *Bulletin*.) This upgrade, scheduled to be completed in 2011, is part of a multibillion dollar, eight-part overhaul of the entire Minuteman III force that involves replacing the engines, fuel, guidance sets, and software.

SNAPSHOT

The United States reduced its nuclear stockpile to 5,400 warheads.

Small-scale production of warheads resumed at Los Alamos National Laboratory.

Plans for new nuclear warheads stalled.

Boeing delivered the 513th guidance set to the air force in March 2007, a production run that is intended to continue through early 2009.

Only one Minuteman III missile flight-test was launched in 2007, compared to four in 2006. The missile was launched from Vandenberg AFB in California on February 7, and delivered a single, unarmed warhead approximately 4,200 miles (6,760 kilometers) with impact on a water target east of Kwajalein in the Marshall Islands.

SUBMARINE-LAUNCHED AND SUBMARINE BALLISTIC MISSILES (SLBMs). The SSBN fleet is comprised of 14 submarines (two are in overhaul) that carry approximately 1,728 operational warheads—close to 38 percent of the operational nuclear arsenal. Many warheads have been removed from Trident II submarines to meet 2001 Strategic Arms Reduction Treaty (START) requirements and to keep pace with future SORT goals.

The upgrade of Pacific-based SSBNs from Trident I C4 SLBMs to the longer-range and more accurate Trident II D5 is scheduled to be completed in 2008, when the *Alabama* finishes its backfit. In addition to the W76, the D5 carries the W88, the highest-yield ballistic missile warhead in the U.S. arsenal.

In 2007, we obtained information from the National Nuclear Security Administration (NNSA) showing that the Bush administration had decided in 2005 that 63 percent of the approximately 3,200-warhead W76 inventory will be modified under a life-extension program (LEP) lasting through 2021.

The program will produce an estimated 2,000 W76-1/Mk-4A warheads with increased capability against hardened targets.⁶ “With the accuracy of D5 and Mk-4, just by changing the fuse in the Mk-4 reentry body, you get a significant improvement,” wrote the head of the navy’s Strategic Systems Program in 1997. “The Mk-4, with a modified fuze and Trident II accuracy, can meet the original D5 hard target requirement,” he explained.⁷ The first production unit of the modified warhead, known as the W76-1/Mk-4A, was scheduled to be delivered to the navy in October 2007 but was delayed. Initial operational capability is expected around March 2008, when the first two launch tubes will be loaded with W76-1/Mk-4A warheads.⁸

Beginning in 2014, if approved by Congress, the navy plans to begin replacing the W76 warheads in the D5s with new ones from the Reliable Replacement Warhead (RRW) Program, RRW-1 warheads (sometimes called WR-1s). The RRW-1 is based on the never-deployed Skua-9 (named after the predatory seabird), a two-stage thermonuclear warhead design developed by Lawrence Livermore National Laboratory and tested several times before the 1974 Threshold Test Ban Treaty, which limited underground tests to 150 kilotons. With additional modern surety features, the RRW-1 will be incorporated into the Mk-5 reentry body that is used for the W88. The navy has approximately 500 excess Mk-5s in storage.⁹

The navy continued its redeployment of the SSBN fleet, transferring the *Alas-*

ka from the Pacific to the Atlantic for homeporting beginning in 2008 at Kings Bay, Georgia (after a refueling overhaul at Virginia’s Norfolk Naval Shipyard). In 2007, the *Henry M. Jackson* returned to Bangor, Washington, from its upgrade to the D5 missile. Since 2002 the navy has transferred five SSBNs from the Atlantic to the Pacific in a reorientation of the sea-based deterrent force’s focus to increase coverage of targets in China, according to navy officials. (The SSBNs also target Russia and North Korea.) More than 60 percent of all U.S. SSBN deterrent patrols now take place in the Pacific, compared to an average of only 15 percent during the 1980s.

Three Trident II D5 missiles were test-launched during 2007 in two events. The *Tennessee* launched two missiles from the Eastern Test Range off the Florida coast on May 15. The missiles were the first to carry the new Lockheed Low-Cost Test Missile Kit, which converts an operational missile into test configuration and contains range safety devices and flight telemetry instrumentation. On November 29 the *Henry M. Jackson* test-launched a single missile from the Western Test Range in an operation to certify the sub for deployment after a lengthy shipyard period and conversion from C4 to D5 SLBMs.

The navy has begun design development studies of a new class of nuclear-powered ballistic missile submarines, tentatively known as SSBN(X).

BOMBERS AND BOMBER WEAPONS. Approximately 1,080 nuclear weapons are earmarked for delivery by long-range

STOCKPILE REDUCTION MILESTONES

1987	1991	1992	2003	2004	2007	2012
The United States begins reducing its 24,000-warhead Cold War stockpile.	President George H. W. Bush speeds up the reduction of the stockpile, which consists of 21,000 warheads.	President Bill Clinton slows the pace of reductions; the stockpile levels out at around 10,500 warheads.	The United States completes dismantlement of the warheads from previously announced reductions.	President George W. Bush announces a “nearly 50-percent” reduction in the stockpile, to be achieved by 2012.	The 50 percent reduction is implemented five years early.	The United States aims to reduce the stockpile by an additional 15 percent by 2012, which will leave roughly 4,600 warheads.

B-2A Spirit and B-52H Stratofortress bombers. B-2 and B-52 aircraft can carry various nuclear bombs, including the B61-7 strategic bomb and the B83 high-yield strategic bomb. The B-2 can also carry the B61-11 “bunker-buster” (rebuilt B61-11s were delivered to the air force in 2007), and the B-52 can carry air-launched cruise missiles (ALCMs). A modified warhead for ALCMs, the W80-3, was scheduled for delivery in 2008, but plans have been deferred while the air force and Congress determine the long-term requirements for nuclear cruise missiles. (For more on nuclear cruise missiles, see November/December 2007 *Bulletin*.)

The advanced cruise missile (ACM), which the B-52 can carry, has been withdrawn from active service. The air force is studying whether to destroy them or convert them into conventional cruise missiles.¹⁰ The W80-1 warheads are being moved to an underground storage facility at Kirtland AFB in New Mexico until the air force decides whether they should be dismantled or used to replace older W80-1 warheads on the ALCM fleet. The decision to retire the ACM is part of the air

force’s contribution to meeting SORT limits by reducing its inventory of nuclear cruise missiles to 528 by 2012.¹¹ In addition, all ALCMs will be removed from Barksdale AFB in Louisiana and based at Minot AFB in North Dakota.

A serious safety breach occurred on August 30, 2007, during the transfer of some ACMs from Minot AFB. Six ACMs with nuclear warheads still installed

were mistakenly loaded onto a B-52 alongside six ACMs without warheads and flown across the United States to Barksdale, where the live missiles sat unattended on the tarmac. For more than a day, the air force did not know that the nuclear weapons had left their high-security storage site at Minot. The dramatic failure of the nuclear command and control system was first described

in *Military Times* and was reported to have been labeled by the government as a “Bent Spear,” the second-highest nuclear incident level in the U.S. military, behind only “Broken Arrow.”¹² However, according to information we received from the air force, the mishap is not on Air Combat Command’s list of nuclear weapons incidents. An initial air force investigation has been broadened to

THE U.S. ARSENAL

TYPE/DESIGNATION	NO.	YEAR DEPLOYED	WARHEADS X YIELD (KILOTONS)	ACTIVE/SPARES
ICBMs				
LGM-30G MINUTEMAN III				
Mk-12	138	1970	1 W62 x 170	214/20
Mk-12A	250	1979	1–3 W78 x 335 (MIRV)	450/20
Mk-21/SERV	100	2006 (1986)	1 W87 x 300*	100/10
TOTAL	488			764/50
SLBMs**				
UGM-133ATRIDENT II D5				
Mk-4		1992	6 W76 x 100 (MIRV)	1,344/80
Mk-5		1990	6 W88 x 455 (MIRV)	384/20
TOTAL	288			1,728/100
BOMBERS				
B-52H Stratofortress	94/56***	1961	ALCM/W80-1 x 5–150	528/25
B-2 Spirit	21/16	1994	B61-7/-11, B83-1	555/25
TOTAL	115/72			1,083/50†
NONSTRATEGIC FORCES				
Tomahawk SLCM	325	1984	1 W80-0 x 5–150	100
B61-3, -4 bombs	n/a	1979	0.3–170	400
TOTAL	325			500
GRAND TOTAL				~4,075/200††

ACM: advanced cruise missile; ALCM: air-launched cruise missile; ICBM: intercontinental ballistic missile; MIRV: multiple independently targetable reentry vehicle; SLCM: sea-launched cruise missile; SLBM: submarine-launched ballistic missile.

* The W87 was previously deployed on the MX Peacekeeper, that last of which was deactivated in 2005.

** Two additional subs with 48 missiles are normally in overhaul and not available for deployment. Their 288 warheads are considered part of the responsive force of reserve warheads. Deployment of the W76-1/Mk-4A is scheduled to begin in March 2008.

***The first figure is the aircraft inventory, including those used for training, testing, and backup; the second is the primary mission aircraft inventory, the number of operational aircraft assigned for nuclear and/or conventional missions.

†The large pool of bombs and cruise missiles allows for multiple loading possibilities depending on the mission. We assume that half of the ALCM’s have been withdrawn from operational status as a consequence of the Bush administration’s 2007 stockpile decision. The ACM was retired in 2007.

†† Approximately 1,260 additional warheads are in reserve, and roughly 5,150 await dismantlement. Spares are not counted by the administration as operational warheads.

other agencies, and Congress has stated that it plans to hold hearings.

Nonstrategic nuclear weapons. The size of the U.S. operational nonstrategic (tactical) nuclear weapons arsenal remains approximately 500, with another 790 in the inactive stockpile. Nonstrategic weapons include the B61-3 and B61-4 gravity bombs, as well as the W80-0 warhead used on the nuclear Tomahawk land-attack cruise missile.

In 2007, we disclosed that the U.S. Air Force had quietly removed nuclear weapons from Ramstein Air Base in Germany.¹³ Seven other bases in six European countries host an estimated 350 B61-3 and B61-4 gravity bombs for delivery by various U.S. and NATO aircraft. The 4th Fighter Wing at Seymour Johnson AFB in North Carolina also has a nuclear strike mission in support of overseas contingencies. Additional inactive tactical bombs are in reserve status stored at Nellis AFB in Nevada and Kirtland AFB.

Approximately 100 active Tomahawk sea-launched cruise missiles have nuclear warheads, and another 200 are kept in inactive reserve. None of the weapons is deployed at sea, kept instead at the Strategic Weapons Facilities at Bangor, Washington, and King's Bay, Georgia, alongside strategic weapons for the SSBNs.

NUCLEAR WARHEAD PRODUCTION. The United States has formally resumed small-scale production of nuclear weapons for the first time since 1992. The NNSA announced in September 2007 that it had certified the first-ever W88 warhead equipped with a replacement plutonium core (pit) for entry into the nuclear stockpile. The pit was produced by the TA-55 facility at Los Alamos National Laboratory in July 2007 after more than a decade of planning and engineering; the goal is to be able to manufacture 10 W88 pits per year to replace those destroyed during routine evaluation. After W88 production is completed, the intention is to produce pits for other stockpiled warheads and expand Los Alamos's capacity to 30–50 pits per year. NNSA has also proposed building a larger factory with a capacity of approximately 125 pits per year.

The Bush administration has proposed large-scale production of so-called reliable replacement warheads, the first of which (RRW-1s) would complement W76-1 and W88 warheads on Trident II D5 SLBMs. In the medium term, the plan involves mixing existing and RRW warheads in the stockpile to increase the diversity of warheads on each of the three legs of the nuclear triad. The new warheads will, the administration claims, have more flexible design parameters and be simpler and cheaper to maintain without nuclear testing. In the long term, all warhead types in the “enduring” stockpile could be replaced. In addition to providing a warhead for the navy's Mk-4 reentry body, the first phase of RRW also includes a warhead for the Mk-21 (W87) and Mk-12A (W78) reentry vehicles for the ICBM force.¹⁴ The Nuclear Weapons Council (a joint body of the Defense Department and NNSA) apparently has approved preliminary design work on an RRW-2, a candidate warhead to replace a portion of the W78 warheads.¹⁵

The administration's plan, which would require refurbishment of the nuclear weapons production complex, ran into congressional opposition in 2007, when the House and Senate agreed to deny funding for the program until a comprehensive review of the nuclear posture has been carried out.¹⁶

Additionally, a technical review by the Jasons panel in September 2007 concluded that the administration's RRW certification plan was inadequate, and that “additional experiments and analysis are needed that explore failure modes, and assess the impact on performance of new manufacturing processes. Substantial work remains on the physical understanding of the surety mechanisms that are of high priority to the RRW program.” The group also said, “It is too early to assess how the [RRW] will impact the modernization and streamlining of NNSA's production complex.”¹⁷

WARHEAD DISMANTLEMENT. The NNSA announced in October 2007 “an astounding 146 percent increase in dismantled nuclear weapons over the previous year's rate, almost tripling its goal of a 49 percent increase.” This

achievement “sends a clear signal to the world that this administration remains committed to reducing the number of nuclear weapons in the U.S. nuclear stockpile,” NNSA declared.¹⁸

While such a percentage looks impressive, the actual number of dismantled warheads is less so—and the real figures are secret. What NNSA failed to say was that because it dismantled few warheads in 2006, even a 146-percent increase does not amount to much when compared to the overall size of the stockpile. Furthermore, the rates are miniscule compared to the number dismantled annually in the 1990s. (See January/February 2004 *Bulletin*.) We estimate that approximately 100 warheads were dismantled in 2006 and roughly 250 in 2007, about the same number as in 2003. That is a far cry from the average of almost 1,800 warheads dismantled per year during the 1990s. At the current rate, the backlog of retired nuclear weapons—even including the “nearly 50 percent” cut in the size of the overall stockpile to be accomplished by 2012—will take through 2023 to complete, the lowest dismantlement rate of any U.S. administration since the Eisenhower administration. The fiscal 2008 Defense Authorization Act calls for a detailed report on the existing plan and schedule for retiring and dismantling excess warheads.¹⁹

The number of warheads scheduled for dismantlement will force the Pantex Plant in Texas to increase its storage capacity to house plutonium pits. Pantex already stores more than 14,000 pits but is expected to run out of room in 2014. To increase the storage capacity to 20,000 pits (the maximum permitted by the environmental impact statement for the site), in July 2007 plant operator Babcock & Wilcox asked the NNSA for authorization to build six new storage magazines.²⁰ ■

FOR NOTES, PLEASE SEE P. 58.

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Kyoto Protocol

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Nuclear notebook

CONTINUED FROM P. 53

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10. Hans M. Kristensen, “U.S. Air Force Decides to Retire Advanced Cruise Missile,” FAS Strategic Security Blog, March 7, 2007, www.fas.org/blog/ssp/2007/03/us_air_force_decides_to_retire.php.

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17. Jasons, “Reliable Replace [sic] Warhead Executive Summary,” *MITRE Corporation*, JSR-07-336E, September 7, 2007, p. 1.

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