

# United States of America

*Date of first nuclear explosion- 16 July 1945*

## 1. Amount, Location, and Operational Plan of Nuclear Weapons Strategic Nuclear Weapons

Type	No. Deployed	Range (km)	Warheads x Yield (kilotons)	Warheads in Stockpile: Active/Spares
<i>Bombers</i>				
B-52H Stratofortress	85/56*	16,000	ALCM/W80-1 x 5-150	984/360**
			ACM/W80-1 x 5-150	400
B-2A Spirit	21/16	16,000		533
<b>Subtotal</b>	<b>116/72</b>			<b>1917/360</b>
<i>ICBMs</i>				
LGM-30G Minuteman III: Mk 12	150	13,000	1 W62 x 170	150
LGM-30G Minuteman III: Mk 12	50	13,000	3 W62 x 170 (MIRV)	150
LGM-30G Minuteman III: Mk 12A	150	13,000	2-3 W78 x 335 (MIRV)	450
LGM-30G Minuteman III: Mk 12A	100	13,000	1 W78 x 335	100
LGM-30G Minuteman III: Mk SERV	50	13,000	1 x 300	50
<b>Subtotal</b>	<b>500</b>			<b>900</b>
<i>SLBMs</i>				
UGM-133A Trident II D5*** Mk-4	n/a	>7,400	6 W76 x 100 (MIRV)	1,344
UGM-133A Trident II D5*** Mk-5	n/a	>7,400	6 W88 x 475 (MIRV)	384
<b>Subtotal</b>	<b>336</b>			<b>1,728</b>
<b>Total Strategic Weapons</b>	<b>951</b>			<b>4,543/360</b>

## Tactical Nuclear Weapons

Type	No. Deployed	Range (km)	Warheads x Yield (kilotons)	Warheads in Stockpile: Active/Spares
B61-3, -4 bombs	n/a	n/a	0.3-170	400****
Tomahawk SLCM	320	2,500	1 W80-0 x 5-150	100/190
<b>Total Tactical Weapons</b>				<b>500/190</b>

### Total Nuclear Weapons

<b>Total Active US Nuclear Weapons</b>				<b>5,043</b>
<b>Inactive Weapons (above plus others)</b>				<b>~5,000</b>
<b>Grand Total US Nuclear Weapons</b>				<b>~10,000</b>

http://first.sipri.org/index.php; and Robert S. Norris and Hans M. Kristenson, "U.S. Nuclear Forces, 2007" from *NRDC: Nuclear Notebook*, in *Bulletin of the Atomic Scientists*, January/February 2007, volume 63(1), pp 79-82.

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

\*\*The first figure inis column is for active weapons, while the second is for inactive weapons.

\*\*\*Conversion of the *Henry Jackson* and the *Alabama* to Trident II D5 SLBMs will be completed in 2007 and 2008, respectively, bringing to 14 the number of SSBNs capable of carrying D5s.

\*\*\*\*As many as another 400 B61-3 and -4s are deployed in Belgium, Germany, Italy, the Netherlands, Turkey, and the United Kingdom. Also, B61-10s have been moved to the inactive stockpile.

### US Deployment/Storage Sites

Location (City, State): Type of Weapon Weapons Numbers Breakdown	Status
<b>Bangor, Washington: Trident SLBMs, SLCMs</b>	
1,100 W76s/Trident I C4 SLBMs	Active
850 W76s/Trident I C4 SLBMs	Inactive
264 W88s/Trident II D5 SLBMs	Active
150 W80-0s/SLCMs	Active
<i>Total: 2,364 weapons in Bangor, Washington</i>	
<b>Malstrom AFB, Montana: Minuteman III ICBMs</b>	
150 W62s	In 50 ICBM silos
10 W62s	Spares
200 W78s	In 100 ICBM silos
150 W78s	In 50 ICBM silos
25 W8s	Spares
<i>Total: 535 weapons in Malstrom, AFB, Montana</i>	
<b>Warren AFB, Wyoming: Minuteman III ICBMs</b>	
19 W62s	In 19 ICBM silos
20 W62s	Spares
<i>Total: 39 weapons in Warren AFB, Wyoming</i>	
<b>Warren AFB, Colorado</b>	
46 W62s	In 46 ICBM silos
<i>Total: 46 weapons in Warren AFB, Colorado</i>	
<b>Warren AFB, Nebraska: Minuteman III ICBMs</b>	
85 W62s	In 85 ICBM silos
<i>Total: 85 weapons in Warren AFB, Nebraska</i>	
<b>Minot AFB, North Dakota: B52-H Bombers, Minuteman III ICBMs, ACMs, ALCMs</b>	
194 B61-7 bombs	Active

<b>Location (City, State): Type of Weapon Weapons Numbers Breakdown</b>	<b>Status</b>
130 B83-1, -0 bombs	Active; B-83-0 bombs are inactive
200 W80-1/ALCMs	Active
300 W80-1/ACM	Active
300 W78s	In 100 ICBM silos
100 W78s	In 50 ICBM silos
30 W78s	spares
<i>Total: 1,254 weapons in Minot AFB, North Dakota</i>	
<b>Nellis AFB, Nevada: B83, B61 bombs in storage</b>	
306 B83-1, -0 bombs	In storage; B-83-0 bombs are inactive
186 B61-3 bombs	In storage
204 B61-4 bombs	In storage
206 B61-10 bombs	In storage; inactive
<i>Total: 902 weapons in Nellis AFB, Nevada</i>	
<b>Kirtland AFB, New Mexico: ALCMs, ICBMs, GL- CMs in storage</b>	
711 W80-1/ALCMs	In storage
250 W62s/Minuteman III ICBMs	In storage
553 W87s/MX Peacekeeper ICBMs	In storage
400 W84/GLCMs	In reserve
<i>Total: 1,914 weapons in Kirtland AFB, New Mexico</i>	
<b>Barksdale AFB, Louisiana: B-52H Bombers</b>	
210 B61-7 bombs	Active
130 B83-1, -0 bombs	B-83-0 bombs are inactive
500 W80-1/ALCMs	Active
100 W80-1/ACMs	Active
<i>Total: 940 weapons in Barksdale AFB, Louisiana</i>	
<b>Whiteman AFB, Missouri: B-2 Bombers</b>	
35 B61-7 bombs	Active
41 B61-11 bombs	Active
60 B83-1, -0 bombs	B-83-0 bombs are inactive
<i>Total: 136 weapons Whiteman AFB, Missouri</i>	
<b>Kings Bay, Georgia: Trident SLBMs, SLCMs</b>	
612 W76s/Trident I C4	Active
468 W76s/Trident I C4	Inactive
140 W88s/Trident II D5	Active
144 W80-0s/SLCMs	Active
<i>Total: 1,364 weapons in Kings Bay, Georgia</i>	

Robert S. Norris and Hans M. Kristenson, "Where the Bombs Are, 2006" from *NRDC: Nuclear Notebook*, in *Bulletin of the Atomic Scientists*, November/December 2006, volume 62(61), pp 57-58.

### Foreign Deployment Sites

Around 400 US nuclear weapons are also deployed in Europe, in Belgium, Germany, Italy, the Netherlands, Turkey, and the United Kingdom. For deployment locations, weapons types, and numbers, see the chapters for those states.

### The Role of Nuclear Weapons in National Security Strategy

**Key documents:** Nuclear Posture Review (January 2002), National Security Strategy (September 2002), National Strategy to Counter Weapons of Mass Destruction (December 2002)

Recent security policy documents such as these maintain the role of nuclear weapons in US national security policy, including the use of nuclear weapons in “immediate, potential or unexpected contingencies” against a number of named countries including Iraq, Iran, and North Korea.

The *Nuclear Posture Review (NPR)* establishes a New Triad, composed of:

- Offensive strike system (both nuclear and non-nuclear)
- Defenses (both active and passive)
- A revitalized defense infrastructure that will provide new capabilities in a timely fashion to meet emerging threats.

In March 2005, the Department of Defense posted, and then removed, a controversial draft revision of its doctrine for nuclear weapons operations on its website. The draft used unusually clear language regarding policies on the use of nuclear weapons in a wide variety of circumstances other than retaliation for nuclear weapons use by another state. After much controversy, the DoD withdrew the draft nuclear doctrine documents and cancelled the revision of the doctrine.

<http://www.wslfweb.org/nukes/nukeops.htm>; draft DoD documents at: [http://www.wslfweb.org/docs/doctrine/3\\_12fc2.pdf](http://www.wslfweb.org/docs/doctrine/3_12fc2.pdf); DoD comments available at: <http://www.wslfweb.org/docs/doctrine/cc312fc.pdf>

The *National Security Strategy (NSS)* calls for:

- “Proactive counterproliferation efforts...integrated into the doctrine, training, and equipping of our forces and those of our allies to ensure that we can prevail in any conflict with WMD-armed adversaries
- “Minimizing the effects of WMD use against our people...(to) help deter those who possess such weapons... the United States must also be prepared to respond to the effects of WMD use against our forces abroad”;

The NSS also recognizes that deterrence is no longer “an effective defense” in a post-Cold War scenario. It asserts that “rogue states...see these (WMD) as their best means of overcoming the conventional superiority of the United States.”

The *National Strategy to Counter Weapons of Mass Destruction* has three principal pillars:

- Counterproliferation: Interdiction, deterrence, defense and mitigation
- Strengthened Nonproliferation: Active non-proliferation diplomacy, multilateral regimes, non-proliferation and threat reduction cooperation, controls on nuclear materials, US export controls, non-proliferation sanctions;
- Consequence Management to Respond to WMD Use: Coordination of all federal efforts.

The *Strategic Deterrence Joint Operating Concept*, released in February 2004, is also useful in understanding the role of US nuclear weapons in its national security strategy. According to Western States Legal Foundation, the concept paper intends “to help guide decisions about force development and weapons acquisition. This paper lays out a broad vision of “deterrence” encompassing preemptive warfare and an integrated spectrum of high-tech force, from conventional weapons with global reach to more “credible” nuclear options, intended to allow the U.S. to overpower adversaries anywhere on earth.” <http://www.wslfweb.org/nukes/nukeops.htm>

## 2. Compliance with Article VI of the NPT

### **Nuclear Weapons Modernization/Vertical Proliferation**

In April 2006, the US National Nuclear Security Administration (NNSA) announced its plans for "Complex 2030", a plan to design new nuclear weapons and resume industrial-scale bomb production. The NNSA subsequently published an October "Notice of Intent" to build this Complex, which would cost over US\$ 150 billion over the next 25 years. Complex 2030 will revamp the US nuclear weapons infrastructure. According to a June 2006 NNSA press release,\* it will enable "a smaller, safer, more secure and more reliable stockpile [that] is backed up by a robust industrial and design capability to better respond to changing technical, geopolitical or military needs."

\*[http://www.nnsa.doe.gov/docs/newsreleases/2006/PR\\_2006-06-28\\_NA-06-20.htm](http://www.nnsa.doe.gov/docs/newsreleases/2006/PR_2006-06-28_NA-06-20.htm)

The centerpiece of Complex 2030 is the Reliable Replacement Warhead (RRW). Although the numbers and types of warheads remains unclear, the Department of Energy (DOE) and the US weapons labs see this as a way to rebuild every US nuclear weapon. One DOE report in 2005 envisioned a new-design RRW coming out of the weapons labs every five years, with up to 125 new nuclear weapons being produced each year. On 2 March 2007, the DOE selected a new design for the first nuclear weapon to be produced after the Cold War.

It should be noted that the DOE sees this as a way retain nuclear weapons indefinitely, *while reducing their numbers*. An NNSA factsheet\*\* even stated that, "Once it is demonstrated that replacement warheads can be produced on a timescale in which geopolitical threats could emerge, or the nuclear weapons complex can respond in a timely way to technical problems in the stockpile, further reductions can be made in reducing on-deployed warheads." Thus, the United States will be able to point to weapons reductions while simultaneously planning for the indefinite retention of their nuclear weapons arsenal. \*\* [http://www.nnsa.doe.gov/docs/factsheets/2006/NA-06\\_FS03.pdf](http://www.nnsa.doe.gov/docs/factsheets/2006/NA-06_FS03.pdf)

### **Weapons Systems Modernization**

#### *Missile Upgrades*

Over the next six years, the warheads on the Minuteman III missile force will be changed to almost twice their current yield, and will be more accurate.

#### *Submarine Upgrades*

The Pacific-based nuclear-powered ballistic missile submarines (SSBNs) were upgraded to carry the newer and more accurate Trident II D5 submarine-launched ballistic missile (SLBM), with higher yield warheads. An even newer, modified D5 missile is being produced, with plans for 108 new missiles by 2011, to be deployed in 2013. An SLBM-based warhead is also being modified to include a ground-burst capability, making it more lethal, and is scheduled to be delivered to the navy in September 2007. The four older SSBNs that were converted to nuclear-powered cruise missile submarines (SSGNs), entered into service in 2006, and can each carry up to 154 Tomahawk cruise missiles.

#### *Bomber Upgrades*

The airforce is upgrading both its B-2A Spirit and B-52H Stratofortress bombers' communications systems. The B-52's cruise missiles are undergoing service life-extension programs, extending them to 2030. A modified warhead, the W80-3, is scheduled for delivery in 2008.

### **Nuclear Weapons Reductions**

- Reduced number of deployed strategic warheads to 6,000 by December 1991 as required by the START Treaty;
- Eliminated 1,032 launchers for intercontinental ballistic missiles and submarine-launched ballistic missiles, 350 heavy bombers, and 28 ballistic missile submarines;
- Eliminated nearly 90% of US non-strategic nuclear weapons, reduced the number of non-strategic nuclear weapon storage sites in Europe by 80%, and the types of nuclear systems in Europe from 9 in 1991 to 1;
- Dismantled approx. 13,000 nuclear weapons since 1988;

- Halted production of plutonium for nuclear weapons in 1988;
- Halted nuclear explosive testing in 1992;
- Removed more than 200 tons of fissile material from military stockpile;
- Deactivated 42 of 50 MX (“Peacekeeper”) ICBMs and removed four ballistic missile submarines from strategic service; complete elimination of MX missile expected by end 2005;
- Under the Strategic Offensive Reductions Treaty (SORT, a.k.a. Moscow Treaty), the US will reduce about 80% of strategic nuclear warheads deployed from 1991 levels by 2012.

As noted in Statement by Ambassador Jackie W. Sanders, Special Representative of the President for the Non-Proliferation of Nuclear Weapons to the 2005 Review Conference of the NPT, Main Committee I, New York, 20 May 2005. available at: <http://www.reachingcriticalwill.org/legal/npt/RevCon05/MCI/USA20.pdf>

#### *Missile-Related Reductions*

The US will begin retiring 50 Minuteman III missiles in 2007. The airforce will also begin to reduce the number of warheads per Minuteman III, in order to meet the SORT limits. The US plans to reduce its deployed strategic warheads to 3,500–4,000 by the end of 2007. It looks like the future 450-missile force will carry 500 warheads, with 300 in reserve.

#### *Submarine-Related Reductions*

The navy downloaded the number of warheads per Trident II D5 submarine-launched ballistic missile (SLBM) from 8 to approximately 6 in 2005, and is expected to download again over the next six years to about four warheads per D5 SLBM.

### **Major Nuclear Weapons Facilities Shut Down**

- Rocky Flats (plutonium pit production)
- Mound, Pinellas, Fernald (weapons components)
- Hanford (plutonium production/reprocessing)
- Savannah River, F Canyon (plutonium production reactors)
- Oak Ridge (uranium enrichment)

### **Other Facilities Shut Down**

- Portsmouth uranium enrichment plant
- Fernald uranium metal production for reactor fuel and target rods

## **3. Location and capability of nuclear facilities**

### **Power Reactors**

Operational: 103  
Shut down: 29  
Decommissioned: 0  
Under Construction: 0  
Planned: 0

<http://www.iaea.or.at/programmes/a2/>

### **Research Reactors**

Operational: 41  
Shut Down: 117  
Decommissioned: 69  
Under Construction: 0  
Planned: 0

<http://www.iaea.or.at/worldatom/rddb/>

### **Uranium Enrichment Facilities**

Currently, the United States uses the gaseous diffusion process to enrich uranium. There are two gaseous diffusion plants in the United States, at Piketon, Ohio, and Paducah, Kentucky. Both are operated by the United States Enrichment Corporation (USEC), which was created as a government corporation under the Energy Act of 1992 and privatized by legislation in 1996. The enrichment plant in Portsmouth, Ohio closed on 11 May 2001.

In February 2004, the Nuclear Regulatory Commission (NRC) issued a license for United States Enrichment Corporation (USEC) to construct and operate a demonstration and test facility known as the Lead Cascade, to be located at the Piketon, Ohio plant. In February 2007, the NRC concluded

that USEC's application met all safety requirements. However, the projected costs for the plant have increased from \$1.7 billion to \$2.3 billion, and USEC is looking for investment from other companies and the federal government to keep the uranium enrichment project afloat beyond this year. The estimated completion date for the plant has been pushed back by a year, to 2012.

In June 2006, the NRC issued a license to Louisiana Energy Services to construct and operate a commercial gas centrifuge enrichment facility in Lea County, New Mexico.

<http://www.wise-uranium.org/epusecc.html>; <http://www.nrc.gov/reading-rm/doc-collections/fact-sheets/enrichment.html>  
<http://www.nrc.gov/reading-rm/doc-collections/fact-sheets/enrichment.html>

### Uranium Mines

Site	Location	Status
Anderson mine	Arizona	idle
Arizona 1	Arizona	idle
Canyon Mine	Arizona	construction halted
Pinenut Mine	Arizona	idle
Wate property	Arizona	exploration halted
Workman Creek deposit	Arizona	exploration halted
Cañon City mill	Colorado	idle
Schwartzwalder project	Colorado	idle
Southwest CO (15)	Colorado	operating/idle
Sunday Mine Complex	Colorado	operating
Graysill	Colorado	no information
Hansen property	Colorado	exploration halted
Sapphire Mine	Colorado	under construction
Torbyn Mine	Colorado	under construction
Whirlwind Claim	Colorado	under construction
Paradox Valley	Colorado	no information
Coyote Basin	Colorado	exploration halted
Crow Butte	Nebraska	operating
Big Red	Nebraska	exploration finished
Kings Valley project	Nevada	exploration ongoing
Apex deposit	Nevada	no information

Site	Location	Status
Ambrosia Lake	New Mexico	idle
Churchrock (Strathmore)	New Mexico	under construction
Churchrock (HRI)	New Mexico	idle
Crownpoint	New Mexico	idle
Hosta Butte	New Mexico	exploration halted
La Jara Mesa	New Mexico	no information
Marquez	New Mexico	no information
Mt. Taylor	New Mexico	exploration finished
Ram Claims	New Mexico	exploration halted
Roca Honda	New Mexico	under construction
Noserock	New Mexico	exploration finished
Rio Peurco	New Mexico	no information
Treeline deposit	New Mexico	exploration ongoing
Aurora Property	Oregon	exploration finished
Dewey/Burdock property	South Dakota	exploration ongoing
Goliad deposit	Texas	exploration ongoing
Alta Mesa	Texas	operating
Hobson U plant	Texas	idle
Palangana Mine Property	Texas	idle

Site	Location	Status	Site	Location	Status
Holiday-El Mesquite	Texas	reclamation ongoing	Cyclone property	Wyoming	exploration halted
Kingsville Dome	Texas	idle	East Shirley Basin deposit	Wyoming	no information
Rosita	Texas	idle	Elkhorn project	Wyoming	no information
Vasquez	Texas	operating	Gas Hills Peach project	Wyoming	reclamation ongoing
Bullfrog	Utah	exploration finished	Highland	Wyoming	operating
Tony M mine	Utah	idle	JAB property	Wyoming	exploration halted
Hot Rock	Utah	no information	Jackpot Mine project	Wyoming	exploration finished
Lisbon	Utah	idle	Juniper Ridge	Wyoming	idle
Firefly project	Utah	exploration ongoing	Nichols Ranch	Wyoming	no information
Rim Mine	Utah	idle	Nine Mile Lake	Wyoming	no information
Pandora mine	Utah	operating	North Butte	Wyoming	exploration finished
San Rafael	Utah	exploration finished	Ruth project	Wyoming	exploration finished
Cedar Mountain property	Utah	exploration finished	Peterson Uranium Project	Wyoming	exploration finished
Shootaring Canyon Mine	Utah	idle	Red Desert Basing project	Wyoming	no information
Green River N	Utah	exploration finished	Reno Creek	Wyoming	exploration finished
Green River S	Utah	exploration finished	Lye Property	Wyoming	exploration finished
Velvet Mine	Utah	idle	Reynolds Ranch	Wyoming	exploration finished
Frank M deposit	Utah	exploration finished	Sheep Mountain mines	Wyoming	exploration ongoing
White Mesa mill	Utah	idle	Sky project	Wyoming	no information
Coles Hill deposit	Virginia	no information	Smith Ranch	Wyoming	operating
Ford	Washington	idle	Northwest Unit	Wyoming	no information
Allemand-Ross property	Wyoming	exploration ongoing	Sweetwater Mill	Wyoming	idle
Antelope property	Wyoming	exploration halted	Bear Creek	Wyoming	exploration finished
Cedar Rim claims	Wyoming	no information	Ruby Ranch	Wyoming	exploration finished
Charlie project	Wyoming	exploration finished	Taylor Ranch	Wyoming	exploration finished
Christensen Ranch	Wyoming	reclamation ongoing	Moore Ranch	Wyoming	exploration finished
Copper Mountain U project	Wyoming	no information	Lost Soldier	Wyoming	no information

Site	Location	Status
Lost Creek	Wyoming	no information
Red Rim	Wyoming	exploration finished
George-Ver, Bullrush, and Loco-Lee	Wyoming	exploration halted
Bison Basin	Wyoming	idle

<http://www.antenna.nl/wise/uranium/uousa.html>

#### Nuclear Facilities

Lynchburg, VA: fuel fabrication

Erwin, TN: uranium processing and fuel fabrication

Savannah River Site, SC: reprocessing, some uranium processing

Y-12 plant at Oak Ridge, TN: weapons-related processing

Redox plant, Hanford: military reprocessing; closed

Paducah, KY: uranium enrichment

Metropolish, IL: uranium hexafluoride conversion facility

Lea County, NM: uranium enrichment; under construction

Piketon, OH: uranium enrichment; planned

In March, 2005, the Nuclear Regulatory Commission authorized the construction of a facility at the Savannah River Site in South Carolina to manufacture mixed plutonium and uranium oxide (MOX) fuel for use in commercial nuclear power plants, the first MOX fuel fabrication facility in the US.

<http://www.nrc.gov/materials/fuel-cycle-fac/mox/licensing.html>

#### 4. Fissile Material holdings

##### Military Stocks of Fissile Materials

Plutonium: 47 tons

HEU: 700 (+/- 50) tons

##### Declared Excess

Plutonium: 52.5 tons

HEU: 174.3 tons originally; 123 tons remaining

[http://www.isis-online.org/global\\_stocks/end2003/military\\_pu.pdf](http://www.isis-online.org/global_stocks/end2003/military_pu.pdf) (revised June 30, 2005)

[http://www.isis-online.org/global\\_stocks/end2003/military\\_excess\\_heu.pdf](http://www.isis-online.org/global_stocks/end2003/military_excess_heu.pdf) (revised June 30, 2005)

**Unseparated Civil Plutonium:** 403 tons

**Separated Civil Plutonium:** 4-5 tons declared excess, mostly produced in UK civil reactors decades ago [http://www.isis-online.org/global\\_stocks/end2003/plutonium\\_watch2005.pdf](http://www.isis-online.org/global_stocks/end2003/plutonium_watch2005.pdf) (revised August, 2005)

##### Civil Highly Enriched Uranium

End of 2003: 124 tons

Projected for 2020: 22 tons

[http://www.isis-online.org/global\\_stocks/end2003/civil\\_heu\\_watch2005.pdf](http://www.isis-online.org/global_stocks/end2003/civil_heu_watch2005.pdf) (revised August, 2005)

##### Radioactive Waste Management

Nearly 80 percent of the DOE's inventory of spent fuel is stored in Hanover, Washington.

<http://www.atomicarchive.com/Almanac/USAFacilities.shtml>

In February 2005, a federal licensing board approved a proposed nuclear waste dump on the Skull

Valley Goshute Indian reservation, about 50 miles southwest of Salt Lake. The State of Utah, environmental groups, and the indigenous community fought the plans, and on 7 September 2006 the US Bureau of Land Management rejected transportation plans for shipping the proposed 44,000 tons of highly radioactive waste to the site.

[http://www.nirs.org/radwaste/scullvalley/sv\\_victory91406.htm](http://www.nirs.org/radwaste/scullvalley/sv_victory91406.htm); <http://nucnews.net/nucnews/2005nn/0502nn/050224nn.txt>  
Reed, Travis, "Board Backs Nuclear Waste Dump in Utah," *Seattle Post Intelligencer*, February 24, 2005.

*Low-level waste:* There are three existing low-level waste disposal facilities in the United States in Barnwell, South Carolina, Richland, Washington and Clive, Utah, where LLW are buried in near-surface shallow trenches, usually in the containers in which they were shipped.

<http://www.nrc.gov/waste/llw-disposal.html>

*High-level waste:* Currently, most high-level radioactive waste is stored at the reactor sites. Plans for the underground engineered repository at Yucca Mountain, Nevada, continue to face delays and problems. Most recently, the project encountered one of its greatest setbacks when technical and environmental studies were proved falsified in spring 2005. The Department of Energy has a deadline of June 2008 to submit proposals to the Nuclear Regulatory Commission for approval. The project may face more budget cuts in Congress in summer 2007.

<http://www.nrc.gov/waste/hlw-disposal.html>  
<http://www.lasvegassun.com/sunbin/stories/sun/2007/mar/18/566634792.html?yucca>

## 5. Nuclear activities

### Research Programs

The Department of Energy (DoE) has plans for two research programs: Generation IV (GenIV) and Advanced Fuel Cycle Initiative (AFCI), to identify, design, and deploy new and advanced commercial nuclear power reactor and fuel cycle technologies.

The DoE's Office of Nuclear Energy claimed in September 2003 that the first commercial Gen IV reactor could be deployed between 2020 and 2035.

Under the DoE's Nuclear Power 2010 program, it hopes to complete two new nuclear power plants by the end of the decade. Under the Vision 2020 plan, the Nuclear Energy Institute hopes to generate 50 GW of new US capacity by 2020 despite strong misgivings from some in the scientific and environmental communities. <http://www.nrdc.org/nuclear/bush/fireprocessing.asp>; <http://afci.sandia.gov/>

### Nuclear Research Centers

AATDF - Advanced Applied Technology Demonstration Facility	BNL - Brookhaven National Lab
AFRRI - Armed Forces Radiobiology Research Inst	BNL - Energy and Nuclear Technology Division
AIMTech - Advanced Infrastructure Management Technologies	CANES - Center for Advanced Nuclear Energy Systems EN
Amargosa Desert Research Site	CCT - Center for Clean Technology
Amarillo National Resource Center for Plutonium	CDRH - Center for Devices & Radiological Health
Ames Lab	CEB - Center for Environmental Biotechnology
ANECL - Advanced Nuclear Engineering Computing Laboratory	CEEPR - MIT Center for Energy & Environmental Policy Research
ANL - Argonne National Lab	CENTER - Center for Excellence in Nuclear Technology, Engineering, & Research
ANRC - Amarillo National Research Center	Center for Hazardous Waste Remediation Research
ASTD - Accelerated Site Technology Deployment	CeRaM - Center for Radioactive Waste Management
ATRP - Advanced Technology Research Project for Nuclear Technologies	CERF - Civil Engineering Research Foundation
Battelle Memorial Inst	CGER - Commission on Geosciences, Environment
Bettis Atomic Power Laboratory	

& Resources	NDCEE - National Defense Center for Environmental Excellence
CISAC - Center for International Security & Cooperation	NERAC - Nuclear Energy Research Advisory Committee EN
CNDE - Center for Non-Destructive Evaluation	NERI - DOE Nuclear Energy Research Initiative EN
CNRWA - Center for Nuclear Waste Regulatory Analyses	NERSC - National Energy Research Scientific Computing Center
Crocker Nuclear Laboratory	NETL - National Energy Technology Laboratory
DARPA - Defense Advanced Research Projects Agency	New Mexico Environmental Evaluation Group [WIPP Review]
ERL - NOAA Environmental Research Labs	NIH - National Inst of Health
ESTCP - Environmental Security Technology Certification Program	NIST Boulder Laboratories
Federal Laboratory Consortium for Technology Transfer EN	NRC - National Research Council
Fernald Environmental Management Project	NRL - Naval Research Laboratory
FETC - Federal Energy Technology Center	NRRI - National Regulatory Research Institute
FFTF - Fast Flux Test Facility	NSF - National Science Foundation
Floyd R. Newman Laboratory of Nuclear Studies	NSTG - Nuclear Science & Technology Group
FNAL - Fermi National Accelerator Lab	NTLF - National Tritium Labelling Facility
Great Lakes Mid-Atlantic Center for Hazardous Substance Research	NTS - Nevada Test Site
Hanford	ORF - Oceanic Resource Foundation
HEI - Health Effects Institute	ORNL - Oak Ridge National Lab
HSARPA - Homeland Security Advanced Research Project Agency EN	ORNL Nuclear Analysis & Shielding Section
HSRC - Hazardous Substance Research Centers	ORNL Radiation Information Analysis Section
IICER - Institute for International Cooperative Environmental Research	Pew Center on Global Climate Change
INEEL - Idaho National Engineering & Environmental Lab	PNNL - Pacific Northwest National Lab
I-NERI - International Nuclear Energy Research Initiative	REDC - Radiochemical Engineering Development Center
INRA - Inland Northwest Research Alliance EN	RESL - Radiological Environmental Sciences Lab
INSPI - Innovative Nuclear Space Power & Propulsion Inst	RFETS - Rocky Flats Environmental Technology Site
Institute for Nuclear Theory	SERDP - Strategic Environmental Research & Development Program
IRI - Industrial Research Institute	SLAC - Stanford Linear Accelerator
ISNPS - Inst for Space & Nuclear Power Studies	SNL - Sandia National Lab
JLAB - Jefferson National Accelerator Facility Kansas City Plant	SNL/CA - Sandia National Lab/California
KRL - Kellogg Radiation Laboratory	SRS - Savannah River Site EN
LANL - Los Alamos National Lab	SRTC - Savannah River Technology Center EN
LANL Geotechnical Engineering Research Group	SSC - Superconducting Super Collider Project
LBL - Lawrence Berkeley Lab	SSTI - State Science & Technology Institute
LLNL - Lawrence Livermore National Lab	SWRI - Southwest Research Inst
MEMP - Miamisburg Environmental Management Project	TDC - INEEL Technology Deployment Center
NAREL - National Air & Radiation Environmental Lab	TFA - Tanks Focus Area Technical Team
NBL - New Brunswick Lab	TFG - Tritium Focus Group
NCERQA-EPANationalCenterforEnvironmental Research & Quality Assurance	TUNL - Triangle Universities Nuclear Lab
	US DOE Labs & Web Servers list
	WMRC - Waste Management & Research Center Yucca Mountain Project

## **Nuclear Cooperation**

Under the 1950s-era Atoms for Peace program, the United States would lease HEU to foreign countries with the explicit provision that the spent fuel would be returned to the US for treatment and disposal. In 1964, this policy was revoked.

In May 1996, the DoE initiated a program, now known as the Foreign Research Reactor Spent Fuel Acceptance Program, whereby the US recovers foreign research reactor spent fuel containing HEU produced in the US. This program covers about 30% of the US-produced HEU, which had been provided to foreign countries. Memorandum for the Secretary, from Gregory H. Friedman, Inspector General, "Audit Report on 'Recovery of Highly Enriched Uranium Provided to Foreign Countries,'" February 9, 2004.

The DoE organized the Generation IV International Forum- 10 countries to jointly develop six nuclear energy systems: South Africa, Argentina, Brazil, South Korea, Switzerland, Japan, Canada, United Kingdom, France, and US. In February 2005, only five participants of the Forum- the United States, United Kingdom, Japan, France, and Canada- signed the agreement to proceed with the Gen IV program. The agreements listed below are in the Gen IV framework. <http://gif.inel.gov/>  
[http://www.armscontrol.org/act/2003\\_12/Lavoy.asp](http://www.armscontrol.org/act/2003_12/Lavoy.asp); <http://www.ig.energy.gov/documents/CalendarYear2004/ig-0638.pdf>

*Brazil:* Agreement (20 June 2003) including cooperation on advanced reactor developments; advanced reactor fuel and reactor fuel cycle-integration; life management and upgrading of current operating reactors; advanced fuel and material irradiation and use of experimental facilities; environmental and safety issues related to new reactor and fuel cycle technologies; and fundamental areas of nuclear engineering and science.

*Canada:* Agreement (17 June 2003) to collaborate on seven projects totaling approximately \$20 million. The projects range in duration from two to four years and will focus on: Hydrogen Production by Nuclear Systems; Sustainable and Advanced Fuel Cycles; and Supercritical-Water-Cooled Reactor Concepts.

*EU:* Agreement (24 February 2004) to collaborate on eight new projects, at approximately \$2 million per year, including but are not limited to: Fuels & materials research and development for advanced nuclear reactors; Advanced Reactor design and engineering development; Research and development related to the transmutation of high-level nuclear waste; Transmutation related systems analyses.

*France:* Agreement (10 July 2001) to collaborate on eleven new projects totaling approximately \$28 million over three years, focusing on: Advanced Gas-Cooled Fast Reactor; Hydrogen Production by Nuclear Systems; and Advanced Fuels and Materials Development.

*India:* In March 2006, the US announced a proposed nuclear cooperation agreement with India, despite the framework of international rules and institutions derived from the NPT that have prevented non-Member States from acquiring nuclear fuel and technology. US Congress has rewritten US law to make an exception for this deal, even though it will enable India to use its limited uranium supply for nuclear weapons. Several barriers still stand in the way, not least agreement from the Nuclear Suppliers Group.

*Japan:* Agreement (24 November 2004) to collaborate on their first project titled "Development of Materials for Supercritical-Water-Cooled Reactor (SCWR)".

*South Korea:* Agreement (16 May 2001) to collaborate on six new projects totaling approximately \$12 million over three years, focusing on: Advanced Gas-Cooled Fast Reactor; Hydrogen Production by Nuclear Systems; Advanced Fuels and Materials Development; Supercritical-Water-Cooled Reactor Concepts.

## 6. International non-proliferation efforts

The US is also a participant in the G8 Global Partnership against the spread of weapons and materials of mass destruction, launched in Kananaskis, Canada 2002.

### Treaties Signed and Ratified, Date of Deposit

Agreement Between the United States of America and the Union of Soviet Socialist Republics on Notification of Launches of Intercontinental Ballistic Missiles and Submarine-Launched Ballistic Missiles, 31 May 1988  
African Nuclear-Weapon-Free Zone Treaty (Treaty of Pelindaba) Protocols I & II, not yet ratified, 11 April 1996  
Antarctic Treaty, 18 August 1960  
Biological and Toxin Weapons Convention, 26 March 1975  
Certain Conventional Weapons Convention, 24 March 1995  
Chemical Weapons Convention, 25 April 1997  
Comprehensive Nuclear Test Ban Treaty, not yet ratified  
Convention on the Physical Protection of Nuclear Material, 1980  
The Intermediate Nuclear Forces Treaty, 1 June 1988  
Nuclear Non-Proliferation Treaty, 5 March 1970  
Outer Space Treaty, 10 October 1967  
Sea Bed Treaty, 18 May 1972  
South Pacific Nuclear Free Zone Treaty (Treaty of Rarotonga) Protocols 1 & 2, not yet ratified, 25 March, 1996  
Strategic Offensive Reductions Treaty, 1 June 2003  
Treaty for the Prohibition of Nuclear Weapons in Latin America and the Caribbean (Treaty of Tlatelolco) Protocols I & II, with reservations, 12 May 1971  
Treaty on the Elimination of Intermediate-Range and Shorter-Range Missiles (INF Treaty), 1 June 1988  
Treaty on the Reduction and Limitation of Strategic Offensive Arms (START I Treaty), 5 December 1994

The US signed the IAEA Additional Protocol 12 June 1998, but has not completed the ratification process.

### Multilateral Groups

Conference on Disarmament  
Hague Code of Conduct against Ballistic Missile Proliferation  
Missile Technology Control Regime  
Nuclear Suppliers Group  
Proliferation Security Initiative  
Wassenaar Arrangement  
Zangger Committee

<http://first.sipri.org/index.php>

## 7. Positions taken in international fora on various issues of disarmament

*Non-Proliferation Treaty*: "[W]e must remain mindful that the Treaty will not continue to advance our security in the future if we do not successfully confront the current proliferation challenges." - **Statement by Secretary of State for Arms Control Stephen G. Rademaker to the 2005 Review Conference of the NPT, New York, 2 May 2005.** <http://www.reachingcriticalwill.org/legal/npt/RevCon05/GDstatements/U.S.pdf>

*NPT Review Conferences*: "NPT Review Conferences... facilitate a thorough exchange of views on Treaty implementation, and reaffirm the Parties' belief that the Treaty as a whole contributes to interna-

tional security, as well as their own... Review Conferences, however are not amendment conferences, and any declarations or decisions or other text emanating from them neither supercede, nor reinterpret, nor add onto the explicit legal obligations of all Parties under the Treaty. The legal undertakings of the NPT are solemn commitments, requiring the approval of national political authorities and sovereign constitutional ratification processes. As we review Article VI progress, and consider how to shape discussions for the next five years, it will be important to keep these points in mind." **-Statement by Ambassador Jackie W. Sanders, Special Representative of the President for the Non-Proliferation of Nuclear Weapons to the 2005 Review Conference of the NPT, Main Committee I, New York, 20 May 2005.** <http://www.reachingcriticalwill.org/legal/npt/RevCon05/MCI/USA20.pdf>

*Nuclear Disarmament:* "So what is the environment necessary for ongoing reductions in nuclear weapons to continue to their logical conclusion? ... It certainly requires a world in which states do not see increases in their security as a zero-sum equation requiring less security on the part of others. Fundamentally, we are talking about a world in which the lessening of international tension and the strengthening of international trust make it possible for us all to transcend the competitive military dynamics and concerns that have helped encourage reliance upon nuclear weapons to date." **Statement by Ambassador Christina Rocca to the Conference on Disarmament, Geneva, 23 March, 2007.** <http://www.reachingcriticalwill.org/political/cd/speeches07/1session/Feb6USA.pdf>

*Conference on Disarmament:* "It is no secret that the United States would have preferred a clear cut decision to start negotiations on FMCT based on the mandate we tabled (CD/1776) without reference to any other issue. We have spoken against linkages for years and we are not convinced that all linkages have yet been broken as result of this plan - it bears a very close resemblance to the A-5 proposal, something we oppose. Despite those concerns, the United States has decided it will not stand in the way of consensus on the P-6 proposal -- as you have presented it to us today... We understand that proposing amendments to the P-6 proposal, for ostensibly procedural reasons, would have the effect of preventing substantive work in the CD... [I]f the CD cannot agree to this compromise, we do not believe it will ever be able to break out of its stalemate." **-Statement by Ambassador Christina Rocca to the Conference on Disarmament, Geneva, 23 March, 2007.** <http://www.reachingcriticalwill.org/political/cd/speeches07/1session/Mar23US.html>

*Fissile Material:* "The negotiation of a legally binding treaty banning the production of fissile material for nuclear weapons or nuclear explosive devices is a goal that the international community long has endorsed as an important step to reduce nuclear dangers. At the same time, the United States has concluded that effective international verification of an FMCT is not realistically achievable. Our delegation calls on the CD to begin such negotiations as soon as possible after it reconvenes in January."- **Statement by Assistant Secretary of State Stephen G. Rademaker to the Third Preparatory Committee for the 2005 Review Conference of the Treaty on the Non-Proliferation of Nuclear Weapons, New York, 3 May 2004.** <http://www.reachingcriticalwill.org/legal/npt/prepcom04/usarticleIV.pdf>

*Additional Protocol:* "The United States continues to work with others to advance other elements of the President's action plan, including universalizing adherence to the Additional Protocol and making it a condition of nuclear supply". - **Statement by Stephen G. Rademaker, United States Secretary of State for Arms Control to the 2005 Review Conference of the NPT, New York, 2 May 2005.** <http://www.reachingcriticalwill.org/legal/npt/RevCon05/GDstatements/U.S.pdf>

*Negative Security Assurances:* "We wish to make clear, however, as we have made clear in other contexts, that the United States continues to oppose any proposal for an NSA treaty, or other global, legally binding security assurances regime." **United States explanation of vote in the 58th session of the General Assembly First Committee, on draft resolution 58/L.8 "Conclusion of effective international arrangements to assure non-nuclear weapon States against the use or threat of use of nuclear weapons"; October 2003.** (The United States has continued to use this explanation in subsequent sessions of the First Committee, up through 2006) <http://www.reachingcriticalwill.org/political/1com/1com03/voting/L8USEoV.htm>

*Fuel Cycle*: “We will help nations end the use of weapons-grade uranium in research reactors... The world's leading nuclear exporters should ensure that states have reliable access at reasonable cost to fuel for civilian reactors, so long as those states renounce enrichment reprocessing. Enrichment and reprocessing are not necessary for nations seeking to harness nuclear energy for peaceful purposes.”  
- **Statement by the President of the United States of America, circulated as official text to the Conference on Disarmament, 12 February 2004.**