THE DEFENSE MONITOR

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# PREPARING FOR NUCLEAR WAR: PRESIDENT REAGAN'S PROGRAM

## *Defense Monitor in Brief*

- President Reagan and his advisors appear to be preparing the United States for nuclear war with the Soviet Union.
- President Reagan plans to spend $222 Billion in the next six years in an effort to achieve the capacity to fight and win a nuclear war.
- The U.S. has about 30,000 nuclear weapons today. The U.S. plans to build 17,000 new nuclear weapons in the next decade.
- Technological advances in the U.S. and U.S.S.R. and changes in nuclear war planning are major factors in the weapons build-up and make nuclear war more likely.
- Development of new U.S. nuclear weapons like the MX missile create the impression in the U.S., Europe, and the Soviet Union that the U.S. is building a nuclear force to destroy the Soviet nuclear arsenal in a preemptive attack.
- Some of the U.S. weapons being developed may require the abrogation of existing arms control treaties such as the ABM Treaty and Outer Space Treaty, and make any future agreements to restrain the growth of nuclear weapons more difficult to achieve.
- Nuclear "superiority" loses its meaning when the U.S. and the U.S.S.R. both possess far more nuclear weapons than the number required to destroy one another in all circumstances.
- This *Monitor* features a status report on all U.S. nuclear weapons programs, an inventory of the U.S. nuclear stockpile, and information on locations of nuclear weapons in the U.S.

President Reagan has announced his hopes for reaching agreements with the Soviet Union on limiting nuclear weapons in Europe and in newly revived negotiations on strategic weapons (START talks). Both the United States and the Soviet Union have recently stepped up their propaganda campaigns to sway public opinion. Whether any practical achievements will flow from the war of words remains to be seen. What is already clear is that President Reagan has approved the most ambitious build-up of nuclear weaponry in U.S. history. The danger of nuclear war is increasing, despite attempts to revive confidence in negotiations.

President Reagan and his advisors appear to have psychologically declared war on the Soviet Union. Some officials believe the U.S. is in a "pre-war" situation and that there is a good chance of nuclear war with the Soviets. They want to prepare our country to fight and win this approaching nuclear war.

This dramatic, if not apocalyptic, presumption is what underlies the new nuclear weapons program of the Reagan Administration. It is an attempt to acquire a full-fledged nuclear war-fighting capability. As Frank Carlucci, Deputy Secretary of Defense, has admitted, "that is a very large order." It is a very expensive and very dangerous order as well.

The Reagan Administration is planning a major expansion of U.S. nuclear forces over the next six years.

The programs involve land, sea and air-based missiles, new bombers, space weaponry and missile defense systems, among others. The implied purpose of this $222 Billion effort is to gain nuclear "superiority" over the Soviet Union. The new nuclear weapons program, coupled with programs already funded and under development, will result in 17,000 new nuclear weapons over the next decade.

Contributing to the dangers of deploying thousands of new nuclear weapons is an unsettling change of emphasis in U.S. strategic doctrine that may make nuclear war more probable in the coming decades. These changes in doctrine gained much public attention when an outline of Presidential Directive 59 was first leaked to the press in August 1980. PD-59 codified the strategic doctrine known as "countervailing strategy" which evolved during the 1970's. In effect, it expands the capabilities required or demanded of U.S. nuclear forces in a nuclear war and attempts to give the President a wider range of choices.

Emphasis has shifted from conceiving of nuclear weapons as deterrents to how they can be used as warfighting weapons.

The Reagan Administration appears to be carrying the countervailing strategy one step further. It plans to incorporate both the "limited nuclear options" of the Carter strategy and its own ill-conceived notions of nuclear superiority into the nuclear weapons build-up.

No one in the Administration has bothered to produce a realistic definition of nuclear superiority in an age when both the U.S. and the U.S.S.R. have thousands of nuclear weapons and the ability to effectively destroy one another. However, it appears that a major component of such a drive for superiority will be the ability to wage "limited" nuclear war. Through tremendous expenditures for both new nuclear weapons and the systems to deliver them, the Administration intends to build the capacity to fight nuclear wars that range from limited use through a protracted conflict to an all-out attack.

### U.S. Seeks to "Prevail" in Nuclear War

"We set out to ... achieve improved capabilities to enhance deterrence and U.S. capabilities to prevail should deterrence fail."

Defense Secretary
Caspar Weinberger
November 3, 1981

These recent developments in strategy and doctrine also have serious implications for attempts at arms control. So long as our leaders emphasized concepts such as assured destruction or sufficiency, fixed criteria could be arrived at for determining the size and characteristics of U.S. nuclear forces. But war-fighting concepts remove all constraints on the number, variety and complexity of new nuclear weapons and their delivery systems.

This new phase of the arms race is being pushed along by technological advances, which when added to warfighting doctrine and vast numbers of new nuclear weapons, make their use more plausible. Advances in the technical sophistication of this new generation of weapons support warfighting concepts that are becoming part of the strategies of the U.S. and the U.S.S.R.

For example, through advances in propulsion, guidance, and engineering, our intercontinental ballistic missiles (ICBMs) and other nuclear delivery systems are developing the accuracy to destroy small hardened targets such as missile silos and command bunkers. This accuracy, when incorporated into all our delivery systems (cruise missiles, SLBMs, ICBMs, etc.) will give the U.S. a counterforce capability that could soon threaten Soviet nuclear forces.

Our leadership, both civilian and military, have consistently emphasized that we seek only a nuclear force capable of deterring our opponents. Yet, when first strike capabilities and threats are weighed what really matters is how the other side views our intentions.

U.S. nuclear forces long ago surpassed the criteria of "minimum deterrence" or "assured destruction." The U.S. public is being mistakenly led to believe that the continued expansion of our nuclear forces enhances deterrence. In fact, if it contributes to Soviet insecurities about the safety of their own nuclear retaliatory forces it may be doing just the opposite.

### A Nuclear Warfighting Capability

"I think we need to have a counterforce capability. Over and above that, I think that we need to have a warfighting capability."

Frank Carlucci
Deputy Secretary
of Defense
January 13, 1981

Several other features of the Reagan nuclear weapons programs are particularly troubling. The exemption of strategic programs from budgetary restraint will cause an imbalance in our armed forces, depriving much needed funds from conventional forces. Second, there is no evidence that the Reagan Administration has seriously incorporated a role for arms control into its national security plans.

In October 1980, candidate Ronald Reagan stated that there was, indeed, an ongoing nuclear arms race, but that only the Soviet Union was participating. This is simply not true. The U.S. is not now nor ever has been "strategically inferior" to the Soviet Union. As the survey below of U.S. nuclear weapons programs demonstrates, the enhancement and enlargement of U.S. nuclear forces has continued unabated throughout the 1970's and will be accelerated in the 1980's.

The Reagan Administration's effort to prepare to fight a nuclear war is a dangerous and futile objective that must be reconsidered. The record of the arms race shows that each advance will be met by the other side, probably sooner than later, and that neither nation can gain a significant advantage.

Nuclear weapons should serve only one purpose, to deter war. The only true test for the sufficiency of our nuclear forces is that they be able to meet any Soviet attack in a way that denies the Soviets an advantage for having made the attack. Our present capability to deliver over 12,000 nuclear weapons on the Soviet Union more than meets this test of sufficiency.

# THE STATUS OF U.S. NUCLEAR WEAPONS PROGRAMS

## Land-based Missiles

**Missile Experimental (MX).** The Reagan Administration has decided to cancel the Carter Administration's multiple shelter basing plan but move ahead with the missile itself. The Reagan plan calls for placing some portion of 100 MX missiles in existing Minuteman silos beginning in 1986 and hardening them. The problem of how to base MX continues to plague the Reagan Administration. They state hardened silos are an interim or temporary solution while further study is done on three, more permanent basing options, one or more of which will be decided upon in 1984. The three are: MX deployed aboard continuous airborne alert aircraft; deep underground missile basing (DUMB); and a Ballistic Missile Defense (BMD) system to protect fixed silos. These decisions have neither quelled the controversies surrounding MX nor answered basic questions about the strategic requirements for MX or its contribution to our national defense.

The most important question about MX, but the least discussed, is whether the U.S. needs a hard target-killing missile. If we are preparing to fight and win a nuclear war by initiating a preemptive disabling strike on Soviet nuclear forces, the answer is yes. Otherwise, we do not need it, for there are very few hard targets other than missile silos which require the power and accuracy of an MX system.

**Minuteman Improvements.** There are 550 Minuteman III (MM III) ICBMs and 450 Minuteman II ICBMs. The former carry three nuclear weapons each and the latter carry one.

*Airborne Launch Control System* (ALCS)—Under the third phase of this program, a communications system will be installed on 200 MM III missiles and EC-135 aircraft. This will give commanders the ability to re-target and launch missiles from the air, if ground launch centers are destroyed in an attack. This system, to include three missile squadrons at Grand Forks Air Force Base, North Dakota, and one at Malmstrom Air Force Base, Montana, is scheduled for initial operation in 1984 and completion by 1985.

*Mark 12A Retrofit*—Three hundred MM III missiles are being retrofitted with the Mark 12A reentry vehicle (RV). Each of these 900 Mark 12A RVs (three weapons per missile) will have twice the accuracy and double the explosive power (335 kilotons-kt.) of the weapons on other MM IIIs. This will give each retrofitted MM III ten times the lethality of a MM II. The retrofitting has been completed on about 150 missiles at Minot Air Force Base and Grand Forks Air Force Base, North Dakota. The Minot program will be completed in the fall of 1982, Grand Forks in early 1983.

*Launch control systems*—Improvements in communications for 300 MM II silos have been completed at Malmstrom Air Force Base, Montana, and Whiteman Air Force Base, Missouri.

*Other Recent Improvements.* The *Command Data Buffer System,* completed in 1977 on 500 Minuteman III missiles, allows remote retargeting of each missile in 25 minutes and the entire force in ten hours, a process which used to take weeks. A *silo upgrade* program for Minuteman silos, completed in January 1980, provided all Minuteman wings with a substantial increase in hardening against nuclear effects, resulting in a significant improvement in survivability for Minuteman. *Minuteman Ground Launch Centers* are being upgraded by connecting them to the Air Force Satellite Communications System (AFSATCOM), the 616A survivable Low Frequency Communications System, and the SAC Digital Information Network (SACDIN). These systems will reduce the processing time for emergency messages as well as missile crew workload during crises. Scheduled completion is Fiscal Year (FY) 1985.

*Maneuverable Reentry Vehicles (MARV).* The Air Force's Advanced Ballistic Reentry System (ABRES) program develops reentry technology in support of existing and future missile systems. ABRES provides the funding for development of the Advanced Maneuvering Reentry Vehicle (AMARV). AMARV was ostensibly designed as a hedge against any future Soviet anti-ballistic missile (ABM) threat. But AMARV's ability to correct its trajectory during the reentry and terminal phases of flight will give it nearly 100 percent accuracy. Such accuracy, when combined with a large number of missiles—perhaps the MX and Minuteman III—could pose a potent first strike threat against the Soviet ICBM force. Additionally, the Navy is developing its own maneuvering RV, the Mark 500 "Evader," for possible use on the Trident II missile.

*Advanced Ballistic Reentry Vehicle (ABRV).* Recently, ABRES has focused on other innovations in missile technology, including penetration aids (decoys, chaff, etc.) for Pershing II, Trident, and MX and demonstration of an Advanced Ballistic Reentry Vehicle (ABRV). There are reports that the Pentagon has tentatively decided to use the ABRV instead of the MK12A on the MX ICBM. Each ABRV may have almost double the explosive power (about 600 kt) of the MK12A and will be more accurate.

## Long-Range Bombers

**B-52 Modifications.** The United States presently has 347 B-52s and 62 FB-111s as active parts of the

### The Drive for Superiority

"We will build toward a sustained defense expenditure sufficient to close the gap with the Soviets, and ultimately reach the position of military superiority that the American people demand."

*Republican National Platform*
1980 Campaign

strategic bomber force. Twenty years ago our bombers carried 97 percent of our nuclear weapons. Because of the shift of emphasis to ICBMs and submarines, the bomber force now carries approximately 23 percent of our nuclear weapons but still half the megatonnage.

While the Air Force has been the strongest proponent for a replacement to our "aging" B-52s they have also actively sought and received a wide variety of programs to modernize them as well. These programs include electronic countermeasures, sensors, communications systems via satellite, warning radar receivers, jammers and terrain guidance systems, and hardening against the effects of electromagnetic pulse generated by nuclear explosions, among others. Additionally, B-52Gs have begun carrying air-launched cruise missiles (ALCM). Former Secretary of Defense Harold Brown concluded that these improvements would ensure that "the B-52 force can remain effective into the 1990's."

**B-1B Bomber.** Despite the extensive cruise missile program and the FB-111 and B-52 modifications programs, the Air Force has been trying to revive the B-1 long-range penetrating bomber since Carter's 1977 decision to terminate the program and accelerate cruise missile development. President Reagan recently decided to build a force of 100 B-1 variant aircraft (B-1B) as a successor to the B-52. The Reagan budget for FY 1982 includes $2.4 Billion for procurement and research and development for the B-1B.

The B-1 had been designed primarily as a manned penetrating bomber to carry nuclear bombs to targets inside the Soviet Union. Its ability to carry out this mission against early-1990s Soviet air defenses is doubted by many military experts.

The Reagan Administration now claims the B-1B will also perform other missions, including: cruise missile carriage; conventional bombing; and theater support, both conventional and nuclear. While the B-1B may have such add-on capabilities, to risk an aircraft which costs $300-400 million per copy for conventional and theater missions is questionable strategy.

The B-1B will be similar in design to the four prototypes Rockwell built in the 1970's (at a total development cost of $6 Billion). It will also incorporate advances in avionics, cruise missile carriage, air defense penetration, and radar cross-section reduction which are currently available. The Reagan Administration claims a squadron of 15 B-1Bs will be operational in 1986. It is estimated that the force of 100 B-1B aircraft will cost between $30-40 Billion.

**Advanced Technology Bomber ("Stealth").** "Stealth" technology incorporates improvements in design and countermeasures to reduce an airplane's radar cross-section making it nearly "invisible" to radar and able to elude current Soviet air defenses. These innovations include: improvements in propulsion; reduced aircraft weight; non-metallic and radar absorbing materials; fewer engines; refined avionics; improved defensive countermeasures; modifications of air intakes; reduced engine exhaust temperatures; and treatment of fuels to lower infra-red signatures.

The Reagan Administration says it will accelerate research and development of the Stealth bomber aircraft, and predicts that it will become available in the early 1990s. Some Congressional critics claim that the Administration is downplaying Stealth so that it can pay for the B-1B. Actual cost figures for Stealth are classified but estimates range from $22 to $56 Billion depending on the number of aircraft. The Air Force has recommended production of 110 Stealth bombers. The Pentagon has estimated the total cost of the B-1B, Stealth and ALCM programs until the end of the 1990s to be $115 Billion in FY 1981 dollars. The Administration has allocated $78 Billion for 1982-87 for all bomber programs.

### Overspending on Nuclear Weapons

"It is naive to assume that the defense budget is open ended. If we allocate so much of our defense budget to strategic programs that we allow our conventional posture to suffer, we will inadvertently decrease our options in protecting our vital interests without resorting to the use of nuclear weapons."

Senator Sam Nunn
Senate Armed
Services Committee
December 3, 1981

## Submarines

**Trident I Backfit Program.** The program to backfit Trident I (C-4) missiles on 12 Lafayette and Benjamin Franklin Class Poseidon sub-

marines continues. Seven retrofittings have been completed and the entire program is scheduled to be finished in FY 1982. Trident I weapons are two and one half times more powerful than Poseidon (C-3) weapons and have a range of over 4,000 miles as opposed to 2,500 for the Poseidon. The greater range increases the patrol area of these subs by a factor of 10, allowing them to operate in much larger regions of the Pacific and the Atlantic, thereby hedging against the possibility of major Soviet anti-submarine advances.

The estimated cost for producing Trident I missiles for 12 Poseidon submarines is $4.5 Billion and for 15 Trident submarines is now $11.3 Billion.

One Poseidon squadron which will carry the Trident missiles was relocated in July 1979 from Rota, Spain to Kings Bay, Georgia. Other Poseidon squadrons are located in Holy Loch, Scotland and Charleston, South Carolina. Eight Polaris submarines have been redesignated attack submarines and have been withdrawn from the strategic force. The USS Theodore Roosevelt and USS Abraham Lincoln have been dismantled.

**Trident Submarine Program.** The first nine Trident submarines have been authorized and are all scheduled to be completed by 1987. Advance funding for the tenth, eleventh and twelfth was recently approved by Congress. The Trident is the largest submarine the U.S. has ever built and a most formidable weapon. It displaces almost 19,000 tons (a Poseidon submarine is about 8,000) and is 560 feet long. Each Trident sub will carry 24 missiles compared to 16 missiles on Poseidon and Polaris. Its 168-192 warheads will give each submarine a total destructive power of 15-20 megatons. For comparison, it has been estimated that all the U.S. bombs dropped on Europe and Japan during World War II totalled about two megatons in explosive power. Each Trident submarine can cover more targets than ten Polaris subs.

## Reagan's $222 Billion Program

| | |
|---|---|
| Bombers/Cruise missiles | $78 Billion |
| Sea-based weapons | $51 Billion |
| ICBMs | $42 Billion |
| Nuclear defense (air defense, civil defense, etc.) | $29 Billion |
| Command-Control-Communications | $22 Billion |
| TOTAL | $222 Billion for 1982-87 |

**Note:** *Additional expenditures on nuclear weapons in the Department of Energy budget will add $30-35 Billion. Does* **not** *include tactical nuclear weapons.*

The first ten Trident submarines will be based in Bangor, Washington and subsequent ones at Kings Bay, Georgia. The total cost estimate for building the Bangor base is $700.7 million. The total cost estimate for building the Kings Bay facility is $1.25 Billion. While the Trident submarine construction program at Electric Boat in Groton, Connecticut has been plagued with problems—cost over-runs, design changes, delays, faulty workmanship and failure to meet design specifications—the first Trident sub, USS Ohio, was commissioned on November 11, 1981. It will begin active patrol in 1982. The second Trident, USS Michigan, will follow one year later with subsequent subs scheduled to be delivered every 8-10 months. How many Trident subs the Navy will buy in all depends on many factors still to be resolved, but will probably be at least twenty. The cost of each Trident sub (without nuclear reactor and missiles) now exceeds $1.2 Billion. The cost of the total Trident submarine program is more than $30 Billion.

**Trident II.** President Reagan has decided to step up development of a larger, more accurate Trident II (D-5) missile for deployment on Trident submarines to replace Trident I missiles beginning in 1989. In its advanced development program, the Navy has already begun working on a number of options, though more testing will be necessary before certain design criteria are established. Whatever type of Trident II is decided upon, it will have some combination of greater accuracy, range, explosive power and/or number of weapons than the Trident I.

Advances in guidance will give the Trident II missile accuracy comparable to a cruise missile or MX. The weapon chosen could be the W-78, which in combination with the missile's high accuracy would give the Trident II a substantial hard target kill capability. The missile is being specifically designed to give our sea-based forces the ability to destroy the Soviet land-based missiles in their silos, a capability that the other two legs of our triad will have soon. As noted previously, the MK500 "Evader" maneuvering reentry vehicle is also being considered as an option on both the Trident I and II.

In 1980 the cost of the research and development effort alone was estimated to be $8 Billion. Total cost of the Trident II missile program is estimated at $20 Billion.

## Cruise Missiles

Cruise missiles are pilotless, jet-powered, subsonic, miniature airplanes which carry nuclear or conventional warheads. The German V-1 "buzz bomb" was an early, but crude and inaccurate example of a cruise missile. Technological advances have made American cruise

### "A Pre-War World"

"We are living in a pre-war and not a post-war world."

Eugene Rostow
Currently Director,
U.S. Arms Control
and Disarmament Agency
June 1, 1976

missiles into formidable weapons, able to change direction and altitude in flight. U.S. cruise missiles use the TERCOM guidance system to compare terrain features enroute with information stored on an on-board computer. With regularly updated guidance the cruise missile is able to follow an evasive course, hugging the ground below radar coverage, and strike within 200 feet of its target.

Its small jet engine propels it at 500 miles per hour with ranges of up to 1,500 miles. Three nuclear versions, each of which have the explosive power of 200 kilotons, are planned to be deployed in the near future. The total cost for all cruise missile programs is $15 Billion. While its size, mobility, penetrability, and accuracy make it popular with some, those same factors pose serious arms control problems.

*Ground-Launched Cruise Missile*

**Air-Launched Cruise Missiles (ALCM).** Boeing recently began full-scale production of the AGM-86B air-launched cruise missile. One bomber is now equipped with ALCMs. A squadron of B-52G's at Griffiss Air Force Base, Rome, New York will be the first one armed to carry 12 external ALCMs, beginning in December 1982. By FY 1990 all 172 B-52G's will be equipped to carry 20 ALCMs each, with 151 operational at any one time. The total cost for 3,418 missiles is estimated to be $6 Billion. The Reagan Administration has decided to deploy ALCMs on 100 B-1B bombers and 96 B-52Hs as well. This could mean the addition of hundreds or thousands more ALCMs beyond the 3,418 now planned.

**Ground-Launched Cruise Missiles (GLCM).** On December 12, 1979, NATO Defense and Foreign Ministers agreed to deploy 464 GLCMs in Europe: 160 in the United Kingdom; 112 in Italy; 96 in Germany and 48 each in Belgium and The Netherlands. Decisions have been made and announced on the sites for cruise missile bases in the United Kingdom and Italy. The first operational site will be at Greenham Common and is scheduled to be ready in December 1983. The other location in the United Kingdom is RAF Molesworth. The Italian site was publicly announced in August 1981 and will be at Comiso in southern Sicily. It is planned to be operational in 1984. The total cost for the GLCM program is estimated to be $3.2 Billion. The program remains highly controversial in all the countries scheduled for deployment. The ultimate fate of GLCMs in Europe may be determined during the current negotiations between the U.S. and the Soviet Union on nuclear weapons in Europe.

**Sea-Launched Cruise Missiles (SLCM).** Over the next decade the Navy plans to build up to 4000 sea-launched cruise missiles for a large number of submarines and surface ships. Some will carry nuclear weapons. Initial plans call for SLCMs to be put on thirty surface ships and seventy-four attack submarines. There are three versions of sea-launched cruise missiles: a conventional anti-ship, a conventional land-attack, and a nuclear land-attack missile.

In January 1982 Los Angeles-class nuclear-powered attack submarines will begin to carry conventionally-armed, land-attack cruise missiles with a range of 700 miles. Each submarine will have twelve launchers. In mid-1982 the anti-ship version (250 mile-range) launched from submarines will be deployed and a year later they will be put on surface ships for land-attack and anti-ship missions. Hundreds of nuclear tipped SLCMs with a range of 1500 miles will be deployed on surface ships and attack submarines beginning in mid-1984. Admiral Hayward, Chief of Naval Operations, has said, the introduction of these missiles "will play [a] pivotal role in changing the nature of naval warfare in the future."

## Other Theater Nuclear Weapons

**Pershing II.** With the introduction of the Pershing II, the U.S. Army will join the Navy and the Air Force in having a long-range ballistic missile system. Restricted to short- and medium-range nuclear missiles in the past, the 1979 NATO decision to replace 108 U.S. Pershing IA launchers in West Germany with the same number of Pershing II launchers will give the Army the ability to strike deep into Soviet territory.

The range of Pershing II is 1,000 miles as compared to 100-450 miles for the Pershing IA. A potential extended range version could increase

*(continued on page 14)*

# Nuclear Weapons Locations in the United States

Details concerning the exact number and location of nuclear weapons in the United States are classified information. From unclassified sources it is possible to estimate where they are and in some cases how many.

Nuclear weapons are deployed or stored in about 34 states and three territories at approximately 100 of the almost 1000 military installations and properties in the US and in US territories.

There are nuclear weapons present at twenty Strategic Air Command (SAC) air bases, all six Minuteman (MM) and three Titan II missile fields and in the vicinity of the fleet ballistic missile submarine bases in the United States. The locations are listed in sections I, II, and III.

I. **Strategic Air Command bomber bases**—For an average sized squadron of B-52s (15) there will be an average of approximately 150 weapons at each base. The first eight bases listed below are scheduled to receive the air-launched cruise missile (ALCM). One B-52 squadron is also at Andersen Air Force Base (AFB) in Guam.

Blytheville, Ark.—Blytheville AFB
Bossier City, La.—Barksdale AFB
Fort Worth, Texas—Carswell AFB (double squadron)
Grand Forks, N.D.—Grand Forks AFB
Oscoda, Mich.—Wurtsmith AFB
Rapid City, S.D.—Ellsworth AFB (double squadron)
Rome, New York—Griffiss AFB
Spokane, Wash.—Fairchild AFB
Abilene, Texas—Dyess AFB
Goldsboro, N.C.—Seymour Johnson AFB
Gwinn, Mich.—K. I. Sawyer AFB
Limestone, Maine—Loring AFB
Warner Robins, Ga.—Robins AFB
Merced, Calif.—Castle AFB
Minot, N.D.—Minot AFB
Riverside, Calif.—March AFB
Sacramento, Calif.—Mather AFB
Plattsburgh, N.Y.—Plattsburgh AFB (FB-111)
Portsmouth, N.H.—Pease AFB (FB-111)

II. **Intercontinental Ballistic Missile (ICBM) locations**—1052 ICBMs are deployed in missile silos in ten states spread over approximately 80,000 square miles (the size of Minnesota).

Cheyenne, Wyo.—F. E. Warren AFB—600 weapons on 200 MMIII spread over 15,000 sq. mi. The majority of the weapons are in Colorado and Nebraska.
Grand Forks, N.D.—Grand Forks, AFB—450 weapons on 150 MMIII spread over 8500 sq. mi.
Great Falls, Mont.—Malmstrom AFB—300 weapons on 150 MMII and 50 MMIII spread over 23,000 sq. mi.
Knob Noster, Mo.—Whiteman AFB—150 weapons on 150 MMII spread over 10,000 sq. mi.
Minot, N.D.—Minot AFB—450 weapons on 150 MMIII spread over 4500 sq. mi.
Rapid City, S.D.—Ellsworth AFB—150 weapons on 150 MMII spread over 5600 sq. mi.
Jacksonville, Ark.—Little Rock AFB—17 weapons on 17 Titan II missiles spread over 2700 sq. mi.
Tucson, Ariz.—Davis Monthan AFB—18 weapons on 18 Titan II missiles spread over 2700 sq. mi.
Wichita, Kan.—McConnell AFB—17 weapons on 17 Titan II missiles spread over 7500 sq. mi.

III. **Fleet Ballistic Missile Submarine Bases**—Poseidon submarines are based at Charleston, S.C. and Kings Bay, Ga. (also in Holy Loch, Scotland). The first ten Trident submarines will be based in Bangor, Washington.

The weapons in sections I-III are called "strategic," meaning that they are designed to reach the Soviet Union from the US or at long-range from the sea. Each service has other missions which involve nuclear weapons.

IV. **Air Force**

A. **Air Defense**—Five active F-106 aircraft squadrons which can carry Genie air-to-air nuclear missiles to intercept enemy bombers are deployed at five active and five alert bases.

**Active**
Rome, New York—Griffiss AFB
Gwinn, Michigan—K. I. Sawyer AFB
Minot, N.D.—Minot AFB
Tacoma, Wash.—McChord AFB
Hampton, Va.—Langley AFB

**Alert**
Limestone, Maine—Loring AFB
Springfield, Fla.—Tyndall AFB
Tucson, Ariz.—Davis-Monthan AFB
Klameth, Ore.—Kingsley Field
Charleston, S.C.—Charleston AFB

One active F-4 squadron is at Elmendorf AFB, Anchorage, Alaska and is sent to alert bases at: Galena Airport, Galena, Alaska; King Salmon Airport, Naknek, Alaska; and Eielson AFB, North Pole, Alaska.

Air Defense units with F-106 and F-4C/D aircraft are deployed at fourteen Air National Guard locations and may carry Genie missiles. Because of stringent safety requirements, it is doubtful that these units maintain nuclear qualifications routinely.

Callahan, Fla.—Jacksonville International Airport (F-106)
Falmouth, Mass.—Otis AFB (F-106)
Fargo, N.D.—Hector Field (F-4)
Fresno, Calif.—Fresno Air Terminal (F-106)
Goldsboro, N.C.—Seymour Johnson AFB (F-4, alert)
Great Falls, Mont.—Great Falls International Airport (F-106)
Honolulu, Hawaii—Hickham AFB (F-4)
Houston, Texas—Ellington AFB (F-4)
Klameth, Ore.—Kingsley Field (F-4, alert)
Mt. Clemens, Mich.—Selfridge Air National Guard Base (F-4)
Niagara Falls, N.Y.—Niagara Falls International Airport (F-4)
Pleasantville, N.J.—Atlantic City Airport (F-106)
Portland, Ore.—Portland International Airport (F-4)
Victorville, Calif.—George AFB (F-106)

B. **Tactical Air Command**—Three kinds of aircraft that have strike and interdiction missions, which would include the use of nuclear weapons, are at the following bases. It is unclear whether nuclear weapons would be carried with the aircraft across the oceans or whether they are stored elsewhere in the US or abroad.

Clovis, N.M.—Cannon AFB (F-111D)
Goldsboro, N.C.—Seymour Johnson AFB (F-4E)
Homestead, Fla.—Homestead AFB (F-4E)
Mountain Home, Idaho—Mountain Home AFB (F-111A)
Ogden, Utah—Hill AFB (F-16)
Tampa, Fla.—MacDill AFB (F-4D/E)
Valdosta, Ga.—Moody AFB (F-4E)

C. **Air Force Logistics**—Five Air Logistic Centers provide support for the Air Force's weapons systems in the form of procurement, supply, maintenance and transport. Three appear to have nuclear weapons support responsibilities.

Ogden, Utah—Hill AFB
Oklahoma City, Okla.—Tinker AFB
San Antonio, Texas—Kelly AFB

Three probable nuclear weapons storage sites are at:

Albuquerque, N.M.—Kirtland AFB
Bossier City, La.—Barksdale AFB
Las Vegas, Nev.—Nellis AFB

D. **Military Airlift**—The most common aircraft used to transport nuclear weapons is the C-141. Five Military Airlift Command (MAC) bases provide possible transit points for domestic and overseas shipment of nuclear weapons.

Fairfield, Calif.—Travis AFB
North Charleston, S.C.—Charleston AFB
San Bernadino, Calif.—Norton AFB
Tacoma, Wash.—McChord AFB
Wrightstown, N.J.—McGuire AFB

E. All Air Force **training** instruction for nuclear weapons takes place at Kirtland AFB in Albuquerque, N.M. The Air Force Weapons Laboratory is also at Kirtland AFB.

(continued on page 10)

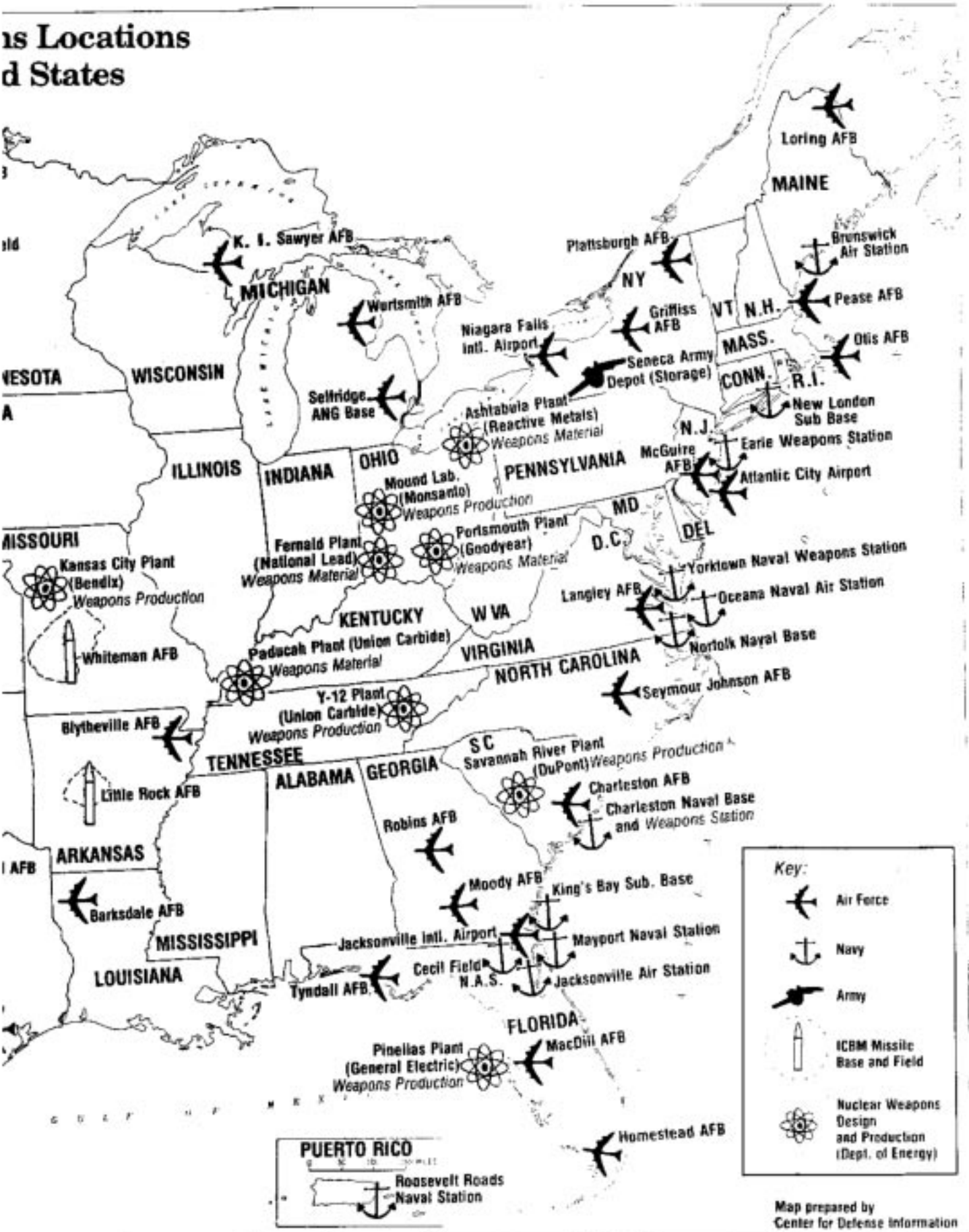
Malmstrom ICBM Missile Field



# Nuclear Wea
# in the Ur

Whidbey Is. Air Station
Trident Sub Base
WASHINGTON
Fairchild AFB
McChord AFB
Great Falls Intl. Airport
MONTANA
Malmstrom AFB
Minot AFB
Grand F
Portland International Airport
Hanford Reservation
*Weapons Material*
(United Nuclear/Rockwell)
OREGON
IDAHO
NORTH DAKOTA
SOUTH DAKOTA
Idaho Lab.
*Weapons Material*
(Exxon)
WYOMING
Ellsworth AFB
Kingsley Field
CALIFORNIA
Sierra Army Depot
Mountain Home AFB
NEVADA
UTAH
NEBRASKA
F. E. Warren AFB
Travis AFB
Mather AFB
Hill AFB
Alameda Naval Air Station
Concord Weapons Station
Livermore Lab (Univ. of Calif.) *Weapons Design*
Castle AFB
Fresno Air Terminal
COLORADO
Moffett Field Air Station
Nevada Test Site
Rocky Flats Plant
*Weapons Production*
(Rockwell)
KANSAS
Lemoore Naval Air Station
Nellis AFB
McConnell AFB
George AFB
ARIZONA
NEW MEXICO
Norton AFB
Los Alamos Lab
(Univ. of Calif.)
*Weapons Design*
OKLAHOMA
March AFB
TEXAS
Tinker AFB
Long Beach Station
and Seal Beach
Weapons Station
Kirtland AFB
Sandia Lab
(Western Electric)
*Weapons Design*
FL. Sill
San Diego
Naval Base and
North Island Air Station
Davis Monthan AFB
Pantex Plant
(Mason & Hanger)
*Nuclear Weapons Assembly*
Cannon AFB
Dyess AFB
Kelly AFB
Ellington
ALASKA
Elelson AFB
Galena Airport
Eimendorf AFB
King Salmon Airport
Adak Naval Station
HAWAII
Pearl Harbor Naval Base
West Loch *Weapons Storage*
Hickham AFB
Barbers Pt. Air Station
Waikele *Weapons Storage*

# ıs Locations
# d States



V. **Navy**

A. **Naval Warship Bases**—Most US naval warships are equipped with nuclear-capable systems and carry various types of nuclear weapons when at sea on operations. In addition, auxiliary ships such as submarine and destroyer tenders and ammunition ships routinely carry nuclear weapons as floating depots for other ships. Nuclear weapons will be on board nuclear-capable ships and/or in an appropriate storage depot in or near their bases at:

Alameda, Calif.—Alameda Naval Air Station
Charleston, S.C.—Charleston Naval Base
Groton, Ct.—New London Submarine Base
Long Beach, Calif.—Long Beach Station
Mayport, Fla.—Mayport Naval Station
Norfolk, Va.—Norfolk Naval Base
Pearl Harbor, Hawaii—Pearl Harbor Submarine and Naval Base
San Diego, Calif.—San Diego Naval Base

B. **Storage Depots**—At least seven locations are main storage depots for naval nuclear weapons. Naval ships carry and naval depots store nuclear weapons for the Marine Corps.

Leonardo, N.J.—Earle Weapons Station
Charleston, S.C.—Charleston Weapons Station
Concord & Solano, Ca.—Concord Weapons Station
Seal Beach, Calif.—Seal Beach Weapons Station
Yorktown, Va.—Yorktown Weapons Station
Waikele, Hawaii—Lualualei Naval Magazine (Waikele Branch)
Pearl Harbor, Hawaii—Lualualei Naval Magazine (West Loch Branch)

C. **Naval Aircraft Bases**—Naval aircraft which perform nuclear missions from aircraft carriers are rotated to aircraft carriers from two East coast and two West coast bases. It is possible that nuclear weapons are stored at these four air stations:

Virginia Beach, Va.—Oceana Naval Air Station (A-6)
Cecil Field, Fla.—Cecil Field Air Station (A-7E)
Whidbey Is., Wash.—Whidbey Island Air Station (A-6)
Lemoore, Calif.—Lemoore Naval Air Station (A-7E)

Nuclear-capable anti-submarine helicopter and aircraft squadrons are rotated to aircraft carriers from three bases:

Cecil Field, Fla.—Cecil Field Air Station (S-3)
Jacksonville, Fla.—Jacksonville Air Station (SH-3)
San Diego, Calif.—North Island Air Station (S-3, SH-3)

Naval nuclear weapons training courses are conducted at the above six bases as well as at Norfolk Naval Air Station, Va., and at Kirtland AFB, N.M.

Land-based P-3 squadrons for anti-submarine missions are located at four bases and are regularly rotated to four more bases in the US or its territories.

Moffett Field, Calif.—Moffett Field Air Station
Barbers Point, Hawaii—Barbers Point Air Station
Brunswick, Maine—Brunswick Air Station
Jacksonville, Fla.—Jacksonville Air Station
Adak, Alaska—Adak Station
Agana, Guam—Agana Air Station
Midway Island, Pacific—Midway Island Air Facility
Ceiba, Puerto Rico—Roosevelt Roads Station

VI. **Army**—The majority of the Army's nuclear weapons are overseas with most of the remaining stored at two large depots. Seneca Army Depot in Romulus, N.Y. and Sierra Army Depot, near Herlong, California are storage and transhipment points to carry nuclear weapons to Europe and Asia. The Lance and 8-inch artillery "neutron" weapons will probably be stored at Seneca.

At Ft. Sill in Lawton, Oklahoma the Army trains units for the Pershing, Lance and nuclear field artillery weapons systems. Two Lance battalions are stationed there. There are nuclear artillery battalions at eight other Army bases but they probably do not have nuclear weapons with them.

VII. **Department of Energy Facilities**

The Department of Energy is responsible for overseeing the production of nuclear weapons and nuclear material. An extensive nationwide complex of nuclear weapons laboratories and production facilities, employing 45,000 people, design and manufacture the hundreds of components of a nuclear weapon.

A. **Laboratories**

Los Alamos, N.M.—Los Alamos Laboratory
Livermore, Calif.—Lawrence Livermore Laboratory
Albuquerque, N.M.—Sandia Laboratory

Owned by the Department of Energy but operated by the University of California, the Los Alamos and Livermore laboratories compete to design new nuclear weapons and to modify old ones. The Sandia Laboratory at Kirtland AFB is operated by the Western Electric Company, a subsidiary of American Telegraph and Telephone. It also has a laboratory at Lawrence Livermore. Its responsibilities include making sure that nuclear weapons meet manufacturing specifications and designing non-nuclear components for nuclear weapons. The three laboratories (as well as the United Kingdom) use the Nevada Test Site (65 miles N.W. of Las Vegas) to test nuclear weapons.

B. **Nuclear Weapons Production Facilities**

Golden, Colo.—The Rocky Flats Plant operated by Rockwell International makes several components for nuclear weapons, among them plutonium triggers to ignite thermonuclear weapons.

Kansas City, Mo.—The Kansas City Plant operated by the Bendix Corporation manufactures non-nuclear components for nuclear weapons such as electronic guidance systems and locking devices.

Miamisberg, Ohio—The Mound Laboratory operated by Monsanto Research Corporation manufactures detonators, timers and explosive pellets for nuclear weapons and does research on tritium.

Clearwater, Florida—The Pinellas Plant operated by General Electric manufactures neutron generators for nuclear weapons.

Oak Ridge, Tenn.—The Y-12 Plant operated by Union Carbide Company-Nuclear Division manufactures uranium and lithium components for nuclear weapons.

Aiken, S.C.—The Savannah River Plant operated by DuPont extracts and purifies tritium for weapons production.

Amarillo, Texas—The Pantex Plant operated by Mason & Hanger—Silas Mason Co. is the final assembly plant for nuclear weapons. It also makes conventional explosives and other components for nuclear weapons. It delivers the finished nuclear weapon to the Department of Defense and disassembles old weapons that have been retired.

C. **Nuclear Material Production Facilities**

Two gaseous diffusion facilities separate uranium isotopes for further processing:
Paducah, Kentucky—The Gaseous Diffusion Plant is operated by Union Carbide Company-Nuclear Division.
Piketon, Ohio—The Portsmouth Gaseous Diffusion Plant is operated by Goodyear Atomic Corporation.

Further uranium processing takes place at two other facilities:
Fernald, Ohio—The Feed Materials Production Center is operated by National Lead of Ohio.
Ashtabula, Ohio—The Ashtabula Extrusion Plant is operated by Reactive Metals, Inc.

Weapons grade plutonium is produced at the Hanford Reservation in Richland, Washington by United Nuclear Corporation, Inc. and Rockwell International.

Three reactors at the Savannah River Plant in Aiken, S.C. produce tritium, weapons-grade plutonium, plutonium-238 and other isotopes for nuclear weapons.

At the Idaho National Engineering Laboratory, at Idaho Falls, Idaho, operated by Exxon, spent fuel from naval reactors is reprocessed and sent to Oak Ridge, Tenn.

# Department of Energy Weapons Activities

The costs of nuclear weapons programs do not normally include the amounts for producing the nuclear warheads or bombs. This is the responsibility of the Department of Energy and is funded in its budget. The Fiscal Year 1982 Reagan budget request is $5 Billion for atomic energy defense programs of which 80 percent is for weapons activities and materials production. This is up from President Carter's FY81 budget of $3.7 Billion and his FY80 budget of $3 Billion and is the largest single year increase in the history of the weapons program.

The cost of individual nuclear weapons programs is classified information but typically they run between 10-20 percent of the cost of the total weapon system. A decade ago the cost to produce a weapon for the eight inch Artillery Fired Atomic Projectile (AFAP) was over $400,000 apiece and the cost for the 155mm AFAP was $452,000 apiece. The cost today for the 560 weapons for the Ground Launched Cruise Missile (GLCM) is $630 million or $1.1 million a piece.

As defined by the Department of Energy and the Department of Defense, nuclear weapons go through seven phases in their cycle from conception to retirement. The seven phases are:

**Phase 1**—Weapons Conception
**Phase 2**—Program Study or Feasibility Study
**Phase 3**—Development Engineering or Full-Scale Development
**Phase 4**—Production Engineering
**Phase 5**—First Production
**Phase 6**—Quantity Production and Stockpile
**Phase 7**—Retirement

The exact number of U.S. nuclear weapons is classified information and constantly changing. As new weapons are produced older ones are retired and disassembled and the nuclear material reused. There are 26 types of nuclear weapons in the stockpile, in up to 50 versions depending on modifications, explosive power and fuzing. A certain number of weapons exist which are not operational but for a number of reasons have not been dismantled. For example, the W-71 warhead for the Spartan long-range interceptor missile has been deactivated and placed in storage depots. The same has been done with the W-66 warhead for the Sprint short-range interceptor missile. Both are scheduled for retirement in FY 1983. Though they are in the stockpile they were not included in the chart on pages 12-13 because they are not operational.

Under current plans, over the next decade approximately 17,000 new nuclear weapons will be produced for the stockpile, 10,500 as additions, the rest as replacements. The United States can presently deliver, from the U.S., from Europe and elsewhere, and from sea, approximately 12,000 nuclear weapons on the Soviet Union. By the end of the decade the number could rise to close to 20,000.

The seven weapons in Phases 3 and 4 are listed in the nuclear stockpile chart as well. Three (of ten) weapons in Phases 1 and 2 are of special interest. The weapon for the MX missile will soon be chosen and begin its development phase. Contenders are the W-78 with the MK-12A Reentry Vehicle or the Advanced Ballistic Reentry Vehicle (ABRV) with yields 400-600 kt. A Low Altitude Defense anti-ballistic missile system, if built, would require an appropriate weapon. The new Trident II (D-5) missile will also require an appropriate (probably new) weapon.

## Nuclear Weapons Engineers at Sandia Laboratories with Nuclear Weapons

155-mm Nuclear Artillery Shell

W62/Mk12 Reentry Vehicle for Minuteman III ICBM

Atomic Demolition Munitions

W69/SRAM Bomber-carried missile

## UNITED STATES NUCI

| Weapon System[a] | Dept. of Energy Weapon Designation | Explosive Power[b] | Service | Number[c] | Remarks |
|---|---|---|---|---|---|
| Bomber-carried **Air-Launched Cruise Missile** (ALCM) (1981) | W-80-1* | 200kt | Air Force | 60 | 3,418 are planned for 151 B-52Gs. These, or more, will be deployed on B-52Hs and/or B-1Bs. The ALCM weighs 3,300 lbs. |
| Land-based **Minuteman III ICBM** MK-12A MIRV × 3 (1979) | W-78* | 335kt | Air Force | 450 | 900 will be deployed on 300 MMIII by early 1983. 1,083 MK 12A RVs are being produced. |
| Submarine-based **Trident I SLBM** MK-4 MIRV × 7-10 (1979) | W-76* | 100kt | Navy | 952-1288 | For seven Poseidon submarines retrofit to date and one Trident submarine. For other five Poseidon subs 560-800 more to be completed in 1982. When 15 Trident submarines are built, 2520-3600 Trident I SLBM weapons. |
| Bomber-carried **Short Range Attack Missile** (SRAM) (1972) | W-69 | 170kt | Air Force | 1140 | Supersonic air-to-ground missile. 1020 deployed to B-52G/H bases and 120 to FB-111A bases. SRAM weighs 2,240 lbs. |
| Submarine-based **Poseidon SLBM** MK-3 MIRV × 8-10 (1971) | W-68† | 40kt | Navy | 3480 | Average 145 weapons for each of 24 submarines. After Trident I retrofitting nineteen Poseidon submarines will retain Poseidon SLBMs. As Polaris submarines have been retired the number of warheads on Poseidon SLBMs has been selectively increased. |
| Land-based **Minuteman III ICBM** MK-12 MIRV × 3 (1970) | W-62† | 170kt | Air Force | 1200 | 250 MMIII will retain the MK-12RV after early 1983. |
| Submarine-based **Polaris A-3 SLBM** MK-2 MIRV × 3 (1964) | W-58† | 200kt | Navy | 0 | Eight Polaris submarines have been redesignated attack subs and withdrawn from the strategic force. Two other Polaris subs have been dismantled. The 480 Polaris weapons will be retired. |
| Land-based **Minuteman II ICBM** MK-11 (1966) | W-56 | 1-2mt | Air Force | 450 | One each on 450 MMII. Some MMII may be replaced with MMIII. |
| Land-based **Titan II ICBM** MK-6 (1963) | W-53† | 5-9mt | Air Force | 54 | 52 Titan II missiles presently operational. All or part to be retired. |
| Land-warfare 8-inch Artillery Fired Atomic Projectile (AFAP) (1981) | W-79* | sub kt-2 kt | Army, Marine Corps, U.S.-Europe | 50 | The neutron weapon. 800 are planned to be produced and will be stockpiled in the U.S. |
| Land-warfare Lance Mobile Short-Range Surface-To-Surface Ballistic Missile (1972) | W-70 (Mod 1, 2, 3*)[d] | 3 yield options 1kt-100kt | Army, U.S.-Europe | 400 | 360 Mods 1 and 2 are presently deployed in Europe and elsewhere. Mod 3 is the enhanced radiation version (neutron weapon) now in production. About 380 are planned. |
| Naval-warfare SUBROC Submarine-Launched Anti-Submarine Nuclear Missile (1965) | W-55 | Several kt | Navy | 400 | On 66 of 82 nuclear-powered attack submarines. Each sub can carry 4-6. With a range of over 30 miles, Subroc can be targeted to hit land. |
| Land-warfare Special Atomic Demolition Munition (SADM) (1964) | W-54 | .01kt-1kt | Army, Marine Corps, U.S.-Europe | 300 | Man-portable (58½ lbs.) land mines deployed in Europe and elsewhere. |
| Land-warfare Pershing Ia Mobile Long-Range Surface-To-Surface Ballistic Missile (1962) | W-50 | 3 yields 60,200 400kt | Army, U.S.-Europe | 235 | For 108 U.S. and 72 West German launchers. Assumes 55 reloads. |
| Land-warfare 155mm Artillery Fired Atomic Projectile (AFAP) (1963) | W-48 | Sub kt-2kt | Army, Marine Corps, U.S.-Europe | 3300 | Eight types of nuclear capable 155mm artillery guns available. The most common is the M-109. The W-82 is planned to replace the W-48. |
| Land-warfare Medium Atomic Demolition Munition (MADM) (1964) | W-45-3 | 1-15 kt | Army, Marine Corps, U.S.-Europe | 300 | Land mines deployed in Europe and elsewhere. |
| Naval-warfare Terrier Surface-To-Air Anti-aircraft Missile (1956) | W-45-1† | 1kt | Navy | 310 | The RIM-2D version is nuclear. Terrier is carried on 31 missile cruisers and destroyers. Assumes 10 per ship. |
| Naval-warfare ASROC Ship-Launched Anti-Submarine Missile (1961) | W-44 | probably 1kt | Navy | 850 | Carried on 78 destroyers, 27 cruisers, and 65 frigates. Assumes five warheads per ship. |
| Land-warfare 8-inch Artillery-Fired Atomic Projectile (AFAP) (1956) | W-33† | Sub kt-10 kt | Army, Marine Corps, U.S.-Europe | 1700 | Being replaced by W-79. Three types of nuclear capable 8 inch artillery guns available (M-55, M-110, M-115). Approximately 1000 warheads in Europe. |

## WEAPON STOCKPILE

| Weapon System[a] | Dept. of Energy Weapon Designation | Explosive Power[b] | Service | Number[c] | Remarks |
|---|---|---|---|---|---|
| Land-warfare Honest John Short-Range Surface-To-Surface Missile (1958) | W-31† | 3 yields available 1-20kt | U.S.-Europe | 200 | 1000 Honest John weapons withdrawn from Europe during 1980. 200 remain in Greece and Turkey. Warhead will remain in the inventory past 1992. |
| Land-based Nike Hercules Surface-To-Air Guided Missile (1958) | W-31 | 3 yields available 1-20kt | Army, U.S.-Europe | 750 | Will be phased out and replaced by the Patriot missile. |
| Air-warfare Genie Air-To-Air Missile (1957) | W-25 | a few kilotons | Air Force | 400 | Deployed with approximately 300 aircraft for air defense missions. |
| **Light-Weight Strategic and Tactical Nuclear Bomb** (1968) | B-61 (Mod 0, 1, 2, 3*, 4*, 5) | 4 yield options 100-500kt | Air Force, Navy, Marine Corps, U.S.-Europe | e | Mod 1 is the strategic version. It weighs 718 lbs. Mod 0 was first deployed in 1968, Mod 1 in 1969, Mod 2 in 1975, Mod 3 and 4 in 1976 and Mod 5 in 1977. |
| **Light-Weight Nuclear Depth Charge or Nuclear Bomb** (1964) | B-57 | 4 yield options Sub kt-20kt | Air Force, Navy, Marine Corps, U.S.-Europe | e | For anti-submarine warfare aircraft and helicopters and tactical aircraft. |
| **Very Heavy Nuclear Bomb** (1962) | B-53 | probably 9mt | Air Force | e | Only carried on B-52s. Weighs 8850 lbs. |
| **Medium-Weight Nuclear Bomb** (1961) | B-43 | at least five yields | Air Force, Marine Corps, Navy, U.S.-Europe | e | Can be carried on most nuclear-capable strategic and tactical aircraft. |
| **Heavy Nuclear Bomb** (1958) | B-28 | various yields | Air Force, Marine Corps, Navy | e | Can be assembled in five different configurations. Weighs 2540 lbs. |

## NUCLEAR WEAPONS IN ADVANCED RESEARCH (DOE Phases 3 and 4)

| | | | | | |
|---|---|---|---|---|---|
| **Pershing II Land-Mobile Long-Range Surface-To-Surface Ballistic Missile** (1983) | W-85 | 10-20kt | Army | 108 planned | For each of the 108 launchers. |
| **Ground-Launched Cruise Missile** (GLCM) (1983) | W-84 | 200kt | Air Force | 560 planned | For 116 launchers in Europe. Four missiles per launcher. |
| **Medium-Weight High Yield Nuclear Bomb** (1983) | B-83 | various yields | Air Force, Marine Corps, Navy, U.S.-Europe | probably several thousand | Weighs 2,408 lbs. Will replace the B-28 and B-43. |
| 155mm Artillery-Fired Atomic Projectile (AFAP) (1984-85) | W-82 | less than 2kt | Army, Marine Corps, U.S.-Europe | probably several thousand | To replace W-48. No plans as yet to produce an enhanced radiation version. |
| Standard Missile 2 Extended Range (SM-2ER) (1982) | W-81 | probably 1kt | Navy | probably several hundred | For Aegis anti-aircraft systems. Will replace Terrier RIM-2D. |
| **Sea-Launched Cruise Missile** SLCM) (1984) | W-80-0 | 200kt | Navy | 384 | Initial plans to date call for 194 for submarines and 190 for surface ships. Many more may be produced. |

*Notes:*

***Boldface indicates capable of being delivered on the Soviet Union.***

*a. Operational date and MIRVed weapons load indicated.*

*b. kt-kiloton. 1 kt equals one thousand tons of TNT. The Hiroshima bomb was 13 kilotons. mt-megaton. 1 mt equals one million tons of TNT.*

*c. Best estimate as of end of 1981, excluding spares and weapons presently being retired. Including everything there are about 30,000 nuclear weapons.*

*d. Different mods relate to various fuzing, delivery mode or yield options.*

*e. For five types of bombs, approximately 6000 total.*

* *Being produced.*

† *Some or all being retired.*

***Source:***

*CDI, DOD, DOE, Natural Resources Defense Council. Chart prepared by Center for Defense Information.*

it to 2,400 miles. The Pershing II will be the most accurate ballistic missile in the world. Its reentry vehicle will be terminally guided by an on-board radar system to strike within about 100 feet of its target, as against 1300 feet for the Pershing IA. Because of this precise guidance, the explosive power of the new W-85 warhead has been reduced to 10-20 kt from the 60-400 kt yield of the Pershing IA. Present plans do not include production of the W-86 earth penetrator warhead. Other features of the Pershing II will be its four-to-six minute flight time to the Soviet Union from West Germany and its high state of readiness.

Seventy-two additional Pershing IA launchers are deployed with the West German Air Force. There are no present plans to replace these with Pershing IIs. The first Pershing IIs are scheduled to be in place in December 1983 with all in place by the end of 1985. However, deployment could be delayed due to political considerations or cancelled as a result of the negotiations on nuclear weapons in Europe.

**Enhanced Radiation Weapons (Neutron "Bomb").** The Reagan Administration has decided to move forward on production of enhanced radiation warheads or "neutron bombs" for use with Lance short-range surface-to-surface ballistic missiles and eight-inch artillery shells. The estimated production is 380 warheads for the Lance and 800 for the eight-inch shell. For the time being, at least, the neutron warheads will be stored in the United States, ready for rapid deployment to Europe.

Enhanced radiation weapons are designed to permit the release of the high-energy "fast" neutrons produced in thermonuclear (fusion) reactions so that a higher percentage of the energy released will be in the form of prompt radiation, with blast and thermal damage somewhat reduced, in comparison to battlefield fission weapons.

Its proponents claim that the neutron weapon will reduce "collateral damage" (damage to property, buildings, etc.) while killing enemy soldiers through massive doses of radiation. Thus, they assert, it is the perfect deterrent to a mass Soviet tank attack in Western Europe—it would kill tank crews but leave villages intact.

These assertions fail to consider: that NATO already has excellent anti-tank capabilities; that the weapon would still cause vast amounts of blast and thermal damage, especially if large numbers were used against a mass attack; and that Soviet tank crews might not be immediately incapacitated and could fight on for several hours. But its most dangerous effect will be to lower the nuclear threshold and make nuclear war in Europe more likely. Further, it is probable that the Soviets will now build a neutron bomb of their own.

## Command, Control, Communications, and Intelligence ($C^3I$) Programs

An extensive global network gives command and control centers such as the White House, the Pentagon, and SAC headquarters the ability to communicate with all elements of U.S. strategic forces. Command, control, communications, and intelligence ($C^3I$) systems are designed to warn command authorities of imminent nuclear attack, assess the attack and possible responses, send out orders to our strategic nuclear forces, and evaluate the damage to both sides from a nuclear exchange. These systems include satellites, computers, underground antenna grids, special aircraft, ground-based radars, space-based sensors, and, soon, even lasers.

With the implementation of a nuclear war-fighting strategy comes the need for a $C^3I$ network that can continue to operate throughout the course of a nuclear war. Steps are now underway to make our $C^3I$ systems more survivable, jam-resistant and secure so that our nuclear forces can conduct a protracted nuclear war at any level of escalation. The Administration plans to spend $22 Billion over the next six years for this purpose.

Present improvements in our $C^3I$ system are designed to provide redundancy to the network, so that should part of it be destroyed in a nuclear war our commanders could control the course of a nuclear war from the execution of "limited nuclear options" through a full-scale nuclear attack.

While redundancy of communications and close control over nuclear weapons is a desirable end, certain improvements in $C^3I$ could also delude military and civilian leaders into believing that a nuclear war is controllable, fightable and winnable. While it is essential to maintain the credibility of our nuclear retaliatory threat, some measures for improving this credibility have the added effect of both inducing our leaders to contemplate limited nuclear warfighting and persuading the Russians that we are trying to achieve just such a capability.

It will be extremely difficult to design a $C^3I$ system that is more survivable than the strategic force it is intended to support. The uncertainties that would inevitably remain concerning command and control make the use of nuclear weapons for controlled escalation a very difficult problem.

**Some Current and Projected Improvements in $C^3I$**

- **E-4B Advanced Airborne National Command Post (AABNCP)**—(A modified 747 aircraft. Enables President to command U.S. nuclear forces from the air during a nuclear crisis)
- **Strategic Air Command Digital Network (SACDIN)**—(Survivable communications between SAC H.Q. and missiles/bombers)
- **MILSTAR EHF Communications Satellite**
- **Ground-based Electro Optical Deep Space Surveillance System (GEODSS)**—(Satellite monitoring)
- **Two Additional PAVE PAWS sites**—(Early warning of SLBM launches)
- **Air Force Satellite Communications (AFSATCOM)**—(Allows President and military commanders to communicate with and send out orders to U.S. nuclear forces)
- **Extremely Low Frequency (ELF) System**—(Communications with submarines)
- **Satellite survivability enhancement**

### Haig: "U.S. Very, Very Strong"

"In a contemporary sense, the United States is very, very strong and very, very capable, especially in the strategic area. Our systems are both more sophisticated and reliable and more technologically sound."

Secretary of State Alexander Haig
September 11, 1981

## Other Programs

**Air Defense.** The Reagan Administration will undertake a large and expensive effort to upgrade continental United States (CONUS) air defense. The CONUS system is primarily responsible for detecting and shooting down enemy bombers which attempt to strike the United States. The Soviet Union presently has about 150 aging long-range bombers.

Five squadrons of F-106 interceptors will be replaced with F-15s. At least six additional AWACS airborne surveillance aircraft will be purchased to supplement the 17 AWACS now assigned to CONUS. AWACS provide sea and air surveillance and control interceptors in wartime. Also, a combination of new over-the-horizon backscatter (OTH-B) radars and improved versions of present ground radars will be built.

**Ballistic Missile Defense (BMD).** Though the Anti-Ballistic Missile (ABM) Treaty of 1972 and its protocol severely limited testing and deployment of ballistic missile defense systems, research and development have continued under a vigorous program directed by the Department of the Army. Possible deployment of a BMD system for defense of MX, Minuteman, or other sites is currently receiving a great deal of attention. The Reagan Administration is pursuing missile defense as one of its three possible options for long-term basing of MX.

LoADS (Low Altitude Defense System) is the BMD system now under development which could be deployed the most rapidly. It is designed to attack incoming weapons at altitudes below 50,000 feet with an interceptor missile which would carry a nuclear warhead of a few kilotons yield. Each LoADS unit would probably contain three interceptors (each about half the size of the old Sprint missile of the Safeguard program), a small radar, and a computer. A LoADS unit would have to locate incoming missiles, discriminate between weapons and decoy devices or other electronic countermeasures, and then destroy the attacking weapon, in less than ten seconds—a formidable task.

LoADS was being considered most immediately for application in conjunction with the MX in a mobile basing scheme, but it is also being designed to defend fixed silos.

Research is also being conducted on other BMD systems, including long-range, non-nuclear ones, for parallel use with LoADS in a "layered defense." Further long-term BMD research involves the use of space-based lasers and other mechanisms with potential BMD application.

As now envisioned, the deployment of BMD would be prohibitively expensive (some experts suggest a minimum of $11 Billion for a baseline LoADS system alone), would probably violate the ABM Treaty, would prompt the Soviets to build their own BMD system, and would have many serious operational problems. LoADS intercept would occur at such low altitudes that only one shot would be possible, leaving no margin for error. The Soviets could develop countermeasures, such as a maneuvering reentry vehicle (MARV), to evade LoADS interceptors and they could simply put more weapons on their missiles to overwhelm the system.

The Reagan Administration's request for funding of a total BMD program for FY 1982 is about $600 million.

**Anti-satellite warfare (ASAT).** The United States is now accelerating development of weapons designed to destroy enemy satellites. Anti-satellite (ASAT) weapons are attractive to the military because destruction of enemy satellites would eliminate important military capabilities of the adversary.

The most important near-term U.S. effort is the Miniature Homing Intercept Vehicle, a small device that would home in on the infra-red radiation of a target satellite and collide with it at high speed. Initially, this vehicle will be tested on a small, two-stage rocket launched from an F-15 jet fighter. Testing will begin in early 1983. If the testing proves successful, this ASAT weapon would be capable of being launched from virtually any modified F-15 and perhaps other aircraft. It could also be launched from a land-based rocket. Plans now call for this first generation ASAT weapon to be ready for operation by 1985.

The ASAT program will also pursue methods for attacking satellites in high and geosynchronous orbits of about 22,300 miles, where many important military satellites are stationed.

Some backers of a large U.S. ASAT program imply that we can move armed conflicts into outer space and prevent mass destruction on earth. However, at least for the near future, space-based weapons are being designed to contribute to fighting on earth, not replace it. Space may be a place where wars will start, but it will not make war safe for mankind. What the extension of military competition into space does is add to the complexity and cost of the arms race and further complicate arms control measures.

**Laser and Particle-Beam Weapons.** Research is also being conducted on longer-term, more exotic ASAT weapons such as high-energy lasers and charged particle beam weapons. These programs are largely under the auspices of the Defense Advanced Research Projects Agency (DARPA).

Lasers are intense beams of light

that can be narrowly focused at great distances. There are many problems to be solved before lasers could be used as long-range weapons, but both the U.S. and U.S.S.R. are engaged in this research.

Lasers based on satellite battle stations are being contemplated as a way to attack other satellites, such as warning and communications satellites. This could increase fear of surprise attack on both sides, adding to instability.

Further, the overlap in the application of exotic technologies to both ASAT and BMD is an important aspect that has received little attention. Space-based lasers might also be used as an anti-ballistic missile system. Laser BMD systems could stimulate a new round in the arms race, as each side attempted to cancel out the other's BMD capability.

Particle beams are another form of directed energy which are concentrated beams of sub-atomic charged particles. Particle beams may have several advantages over lasers as space weapons and may have longer range in the atmosphere if the problem of beam scattering can be overcome.

**Anti-Submarine Warfare (ASW).** In the past decade, the U.S. has spent substantial funds in an intense effort to develop an effective anti-submarine warfare capability. A significant breakthrough (by either side) in ASW might prove to be highly destabilizing in a field of warfare where the U.S. now maintains a clear lead over the Soviet Union. Although U.S. ASW capabilities are principally structured to preserve sea lines of communication and protect carrier battle groups, major improvements in ASW might create a serious threat to the Soviets' ballistic missile submarines. At present, despite some advances in detecting Soviet submarines, the U.S. still has no real protection against missile attack from the sea.

**Civil Defense.** Over the past thirty years the United States has spent $2.6 Billion on civil defense, from a low of $26 million in 1951 to a high of $207 million in 1962. The Reagan Administration requested $132.8 million for FY 1982 for civil defense, a 13 per cent increase over the FY 1981 funding level. The Reagan Administration has emphasized civil defense as a significant part of its nuclear weapons package.

## Very Expensive Nuclear Weapons

| | |
|---|---|
| B-1 Bomber | $40 Billion |
| Trident Submarine | + $30 Billion |
| MX Missile | $30 Billion |
| Stealth Bomber | $22-56 Billion |
| Trident II Missile | $20 Billion |
| Air-Launched Cruise Missile | $6 Billion |
| Ground-Launched Cruise Missile | $3.2 Billion |
| Pershing II Missile | $1.8 Billion |

**Note:** *These estimated program costs do not include costs of nuclear weapons in the Department of Energy budget or the costs of operating those weapons.*

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