Western States Legal Foundation
Nevada Desert Experience

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The Nevada Test Site: Desert Annex of the Nuclear Weapons Laboratories

Introduction

The Nevada Test Site (NTS), an immense tract of desert and mountains northwest of Las Vegas, is the test range where the United States government set off over 900 nuclear explosions during the Cold War phase of the arms race. For most Americans, the Test Site is only a symbol of a closed chapter of history, a time of great danger that now is over. Even those who know that the Nevada Test Site still is used for "subcritical" testing of nuclear weapons materials and components underground may think operations largely have been suspended, with unused facilities retained only against the eventuality of a return to full scale underground nuclear testing. But the Test Site remains an important part of the nuclear weapons complex, both a remote site where dangerous activities can be conducted with little public knowledge and a weapons laboratory unto itself. High risk programs involving nuclear material, such as nuclear criticality experiments, are slated for transfer to the Test Site, and it also is being considered as a location for a proposed factory to mass produce plutonium pits, the atomic explosive "triggers"at the core of most nuclear weapons. In addition, a wide range of other weapons testing takes place at NTS, ranging from flight testing of unmanned air vehicles to new types of conventional explosives. And as is true today of many military research laboratories, the NTS has an increasingly entrepreneurial culture, run with an eye to increasing its "market share" of tax dollars for its for-profit corporate managers.

Nuclear Testing at the Nevada Test Site: Out of Sight, but Never Ending

The first nuclear explosion at the Nevada Test Site, code-named Able, was conducted on January 27, 1951. Since then, 99 more tests were detonated aboveground there, and 804 were done underground. Twenty four underground tests were conducted jointly with the United Kingdom, which used NTS for the development of its own considerable nuclear arsenal. Some underground tests involved more than one nuclear explosion.[1] In a nuclear arms race that saw the development of weapons ranging from bombs that could destroy entire cities to atomic explosives that could be fired from an artillery shell, a mind-boggling array of nuclear tests were conducted. Nuclear explosives were "dropped from planes, shot as rockets, detonated on the surface, shot from a cannon, placed on top of towers, and suspended from balloons."[2] Structures like houses and underground parking garages were built and subjected to nuclear detonations to study the effects of nuclear war on cities. Animals were penned up where they would be burnt, blasted, or irradiated to death, and thousands of soldiers were deployed to the site to study their response to a nearby nuclear explosion. Much

1,000+ U.S. NUCLEAR TESTS SINCE 1945

* **denotes "subcritical" test**

Aardvark 1962
Abeytas 1970
Abilene 1988
Able 1946
Able 1951
Able 1951
Able 1952
Abo 1985
Absinthe 1967
Ace 1964
Acushi 1963
Adobe 1962
Adze 1968
Agile 1967
Agouti 1962
Agrini 1984
Ahtanum 1963
Ajax 1966
Ajo 1970
Akavi 1981
Akbar 1972
Alamo 1988
Aleman 1986
Algodones 1971
Aligote 1981
Aliment 1969
Allegheny 1962
Alma 1962
Almendro 1973
Alpaca 1965
Alumroot 1973
Alva 1964
Alviso 1975
Amarillo 1989
Anacostia 1962
Anchovy 1963
Androscoggin 1962
Angus 1973
Annie 1953
Antler 1961
Apache 1956
Apodaca 1971
Apple-1 1955
Apple-2 1955
Apshapa 1963
Arabis-Blue 1970
Arabis-Green 1970
Arabis-Red 1970
Argus I 1958
Argus II 1958
ArgusIII 1958
Arikaree 1962
Arkansas 1962
Armada 1983
Armadillo 1962
Arnica-Violet 1970
Arnica-Yellow 1970
Arsenate 1972
Artesia 1970
Asco 1978
Asiago 1976
Aspen 1958
Atarque 1972
Atrisco 1982
Auger 1968
Auk 1964
Austin 1990
Avens-Alkermes 1970
Avens-Andorre 1970
Avens-Asamlte 1970
Avens-Cream 1970
Aztec 1962
Azul 1979
Baccarat 1979
Backbeach 1978
Backgammon 1979
Backswing 1964
Badger 1953
* Bagpipe 1998
Baker 1946

Baker 1951
Baker 1951
Baker 1952
Baker-2 1951
Baltic 1971
Bandicoot 1962
Baneberry 1970
Banon 1976
Barbel 1964
Barnwell 1989
Barracuda 1963
Barranca 1971
Barsac 1969
Baseball 1981
Bay Leaf 1968
Bee 1955
Beebalm 1970
Belen 1970
Bellow 1984
Belmont 1986
Benham 1968
Bernal 1973
Bernalillo 1958
Bevel 1968
Bexar 1991
Biggin 1969
Bighorn 1962
Bilby 1963
Bilge 1975
Billet 1976
Bit-A 1968
Bit-B 1968
Bitterling 1964
Black 1962
Blackfoot 1956
Blanca 1958
Blenton 1969
Bluegill 3 Prime 1962
Bluestone 1962
Bobac 1962
Bobstay 1977
Bodie 1986
Bogey 1964
Boltzmann 1957
Bonarda 1980
Bonefish 1964
Boomer 1961
Borate 1987
Bordeaux 1967
Borrego 1982
Bourbon 1967
Bouschet 1982
Bowie 1990
Bowl-1 1969
Bowl-2 1969
Boxcar 1968
Bracken 1971
Branco 1983
Branco-Herkimer 1983
Bravo 1954
Brazos 1962
Breton 1984
Brie 1987
Bristol 1991
Bronze 1965
Brush 1968
Buff 1965
Buggy-A 1968
Buggy-B 1968
Buggy-C 1968
Buggy-D 1968
Buggy-E 1968
Bulkhead 1977
Bullfrog 1988
Bullion 1990
Bumping 1962
Bunker 1964
Burzet 1979
Buteo 1965
Butternut 1958
Bye 1964
Caboc 1981
Cabra 1983
Cabresto 1973
Cabrillo 1975
Cabriolet 1968
Cactus 1958
Calabash 1969
Calamity 1962
Cambric 1965
Camembert 1975
Camphor 1971
Campos 1978
Can-Green 1970
Can-Red 1970
Canfield 1980
Canjilon 1970
Canna-Limoges 1972
Canna-Umbrinus 1972
Cannikin 1971
Canvasback 1964
Capitan 1972
Caprock 1984
Carmel 1963
Carnelian 1977

of the population of the United States, living in the great part of the country east of Nevada, were unknowing participants in these experiments as well, with fallout distributed thousands of miles downwind.[3]

The last full-scale underground nuclear explosion at NTS took place on September 23, 1992. At that time, the U.S. government initiated a voluntary moratorium on nuclear explosive testing, a moratorium that continues to this day. The United States signed the Comprehensive Test Ban Treaty (CTBT) in 1996, but the Senate refused to ratify it, and it has since been repudiated by the Bush Administration.

Although the United States no longer explodes nuclear weapons underground, it continues to conduct a wide range of nuclear weapons research, and to develop and deploy nuclear weapons with new military capabilities. Budgets for the Department of Energy nuclear weapons laboratories today match those during the frenzied Cold War arms buildup, with the labs constructing an array of new nuclear weapons experimental facilities that will provide the capacity to simulate various aspects of nuclear explosions and study the resulting data in unprecedented detail. (See sidebar, Stockpile Stewardship: Nuclear Weapons Research and Production for the 21st Century) The Fiscal Year 2004 nuclear weapons budget includes funds for work at NTS that would allow the United States to resume full scale underground testing more quickly should the government choose to do so.

And despite the absence of full-scale underground nuclear explosions, the Nevada Test Site continues to play a central role in nuclear weapons research. "Subcritical" tests are conducted underground at the NTS U1A complex, a vast warren of tunnels deep beneath the desert. These tests are called "subcritical" because they use fissile materials but there is no self-sustaining nuclear chain reaction. Most subcritical tests employ weapons grade plutonium (Pu-239), which is imploded with high explosives or shocked in various ways.[4] The data from these tests is integrated with that from a variety of other physical experiments in a continuing effort to expand nuclear weapons knowledge that both sustains the huge existing U.S. nuclear arsenal and contributes to efforts to develop nuclear weapons with new capabilities. (See sidebar, Nuclear Testing and the Quest for More Useable Nuclear Weapons).

In addition to providing information useful for nuclear weapons research, subcritical tests also play a central role in keeping the test site in a state of readiness:

> Because of such factors as their inclusion of plutonium, their location– almost 1000 feet down at the NTS– and their complexity, the greatest proportion of test readiness is derived from the program of subcritical experiments.[5]

When conducted underground at the same site used for full-scale nuclear weapons tests, subcritical experiments make verification of a test ban more difficult,[6] and manifest to the world both the existence of a vigorous nuclear weapons research program and the intention to retain the capability for full-scale underground tests. As was the case with full scale tests, the Los Alamos and Livermore National Laboratories each conduct subcritical tests, competing in an intramural arms competition intended to sharpen the skills of nuclear weapons design teams and to encourage creative and varied approaches to the constant refinement of weapons of mass destruction. To conduct these and other activities, the nuclear weapons laboratories maintain a

STOCKPILE STEWARDSHIP: Nuclear Weapons Research and Production for the 21st Century

...[A]n ability to innovate and produce small builds of special purpose weapons, characteristic of a smaller but still vital nuclear infrastructure, would act to convince an adversary that it could not expect to negate U.S. nuclear weapons capabilities. The development and subsequent modification of the B61-7 bomb—converting a few of them into B61-11 earth penetrator weapons—is a case in point. John Gordon, Administrator of the National Nuclear Security Administration (NNSA)[7]

The 2002 Nuclear Posture Review called for "revitalized defense infrastructure that will provide new capabilities in a timely fashion to meet emerging threats."[8] A significant part of this infrastructure is the Department of Energy (DOE)/National Nuclear Security Administration (NNSA) nuclear weapons research, testing, and production facilities. To sustain this vast complex, the U.S. is spending more than six billion dollars a year on the "Stockpile Stewardship" program, including billions on new and more advanced nuclear weapons research and production facilities.

These facilities include:

--The National Ignition Facility (NIF), now nearing completion at the Livermore National Laboratory in California. The NIF is a laser driven fusion machine the size of a football stadium, designed to create very brief, contained thermonuclear explosions. It is slated to be used for a wide range of applications from training weapons designers in nuclear weapons science to nuclear weapons effects testing. NIF experiments, together with other fusion research being conducted at the nuclear weapons laboratories, could, in the long run, lead to the development of pure fusion weapons, not requiring plutonium or uranium.

--The Dual Axis Radiographic Hydrotest Facility (DARHT).Located at the Los Alamos National Laboratory in New Mexico, DARHT is one of several facilities where mockups of primaries or "pits," the first stage of a thermonuclear weapon, are imploded while very fast photographic or x-ray images are generated, thus allowing scientists to "see" inside the implosion. DOE/NNSA already is developing technology for an even more sophisticated "hydrodynamic testing" facility, the Advanced Hydrotest Facility.

--Pulsed power technologies: Further experiments exploring the extreme conditions created in a nuclear weapon explosion are studied using various types of "pulsed power," in which a large amount of energy is stored up and then released very quickly in a small space. The energy source can be chemical high explosives or stored electrical energy. Pulsed power facilities at both DOE and Department of Defense laboratories are used to explore nuclear weapons function and effects and directed energy weapons concepts, and could play a role in the development of a wide range of high technology weapons, including new types of nuclear weapons.

The data streams from these and other experimental facilities, along with that from "subcritical" tests conducted at the Nevada Test Site and the archived data from over 1000 past U.S. nuclear tests, will be integrated via the Advanced Strategic Computing Program. This multi-billion dollar supercomputing program reaches beyond the weapons laboratories, seeking to incorporate the nation's leading universities into an effort to attract and train yet another generation of nuclear weapons designers. Finally, smaller, modernized nuclear weapons production processes are being developed to allow flexible, small lot manufacturing, with planning underway for a new plutonium pit factory for large-scale production.

In addition to the Modern Pit Facility, the DOE is pursuing a wide range of programs to modernize its nuclear weapons production infrastructure. These range from a smaller pit manufacturing capability at Los Alamos National Laboratory in New Mexico to upgraded nuclear weapon component manufacturing facilities at Oak Ridge National Laboratory and tritium facilities at Savannah River, Georgia. In addition, the government has begun producing tritium for nuclear weapons at civilian nuclear power plants operated by the Tennessee Valley Authority (TVA).

Carp 1963
Carpetbag 1970
Carrizozo 1970
Cashmere 1965
Casselman 1963
Cassowary 1964
Cathay 1971
Catron 1958
Cebolla 1972
Cebrero 1985
Cedar 1958
Centaur 1965
Ceres 1958
Cerise 1966
Cernada 1981
Cerro 1982
Chaenactis 1971
Chama 1962
Chamita 1985
Chancellor 1983
Chantilly 1971
Charcoal 1965
Charleston 1957
Charlie 1951
Charlie 1952
Chartreuse 1966
Chateaugay 1968
Chatty 1969
Chavez 1958
Checkmate 1962
Cheedam 1983
Chena 1961
Chenille 1965
Cherokee 1956
Cheshire 1976
Chess 1979
Chetco 1962
Chevre 1976
Chiberta 1975
Chinchilla 1962
Chinchilla II 1962
Chipmunk 1963
Chocolate 1967
Cimarron 1962
* Cimarron 1998
Cinnamon 1966
Clairette 1981
* Clarinet 1999
Clarksmobile 1968
Clean Slate I 1963
Clean Slate II 1963
Clean Slate III 1963
Clearwater 1963
Climax 1953
Club 1964
Clymer 1966
Coalora 1983
Cobbler 1967
Codsaw 1962
Coffer 1969
Cognac 1967
Colby 1976
Colfax 1958
Colmor 1973
Colwick 1980
Commodore 1967
Comstock 1988
Concentration 1978
Contact 1989
Corazon 1970
Corduroy 1965
Cormorant 1964
Cornice-Green 1970
Cornice-Yellow 1970
Cornucopia 1986
Correo 1984
Coso-Bronze 1991
Coso-Gray 1991
Coso-Silver 1991
Cottage 1985
Coulomb-A 1957
Coulomb-B 1957
Coulomb-C 1957
Coulommiers 1977
Courser 1964
Cove 1977
Cowles 1972
Coypu 1963
Cremino 1978
Cremino-Caerphilly 1978
Crepe 1964
Crestlake-Briar 1974
Crestlake-Tansan 1974
Crew 1968
Crew-2nd 1968
Crew-3rd 1968
Crewline 1977
Crock 1968
Crowdie 1983
Cruet 1969
Cuchillo 1972
Culantro-A 1969
Culantro-B 1969
Cumarin 1970
Cumberland 1963

permanent presence at the Test Site. In addition, NTS personnel work at the weapons laboratories; they will, for example, hone skills relevant to nuclear testing by developing diagnostics for the National Ignition Facility, an enormous laser fusion project that will create small thermonuclear explosions in a steel containment vessel.[9]

The Nevada Test Site: Weapons Lab Today, Weapons Factory Tomorrow?

In addition to weapons experiments that take advantage of the infrastructure and skills developed for underground nuclear testing and that help sustain capabilities, the Nevada Test Site supports a growing array of nuclear weapons facilities:[10]

--The Big Explosive Experiment Facility (BEEF) allows non-nuclear high explosive tests too powerful to be conducted at high explosive testing facilities at the nuclear weapons labs in Livermore and Los Alamos. BEEF can be used to tests new types or configurations of conventional explosives, and also for "hydrodynamic" experiments, in which the high explosive components of nuclear weapons can be tested, using substitutes for fissile materials that are similar in their physical characteristics but will not result in a nuclear explosion.

--The Joint Actinide Shock Physics Experimental Research Facility (JASPER) is a large gas gun that tests the characteristics of plutonium and other materials by blasting them with high speed projectiles.

--The Atlas pulsed power facility, a machine that instantaneously releases large amounts of stored electrical energy in a small space to simulate certain aspects of nuclear explosions, will be relocated from the Los Alamos National Laboratory to NTS.

--The Device Assembly Facility (DAF), a complex of thirty buildings reinforced with steel and covered with earth, is one of the two sites, together with the Pantex Plant in Texas, where special nuclear materials– plutonium and uranium– can be combined into either nuclear weapons or configurations for nuclear weapons tests, such as the subcritical experiments conducted at NTS. The DAF originally was built to assemble nuclear weapons for underground tests, and is jointly operated by the Los Alamos and Livermore National Laboratories. Located far from population centers and surrounded by layers of security, the DAF is one of the largest and most modern facilities available to the U.S. government for operations involving both nuclear materials and high explosives, including assembly of nuclear weapons.

With no full scale underground tests on the immediate horizon, the DAF is being given other roles involving nuclear materials. Test assemblies for subcritical experiments are put together at the DAF. Criticality experiments, which involve significant quantities of such weapons useable materials as highly enriched uranium and which study the behavior of these materials at or near the conditions where they generate a self-sustaining nuclear chain reaction, are being transferred to the DAF from Los Alamos. Some criticality experiments still may be conducted at Los Alamos, but those involving larger quantities of weapons-useable nuclear material will be moved to NTS. The move is expected to involve

relocation to NTS of 2.6 tons of special nuclear material (probably plutonium and enriched uranium), as well as 11 tons of depleted uranium and thorium.[11]

The Nevada Test Site also is being considered as one possible location for the Modern Pit Facility, a factory to mass produce plutonium pits, the key component of the atomic explosive trigger at the heart of most modern nuclear weapons. The proposed pit factory would be able to produce as many as 450 pits per year working a single shift, and considerably more with two shift operation.[12] By comparison, China, the world's third leading nuclear power after the United States and Russia, is believed to have about 400 nuclear weapons.[13] And even if the Modern Pit Facility isn't built at NTS, the Test Site's managers, Bechtel Corporation, are determined to compete for an

Nuclear Weapons Testing on Indigenous Lands

The existence of nuclear weapons in the world causes ecological devastation, even if they never are used in warfare. A half century of testing has contaminated vast reaches of the planet, and has resulted in millions of premature deaths by causing birth defects, cancer, and other diseases. Nuclear explosions at the Nevada Test Site have left millions of curies of strontium, cesium, and plutonium underground. In addition, hundreds of thousands of cubic yards of radioactive waste have been buried at NTS. Above ground nuclear testing, along with plutonium dispersal experiments and depleted uranium ammunition testing, caused additional contamination. For an overview of radioactive contamination at NTS, see Arjun Makhijani, Howard Hu, and Katherine Yih, Nuclear Wastelands: A Global Guide to Nuclear Weapons Production and its Health and Environmental Effects, (Cambridge, Massachusetts, MIT Press: 1995), pp.224-227

"...[Of] the eight nations in the world that have detonated nuclear weapons during the last 55 years, five have used the lands of indigenous peoples. The United States, Russia, Britain, France and China have tested their nuclear might on lands held sacred by the people of First Nations. The Western Shoshone nation of North America, the Marshall Islanders, and other South Pacific Islanders, Australian Aboriginals, the Kazakhs, and Tibetans are but a few of those whose land has been consistently contaminated with nuclear poison...." Richard Salvador, Pacific Islands Association of NGOs, NGO Presentation, "Indigenous Perspective," to the NPT Review Conference Preparatory Committee, New York, April 2002

"No Developed nation tests its nuclear weapons on its own lands. All nuclear testing is done on indigenous people's lands... The Western Shoshone are the rightful custodians of this land, affirmed by the Treaty of Ruby Valley in 1863. With over 900 bombs exploded, they are the most bombed nation in the world." Raymond D. Yowell, Chief, Western Shoshone National Council, Healing Global Wounds event invitation, The Test Banner, American Peace Test, Summer/Fall 1992.

For more on the impacts of nuclear weapons research, development, testing and production on indigenous peoples world wide, see the the fact sheet and resource links, "Indigenous People and the Nuclear Age: Making the Connections," prepared by the Women's International League for Peace and Freedom, at http://www.reachingcriticalwill.org/technical/factsheets/indigenous.html

Cup 1965
Cyathus 1970
Cybar 1986
Cyclamen 1966
Cypress 1969
Dalhart 1988
Daiquiri 1966
Dakota 1956
Daman I 1962
Danablu 1983
Danny Boy 1962
Darwin 1986
Dauphin 1980
De Baca 1958
Dead 1962
Deck 1975
Delamar 1987
Delphinium 1972
Derringer 1966
Des Moines 1962
Dexter 1971
Diablo 1957
Diablo Hawk 1978
Diagonal Line 1971
Diamond Ace 1982
Diamond Beech 1985
Diamond Dust 1970
Diamond Fortune 1992
Diamond Mine 1971
Diamond Sculls 1972
Diana Mist 1970
Diana Moon 1968
Dianthus 1972
Dido Queen 1973
Diesel Train 1969
Diluted Waters 1965
Dining Car 1975
Discus Thrower 1966
Disko Elm 1989
Distant Zenith 1991
Divider 1992
Dixie 1953
Dofino 1977
Dofino-Lawton 1977
Dog 1951
Dog 1951
Dog 1952
Dogwood 1958
Dolcetto 1984
Dona Ana 1958
Door Mist 1967
Doppler 1957
Dormouse 1962
Dormouse Prime 1962
Dorsal Fin 1968
Double Play 1966
Double Tracks 1963
Dovekie 1966
Draughts 1978
Drill 1964
Drill 1964
Driver 1964
Dub 1964
Duffer 1964
Dulce 1962
Dumont 1966
Duoro 1984
Duryea 1966
Dutchess 1980
Eagle 1963
Easy 1951
Easy 1951
Easy 1951
Easy 1952
Ebbtide 1977
Edam 1975
Eddy 1958
Eel 1962
Effendi 1967
Egmont 1984
Elder 1958
Elida 1973
Elkhart 1965
Embudo 1971
Emerson 1965
Emmenthal 1978
Encino 1962
Encore 1953
Erie 1956
Ermine 1962
Escabosa 1974
Esrom 1976
Ess 1955
Estaca 1974
Estuary 1976
Evans 1958
Fade 1964
Fahada 1983
Fajy 1979
Fallon 1974
Farallones 1977
Farm 1978
Faultless 1968
Fawn 1967
Feather 1961

Fenton 1966
Ferret 1963
Ferret Prime 1963
Fig 1958
File 1968
Finfoot 1966
Fir 1958
Fisher 1961
Fizeau 1957
Fizz 1967
Flask-Green 1970
Flask-Red 1970
Flask-Yellow 1970
Flathead 1956
Flax-Backup 1972
Flax-Source 1972
Flax-Test 1972
Flora 1980
Flotost 1977
Floydada 1991
Fob-Blue 1970
Fob-Green 1970
Fob-Red 1970
Fondutta 1978
Fontina 1976
Fore 1964
Forefoot 1977
Forest 1964
Fox 1951
Fox 1952
Franklin 1957
Franklin Prime 1957
Freezeout 1979
Frigate Bird 1962
Frijoles-Deming 1971
Frijoles-Espuela 1971
Frijoles-Guaje 1971
Frijoles-Petaca 1971
Frisco 1982
Funnel 1968
Futtock 1975
Galena-Green 1992
Galena-Orange 1992
Galena-Yellow 1992
Galileo 1957
Galveston 1986
Ganymede 1958
Garden 1964
Gasbuggy 1967
Gascon 1986
Gazook 1973
George 1951
George 1952
Gerbil 1963
Gibne 1982
Gibson 1967
Gilroy 1967
Glencoe 1986
Gnome 1961
Goldstone 1985
Gorbea 1984
Gouda 1976
Gourd-Amber 1969
Gourd-Brown 1969
Grable 1953
Grape A 1969
Grape B 1970
Greeley 1966
Greys 1963
Grove 1974
Grunion 1963
Gruyere 1977
Gruyere-Gradino 1977
Guanay 1964
Gum Drop 1965
Gundi 1962
Gundi Prime 1963
HA(High Altitude) 1955
Haddock 1964
Halfbeak 1966
Hamilton 1958
Handcar 1964
Handicap 1964
Handley 1970
Haplopappus 1972
Hard Hat 1962
Hardin 1987
Harebell 1971
Harkee 1963
Harlem 1962
Harlingen-A 1988
Harlingen-B 1988
Harry 1953
Harzer 1981
Hatchet 1968
Hatchie 1963
Havarti 1981
Haymaker 1962
Hazebrook- Apricot 1987
Hazebrook-Checkerberry 1987
Hazebrook-Emerald 1987
Hearts 1979
Heilman 1967
Hermosa 1985
Hickory 1958
Hidalgo 1958
Hod-A 1970
Hod-B 1970
Hod-C 1970
Hognose 1962
Holly 1958
* Holog 1997
Hood 1957
Hook 1964
Hoopoe 1964
Hoosic 1962
Horehound 1969
Hornet 1955
Hornitos 1989
Hospah 1971
Hosta 1982
Housatonic 1962
Houston 1990
How 1952
Hoya 1991
Hudson 1962
Hudson Moon 1970
Hudson Seal 1968
Hula 1968
Hulsea 1974
Humboldt 1958
Hunters Trophy 1992
Hupmobile 1968
Huron 1956
Huron King 1980
Huron Landing 1982
Husky Ace 1973
Husky Pup 1975
Hutch 1969
Hulia 1963
Hybla Fair 1974
Hybla Gold 1977
Hyrax 1962
Iceberg 1978
Ildrim 1969
Imp 1968
Inca 1956
Ingot 1989
Inlet 1975
Ipecac-A 1969
Ipecac-B 1969
Islay 1981
Item 1951
Izzer 1965
Jackpots 1978
Jal 1970
Jara 1974
Jarlsberg 1983
Jefferson 1986
Jerboa 1963
Jib 1974
Jicarilla 1972
John 1957
Johnnie Boy 1962
Jornada 1982
Jorum 1969
Junction 1992
Juniper 1958
Juno 1958
Kankakee 1966
Kappeli 1984
Kara 1972
Karab 1978
Kash 1980
Kashan 1973
Kasseri 1975
Kaweah 1963
Kawich A-Blue 1988
Kawich A-White 1988
Kawich-Black 1989
Kawich-Red 1989
Kearsarge 1988
Keel 1974
Keelson 1976
Kennebec 1963
Kepler 1957
Kermet 1965
Kernville 1988
Kesti 1982
Kestrel 1965
Khaki 1966
Kickapoo 1956
King 1952
Kingfish 1962
Kinibito 1985
Klickitat 1964
Kloster 1979
Knickerbocker 1967
Knife A 1968
Knife B 1968
Knife C 1968
Knox 1968
Koa 1958
Kohocton 1963
Koon 1954
Kootanai 1963
Kryddost 1982
Kyack-A 1969
Kyack-B 1969

ever larger piece of the burgeoning high-tech weapons pie. As Frederick Tarantino, President and General Manager for NTS manager Bechtel Nevada, put it, "[i]f we don't get it, that's OK.... We'll go after something just as a large."[14]

A Full Service Test Range

The Nevada Test Site also is used for a variety of military tests besides those linked directly to nuclear weapons development. Over the years, NTS has been used to develop systems ranging from missile re-entry bodies to ballistic missile defense. Depleted uranium munitions were tested at NTS, with experiments including "controlled burns" and live firing.[15] A small facility capable of manufacturing biological weapons was built at the Test Site in the 1990's, as part of a "counterproliferation" program aimed at determining how difficult it would be for countries or non-state organizations to do the same and at developing detection technologies.[16] NTS also operates a hazardous materials spill facility, where large quantities of dangerous chemicals can be released for a variety of purposes, such as developing response and cleanup techniques or sensors to detect chemical weapons or their components.[17] Recent military tests have included unmanned aircraft fitted with sensors to detect chemical weapons[18] and the "thermobaric" bomb, a powerful explosive that was rushed into production for use against tunnels and caves in the Afghanistan war.[19] Tunnel complexes at NTS are being used for a variety of tests aimed at developing additional ways to destroy targets buried in cave and tunnels, such as missile operations or command and control facilities.[20]

The Nuclear Non-Proliferation Treaty, the Comprehensive Test Ban Treaty, and U.S. Nuclear Weapons Policies

Each of the Parties to the Treaty undertakes to pursue negotiations in good faith on effective measures relating to cessation of the nuclear arms race at an early date and to nuclear disarmament, and on a treaty on general and complete disarmament under strict and effective international control. Article VI , Treaty on the Non-Proliferation of Nuclear Weapons, Signed at Washington, London, and Moscow July 1, 1968. Entered into force March 5, 1970.

Ending nuclear testing has been seen as a key stepping stone towards the elimination of nuclear weapons virtually since efforts to control nuclear weapons began. The United States and the other parties to the 1963 Limited Test Ban Treaty, which banned all but underground nuclear test explosions, proclaimed as their "principal aim" the "speediest possible achievement of an agreement on general and complete disarmament under strict international control in accordance with the objectives of the United Nations which would put an end to the armaments race and eliminate the incentive

Nuclear Testing and the Quest for More Useable Nuclear Weapons

The push by elements inside and outside the government for nuclear weapons with new military capabilities slowed for a brief period after end of the Cold War, with Congress placing some restrictions on research on nuclear warheads with a yield below 5 kilotons, and an official Clinton Administration policy of no "new" nuclear weapons. Despite this policy, U.S. nuclear weapons research continued throughout the 90's. The goals of these efforts were twofold: to develop capacities to destroy difficult types of targets, and to design nuclear weapons that would be politically feasible to use. A 1999 Department of Defense planning document identified as a priority the ability "to provide national leaders with improved options by increasing the responsiveness of strategic forces and developing more discriminate options, as done most recently with the introduction of the B61–11 earth-penetrating weapons."[21] The B61-11, deployed in 1997, was a modification of an existing design. It was developed without underground nuclear explosive testing, using the component testing and computer simulation capabilities of the Department of Energy "Stockpile Stewardship" program.[22] Research also continued on nuclear weapons effects, focusing on the "need to hold evolving enemy targets at risk using the reduced stockpile, and recognizing greatly increasing political and environmental constraints."[23]

With the ascendance of the Bush Administration, the push for nuclear weapons with new military capabilities has intensified. The 2002 Bush Nuclear Posture Review (NPR), a major policy document that outlined plans for strategic weapons development, stated that

> There are several nuclear weapon options that might provide important advantages for enhancing the nation's deterrence posture: possible modifications to existing weapons to provide additional yield flexibility in the stockpile; improved earth penetrating weapons (EPWs) to counter the increased use by potential adversaries of hardened and deeply buried facilities; and warheads that reduce collateral damage.[24]

The NPR also indicated that the U.S. was prepared to use nuclear weapons in a wide range of circumstances and against a number of countries, including Iraq, Iran and North Korea. The FY2004 Department of Energy budget request, submitted in the Spring of 2003, called for an "advanced warhead concepts initiative" at the nuclear weapons laboratories to study various new nuclear weapons ideas.[25] And the National Nuclear Security Agency requested funding in FY 2003 to begin study of a new or modified "Robust Nuclear Earth Penetrator" (RNEP).[26] According to press reports, the RNEP concept now under consideration calls for a nuclear weapon with a substantial yield, likely to be several times the power of the bombs that destroyed Hiroshima and Nagasaki.[27]

Additional nuclear planning documents leaked to the public in early 2003, together with the administration's recent Defense Department bid solicitations and FY2004 budget submissions, reveal that the Robust Nuclear Earth Penetrator is only one of a number of modified or new nuclear weapons under consideration. A January 2003 Pentagon meeting attended by high-ranking officials from the Defense Department and the Energy Department nuclear weapons programs set the agenda for further planning sessions that would evaluate "[r]equirements for low-yield weapons, EPWs, [earth penetrating weapons] enhanced radiation weapons, [and] agent defeat weapons" (weapons intended to destroy chemical or biological agents). Issues to be covered included "[e]ffects modeling capabilities to effectively plan for these weapons," "testing strategy for weapons more likely to be used in small strikes," and the "strategy for selecting first "'small builds.'"[28] Research also is going forward on new strategic missiles with greater range, accuracy, and maneuverability, and with the capability to deliver both nuclear and conventional payloads.[29]

This fall, Congress removed restrictions on low-yield nuclear weapons research, and approved funds for research on the robust nuclear earth penetrator (RNEP). National Nuclear Security Administrator Linton Brooks, in a memo to the nuclear weapons laboratories, thanked them for their support in the effort to remove restrictions on nuclear weapons research, and told the labs that "I expect your design teams to engage fully with the Department of Defense to examine advanced concepts that could contribute to our nation's security."[30] Although a number of new capabilities can be obtained by the modification of existing nuclear weapons, exploration of "advanced concepts" may lead to a push by nuclear weapons advocates for a resumption of full scale underground testing.

Laban 1983
Labis 1970
Labquark 1986
Lacrosse 1956
Lagoon 1971
Laguna 1971
Lampblack 1966
Lanpher 1967
Laplace 1957
Laredo 1988
Lassen 1957
Latir 1974
Lea 1958
Ledoux 1990
Lexington 1967
Leyden 1975
Lime 1966
Linden 1958
Links 1964
Liptauer 1980
Little Feller I 1962
Little Feller II 1962
Lockney 1987
Logan 1958
Long Shot 1965
Longchamps 1972
Lovage 1969
Lowball 1978
Lubbock 1991
Luna 1958
Mackerel 1964
Mad 1961
Madison 1962
Magnolia 1958
Mallet 1968
Manatee 1962
Manteca 1982
Manzanas 1970
Maple 1958
Maribo 1985
* Mario 2002
Mars 1958
Marsh 1975
Marshmallow 1962
Marsilly 1977
Marvel 1967
Mast 1975
Mataco 1963
Mauve 1965
Maxwell 1966
Mazama 1958
Memory 1979
Mercury 1958
Merida 1972
Merlin 1965
Merrimac 1962
Mescalero 1972
Mesilla 1962
Mesita 1973
Met 1955
Metropolis 1990
Mickey 1967
Midas Myth/
Milagro 1984
Middle Note 1987
Midi Mist 1967
Midland 1987
Miera 1973
Mighty Epic 1976
Mighty Oak 1986
Mike 1952
Milk Shake 1968
Mill Yard 1985
Milrow 1969
Mineral Quarry 1990
Minero 1984
Miners Iron 1980
Ming Blade 1974
Ming Vase 1968
Mini Jade 1983
Miniata 1971
Mink 1961
Minnow 1964
Mint Leaf 1970
Minute Steak 1969
Mission Cyber 1987
Mission Ghost 1987
Mississippi 1962
Misty Echo 1988
Misty North 1972
Misty Rain 1985
Mizzen 1975
Moa 1965
Mogollon 1986
Mohawk 1956
Molbo 1982
Monahans-A 1988
Monahans-B 1988
Monero 1972
Montello 1991
Monterey 1982
Mora 1958
Morgan 1957
Morrones 1970
Moth 1955
Mudpack 1964
Muenster 1976
Muggins 1983
Muleshoe 1989
Mullet 1963
Mundo 1984
Muscovy 1965
Mushroom 1967
Muskegon 1962
Mustang 1963
Nama-Amarylis 1971
Nama-Mephisto 1971
Nambe 1962
Nancy 1953
Narraguagus 1963
Nash 1967
Natches 1963
Natoma 1973
Navajo 1956
Navata 1983
Nebbiolo 1982
Nectar 1954
Neptune 1958
Nessel 1979
New Point 1966
Newark 1966
Newton 1957
Nightingale 1988
Nipper 1969
Niza 1981
Noggin 1968
Noor 1968
Norbo 1980
Normanna 1984
Numbat 1962
Nutmeg 1958
Oak 1958
Oakland 1967
Oarlock 1977
Obar 1975
Oberon 1958
* Oboe 1 1999
* Oboe 2 1999
* Oboe 3 2000
* Oboe 4 2000
* Oboe 5 2000
* Oboe 6 2000
* Oboe 7 2001
* Oboe 8 2001
* Oboe 9 2002
Ocate 1972
Ochre 1966
Oconto 1964
Offshore 1979
Olive 1958
Onaja 1972
Orange 1958
Organdy 1965
Orkney 1984
Osage 1956
Oscuro 1972
Otero 1958
Otowi 1962
Owens 1957
Paca 1962
Packard 1969
Packrat 1962
Paisano 1963
Pajara 1973
Palanquin 1965
Palisade-1 1989
Palisade-2 1989
Palisade-3 1989
Paliza 1981
Pamlico 1962
Pampas 1962
Panamint 1986
Panchuela 1987
Panir 1978
Par 1964
Parnassia 1971
Parrot 1964
Pascal-A 1957
Pascal-B 1957
Pascal-C 1957
Passaic 1962
Peba 1962
Pedernal 1971
Pekan 1963
Penasco 1970
Pepato 1979
Pera 1979
Persimmon 1967
Petit 1962
Petrel 1965
* Piano 2003
Piccalilli 1969
Pike 1964
Pile Driver 1966
Pin Stripe 1966
Pine 1958
Pineau 1981
Pinedrops-Bayou 1974
Pinedrops-Sloat 1974
Pinedrops-Tawny 1974
Pipefish 1964
Pipkin 1969

to the production and testing of all kinds of weapons, including nuclear weapons."[31] The Preamble to the Non-Proliferation Treaty (NPT) recalled the intent expressed in the Limited Test Ban Treaty "to seek to achieve the discontinuance of all test explosions of nuclear weapons for all time," in the context of a broader effort "to facilitate the cessation of the manufacture of nuclear weapons, the liquidation of all their existing stockpiles, and the elimination from national arsenals of nuclear weapons and the means of their delivery pursuant to a Treaty on general and complete disarmament under strict and effective international control...."

In 1995, the NPT parties reaffirmed their commitment to the Treaty and set out further steps for implementing its provisions in a set of "Principles and Objectives for Nuclear Non-Proliferation and Disarmament." The "Principles and Objectives" document reaffirmed the nuclear weapon states' NPT Article VI obligation and listed the Comprehensive Test Ban (CTBT) first among measures "important in the full realization and effective implementation of Article VI."[32] The United States signed the CTBT in 1996.

In 1999, the United States Senate voted not to approve ratification of the CTBT, and has chosen not to revisit the matter since that time. The Clinton administration and its allies, rather than trying to rally disarmament supporters as a counterweight to the powerful interests represented by the nuclear weapons complex, had portrayed the CTBT as a means to preserve the decisive technological advantage in nuclear weaponry held by the U.S., and as a way to prevent non-nuclear weapon states from acquiring nuclear weapons, rather than as a step on the road to disarmament. This view was reaffirmed by Secretary of State Madeline Albright even after it had proved a losing strategy in the CTBT ratification campaign: "We simply do not need to test nuclear weapons to protect our security. On the other hand, would-be proliferators and modernizers must test if they are to develop the kind of advanced nuclear designs that are most threatening. *Thus, the CTBT would go far to lock in a technological status quo that is highly favorable to us*."[33]

In 2000, the NPT parties, including the United States, reiterated their commitment to disarmament, agreeing to a set of "practical steps for the systematic and progressive efforts to implement article VI of the Treaty..." These steps included, once again, ratification of the CTBT, recognition of a "principle of irreversibility" to apply to nuclear disarmament, and "an unequivocal undertaking by the nuclear-weapon States to accomplish the total elimination of their nuclear arsenals leading to nuclear disarmament, to which all States parties are committed under article VI."[34] Since that time, the U.S. has repudiated the CTBT, ramped up efforts to increase nuclear test readiness, and continued its ambitious program to refurbish its nuclear complex. The goal is to maintain nuclear supremacy in all conceivable circumstances by building facilities able to mass produce

nuclear weapons should the "need" some day arise, while at the same time being able to design and build new kinds of nuclear weapons quickly:

> For example, a future adversary nation seeking to gain some nuclear advantage would be forced to conclude that its buildup could not occur quicker than the United States could act to reconstitute higher force levels. Alternatively, an ability to innovate and produce small builds of special purpose weapons, characteristic of a smaller but still vital nuclear infrastructure, would convince an adversary that it could not expect to negate United States nuclear forces, for example, by seeking to house vital command and control functions in hard, deeply buried installations.[35]

The nuclear weapons laboratory testing and simulation technologies that comprise the U.S. "Stockpile Stewardship" program, and similar though far less ambitious programs in other nuclear weapons states, makes a Comprehensive Test Ban simultaneously less "comprehensive" and more necessary. A ban on nuclear explosive testing can limit, but not stop, advanced nuclear weapons development. It has little effect on existing arsenals, which can be maintained at high levels of readiness without explosive testing using technology now decades old.[36] The U.S. can upgrade existing nuclear weapons while remaining within the parameters of well-understood concepts and designs.[37] It also is possible that substantial progress can be made towards more extensive design innovations, which could increase pressure for a resumption of testing. This would be of particular concern in a crisis, whether the consequence of real events like the 9-11 attacks or a determined and successful propaganda campaign like that preceding the 2003 Iraq invasion. We have seen that few in Congress will challenge a demand by a sitting President, bolstered by classified information about some looming threat, on matters involving "weapons of mass destruction." A CTBT that has entered into force, which requires ratification by the United States, among others, could provide something of a "firebreak," making the decision to resume testing in order to deploy new weapons more consequential.

The Preamble to the Comprehensive Test Ban Treaty expresses the intent of the treaty to cut off the development and modernization of nuclear weapons as a meaningful disarmament measure, recognizing "that the cessation of all nuclear weapon test explosions and all other nuclear explosions, by constraining the development and qualitative improvement of nuclear weapons and ending the development of advanced new types of nuclear weapons, constitutes an effective measure of nuclear disarmament and non-proliferation in all its aspects," and "that an end to all such nuclear explosions will thus constitute a meaningful step in the realization of a systematic process to achieve nuclear disarmament...[38]

Piranha 1966
Pisonia 1958
Piton-A 1970
Piton-B 1970
Piton-C 1970
Plaid II 1966
Planer 1969
Platte 1962
Platypus 1962
Player 1964
Pleasant 1963
Pliers 1969
Plomo 1974
Pod-A 1969
Pod-B 1969
Pod-C 1969
Pod-D 1969
Polka 1967
Polygonum 1973
Pommard 1968
Pongee 1965
Ponil 1985
Pool 1976
Poplar 1958
Portmanteau 1974
Portola 1975
Portola-Larkin 1975
Potrero 1974
Portulaca 1973
Post 1955
Potrillo 1973
Pratt 1974
Presidio 1987
Priscilla 1957
Project 56 No. 1 1955
Project 56 No. 2 1955
Project 56 No. 3 1955
Project 56 No. 4 1956
Project 57 No. 1 1957
Puce 1966
Puddle 1974
Purple 1966
Purse 1969
Puye 1974
Pyramid 1980
Quargel 1978
Quay 1958
Queso 1982
Questa 1962
Quince 1958
Quinella 1979
Raccoon 1962
Rack 1968
Rainier 1957
Randsburg 1990
Raritan 1962
Ray 1953
Reblochon 1978
*** Rebound 1997**
Red Hot 1966
Redmud 1976
Redwood 1958
Reo 1966
Rex 1966
Rhyolite 1988
Rib 1977
Rickey 1968
Rinconada 1962
Ringtail 1961
Rio Arriba 1958
Rio Blanco-1 1973
Rio Blanco-2 1973
Rio Blanco-3 1973
Riola 1980
Rivet I 1967
Rivet II 1967
Rivet III 1967
Rivoli 1976
Roanoke 1962
*** Rocco 2002**
Romano 1983
Romeo 1954
Roquefort 1985
Rose 1958
Rousanne 1981
Rovena 1966
Rudder 1976
Rulison 1969
Rummy 1978
Rushmore 1958
Russet 1968
Ruth 1953
Sabado 1983
Sacramento 1962
Salmon 1964
Salut 1985
San Juan 1958
Sandreef 1977
Sanford 1958
Santa Fe 1958
Santee 1962
Sapello 1974
Sappho 1972
Sardine 1963
Satsop 1963
Saturn 1957
Satz 1978
Saxon 1966
Sazerac 1967
Scaevola 1958
Scantling 1977
Scaup 1965
Schellbourne 1988
Schooner 1968
Scissors 1968
Scotch 1967
Screamer 1965
Scree-Acajou 1970
Scree-Alhambra 1970
Scree-Chamois 1970
Scroll 1968
Scupper 1977
Scuttle 1969
Seafoam 1973
Seamount 1977
Seaweed-B 1969
Seaweed-C 1969
Seaweed-D 1969
Seaweed-E 1969
Seco 1981
Sedan 1962
Seersucker 1965
Seminole 1956
Sepia 1965
Sequoia 1958
Serena 1985
Serpa 1980
Sevilla 1968
Seyval 1982
Shallows 1976
Shaper 1970
Shasta 1957
Shave 1969
Sheepshead 1979
Shoal 1963
Shrew 1961
Shuffle 1968
Sidecar 1966
Sienna 1966
Silene 1973
Simms 1966
Simon 1953
Sled 1968
Small Boy 1962
Smoky 1957
Snubber 1970
Socorro 1958
Solano 1972
Solanum 1972
Solendon 1964
Spar 1973
Spider-A 1969
Spider-B 1969
Spoon 1964
Sprit 1976
Spud 1968
St.Lawrence 1962
Staccato 1968
*** Stagecoach 1998**
Stanley 1967
Stanyan 1974
Starfish Prime 1962
Starwort 1973
Sterling 1966
Stillwater 1962
Stilt 1967
Stilton 1975
Stinger 1968
Stoat 1962
Stoddard 1968
Stokes 1957
Stones 1963
Strait 1976
Strake 1977
Sturgeon 1964
Stutz 1966
Suede 1965
Sugar 1951
Sulky 1964
Sundown-A 1990
Sundown-B 1990
Sunset 1962
Sutter 1976
Swanee 1962
Switch 1967
Swordfish 1962
Sycamore 1958
Tafi 1980
Tahoka 1987
Tajique 1972
Tajo 1986
Tamalpais 1958
Tan 1966
Tanana 1962
Tangerine 1966
Tanya 1968
Tapestry 1966
Tapper 1969
Tarko 1980
Taunton 1962
Techado 1983
Teak 1958

Tee 1965
Tejon 1963
Teleme 1975
Temescal 1974
Templar 1966
Tenabo 1990
Tenaja 1982
Tendrac 1962
Tern 1965
Terrine-White 1969
Terrine-Yellow 1969
Tesla 1955
Tewa 1956
Texarkana 1989
Thistle 1969
* Thoroughbred 2000
Throw 1968
Ticking 1965
Tierra 1984
Tightrope 1962
Tijeras 1970
Tilci 1981
Tinderbox 1968
Tiny Tot 1965
Tioga 1962
Titania 1958
Tobacco 1958
Tomato 1966
Tomme/
Midnight Zephyr 1983
Topgallant 1975
Topmast 1978
Torch 1968
Tornero 1987
Tornillo 1963
Torrido 1969
Tortugas 1984
Towanda 1985
Toyah 1963
Transom 1978
Traveler 1966
Trebbiano 1981
Trinity 1945
Trogon 1964
Truchas-Chacon 1970
Truchas-Chamisal 1970
Truchas-Rodarte 1970
Truckee 1962
Trumbull 1974
Tub-A 1968
Tub-B 1968
Tub-C 1968
Tub-D 1968
Tub-F 1968
Tulia 1989
Tuloso 1972
Tun-A 1969
Tun-B 1969
Tun-C 1969
Tun-D 1969
Tuna 1963
Turf 1964
Turk 1955
Turnstone 1964
Turquoise 1983
Tweed 1965
Tybo 1975
Tyg-A 1968
Tyg-B 1968
Tyg-C 1968
Tyg-D 1968
Tyg-E 1968
Tyg-F 1968
Umber 1967
Umbrella 1958
Uncle 1951
Union 1954
Uranus 1958
Valencia 1958
Valise 1969
Vat 1968
Vaughn 1985
Velarde 1973
Venus 1958
Verdello 1980
Vermejo 1984
Vesta 1958
Victoria 1992
Vide 1981
Vigil 1966
Ville 1985
Villita 1984
Vise 1969
Vito 1967
* Vito 2002
Vulcan 1966
Waco 1987
Wagtail 1965
Wahoo 1958
Waller 1973
Walnut 1958
Ward 1967
Washer 1967
Wasp 1955
Wasp Prime 1955
Welder 1968

The CTBT interpreted literally may not ban expansive laboratory testing programs and subcritical tests. But the commitment made by the NWS at the 1995 NPT review and Extension Conference to achieve a CTBT as part of a program for the "effective implementation of article VI," embodied in a provision which further stated that "[p]ending the entry into force of a Comprehensive Test-Ban Treaty, the nuclear-weapon States should exercise utmost restraint;" must be viewed in a different light. It clearly is bound to a broader interpretive context in which a CTBT is envisioned as a meaningful step along the road to nuclear disarmament, rather than an instrument for the permanent preservation of a two-tier world, in which a few states claim the right not only to possess unlimited weapons of mass destruction, but to destroy any state that dares to develop such weapons themselves.

Before nuclear arms racing can be reversed, it must be stopped. Real progress towards disarmament requires concrete steps by the nuclear weapons states to first control and then eliminate nuclear weapons research, development, and testing in all its forms. The United States, with nuclear weapons research programs that dwarf all others and with a stated policy of researching new kinds of nuclear weapons, bears the greatest responsibility here to take immediate, substantial, and unambiguous action. Because of their role not only in providing information useful for nuclear weapons design but in exercising capabilities needed to rapidly resume a full-scale nuclear explosive testing program, one logical starting place would be the termination of subcritical tests. Cessation of subcritical tests would both be a visible, concrete step towards controlling laboratory nuclear weapons research and would facilitate complete closure of all remaining underground nuclear test sites. In addition to simplifying verification issues, closure of the Nevada Test Site would further broaden the "firebreak" between simulation testing-based prototyping of some types of radically new nuclear weapons concepts and their deployment.

The elimination of nuclear weapons, still the gravest threat to humanity and growing once more as we enter a new century, will for a start require a clear commitment by the most powerful states, and the United States most of all, not only to nuclear disarmament but to a more peaceful world. The apparent determination of the most powerful countries to dominate the world by force of arms is eroding what remains of international order, and nuclear weapons are at the center of a growing global crisis of war and violence. The possibility that countries may obtain nuclear weapons is put forward as a principal rationale for a continuing U.S. high-tech and nuclear weapons buildup, and for preventive warfare without regard for the existing framework of international law. At the same time, the insistence by the existing nuclear weapons states, which also possess the most powerful conventional military forces, that nuclear weapons remain essential to their "security," continues to undercut the fragile nonproliferation regime. As the International Court of Justice noted in its 1996 opinion on the *Legality of the Threat or Use of Nuclear Weapons*,

> In the long run, international law, and with it the stability of the international order which it is intended to govern, are bound to suffer from the continuing difference of views with regard to the legal status of weapons as deadly was nuclear weapons.[39]

Nuclear weapons, and the brutal ultimate power politics that their possession simultaneously makes possible and, to those in their thrall, seem to make necessary,

themselves continue to escape all efforts at their legal regulation, and in the end render efforts to regulate lesser uses of force largely futile as well. And as the World Court then concluded,

> It is consequently important to put an end to this state of affairs: the long-promised complete nuclear disarmament appears to be the most appropriate means of achieving that result. *Id.*

In today's mainstream U.S. political discourse, the daily grist of pundits, "electable" candidates, and "reasonable" experts, we hear barely a whisper about disarmament and the path to a more peaceful world for everyone, only endless debate over which new American weapons system can best destroy the weapons of others. Humanity will not survive many more decades of nuclear weapons and endless high-tech arms racing. It is long past time for us to take up the demand, made at the dawn of the nuclear age, "no longer a prayer, but an order which must rise up from people to their governments– the order to choose finally between hell and reason."[40]

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Wembley 1968
Wexford 1984
Wheeler 1957
White 1962
Whiteface-A 1989
Whiteface-B 1989
Whitney 1957
Wichita 1962
Wigwam 1955
Wilson 1957
Winch 1969
Wineskin 1969
Wishbone 1965
Wolverine 1962
Wool 1965
Worth 1967
Wrangell 1958
X-ray 1948
Yankee 1954
Yannigan-Blue 1970
Yannigan-Red 1970
Yannigan-White 1970
Yard 1967
Yellowwood 1958
Yerba 1971
Yeso 1962
Yoke 1948
York 1962
Yuba 1963
Yucca 1958
Yukon 1962
Yuma 1956
Zaza 1967
Zebra 1948
Zinnia 1972
Zucchini 1955
Zuni 1956

Notes

1. Some tests involved multiple nuclear blasts; the total number of underground nuclear detonations at the Nevada Test Site was 828, counted as 804 "tests." See generally U.S. Department of Energy, "United States Nuclear Tests July 1945 through September 1992," DOE/NV--209-REV 15

2. U.S. Department of Energy, "Atmospheric Tests at the Nevada Test Site, 1951 - 1962," March 2000, DOE/NV–716, March 2001, p.2.

3. For a collection of materials on the health effects of U.S. nuclear weapons testing, including government studies and critical commentary, see the Alliance for Nuclear Accountability "Health Issues" page at http://www.ananuclear.org/healthpage.html

4. Subcritical tests also can be conducted aboveground, contained in steel vessels. See Greg Mello and Andrew Lichterman, "Nuclear Testing in Tanks: Subcritical Nuclear Tests Resume at Los Alamos," Los Alamos Study Group. June, 1999, http://www.lasg.org/updatej99_b.html

5. U.S. Department of Energy, National Nuclear Security Administration, *Fiscal Year 2001 Stockpile Stewardship Plan,* 2000, obtained by the Western States Legal Foundation via the Freedom of Information Act, p. 31-2.

6. See Suzanne L. Jones and Frank N. Von Hippel, "Transparency Measures for Subcritical Experiments Under the CTBT," *Science and Global Security,* 1997, Vol.6, p.291, 292-3.

7. John A. Gordon, Administrator of the National Nuclear Security Administration (NNSA), Written Statement to the Committee on Armed Services, U.S. Senate, February 14, 2002.

8. U.S. Department of Defense, "Nuclear Posture Review Report: Forward,"January 8, 2002, http://www.globalsecurity.org/wmd/library/policy/dod/npr.htm

9. Statement of Dr. Frederick A. Tarantino, President and General Manager, Bechtel Nevada, before the House Armed Services Committee, Procurement Subcommittee, June 12, 2002.

10. See generally U.S. Department of Energy, *Final Environmental Impact Statement for the Nevada Test Site and Off-Site Locations in the State of Nevada* (1996), Volume 1, Appendix A, "Dewcription of Projecs and Activities, and National Nuclear Security Administration, Infrastructure Plan for the NNSA Nuclear Weapons Complex, April, 2003, p.19.

11. U.S. Department of Energy, National Nuclear Security Administration, "Record of Decision for the Final Environmental Impact Statement for the Relocation of Technical Area 18 Capabilities and Materials at the Los Alamos National Laboratory ," 67 Federal Register no. 251, December 31, 2002, pp. 79906-79911.

12. For additional information on the Modern Pit Facility, see Andrew Lichterman, *Mass Producing Weapons of Mass Destruction: U.S. Plans for a New Nuclear Weapons Factory and the Global Resurgence of Nuclear Arms*, Western States Legal Foundation and the Los Alamos Study Group, Information Bulletin, Summer 2003 http://www.wslfweb.org/docs/mpfinfo.pdf

13. See Natural Resources Defense Council, "Table of Global Nuclear Weapons Stockpiles, 1945-2002," Table of Global Nuclear Weapons Stockpiles, 1945-2002

14. Chris Jones, "The Business of Defense: All New Site Lines," Las Vegas Review-Journal (web edition), October 26, 2003.

15. U.S. Department of Energy, *Final Environmental Impact Statement for the Nevada Test Site and Off-Site Locations in the State of Nevada* (1996), Volume 1, Appendices A-F, p.A-46.

16. See GlobalSecurity.org, "Nevada Test Site: BACHUS, Biotechnology Activity Characterization by Unconventional Signatures," http://www.globalsecurity.org/wmd/facility/nts-camp-12.htm

17. See Henry Goldwire, Jr., "Remote Sensor Test Range: Proving Ground for Tomorrow's Sensor Technologies," *Science and Technology Review* (Lawrence Livermore National Laboratory), April 2000.

18. NPS/CIRPAS Activity Summary, CADDIE Demonstration, http://web.nps.navy.mil/~cirpas/Projects/CADDIE%20Activity%20Summary.htm

19. U.S. Department of Defense, Defense Threat Reduction Agency, "Thermobaric Warheads," http://www.dtra.mil/td/thermo/td_thermo.html

20. U.S. Department of Defense, Deputy Under Secretary of Defense (Science and Technology), Defense Technology Area Plan, (2000), p.XI-9, obtained by Western States Legal Foundation under the Freedom of Information Act. Full document available at http://www.wslfweb.org/docs/dstp2000/dtappdf/contents.pdf

21. U.S. Department of Defense, Deputy Under Secretary of Defense (Science and Technology), *Defense Technology Area Plan,* (2000), p.XI-7, obtained by Western States Legal Foundation under the Freedom of Information Act. Full document available at http://www.wslfweb.org/docs/dstp2000/dtappdf/contents.pdf

22. For more information on the B61-11 and other research on nuclear weapons with new capabilities during the 1990's, see Greg Mello, "New bomb, No Mission," *The Bulletin of Atomic Scientists*, May/June 1997, and Andrew Lichterman, *Looking for New Ways to Use Nuclear Weapons: U.S. Counterproliferation Programs, Weapons Effects Research, and "Mini-Nuke" Development*, Western States Legal Foundation Information Bulletin, Winter 2001, http://www.wslfweb.org/docs/mininuke.pdf.

23. U.S. Department of Defense, Deputy Under Secretary of Defense (Science and Technology), *Defense Technology Objectives for Defense Technology Area Plan,* (2000), "Nuclear Phenomenology," p. II-372, obtained by Western States Legal Foundation under the Freedom of Information Act . (Emphasis added) The full document can be found on the WSLF web site at http://www.wslfweb.org/docs/dstp2000/dtopdf/24-NT.pdf

24. Nuclear Posture Review, pp. 34-35, provided in "Nuclear Posture Review Excerpts," Globalsecurity.org, at http://www.globalsecurity.org/wmd/library/policy/dod/npr.htm (hereafter *Nuclear Posture Review*). For a more detailed analysis of the Nuclear Posture Review and current U.S. nuclear weapons policies and their relationship to other high-tech weapons programs, see Andrew Lichterman and Jacqueline Cabasso, *The Shape of Things to Come: The Nuclear Posture Review, Missile Defense, and the Dangers of a New Arms Race*, WSLF Special Report, April 2002, http://www.wslfweb.org/docs/shape.pdf For additional information from a variety of sources about the Nuclear Posture Review, see the WSLF NPR information page at http://www.wslfweb.org/nukes/npr.htm

25. U.S. Department of Energy FY2004 Congressional Budget Request, National Nuclear Security Administration, Weapons Activities, Executive Summary, p.42 (pdf file pagination)

26. U.S. Department of Energy FY2003 Congressional Budget Request, National Nuclear Security Administration, Weapons Activities, Executive Summary p.10 (pdf file pagination)

27. See Walter Pincus, "Pentagon Pursues Nuclear Earth Penetrator," *The Washington Post*, March 7, 2003, p.A25.

28. "Stockpile Stewardship Conference Planning Meeting Minutes," 10 January 2003, Attachment 2, "Panels: Draft Topics Lists and Members." Obtained by the Los Alamos Study Group, www.lasg.org, full document available at http://www.lasg.org/StockpileStewardshipReview%5b1%5d.htm

29. For an overview of these missile programs, see *Missiles of Empire: America's 21st Century Global Legions*, Western States Legal Foundation Information Bulletin, Fall 2003 http://www.wslfweb.org/docs/missiles03.pdf

30. "Memo re FY 2004 National Defense Authorization Act," Linton Brooks, Administrator, National Nuclear Security Administration, U.S. Department of Energy, to Pete Nanos, Director, Los Alamos National Laboratory, Michael Anastasio, Director, Livermore National Laboratory, and C. Paul Robinson, President, Sandia National Laboratory, December 5, 2003. Obtained by the Los Alamos Study Group, http://www.lasg.org

31. Preamble, *Treaty Banning Nuclear Weapon Tests in the Atmosphere, in Outer Space and under Water* (1963) Entered into Force: 10 Oct 1963.

32. 1995 Review and Extension Conference of the Parties to the Treaty on the Non-Proliferation of Nuclear Weapons, *Principles and Objectives for Nuclear Non-Proliferation and Disarmament*, NPT/CONF,1995/L.5, 9 May 1995.

33. Secretary of State Madeleine K. Albright, Remarks at Chicago Council on Foreign Relations, November 10, 1999, Chicago, Illinois, as released by the Office of the Spokesman, U.S. Department of State. Emphasis added.

34. 2000 Review Conference of the Parties to the Treaty on the Non-Proliferation of Nuclear Weapons, *Final Document*, NPT/CONF.2000/28, 22 May 2000.

35. National Nuclear Security Administration, *Infrastructure Plan for the NNSA Nuclear Weapons Complex*, April, 2003, p.8.

36. In 1978, long before the sophisticated new weapons testing facilities now being built by the United States were contemplated, three prominent U.S. nuclear weapons scientists, Norris Bradbury, Carson Mark, and Richard Garwin, wrote to President Jimmy Carter informing him that it would be possible to assure the safety and reliability of nuclear warheads without underground nuclear testing, so long as warhead designs were not significantly changed. They noted that

> ...[T]he assurance of continued operability of stockpiled nuclear weapons has in the past been achieved almost exclusively by non-nuclear testing-- by meticulous inspection and disassembly of the components of the nuclear weapons, including their firing and fusing equipment. Problems encountered in this inspection are normally validated by additional sampling and solved by the remanufacture of the affected components. This program is, of course, supplemented by the instrumented firing of the entire nuclear weapon with inert material replacing

the fissile materials, and the entire program thus far described would be unaffected by the requirements of a CTBT. It has been exceedingly rare for a weapon to be taken from the stockpile and fired 'for assurance.'

It has been rare to the point of non-existence for a problem revealed by the sampling and inspection program to require a nuclear test for its resolution. There are three acceptable approaches to the correction of deficiencies without requiring nuclear testing:

1) Remanufacture to precisely the original specifications

2) Remanufacture with minor modifications in surface treatment, protective coatings, and the like, after thorough review by experienced and knowledgeable individuals.

3) Replace the nuclear explosive by one which has previously been tested and accepted for the stockpile.

A fourth option, to replace the troubled nuclear system by one not already proof tested may result in improved performance, lesser use of special nuclear materials, or the like, *virtues which have more to do with improvement of the stockpile than with confirming its operability....*" Letter, N. Bradbury, C. Mark, and R. Garwin, to President Jimmy Carter, August 15, 1978, Appendix J to R.E. Kidder, "Maintaining the U.S. Stockpile of Nuclear Weapons During a Low-Threshold or Comprehensive Test Ban," Lawrence Livermore National Laboratory 1987. (Emphasis added)

37. As Sandia National Laboratory Director C. Paul Robinson noted in his testimony to the Senate Armed Services Committee on the CTBT, while the national laboratories "cannot create completely new concepts without testing, many previously tested designs could be weaponized to provide new military capabilities." Robinson observed that

For example, if nuclear weapons emerge as the right answer to deter the use of other weapons of mass destruction in a regional conflict, the nuclear weapons we currently deploy may carry too high a yield and be far too disproportionate a response to be a credible deterrent. Proven designs of lower yield exist that might be adaptable for new military requirements in the future. I believe that such weapons could be deployed this way without the need for nuclear tests. Statement of C. Paul Robinson to the U.S. Senate Armed Services Committee, October 7, 1999.

38. Comprehensive Nuclear-Test-Ban Treaty, Opened for signature at New York: 24 September 1996, Not yet in force, Depositary: Secretary-General of the United Nations.

39. Legality of the Threat or Use of Nuclear Weapons(General List No. 95 (Advisory Opinion of 8 July 1996)) Para. 98.

40. Albert Camus, "Between Hell and Reason," Combat, August 6, 1945, in Kai Bird and Lawrence Lifschultz, eds., *Hiroshima's Shadow: Writings on the Denial of History and the Smithsonian Controversy*, (Stony Creek, Connecticut: 1998), 261.

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