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U.S. nuclear forces, 2010

Two important recent events—the signing of New START and the release of the Obama administration's Nuclear Posture Review—will shape the configuration of the U.S. nuclear arsenal for years to come.

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In an unprecedented event, the Pentagon disclosed on May 3, 2010, that its total stockpile of nuclear weapons included 5,113 warheads, a size very close to what we have estimated on these pages. As of January, the United States maintained a nuclear arsenal of an estimated 2,468 operational warheads. The arsenal consists of roughly 1,968 strategic warheads deployed on 798 strategic delivery vehicles and 500 nonstrategic warheads. In addition, approximately 2,600 warheads are held in reserve. That adds up to a total stockpile of about 5,113 warheads. Several thousand retired warheads, probably 3,500-4,500, are awaiting dismantlement.

The number of weapons dismantled each year in 1994-2009 was also declassified, adding to the 1970-1997 list previously disclosed.[1] Secretary of State Hillary Clinton declared at the opening of the nuclear Non-Proliferation Treaty Review Conference in New York: "Beginning today, the United States will make public the number of nuclear weapons in our stockpile and the number of weapons we have dismantled since 1991." [2]

Two important events occurred in April that will have a significant impact on the future of U.S. nuclear forces. The first took place on April 6, when the Obama administration released its Nuclear Posture Review (NPR); the second came two days later, when U.S. President Barack Obama and Russian President Dmitry Medvedev signed New START, an arms control treaty that sets future limits on strategic weapons.[3] In terms of specific force levels, the NPR concludes that the United States can sustain stable nuclear deterrence with approximately 1,550 strategic warheads deployed on its triad of 700 land- and sea-based ballistic missiles and long-range bombers. These force levels are set in New START and must be realized within seven years of its ratification. The NPR also

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TYPE/DESIGNATION	NO.	YEAR DEPLOYED	WARHEADS X YIELD (KILOTONS)	DEPLOYED
ICBMS				
LGM-30G Minuteman III				
Mk-12	~0	1970	1–3 W62 x 170 (MIRV)	~0[1]
Mk-12A	250	1979	1–3 W78 x 335 (MIRV)	250
Mk-21/SERV	200	2006[2]	1 W87 x 300	250
TOTAL	**450**			**500**
SLBMs[3]				
UGM-133A Trident II D5	288			
Mk-4		1992	4 W76 x 100 (MIRV)	568
Mk-4A		2008	4 W76-1 x 100 (MIRV)	200
Mk-5		1990	4 W88 x 455 (MIRV)	384
TOTAL	**288**			**1,152**
Bombers				
B-52H Stratofortress	93/44[4]	1961	ALCM/W80-1 x 5–150	216
B-2A Spirit	20/16	1994	B61-7/-11, B83-1	100
TOTAL	**113/60**			**316**[5]
Nonstrategic forces				
Tomahawk SLCM	325	1984	1 W80-0 x 5–150	(100)[6]
B61-3, -4 bombs	n/a	1979	0.3–170	400[7]
TOTAL	**>325**			**500**
GRAND TOTAL				**~2,468**[8]

1. The air force missed the October 1, 2009, deadline for the retirement of the W62 warhead, but we estimate the warhead has probably been removed from operational missiles.

2. The W87 was first deployed on the MX/Peacekeeper in 1986.

3. Two additional subs with 48 missile tubes are normally in overhaul and not available for deployment. Their 48 missiles with 288 warheads are considered part of the responsive force of reserve warheads. Delivery of the W76-1/Mk4A First Production Unit occurred in late October 2008, and the warhead formally entered the stockpile in early 2009.

4. 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.

5. The pool of bombs and cruise missiles allows for multiple loading possibilities depending on the mission. We estimate that the force level of 528 ALCMs of all categories by 2012 has already been achieved, of which 216 are operationally deployed on bases, and that gravity bombs are only operationally deployed with the B-2.

6. The TLAM/N is in the process of being retired.

7. Approximately 200 B61 bombs are deployed at six bases in five European NATO countries.

8. The U.S. government does not count spares as operational warheads. We have included them in the reserve, which we estimate contains approximately 2,600 warheads. Several thousand other retired warheads are awaiting dismantlement.

ALCM: air-launched cruise missile

ICBM: intercontinental ballistic missile

MIRV: multiple independently targetable reentry vehicle

SERV: security enhanced reentry vehicle

SLCM: sea-launched cruise missile

SLBM: submarine-launched ballistic missile

TLAM/N: tomahawk land attack missile-nuclear

determines that the U.S. reserve of non-deployed warheads can be "significantly reduced," but that "some" warheads will continue to be stored in case of technical problems or international developments.[4]

Like previous arms control agreements, New START does not require the destruction of Russian and U.S. nuclear warheads, but it does limit how many can be deployed on ballistic missiles and bombers. In terms of verification, the treaty will count actual deployed warheads on ballistic missiles, but unlike the original START, it will attribute only one warhead to each nuclear-capable bomber. As a result, both Russia and the United States will be able to deploy all but a few dozen of the 1,550 warheads on ballistic missiles.[5] At the current rate of reductions, the U.S. could reach the New START limit as soon as this year.[6]

New declaratory nuclear policy. There are many differences between Obama's 2010 NPR and George W. Bush's 2001 NPR. Foremost among them is the country's declaratory nuclear policy. The Obama posture review states: "The fundamental role of U.S. nuclear weapons, which will continue as long as nuclear weapons exist, is to deter nuclear attack on the United States, our allies, and partners." [7] The objective to deter "nuclear" attack represents a narrowing of the Bush administration's policy to deter any attack involving "weapons of mass destruction," a designation that includes biological and chemical weapons.[8] Defense Secretary Robert Gates explained that "the term 'fundamental purpose' basically made clear—and other language makes clear—this is obviously a weapon of last resort." [9] The change was accordingly accompanied by a revamped negative security assurance: "The United States will not use or threaten to use nuclear weapons against non-nuclear weapon states that are party to the [Nuclear Non-Proliferation Treaty] and in compliance with their nuclear nonproliferation obligations." [10]

There is some uncertainty about whether this change in declaratory policy will actually affect the role of U.S. nuclear weapons. On *Face the Nation*, Gates explained, "The new part of this is that we would not use nuclear weapons against a non-nuclear state that attacked us with chemical and biological weapons." [11] Yet the 2010 NPR also states that among the countries not covered by the negative security assurance, "there remains a narrow range of contingencies in which U.S. nuclear weapons may still play a role in deterring a conventional or [chemical and biological weapons] attack against the United States or its allies and partners." Thus, the posture review concludes that Washington is "not prepared at the present time to adopt a universal policy that the 'sole purpose' of U.S. nuclear weapons is to deter nuclear attack on the United States and our allies and partners." [12]

In other words, if a country *is* in compliance with the Nuclear Non-Proliferation Treaty (NPT) and attacks the United States or its allies with chemical and biological weapons, then it will not be subject to nuclear retaliation. But if that country is *not* in compliance with the NPT (or if it possesses nuclear weapons) and it uses chemical, biological, or even conventional weapons against Washington or its allies and partners, then the United States might retaliate with nuclear weapons.

The 2010 NPR states that Washington "will not develop new nuclear warheads," although it leaves "new" undefined.

Either way, the role of U.S. nuclear weapons will probably remain the same. The U.S. strategic nuclear war plan includes six adversaries: Russia, China, North Korea, Iran, Syria, and a 9/11-type WMD attack by a non-state actor in cooperation with a nuclear state.[13] Russia and China are not affected by the change; North Korea and non-state actors are not NPT members; and Iran and Syria are not in full NPT compliance due to insufficient cooperation with the International Atomic Energy Agency (IAEA). (The determination of compliance is made by the United States, not the IAEA.)

Nuclear warhead production. The 2010 NPR states that Washington "will not develop new nuclear warheads," although it leaves "new" undefined. Washington might produce so-called life extension program warheads, but the posture review says life extension programs "will use only nuclear components based on previously tested designs and will not support new military missions or provide for new military capabilities." Under the Obama administration's plan, "the full range of [life extension program] approaches will be considered: refurbishment of existing warheads, reuse of nuclear components from different warheads, and replacement of nuclear components."

Mindful of the international repercussions of producing replacement warheads, the posture review promises, "Any decision to proceed to engineering development for warhead [life extension programs] . . . will give strong preference to options for refurbishment or reuse. Replacement of nuclear components would be undertaken only if critical Stockpile Management Program goals could not otherwise be met, and if specifically authorized by the president and approved by Congress." While this policy suggests that the Obama administration is unlikely to produce replacement warheads, it is broad enough to permit production of Reliable Replacement Warheads in the future.

For now, the NPR recommends three warhead production projects: (1) fully fund the W76-1 warhead for completion in fiscal 2017;

(2) produce the B61-12 starting in fiscal 2017; and (3) initiate a study on a W78 life extension program in fiscal 2010. To produce replacement plutonium cores ("pits") for nuclear weapons, the posture review not only funds the Chemistry and Metallurgy Research Replacement Project and Nuclear Facility at Los Alamos National Laboratory, but also allows for increased funding if necessary. At the moment, the facility is budgeted at $1.86 billion through fiscal 2015.[14] In 2008, the Bush administration proposed that the facility be able to produce 20 plutonium pits per year, with an emergency capacity of 80 pits per year by 2022. However, a 2009 study by the esteemed JASON panel of independent experts refuted claims that replacement warheads are needed because of existing warhead unreliability.[15] Nevertheless, a vigorous debate is expected this year over what it means to modernize U.S. forces and the related issue of whether life extension programs can, or should, add new military capabilities to existing warheads.

A vigorous debate is expected this year over what it means to modernize U.S. forces and the related issue of whether life extension programs can, or should, add new military capabilities to existing warheads.

Nuclear war planning and organization. The posture review's impact on the strategic U.S. nuclear war plan will become apparent later this year after Obama issues his first guidance to the military on how it should plan for the potential use of nuclear weapons. The current plan, known as Operations Plan (OPLAN) 8010-08 Strategic Deterrence and Global Strike, was put into effect in February 2008 and updated in February 2009.

It contains a "family" of strike plans against six adversaries (mentioned above) but focuses mainly on Russia and China, the potential adversaries with the largest arsenals. The strike plans consist of Selective Attack Options, Basic Attack Options, Emergency Response Options, and Directed/Adaptive Planning Capability Options designed to cover many contingencies and objectives. The strategic war plan no longer contains Major Attack Options, a hallmark of the Cold War-era Single Integrated Operational Plan.[16]

To practice OPLAN 8010-08, U.S. Strategic Command conducted the Global Thunder 09 nuclear exercise last September, testing the readiness of U.S. ballistic missiles and long-range bombers. Shortly afterward, Russia requested an "open display" of B-2 bombers at Whiteman Air Force Base (AFB) in Missouri and an intercontinental ballistic missile (ICBM) reentry vehicle on-site inspection at Warren AFB in Wyoming in accordance with START. These were the last Russian inspections in the United States under the treaty, which expired on December 5, 2009.

In an effort to increase the readiness and proficiency of its nucle-

ar mission, the air force recently reorganized its nuclear command structure. In particular, Air Force Global Strike Command, based at Barksdale AFB in Louisiana, took control of the ICBM force on December 1, 2009, and the long-range bomber force on February 1, 2010, consolidating all strategic air force wings under one command. The 798th Munitions Maintenance Group was set up at Minot AFB in North Dakota in August 2009 to lead maintenance, handling, and surveillance of the ICBM arsenal. Meanwhile, the 498th Munitions Maintenance Group was relocated from Kirtland AFB in New Mexico to Whiteman to oversee the bombers. It commands the 898th Munitions Squadron and the 708th Nuclear Sustainment Squadron at Kirtland AFB and is subordinate to the 498th Nuclear Systems Wing at Kirtland, which is responsible for sustaining nuclear bombs and cruise missiles. In addition, standardization and training of nuclear inspection teams have been changed to improve the quality of the 10-14 Nuclear Surety Inspections that are performed annually across the major commands.

It is unclear whether the ICBM force will be reduced under New START; there are several possibilities, including retiring 50–150 missiles. The decision will be contentious because it will affect budgets and jobs at air force bases in Wyoming, Montana, and North Dakota.

Land-based ballistic missiles. The U.S. ICBM force has undergone significant changes since the Moscow Treaty was signed in 2002; it will continue to change under New START. Approximately 500 warheads are now deployed on 450 ICBMs—a reduction of 50 warheads from 2009 levels, due to the retirement of the 170-kiloton W62 warhead. (All W62 warheads have probably been removed from operational missiles, although the Pentagon missed its September 2009 deadline for retiring the weapon completely.) The modern 300-kiloton Mk 21/W87 Safety Enhanced Reentry Vehicle is replacing the W62; the W87's increased yield and accuracy broadens the range of targets of the Minuteman ICBM force.

After the START II requirement to reduce ICBMs' nuclear payload to a single warhead was abandoned, the Bush administration decided to retain some missiles with multiple independently targetable reentry vehicles (MIRVs). In a reversal, the Obama NPR has determined that the ICBMs will be "de-MIRVed" after all, although the capability to re-MIRV the missiles will be retained. It is unclear whether the ICBM force will be reduced under New START; there are several possibilities, including retiring 50–150 missiles. The decision will be contentious because it will affect budgets and jobs at air force bases in Wyoming, Montana, and North Dakota.

The multi-year, $7 billion upgrade of the Minuteman III ICBM is nearly complete, and the service life of the Minuteman III has been

extended to 2030, delaying plans to deploy a replacement ICBM in 2018. The NPR decided to begin studies in 2011-2012 for a new ICBM to replace the Minuteman III sometime between 2030 and 2040. The study will examine "a range of possible deployment options" that "support continued reductions in U.S. nuclear weapons while promoting stable deterrence."[17]

The 341st Missile Wing Plans and Programs Office stated, "An Empty Quiver has generally been seen as an impossibility, but due to an ever-changing and diverse threat environment . . . the [United States] no longer has the luxury of assuming what is and what is not possible."

There were two Minuteman III flight-tests in 2009, compared to four in 2008. A missile taken from Minot AFB was test-launched from Vandenberg AFB in California on June 29; the three unarmed W78/Mk-12A reentry vehicles flew approximately 6,740 kilometers (4,190 miles) to near Kwajalein Atoll in the Marshall Islands. On August 23, another Minuteman III, probably from Malmstrom AFB, was test-launched with a single reentry vehicle over the same range. Additional simulated launches occurred at the ICBM bases; one exercise took place at Minot AFB in May, and another took place one month later.

The ICBM wings also conducted several nuclear exercises during 2009. In June at Warren AFB, 1,300 personnel from 11 federal agencies conducted Nuclear Weapons Accident/Incident Exercise 2009, a simulated terrorist attack against the base. And between November 30 and December 9 at Warren AFB, the 20th Air Force carried out a Combat Capability Evaluation, which was followed by a no-notice Limited Nuclear Surety Inspection conducted by Air Force Global Strike Command.

The 15th Munitions Squadron stood up at Warren AFB in August 2009 to assume responsibility for the weapons storage area that houses the base's nuclear weapons. (It replaced the 90th Missile Maintenance Squadron.) That same month, the 16th Munitions Squadron was activated at Malmstrom AFB to operate the weapons storage area there.

The 341st Missile Wing at Malmstrom received a Limited Nuclear Surety Inspection in early February 2009, which was a re-inspection prompted by a failed Nuclear Surety Inspection in October 2008. Two months later, the wing was the focus of a simulated "Empty Quiver" incident, during which 120-150 personnel practiced how to respond to, and recover, a lost, stolen, or seized nuclear warhead. The 341st Missile Wing Plans and Programs Office stated, "An Empty Quiver has generally been seen as an impossibility, but due to an ever-changing and diverse threat environment . . . the [United States] no longer has the luxury of assuming what is and what is not possible."[18]

The 92nd Missile Wing at Minot AFB underwent a no-notice Limited Nuclear Surety Inspection from the Air Force Global Strike Command in the first week of December 2009.

Ballistic missile submarines. On March 27, 2009, the nuclear-powered ballistic missile submarine (SSBN) *Alaska* arrived at Kings Bay Naval Submarine Base in Georgia after completing a 26-month refueling overhaul at the Norfolk Naval Shipyard in Virginia. The SSBN was previously based at Bangor Naval Submarine Base in Washington. The transfer completes the realignment of SSBNs between the Pacific and Atlantic coasts and increases the number of SSBNs based at Kings Bay from five to six. The remaining eight SSBNs are based at Kitsap Naval Submarine Base near Bangor. The 2010 NPR recommends retaining a fleet of 14 SSBNs for the time being, but two boats could be retired toward the end of the decade. The 12-boat force level matches the navy's long-range shipbuilding plan. The posture review also supports development of a follow-on to the Ohio-class SSBN, which will begin retiring in 2027. Each new submarine, tentatively known as SSBN(X), will probably carry 16 submarine-launched ballistic missiles (SLBMs).

The 12 operational SSBNs carry a total of 288 Trident II D5 SLBMs. (Two additional SSBNs undergo overhaul at any given time; their 48 missiles and associated warheads are not counted by the Moscow Treaty or New START.) We estimate that each missile carries an average of four warheads for a total of 1,152 warheads on the 12 deployed SSBNs. Surprisingly, the 2010 NPR declares that even if Washington reduces the SSBN force to 12 boats, "this decision will not affect the number of deployed nuclear warheads on SSBNs."[19] Apparently, the Trident force has been the predominant U.S. nuclear strike platform for some time and seems to increase in importance under New START. Together with bombers, the SSBNs will be the main upload platform for reserve warheads.

The SSBN force conducted 31 strategic deterrent patrols during 2009, the same number as in 2008. With eight SSBNs based in the Pacific Ocean versus six in the Atlantic Ocean and a patrol rate comparable to that of the Cold War, more than two-thirds of U.S. SSBN patrols now take place in the Pacific, compared to only one-seventh during the 1980s. This change reflects a shift in strategic focus from the Soviet Union/Russia to China and other potential adversaries in the Pacific region.

Procurement of the D5LE, a modified Trident II D5 SLBM, began in 2008 and doubled from 12 to 24 missiles in 2009. A total of 108 missiles will be purchased through 2012, at a cost of more than $4 billion. The first D5LE will be deployed this year. It will arm Ohio-class SSBNs for the rest of their service lives, which have been extended from 30 to 44 years.

In terms of age, the oldest SSBN is scheduled to retire in 2027, followed by the next boat in 2030, reducing the SSBN force to 12. To offset subsequent retirements, the navy plans to begin building the first SSBN(X) boat in 2019, the second boat in 2022, and another boat every year from 2024 until 2033.[20] The first SSBN(X) is scheduled to become operational in 2029. It will likely carry fewer missiles than the current Ohio-class SSBN—probably 16—to permit more boats under future arms control agreements and more operational flexibility. The new SSBN program is projected to cost more than $80 billion.

Deployment of the W76-1/Mk-4A warhead, a modernized version of the existing W76/Mk-4, is under way. The warhead is equipped with a new fuse that allows more flexibility in setting the height of burst, which, according to the Energy Department, would "enable W76 to take advantage of [the] higher accuracy of [the] D5 missile" and bring more targets, including hard targets, within range.[21] The first W76-1/Mk-4A was delivered in late October 2008 and entered the stockpile in February 2009. The Bush administration decided in 2005 to upgrade 63 percent of the 2001 inventory of W76s—corresponding to roughly 2,000 warheads—by fiscal 2021. The 2010 posture review speeds up the completion date of this program to fiscal 2017.[22]

Similar to the air force command reorganization, the navy recently split its Submarine Group Trident in two; one half now oversees Submarine Group 10 at Kings Bay, and the other oversees Submarine Group 9 at Kitsap. Submarine Group 10 will be further subdivided with two different commodores, one for the SSBNs of Submarine Squadron 20, and the other for the cruise-missile submarines of Submarine Squadron 16.

Last year, U.S. SSBNs flight-tested four Trident II D5 missiles. The *Alabama* launched one D5 in the Pacific on February 3. The *West Virginia* launched one missile in the Atlantic on September 3 and another on the following day. Finally, the *Alaska* launched a D5 in the Atlantic on December 19, marking the 130th consecutive successful D5 flight test since 1989.[23] (A media report from early 2010 that a U.S. SSBN test-launched an SLBM during an exercise in the Middle East is untrue.)

Strategic bombers. The air force possesses 20 B-2s and 93 B-52Hs, of which 18 and 76, respectively, are nuclear-capable. Of these, only 16 B-2s and 44 B-52s are thought to be fully nuclear certified at any given moment. The 2010 NPR determines that some of the nuclear-capable B-52s will be converted to a conventional-only role.

For the past several years, we have estimated that approximate-

ly 500 of the 2,140 deployed strategic warheads were deployed at Barksdale, Minot, and Whiteman AFBs. But in connection with the signing of New START, we learned that the air force has removed more warheads from the bases. Consequently, we estimate that only 316 bomber weapons are left across the three bases. The bomber weapons include B61-7, B61-11 (for B-2s only), and B83-1 gravity bombs and the air-launched-cruise-missile-delivered W80-1 (for B-52Hs only). Since New START does not count actual bomber weapons (only aircraft), the pressure to reduce weapons on the bomber bases is gone.

As for force enhancements, in December 2009, the air force authorized full-scale production of new advanced radars for its B-2s. The $1.2 billion program will provide the bombers with advanced electronically scanned array antennas. The first B-2 fitted with the new radar was delivered in March 2009, and the upgrade will be complete by 2011. The NPR announces that the Defense Department "will invest more than $1 billion over the next five years to support upgrades to the B-2 stealth bomber. These enhancements will help sustain survivability and improve mission effectiveness."[24]

In terms of inspections and tactical exercises, the 2nd Bomb Wing at Barksdale AFB received Nuclear Surety Staff Assistance Visits last summer in preparation for a Nuclear Surety Inspection. A no-notice Nuclear Surety Inspection was held two months later and another in January. In February 2009, B-52Hs from the 2nd Bomb Wing conducted a Global Power training mission, during which they flew across the Atlantic Ocean, traveled over the Mediterranean Sea, and landed at Diego Garcia in the Indian Ocean. Afterward, they continued east, stopping at Andersen AFB in Guam, before heading back to Barksdale AFB. "This sends a clear message that we can hold any target at risk throughout the globe," according to a Bomb Wing statement. "Our demonstration of our capability is a critical part of the deterrence equation."[25] The Global Power mission was followed by a four-month extended forward deployment of B-52Hs from the 2nd Bomb Wing to Andersen.

The 5th Bomb Wing at Minot AFB conducted a Bomber Strategic Aircraft Regeneration Team exercise on January 28, 2009, that simulated setting up an alternative deterrent base at a forward location. Similarly, a nuclear operational readiness exercise known as Prairie Vigilance 09-7 was conducted over a period of 10 days starting in late April 2009. It involved 12 B-52Hs from both Minot and Barksdale AFBs and more than 3,500 personnel and was intended to demonstrate the U.S. ability to employ nuclear weapons. The wing received a no-notice Nuclear Surety Inspection about a month later. In September, it absorbed the 69th Bomb Squadron, which enables B-52H squadrons from Minot and Barksdale AFBs to focus one

squadron on the nuclear mission for six-month intervals. Consequently, 10 B-52Hs will gradually transfer from Barksdale to Minot, eventually increasing the total number of combat-ready B-52Hs at Minot from 12 to 22. In preparation for the transfer, the 69th Bomb Squadron received its Initial Nuclear Surety Inspection in January 2010.

The latest NPR does not make a public decision on the future of the nuclear deployments in Europe. Instead, it leaves it to NATO's Strategic Review process to determine the future role of nuclear weapons in the alliance.

The B-2s of the 509th Bomb Wing at Whiteman conducted numerous nuclear exercises and inspections in 2009, including two no-notice Nuclear Surety Inspections. Additionally, a Nuclear Operational Readiness Exercise was held there on August 10; a week later, the 72nd Test and Evaluation Squadron for Air Combat Command conducted a nuclear weapons system evaluation program inspection. A second Nuclear Operational Readiness Exercise called Spirit Force 09-5 was held on September 29, followed by a Nuclear Operational Readiness Inspection a few weeks later. Four B-2s from the wing's 13th Bomb Squadron deployed for a four-month extended deployment at Andersen AFB. They were accompanied by 14 F-22s, marking the first time the two stealth aircraft had been deployed simultaneously to Guam. During the forward deployment, the B-2s and F-22s carried out a 24-hour, 16,000-kilometer (9,940-mile) training exercise to Alaska and back to showcase the global reach of the U.S. bomber force. After dropping 20 joint direct attack munitions on the Alaska Range Complex, the B-2s "then took part in the large-force portion of the exercise with F-22s providing escort to the B-2s into a highly defended area by Red Air threats and by surface-to-air missiles," according to an air force press release. "The overall point of the exercise was to coordinate the B-2s and the F-22s through a low observable integration mission."[26]

Nonstrategic nuclear weapons. The United States retains approximately 500 active nonstrategic nuclear warheads. These consist of approximately 400 B61 gravity bombs and 100 W80-0 warheads for sea-launched, land-attack Tomahawk (TLAM/N) cruise missiles. Another 700–800 nonstrategic warheads, including roughly 190 W80-0 warheads, are in inactive storage. Neither the Moscow Treaty nor New START places limits on Russian and U.S. inventories of nonstrategic nuclear weapons.

About 200 B61 bombs are deployed in Europe at six airbases in five NATO countries (Belgium, Germany, Italy, the Netherlands, and Turkey).[27] The aircraft that are assigned nuclear strike missions with U.S. nuclear weapons include Belgian and Dutch F-16s and German and Italian Tornadoes. Although they no longer are

thought to have a nuclear strike mission, Turkish and Greek aircraft occasionally participate in NATO's Steadfast Noon nuclear exercises, probably as air defense aircraft.

The latest NPR does not make a public decision on the future of the nuclear deployments in Europe. Instead, it leaves it to NATO's Strategic Review process to determine the future role of nuclear weapons in the alliance. The posture review states that the F-35 Joint Strike Fighter will be equipped with a B61 nuclear capability starting in 2017 to replace F-15s and F-16s in the nuclear strike role. Even if the weapons are withdrawn from Europe, the U.S. plans a fleet of nuclear F-35s in the United States to "retain the capability to forward-deploy non-strategic nuclear weapons in support of its Alliance commitments."

In a significant development, the 2010 NPR recommends that the nuclear version of the TLAM be retired. Designed for deployment on selective attack submarines, the TLAM/N is now stored at the SSBN bases in Washington and Georgia.

Stockpile management. The total U.S. stockpile of roughly 5,100 warheads is organized in two overall categories: active and inactive warheads. The deployed category includes 2,468 intact warheads (with all the components) deployed on operational delivery systems. The approximately 2,600 non-deployed warheads are either active in the "responsive force" that can be deployed on operational delivery systems in a relatively short amount of time or inactive and in long-term storage with their limited-life components (i.e., tritium) removed. Several thousand retired warheads, probably 3,500-4,500, are awaiting dismantlement.

The nearly 14,000 pits (plutonium cores) that the United States stores at Pantex make up most of the 38 tons of plutonium reserved for nuclear weapons. The stockpiled warheads contain roughly 15 tons of plutonium, or an average of three kilograms per warhead. More than 5,000 thermonuclear secondaries, or canned assemblies, are kept at the Oak Ridge Y-12 Plant in Tennessee. ■

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NOTES

1. U.S. Department of Defense, *Increasing Transparency in the U.S. Nuclear Weapons Stockpile*, Fact Sheet, May 3, 2010. Available at http://www.defense.gov/npr/docs/10-05-03_Fact_Sheet_US_Nuclear_Transparency__FINAL_w_Date.pdf; U.S. Department of Defense, Background Briefing on Nuclear Stockpile, May 3, 2010. Available at http://www.defense.gov/advisories/advisory.aspx?advisoryid=3211

2. U.S. Department of State, *Remarks at the Review Conference of the Nuclear Nonproliferation Treaty*, May 3, 2010. Available at http://www.state.gov/secretary/rm/2010/05/141424.htm

3. Officials New START documents are available at http://www.state.gov/t/vci/trty/126118.htm

4. The Nuclear Posture Review and other official documents relating to U.S. nuclear policy are available at http://www.defense.gov/npr/

5. The State Department website includes the text and protocol of New START, as well as many other fact sheets and documents. U.S. Department of State, "New Strategic Arms Reduction Treaty (New START)," Bureau of Verification, Compliance, and Implementation. Available at http://www.state.gov/t/vci/trty/126118.htm.

6. See: Hans M. Kristensen, "U.S. Moves Rapidly Toward New START Warhead Limit," FAS Strategic Security Blog, May 2, 2010, available at http://www.fas.org/blog/ssp/2010/05/downloading.php

7. U.S. Department of Defense, Office of the Secretary of Defense, *Nuclear Posture Review Report*, April 2010, p. vii. Available at http://www.defense.gov/npr/docs/2010%20Nuclear%20Posture%20Review%20Report.pdf.

8. The previous declaratory policy, stated most recently in February 2008 by Stephen Hadley, then national security advisor: "The United States has made clear for many years that it reserves the right to respond with overwhelming force to the use of *weapons of mass destruction* against the United States, our people, our forces, and our *friends* and allies. *Additionally*, the United States will hold any state, *terrorist group, or other non-state actor* fully accountable for supporting or enabling terrorist efforts to obtain or use weapons of mass destruction, whether by facilitating, financing, or providing expertise or safe haven for such efforts." Emphasis added. White House, "Remarks by the National Security Advisor, Stephen Hadley, to the Center for International Security and Cooperation," February 8, 2008, p. 5.

9. U.S. Department of Defense, "DOD News Briefing with Secretary Gates, Navy Adm. Mullen, Secretary Clinton, and Secretary Chu from the Pentagon," April 6, 2010. Available at http://www.defense.gov/Transcripts/Transcript.aspx?TranscriptID=4599.

10. U.S. Department of Defense, Office of the Secretary of Defense, *Nuclear Posture Review Report*, April 2010, p. viii. Available at http://www.defense.gov/npr/docs/2010%20Nuclear%20Posture%20Review%20Report.pdf. The previous formulation, first adopted in 1978, and restated in 2002, said: "[The United States] will not use nuclear weapons against non-nuclear weapon states parties to the [Nuclear Non-Proliferation Treaty], except in the case of an invasion or any other attack on the United States, its territories, its armed forces or other troops, its allies, or on a state toward which it has a security commitment, carried out or sustained by such a non-nuclear weapon state in association or alliance with a nuclear weapon state." See Philipp C. Bleek, "Bush Administration Reaffirms Negative Security Assurances," *Arms Control Today*, March 2002. Available at http://www.armscontrol.org/print/1010.

11. U.S. Department of State, "Interview with Bob Schieffer of CBS's 'Face the Nation,' Hillary Rodham Clinton, Secretary of State, Robert Gates, Secre-

tary of Defense," April 9, 2010. Available at http://www.state.gov/secretary/rm/2010/04/139974.htm.

12. U.S. Department of Defense, Office of the Secretary of Defense, *Nuclear Posture Review Report*, April 2010, p. 16. The Nuclear Posture Review cautions that despite the pledge not to use nuclear weapons against non-nuclear weapon states that are in compliance with the Nuclear Non-Proliferation Treaty, because of the catastrophic potential of biological weapons and the rapid pace of biotech development, "the United States reserves the right to make any adjustment in the assurance that may be warranted by the evolution and proliferation of the biological weapons threat and U.S. capacities to counter that threat."

13. Hans M. Kristensen, "Obama and the Nuclear War Plan," Federation of American Scientists (FAS) Strategic Security Blog, February 2010, p. 3. Available at http://www.fas.org/programs/ssp/nukes/publications1/WarPlanIssueBrief2010.pdf.

14. U.S. National Nuclear Security Administration (NNSA), "FY2011 Congressional Budget Request," February 2010, pp. 173–74. See also NNSA, "Record of Decision for the Complex Transformation Supplemental Programmatic Environmental Impact Statement: Operations Involving Plutonium, Uranium, and the Assembly and Disassembly of Nuclear Weapons," *Federal Register*, vol. 73, no. 245, December 19, 2008, pp. 77647–56. Available at http://edocket.access.gpo.gov/2008/pdf/E8-30194.pdf.

15. JASON Program Office, "Life Extension Program, Executive Summary," MITRE Corporation, September 9, 2009. Available at http://www.fas.org/programs/ssp/nukes/nuclearweapons/jason2009.pdf.

16. Hans M. Kristensen, *Obama and the Nuclear War Plan*, FAS Issue Paper, February 2010, available at http://www.fas.org/blog/ssp/2010/02/warplan.php

17. Office of the Secretary of Defense, *Nuclear Posture Review Report*, April 2010, p. 23. Available at http://www.defense.gov/npr/docs/2010%20Nuclear%20Posture%20Review%20Report.pdf.

18. U.S Air Force, 341st Missile Wing Plans and Program Office, "Interagency Nuclear Recovery Exercise to Take Place," April 15, 2009.

19. U.S. Department of Defense, Office of the Secretary of Defense, Nuclear Posture Review Report, April 2010, p. 22.

20. Ronald O'Rourke, "Navy Force Structure and Shipbuilding Plans: Background and Issues for Congress," Congressional Research Service Report for Congress, RL32665, December 22, 2009, pp. 7, 11.

21. U.S. Department of Energy, Office of Defense Programs, *Stockpile Stewardship and Management Plan: First Annual Update* (Energy Department: Washington, D.C., October 1997), pp. 1–14. (Partially declassified and released under the Freedom of Information Act.)

22. U.S. Department of Defense, Office of the Secretary of Defense, *Nuclear Posture Review Report*, April 2010, p. 16. For the Bush administration's 2005 decision, see Hans M. Kristensen, "Administration Increases Submarine Nuclear Warhead Production Plan," FAS Strategic Security Blog, August 30, 2007. Available at http://www.fas.org/blog/ssp/2007/08/us_tripples_submarine_warhead.php. For the statement about a ramped-up production rate, see Brig. Gen. Garrett Harencak, U.S. Air Force, Principle Assistant Deputy Administrator for Military Application, "Statement Before the Subcommittee on Energy and Water Development of the House Appropriations Committee, Hearing on the Department of Energy Weapons Activities and Naval Reactors, 2011 Budget," March 4, 2010, Federal News Service transcript, p. 11.

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25. U.S. Air Force, 2nd Bomb Wing Public Affairs, "2nd Bomb Wing Conducts Global Power Mission," February 5, 2009.

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