

U.S. Nuclear Weapons in Europe

**A Review of Post-Cold War Policy,
Force Levels, and War Planning**



Prepared by
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Further Information

A copy of this report (PDF color) and the individual color satellite images from Appendix C are available on the NRDC web site at <http://www.nrdc.org/nuclear/euro/contents.asp>

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Front page photo: The tail section of a B61 nuclear bomb undergoing testing at Sandia National Laboratories. *Source: Sandia National Laboratories.*

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EXECUTIVE SUMMARY

Piecing together evidence from an array of sources, the Natural Resources Defense Council has determined that the United States is still deploying 480¹ nuclear weapons in Europe. That should come as a surprise. Until now, most observers believed that there were no more than half of those weapons still left on the continent. Declassified documents obtained under the U.S. Freedom of Information Act, military literature, the media, non-governmental organizations, and other sources show that the 480 bombs are stored at eight air bases in six NATO countries – a formidable arsenal larger than the entire Chinese nuclear stockpile.

The military and political justifications given by the United States and NATO for U.S. nuclear weapons in Europe are both obsolete and vague. Long-range weapons in the United States and Britain supplant the unique role the weapons once had in continental Europe, yet it seems NATO officials have been unwilling or unable to give them up. The deployment irritates efforts to improve relations with Russia and undercuts global efforts – and those of the United States and Europe – to persuade rogue nations from developing nuclear weapons. The Bush administration and the NATO alliance should address this issue as a matter of global nuclear security, and the United States should withdraw all of its nuclear weapons from Europe.

End of Cold War, nuclear war planning modernization, revoke traditional justification for weapons

Originally, the United States deployed nuclear weapons in Europe against the threat of a Soviet invasion during the Cold War. That threat ended more than a decade ago. In the 1990s, the United States modernized its nuclear war planning system, improving the ability to rapidly design and execute nuclear strike plans. Weapons based in the United States can cover all of the potential targets covered by the bombs in Europe, and NATO officials publicly say that they have reduced the number and role of nuclear weapons in Europe. Despite these facts, the United States still requires its military in Europe to maintain nuclear strike plans. Clinging to a Cold War nuclear posture impedes NATO's transition to a modern alliance and drains scarce resources that the alliance urgently needs to fulfill real-world non-nuclear missions.

Political and military landscape eliminate the need for nuclear weapons

European security conditions have changed significantly since NATO set the level of 480 bombs in 1993, eliminating a need for U.S. nuclear weapons in Europe. Nearly all of the countries that once were potential targets for the weapons are now members of NATO. Although NATO stated in 1996 that it had “no intention, no reason, no plan” to station nuclear weapons in new member states, the limited combat range of the nuclear strike aircraft deployed in Europe probably requires some form of staging through Eastern European air bases to effectively engage targets in Russia. Yet NATO itself has reduced the readiness level of the aircraft to such an extent that it would probably be more expedient to transfer the weapons from the United States in a crisis than to increase the readiness level.

NATO maintains that these bombs are not aimed at any particular country. A June 2004 NATO issue paper claims that the alliance has “terminated the practice of maintaining standing peacetime nuclear contingency plans and associated targets for its sub-strategic nuclear forces. As a result, NATO’s nuclear forces no longer target any country.” The statement is likely an exaggeration and slightly misleading. Although NATO no longer keeps aircraft on alert at the end of the runways as it did for most of the Cold War, it still maintains detailed nuclear strike plans for potential strikes against specific targets in specific countries. To justify further the presence of these weapons, NATO officials claim that the weapons are a deterrent to war, a theory disproved by the outbreak of armed conflict in Bosnia and Yugoslavia.

Absent any meaningful military role in Europe, nuclear planners have begun to search for political justifications for the nuclear weapons outside Europe. In the 1990s, U.S. and NATO officials heralded what they described as an unprecedented reduced role for nuclear weapons. At the same time, however, U.S. European Command (EUCOM) and U.S. Strategic Command arranged for the potential use of the NATO nuclear bombs outside of EUCOM’s area of responsibility. European parliaments may not be aware of this change and some of them probably would not support it.

U.S. nuclear weapons in Europe undercut efforts to reduce global nuclear threat

Not only are U.S. and European rationales for forward-deploying U.S. nuclear weapons in Europe thin, but the presence of the weapons in Europe could affect the delicate relationship with other nuclear powers. Stationing U.S. nuclear weapons in Europe undercuts efforts to improve relations with Russia and gives the Russian military an excuse to maintain its own non-strategic nuclear weapons.

Equally troublesome is the fact that NATO has earmarked nearly a third of the forward-deployed weapons in Europe for use by the air forces of non-nuclear NATO countries, a violation of Non-Proliferation Treaty’s (NPT) main objective. Some claim that there is no NPT violation because the weapons remain under U.S. custody until the U.S. president authorizes their use for war, at which time the treaty would no longer be in effect. But all preparation for the use of the weapons takes place now in peacetime. Equipping non-nuclear countries with the means to conduct preparations for nuclear warfare expresses a double standard that conflicts with U.S. and European nuclear nonproliferation objectives to persuade countries such as Iran and North Korea from developing nuclear weapons.

What should be done about U.S. nuclear weapons in Europe?

To end Cold War nuclear planning in Europe, the United States should immediately withdraw the remaining nuclear weapons from Europe. Doing so would complete the withdrawal that began in 1991, free up resources in the U.S. Air Force and European air forces for real-world non-nuclear missions, and enable NATO to focus on the non-nuclear security priorities that matter.

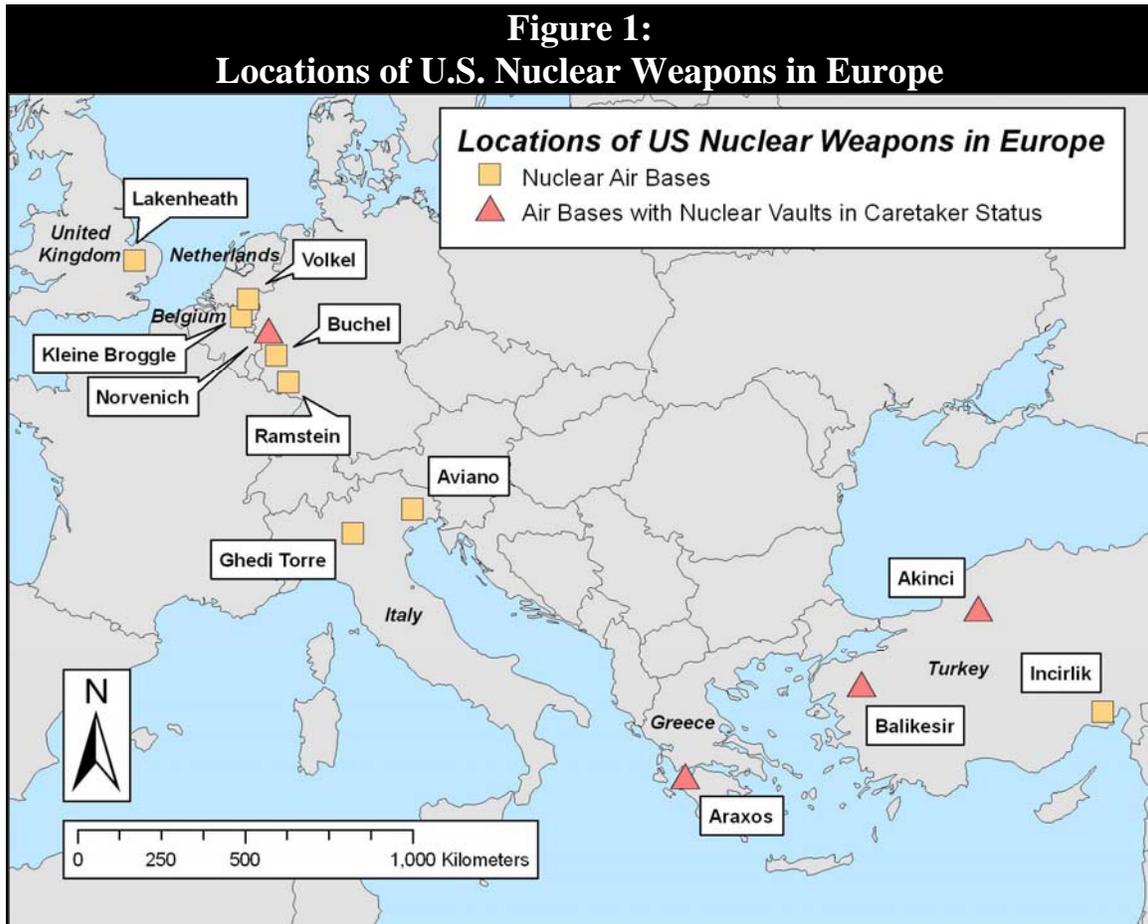
In addition, NATO should end the practice of assigning nuclear strike missions to non-nuclear member countries. This should involve the removal of all mechanical and

electronic equipment on host nation aircraft intended for the delivery of nuclear weapons, and the denuclearization of facilities on national air bases intended for storage and maintenance of nuclear weapons. Doing so would end NATO's nuclear double standard and strengthen the stand of the United States and Europe in persuading other countries from developing nuclear weapons.

Finally, the United States and Europe should use the political leverage that would come from these initiatives to engage Russia to drastically reduce their large inventory of non-strategic nuclear weapons. At the same time, NATO should use the removal of nuclear weapons from Greece, Italy, and Turkey to invigorate efforts toward a nuclear weapons free zone in the Middle East. Such initiatives would provide real benefits to NATO security.

LARGE U.S. NUCLEAR FORCE REMAINS IN EUROPE

The United States currently deploys approximately 480 nuclear weapons in Europe. The weapons are stored at eight bases in six countries, mainly located in northeastern Europe. At four other bases, mostly in the eastern Mediterranean region, the nuclear weapons have been removed but could be redeployed if necessary (see Figure 1).



All the weapons are gravity bombs of the B61-3, -4, and -10 types.² Germany remains the most heavily nuclearized country with three nuclear bases (two of which are fully operational) and may store as many as 150 bombs (depending on the status of the weapons removed from the German Air Base at Memmingen and Araxos Air Base in Greece). Royal Air Force (RAF) Lakenheath stores 110 weapons, a considerable number in this region given the demise of the Soviet Union. Italy and Turkey each host 90 bombs, while 20 bombs are stored in Belgium and in the Netherlands (see Table 1).

The current force level is two-three times greater than the estimates made by nongovernmental analysts during the second half of the 1990s. Those estimates were based on private and public statements by a number of government sources and assumptions about the weapon storage capacity at each base. Although some of those

sources correctly identified 480 U.S. weapons in Europe by 1994, reductions rumored to have taken place in the second half of the 1990s in fact never happened.

Table 1: U.S. Nuclear Weapons in Europe, 2005*				
Country	Base	Weapons (B61)		
		US	Host	Total
Belgium	Kleine Brogel AB	0	20	20
Germany	Büchel AB	0	20	20
	Nörvenich AB	0	0	0
	Ramstein AB	90	40	130
Italy	Aviano AB	50	0	50
	Gheddi Torre AB	0	40	40
Netherlands	Volkel AB	0	20	20
Turkey	Akinci AB	0	0	0
	Balikesir AB	0	0	0
	Incirlik AB	50	40	90
United Kingdom	RAF Lakenheath	110	0	110
Total		300	180	480

* See Appendix A for more details and background.

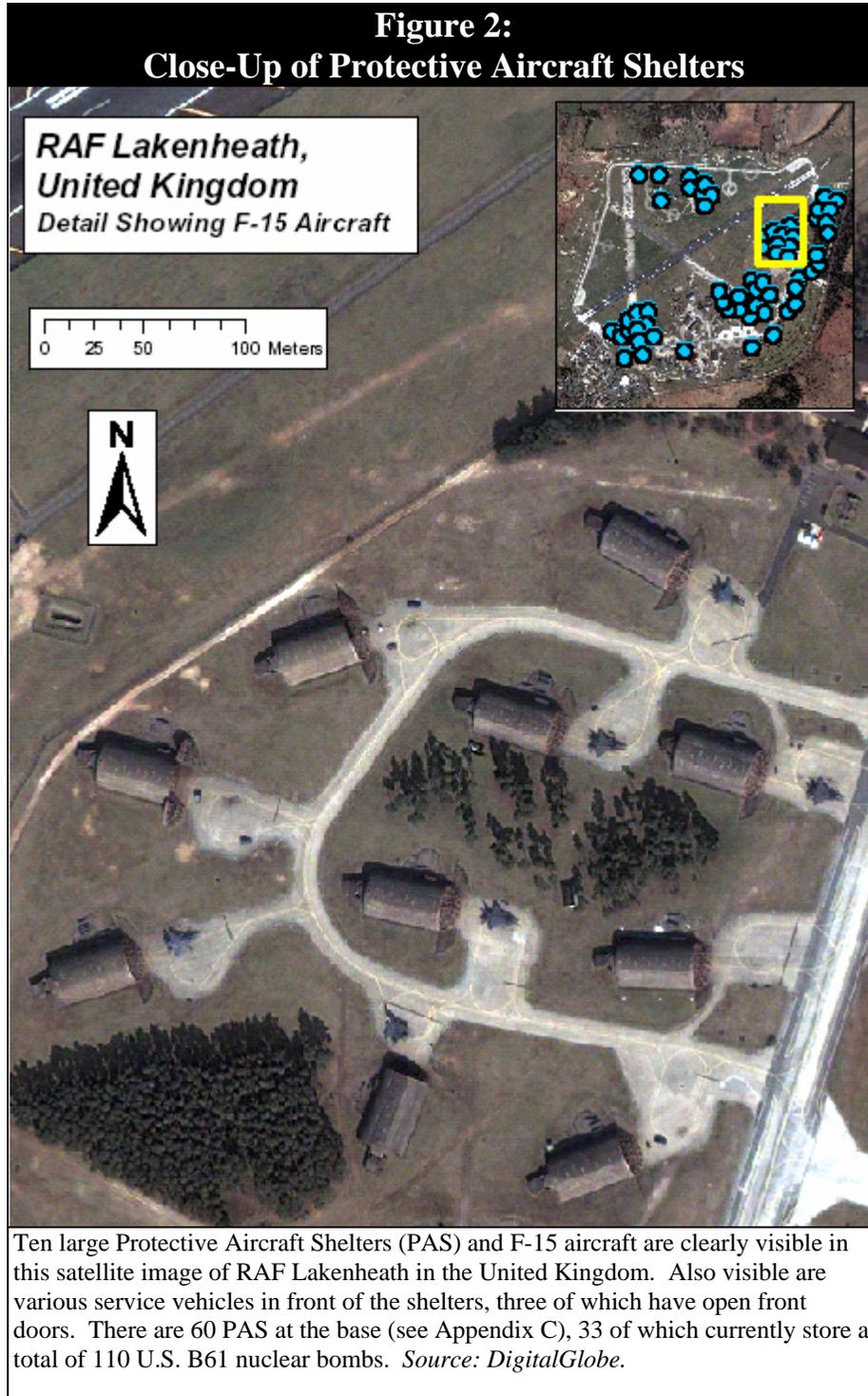
The actual force level – greater in size than the entire Chinese nuclear stockpile – was continued from the force level set by the Clinton administration in 1994 and 2000. One of President Clinton’s last acts as president was to sign Presidential Decision Directive/NSC-74 in November 2000, which authorized the U.S. Department of Defense to deploy 480 nuclear bombs in Europe. The new directive replaced a previous deployment directive from October 1997 that covered the years 1998 and 1999. The Bush administration is not thought to have changed the force level.

Table 2: B61 Nuclear Bomb Characteristics³					
Weapon	Yield	Years Build	Total U.S. Stockpile		
			Active	Reserve/ Inactive	Total
B61-3	.3, 1.5, 60, or 170 kilotons	1979-1989	200	196	396
B61-4	.3, 1.5, 10, or 45 kilotons	1979-1989	200	212	412
B61-10*	.3, 5, 10, or 80 kilotons	1990-1991	180	28	208
Total			580	436	1,016

* The B61-10 is a converted Pershing II missile W85 warhead.

The forward-deployed weapons probably include all three versions of the tactical B61 bomb (B61-3, B61-4, and B61-10). The B61-3 and -4 versions were built between 1979

and 1989, while the B61-10 is a converted Pershing II warhead. All three types have four selective yields down to 0.3 kilotons (300 tons), the lowest known yield of any U.S. nuclear weapon. Their maximum yields vary from 45 kilotons (B61-4) to as much as 170 kilotons (B61-3). (See Table 2)



The 480 bombs deployed in Europe represent more than 80 percent of all the active B61 tactical bombs in the U.S. stockpile. No other U.S. nuclear weapons are forward-deployed (other than warheads on ballistic missile submarines). An additional 436 bombs are in reserve or inactive status but could be returned to the active stockpile quickly if necessary.

Approximately 300 of the 480 bombs are assigned for delivery by U.S. F-15E and F-16C/D aircraft (capable of carrying up to five and two B61 bombs each, respectively) deployed in Europe or rotating through the U.S. bases. The remaining 180 bombs are earmarked for delivery by the air forces of five NATO countries, including Belgian, Dutch, and Turkish F-16s and German and Italian PA-200 Tornado aircraft (up to two weapons each).

Control of the nuclear weapons at national air bases is performed by the U.S. Munitions Support Squadron (MUNSS) at each base (see Table 3). Each MUNSS includes approximately 110 personnel that are responsible for the physical security of the weapons, maintenance and logistics of the weapons and the Weapons Storage and Security System (WS3), and handing over the nuclear bombs to the national air forces if ordered to do so by the U.S. National Command Authority. Prior to assignment to a MUNSS, officers undergo a two-day route orientation at Spangdahlem Air Base.⁴ All MUNSS units fall under the command of the 38th Munitions Maintenance Group (MMG) at Spangdahlem Air Base. The group was stood up on May 27, 2004.⁵

**Table 3:
Munitions Support Squadrons At National Air Bases**

Base	Designation*	Status
Araxos AB, Greece		731 MUNSS withdrawn in 2001
Akinci AB, Turkey		739 MUNSS withdrawn in 1996
Balikesir AB, Turkey		39 MUNSS withdrawn in 1996
Büchel AB, Germany	702 MUNSS	Previously 852 MUNSS
Ghedi Torre AB, Italy	704 MUNSS	Previously 831 MUNSS
Kleine Brogel AB, Belgium	701 MUNSS	Previously 52 MUNSS
Nörvenich AB, Germany		604 MUNSS withdrawn in 1996
Volkel AB, the Netherlands	703 MUNSS	Previously 752 MUNSS

* New three-digit designations were assigned in 2004. All MUNSS units are organized under the 38th Munitions Maintenance Group (MMG) at Spangdahlem AB.

The breakdown of the weapons deployment reveals some interesting characteristics of the distribution of the weapons. The greatest number of weapons (300, or more than 62 percent) are stored on bases in northern Europe. More than 83 percent (110 of 132 spaces) of the vaults at RAF Lakenheath still store nuclear weapons. This “northern focus” is noteworthy given the considerable changes in the former Soviet Union. The 180 weapons on southern bases are fewer but much closer to the “new threat” of the proliferating countries in the Middle East region, a security problem that NATO is currently focused on.

Another interesting feature is that nuclear weapons that were withdrawn from two German bases, two Turkish bases, and one Italian base in the mid 1990s were not returned to the United States but transferred to the main U.S. base in those countries. In Germany, the weapons were moved from Memmingen Air Base and Nörvenich Air Base to Ramstein Air Base. In Turkey, they were moved from Akinci Air Base and Balikesir Air Base to Incirlik Air Base, and in Italy, the weapons were moved from Rimini Air Base to Ghedi Torre Air Base. These transfers appear to have been a consistent pattern: Nuclear weapons were not withdrawn from the European theater when a U.S. Munitions Support Squadron (MUNSS) was inactivated at national bases, but instead were moved to the main U.S. operating base in each country. In all of these cases, the weapons continue to be earmarked for “host nation use” and delivery by the national air forces.

In the case of Ghedi Torre Air Base, the situation is particularly noteworthy because the base’s utilized weapons storage capacity is nearly double that of the other national bases. Out of a maximum capacity of 44 weapon spaces in 11 vaults at Ghedi Torre, roughly 40 (more than 90 percent) are filled. It is the only known case in Europe where a national air base stores more than 20 nuclear weapons. Half of the weapons at Ghedi Torre were previously stored at Rimini Air Base, which ended nuclear operations in 1993. It is unclear whether this means that the 6th Stormo Wing at Ghedi Torre has a particularly large nuclear strike mission, or that another Italian wing also has a nuclear role.

The deployment of U.S. nuclear weapons on the territories of European countries is arranged by a series of secret nuclear agreements between the United States and each host or user country. The nuclear agreements fall into four categories:⁶

The Atomic Stockpile Agreement is a bilateral agreement between the United States government and a user nation. It guides introduction and storage within a country, custody, security, safety and release of weapons, as well as cost sharing.

The Atomic Cooperation Agreement is a bilateral agreement between the United States and a user nation that provides for the “Exchange of Atomic information useful for mutual Defense Purposes.”

The Service-Level Agreement is a bilateral technical agreement between the military services of the United States and the user nation. It implements the government-to-government stockpile agreement and provides details for the nuclear deployment and use and defines joint and individual responsibilities.

“Third party” stockpile agreements are government-level agreements between the United States, third nation and user nation. It guides stockpiling of nuclear weapons within the territory of a third-nation for the use by NATO committed forces of a signatory user nation.

Between 1952 and 1968, a total of 68 individual nuclear agreements were signed between the United States and nine NATO countries. By 1978, 53 of those agreements remained

in effect, including nine service-to-service technical agreements governing the deployment of U.S. Air Force nuclear bombs in as many countries (Belgium, Canada, Germany, Greece, Italy, Netherlands, Turkey and the United Kingdom).⁷ Canada left NATO's surrogate nuclear club in 1984, apparently followed by Greece in 2001. As a result, nuclear agreements today are in effect with six NATO countries: Belgium, Germany, Italy, Netherlands, Turkey, and United Kingdom. The code words for some of the technical agreements (Service-Level Agreements) for the NATO countries that currently store U.S. nuclear weapons are known: Pine Cone for Belgium; Toolchest for Germany; Stone Ax for Italy; and Toy Chest for the Netherlands.⁸

Underground Nuclear Weapons Storage Logistics

The B61 nuclear bombs in Europe are stored in what is known as the Weapon Storage and Security System (WS3), a nuclear weapons storage capability unique to the European theater. This system enables the weapons to be stored underground in Weapons Storage Vaults (WSV) inside the individual Protective Aircraft Shelters (PAS)⁹ on each base rather than in igloos in a centralized Weapons Storage Area (WSA). There are currently 204 WSVs in Europe, with a total capacity of 816 weapons (see Table 4).

Table 4: Weapon Storage and Security System (WS3)			
Country	Base	WSV	Max. Capacity
Belgium	Kleine Brogel AB	11	44
Germany ^a	Büchel AB	11	44
	Nörvenich AB ^b	11	44
	Ramstein AB	55 ^c	220
	Araxos AB ^b	6	24
Greece	Aviano AB	18	72
Italy	Gheddi Torre AB	11	44
	Volkel AB	11	44
Netherlands	Akinci AB ^b	6	24
	Balikesir AB ^b	6	24
	Incirlik AB	25	100
United Kingdom	RAF Lakenheath	33	132
Total		204	816

^a The German air base at Memmingen was closed in 2003.
^b The vaults at these bases are in caretaker status with no weapons.
^c One of these is thought to be a training vault.

Until now most independent analysts have assumed that each vault could store up to two weapons. But declassified documents disclose, as do careful analysis of photographs of the vaults published by the U.S. Air Force and Sandia National Laboratories (SNL) (reproduced below), that each vault can store up to four weapons. In reality, however, most bases utilize only part of their maximum capacity. The one exception is Ghedi

Torre Air Base in Italy, which stores 40 weapons in 11 vaults with only four spares (see Appendix A).

The WS3 program started in 1976 when SNL began a “forward look” study to determine how to better safeguard nuclear weapons deployed in overseas locations. At that time, nuclear weapons were stored in igloos in a double-fenced WSA at the base. In 1979, the effort produced a capability study on how to disperse the weapons for storage in the hangars themselves. Full-scale development of the four-weapon vault system began in September 1983, and Research, Development, Test, and Evaluation (RDT&E) was carried out at Ramstein Air Base in November and December 1987. The program entered production and deployment phase in August 1988 with a contract awarded to Bechtel International Inc. The first location to achieve Initial Operational Capability (IOC) was Büchel Air Base in September 1990. Incirlik Air Base was the last, in April 1998. Originally, 249 vaults were built at 15 sites in seven countries (see Appendix B).¹⁰ The WS3 system is made up of five functional areas:

- Weapon Storage Vault (WSV)
- Communications, Command, and Control (C3)
- Assessment
- Code Transfer and Storage
- Voice Communication

The WSV, the mechanical portion of the WS3, is a reinforced concrete foundation and a steel structure recessed into the floor of Protective Aircraft Shelters (PAS). The vault barrier, barrier support, midlevel deck, and platform assembly are designed to be elevated out of the concrete foundation by means of an elevator drive system to provide access to the weapons in two stages or levels, or to be lowered into the floor to provide protection and security for the weapons. The floor slab is approximately 16 inches thick. Sensors to detect intrusion attempts are imbedded in the concrete vault body. A fully configured WSV will store up to four nuclear weapons (see Figures 3 and Figure 4).¹¹

The WS3 was originally envisioned to be a global system deployed at U.S. Air Force bases where the U.S. deployed nuclear weapons overseas. A total of 437 vaults with a maximum capacity of more than 1,700 weapons were initially planned for 28 locations worldwide (36 vaults were planned for Kunsan Air Base in South Korea). Of these, 401 were in Europe with a combined capacity of 1,604 weapons. The scope of the program was scaled back considerably, as were the number of WSVs at each base. In 1997, there were 249 sites with a capacity of 996 weapons (even though only approximately 520 U.S. and U.K. weapons were present) in Europe. Today, there are 204 vaults with a maximum capacity of 816 weapons – nearly double the number of weapons actually deployed (see Appendix A and Appendix B).

**Figure 3:
Elevated Weapon Storage Vault in Hangar**



Elevated Weapons Storage Vault (WSV) with B61 body in Protective Aircraft Hangar with F-16 in the background. Notice the offset twin hangars in the ceiling of the top rack enabling storage of two offset weapons on each level for a total of four weapons in the vault. *Source: U.S. Air Force.*

Initially, a small number of vaults at six bases in four countries were planned to store W84 warheads for the Ground Launched Cruise Missile. The 1987 INF Treaty removed this requirement. Araxos Air Base in Greece was initially planned to have 11 vaults, but in July 1996 the Pentagon awarded a contract for construction of only six vaults, the same number as Akinci Air Base and Balikesir Air Base in Turkey.¹² The WS3 system was also used to store Royal Air Force WE177 bombs at the RAF Brüggen in Germany between 1995 and 1998, after which the United Kingdom scrapped its aircraft-delivered nuclear weapons.

Since 1993, the WS3 sites at several bases have been inactivated as the nuclear weapons were moved to Major Operating Bases (MOB). This includes Memmingen Air Base, Nörvenich Air Base, and RAF Brüggen in Germany, Akinci Air Base and Balikesir Air Base in Turkey, Araxos Air Base in Greece, RAF Marham in the United Kingdom, and Rimini Air Base in Italy. Four of these bases (RAF Brüggen, RAF Marham, Memmingen Air Base, and Rimini Air Base) have since closed and the WS3 dismantled. At the remaining four inactivated sites, the WS3s are in “caretaker status” and have been “mothballed in such a way that if we chose to go back into those bases we can do it,” according to Harold Smith, the former U.S. Assistant to the Secretary of Defense for Nuclear, Chemical, and Biological Defense Programs.¹³

**Figure 4:
Weapon Storage Vault Loading
Demonstration**



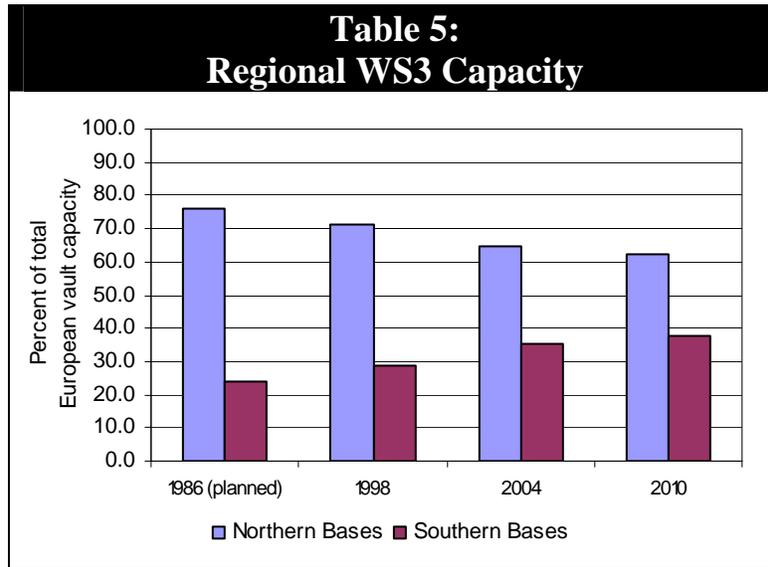
Loading demonstration of two B61 bomb shapes into the top bay of a Weapons Storage Vault (WSV) at Sandia National Laboratories. Notice the tailfins of the two bombs hanging in opposite directions, enabling storage of two weapons in each bay.
*Source: Sandia National Laboratories.*¹⁴

Over time, due to the cancellation and closure of some sites, the geographical distribution of the WS3 system in Europe has changed from a predominantly northern European one to a system where the sites in the southern region represent a gradually increasing share of the total system. Even today, however, a decade and a half after the Soviet Union collapsed, nearly two-thirds of the WS3 capacity is located in northern Europe (see Table 5).

According to the U.S. Air Force, the storage of nuclear weapons inside aircraft hangars is an improved storage process to the previously used method of centralized storage in WSAs. “The concept of decentralized (dispersal) and co-locating the weapon(s) with the aircraft enhances survivability, safety, security, and operational availability while reducing the overall intelligence signature.”¹⁵

Obviously, bringing nuclear weapons into hangars in close proximity with aircraft fuel and conventional munitions raises a whole other set of security issues. Two sizes of shelters have been equipped with the WSV system, a larger PAS measuring 37.5 x 23 meters and a smaller 32.5 x 17 meters shelter. Many of the nuclear bases have a mix of the two types of shelters, but RAF Lakenheath alone has larger shelters. Most national bases only have the small shelters. To ensure separation of nuclear weapons from flammable or explosive materials, the WSV must always be closed under normal

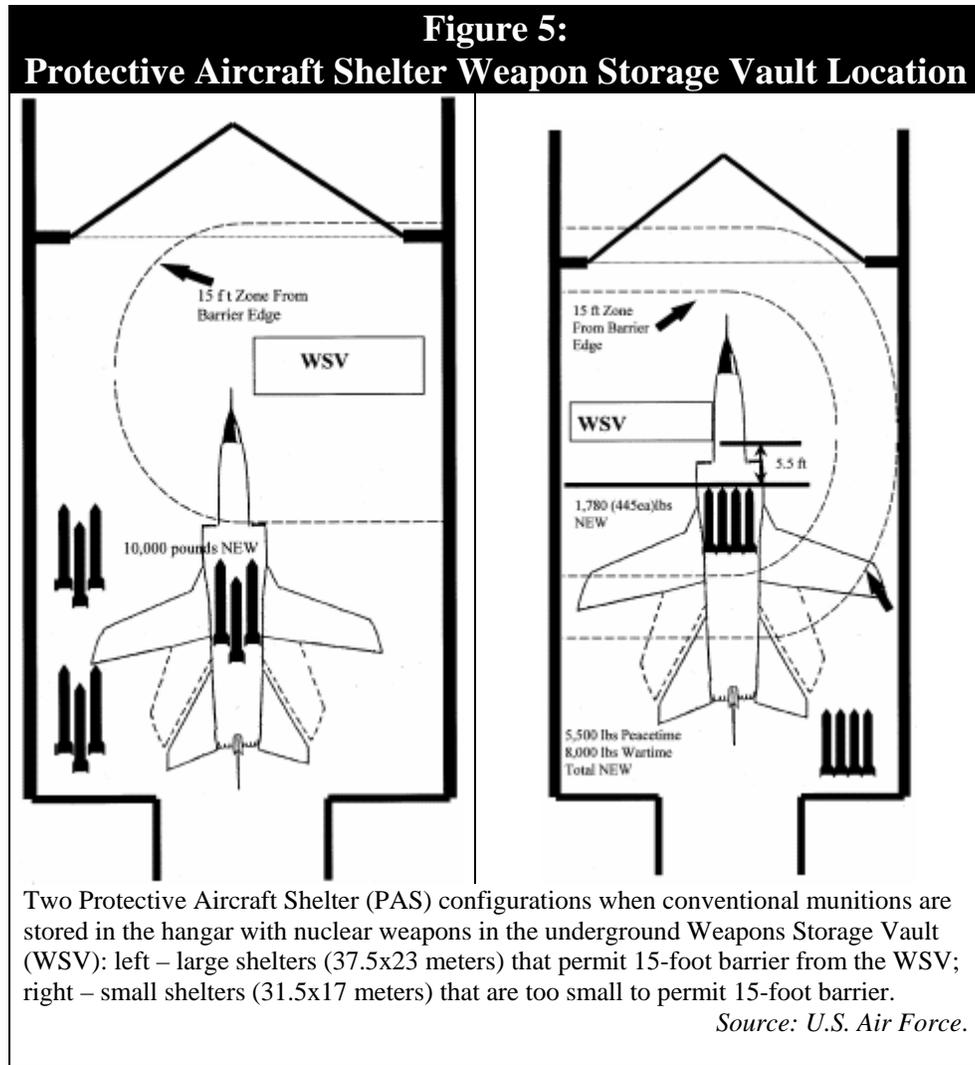
circumstances, and limits have been set on how much explosive material may be present in each PAS and how close to the vault (see Figure 5).



PAS with vaults installed are occasionally inspected under the Treaty on Conventional Armed Forces in Europe (CFE), which entered into force in 1992. But inspectors are granted access only when the nuclear weapons storage vault is down and locked. WS3 control panels are covered and photographs are not to reveal the location of vaults and control panels. If, for any reason, a vault is unlocked or is up during an inspection, the entire PAS will become a nuclear exclusion zone and access will be denied. In this case, U.S. personnel will remove aircraft from the shelter and declare it “a sensitive point.”¹⁶

Support of the WS3 is provided by 14 Weapons Maintenance Trucks (WMT) located at the weapons locations (see Figures 6).¹⁷ The system was initiated in 1991, when U.S. Air Forces in Europe (USAFE) first put into effect its Regionalized Nuclear Weapons Maintenance Concept (RNWMC) at operational units with WS3s. A task team of 21 Air Force Safety Command (AFSC) 2W2X1 (Munitions Systems Specialist, Nuclear Weapons) personnel was established under the 86th Wing’s Equipment Maintenance Squadron at Ramstein Air Base to deploy temporarily to selected locations and perform nuclear weapons maintenance inside the WMT parked within a PAS.¹⁸

Refinements and upgrades of the WS3 system continue today that suggest NATO plans to keep U.S. nuclear weapons in Europe for many years to come. Blast effect studies were completed for the WS3 in 1999 and 2000,¹⁹ and the current modification program seeks to enable WS3 sustainment through FY2018. This program is a two-phase effort stretching through 2005 (see Figure 7).²⁰



The total cost of maintaining nuclear deployments to Europe is not known. But some indicators are found in the funding for building and maintaining the WS3 facilities. The WS3 at Ramstein Air Base was initially projected to cost \$800,000 (58 vaults in 1986).²¹ The contract for construction and installation of 18 WSVs (six at each base) at Araxos Air Base in Greece and Akinci and Balikesir in Turkey was \$11.6 million in 1996,²² or more than half a million dollars per vault. The U.S. Air Force's cost for operating and maintaining the WS3 in FY1999 was \$81,719.²³

It cost USAFE \$680,000 in 1999 to initiate the current modernization effort. One of the challenges discussed within the U.S. Air Force WS3 team was how to persuade NATO to contribute to the funding. Through 2005, the total cost was estimated at \$10.2 million.²⁴ Most recently, in July 2004, the U.S. Air Force awarded a \$2 million contract for the upgrade of monitoring and console equipment for WS3 at 12 NATO installations.²⁵

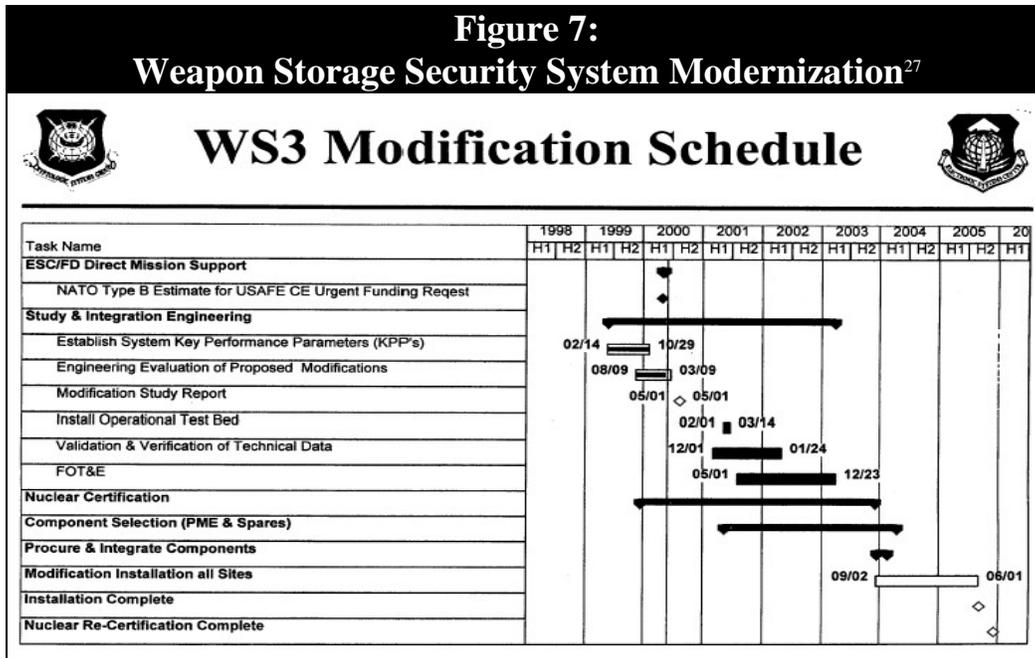
**Figure 6:
NATO Nuclear Weapons Maintenance Truck²⁶**



NATO nuclear Weapons Maintenance Truck (WMT) for service of B61 bombs held in Weapons Security Storage System (WS3) vaults in Protective Aircraft Shelters (PAS) at eight bases in six NATO countries. Picture is from Kleine Brogel Air Base in Belgium. Fourteen such trucks exist.



The interior of a WMT used at Kleine Brogel Air Base. Note the grey brace in the foreground used to lock in the bomb during maintenance. A logo for the Jabo G-34 fighter-bomber squadron at Memmingen Air Base in Germany is also visible on the inside of the right-hand side rear door.



Stockpile Upgrades Made Under Guise of Safety Concerns

Over the past several years, the B61 nuclear weapons deployed in Europe have been modified and equipped with new capabilities. In 2002, the Sandia National Laboratories (SNL) completed alterations on all B61-3, -4, and -10 weapons stored in Europe.²⁸ The purpose of these alterations was to enhance the reliability, use control, and safety of these retrofitted weapons (see Table 6). According to the Department of Energy, “These alterations upgrade components or refurbish or replace aged components so that weapons will continue to meet Military Characteristics and remain safe and reliable in the environments defined in the Stockpile-to-Target Sequence.”²⁹ The projects involved hundreds of personnel across the SNL complex.

The upgrades included development and deployment of the Code Management System (CMS) (ALT 339), a project first begun in 1995 to improve command and control of nuclear weapons. The codes are used in conjunction with Permissive Action Links (PALs) inside the nuclear weapon to recode, unlock, lock, and manage the weapons, while ensuring the secrecy and authenticity of launch orders. In total, CMS consists of fourteen custom products (nine software and five hardware products). The software was designed at Sandia and contains about 160,000 lines of uncommented computer source code (260,000 including comments). The hardware was manufactured at the National Nuclear Security Administration’s Kansas City Plant and fits in a kit the size of a small suitcase.³⁰

The weapon upgrades coincided with delivery of new trainers for use by ground crews in weapons practice drills. For the European nuclear bases, a total of 54 Type 3 trainers were required for February 2004 (see Table 7).

**Table 6:
Recent Modifications to U.S. Nuclear Weapons in Europe**

ALT 335	Carried out between October 1998 and September 2003. Installed a Trajectory Sensing Signal Generator (TSSG), a safety improvement that increases the nuclear safety of the bomb in certain normal and abnormal environments. Büchel AB received initial training in May 1996.
ALT 339	Carried out between October 1998 and September 2003. Installed the MC4519 MCCS Encryption Translator Assembly (MET) in B61-3, -4, and -10 to provide weapons with cryptographic capability to implement end-to-end encryption in the PAL Code Management System (CMS). MC4519 MET coupled with the CMS enables recoding of nuclear weapons in a fully encrypted manner. MET capability improves the positive controls over use of the warhead. Regular monthly shipments started in June 1997. The first CMS became operational on B61s in Europe on November 30, 2001.
ALT 354	Carried out between March 2001 and March 2002. Adjustment of fin cant angle for B61-3, -4, and -10 to improve weapon spin rates when used in conjunction with existing spin motor.

The CMS greatly simplifies use and logistics for personnel and greater flexibility and speed in maintenance and arming of the weapons. The products were delivered on November 7, 2001, but MUNSS units began training for them in 1996 (the 817th MUNSS at Büchel Air Base in March 1996). The CMS first became operational on nuclear bombs in Europe on November 30, 2001. One part of the system, a cryptographic processor, was deployed in Europe in 1997 “to address some Y2K problems.” CMS replaced the code management equipment on all U.S. military and National Nuclear Security Administration (NNSA) users by early 2004, and is envisioned to be the common foundation for all future upgrades of U.S. PAL system hardware and software.³¹

**Table 7:
Type 3 Trainer Requirements by Location and Type³²**

Base	Type 3A	Type 3E	Total
Aviano B61-4	2	3	5
Büchel B61-4	1	6	7
Ghedi Torre B61-4	1	6	7
Incirlik B61-4	2	1	3
Kleine Brogel B61-4	1	6	7
Lakenheath B61-4	2	7	9
Ramstein B61-0		1	1
Ramstein B61-4	2	4	6
Spangdahlem B61-4	1	1	2
Volkel B61-4	1	6	7
Total	13	41	54

It would be tempting to interpret this Air Force instruction list as a disclosure of which modifications of the B61 bomb are deployed at each base, but that would probably be a mistake for several reasons. First, it would imply that the B61-0 is deployed in Europe, but the last B61-0, a strategic bomb, was dismantled in 1996. Second, it would mean that only the B61-4 (not B61-3 and B61-10) is deployed even though the entire U.S. stockpile of B61-4s consists of only 200 active weapons, less than half of the current stockpile in Europe. Nor does the number of trainers at each base appear to indicate how many weapons are stored at each facility since bases with 20 or 100 weapons have almost the same number of trainers.

Rather, the number next to the base name appears to be part of the designation of the trainer itself, which can be used for all three bomb types. Trainers used at air bases for handling nuclear weapons until recently were mock-ups of older trainers designed for older versions of the B61 bomb or were U.S. Navy conventional bomb trainers retrofitted to look like B61s. The U.S. Air Force decided in 1997 that the old trainers should be discontinued because weapons loading and handling crews were unable to complete exercises intended to check their ability to safely move, inspect, mount to aircraft, arm, disarm, and return to storage the B61-3, -4, and -10 bombs – modifications of the B61 that are similar in appearance and function.

In March 1998, the U.S. Air Force asked Sandia National Laboratories to design a new trainer that would resemble the B61-3, -4, and -10 nuclear bombs. The result was the B61-4 Type 3E trainer (see Figure 8) of which the first six were delivered to the U.S. Air Force in December 2001. The B61-4 Type 3E is the first loading and handling weapon trainer specifically designed to simulate the B61-3, -4, and -10. A total of 51 units were scheduled for delivery by March 2003. The new B61-4 Type 3E trainer includes the following features:³³

- A Weapons Simulation Package (WSP), the internal brains of the trainer that simulates B61-3, -4, and -10 electric signals, including a monitor logic simulator, PAL system simulator assembly, new integrated circuit processor, new software, and new electric filters and regulators.
- A Preflight Control (PFC) system that allows PAL operations with the new Code Management System (CMS).
- New PAL capabilities that allow handlers and pilots to perform more preflight ground procedures and insert arming codes from the cockpit.
- Connectors, cables, plugs, seals, lugs, lid, housing assemblies, knobs, and switches precisely like those of a War Reserve B61 and that interface with the aircraft.
- Compatibility with F-15, F-16, F-111, and B-2 aircraft.

In 2002, the new trainers began arriving at U.S. air bases and NATO sites in Europe. A Sandia team also visited eight Air Force bases and NATO sites with a special suitcase-size version of the Type 3E trainer itself (its electronic form in compact form) and hooked the box up to actual aircraft.

**Figure 8:
B61-4 Type 3E Trainer**



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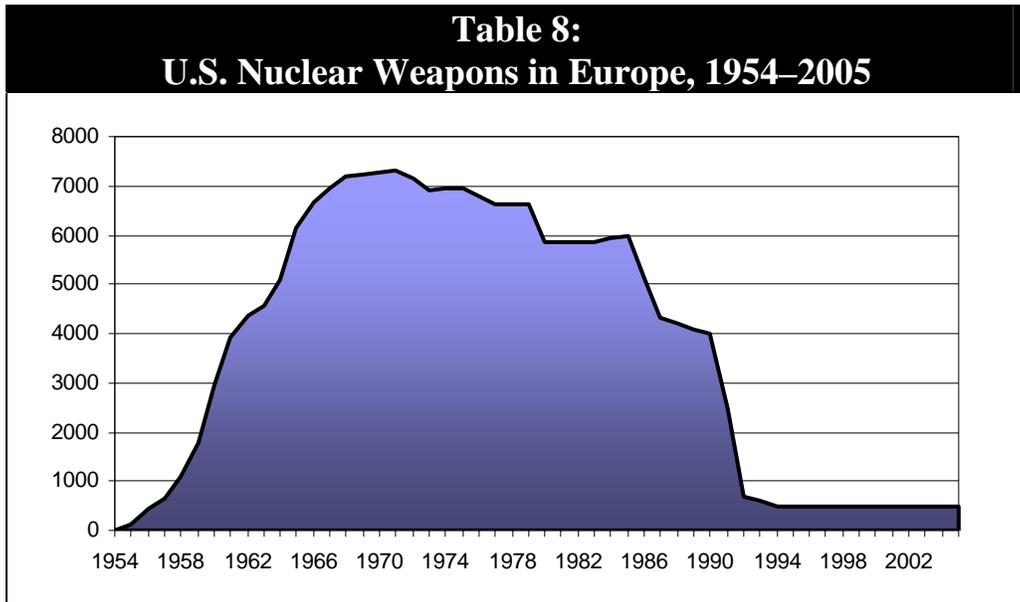
A B61-4 Type 3E trainer assembly used by U.S. Air Force and NATO units in Europe to practice nuclear weapons maintenance and aircraft loading at air bases in six European countries. The U.S. Air Force began shipping the new trainers to Europe in December 2001.

Source: Sandia National Laboratories

HISTORY OF U.S. NUCLEAR WEAPONS IN EUROPE

Political and Military Reasons For Deployment

The current deployment of nuclear weapons in Europe, and its justification, is the result of more than 50 years of nuclear policy. Much of the history of U.S. nuclear weapons deployments to Europe has recently become available thanks to diligent research based upon crucial documents released under the Freedom of Information Act (FOIA).³⁴ This information makes it possible, for the first time, to trace the numbers and kinds of the nuclear weapons deployed to Europe (see Table 8).



The U.S. first deployed nuclear weapons to Europe in September 1954 when the first weapons arrived in Britain. Within 10 years, deployments spread to Germany, Italy, France, Turkey, the Netherlands, Greece, and Belgium, and in 1971 the deployment peaked with approximately 7,300 nuclear warheads deployed in Europe. After reaching a peak a gradual but steady decline ensued. While there continued to be many government statements about the importance and purpose of deploying nuclear weapons to Europe, the trend was clear: The stockpile would continue to decrease.

The beginning of the decline occurred between 1975 and 1980 when the arsenal was reduced by more than 1,000 warheads. This development coincided with a similar withdrawal of part of the U.S. arsenal of tactical nuclear weapons from Pacific Command after a review disclosed severe security concerns and numbers well in excess of war planning needs.

In several Pacific nations visited by a U.S. congressional delegation, American ambassadors professed that they did not know whether nuclear weapons were deployed in

the country or not. Several ambassadors pleaded ignorance about any understandings that may have been reached with the host country about the possible use of nuclear weapons.³⁵ Throughout the 1960s and early 1970s, more and more nuclear weapons had been added to the storage sites, eventually causing the Joint Chiefs of Staff (JCS) to become concerned about their physical security. In 1974, the JCS directed that the requirements for nuclear weapons deployment be reevaluated.³⁶

Donald R. Cotter, the assistant to the Secretary of Defense (Atomic Energy), conducted an inspection of Commander in Chief, U.S. Pacific Command's (CINCPAC's) nuclear facilities in September 1974 and concluded that the number of nuclear weapons stored ashore in the Western Pacific were "well in excess" of requirements.³⁷ In response, Pacific Command said it preferred to reduce or phase out the ASW weapons, surface-to-air missiles, and the atomic demolition munitions while retaining bombs and surface-to-surface missiles.³⁸

A prolonged congressional debate and a series of internal Pentagon reviews in 1973 and 1974 led to a conclusion that there were an excessive number of nuclear weapons in Europe as well. Secretary of Defense James Schlesinger directed the first major revision of its nuclear posture in Europe since they were initially deployed in 1954.

Schlesinger's views were partially influenced, according to one recent account, by the outbreak of war in July 1974 between two nuclear-equipped NATO countries, Turkey and Greece. Schlesinger wanted to know if the U.S. nuclear weapons were secure and asked his director of telecommunications and command and control systems, Thomas C. Reed, if he could talk to the U.S. officers holding the keys to the weapons. Reed reported back that the U.S. custodians were in charge, but at one Air Force base "things got a little dicier."

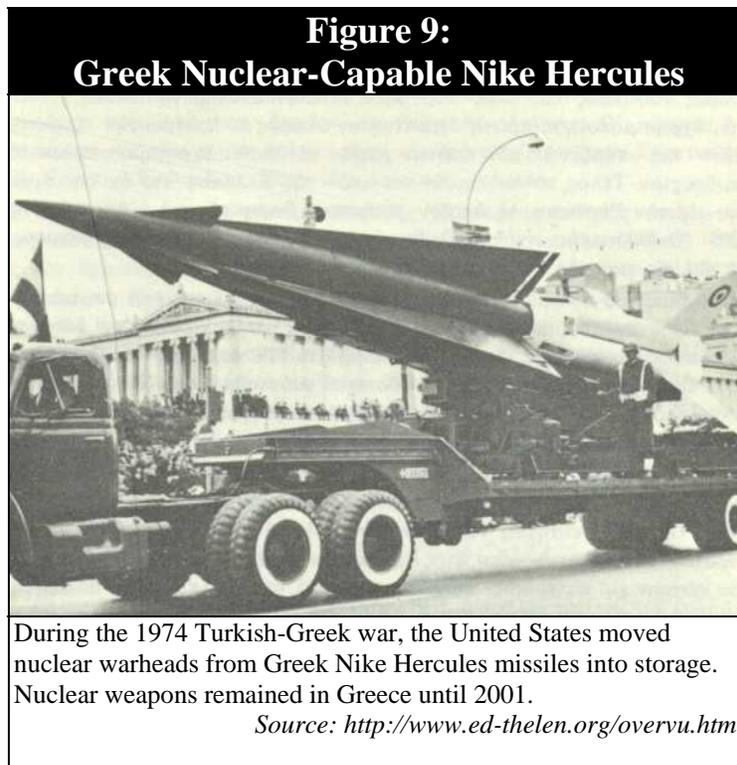
"The local Army troops outside the fence wanted in. Their Air Force countrymen inside wanted them kept out. The nukes on alert aircraft were hastily returned to bunkers as the opposing commanders parleyed under a white flag. Soon both sides went off to dinner, but through it all we held out breath."³⁹

Fears about the physical security of the weapons had been raised during the military coup d'état in Greece in 1967, where "political tension in the vicinity of some of our nuclear storage facilities" had caused concern in Washington.⁴⁰ As a result of the Turkish-Greek war, the United States removed its nuclear bombs from Greek and Turkish alert fighter-bombers and transferred the nuclear warheads from Greek Nike Hercules missile units (see Figure 9) in the field to storage. Greece saw this as another pro-Turkish move by NATO and responded by withdrawing its forces from NATO's military command structure. This forced Washington to contemplate whether to remove its nuclear weapons from Greece altogether, but in the end the Ford administration decided against it after the State Department warned that removal would further alienate the Greek government from NATO.⁴¹

Nothing was said about this nuclear dilemma in the final communiqué from NATO's Nuclear Planning Group (NPG) that met in December 1974. The group remarked it had "discussed the recent legislation in the United States calling for an examination of the doctrine for the tactical use of nuclear weapons and of NATO's nuclear posture...."⁴² Other than that, the public was kept in the dark.

The Turkish and Greek episode and the discoveries at Pacific Command led to immediate improvements in the command and control of the forward-deployed nuclear weapons. A wave of terrorist attacks in Europe at the time added to the concerns. By the end of 1976, all U.S. tactical nuclear weapons were equipped with Permission Action Links (PALs). The June 1975 NPG meeting made a vague reference to this by stating that, "actions [were taken] to enhance the security of nuclear weapons stored in NATO Europe."⁴³

The U.S. withdrew several older weapon systems and introduced several new ones, even proposing enhanced radiation warheads, or "neutron bombs," which proved too controversial. The NATO NPG meeting in January 1976 discussed "greater flexibility and more options" for the future posture,⁴⁴ achieved in part by assigning additional U.S. Poseidon ballistic missile submarines to NATO.



By 1980, the stockpile was further reduced by more than 1,000 to about 5,800 warheads.⁴⁵ Additional reductions were delayed by concern over the Soviet deployment of SS-20 missiles, decisions to modernize Lance and artillery systems, as well as the dual-track NATO decision of December 1979 to deploy 464 ground-launched cruise missiles and 108 Pershing II ballistic missiles beginning in late 1983. These events

halted any further declines and even resulted in a slight increase of U.S. warheads in Europe, reaching nearly 6,000 in 1985.⁴⁶

Public Uproar in mid-1980s Forces More Reductions

NATO's objective with the dual-track decision was to pressure the Soviet Union into negotiations to reduce or eliminate intermediate-range nuclear forces (INF). The capabilities of the new NATO weapons clearly caused concern in Moscow, but the public uproar surrounding the Euro-missiles significantly increased the pressure on NATO and the United States to reduce its nuclear arsenal in Europe.

The result was a curious one. On the one hand, NATO expressed its concern over the Soviet nuclear buildup in Eastern Europe and the western Soviet Union and decided to modernize its own nuclear forces. On the other hand, NATO acknowledged that there were already more nuclear weapons in Europe than were needed. As the alliance struggled to resolve the conflicting positions internally, NATO continued to pressure the Soviet Union. In the midst of it all, the alliance suddenly decided in October 1983 to unilaterally withdraw an additional 1,400 tactical nuclear weapons in the so-called Montebello Decision.⁴⁷

“With the Alliance analysis now complete, the Nuclear Planning Group has decided on 27th October, 1983 to withdraw 1,400 warheads during the next several years. This Ministerial decision, taken together with the already accomplished withdrawal of 1,000 warheads, will bring to 2,400 the total number of warheads to be removed from Europe since 1979. Moreover, this reduction will not be affected by any deployment of Longer-Range INF (LRINF) since one warhead will be removed for each Pershing II or Ground-Launched Cruise Missile (GLCM) warhead deployed.”⁴⁸

The withdrawal of the warheads was planned to be completed by the end of 1988 and involved reductions of a variety of warhead types, including Atomic Demolition Munitions (ADMs). Once completed, NATO declared, “This sustained program of reductions will have reduced NATO's nuclear stockpile to the lowest level in over 20 years.”⁴⁹

One year before the Montebello withdrawal target date, the United States and Soviet Union signed an agreement in December 1987 to eliminate all land-based intermediate-range and shorter-range nuclear forces with ranges between 500 and 5,500 kilometers. The INF Treaty, as it became known, entered into force on June 1, 1988, with an elimination end date of June 1991. For NATO, this meant withdrawal and destruction of all Pershing IA, Pershing II, and GLCMs deployed to Europe since 1983 and all others in the United States as well. Not all of the 572 Pershing II and GLCMs ever made it to Europe, and so fewer than that were removed. Moreover, the Pershing IA was not part of the treaty but was covered by a side agreement between the United States and West Germany. Parallel with the INF withdrawal, NATO also continued ongoing retirement of Nike Hercules and older eight-inch artillery warheads.⁵⁰

Coinciding with these reductions, the Pentagon in January 1990 announced the closure or realignment of nearly 80 military bases worldwide, including the two in Turkey where U.S. nuclear bombs were stored for use by the Turkish air force. The Munitions Support Squadrons (MUNSS) at Erhac/Malatya and Eskisehir were disbanded in mid 1991, but nuclear weapon storage continued at two other Turkish bases, Murted and Balikesir.⁵¹

At the NPG meeting in May 1990, NATO announced that the number of alliance nuclear weapons in Europe had been unilaterally reduced by more than one third since 1980,⁵² from approximately 6,000 warheads in 1980 to nearly 4,000.

Rationale for U.S. Deployment in Europe Challenged by World Events

The ink was barely dry on the NPG statement before it was overwhelmed by a series of extraordinary events: the fall of the Berlin Wall and the dissolution of the Soviet Union. In June 1990, non-Soviet Warsaw Pact countries were formally removed from the U.S. strategic nuclear war plan (SIOP),⁵³ requiring adjustments to the theater strike plans for the tactical nuclear weapons in Europe. One year later, by the time of the INF deadline in June 1991, less than 2,500 U.S. nuclear weapons were left in Europe, 1,400 of which were air-delivered bombs.

The dramatic changes to the East called into question whether even 2,500 warheads were necessary. The allure of nuclear weapons in Europe had long faded, and as the NATO countries met in London in December 1990, they acknowledged that they now had to “go further.” Additional reductions in the numbers and changes to the strategy were now possible. NATO envisioned a complete elimination of its nuclear artillery shells from Europe if the Soviet Union would do the same. The withdrawal of Soviet conventional forces from eastern Europe and the implementation of the CFE agreement meant that, “the Allies concerned can reduce their reliance on nuclear weapons.” The NATO ministers ordered the development of a new military strategic concept of a modified flexible response strategy that made nuclear forces “truly weapons of last resort.”⁵⁴ The ministers cautioned that the remaining weapons would continue “to fulfill an essential role in the overall strategy of the Alliance to prevent war by ensuring that there are no circumstances in which nuclear retaliation in response to military action might be discounted.”⁵⁵

Figure 10:
Ground-Launched Cruise Missile



Some W84 warheads from the Ground-Launched Cruise Missile (GLCM) were planned to be stored in WS3 Weapons Storage Vaults (WSVs) on six air bases in Europe (see Appendix B). The requirement was removed by the INF Treaty. *Source: U.S. Army.*

The United States had an additional 17,000 nuclear weapons *outside* of Europe to deter the Soviet Union. So the London Declaration's suggestion that the remaining weapons deployed in Europe somehow made a difference seemed dubious at best. Yet the final communiqué from the NPG meeting in December 1990 portrayed a nuclear policy where the number of weapons may have declined but the basic purpose seemed essentially unchanged:

“Our nuclear policy will continue to be based on fundamental principles which remain valid: nuclear weapons, strategic and sub-strategic, play a key role in the prevention of war and the maintenance of stability; European-based nuclear forces provide the necessary linkage to NATO's strategic forces; and widespread participation in nuclear roles and policy formulation demonstrates Alliance cohesion and the sharing of responsibilities, and makes an important contribution to our nuclear posture.”⁵⁶

It is curious but perhaps not surprising that at a time when NATO could have decided to eliminate all the nuclear weapons in Europe, the remaining weapons instead became reaffirmations of the basic value and importance of keeping them in Europe. The alliance's fundamental reason for existing – to defend NATO from the Soviet Union – had evaporated and stability was needed to carry on. Nuclear weapons, because of their special nature and history, provided a lure of stability and prestige, so NATO decided to keep the weapons. The decision to retain U.S. nuclear weapons in Europe also reaffirmed the principle that those weapons had to continue to be widely dispersed to half a dozen NATO countries to underscore alliance unity and burden-sharing. This need was emphasized in the final communiqué from the NPG in December 1990:

“The remaining nuclear forces, for which we seek the lowest and most stable level commensurate with our security requirements, must be sufficiently flexible, effective, survivable, and broadly based if they are to make a credible contribution to NATO's overall strategy for the prevention of war.”⁵⁷

Obviously, none of this was actually the case. With the Warsaw Pact gone and a Soviet Union in internal disarray, a major war in Europe spearheaded by the Kremlin was the last thing NATO should worry about. Many new challenges faced Europe, including civil unrest in former Eastern Bloc countries, but nuclear weapons were utterly irrelevant in that struggle. In stark contrast to the lofty words from the NPG meeting, as the emerging war in Yugoslavia would demonstrate so vividly, the suggestion that forward-deployed U.S. nuclear weapons in Europe made a “credible contribution” to the prevention of war was nonsense.

The 1991 Gulf War Helps Create New Justification

Yet another war on NATO's periphery would, to some, soon strengthen the justification for maintaining U.S. nuclear weapons in Europe. The 1991 Gulf War and the subsequent

discovery of an advanced Iraqi nuclear weapons development effort raised the prospect that “rogue” nations might develop weapons of mass destruction (WMD) and threaten a European capital. Almost overnight, proliferation of weapons of mass destruction became a new rationale for maintaining U.S. tactical nuclear weapons in Europe.

Shortly before coalition forces initiated their attack to force Iraq out of Kuwait, NATO’s NPG met in December 1990, but the final communiqué from the meeting did not mention WMD proliferation.⁵⁸ The war was to change all that. At its first meeting after the war, held in May 1991, the NPG stopped short of formally linking nuclear weapons in Europe to WMD proliferation in the Middle East. But the NPG did discuss “the potential risk posed by proliferation of ballistic missiles and weapons of mass destruction” and how to deal with them.⁵⁹ This linkage between proliferation and the nuclear posture would gradually deepen in the years to come.

At the time the Gulf War began on January 17, 1991, Iraq was known to have chemical weapons and ballistic missiles.⁶⁰ The Bush administration issued a formal threat, presumably nuclear retaliation, if Saddam Hussein used chemical or biological weapons, destroyed the Kuwaiti oil fields, or supported terrorists. At a January 9, 1991, meeting between Iraqi Foreign Minister Tariq Aziz and U.S. Secretary of State James Baker, the U.S. envoy handed Aziz a letter from President Bush warning that if

"God forbid . . . chemical or biological weapons are used against our forces – the American people would demand revenge [...]. This is not a threat but a pledge that if there is any use of such weapons, our objective would not be only the liberation of Kuwait, but also the toppling of the present regime."⁶¹

Baker did not mention nuclear weapons explicitly but he later explained in his memoir that he "purposely left the impression that the use of chemical or biological agents by Iraq would invite *tactical* nuclear retaliation."⁶² Whether Aziz understood this as a nuclear threat is not clear. The letter made no distinction between the three unacceptable acts listed by Bush or how the United States viewed their importance. Because Iraq did not use chemical or biological weapons, some have since suggested that nuclear weapons played a valuable role in deterring their use. Baker concluded that: "We do not really know whether this was the reason" that Iraq did not use the weapons. "My own view" he went on to say, "is that the calculated ambiguity regarding how we might respond has to be part of the reason."⁶³

But nuclear weapons did not influence Hussein’s other types of behavior. In fact, Iraq did destroy Kuwait's oil fields and installations, one of the three actions on President Bush's list. Why the threat should have deterred the first action but not the third remains a puzzle. On balance, the alleged effect of nuclear weapons in deterring Iraq’s behavior is dubious at best and is not conclusive. If anything, Saddam’s constraints appear to have been more influenced by fear of regime change than by fear of nuclear attack.



Besides, President Bush's nuclear threat was in fact a hollow one. Shortly before the Gulf War began, Bush decided that, "U.S. forces would not retaliate with chemical or nuclear weapons if the Iraqis attacked with chemical munitions."⁶⁴ The decision was disclosed in the *Washington Post* only two days prior to Baker's meeting with Aziz,⁶⁵ but it is not clear what impact the disclosure may have had, if any, on the Iraqi leadership's reading of the threat Baker conveyed to Aziz.

If President Bush ever considered the nuclear option, his decision not to use nuclear weapons may have been influenced by recommendations from the chairman of the Joint Chiefs of Staff General Colin Powell. Prior to the war, Powell ordered, at the request of Secretary of Defense Dick Cheney, a handful of Pentagon officials to work out nuclear strike options against Iraq. "The results unnerved me," Powell later confessed in *My American Journey*. "To do serious damage to just one armored division dispersed in the desert would require a considerable number of small tactical nuclear weapons.... If I had had any doubts before about the practicality of nukes in the field of battle, this report clinched them," Powell concluded.⁶⁶

Defense Secretary Dick Cheney seemed less discouraged. In January 1991, as U.S. forces massed to liberate Kuwait, he issued a top-secret Nuclear Weapons Employment Policy (NUWEP), which reportedly tasked the military to plan for nuclear operations against nations developing or capable of delivering WMD.⁶⁷ Despite General Powell's belief, the Joint Military Net Assessment, published by his office in March 1991, concluded that no-strategic nuclear forces in particular "could assume a broader role globally in response to the proliferation of nuclear capability among Third World nations."⁶⁸

New Cuts Lead to New Reaffirmation of Nuclear Role

On September 27, 1991, President George H.W. Bush announced that the United States would withdraw all tactical ground-launched and naval nuclear weapons worldwide. The initiative removed roughly 2,400 nuclear warheads from Europe but left behind about 1,400 air-delivered bombs in seven European countries.⁶⁹ NATO's public endorsement of the U.S. decision occurred in Taormina, Italy, where the NPG met on October 17 and 18 with the "principle objective" of agreeing to the new sub-strategic force posture and stockpile levels.⁷⁰

With former targets in eastern Europe gone and the Soviet Union disintegrating, even 1,400 nuclear bombs seemed in excess of any real military need. The NPG therefore decided that in addition to the elimination of ground-launched systems, the number of air-delivered weapons in NATO's European stockpile would be cut by approximately 50 percent to about 700 bombs.⁷¹ Altogether, the NPG declared, the total reduction in NATO's stockpile of sub-strategic weapons in Europe would be "roughly 80 percent."⁷² Later, in 1999, NATO declared that the reduction in non-strategic nuclear weapons was "over 85 percent,"⁷³ and was completed in 1993.⁷⁴ As for the role of the remaining bombs, the 1991 NPG communiqué explained:

"Nuclear weapons will continue for the foreseeable future to fulfill their essential role in the Alliance's overall strategy, since conventional forces alone cannot ensure war prevention. We will therefore continue to base effective and up-to-date sub-strategic nuclear forces in Europe, but they will consist solely of dual-capable aircraft, with continued widespread participation in nuclear roles and peacetime basing by Allies."⁷⁵

This policy became embedded into the new Strategic Concept approved by the North Atlantic Council meeting in Rome in October 1991, which reiterated that "the presence of...U.S. nuclear forces in Europe remain vital to the security of Europe."⁷⁶ An article in *NATO's Sixteen Nations* further explained the thinking at the Rome Summit:

"Nuclear forces, no longer even defined as 'weapons of last resort', are not considered relevant to immediate crisis management, but will be kept, much reduced, as the ultimate insurance against existing and possible new nuclear arsenals of other countries. Similar to conventional forces, the emphasis there is also on common involvement, by maintaining common allied planning and an allied potential, mainly in the form of dual-capable aircraft, with a strategic backup from three allied nuclear powers (United States, Britain, and France)."⁷⁷

Neither the Strategic Concept nor the article in *NATO's Sixteen Nations* explained why this required maintaining U.S. nuclear weapons forward-deployed in Europe or why the thousands of other U.S., British, and French nuclear weapons couldn't have the same effect.

A secret document approved by NATO in late 1991, the 30-page MC-400, provided more details on NATO's strategy for nuclear and conventional forces in the post-Cold War era and provided military guidance for implementing the new strategy. Russia remained a main concern but weapons of mass destruction proliferation the Middle East received increased attention. NATO's nuclear arsenal was mainly a political weapon, MC-400 reiterated, but added that they could be used selectively to end a conflict by confronting an attacker with overwhelming costs if continuing the war. Nuclear weapons would be used especially on an initial strike, in a way that is "constrained, discriminate, and measured," the document said. Targets would include high-priority military targets, especially on an enemy's home territory, using either air-delivered nuclear bombs or missiles launched from ships and/or submarines.⁷⁸

In response to the U.S. decision to remove ground-launched and naval nuclear weapons from Europe, the Soviet Union proposed that the remaining U.S. and Soviet nuclear bombs in Europe should be removed from all tactical air bases and stored at central locations away from the planes that would carry them. U.S. Defense Secretary Dick Cheney initially told reporters that he found "some merits" in the proposal, and a senior defense official told the *Washington Post* that NATO would study where the storage sites might be located and how much it would cost. But the proposal would require giving up the new Weapons Storage and Security System (WS3) NATO was building inside aircraft shelters at bases in Europe, and Cheney was concerned that storing the bombs in only one or a few sites would single out individual countries and make them vulnerable to criticism.⁷⁹

Unfortunately, nothing came of the Soviet proposal. Instead, the NATO weapons were transferred from Weapons Storage Areas (WSA) to the new dispersed WS3 sites as these became operational during the 1990s. Once again, NATO used an opportunity for

change to instead reaffirm the importance of widely dispersed forward-deployed nuclear weapons to Europe's security. In doing so, it rejected the denuclearization of Europe. According to then NATO General Secretary Manfred Woerner:

“Nuclear arms cannot be disinvented. We live in a world in which there remain many such weapons, and I cannot imagine situations in which Europe can be denuclearized.”⁸⁰

With a new numerical warhead level set, NATO moved and consolidated weapons at the various bases. For example, the 402nd Munitions Support Squadron (MUNSS) at Rimini in Italy was inactivated on August 1, 1993.⁸¹ But the nuclear weapons were not returned to the United States but instead moved to the second Italian base at Ghedi Torre, increasing the number of B61 nuclear bombs to 40, stored in 11 vaults.

The Rimini inactivation followed the transfer of the 401st Fighter Wing from Torrejon Air Base in Spain to Aviano Air Base in May 1992. After arriving at the base, the wing began receiving nuclear weapons certification training.

Interestingly, the nuclear mission interfered with the wing's conventional responsibilities in the Balkans, so USAFE asked for a 180-day waiver of the 18-month nuclear surety inspection interval for the 401st Wing. The burden of maintaining nuclear proficiency was considerable: Between January 1993 and March 1994, the 401st Wing conducted a total of seven local Nuclear Surety Inspection (NSI) exercises. Even amid the urgent non-nuclear requirements in post-Cold War Europe, the U.S. Air Force insisted that nuclear proficiency was so important that it turned down the request and granted only a 60-day waiver. In the next inspection in November 1994, however, only facilities would be inspected excluding all areas pertaining to aircrew performance and weapons loading.⁸² Later, in April 1994, the 401st Fighter Wing was redesignated the 31st Fighter Wing.

Nuclear Reductions Trigger Security Problems

While NATO issued assurances about the safe storage of its nuclear weapons, the U.S. Air Force was urgently trying to correct deficiencies. In October 1992, General Merrill McPeak, the U.S. Air Force chief of staff, warned about the worsening practices regarding the safe handling and storage of nuclear weapons and directed commanders at every level to review surety programs to ensure that performance standards were rigorously maintained.



As a result, USAFE quadrupled the number of exercise Emergency Action Messages (EAMs) sent to the field and increased its Staff Assistance Visit (SAV) program, doubling the frequency of visits. Previously, teams visited nuclear units just prior to a NSI (every 18 months), but now the SAV would conduct several visits midway between the NSI approximately every nine months.⁸³

USAFE evaluated the nuclear surety of 12 units in 1993, of which five were found to be “unsatisfactory.” A MUNSS Tiger Team formed in December found that the problems were inadequate management and supervision. Specific deficiencies included:

- An unresponsive personnel assignment system
- A shortage of officers experienced in nuclear operations
- A lack of career command post professionals
- Inadequate training across the board⁸⁴

NATO Tactical evaluations (Tac Evals), which were less stringent than the USAFE inspections, were also eroding. So poor was the erosion of USAFE flying support for Tac Evals during 1992 that General James Jamerson, U.S. Commander, Allied Forces Central Europe and Commander, USAFE, had to remind the numbered air forces that “requests for participation (Cold Igloo missions) remained one of the most visible indicators of U.S. support for NATO” and, therefore, were priority missions. Nevertheless, Tac Evals continued to be canceled in 1993 or postponed due to more urgent non-nuclear commitments, mission changes, and base closures. As a result, only two nuclear units received NATO evaluations during 1993 (36th Fighter Wing and the then 7501 MUNSS at Nörvenich Air Base).⁸⁵

This decline in nuclear security appears to be an unintended side effect of the dramatic reductions in the number of nuclear weapons. The number of nuclear-capable units in the U.S. military dwindled as well, and with long-term job security looking a bit shaky the MUNSS positions were difficult to fill. Security police especially found it difficult to get officers and NCOs with nuclear training and experience. Maintenance units faced the same problem. Most people had experience with missiles, while fewer and fewer had experience with nuclear gravity bombs.⁸⁶

Personnel security was another serious problem. Some newly assigned people arrived at the MUNSS units before receiving their security clearance. The U.S. Air Force later found that several individuals could not be certified under the Personal Reliability Program (PRP). At remote sites with one-year rotation such as Turkey or Greece, personnel might be certified less than half of their assigned time, or not at all, the U.S. Air Force found.⁸⁷

The single greatest cause of MUNSS failure, the U.S. Air Force determined, was inexperience and incomplete training of personnel. Maintenance officers were not getting the required nuclear courses following their aircraft maintenance officers’ course, and new nuclear technicians were not familiar with the procedures for the B61 bomb. Personnel with responsibility for receiving and processing Emergency Action Messages

(EAMs) in the command posts were also arriving untrained, and USAFE emergency action trainers were not prepared to train them. Overall, too many inexperienced officers and enlisted personnel were being assigned to the MUNSS, with no quality check by USAFE headquarters, the numbered air forces, or MUNSS commanders. Even the commanders were a problem. A majority of MUNSS commanders were newly appointed with no prior experience at that command level,⁸⁸ even though their job was to guard and employ the ultimate weapons.

The U.S. Air Force implemented new procedures and committed new resources in an attempt to fix the problem. Between April and November 1994, for example, the wing readiness and inspection division of the 31st Wing at Aviano Air Base in Italy conducted no less than 11 Limited Nuclear Surety Inspections (LNSIs).⁸⁹ Inspection scores in 1995 showed some improvement, but the declining pool of nuclear trained personnel continued to be a problem. The reduced manning made it difficult to keep inspection visits on track. The schedule at the time called for main operating bases (Aviano, Lakenheath, Ramstein, Incirlik) and standard tour MUNSS sites (Kleine Brogel, Volkel, Büchel, Nörvenich, Memmingen, Ghedi Torre) to be visited annually, with semiannual visits to the three short-tour (one-year rotation) MUNSS sites in Turkey (Akinci and Balikesir) and Greece (Araxos).⁹⁰

Another attempt to improve nuclear surety involved NATO's oversight of nuclear certifications of USAFE units in support of the alliance. NATO periodically conducts TAC EVALs of USAFE nuclear-capable units, but up until 1998 there was no procedure in place for NATO to monitor their readiness and capability to carry out their nuclear mission. To correct this deficiency, Supreme Headquarters Allied Powers Europe (SHAPE) in March 1998 requested that the U.S. Air Force release executive summaries to NATO officials of all nuclear evaluations of units tasked to provide Dual-Capable Aircraft (DCA) support to NATO.

Air Combat Command (ACC) complied with the request, and the first opportunity to provide the information came after a combined Nuclear Surety Inspection (NSI), Phase II Operational Readiness Inspection (ORI), and Fighter Nuclear Procedures Inspection (FNPI) for the 4th Fighter Wing (FW) at Seymour Johnson Air Force Base in North Carolina in May 1998. This was also the first such nuclear readiness evaluation of that unit, which assessed the ability of the wing to carry out its assigned mission, including deploying F-15Es to Europe. ACC later reported that NATO officials at SHAPE were pleased with the results.⁹¹

Another change implemented by NATO was to replace the NATO Alert System with the Nuclear Precautionary System (NPS), which occurred in October 1994. The NPS directed that the nuclear strike aircraft would be under much tighter political control than previously. At the same time, NPS also eased the Soviet-focused nuclear command and control architecture and provided a more flexible system that could support strikes against regional aggressors armed with weapons of mass destruction.⁹²

NUCLEAR PLANNING IN EUROPE MODERNIZED

STRATCOM to Support European Command

The extensive military reorganization following the ending of the Cold War also affected those responsible for nuclear strike planning in the European theater. Up until the early 1990s, the U.S. European Command (EUCOM) was essentially single-handedly in charge of the U.S. part of planning and maintaining the nuclear strike plans for tactical nuclear force employment in Europe. That changed after the creation of U.S. Strategic Command (STRATCOM) in June 1992.

The U.S. military leadership initially created STRATCOM with the intention of placing all U.S. nuclear planning and execution under a single command, whether strategic or tactical. This plan met with considerable opposition from the regional Commander In Chiefs (CINCs) who thought that their close involvement in their regions made them better qualified to do the regional planning. STRATCOM's strength was its expertise in target identification and analysis, force execution planning, and calculation of probability of arrival and damage expectancy, skills developed through 50 years of maintaining the SIOP (Single Integrated Operational Plan), the U.S. strategic nuclear war plan.⁹³

With the Clinton administration's initiation of the Counterproliferation Program in 1993, strike planning against regional WMD targets became a new focus. STRATCOM already had a role in countering the WMD in the context the former Soviet Union and was assigned to assist regional commands in drawing up their regional nuclear strike plans.⁹⁴ But the command wanted more. STRATCOM commander General Lee Butler testified before Congress in April 1993 that at the request of the Joint Chiefs of Staff Chairman General Colin Powell, STRATCOM was "working with selected regional Unified Commands to explore the transfer of planning responsibilities for employment of nuclear weapons in theater conflicts." Doing so could "save manpower and further centralize the planning and control" of U.S. nuclear forces,⁹⁵ an objective both he and Powell shared. Part of the result of this effort was the SILVER Books project.

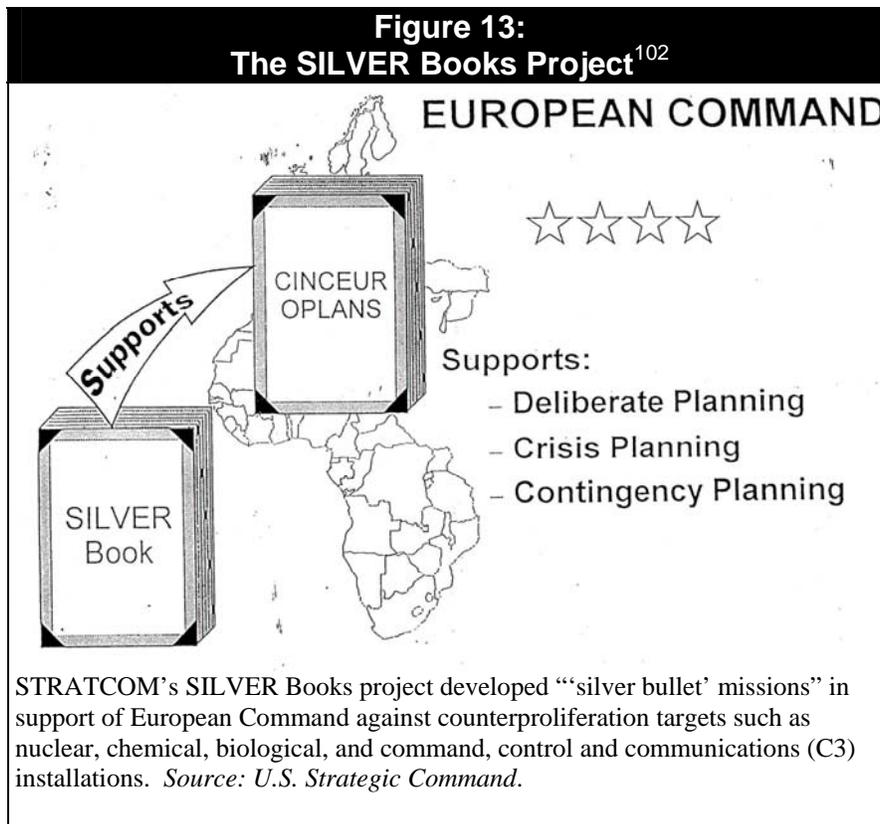
The SILVER Books were plans for military strikes against WMD facilities in a number of "rogue" nations in a regional context. As such, the project was a precursor to the doctrine of preemption adopted by the Bush administration in September 2002. SILVER was an acronym for Strategic Installation List of Vulnerability Effects and Results, a project that involved "the planning associated with a series of 'silver bullet' missions aimed at counterproliferation."⁹⁶ Targets included nuclear, chemical, biological, and command, control and communications (C3) installations.⁹⁷ (See Figure 13)

Regional nuclear targeting was the turf of the regional CINCs, however, and for STRATCOM to take over part or the entire mission required delicate maneuvering. To prepare the framework, the Weapons Subcommittee of STRATCOM's Strategic Advisory Group (SAG) in early 1994 began analyzing regional target sets and weapons capabilities needed for representative SILVER Book strikes. The primary analysis centered on defeat mechanisms for chemical/biological and buried targets. A total of six

facilities were analyzed using conventional, unconventional, and nuclear weapons appropriate for the attack,⁹⁸ with a focus on fixed installations.⁹⁹ By April 1994, the process had advanced far enough so that the new STRATCOM commander, Admiral Henry G. Chiles, Jr., could report to Congress:

"Systems and procedures to accomplish this task have been developed, and planning coordination with regional commanders has begun....In a supporting role, STRATCOM will provide its planning expertise to assist geographic unified commanders when required."¹⁰⁰

The SILVER Books project was focused on counterproliferation and was part of a broader effort called the Theater Nuclear Support model to more fully integrate STRATCOM into theater nuclear planning. By February 1994, the necessary directives had been drafted to support DCA planning and promulgate mission plans to the CINCs. This included an update of the Theater Support STRATCOM Administrative Instruction (SAI) with several sections that formalized all internal procedures for theater nuclear support. Another concerned the assignment of STRATCOM as manager of the worldwide SAS/PAL system for non-strategic nuclear forces.¹⁰¹



Several disagreements were hammered out during this period. A conference organized by Joint Staff at the Pentagon in early February 1994 included staff from STRATCOM, ACC, and the regional CINCs. ACC objected to STRATCOM providing "stick routes" to the ACA fighter-bombers, arguing that "the pilots in the field are better equipped to

determine the best route to fly.”¹⁰³ Likewise, EUCOM staff later visited Offutt Air Force Base to discuss its concerns. STRATCOM reciprocated by sending staff to brief EUCOM. Commander in Chief, U.S. European Command (CINCEUR) indicated “substantial agreement with the Theater Nuclear Support model” in early 1994, according to STRATCOM.¹⁰⁴

To better establish close collaboration with the regional CINCs, STRATCOM planners envisioned appointing a single point of contact to develop a uniform method of interfacing with the theater CINCs that request deliberate planning of Theater Nuclear Options (TNOs) for targets identified in their theater. A representative from CINCEUR visited STRATCOM in February 1994 to discuss EUCOM’s specific concerns with the support model and the support plan, and STRATCOM intended to follow up with a visit to EUCOM “to tailor their support plan, particularly with regard to execution.”¹⁰⁵

During a visit to EUCOM in May 1994, the two unified commands briefed each other on the various elements of their mission. EUCOM staff presented briefings on EUCOM’s roles and missions, nuclear weapons requirements, and Theater Missile Defense Initiative. STRATCOM staff gave briefings on the Theater Nuclear Support Model and Counterproliferation Initiatives.¹⁰⁶

These meetings helped resolve their differences, and by examining the discussions we can better understand the reasons why the United States adjusted nuclear war planning in Europe and its periphery to the post–Cold War era. The May 1994 meeting dealt with issues such as U.S. Air Force support of NATO nuclear missions with DCA based in the United States. The aircraft would, under the various Operational Plans (OPLAN), deploy to staging bases in Europe. The CINCEUR adjusted STRATCOM’s support plan to operate nuclear aircraft in other countries, and both sides agreed to modify the plan so that nuclear deployment and overflight of other countries would be “subject to agreement of the host nation.” A draft nuclear support annex to OPLAN 4122 (rapid reinforcement of Europe in a general war) was being finalized.¹⁰⁷

The participants also discussed EUCOM’s support of Central Command’s (CENTCOM) nuclear mission in the Persian Gulf region, including deployment of command and control aircraft from the EUCOM’s area. At the time, a final draft of the nuclear annex to OPLAN 1002 for countering a Persian Gulf conflict was being finalized by the Joint Staff, and EUCOM and STRATCOM agreed to exchange PAL materials for use in nuclear strike “missions not executed from CINCEUR’s AOR [Area of Responsibility] using CINCEUR delivery platforms/weapons.”¹⁰⁸ This apparently meant that nuclear weapons stationed in Europe also had roles outside of Europe in the CENTCOM area, which includes Iran, Iraq, and Syria.

With these issues sorted out, it was time to implement the planning. On June 28, 1994, the Joint Chiefs of Staff Chairman issued Change 4 to the Joint Strategic Capabilities Plan nuclear Annex C (JSCP CY 93-95). This guidance formally assigned the Theater Nuclear Support mission to STRATCOM.¹⁰⁹ The new directive included guidance for

CINCs “requesting preplanned targeting *outside* their own Area of Responsibility (AOR).”¹¹⁰

Building on the Theater Nuclear Support mission and the authority that flowed from it, STRATCOM continued to fine tune the SILVER Books. By late 1994, a prototype SILVER Book was ready for the European Command to support deliberate planning, crisis planning (adaptive planning), and contingency planning. STRATCOM briefed the EUCOM staff in November 1994.¹¹¹ The SILVER Book contained a menu of options for striking known, fixed WMD sites in the region.¹¹²

For STRATCOM, the advantages of taking responsibility for counterproliferation targeting were obvious. With 50 years experience in target analysis, strike planning, and damage expectancy calculations, STRATCOM would bring superior skills to the regional planning. EUCOM would be able to save manpower for more important missions. Nevertheless, the regional CINCs remained concerned that the SILVER Books project would grant STRATCOM too much authority in theater strike planning.

Eventually, the Joint Staff agreed with the regional CINCs. The Final Report of the Counterproliferation Missions and Functions Study of March 1995 recommended that the SILVER Books concept should not be implemented as envisioned by STRATCOM. Nonetheless, the regional CINCs should ensure that their counterproliferation concept plans (CONPLANS) and counterproliferation-related portions of OPLANs addressed the types of considerations highlighted by the SILVER Books prototype.¹¹³ For STRATCOM this was only half a defeat. Although it failed to get responsibility for the counterproliferation mission, STRATCOM was assigned the Theater Nuclear Support mission that would, in any case, involve planning Theater Nuclear Options (TNO) against WMD targets.

The final communiqué from NATO’s NPG meeting in May 1994 did not mention this important development, but it did talk in vague terms about intensifying and expanding NATO’s efforts against proliferation. The group said it “reviewed with satisfaction work recently begun in the Senior Defence Group on Proliferation to assess the proliferation threat and to consider how better to protect against it.”¹¹⁴

The modernization of EUCOM’s nuclear war planning coincided with STRATCOM’s upgrade of the U.S. Strategic War Planning System (SWPS) from an inflexible and lengthy war planning system to a flexible and adaptive planning tool. Begun in 1993 and completed in 2003, the modernized SWPS incorporated not only strategic nuclear forces but also planning for non-strategic aircraft and sea-launched cruise missiles in support of the regional CINCs. One of the most important innovations was that nuclear planning had to be an ongoing and flexible process.

NATO matched the U.S. modernization by developing an automated nuclear planning system to support and integrate the full range of NATO nuclear planning and management functions throughout Command Europe. A proof-of-principle system was delivered by 1994 to create, synchronize, and disseminate nuclear war plans during

peacetime and update war plans quickly in war.¹¹⁵ These were capabilities one might envision were needed during the Cold War with thousands of nuclear facilities being targeted, but NATO's nuclear planners thought this expanded capability was also needed more than a decade after the end of the Cold War.

The result of the modernization was the NATO Nuclear Planning System (NNPS), a force-level nuclear operations planning system designed to automate NATO's coordinated adaptive nuclear planning process. The system came online in 2003 and enables dispersed users to access the NNPS server at SHAPE Headquarters via remote fixed and mobile PC workstations. It provides the capability to load data from external commands and agencies; develop Major Contingency Options (MCOs) and Selective Contingency Option (SCOs) plans, including target development, DGZ (aimpoint coordinates) construction, force application, aircraft route planning, timing and deconfliction, and consequences of execution; and prepare planning products and messages for external commands and agencies. NNPS interfaces with the NATO Nuclear Command and Control Reporting System (NNCCRS), a joint U.S.-NATO nuclear command and control system.¹¹⁶

The parallel modernization of the NATO and U.S. nuclear war planning systems reflects the close and unique relationship between Supreme Headquarters Allied Powers Europe (SHAPE) and the U.S. Under the 2001 Unified Command Plan, European Command (EUCOM) covers all of Russia, and STRATCOM's nuclear support role in the European theater is different and deeper than in Central Command (CENTCOM) and Pacific Command (PACOM). Yet despite STRATCOM's extensive support role, the regional commands still "own" the TNO planning process.

Beyond creating more flexible and responsive nuclear strike planning, the modernization of NATO's nuclear war planning system was also necessary to better integrate nuclear and conventional forces. Forward-deployed nuclear air forces are sometimes seen as stand-alone and autonomous strike capabilities, but executing a nuclear strike mission with a fighter-bomber in a regional scenario may require a significant conventional support package that involves everything from aerial refueling to air defense and aircraft recovery.

During a simulated strike against North Korea conducted by the 4th Fighter Wing at Seymour Johnson Air Force Base in North Carolina in June 1998, for example, the half a dozen F-15E strike aircraft required a support package of E-3A Airborne Warning and Control System (AWACS) aircraft for early warning, KC-135 tankers for refueling, and F-16CJ and F-15C for protection against hostile aircraft.¹¹⁷ Without this extensive support from conventional forces, the nuclear strike would not have been effective. With the exception of aircraft at Incirlik Air Base, nuclear strike aircraft in Europe require refueling to reach their presumed targets in western Russia or the Middle East region.

The modernization of the war planning system has created a paradox: While NATO officials describe the number of nuclear weapons in Europe as greatly reduced and their role truly that of weapons of last resort, the modernized nuclear war planning systems

have created a capability to design and execute nuclear strike options that is greater than at any time during the Cold War.

Nuclear Strike Training

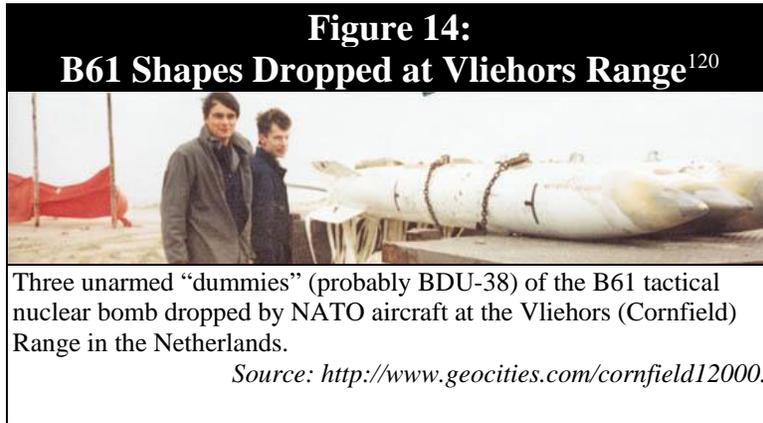
Maintaining credible wartime nuclear strike missions require training in peacetime. To support the forward deployment of U.S. nuclear weapons in Europe and the assignment of nuclear strike missions to aircraft from non-nuclear NATO countries, USAFE and NATO maintain an extensive infrastructure of bombing ranges where U.S. and NATO pilots can practice their skills in dropping nuclear bombs. In 1994, after the withdrawal of ground-launched nuclear weapons was completed in 1993, the USAFE maintained 15 bombing ranges in eight countries expressly used for nuclear weapons training (see Table 9).

Table 9: Nuclear Weapons Training Ranges¹¹⁸			
Country	Range Name*	Operational	
		(1992)	(1994)
Belgium	Helchteren	X	X
France	Captieux	X	
	Suippes	X	X
Germany	Nordhorn (RAF)	X	X
	Siegenburg (USAFE)	X	X
Italy	Capo Frasca	X	X
	Maniago II	X	
Netherlands	Noordvaarder	X	X
	Vliehors	X	X
Turkey	Konya	X	X
Tunisia	Ben Ghilouf		X
United Kingdom	Cowden	X	X
	Donna Nook	X	X
	Holbeach	X	X
	Jurby	X	
	Roseheathy	X	X
	Tain	X	X
	Wainfleet	X	X
Total		17	15

* All ranges (except Maniago II) are for both nuclear and conventional bombing.

There was at least one bombing range in each NATO nation that hosts U.S. nuclear weapons, except Greece. The list also included France, which is a member of NATO but does not store U.S. nuclear weapons and is not part of NATO’s integrated nuclear command structure. Compared with 1992, the 1994 list deleted a second French range and a “nuclear-only” bombing range in Italy.

One interesting change in 1994 list was the addition of a new nuclear-capable bombing range in Northern Africa: Ben Ghilouf in Tunisia. It is unclear whether Tunisia knows that Ben Ghilouf is for nuclear training. The use of the Tunisian range apparently became available as a result of the Joint Contact Team Program (JCTP), which was designed to “bring military personnel together and share the ideals of democracy with central and eastern European countries.” Nuclear strike training appears to have been one of the results.¹¹⁹



THE 1994 NUCLEAR POSTURE REVIEW

European Nuclear Deployment Reaffirmed

Shortly after the completion of the withdrawal of ground-launched nuclear weapons from Europe, and coinciding with the modernization of the nuclear planning capabilities, the Clinton administration completed the Nuclear Posture Review (NPR) in September 1994. The NPR was portrayed by U.S. government officials as reducing the role of nuclear weapons, but it decided to “maintain current DCA strength in the continental United States (CONUS) and Europe.”¹²¹ In reaching this decision, the NPR looked more to the past than to the future. When presenting the findings to Congress, Deputy Secretary of Defense John Deutch acknowledged that the threat of a massive Soviet conventional attack on Europe had vanished, but instead he pointed to the Russian arsenal of non-strategic nuclear weapons as the principal rationale:

“Let me now turn to the most important – not the most important, but a very important area of our deliberations, which are non-strategic forces. I remind you of the slide I showed earlier, where it showed the Russians have somewhere between [deleted] non-strategic nuclear warheads, while our total inventory is more like [deleted].

And, of course, most of the non-strategic nuclear weapons in Russia are located at distances which can be easily delivered against European targets. So this disparity in non-strategic nuclear forces, those which are not covered by START [Strategic Arms Reduction Treaty], is a matter of considerable concern.”¹²²

Deutch added that the political role was also important: shared responsibility for nuclear forces and making sure the Europeans know that they can rely in a serious way on our nuclear forces as well as our conventional forces. This was an important element, he explained, in understanding “what changes are possible and the pace of changes with respect to non-strategic nuclear forces.” In outlining the reduced force level, Deutch repeatedly underscored the issue of Russia’s non-strategic weapons:

“...I want to emphasize that [the actions we have taken] do not solve the problem of our great concern about the disparity of the non-strategic nuclear forces between the Russians and ourselves. On the one hand, the Russians have not yet explored fully the changed considerations that have occurred within NATO about the role of nuclear weapons. Both of those items remain to be done.”¹²³

Initially the scope of the NPR appears to have been more visionary. The review grew out of a study known as Presidential Review Directive 34 (PRD-34) and was initially intended by then Defense Secretary Les Aspin as a “bottom-up” review of nuclear policy. But after Aspin died and was succeeded by William Perry in January 1994, the *Washington Post* reported that Pentagon hawks and STRATCOM took over and scaled

back the scope of the review.¹²⁴ Other than the removal of nuclear capability from surface ships, the NPR offered little that was new but instead merely continued a scaled-down Cold War posture. The most innovative feature was the “lead and hedge” doctrine, which was portrayed as aiming toward lower force levels and a reduced role of nuclear weapons but at the same time hedged against an uncertain future by maintaining a large force structure with thousands of warheads held in reserve.

For Europe, this meant that the 480 forward-deployed nuclear weapons would stay.¹²⁵ Deutch showed Congress a chart that set the “current level” of the European non-strategic nuclear force commitment at nine percent of the Cold War level.¹²⁶ President Clinton made the NPR official U.S. nuclear policy on September 21, 1994, when he signed Presidential Decision Directive/National Security Council-30 (PDD/NSC-30).

The NPR was completed and the force level set, but the role of nuclear weapons in Europe was far from clear. In his presentation to the Congress, Deutch indicated that the NPR had failed to complete its analysis of the non-strategic force level. Apparently, the consultations with NATO had not brought clarity to the issue of the future role of forward-deployed nuclear weapons in Europe:

“So, an important question is, what is the basis for the presence of any nuclear weapons in NATO now within the framework of the alliance. Of course, it’s still true that the Russians possess a lot of non-strategic nuclear weapons, but the original military justification is certainly changed, although the political value of those weapons as a commitment to the alliance is still high. I believe we have a very long diplomatic road to travel to understand better with NATO what the role is of nuclear weapons in NATO. Indeed, one of the most important outcomes of the Nuclear Posture Review was this notion about how we’re going to address non-strategic nuclear weapons, of which the NATO question is one.”¹²⁷

Such concern, however, was not evident in the final communiqué from NATO’s NPG meeting in December 1994. Instead, the NATO ministers “expressed our deep satisfaction for the reaffirmation of the United States’ nuclear commitment to NATO.”¹²⁸ Intrinsic to this commitment, according to the communiqué, was a widespread deployment of the nuclear weapons in Europe:

“In this context, we reiterate the essential value of maintaining widespread deployment of NATO’s sub-strategic nuclear forces by the United States and European Allies. These forces, which are an integral part of NATO’s nuclear posture, represent an essential element of the trans-Atlantic link and are visible evidence of NATO’s cohesion, solidarity, and burden-sharing.”¹²⁹

Setting commitments was simpler than setting force levels because so many of the normal parameters were gone. And for the military that had to translate the guidance into

plans for the potential use of those political weapons, the decision did not bring clarity. In its history for 1994, the Headquarters for U.S. Air Forces in Europe explained:

“Decisions regarding the proper level of nuclear readiness were not easy to make. The fundamental purpose of nuclear forces was political: to preserve peace, prevent coercion, and deter war. The threat of large-scale nuclear assault on Europe dissipated with the collapse of the Soviet Union, and the need for a large, combat-ready stockpile of nuclear weapons was gone. NATO leaders were hopeful that the foundation of European security and stability would shift increasingly from reliance on military might to reliance on international diplomacy and cooperation. At the same time, parts of Europe were far from peaceful, and NATO recognized that diplomacy and conventional forces alone might not be enough to deter aggression and prevent war. USAFE conducted its planning in the context of NATO policy, which stated that the alliance would, for the foreseeable future, maintain an appropriate mix of conventional and nuclear forces in Europe. The question remained: How many, where, and what balance among the member nations, and at what level of readiness?”¹³⁰

The U.S. Office of the Secretary of Defense was much more euphoric about the impact of the NPR, suggesting it had created a whole new nuclear doctrine: “The new posture... is no longer based on Mutual Assured Destruction, no longer based on MAD,” stated Defense Secretary William Perry. “We have coined a new word for our new posture, which we call Mutual Assured Safety, or MAS.”¹³¹ The new terminology has not been used by the Pentagon since.

Nuclear Deployment Reorganized

In addition to strategic factors such as Russian non-strategic nuclear force levels, proliferation, general war prevention, and political imperatives, NATO’s non-strategic nuclear posture in the mid-1990s was also strongly affected by internal reorganization. The major Base Realignment and Closures (BRAC) that were undertaken by the United States in 1993–1995 resulted in concentrating U.S. Air Force nuclear operations at four main bases; RAF Lakenheath in England, Ramstein Air Base in Germany, Incirlik Air Base in Turkey and Aviano Air Base in Italy. At the same time, nuclear weapons were withdrawn from several host country nuclear air bases, beginning with including Rimini Air Base in Italy in August 1993,¹³² followed by Nörvenich Air Base and Memmingen Air Base in Germany in 1995.¹³³

The remaining MUNSS were organized under three Regional Support Groups (RSGs) activated on July 1, 1994: the 603 RSG at RAF Mildenhall to manage the nuclear weapons stored in the United Kingdom; the 616 RSG at Aviano Air Base in Italy for management of nuclear weapons stored in Italy and Greece; and the 617 RSG at Sembach Air Base in Germany covering nuclear weapons stored in Belgium, the Netherlands, and Germany. In Turkey, the 39th Wing had administrative control for the MUNSS since the wing had no permanently assigned aircraft.¹³⁴

Reorganization continued in April 1995, with the Pentagon announcement of the withdrawal of the 39th MUNSS from Balıkesir Air Base and the 739th MUNSS from Akinci Air Base in Turkey.¹³⁵ The phase-out of the two 110-men units was completed on April 15, 1996.¹³⁶ The nuclear weapons at the two bases were transferred to Incirlik Air Base, where they continue to be earmarked for delivery by the Turkish Air Force.



The life of the RSG concept was soon cut short by further reorganization that resulted from the inactivation of the 17th Air Force in early 1996. The RSGs were inactivated and their function as MUNSS caretakers was given to the 16th Air Force.¹³⁷

The mid-1990s also saw the withdrawal of the last British nuclear weapons from bases in continental Europe, eventually ending the RAF nuclear mission altogether. The United Kingdom briefed the NATO NPG meeting in June 1995 about its decision to phase out its WE177 gravity bombs.¹³⁸ As a result, the Tornado strike aircraft based at RAF Brüggen were withdrawn in 1998 and the 10 WS3 nuclear weapons storage vaults where up to 40 WE177 bombs had been stored were deactivated.¹³⁹ The British declared that the sub-strategic role would instead be taken over by a portion of the warheads on Trident II SLBMs on Vanguard-class SSBNs.¹⁴⁰

Despite all of these changes, however, NATO once again reaffirmed the importance of U.S. nuclear bombs in Europe. Exactly two months after the U.S. completed the deactivation of the 39th MUNSS and 739th MUNSS from the Akinci and Balıkesir air bases in Turkey, the U.S. Air Force signed an \$11.6 million contract with Bechtel National Incorporated to build six nuclear weapons storage vaults at each base (and also Araxos Air Base in Greece) for completion in October 1997.¹⁴¹

The meeting of NATO's Defence Planning Commission in ministerial session in October 13, 1996, declared that the remaining nuclear weapons "are no longer targeted against anyone and the readiness of NATO's dual capable aircraft has been recently adapted." At the same time, NATO reemphasized that U.S. nuclear forces based in Europe provided "an essential and enduring political and military link between the European and the North American members of the alliance." This posture would, the ministers stated, "for the foreseeable future, continue to meet the requirements of the alliance."¹⁴²

European Changes Increase Importance of U.S. Fighter Bombers

A curious effect of NATO's nuclear reductions and relaxations of readiness levels of the remaining dual-capable aircraft (DCA) was that it increased the importance of the nuclear fighter-bombers based in the United States. "With the downsizing of theater nuclear forces worldwide," the U.S. Air Force stated in 1995, "the capability of CONUS-based DCA resources to deploy rapidly was imperative."¹⁴³ DCA based at Seymour Johnson Air Force Base in North Carolina and Cannon Air Force Base in New Mexico were tasked to deliver nuclear bombs in support of European and Pacific command contingencies.

Fighter-bomber squadrons were urgently needed in the regional wars in the Middle East and Balkans at the time. This caused Air Combat Command (ACC) to recommend a reduction in the nuclear readiness level of DCA based in the United States so that the more important conventional missions could be fulfilled. A second reason was that ACC thought the DCA readiness levels were in general too high for any real-world threats.

The Joint Staff gradually accommodated some of these concerns by lowering somewhat the readiness level of DCA based in the United States. But the commitment to "maintain the total number of CONUS-based DCA squadrons [deleted] seems strong," ACC reported. The alternative readiness posture would assign the most capable aircraft to perform the nuclear mission, with the Joint Staff making aircraft type a contingency of reduced readiness requirements.¹⁴⁴ What flowed from this reorganization was that fewer aircraft were maintained at a higher-force readiness level to allow ACC and U.S. Atlantic Command (USACOM, later U.S. Joint Forces Command) greater flexibility in meeting nuclear and conventional war-fighting requirements.¹⁴⁵ These changes were incorporated into the updated Nuclear Appendix (Annex C) to the Joint Strategic Capabilities Plan (JSCP), effective January 1, 1997.¹⁴⁶

Subsequent queries sent to the regional CINCs about their need for nuclear fighter wing support revealed that the European Command was "the only unified command to express a requirement for DCA support." As a result, Joint Staff in April 1998 decided to change the JSCP Annex C to reduce the readiness requirement. Once again, the Joint Staff decided to maintain "the entire CONUS-based DCA force for worldwide commitment" to supplement tactical nuclear operations in "any theater." The new guidance became effective April 24, 1998.¹⁴⁷



Part of the justification for this was the large number of Russian tactical nuclear weapons. The NATO Nuclear Planning Group (NPG) in June 1997 hinted at this in the final communiqué, but the language was vague.¹⁴⁸ Much more direct was an internal message sent by the U.S. Commander in Chief, European Forces (USCINCEUR) in December 1997 in response to ACC's suggestion to change the readiness level of DCAs. The elements of the threat were, according to USCINCEUR:

- “The strategic threat to NATO territory has been significantly reduced, but Russian tactical nuclear weapons and the doctrine to employ them remain a threat to NATO. Russia maintains at least a 3 to 1 advantage in tactical nuclear weapons as compared to the U.S. and a vastly greater advantage over NATO. The Russians enjoy a near 40 to 1 advantage in delivery systems. Significantly, Russian tactics have evolved to lean more heavily than before on tactical nuclear weapons as their conventional force effectiveness has declined.
- Additionally, the proliferation of weapons of mass destruction by states within the EUCOM AOR/AOI and their ability to target the capitals of Europe is of growing concern.”¹⁴⁹

This rationale had one leg in the past (Russian nuclear forces) and another in the future (proliferation). USCINCEUR drew a line in the sand to any further considerations of changing the posture and said that the readiness levels for DCAs in the United States

supporting NATO's posture should not be changed. The USCINCEUR emphasized what he saw as the unique capability of the non-strategic aircraft:

“No weapon system is more capable than DCA with regards to the flexibility of employment, political statement, yield delivery, and attained accuracy.”¹⁵⁰

The USCINCEUR believed that the non-strategic nuclear forces in Europe were one of the most potent elements of the U.S. arsenal and they were not going to be removed from Europe anytime soon. “USCINCEUR's DCA requirements are not short-lived contingencies, but rather critical and enduring elements of the trans-Atlantic alliance,” USCINCEUR concluded.¹⁵¹

NATO Expansion East Reaffirms Status Quo

The concern with Russia was further complicated by plans to expand NATO eastward to include former Warsaw Pact countries. NATO assured Moscow in September 1995 that there “is no [sic] a priori requirement for the stationing of nuclear weapons on the territory of new members.” The alliance's study on NATO enlargement stated that there was “no need now to change or modify any aspect of NATO's nuclear posture or policy.” But the study also cautioned that “the longer term implications of enlargement for both [NATO's nuclear posture and policy] will continue to be evaluated.”¹⁵² Membership in NATO meant that the new countries would become inextricably involved in nuclear war planning in Europe:

“The new member will, as do current members, contribute to the development and implementation of NATO's strategy, including its nuclear components; new members should be eligible to join the Nuclear Planning Group and its subordinate bodies and to participate in nuclear consultation during exercises and crisis.”¹⁵³

Once again, an opportunity was missed to remove nuclear weapons from Europe and reduce the involvement of non-nuclear weapons states. Instead NATO reaffirmed the importance of such weapons to the security of the expanded alliance.

An additional reason for the United States to maintain nuclear weapons in Europe was prompted by a French offer in 1995 to extend its nuclear umbrella over European countries, particularly Germany. Washington interpreted this as another French attempt to undermine U.S. influence in Europe, and saw the value of “extended deterrence” in preventing new nuclear powers or nuclear alliances from emerging. France was unable to explain why its nuclear umbrella would be more effective than the United States and the initiative instead had the effect of causing NATO to reaffirm the status quo.

More Safety Concerns Raise Alarm

The substantive changes in the DCA taskings and employment concepts also caused the U.S. Air Force to update its Operational Plan Data Document (OPDD) for dual-capable F-15E and F-16C and D aircraft based in the United States. These aircraft support NATO

and could in case of war or a serious crisis be moved to bases in Europe. The new OPDD was published in February 1997 and was “significantly changed” from the previous OPDD of August 1994. The document formed part of the preparation for (and was included as an annex to) the Operational Safety Review (OSR) Report that recommended new weapon system safety rules to the Secretary of Defense for signature.

The OSR began on April 14, 1997, at Kirtland Air Force Base with a series of briefings for the USAF Nuclear Weapons System Safety Group (NWSSG) and was followed up with a road trip to several nuclear bases. First stop was Cannon Air Force Base in New Mexico to observe F-16 operations on April 17 and 18. Next, the team traveled to Europe for briefings at Ramstein Air Base and a field trip to RAF Lakenheath April 22–25 to observe F-15E operations and weapons operations in the WSV and upload to aircraft.¹⁵⁴

After the visits, the NWSSG concluded that while the F-15E and F-16C/D weapon systems continued to meet the Department of Defense (DOD) nuclear weapons system safety standards, several improvements were necessary to the new WS3 sites in Europe. These included:

- Improving protection from lightning during weapon maintenance in hardened aircraft shelters (HAS);
- Improving the condition of Type 3E weapon trainers;
- Providing guidance for WS3 code module handling and control;
- Evaluating the WS3 security monitoring system.¹⁵⁵

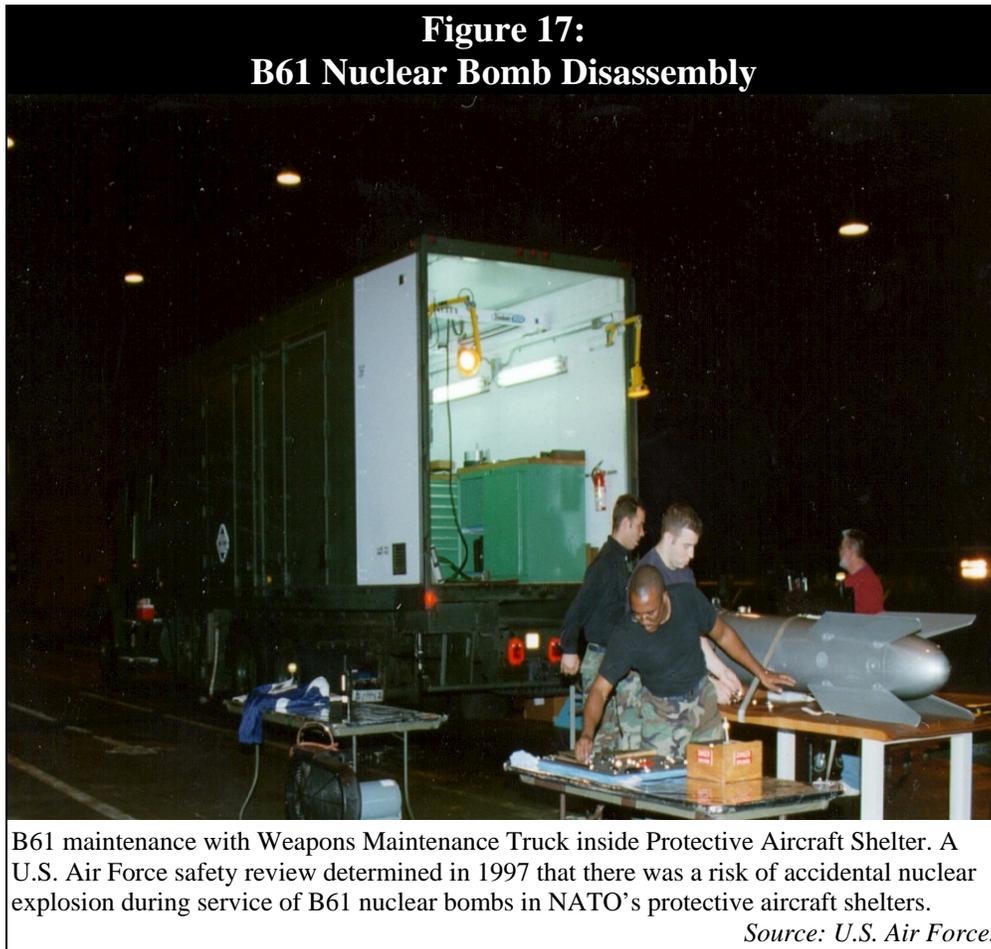
The group also proposed changes to the U.S. strike aircraft weapon system safety rules. One change prohibited training with actual nuclear weapons, which was apparently still taking place in 1997. An alternative procedure would use “dummies,” where the nuclear package had been replaced with an electronic unit to simulate warhead interface. The NWSSG report also recommended that safety rules for non-U.S. NATO strike aircraft incorporate similar rules for mitigating lightning risks. Finally, the concept of operation for when both nuclear weapons and conventional munitions are present in the same HAS (with or without a WSV) had to be streamlined.¹⁵⁶

The potential consequence of lightning striking a nuclear weapon or the Protective Aircraft Shelter where it was located could, under certain conditions, increase the risk of a nuclear detonation. The major concern had to do with a lightning strike when a weapon was in a disassembled state during maintenance and did not have the protection from high voltage that is inherent in an assembled weapon. There was uncertainty as to whether the hardened aircraft shelter construction would provide an adequate “Faraday cage” to protect operations during lightning storms. According to the F-15E and F-16C/D Operational Safety Review from April 1997:

“It cannot be assured that the B61 meets military characteristics (MC) requirements in abnormal environments when the electrical regions are breached and the nuclear systems remain functional. Under these

conditions, *nuclear detonation may occur* if energy capable of initiating the nuclear system is present.”¹⁵⁷

This was a startling discovery. Weapons Maintenance Trucks (WMT) regularly visited the aircraft shelters to partially disassemble B61 weapons for maintenance and inspection. The safety review concluded that these operations created, under certain conditions, a risk of nuclear detonation. The review therefore recommended that all U.S. and non-U.S. NATO WS3-equipped shelters be equipped with electrical surge protection for AC-power and communication system connections between the Weapons Maintenance Trucks and the protective aircraft shelter.¹⁵⁸



The update to the U.S. Air Force Instruction on Safety Rules for Non-US NATO Strike Aircraft from May 2000 removed the WMT grounding requirement to facilitate WMT isolation for lightning protection.¹⁵⁹ And in June 2001, the NATO NPG once again declared: “We are assured that the allies' nuclear weapons and their storage continue to meet the highest standards of safety and security.”¹⁶⁰

NEW PRESIDENTIAL GUIDANCE BUT NO CHANGE

While the political circumstances and the number of nuclear weapons in Europe changed dramatically between 1990 and 1997, the U.S. presidential guidance for how the military should plan for the potential use of the weapons did not. In mid-1997, White House guidance for how the military should plan nuclear war was still based on the guidance issued by President Reagan in 1981. Finally, in October 1997, President Clinton signed Presidential Decision Directive 60 (PDD-60) ordering the military to no longer plan for fighting a protracted nuclear war with the Soviet Union.

The half a decade that passed between the demise of the Soviet Union and this document should have enabled the president to safely order the removal of nuclear weapons from Europe. But the focus of PDD-60 was about reducing strategic forces in preparation for a START III agreement, and the non-strategic nuclear weapons commitment to NATO was not changed.

Shortly after PDD-60 was issued, amidst a debate over whether NATO would deploy nuclear weapons to the new member states, the U.S. Under Secretary of Defense for Policy Walter Slocombe published an article in *NATO Review*, where he explained that the “current nuclear posture is adequate for an enlarged alliance....”¹⁶¹

Part of that posture was tested in late 1998, when F-15Es from the 4th Fighter Wing at Seymour Johnson Air Force Base in North Carolina simulated a nuclear strike in support of NATO. The simulated strike occurred as part of STRATCOM’s Global Guardian 99 exercise held from October 24 to November 2, 1998. STRATCOM initially showed little interest in incorporating fighter-bomber nuclear operations into Global Guardian 99, and this was only the second year that the 4th Fighter Wing participated in the global nuclear exercise. The employment phase of the Wing’s operations included dropping 10 BDU-38s (B61 shapes filled with concrete) on a bombing range (presumably Florida).¹⁶²

Incorporating dual capable aircraft into a STRATCOM exercise was a new phenomenon reflecting the command’s increasing role in regional nuclear targeting and a softening of the separation of strategic and non-strategic nuclear forces. Today, STRATCOM is tasked by the Joint Staff to produce, at the theater CINC’s request, a series of planning documents for the planning and execution (probability of strike success, probability of weapon arrival, fatalities, casualties, dispersion patten of radioactive debris, etc.) of various nuclear strikes with ballistic missiles, cruise missiles, and gravity bombs. As of mid-1997, this planning was completed, except for DCA and gravity bombs.¹⁶³ One objective of the 1998 exercise was to verify the route planning for the 4th Fighter Wing aircraft to their intended targets.

Call for Review of NATO Policy Opens Debate

The 1999 Washington Summit provided an opportunity for NATO to reshape its mission for the twenty-first century. A review of the nuclear policy and posture was part of this process. Yet the road to the new Strategic Concept was far from a smooth ride. In November 1998, Canada and Germany staged what looked like a nuclear revolt by

suggesting that NATO review its nuclear policy and specifically the first-use option, which has characterized NATO doctrine for decades. Their proposal collided with the adjustments of U.S. and NATO nuclear strategy undertaken in the 1990s to use nuclear weapons to deter not only nuclear but other types of weapons of mass destruction as well.¹⁶⁴ Without the option to use nuclear weapons first, some feared, NATO would relinquish its ability to deter attacks by chemical and biological weapons. The rejection of the proposal was swift, and U.S. Defense Secretary William Cohen stated:

"We think that the ambiguity involved in the issue of the use of nuclear weapons contributes to our own security, keeping any potential adversary who might use either chemical or biologicals [sic] unsure of what our response should be. So we think it's a sound doctrine. It was adopted certainly during the Cold War, but modified even following and reaffirmed following [sic] at the end of the Cold War. It is an integral part of our strategic concept, and we think it should remain exactly as it is."¹⁶⁵

On the one hand, the revolt suggested that the challenges facing the alliance almost 10 years after the end of the Cold War were not only external but that major NATO allies were beginning to think anew about the role of nuclear weapons. On the other hand, the revolt provided an opportunity for the nuclear weapon states to reaffirm the status quo. Eventually, Canada and Germany were persuaded to keep their differences of opinion about nuclear doctrine private and to discuss them internally within the alliance. After all, this was a time when NATO was about to present a new Strategic Concept to explain to the world why it was still relevant in the twenty-first century.

The new Strategic Concept was formally approved at the NATO Summit in Washington, D.C., in April 1999. From the perspective of reducing or eliminating reliance on nuclear weapons, the Strategic Concept was a disappointment because it failed to change or scale back the forward deployment of U.S. nuclear weapons in Europe. Instead, it essentially maintained the nuclear status quo repeating past accomplishments and reaffirmed a continuing role in Europe for U.S. non-strategic nuclear weapons and British warheads on strategic submarines.¹⁶⁶

The failure to adjust nuclear policy was twofold in that the Strategic Concept also failed to eliminate a nuclear role for non-nuclear NATO countries at a time when European and U.S. nonproliferation efforts forcefully urged other non-nuclear countries to refrain from developing nuclear weapons capabilities. Instead the Strategic Concept *highlighted* the involvement of non-nuclear NATO states in nuclear weapons storage and strike planning:

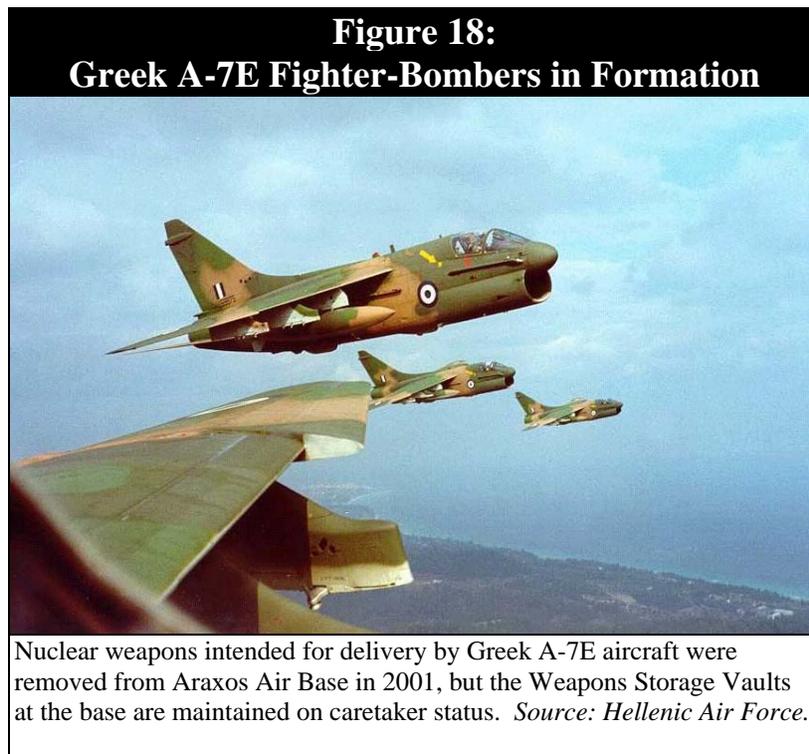
"A credible alliance nuclear posture and the demonstration of alliance solidarity and common commitment to war prevention continue to require widespread participation by European allies involved in collective defence planning in nuclear roles, in peacetime basing of nuclear forces on their territory, and in command, control, and consultation arrangements. Nuclear forces based in Europe and committed to NATO provide an essential political and military link between the European and the North American members of the alliance. The alliance will

therefore maintain adequate nuclear forces in Europe. These forces need to have the necessary characteristics and appropriate flexibility and survivability to be perceived as a credible and effective element of the allies' strategy in preventing war. They will be maintained at the minimum level sufficient to preserve peace and stability.”¹⁶⁷

With the adoption of the Strategic Concept, NATO reaffirmed U.S. nuclear forward deployment in Europe and the involvement of non-nuclear countries in nuclear strike planning. The first steps to implement the new concept were quickly taken at the June 2000 NPG meeting by setting new force-level goals to the year 2006.¹⁶⁸

Nuclear Burden-Sharing Begins to Unravel

By the end of November 2000, however, it was clear that the agreement over nuclear burden sharing began to fray with the authorization to remove the remaining nuclear weapons from Greece. The NATO meeting of December 2001 was silent about this historic event and the implications it may have had on the principle of nuclear-burden sharing. The removal of nuclear weapons from Greece is a clean break with the 1999 Strategic Concept, but the language of the final communiqué from the December meeting of the NPG remained the same, affirming “the continuing validity of the fundamentally political purpose and the principles underpinning the nuclear forces of the Allies as set out in the Alliance's 1999 Strategic Concept.”¹⁶⁹



The 20 B61 bombs at Araxos Air Base were airlifted out in the spring of 2001. Inactivation of the U.S. 731st MUNSS was authorized on March 23, the order issued on

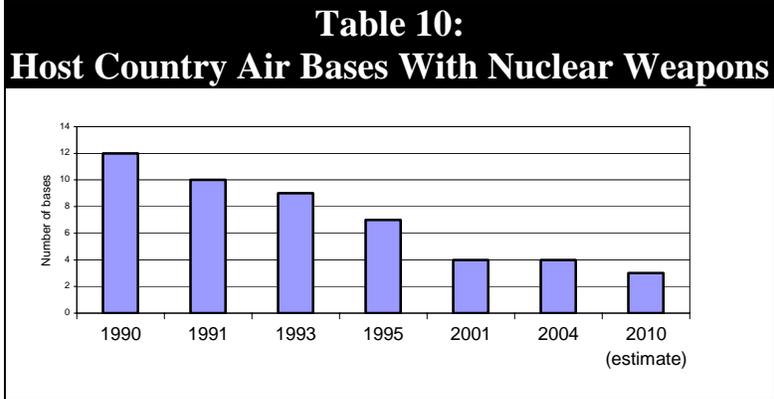
April 6, and the unit stood down on June 20, 2001,¹⁷⁰ ending more than 40 years of U.S. nuclear weapons deployment to Greece. The Greek media issued contradictory reports about the Greek government's response, with some saying a government spokesperson had confirmed the removal in a brief statement, but others saying the government spokesperson stated that there would be no further comment.¹⁷¹ In Washington, a Pentagon spokesman declined to comment: "We have a long-standing policy of neither confirming nor denying the presence or absence of nuclear weapons on any installation, and that is still our policy. It's served us well over the years."¹⁷²

Rumors about the removal began several years before the weapons were withdrawn from Araxos Air Base. In July 1994, the *Bulletin of the Atomic Scientists* reported that the nuclear bombs "may be gone from Greece altogether."¹⁷³ Several years later, in January 2001, media reports in Greece reported that special truck convoys had moved the weapons off the base. The reports were premature, but their removal was imminent. On April 6, 2001, U.S. Air Force Headquarters in Europe issued the Special Order that directed the deactivation of the 731st MUNSS at Araxos by June 20, 2001.¹⁷⁴

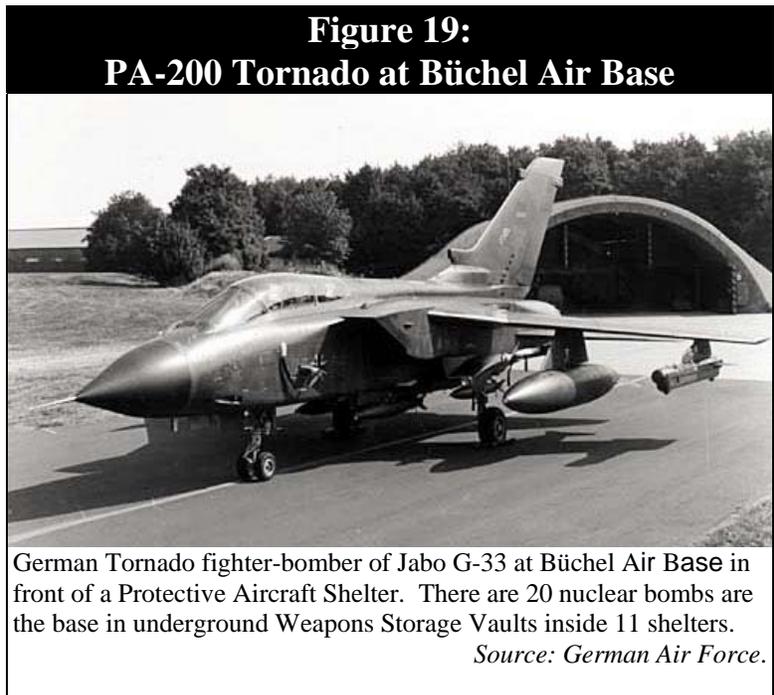
It is not known if the weapons were moved to Aviano Air Base in Italy (the U.S. custodial unit at Araxos Air Base was subordinate to the 31st Wing at Aviano), another base in Europe, or were flown back to the United States. The initial reports in Greek press said that the Italian base was the destination,¹⁷⁵ but Aviano Air Base already stored 50 weapons, and with a maximum WSV capacity of 72, adding 20 bombs from Araxos would fill Aviano almost to capacity. Incirlik Air Base in Turkey did not have room for 20 extra weapons, so if the Araxos bombs were kept in Europe to meet a fixed force level they might have been transferred to Ramstein Air Base. With some redeployment capacity maintained at Araxos Air Base similar to the Akinci and Balikesir air bases in Turkey, the weapons may still be in Europe. If Araxos Air Base had been closed,¹⁷⁶ the bombs would probably have been returned to the United States. The Nuclear Weapons Deployment Plan (NWDP) that authorizes the number of weapons the U.S. Air Force must store at each base permits a deviation from the total of up to plus or minus 10 percent.¹⁷⁷

The reason for the Greek withdrawal is not clear, and NATO has not offered an explanation. NATO statements have continued to emphasize the principle of burden sharing and the widespread deployment of nuclear weapons in Europe. NATO reportedly asked Greece in 1998 to use new F-16s to take over the nuclear strike role from the outdated A-7s, but the Greek government declined because its scarce resources were more urgently needed for air defense and conventional missions.¹⁷⁸

The denuclearization of Greece is important also because it is the latest in a series of gradual withdrawals of nuclear weapons from host nation air bases over the past decade. Since 1990, the number of host nation air bases that store U.S. nuclear bombs has declined by two-thirds from 12 bases in 1990 to only four today (see Table 10). Most dramatic has been the decline in Turkey, where U.S. nuclear bombs were stored at four national air bases in 1990 compared with none today.¹⁷⁹



Greece’s decision is also important because it represents the first case where nuclear weapons have been completely removed from a burden-sharing NATO country. The removal of nuclear weapons from the Turkish bases Erhac and Eskisehir in 1991 and the Italian Rimini base in 1993 was part of the 1991 decision by NATO to reduce air bombs by 50 percent. In those cases, the weapons were returned to the United States, but allied wings maintained a nuclear strike role. The removal of nuclear weapons from the German bases at Nörvenich and Memmingen¹⁸⁰ and the Turkish bases at Akinci and Balikesir was different because the weapons were not returned to the United States but have remained in storage at Ramstein and Incirlik earmarked for host-nation use.



Germany’s contribution to NATO’s nuclear strike mission also seems to be at stake. Nuclear weapons have already been removed from two of three bases that until 1996 stored nuclear weapons (Nörvenich Air Base and Memmingen Air Base).¹⁸¹

The 34 fighter-bomber wing (Jagdbombergeschwader or Jabo G-34) at Memmingen Air Base ceased operations in 2002 and the base was closed in 2003.¹⁸² The Tornado fighter-bombers of the 31st Wing (Jabo G-31) at Nörvenich Air Base (the weapons have already been transferred to Ramstein Air Base) will be replaced with non-nuclear capable Eurofighter (EFA 2000) aircraft in 2007–2010. The 33rd Wing (Jabo G-33) at Büchel Air Base still stores nuclear weapons but will transition to the Eurofighter in 2012–2015.¹⁸³

**Figure 20:
Büchel Air Base**



The southwestern end of Büchel Air Base showing the northern “loop” with aircraft shelters and storage buildings. Protective Aircraft Shelters (PAS) are visible along this loop and the loop on the other side of the runway. Twenty nuclear bombs are stored in 11 PAS on the base.

Source: <http://de.indymedia.org/>

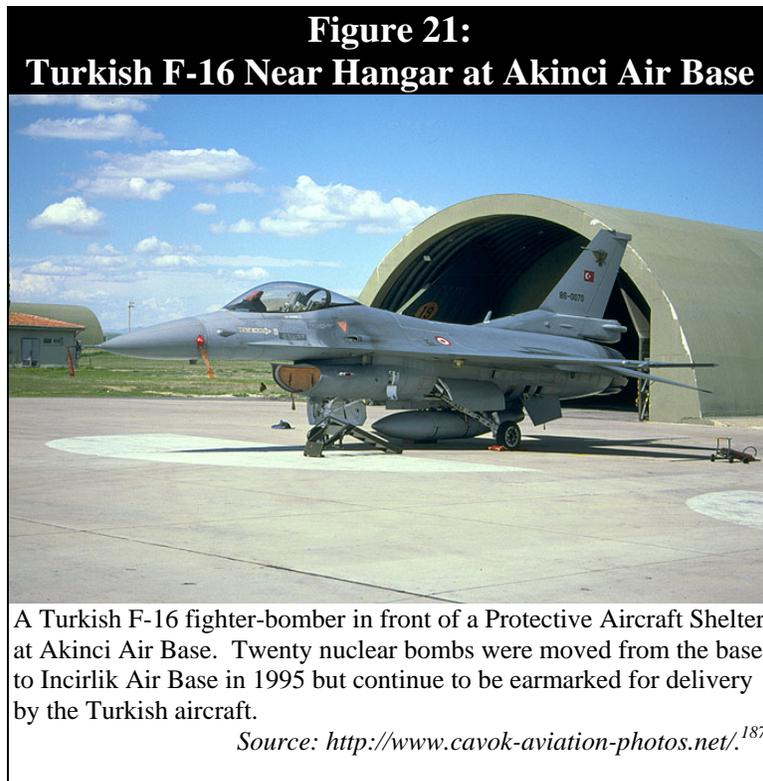
Descriptions of nuclear weapons certification inspections of non-nuclear NATO countries are rare, but one such instance involves the German Jabo G-33 at Büchel Air Base. In April 1996, the same year nuclear weapons were removed from Memmingen Air Base and Nörvenich Air Base, NATO conducted a Tactical Evaluation (TAV EVAL) at the base only three months after USAFE carried out a full force Site Assistance Visit of the 817th MUNSS. The JABOG-33 “did a superb job during the [TAC EVAL] inspection” and the 817th MUNSS received an “Excellent” rating from the TAC EVAL. According to the 817th MUNSS, the “Jabo G-33 and the 817th MUNSS showed others why our motto is ‘Partners in Peace’”:¹⁸⁴

“The GAF [German Air Force] performed superbly during the JSSI [Joint Safety and Security Inspection] portion of the inspection. There [sic] overall ‘Excellence’ rating is testimony to the hard effort that the Jabo G-33 personnel have contributed since the last inspection. The Maintenance Personnel and

Security Force personnel were lauded by inspectors. The contributions of both German and American forces were noted by all.

Notable Performers: *IG AWARD OF EXCELLENCE:* Presented to: The Jabo G-33 Weapons Maintenance Section and the Joint US/GAF Eagle Team (Emergency Services Recapture Team). *IG PAT ON THE BACK:* Presented to [deleted] the GAF Fire Department, the GAF Security Training Section, the GAF Vehicle Transportation Squadron, and the Wartungstaffel.”¹⁸⁵

The German government is on record stating that it will continue its contribution to NATO’s nuclear mission at least through 2006, but that there are no plans, at least at this point, to equip the Eurofighter with a nuclear capability.¹⁸⁶ So unless these circumstances change, Germany may abandon the nuclear mission over the next decade.



As a result of these developments, only four non-nuclear European countries (Belgium, Germany, Italy, and the Netherlands) today store U.S. nuclear weapons at their national air bases. This reduction in the contribution of host nation participation in the nuclear mission raises important questions about the credibility of NATO’s explanation of the nuclear burden-sharing principle and the need to maintain nuclear weapons in Europe. The trend seems clear: Nuclear burden-sharing in NATO, in as far as host country nuclear strike missions are concerned, is on a slow but steady decline toward ending altogether. The only question seems to be when and whether it will be constrained defense budgets and force structure reorganization or a political decision that will end it.

More Policy Refinement but Little Actual Change

Greece's historic departure from NATO's nuclear club was not cited in the final communiqué from the NPG meeting in Brussels in June 2001, which reaffirmed the importance of the nuclear posture and declared that it had finally implemented the Strategic Concept adopted in 1991:

“Ten years ago, with the 1991 Strategic Concept, the alliance embarked on a number of decisive strategy and policy changes to adapt to the post–Cold War security situation. Looking back, we are satisfied that NATO's new strategy of reduced reliance on nuclear weapons, reaffirmed in the 1999 Strategic Concept, has been fully translated into NATO doctrine, and that NATO's drastically reduced nuclear force posture fully complies with alliance key principles. Nuclear forces are a credible and effective element of the alliance's strategy of preventing war; they are maintained at the minimum level sufficient to preserve peace and stability, under conditions that continue to meet the highest standards of safety and security.”¹⁸⁸

The strategy of reduced but continued reliance on U.S. forward-deployed nuclear weapons in Europe as adopted by the 1991 Strategic Concept (and “reaffirmed in the 1999 Strategic Concept”), emanated from a time when the Soviet Union still existed and NATO deployed some 4,000 nuclear weapons in Europe. In the early 1990s, it was important to draw down the forces and reduce the alert level, but one would have hoped that that process had been completed long before 2001 and that a realization had emerged that the remaining nuclear bombs in Europe do not serve NATO's interests in the 21st century. But NATO continues to say they do. There seems little difference between the rationale used for keeping U.S. nuclear bombs in Europe under the 1991 Strategic Concept and that offered by the NATO communiqué a decade later:

1991 Strategic Concept: “A credible alliance nuclear posture and the demonstration of alliance solidarity and common commitment to war prevention continue to require widespread participation by European allies involved in collective defence planning in nuclear roles, in peacetime basing of nuclear forces on their territory and in command, control, and consultation arrangements. Nuclear forces based in Europe and committed to NATO provide an essential political and military link between the European and the North American members of the alliance. The alliance will therefore maintain adequate nuclear forces in Europe. These forces need to have the necessary characteristics and appropriate flexibility and survivability to be perceived as a credible and effective element of the Allies' strategy in preventing war. They will be maintained at the minimum level sufficient to preserve peace and stability.”¹⁸⁹

2001 NPG Final Communiqué: “At our Nuclear Planning Group meeting, we reaffirmed the continuing validity of the fundamentally political purpose and the principles underpinning the nuclear forces of the allies as set out in the alliance's 1999 Strategic Concept. We emphasize again that nuclear forces based in Europe and committed to NATO continue to provide an essential political and military link between the European and North American members of the alliance.”¹⁹⁰

Instead of formulating a clear and bold new vision for its nuclear policy for the 21st century, NATO bureaucrats have put together a hodgepodge of justifications consisting of slightly rewritten policy language from the past, outdated remnants of Cold War threats (Russian non-strategic nuclear weapons), unsubstantiated claims of deterring proliferators of weapons of mass destruction, vague and exaggerated rhetoric about preserving peace and preventing “any kind of war,” and peripheral managerial issues of providing a political and military link between Europe and the United States. Under this vision, forward-deployed U.S. nuclear weapons appeared to serve essentially any purpose against any opponent in Europe or outside the region.

THE 2001 NUCLEAR POSTURE REVIEW

Clinton Era Nuclear Force Unchallenged

One of the Clinton administration's last acts in 2000 was to authorize the continued deployment of 480 nuclear bombs in Europe, a force level first set in 1994. With the election of President George W. Bush, it was possible that the new president might share his father's boldness on unilateral nuclear reductions and would finish the disarmament process begun a decade earlier. In a speech to the National Defense University in May 2001, President Bush pledged that he was "committed to achieving a credible deterrent with the lowest-possible number of nuclear weapons consistent with our national security needs, including our obligations to our allies. My goal," he said, "is to move quickly to reduce nuclear forces."¹⁹¹

One of his first acts as president was to order a Nuclear Posture Review (NPR) intended to bring U.S. nuclear policy more into accord with the international and domestic situation. NATO wanted to be consulted, and as work got under way on the NPR, the final communiqué from the NATO NPG meeting in June 2001 "expressed interest in consulting with the United States on its deliberations to adapt deterrence concepts and forces to meet future security challenges...."¹⁹²

When the NPR was completed in December 2001, and parts of it were leaked to the press a few weeks later, it turned out that the administration's focus had been on incorporating conventional forces and missiles defense into strategic planning rather than reexamining nuclear policy. The nuclear posture was not changed significantly compared with that envisioned under the START III framework agreed between Washington and Moscow in 1997. Concerning the nuclear weapons in Europe, however, the NPR hinted that there might be some changes in the future. The document mentioned that a NATO review was under way to present plans to the defense ministers in the summer of 2002:

"Dual-capable aircraft and nuclear weapons in support of NATO. DoD will not seek any change to the current posture in FY02 but will review both issues to assess whether any modifications to the current posture are appropriate to adapt to the changing threat environment. A plan is already under way to conduct a NATO review of U.S. and allied dual-capable aircraft in Europe and to present recommendations to Ministers in summer of 2002. Dual-capable aircraft and deployed weapons are important to the continued viability of NATO's nuclear deterrent strategy and any changes need to be discussed within the alliance."¹⁹³

The NPR included language suggesting that plans existed to phase out the F-16 once a dual-capable F-35 Joint Strike Fighter (JSF) was deployed. The F-15E, however, with its considerable range and greater capacity (up to five nuclear bombs), would be retained. All of these plans were subject to further study, but the Operational Requirements Document (ORD) for the JSF "requires that initial design permit nuclear capability to be

incorporated at a later date (after Initial Operational Capability (IOC), currently scheduled for 2012) at an affordable price."¹⁹⁴

Since the NPR was released, neither NATO nor the United States has announced that weapons have been reduced, but some adjustment appears to have taken place. At the NPG meeting in June 2002, NATO declared that it had “adopted a new set of NATO Force Goals covering the period until 2008” and “provided guidance to further adapt NATO’s dual-capable aircraft posture.” Yet at the same time, the final communiqué declared: “We continue to place great value on the [nonstrategic] nuclear forces based in Europe and committed to NATO.”¹⁹⁵ As usual, a potential change was immediately followed by a reaffirmation of nuclear weapons.

The reaffirmation was followed by a reorganization of the remaining four MUNSS units at the national air bases in Belgium, Germany, Italy, and the Netherlands. This happened on May 27, 2004, when the 38th Munitions Maintenance Group (MMG) was stood up at Spangdahlem Air Base as part of a command-wide reorganization of geographically separated units. The MUNSS at Ghedi Torre Air Base previously was under the 31st Fighter Wing at Aviano Air Base, but under the new structure all four MUNSS units are subordinate to the 38th MMG at Spangdahlem Air Base.¹⁹⁶

As part of this reorganization, the unit designations of each U.S. nuclear weapons custodian unit was changed: the 52 MUNSS at Kleine Brogel Air Base became the 701 MUNSS; the 852 MUNSS at Büchel Air Base became the 702 MUNSS; the 752 MUNSS at Volkel Air Base became the 703 MUNSS; and the 831 MUNSS at Ghedi Torre Air Base became the 704 MUNSS (see Appendix A).

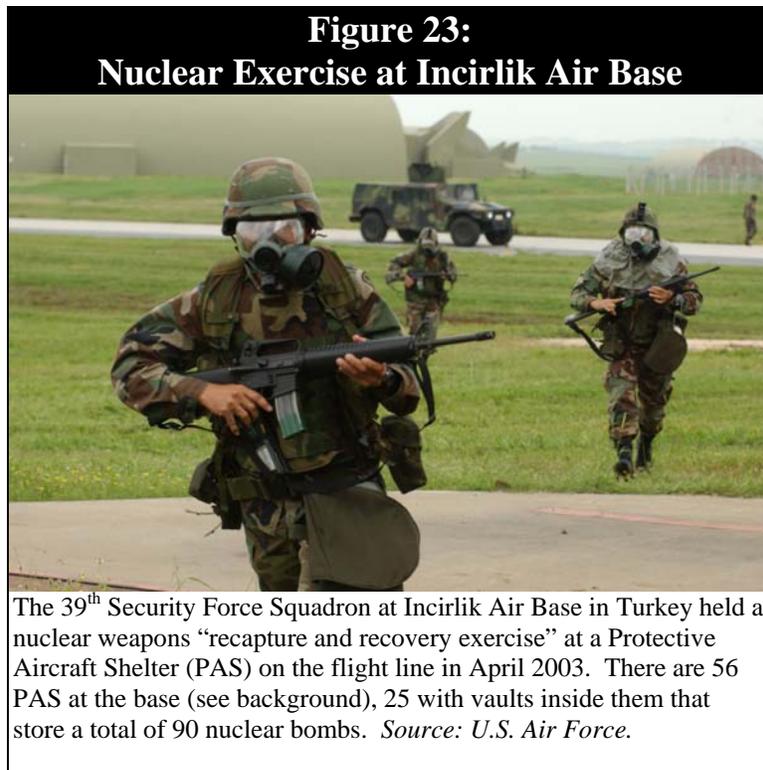
Apart from this, no dramatic changes occurred. An issue paper published by NATO in June 2004 appears to confirm that the number of nuclear weapons in Europe has remained essentially unchanged since 1993. As mentioned above, the only change appears to have been the removal of the British nuclear bombs in 1998. Compared with 1999, the issue paper also confirms that the number of nuclear weapons storage sites has remained essentially unchanged¹⁹⁷ (the only differences apparently being the status of Araxos Air Base and Memmingen Air Base).

The adjustments that have occurred appear to have involved a slight reduction in the number of host-nation aircraft assigned nuclear delivery missions.¹⁹⁸ This appears to reflect the closure of the German Air Base at Memmingen. As a result of the new



guidance, NATO explained in 2003, its “dual-capable aircraft posture has been further adapted, and readiness requirements for these aircraft have been further relaxed.”¹⁹⁹ The readiness of nuclear strike aircraft now should be measured in months, according NATO.²⁰⁰

At the same time, the stock language was used to stress the importance of the U.S. nuclear weapons: “We continue to place great value on the nuclear forces based in Europe and committed to NATO, which provide an essential political and military linkage between the European and the North American members of the alliance.”²⁰¹ The subsequent NPG meeting in December 2003 declared that the DCAs were maintained at a readiness level “consistent with the prevailing security environment.” The contribution of the British Trident force to deterrence and the overall security of the allies were also highlighted.²⁰²



Since the 2001 NPR, the U.S. Air Force and NATO have been busy keeping the nuclear capability in Europe up to date. Various awards are routinely given to Munitions Support Squadrons at the host nation bases, Nuclear Surety Inspections and NATO Tactical Evaluations are held regularly, and maintenance of the WS3 storage sites continues. Both in January 2002 and July 2004, for example, the 48th Fighter Wing at RAF Lakenheath practiced its nuclear skills. In April 2003, security forces of the 39th Fighter Wing at Incirlik Air Base exercised defense against a simulated attempt by hostile forces to gain access to and capture nuclear weapons from a Protective Aircraft Shelter at the base (see Figure 23). In preparation for a subsequent Surety Inspection, members of the

39th Security Force Squadron Security forces were required to respond in five minutes or less after initial notification.²⁰³

Incirlik Air Base had difficulties in late 2003 preparing for a critical readiness inspection of its nuclear weapons storage facilities. Apparently the condition of the WS3 system fell below standard and Headquarters U.S. Air Force Europe directed that “activation be accelerated by one year.” The Air Force dispatched a special team of engineers to the base to ensure that the facilities could be recertified as operational. Inspection and repairs were done to all 25 Weapons Storage Vaults at the base in only one week, enabling the 39th Wing to achieve a ready rating for 100 percent of its WS3 Vaults in the subsequent certification inspection.²⁰⁴

Prospects for Change

The Bush administration declared in connection with the completion of the NPR that Russia no longer is an immediate threat. At the same, the NPR emphasized “capability-based planning” versus planning based on likely threats, so intentions are less relevant than capabilities. As a result, scrupulous targeting of Russian facilities continues, and part of the justification for retaining U.S. nuclear weapons in Europe is Russia’s large number of non-strategic nuclear weapons.

The Russian military apparently is aware of that and is concerned that the U.S. “tactical nuclear weapons deployed in Europe are for Russia acquiring a strategic nature, since theoretically they could be used on our command centers and strategic nuclear centers.”²⁰⁵ The U.S. government belittles such concern and argues that the problem is Russia’s own tactical nuclear weapons. During a visit to Moscow in October 2004, U.S. Assistant Secretary of State for Arms Control Stephen Rademaker stated:

“I can assure you that when European audiences talk about the problem of tactical nuclear weapons in Europe, their concern is directed toward the Russian tactical nuclear weapons and what countries they might be targeted on rather than the relatively small number of tactical nuclear weapons that remain in the NATO arsenal.”²⁰⁶

Rademaker used the occasion to formally criticize what he described as Russia’s lack of implementation of its earlier promises to reduce and dismantle tactical nuclear weapons. It is the view of the U.S. government, he stated, that “considerable concern exists that the Russian commitments have not been entirely fulfilled.”²⁰⁷

The Russian Ministry of Foreign Affairs quickly fired back, saying “commitments” is the wrong word to use because the promises were goodwill gestures and not part of a treaty. Russia has “practically carried out in full” all of the reductions it promised, the Ministry said, including “liquidation” of more than 50 percent of all sea-based tactical missiles and naval aviation, anti-aircraft missiles and nuclear aviation bombs. Moreover, the reduction of tactical nuclear weapons is continuing, the Russian government stressed, and reminded: “All of those weapons, unlike the situation with the United States, are located solely within our national territory.”²⁰⁸

Such nuclear bickering between U.S. and Russian government officials was common during the Cold War. The fact that it occurs today – nearly three years after the 2001 NPR declared an end to nuclear animosity with Russia and Presidents Bush and Putin proclaimed a new partnership between their countries – illustrates the danger of continuing the status quo. It shows that the forward deployment of U.S. nuclear weapons in Europe is an important irritant to improved relations between Russia and NATO, far out of proportion to the vague and unspecific benefits these weapons allegedly contribute to NATO's security interests.

Clearly there is a need to change the situation. Statements made by U.S. government officials in 2004 and unconfirmed rumors suggest that NATO once again may be considering adjusting the nuclear deployments in Europe. Such speculations have occurred before in the 1990s and resulted in the mistaken estimates about the number of nuclear weapons deployed in Europe. This time, however, the indications appear more explicit and take place in the framework of a major U.S. realignment of forward-deployed military forces.

The U.S. Congress has authorized a base realignment and closure (BRAC) round in 2005. When ordering the military to begin planning for BRAC 2005, U.S. Defense Secretary Donald Rumsfeld stated that, at a minimum, the process “must eliminate excess physical capacity; the operation, sustainment, and recapitalization of which diverts scarce resources from defense capability.” At the same time, the reconfiguration of the infrastructure should maximize war-fighting capability and efficiency. The basis for BRAC 2005 is a long-term force structure plan developed by the Chairman of the Joint Chiefs of Staff for the 20-year period 2005-2025. A BRAC Commission will be appointed in March 2005 by the president, and in May the Secretary of Defense will announce what bases and installation will be considered for eventual closure. Finally, in September 2005, the president will approve (or disapprove) the commission's recommendations.

Whether BRAC 2005 will affect the nuclear deployment in Europe remains to be seen. A hint of things to come may have been provided in March 2004 by General James Jones, NATO Supreme Allied Commander and Commander of United States European Command. In response to a Belgian Senate committee member's question about U.S. nuclear weapons and the risk of an accident on Belgian soil, Jones allegedly stated: “The reduction will be significant. Good news is on the way.”²⁰⁹ NATO sources later pointed out that Jones did not mention nuclear weapons specifically, but the Belgian government later stated for the record: “...the United States has decided to withdraw part of its nuclear arsenal deployed in Europe...”²¹⁰ German weekly *Der Spiegel* followed up by asking “whether German nuclear weapons sites will benefit from Gen. Jones' ‘good news.’”²¹¹

According to the *Los Angeles Times*, roughly 200 bases are likely to be closed worldwide as a result of BRAC 2005, down from 560 to 360 over the next six to eight years.²¹² Ironically, part of the guidance provided by the Secretary of Defense for overseas

installations could be seen as arguing against a reduction in the number of nuclear bases. The DOD's 2005 BRAC report emphasizes the development of flexibility "by not overly concentrating military forces in a few locations for particular scenarios."²¹³

Nuclear forces seem inherently in conflict with this principle. As this report illustrates, they have consistently been reduced to fewer and fewer bases since the early 1990s, and the weapons are intended for very particular scenarios. As for the main operating bases in Europe, where most of the nuclear weapons are located (including nuclear weapons intended for "host-nation use"), the 2005 BRAC report expresses a strong commitment:

"A network of main operating bases, with forward-stationed combat forces, will continue to provide the United States with an unmatched ability to conduct military missions worldwide. While some bases will be realigned or consolidated to gain efficiencies and to eliminate excess infrastructure as a result of the overseas posture review, in the foreseeable future main operating bases will continue to be located on reliable, well-protected territory primarily in Europe and East Asia."

It may be, therefore, that the "reduction" mentioned by General Jones might be in the number of nuclear weapons deployed on the remaining host-nation bases. The Pentagon already has canceled a large number of military construction projects (26 in Germany alone worth \$280 million) in 2003 and 2004 for the "repositioning of our global footprint." The purpose of this effort is to shift funds away from "non-enduring" overseas bases – those where the military's long-term presence is questionable – to installations that will fulfill critical operational, logistical, or training mission requirements" that are "key to [the U.S.] global basing posture."²¹⁴

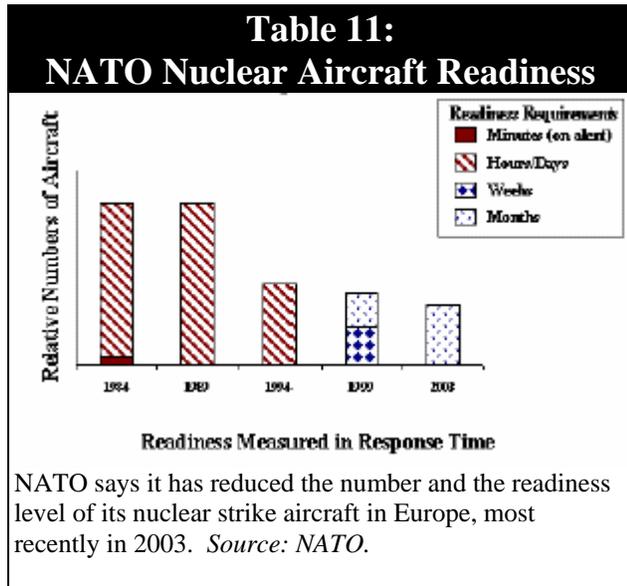
Yet this change in priorities apparently does not affect the nuclear weapons storage facilities. In July 2004, the U.S. Air Force awarded a \$2 million contract to upgrade the monitoring and console equipment for the WS3 facilities at 12 NATO installations.²¹⁵ Unless this contract is canceled as a result of BRAC 2005, the United States apparently intends to maintain its nuclear "footprint" in Europe for some time to come.

One other possibility concerning the reduction suggested by General Jones may be that the deployment of nuclear weapons at northern European bases might be adjusted. There are recent reports that 48 F-15s of the 4th Fighter Wing at RAF Lakenheath may be withdrawn.²¹⁶ There are 48 F-15Es at the base organized under the 492nd and 494th Fighter Squadrons, the two squadrons tasked with the nuclear strike mission. Withdrawing these aircraft would likely result in the withdrawal of the nuclear weapons from the base. Another possibility is that the squadrons could be moved to Incirlik Air Base in Turkey or Aviano Air Base in Italy on a permanent or rotating basis.²¹⁷ The U.S. Air Force is also considering shifting one or two F-16 wings from Germany to Incirlik Air Base. Shifting aircraft south would likely not include their nuclear weapons because the nuclear storage facilities at Incirlik Air Base and Aviano Air Base are almost full.

Short of reducing nuclear weapons across the board or withdrawing them altogether, the most likely outcome may be the removal of the remaining nuclear weapons from host-nation bases. Under that scenario, only the United States would continue to store nuclear weapons at its main operating bases in Europe. The persistent emphasis by NATO officials about the principle of burden-sharing would appear to argue against this option, but it is the direction that NATO has been moving toward for years. Since 1993, Munitions Support Squadrons (MUNSS) have been withdrawn from all or some of German, Greek, Italian, and Turkish air bases and the nuclear weapons moved to the main U.S. operating base in the area. To complete this transition, the MUNSS at Kleine Brogel Air Base in Belgium, Volkel Air Base in the Netherlands, Büchel Air Base in Germany, and Ghedi Torre Air Base in Italy could be transferred to main U.S. operating bases in each area or returned to the United States.

The BRAC process coincides with another major review in 2005: The Quadrennial Defense Review (QDR). Launched every four years, the congressionally mandated QDR reviews the nation’s defense strategy, budget, force structure and modernization plans. Nuclear forces are also reviewed, but both the Clinton and Bush administrations conducted separate Nuclear Posture Reviews in 1994 and 2001, respectively. The Bush administrations planned a new Nuclear Posture Review for 2005, but this now appears to have been combined with the 2005 QDR. The deployment in Europe will likely be reviewed again as part of the QDR.

Whether or not the BRAC or QDR process results in a reduction, the most serious challenge to the continued deployment of U.S. nuclear weapons in Europe ironically comes from NATO itself. In June 2004, a little noticed “issue paper” published by NATO disclosed that the readiness level of the nuclear strike aircraft had been reduced to “months” rather than weeks, days, or hours.²¹⁸ During the Cold War, the readiness level was measured in minutes (for a small number of aircraft on quick-alert) and in hours or days for the remaining force. Under the new and reduced readiness level implemented in 2002, it would supposedly take “months” for NATO to use the fighter-bombers to launch a nuclear strike (see Table 11).



A readiness level of “months” suggests that some of the mechanical and electronic equipment on the fighter aircraft needed to arm and deliver the nuclear bombs may have been removed and placed in storage.

This development raises the question of whether there any longer is an operational need – even if one believes such a need exists – to keep the nuclear weapons in Europe. Since training at the forward bases does not involve live nuclear weapons anyway but uses trainers and “dummies,” there doesn’t seem to be a need to have nuclear weapons physically present at the bases. If a crisis were to emerge, the readiness level of “months” would provide ample time to transport the weapons from storage sites in the United States to the bases in Europe if needed.

The Pentagon planned a separate review of U.S. nuclear forces in 2005 as part of its implementation of the decisions from the 2001 Nuclear Posture Review. The new review now appears to have been merged with the Quadrennial Defense Review (QDR) which is scheduled for completion in February 2006. More than a decade after the U.S. last reduced its nuclear deployment in Europe, the QDR must take a critical look at the rationale used to keep most of America’s non-strategic nuclear weapons deployed overseas.

CONCLUSIONS AND RECOMMENDATIONS

The reductions in the number of nuclear weapons in Europe in the early 1990s were a bold and necessary step. They enhanced European security and helped facilitate the ending of the Cold War and the transformation of NATO. What has been lacking since then is a vision for how to follow up and finish the process of withdrawing U.S. forward-deployed nuclear weapons from Europe.

At every juncture and following every reductions and modification of the posture, NATO bureaucrats have reaffirmed the importance of maintaining U.S. nuclear weapons forward-deployed in Europe. The justifications are poorly explained and muddled, consisting of remnants of Cold War rationales about a Russian threat, vague missions such as war prevention, ambiguous suggestions like deterring proliferation of weapons mass destruction, and dubious claims about nuclear weapons providing a unique link between Europe and its North American allies.

What characterizes these justifications is an infatuation with Cold War rationales and a fear of taking the next bold step to finally bring Europe out of the Cold War:

At a time when NATO and the United States seek a new partnership with Russia and are concerned over the security of Russian tactical nuclear weapons, the interests of the alliance are not served by keeping hundreds of nuclear weapons forward-deployed in Europe. The presence of these weapons is a continuous irritant to normalizations and an unnecessary and counterproductive factor in Russian military planning.

At a time when Europe and the United States need to build a foundation for political and military cooperation to address the challenges facing both countries and their regions, the interests of NATO are not served by suggestions that remnants of a Cold War nuclear posture is the “glue” that ensures close ties across the Atlantic. European NATO allies have plenty of burden to share on non-nuclear missions, such as force structure modernizations, peacekeeping operations, and rapid reaction forces. Those are the issues that NATO should focus on to provide the “glue” across the Atlantic since they will determine the future of the alliance, rather than clinging to outdated arrangements from a time and situation that has now passed. Besides, if the 480 nuclear weapons were removed tomorrow, NATO’s security interests would still be supported by thousands of other United States, British, and French nuclear weapons that continue to be modernized for essentially the same reasons.

At a time when both Europe and the United States are engaged in high-profile diplomatic nonproliferation efforts around the world to promote and enforce non-proliferation of nuclear weapons, deploying hundreds of such weapons in non-nuclear NATO countries and training the air forces of non-nuclear NATO countries – in peacetime – to deliver these weapons in times of war is at cross purposes with an effective non-proliferation message. All of the non-nuclear NATO countries that host nuclear weapons on their

territory (Belgium, Germany, Italy, the Netherlands, Turkey) have signed the 1970 nuclear Non-Proliferation Treaty (NPT) under which they pledge:

"... not to receive the transfer ... of nuclear weapons or other nuclear explosive devices or of control over such weapons or explosive devices directly, or indirectly...."²¹⁹

Likewise, as a nuclear weapons state party to the NPT, the United States has committed itself to:

"... not to transfer to any recipient whatsoever nuclear weapons or other nuclear explosive devices or control over such weapons or explosive devices directly, or indirectly...."²²⁰

U.S. forward-deployed nuclear weapons in Europe are extensively integrated into the military infrastructure of the countries that host these weapons. Nuclear cooperation agreements exist with Belgium, Germany, Italy, the Netherlands, and Turkey to enable their national air forces to deliver U.S. nuclear bombs in times of war. The United States insists that no transfer of the nuclear bombs or control over them is intended "unless and until a decision were made to go to war, at which the [NPT] treaty would no longer be controlling."²²¹ Therefore, the United States argues, there is no breach of the NPT. But the nuclear mission is not dormant until a decision has been made to go to war, and there is no provision that the near-universal treaty expires if one or a few of its signatory states decide to go to war. Even in peacetime, the fighter-bomber pilots of the "non-nuclear" NATO nations practice and prepare for handling and delivering the U.S. nuclear bombs.

Besides, the strictly legal argument misses the point. Such peacetime operations certainly contravene both the objective and the spirit of the NPT. It endorses the concept that non-nuclear countries may adopt "surrogate" nuclear roles on behalf of nuclear powers. If China deployed nuclear weapons at North Korean air bases, equipped North Korean fighter jets with the capability to carry nuclear weapons, and trained North Korean pilots to design nuclear strike missions and deliver the weapons against targets in South Korea and Japan, the United States and NATO would raise hell – and rightly so.

Yet the U.S. government and NATO continue to cling to the Cold War practice – dating as far back as to the early 1960s – of training pilots from non-nuclear NATO countries to deliver U.S. nuclear weapons.²²² This practice contradicts and severely muddles the nonproliferation message the United States and NATO are trying to impress upon the world community.

NATO's contradictory nonproliferation policy of providing non-nuclear NATO countries with the capability to deliver nuclear weapons in wartime, while insisting that other non-nuclear countries must not pursue nuclear weapons capability, reveals a deeply incoherent vision for nuclear security in the 21st Century.

The contradiction also colors NATO's position on nuclear disarmament. At the same time that NATO insists it needs to keep U.S. non-strategic nuclear weapons forward deployed in Europe, all of the NATO member countries – with the notable exception of the United States – voted in favor of a United Nations resolution in October 2004 that called for “further reductions of non-strategic nuclear weapons.” Indeed, the resolution specifically recognized that beyond the reductions currently underway in U.S. and Russian strategic arsenals, “the realization of a world free of nuclear weapons will require further steps, including deeper reductions in all types of nuclear weapons by all the nuclear weapons States in the process of working towards achieving their elimination.”²²³ Since the largest portion of U.S. active non-strategic nuclear weapons are deployed in Europe, “further reductions of non-strategic nuclear weapons” must require that NATO ends its requirement for U.S. nuclear weapons in Europe.

Another claim is that U.S. nuclear bombs are needed in Europe to dissuade European countries from pursuing nuclear weapons capabilities themselves. But this is also no longer a credible argument. All NATO countries are under the umbrella of long-range U.S. and British nuclear forces, and tactical nuclear weapons in Europe make no clear difference. Moreover, in the case of South Korea and Japan, countries located in areas where tension exists – unlike in Europe – that could potentially result in the use of nuclear weapons, tactical nuclear bombs were completely withdrawn in 1991. Neither the United States nor its two allies in that region argue that it is necessary to forward deploy U.S. tactical nuclear weapons.

There is also the issue of safety. Throughout the 1990s, NATO and U.S. officials assured the public that the nuclear weapons in Europe were secure, only to admit in internal upgrade programs and inspections that serious concerns existed. At one point in 1997, they found, this even included the risk of an accidental nuclear detonation.

Despite efforts to improve nuclear proficiency of its nuclear personnel, the U.S. Air Force continues to experience serious deficiencies. In 2003, the pass rate for Air Force Nuclear Surety Inspection hit an all-time low, with only half of the inspections resulting in a pass (the historical pass rate is 79 percent).²²⁴

And then there is the question of how forward deployment fits the new reality of war on terrorism. Are the benefits of deploying 480 nuclear weapons at a dozen installations throughout Europe justified considering the potential threat from a terrorist attack?

In October 2003, Tunisian born Nizar Trabelsi was sentenced to 10 years in prison for plotting to bomb the Kleine Brogel Air Base in Belgium. Trabelsi joined the al Qaeda terrorist network and planned to drive a car containing a bomb into the canteen of the base to kill American soldiers. Two accomplices received lesser sentences. Trabelsi said he did not plan to detonate nuclear weapons stored at the base.²²⁵ The incident followed a drug-related case in 2001, where six Belgian servicemen from Kleine Brogel were taken into custody and charged with exporting hashish to other NATO countries onboard army aircraft.²²⁶

After the terrorist attacks on September 11, 2001, the U.S. government has changed the way it views security of its nuclear weapons. Prior to 2001, the nuclear weapons security philosophy was based on the premise that “people would try to steal them,” according to National Nuclear Security Administration (NNSA) Director Linton Brooks. But now it is obvious that there are individuals who are willing to sacrifice their lives just to create a nuclear incident, he said. As a result, NNSA has expanded its security perimeters so that potential attackers can be stopped farther away from a nuclear facility.²²⁷

In the case of the nuclear weapons deployed in Europe, however, the aircraft shelters that store the weapons are dispersed across eight different bases in six countries. In many cases, the shelters are located only a few hundred meters or less from the fence surrounding the base (see Appendix C). The idea of dispersing the weapons to shelters across the bases instead of storage in a central Weapons Storage Area at each base emerged in the 1970s as a way of ensuring survival of nuclear weapons in case of a Soviet surprise attack. With the Soviet threat gone, however, the assessment of security of nuclear weapons on forward locations must be based on the threats that exist today. The question is whether the vague and nonessential role that U.S. forward-deployed nuclear weapons in Europe play today can any longer be argued to outweigh the potential consequences of a successful terrorist attack – no matter how theoretical that may be.

Withdrawing the remaining U.S. nuclear weapons from Europe would alleviate that unnecessary risk, finish the withdrawal process that was begun in 1991 but which has been dormant for a decade, and enable NATO to focus on the security challenges that are relevant for the future. Perhaps changes might be possible under the current U.S. global posture decision and the impending Base Realignment and Closure (BRAC) process.

The most compelling opportunity to end the forward deployment of nuclear weapons in Europe may be the announcement by NATO that it has reduced the readiness level of the aircraft that are intended to deliver the U.S. nuclear bombs to “months.” The very low readiness level suggests that the electronic and mechanical interfaces that enable the aircraft to carry and deliver the nuclear bombs may have been dismantled and placed in storage. Since training at nuclear bases does not require live nuclear weapons but is done with “dummy” weapons, such a low readiness level calls into question the need to continue to forward deploy U.S. nuclear weapons in Europe because it allows for plenty of time to transfer the weapons in a crisis if needed.

The need for these weapons is rapidly eroding. While NATO still talks about their unique contribution to the alliance, the U.S. Defense Science Board Task Force on Future Strategic Strike Forces recommended in February 2004 that the nuclear capability of the forward-based, tactical, dual-capable aircraft should be eliminated because there is “no obvious military need for these systems....”²²⁸ Because the use of nuclear weapons in a conflict could provoke serious political, economic, military, and environmental consequences, according to the latest U.S. Doctrine for Joint Nuclear Operations, “allied as well as adversary understanding of US nuclear weapon policy is essential.”²²⁹ Yet the vague and unspecific role attributed by NATO to the weapons in Europe suggests that the alliance – and therefore also potential adversaries – is uncertain about the exact role.

Finally, there is the question of burden sharing and whether this long-held principle of NATO nuclear planning is eroding. Although a third of the U.S. forward-deployed nuclear bombs in Europe are earmarked for delivery by half a dozen non-nuclear NATO countries, many of those countries are showing signs of retreating from the nuclear mission. Nuclear weapons were removed from Greece in 2001, Italy only has nuclear weapons on one national air base, Germany also only has nuclear weapons left on one national air base and closed another base in 2003. And Germany may phase out its nuclear mission altogether with its planned replacement of the Tornado aircraft with the Eurofighter in the next decade.

Turkey no longer stores nuclear weapons on its national air bases, and the Turkish government has made decisions during the last couple of years that strongly call into question the credibility of nuclear operations from Turkey territory. During the 2003 war against Iraq, Turkey refused to give the United States permission to move major ground forces through Turkey into northern Iraq. And as recently as in December 2004, the Turkish government announced that it would “not back any U.S. military action on Iran.”²³⁰ NATO’s nuclear posture in Europe is partially justified as a potential deterrent against proliferating countries, and Incirlik Air Base in Turkey is the only NATO nuclear air base within striking range of Iran. The credibility of that deterrent – even if one believes it existed – seems to have eroded with Turkey’s stand.

In conclusion, a final review of the forward deployment of U.S. nuclear weapons in Europe is long overdue. This time, the U.S. Congress and European parliaments must ask tough questions about the rationale for the deployment. They should not be content with vague justifications from the past about nuclear weapons “preventing war” or “providing a political link between Europe and North America.” The focus must be on exactly who the enemy is and where the targets are for these weapons, which essential and unique benefits the weapons provide to NATO’s security that cannot be met through other means, and how the training in peacetime of pilots from non-nuclear countries to deliver nuclear weapons in wartime matches European and U.S. nonproliferation messages.

Appendix A: U.S. Nuclear Weapons in Europe, 2005

Country	Base	Custodian ^a	Delivery Aircraft	WS3 Capacity ²³¹			Weapons (B61)		
				Vaults	Capacity	Completed	U.S.	Host	Total
Belgium	Kleine Brogel AB	701 MUNSS	Belgian F-16	11	44	Apr 1992	0	20	20
Germany ^b	Büchel AB	702 MUNSS	German PA-200 Tornados	11	44	Aug 1990	0	20	20
	Nörvenich AB*		German PA-200 Tornados	11	44	Jun 1991	0	0	0
	Ramstein AB	52 FW	US F-16C/D	55 ^c	220 ^c	Jan 1992	90 ^d	40 ^e	130
Greece	Araxos AB*			6	24	Sep 1997	0	0	0
Italy	Aviano AB	31 FW	US F-16 C/D	18	72	Jan 1996	50	0	50
	Gheddi Torre AB	704 MUNSS	Italian PA-200 Tornados	11	44	Jan 1997	0	40	40
Netherlands	Volkel AB	703 MUNSS	Dutch F-16	11	44	Sep 1991	0	20	20
Turkey	Akinci AB*		Turkish F-16	6	24	Oct 1997	0	0	0
	Balikesir AB*		Turkish F-16	6	24	Sep 1997	0	0	0
	Incirlik AB	39 FW	US F-16C/D	25	100	Apr 1998	50	40	90
United Kingdom	RAF Lakenheath	48 FW	US F-15E	33	132	Nov 1994	110	0	110
Total				204	816		300	180	480

* Site is in caretaker status.

^a Each Munitions Support Squadron (MUNSS) includes approximately 125-150 assigned personnel.

^b Operational and support responsibilities of USAF and the Bundeswehr for munitions support bases in Germany are described in the 1960 Tool Chest Agreement.²³²

^c One vault is a training vault.

^d Assumes 20 weapons removed from Araxos Air Base in 2001 were transferred to Ramstein Air Base rather than to Aviano Air Base to avoid filling the Italian vaults to capacity. Alternatively, the weapons could have been returned to the United States.

^e Half of these weapons may have been returned to the U.S. after Memmingen Air Base closed in 2003.

Appendix B: Planned and Current WS3 Capacity²³³

Country	Base	1986		1997		2004	
		Vaults	Max Cap.	Vaults	Max Cap.	Vaults	Max Cap.
Belgium	Florennes AB	2	8*	0	0	0	0
	Kleine Brogel AB	11	44	11	44	11	44
Germany	RAF Brüggen	0	0	10	40	0	0
	Büchel AB	11	44	11	44	11	44
	Hahn AB	53	212	0	0	0	0
	Memmingen AB	11	44	11**	44	0***	0
	Nörvenich AB	11	44	11**	44	11**	44
	Ramstein AB	58	232	55	220	55	220
	Wueschheim AB	2	8*	0	0	0	0
Greece	Araxos AB	11	44	6	24	6**	24
Italy	Aviano AB	18	72	18	72	18	72
	Comiso AS	2	8*	0	0	0	0
	Gheddi Torre AB	6	24	11	44	11	44
	Rimini AB	6	24	0	0	0	0
Netherlands	Volkel AB	11	44	11	44	11	44
	Woensdrecht AB	2	8*	0	0	0	0
South Korea	Kunsan AB	36	144	0	0	0	0
Turkey	Balikesir AB	6	24	6**	24	6**	24
	Erhac AB	6	24	0	0	0	0
	Eskishir AB	6	24	0	0	0	0
	Incirlik AB	30	120	25	100	25	100
	Murted (Akinci) AB	6	24	6**	24	6**	24
United Kingdom	RAF Bentwaters	25	100	0	0	0	0
	RAF Greenham	2	8*	0	0	0	0
	Common						
	RAF Lakenheath	48	192	33	132	33	132
	RAF Marham	0	0	24	96	0	0
	RAF Molesworth	2	8*	0	0	0	0
	RAF Upper Heyford	55	220	0	0	0	0
Total	28 sites	437	1748	249	996	204	816

* For support of W80 warheads for the Ground-Launched Cruise Missile (GLCMs). It is not known how many W80s could be stored in each vault, but the W80 is much smaller than the B61 bomb, of which up to four can be stored in each WSV, so more than four W80s conceivably could have been stored in each WSV. The 1987 INF Treaty removed this requirement.

** WS3 site in caretaker status. MUNSS inactivated and no weapons present.

*** Memmingen Air Base closed in 2003.

Appendix C: Portraits of NATO Nuclear Bases in Europe

This appendix contains satellite images and maps of air bases in Europe where NATO currently stores nuclear weapons or maintains Weapons Storage Vaults capable of storing nuclear weapons if necessary. Details of the deployments and weapons storage facilities are described below each image and in Appendix A and Appendix B.

Satellite images were obtained for most of the bases, but in four cases (Akinci Air Base, Büchel Air Base, Nörvenich Air Base, and Volkel Air Base) satellite images were not available. Base maps were found for Büchel Air Base and Volkel Air Base, while an aerial photograph was obtained of Nörvenich Air Base. Only Akinci Air Base could not be illustrated.

The quality of the satellite images made it possible to clearly identify both the location and the size of the individual Protective Aircraft Shelters on the bases. The approximate size of the shelters was measured from the satellite images. In some cases, it was also possible to identify the Weapons Storage Area where nuclear weapons were kept before the Weapon Storage and Security System became operational in the 1990s.

Each base contains more Protective Aircraft Shelters than are used for nuclear weapons storage. The satellite images and the information used in this report do not permit identification of which Protective Aircraft Shelters currently store the nuclear weapons.

Below follows the satellite images, photographs, or maps and descriptions of the following bases (note: the images are best viewed in color and all are available on the Internet at <http://www.nrdc.org/xxxx>):

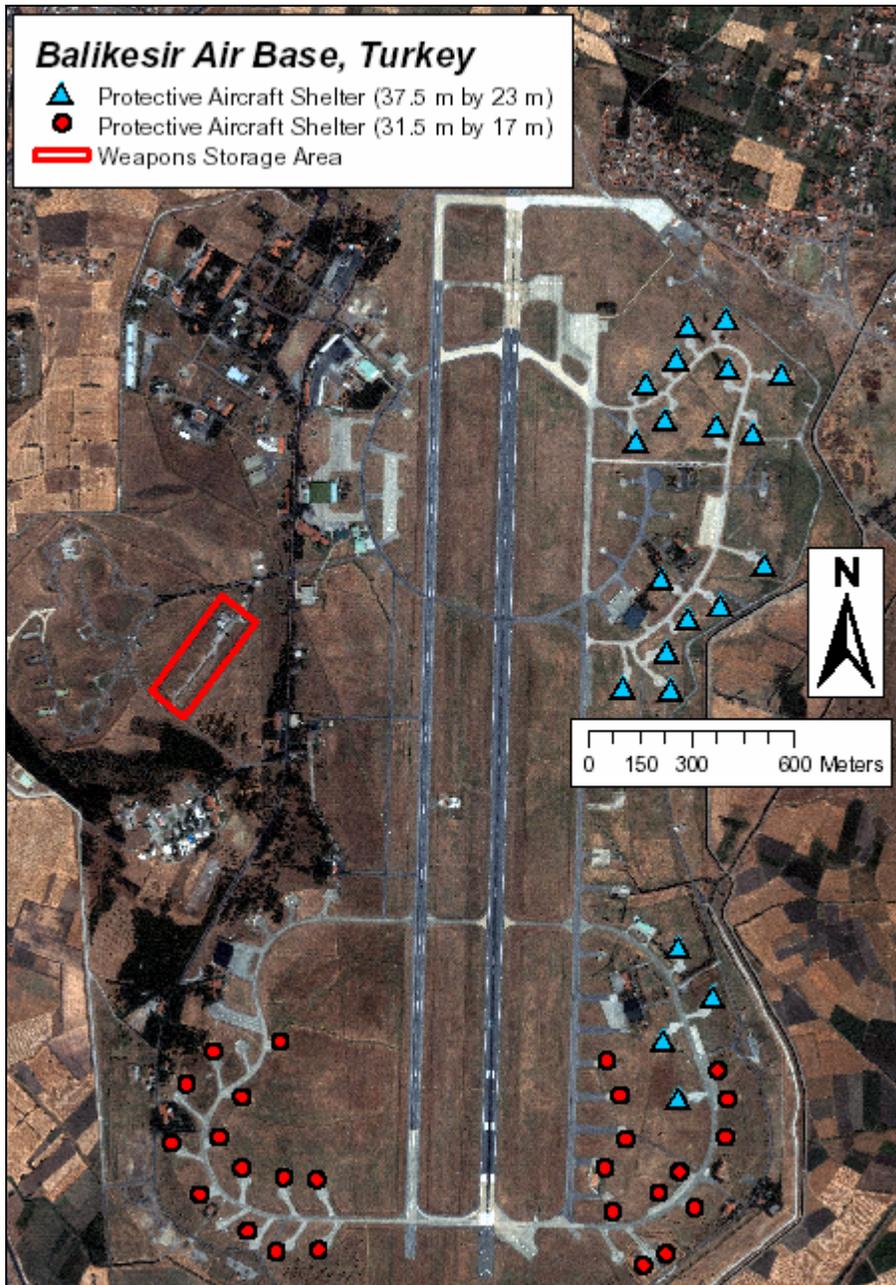
Araxos Air Base, Greece
Aviano Air Base, Italy
Balikesir Air Base, Turkey
Büchel Air Base, Germany
Gheddi Torre Air Base, Italy
Incirlik Air Base, Turkey
Kleine Brogel Air Base, Belgium
Nörvenich Air Base, Germany
RAF Lakenheath, United Kingdom
Ramstein Air Base, Germany
Volkel Air Base, Germany



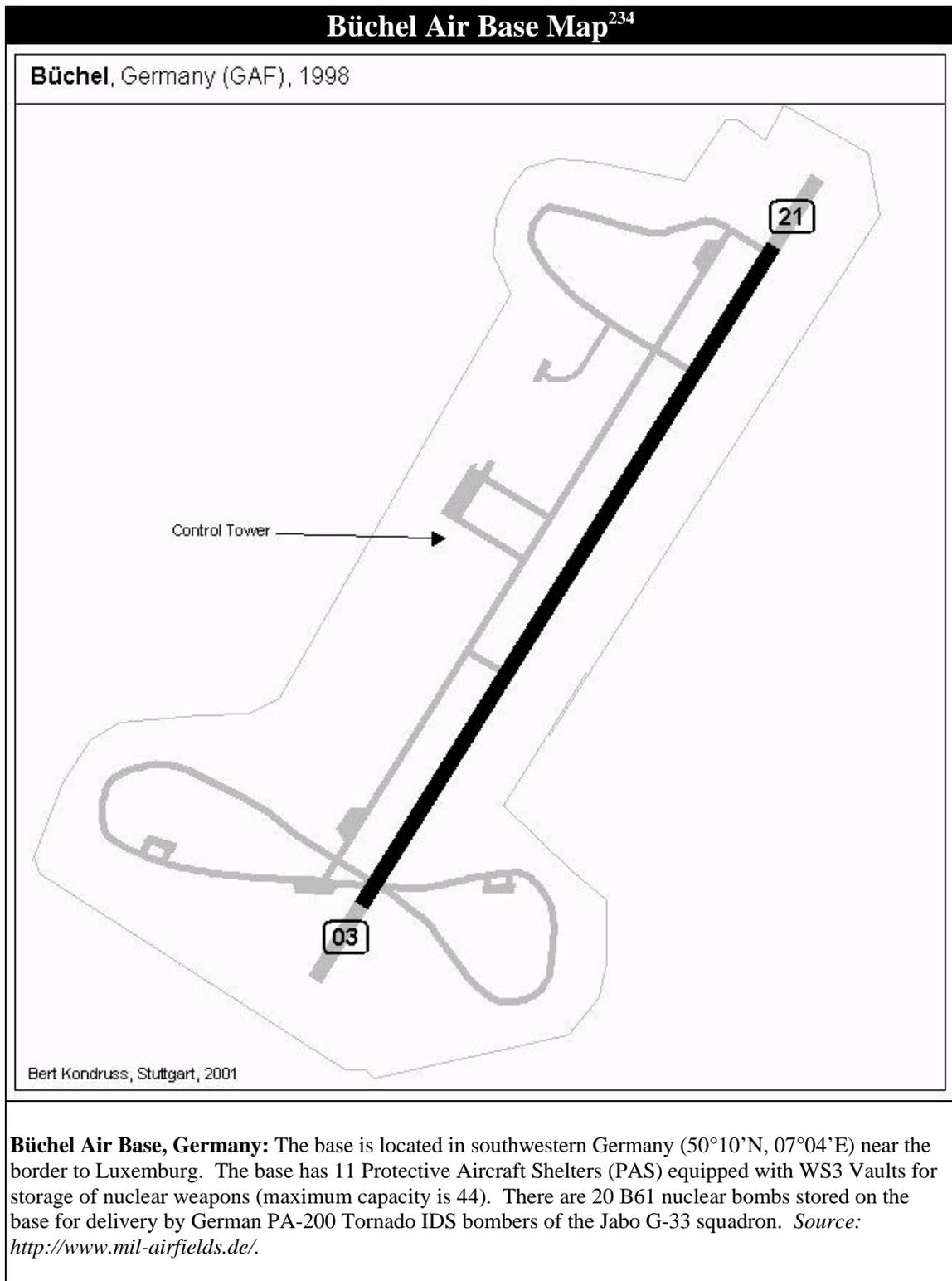
Araxos Air Base, Greece (September 5, 2003): This base is located on the northern tip (38°10'N, 21°25'N) of the island of Peloponnisos. There are 26 small Protective Aircraft Shelters (31.5x17 meters) on the base, six of which are equipped with WS3 Vaults for nuclear weapons storage with a maximum capacity of 44. The vaults were completed in 1997. Prior to that, nuclear weapons were stored in the Weapons Storage Area. The base stored 20 B61 nuclear bombs until the spring of 2001 for delivery by Greek A-7E/H Corsairs II of the 116th Wing's 335 Tiger and 336 Olympus squadrons. *Source: DigitalGlobe.*

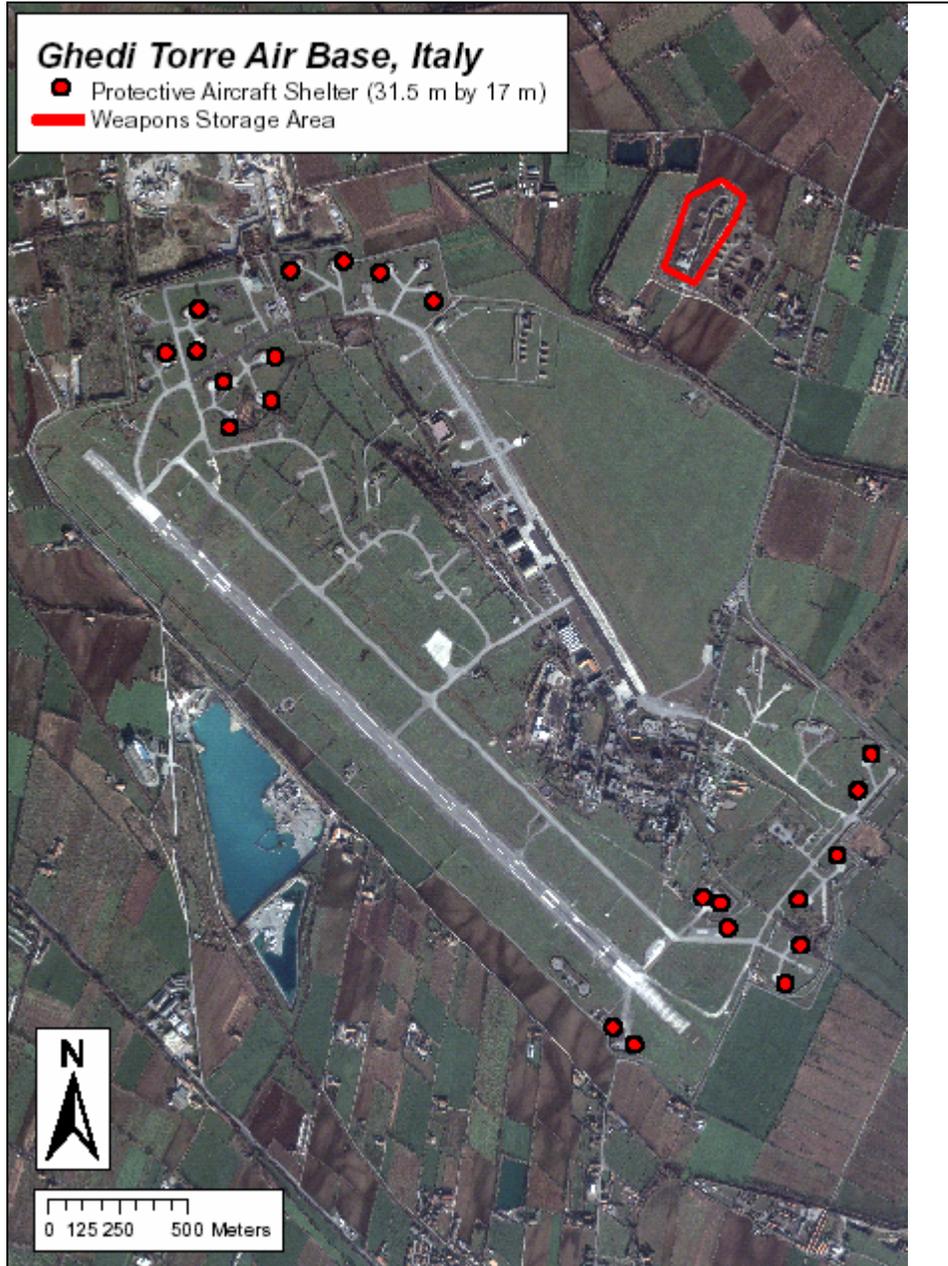


Aviano Air Base, Italy (October 15, 2003): This base is located in northeastern Italy (46°01'N, 12°35'E) near the Slovenian border. There are 49 Protective Aircraft Shelters on the base, 35 of which are large (37.5x23 meters) and the rest small (31.5x17 meters). Eighteen of the shelters are equipped with WS3 Vaults for nuclear weapons storage with a maximum capacity of 72. The vaults were completed in 1996. Prior to that, nuclear weapons were stored in the underground Weapons Storage Area. The base stores 50 B61 nuclear bombs for delivery by U.S. F-16C/D aircraft of the 31st Fighter Wing's 510th and 555th fighter squadrons. *Source: DigitalGlobe.*

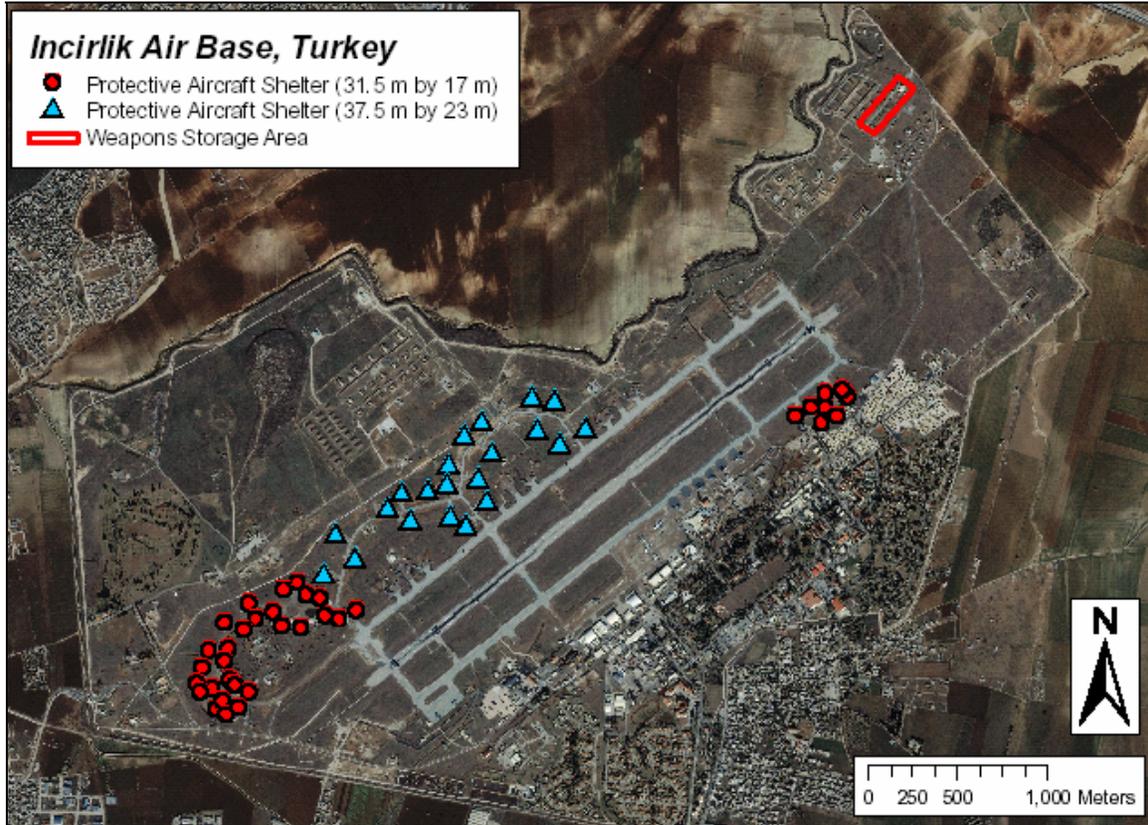


Balıkesir Air Base, Turkey (July 17, 2000): This base is located in western Turkey (39°37'N, 27°56'E). There are 47 Protective Aircraft Shelters (PAS) on the base, 21 of which are large (37.5x23 meters) and 26 smaller (31.5x17 meters) shelters. Six of the shelters are equipped with WS3 Vaults for nuclear weapons storage (maximum capacity of 24). The vaults were completed in 1997. Prior to that, nuclear weapons were stored in the Weapons Storage Area. The base stored 20 B61 nuclear bombs until 1995 for delivery by Turkish F-104G Starfighters (later F-16C/D) of the 9th Wing. Today, weapons are stored at Incirlik Air Base but still earmarked for delivery by the 191st and 192nd squadrons of the 9th Wing. *Source: Space Imaging.*

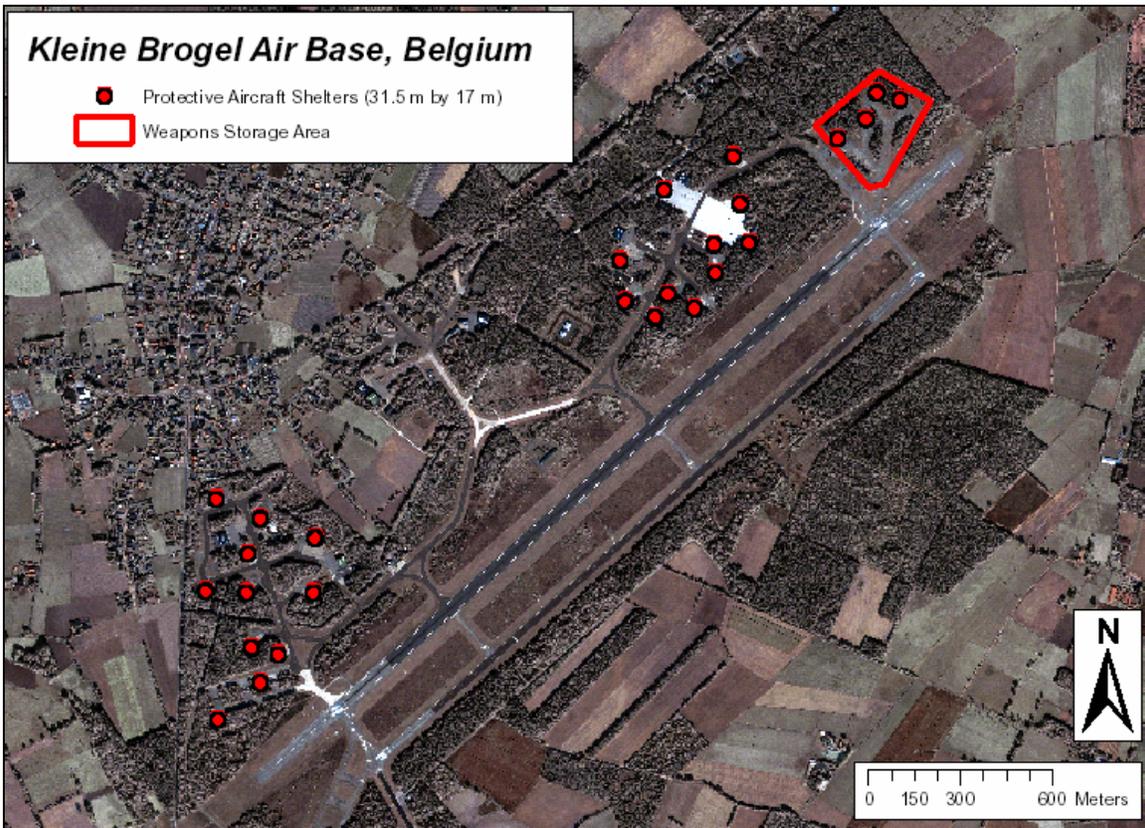




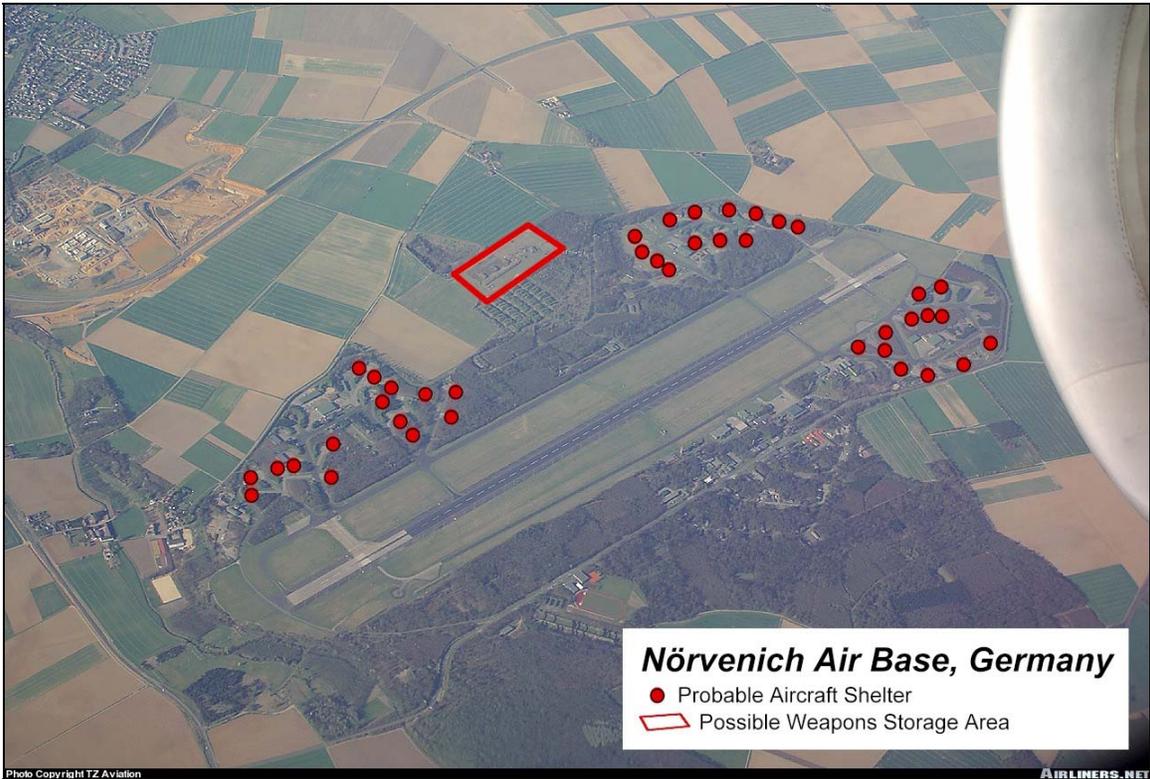
Ghedi Torre Air Base, Italy (January 15, 2003): This base is located in northern Italy (45°25'N, 10°16'E) near the town of Brescia. There are 22 Protective Aircraft Shelters (PAS) on the base, 11 of which are equipped with WS3 Vaults for nuclear weapons storage. The vaults, which have a maximum capacity of 44 weapons, were completed in 1997. Prior to that, nuclear weapons were stored in the Weapons Storage Area. The base stores 40 B61 nuclear bombs for delivery by Italian PA-200 Tornados of 6th Stormo Wing's 102nd and 154th squadrons. *Source: DigitalGlobe.*



Incirlik Air Base, Turkey (December 13, 2002): This base is located in southern Turkey (37°00'N, 35°26'E) near the Syrian border. There are 58 Protective Aircraft Shelters (PAS) on the base, 25 of which are equipped with WS3 Vaults for nuclear weapons storage. The vaults, which have a maximum capacity of 100 weapons, were completed in 1998. Prior to that, nuclear weapons were stored in the Weapons Storage Area. The base stores 90 B61 nuclear bombs, 50 of which are for delivery by U.S. F-16C/Ds from the 39th Fighter Wing, with the remaining 40 earmarked for delivery by the Turkish F-16 fighters of the 4th Wing at Akinci and 9th Wing at Balikesir. *Source: Space Imaging.*



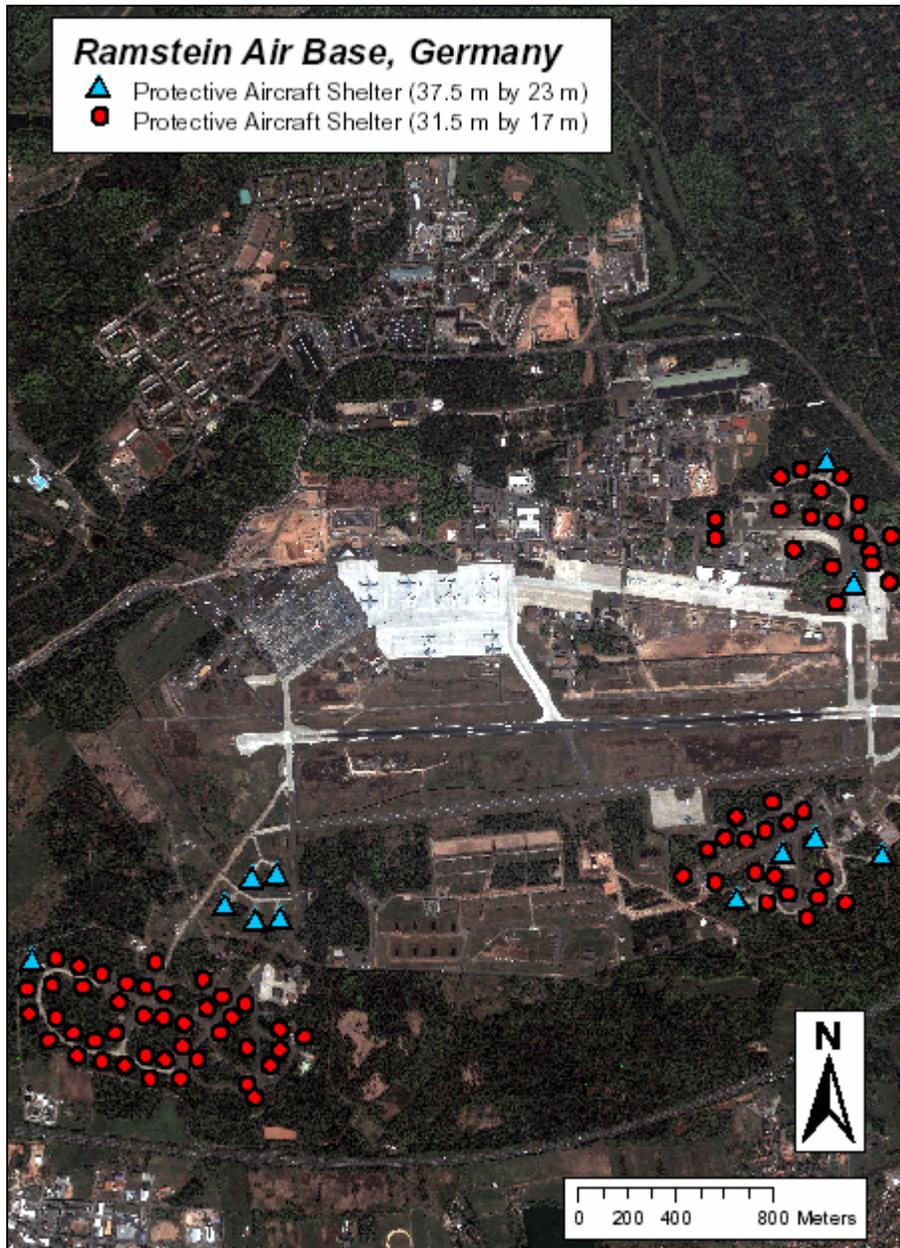
Kleine Brogel Air Base, Belgium (September 21, 2003): This base is located in northeastern Belgium (51°10'N, 05°28'E) near the Dutch border. There are 26 Protective Aircraft Shelters (PAS) on the base of the smaller type (31.5x17 meters), 11 of which are equipped with WS3 Vaults for nuclear weapons. The vaults, which have a maximum capacity of 44 weapons, were completed in 1992. Prior to that, nuclear weapons were stored in the Weapons Storage Area. Kleine Brogel stores 20 B61 nuclear bombs for delivery by Dutch F-16A/Bs of the 10th Wing's 31st and 349th squadrons. *Source: DigitalGlobe.*



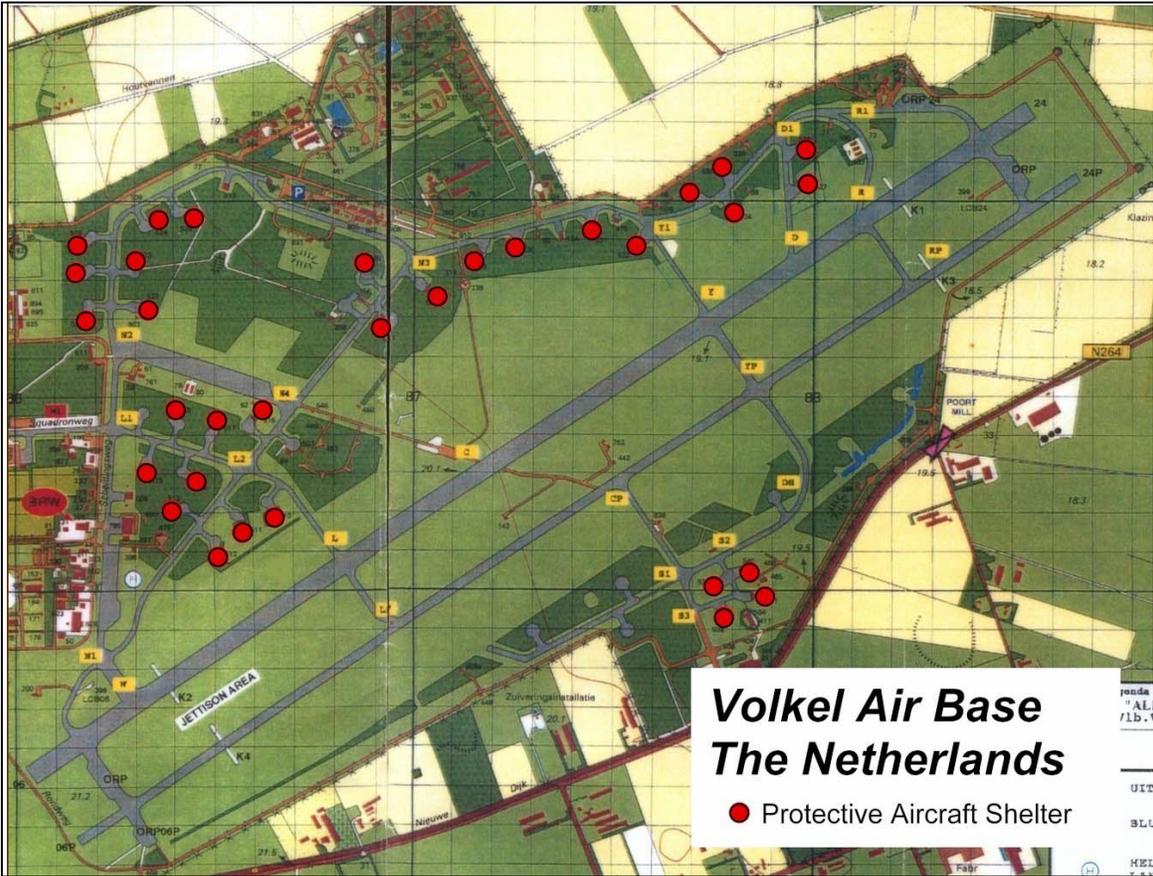
Nörvenich Air Base, Germany (April 15, 2003): The base is located in southwestern Germany (50°50'N, 06°40'E) near Bonn. Identification of Protective Aircraft Shelters (PAS) is uncertain from the low-resolution image available, but 11 of the shelters are known to be equipped with WS3 Vaults for storage of nuclear weapons (maximum capacity is 44). The vaults became operational in 1991. Prior to that, nuclear weapons were probably stored in what is possibly a Weapons Storage Area. Twenty B61 nuclear bombs were moved from the base to Ramstein Air Base in 1995, where they continue to be earmarked for delivery by the German PA-200 Tornado IDS bombers of the Jabo G-31 squadron based at Nörvenich Air Base. *Source: <http://www.airliners.net> (legends added).*



RAF Lakenheath, United Kingdom (March 27, 2003): This base is located in southwest England about 35 kilometers northeast of Cambridge (52°24'N, 00°33'E). There are 60 Protective Aircraft Shelters (PAS) on the base, all of the large version (37.5x23 meters). Thirty-three of these are equipped with WS3 Vaults for nuclear weapons storage. The vaults were completed in 1994. A total of 110 B61 nuclear bombs are stored at the base for delivery by U.S. F-15E of the 492nd and 494th fighter squadrons of the 48th Fighter Wing. *Source: DigitalGlobe.*



Ramstein Air Base, Germany (May 8, 2003): This base is located in southern Germany (49°26'N, 07°36'E) south of Mannheim. There are 90 Protective Aircraft Shelters (PAS) on the base, 12 of which are the large version (37.5x23 meters) and 78 the smaller shelters (31.5x17 meters). Fifty-five of the shelters are equipped with WS3 Vaults for nuclear weapons storage with a capacity of 220. The vaults were completed in 1992. Up to 130 B61 nuclear bombs are stored at the base, depending on the status of the weapons removed from Memmingen Air Base and Araxos Air Base. Of these, up to 90 bombs are for delivery by U.S. F-16C/Ds of the 22nd and 23rd fighter squadrons of the 52nd Fighter Wing based at the nearby Spangdahlem Air Base. Up to 40 of the bombs are for delivery by German Air Force PA-200 Tornados. *Source: DigitalGlobe.*



Volkel Air Base, the Netherlands (July 20, 1999): The base is located in the southeastern parts of the Netherlands (51°39'N, 05°43'E). There are 32 Protective Air Shelters (PAS) on the base, 11 of which are equipped with WS3 Weapons Storage Vaults for nuclear weapons storage with a capacity of 44. The vaults were completed in 1991. Twenty B61 bombs are stored at the base for delivery by Dutch F-16A/Bs of the 311th and 312th fighter squadrons. *Source: Dutch Air Force (legends added).*²³⁵

AB	Air Base
ACC	U.S. Air Combat Command
AFEUR	U.S. Air Forces in Europe
ALT	Alteration
AOI	Area of Interest
AOR	Area of Responsibility
BRAC	Base Realignments and Closures
C3	Command, Control, and Communication
CENTCOM	Central Command
CFE	Conventional Forces Europe, Treaty on
CINC	Command in Chief ²³⁶
CINCEUR	Command in Chief, U.S. European Command
CINCPAC	Commander in Chief, U.S. Pacific Command
CINCSTRAT	Commander in Chief, U.S. Strategic Command
CJCS	Chairman of the Joint Chiefs of Staff
CMS	Code Management System
CONPLAN	Concept Plan
CONUS	Continental United States
DCA	Dual-Capable Aircraft
DOD	Department of Defense
DOE	Department of Energy
DPC	Defence Planning Committee
EAM	Emergency Action message
EUCOM	U.S. European Command
FOIA	Freedom of Information Act
FNPI	Fighter Nuclear Procedures Inspection
FW	Fighter Wing
GLCM	Ground-Launched Cruise Missile
HAS	Hardened Aircraft Shelter
IG	Inspector General
INF	Intermediate-range Nuclear Forces, Treaty on
IOC	Initial Operational Capability
JCS	Joint Chiefs of Staff
JCTP	Joint Contact Team Program
JSCP	Joint Strategic Capabilities Plan
JSF	Joint Strike Fighter
LNSI	Limited/Local Nuclear Surety Inspection
LRINF	Longer-Range Intermediate-range Nuclear Forces
MC	Military Characteristics
MOB	Major Operating Base
MUNSS	Munitions Support Squadron
NATO	North Atlantic Treaty Organisation
NNCCRS	NATO Nuclear Command and Control Reporting System
NNPS	NATO Nuclear Planning System

NPES	Nuclear Planning and Execution System
NPG	Nuclear Planning Group
NPR	Nuclear Posture Review
NPS	Nuclear Precautionary System
NSC	National Security Council
NSI	Nuclear Surety Inspection
NUWEP	Nuclear Weapons Employment Policy
NWDP	Nuclear Weapons Deployment Plan
NWSSG	Nuclear Weapons System Safety Group
OPLAN	Operational Plan
OPDD	Operational Plan Data Document
ORD	Operational Requirements Document
ORI	Operational Readiness Inspection
OSR	Operational Safety Review
PAL	Permission Action Link
PAS	Protective Aircraft Shelter
PDD	Presidential Decision Directive
PRP	Personal Reliability Program
RAF	Royal Air Force
RDT&E	Research, Development, Test, and Evaluation
RSG	Regional Support Group
SACEUR	Supreme Allied Command Europe
SAG	Strategic Advisory Group
SAV	Staff Assistance Visit
SHAPE	Supreme Headquarters Allied Powers Europe
SILVER Books	Strategic Installation List of Vulnerability Effects and Results Books
SIOP	Single Integrated Operational Plan
SLCM	Sea-Launched Cruise Missile
SNL	Sandia National Laboratory
START	Strategic Arms Reduction Treaty
STRATCOM	U.S. Strategic Command
SWPS	Strategic War Planning System
TAC EVAL	Tactical Evaluation
TNO	Theater Nuclear Option
USACOM	U.S. Atlantic Command (now U.S. Joint Forces Command)
WMD	Weapons of Mass Destruction
WMT	Weapons Maintenance Truck
WS3	Weapons Storage and Security System
WSA	Weapons Storage Area
WSV	Weapons Storage Vault

Endnotes

- ¹ Throughout the report it is assumed that there are still some 480 nuclear weapons remaining in Europe. This force level assumes that 20 bombs removed from Araxos, Greece, in 2001, and 20 bombs at Ramstein, Germany, for use by the German wing at Memmingen until 2002 remain at Ramstein. Some or all of these 40 weapons could have been returned to the United States. The nuclear weapons deployment authorization signed by the President on November 29, 2000, permits a deviation from the total 480 deployed in NATO by no more than 10 percent (i.e. 48 weapons). The number of weapons stored within a specific NATO country may vary in the short-term due to maintenance, but if the variance lasts for over one year, the Secretary of Defense must consult the President about the need to update the Directive. It is not known whether President George W. Bush has signed a Presidential Decision Directive regarding nuclear weapons deployment authorization in Europe.
- ² In addition to the air-delivered bombs, an unknown number of nuclear-tipped Tomahawk Land-Attack Missiles (TLAM/N) also support NATO nuclear planning. The TLAM/Ns can be delivered by selected Los Angeles, Improved Los Angeles, and (in the future) Virginia class attack submarines. The missiles are not deployed at sea under normal circumstances but are stored on land at the Strategic Weapons Facility Atlantic (SWFLANT) at Kings Bay, Georgia, on the U.S. east coast. Each TLAM/N carries a W80-0 warhead with a yield of 5-150 kilotons. There are 304 W80-0 warheads in the U.S. stockpile, half of which are at Kings Bay.
- ³ See: Thomas Cochran, Robert S. Norris, and Hans M. Kristensen, "Too Many, Too Slow: The Bush Administration's Stockpile Reduction Plan," Fact Sheet, Natural Resources Defense Council, June 2004, URL <<http://www.nrdc.org/nuclear/fstockpile.asp>>; Robert S. Norris and Hans M. Kristensen, "The B61 Family of Bombs," NRDC Nuclear Notebook, *The Bulletin of the Atomic Scientists*, January/February 2003, URL <<http://www.thebulletin.org/issues/nukenotes/jf03nukenote.html>>.
- ⁴ USAFE, "Munitions Support Squadron Officer Assignment Procedures," USAFE Instruction 36-2104, September 6, 2004, p. 4.
- ⁵ Prior to this structure, the MUNSS at Büchel AB, Kleine Brogel AB, and Volkel AB were assigned to the 52nd Fighter Wing at Spangdahlem AB. "New Group," *Eifel Times*, Spangdahlem Air Base, June 4, 2004, p. 4. The MUNSS at Ghedi Torre AB was previously assigned to the 31st Fighter Wing at Aviano AB.
- ⁶ U.S. Department of Defense, Office of the Assistant to the Secretary of Defense (Atomic Energy), "History of the Custody and Deployment of Nuclear Weapons, July 1945 Through September 1977," February 1978, p. H-2. Partially declassified and released under FOIA to Robert S. Norris.
- ⁷ U.S. Department of Defense, Office of the Assistant to the Secretary of Defense (Atomic Energy), "History of the Custody and Deployment of Nuclear Weapons, July 1945 Through September 1977," February 1978, pp. H-3 – H-5. Partially declassified and released under FOIA to Robert S. Norris.
- ⁸ William M. Arkin, *Code Names: Deciphering U.S. Military Plans, Programs, and Operations in the 9/11 World* (Hanover, New Hampshire: Steerforth Press, 2005), pp. 458, 515, 592, 531.
- ⁹ Protective Aircraft Shelters (PAS) were originally called Hardened Aircraft Shelters (HAS) but were renamed in 2000. U.S. Department of the Air Force, Air Force Instruction 91-113, "Safety Rules for Non-US NATO Strike Aircraft," May 1, 2000, p. 1.
- ¹⁰ U.S. Air Force, Force Protection C2 Systems Program Office, "Weapons Storage & Security (WS3) Program," n.d. [downloaded April 17, 2001]. This information has since been removed from the Air Force web site; Paul Sparaco, WS3 Program Manager, Electronic Systems Center, USAF, "WS3 Sustainment Program: Program Management Review for HQ USAFE/LG," March 3, 2000, p. 10; Paul Sparaco, WS3 Program Manager, Electronic Systems Center, USAF, "Weapons Storage and Security System (WS3) Status Briefing to AF/ILM," December 16, 1997, p. 2. Both documents released under FOIA to Joshua Handler.
- ¹¹ Department of the Air Force, HQ Air Force Safety Center, "Operational Safety Review of the F-15E and F-16C/D Weapon Systems," April 1997, pp. 24-27; Department of the Air Force, HQ Air Force Safety Center, "Operational Safety Review of the Non-US NATO F-16A/B Weapon System," January 1994, pp. 19-23. Both documents partially declassified and released under FOIA.
- ¹² U.S. Department of Defense, Press Release, Contract Number 446-96, July 26, 1996.
- ¹³ "Harold Smith's Goodbye: NATO Weapons-Protection Chairman Lauds Sandia-Designed Vaults, Technology," *Sandia Lab News*, December 20, 1996, p. 9.

- ¹⁴ I am indebted to Otfried Nassauer and Dan Charles for this photo.
- ¹⁵ U.S. Air Force, Force Protection C2 Systems Program Office, “Weapons Storage & Security (WS3) Program,” n.d. [downloaded April 17, 2001]. This information has since been removed from the Air Force web site.
- ¹⁶ HQ USAFE, “Plans and Policy: Implementation of the Treaty on Conventional Armed Forces in Europe,” Directive Number 55-15, February 23, 2003, p. C-3.
- ¹⁷ U.S. Air Force, Cryptologic Systems Group (CPSG), “USAF Weapon Maintenance Truck (WMT) Team,” n.d. [downloaded July 15, 2004].
Initially, 18 Weapon Maintenance Trucks were purchased.
- ¹⁸ U.S. Air Force Inspection Agency, “Function Management Review – USAFE Regionalized Nuclear Weapons Maintenance Concept (RNWMC), PN 94-607, n.d. [1994], p. 3. Partially declassified and released under FOIA.
- ¹⁹ Weidlinger Associates, “Blast-Resistant Structures,” n.d. [downloaded July 15, 2004].
- ²⁰ Defense Threat Reductions Agency, “RDT&E Project Justification,” R-1 Shopping List – Item No. 64-15 of 64-20, Exhibit R-2a (PE 0604222F), February 2004, pp. 772, 773; Paul Sparaco, WS3 Program Manager, Electronic Systems Center, USAF, “WS3 Sustainment Program: Program Management Review for HQ USAFE/LG,” March 3, 2000, p. 12. Released under FOIA to Joshua Handler.
- ²¹ U.S. House of Representatives, Committee on Appropriations, Hearing on the Department of Defense FY 1987 Military Construction Program, Part 5, U.S. Government Printing Office, 1987, p. 216.
- ²² Department of Defense, Office of the Assistance Secretary of Defense (Public Affairs), News Release, “Contract Number: No. 446-94,” July 26, 1996.
- ²³ United States General Accounting Office, “Defense Logistics: Air Force Report on Contractor Support Is Narrowly Focused,” GAO/NSIAD-00-115, April 2000, p. 29.
- ²⁴ E-mail, w/attch, Cole Marcus, MSgt USAFE/LGW, to Paul Sparaco, USAF/Hanscom AFB, et al., “WS3 PMR Minutes (Draft),” March 23, 2000, 4:39 PM. Released under FOIA to Joshua Handler.
- ²⁵ Award, “WS3 NATO Modernization Program Installation Upgrade for Monitoring and Console Equipment, 12 NATO Installations,” *FBOdaily.com*, July 30, 2004.
- ²⁶ Both images from <http://www.nvmygtz.netfirms.com/wmt.htm>
- ²⁶ Paul Sparaco, WS3 Program Manager, Electronic Systems Center, USAF, “WS3 Sustainment Program: Program Management Review for HQ USAFE/LG,” March 3, 2000, p. 19. Released under FOIA to Joshua Handler.
- ²⁸ Sandia National Laboratories, “Sandia Lab Accomplishments 2003,” February 2003.
- ²⁹ Department of Energy, FY2002 Congressional Budget, Weapons Activities/Stockpile Director Work, p. 14 of 28.
- ³⁰ Ken Frazier, “Modernized System to Manage Codes for Nation’s Nuclear Weapons Complete,” *Sandia Lab News*, January 11, 2002, pp. 1, 5.
- ³¹ Ken Frazier, “Modernized System to Manage Codes for Nation’s Nuclear Weapons Complete,” *Sandia Lab News*, January 11, 2002, pp. 1, 5; U.S. Air Force, 52nd Fighter Wing, “Semi-Annual Historical Report: 817th Munitions Support Squadron, 01 January 1996 to 30 June 1996,” n.d. [1996], p. 2. Partially declassified and released under FOIA.
- ³² Department of the Air Force, “Nuclear Weapons Procedures: Maintenance,” Air Force Instruction 21-204, February 17, 2004, pp. 35-36.
- ³³ John German, “Lab-Designed B61 Weapons Trainers Being Delivered to Air Force, NATO Sites Worldwide,” *Sandia Lab News*, October 18, 2002, pp. 1, 4.
- ³⁴ See for example: Robert S. Norris, et al., “Where They Were,” *The Bulletin of the Atomic Scientists*, November/December 1999, pp. 26-35, URL <<http://www.thebulletin.org/issues/1999/nd99/nd99norris.html>>.
- ³⁵ United States Senate, Committee of Foreign Relations, Subcommittee on Security Agreements and Commitments Abroad, “Security Agreements and Commitments Abroad,” 91st Congress, 2d Session, U.S. Government Printing Office, Washington, D.C., 1970, p. 12.
- ³⁶ Command in Chief, U.S. Pacific Command, “CINCPAC Command History 1974,” Volume I, September 25, 1975, p. 262. Partially declassified and released under FOIA. This document is available on the Internet at URL <<http://www.nautilus.org/library/security/foia/japan/CINCPAC74Ip262.pdf>>.
- ³⁷ *Ibid.*, p. 263. Partially declassified and released under FOIA. This document is available on the Internet at URL <<http://www.nautilus.org/library/security/foia/japan/CINCPAC74Ip262.pdf>>.

- ³⁸ Ibid., p. 262. Partially declassified and released under FOIA. This document is available on the Internet at URL <<http://www.nautilus.org/library/security/foia/japan/CINCPAC74Ip262.pdf>>.
- ³⁹ Thomas C. Reed, *At the Abyss: An Insider's History of the Cold War* (Ballantine Books, 2004), p. 173.
- ⁴⁰ "Symington Finds Flaws in NATO's Warhead Security; Greek Incident Hinted," *New York Times*, November 23, 1970.
- ⁴¹ J. W. Finney, "U.S. Delaying Removal of Warheads," *New York Times*, July 24, 1975; as referenced in M. Leitenberg, "Background Materials in Tactical Nuclear Weapons (Primarily in the European Context)," in SIPRI, *Tactical Nuclear Weapons: European Perspectives* (London: Taylor & Francis Ltd., 1978), p. 40.
- ⁴² NATO Nuclear Planning Group, "Final Communiqué," December 10, 1974, paragraph 3.
- ⁴³ NATO Nuclear Planning Group, "Final Communiqué," June 17, 1975, paragraph 7.
Part of the U.S. effort to increase the security of the nuclear weapons occurred under then Defense Secretary of Defense Donald H. Rumsfeld.
- ⁴⁴ NATO Nuclear Planning Group, "Final Communiqué," January 26, 1976, paragraph 6.
- ⁴⁵ The withdrawal of 1,000 warheads was announced at the December 1979 special meeting where NATO also announced its decision to deploy 572 new medium-range missiles. The timeline for the 1,000 warheads was "as soon as feasible." By November 1980, the withdrawal of the 1,000 warheads was "well underway," and by December 12, 1980, the withdrawal had been completed. See: NATO, "Special Meeting of Foreign and Defence Ministers," December 12, 1979, paragraph 7; NATO, Nuclear Planning Group, "Final Communiqué," November 14, 1980, paragraph 6; NATO, North Atlantic Council, "Final Communiqué," December 12, 1980, paragraph 14.
- ⁴⁶ In November 1983, the *New York Times* reported that a confidential DOD report to Congress showed 5,845 nuclear warheads in Europe. Richard Halloran, "Report to Congress Provides Figures for Nuclear Arsenal," *New York Times*, November 15, 1983, p. A15.
- ⁴⁷ The White House, Blue Ribbon Task Group, "Report to the President on Nuclear Weapons Program Management," July 1985, p. 4. Partially declassified and released under FOIA to the U.S. Nuclear Weapons Cost Study Project.
- ⁴⁸ NATO Nuclear Planning Group, "The Montebello Decision: Annex to the Final Communiqué of the Autumn Ministerial Meeting of the NATO Nuclear Planning Group (NPG)," October 27, 1983, paragraph 4.
- ⁴⁹ NATO Nuclear Planning Group, "Final Communiqué," October 30, 1985, paragraph 7; NATO Nuclear Planning Group, "Final Communiqué," March 27, 1985, paragraph 7; NATO Nuclear Planning Group, "Final Communiqué," April 4, 1984, paragraph 5; NATO Nuclear Planning Group, "The Montebello Decision: Annex to the Final Communiqué of the Autumn Ministerial Meeting of the NATO Nuclear Planning Group (NPG)," October 27, 1983, paragraph 7.
- ⁵⁰ Thomas B. Cochran, et al., "The Bomb Book: The Nuclear Arms Race in Facts and Figures," Natural Resources Defense Council, December 1987, p. 25.
Some W84 warheads from the Pershing II were later converted to the B61-10 bomb and returned to Europe where they remain in storage.
- ⁵¹ U.S. Defense Secretary Dick Cheney reportedly wrote a letter to his Turkish counterpart, Safa Gitay, informing him of the planned changes. "US Trim Nuclear Stocks – Turkey," *DPA*, January 30, 1990; Robert S. Norris and William M. Arkin, "Turkey to Loose Some Nuclear Bombs," NRDC Nuclear Notebook, *The Bulletin of the Atomic Scientists*, April 1990, p. 57.
- ⁵² NATO Nuclear Planning Group, "Final Communiqué," May 9-10, 1989 [sic], updated October 27, 2000, paragraph 5.
- ⁵³ U.S. Strategic Command, "Strategic Planning Study," Final Report, 1 October 1993, p. 3-35. Partially declassified and released under FOIA.
- ⁵⁴ NATO Defence Planning Committee and Nuclear Planning Group, "Final Communiqué," December 6-7, 1990, paragraph 7; NATO North Atlantic Council, "London Declaration On A Transformed North Atlantic Alliance," July 5-6, 1990, paragraphs 16, 18.
- ⁵⁵ NATO North Atlantic Council, "London Declaration On A Transformed North Atlantic Alliance," July 5-6, 1990, paragraph 18.
- ⁵⁶ NATO Defence Planning Committee and Nuclear Planning Group, "Final Communiqué," December 6-7, 1990, paragraph 13.
- ⁵⁷ Ibid.

⁵⁸ Ibid., paragraphs 5, 14.

⁵⁹ NATO Defence Planning Committee and Nuclear Planning Group, "Final Communiqué," May 29, 1991, paragraph 14.

⁶⁰ By the eve of the war, Iraqi means for delivering chemical munitions were known to include area bombs and cluster munitions, artillery and mortar shells, and short-range rockets. U.S. Department of the Air Force, *Gulf War Air Power Survey* (Washington, D.C.: Government Printing Office, 1993), Volume II, Part II: Effects and Effectiveness, pp. 312-313.

⁶¹ William M. Arkin, "Gulf War +10: The Secret Story," *The Stars and Stripes*, Special Report, n.d. [2000], Chronology, January 9, 1991.

⁶² James A. Baker, III, with Thomas M. DeFrank, *The Politics of Diplomacy* (New York: Putnam, 1995), p. 359. Emphasis added.

At the beginning of Operation Desert Storm, according to one unclassified estimate, the U.S. had some 1,000 nuclear warheads with its military forces in the region. This included 700 bombs and cruise missiles on aircraft carriers, surface ships and attack submarines, and 300 bombs in Turkey. William M. Arkin, et al., "U.S. Nuclear Weapons in the Persian Gulf Crisis," Greenpeace, January 1991, p. 1.

⁶³ James A. Baker, III, with Thomas M. DeFrank, *The Politics of Diplomacy* (New York: Putnam, 1995), p. 359.

⁶⁴ Ibid.

⁶⁵ R. Jeffrey Smith and Rick Atkinson, "U.S. Rules Out Gulf Use of Nuclear, Chemical Arms," *Washington Post*, January 7, 1991, p. A1.

⁶⁶ Colin Powell, with Joseph E. Persico, *My American Journey* (New York: Random House, Inc., 1995), p. 486.

⁶⁷ William M. Arkin, "Agnosticism When Real Values Are Needed: Nuclear Policy in the Clinton Administration," Federation of American Scientists Public Interest Report, September/October 1994, p. 7.

⁶⁸ Joint Chiefs of Staff, "1991 Joint Military Assessment," Washington, D.C., March 1991, pp. 2-8, 6-1, 7-1 (box), 7-2, 11-12.

For in-depth analysis of how proliferation of weapons of mass destructions influenced U.S. nuclear doctrine and planning in the 1990s, see: Hans M. Kristensen, "Nuclear Futures: Proliferation of Weapons of Mass Destruction and U.S. Nuclear Strategy," British American Security Information Council (BASIC), Washington, DC, March 1998, URL <<http://www.nukestrat.com/pubs/nfuture2.pdf>>; Hans M. Kristensen, "Targets of Opportunity," *The Bulletin of the Atomic Scientists*, September/October 1997, URL <<http://www.bullatomsci.org/issues/1997/so97/so97kristensen.html>>.

⁶⁹ Of warheads removed from Europe included approximately 1,300 artillery warheads and 850 warheads for Lance surface-to-surface missiles. NATO, "NATO's Nuclear Forces in the New Security Environment," NATO Issues, June 3, 2004, p. 3.

⁷⁰ NATO Nuclear Planning Group, "Final Communiqué," October 18, 1991, paragraph 4.

⁷¹ R. Jeffrey Smith, "NATO Approves 50% Cut in Tactical A-Bombs," *Washington Post*, October 17, 1991, p. A28.

In 2004, NATO stated that air delivered gravity bombs were reduced by "well over 50 percent."

⁷² NATO, "NATO's Nuclear Forces in the New Security Environment," NATO Issues, June 3, 2004, p. 3.

⁷³ NATO Nuclear Planning Group, "Final Communiqué," October 18, 1991, paragraph 5.

⁷⁴ NATO Press Release M-DPC/NPG-2(99)157, "Ministerial meeting of the Defence Planning Committee and the Nuclear Planning Group: Final Communiqué," December 2, 1999, paragraph 7.

⁷⁵ NATO Press Release M-DPC/NPG-1(2001)87, "Final Communiqué: Ministerial Meeting of the Defence Planning Committee and the Nuclear Planning Group," June 7, 2001, paragraph 8.

After the NPG meeting in Gleneagles, Scotland in October 1992, NATO declared: "All nuclear warheads from NATO's ground-launched and naval tactical nuclear weapons have now been removed, much earlier than originally envisaged, and...The reductions in the number of air-delivered nuclear weapons, the only remaining sub-strategic systems to be held by the Alliance in Europe, are underway."

⁷⁶ NATO Nuclear Planning Group, "Final Communiqué," October 21, 1992, paragraph 5.

⁷⁷ NATO Press Release M-DPC/NPG-1(1991)87, "Final Communiqué: Ministerial Meeting of the Defence Planning Committee and the Nuclear Planning Group," June 7, 1991, paragraph 8.

⁷⁸ "NATO Nuclear Planning Group Communiqué," *NATO Review*, Vol. 39, No. 6, December 1991, pp. 26, 29.

- 77 "Rome Summit," *NATO's Sixteen Nations*, December 1991, p. 58.
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- ¹⁰⁷ *Ibid.*, pp. 1, 2. Partially declassified and released under FOIA.
- ¹⁰⁸ *Ibid.*; U.S. Strategic Command/J513, “NSNF Working Group Meeting Minutes of 12 Apr 94,” April 14, 1994, p. 1. Both documents partially declassified and released under FOIA.
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- ¹¹⁰ U.S. Strategic Command/J513, Memorandum for the Record, “NSNF Working Group Meeting Minutes of 29 Mar 94,” March 31, 1994, p. 1. Italics added. Partially declassified and released under FOIA.
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- ¹¹² Chairman of the Joint Chiefs of Staff, “CJCS Counterproliferation Missions and Functions Study Final Report,” n.d. [March 1995], p. B-3-1. Partially declassified and released under FOIA.
- ¹¹³ *Ibid.*, p. B-3-10.
- ¹¹⁴ NATO Press Communiqué M-DPC/NPG-1(94)38, “Final Communiqué,” May 24, 1994, paragraph 11.
- ¹¹⁵ Donna Haseley, “NATO Revamps Nuclear Planning to Put Premium on Last-Minute Battle Plans,” *Inside the Air Force*, n.d. [1993].
- ¹¹⁶ Defense Information System Agency/DITCO-SCOTT, “Encore Task Order (TO) Statement of Work (SOW),” attached to Contract DCA200-02-D-5014, as of July 22, 2002, p. 1; U.S. Strategic Command, “STRATCOM Targeting, Analysis, and Mission Planning Support Study,” January 1998 (Revised March 1998), p. 30. Partially declassified and released under FOIA.
- ¹¹⁷ Hans M. Kristensen, “Preemptive Posturing,” *The Bulletin of the Atomic Scientists*, September/October 2002.
- ¹¹⁸ Department of the Air Force, HQ USAFE Office of History, “History of United States Air Forces in Europe, Calendar Year 1992,” Volume I, September 28, 1993, p. 551; Department of the Air Force, HQ USAFE Office of History, “History of United States Air Forces in Europe, Calendar Year 1994,” Volume I, July 11, 1995, p. 717. Both documents partially declassified and released under FOIA.
- ¹¹⁹ In 1996, two years after the addition of the Tunisian range, the African Nuclear-Weapon-Free Zone Treaty (Treaty of Pelindaba) was signed. The treaty bans the use, threat of use, testing or stationing of any nuclear explosive device. This does not appear to prohibit testing of B61 training weapons, however, since these do not contain a nuclear device. Tunisia has signed but not ratified the treaty, which has not entered into force due to lack of sufficient ratifications.
- The U.S. Navy also used the range (although Navy aircraft were denuclearized after the 1994 Nuclear Posture Review) and described in 1997 how exercises with the Tunisian Air Force “provide out forces an opportunity for bombing practices on Tunisian ranges, replicating the conditions under which they may have to fly actual strike missions against a desert target.” Vice Admiral Steve Abbot, U.S. Navy, Commander Sixth Fleet, Statement Before the Joint Hearing by the Committee on Readiness and Subcommittee Military Personnel of the House of Representatives on Unit Readiness, People, and Quality of Life,” March 4, 1997.
- ¹²⁰ Herbert Welmers, “Cornfield Range Homepage,” n.d. [downloaded October 28, 2004], URL <<http://www.geocities.com/cornfield12000/>>. Reprinted with permission.
- ¹²¹ U.S. Strategic Command, “Overview of Nuclear Posture Review (NPR) Results,” n.d. [ca. September 22, 1994], p. 1. Released under FOIA.
- The decision suggests that the U.S. force level in Europe at the time the NPR was completed already had dropped to 480 weapons.
- ¹²² John Deutch, Deputy Secretary of Defense, Hearing Before the Committee on Armed Services: Briefing on Results of the Nuclear Posture Review, September 22, 1994, S. HRG. 103-870, U.S. Government Printing Office, 1994, p. 15.
- ¹²³ *Ibid.*, p. 16.

¹²⁴ R. Jeffrey Smith, "Clinton Decides to Retain Bush Nuclear Arms Policy," *Washington Post*, September 22, 1994, p. A1.

For an accord of the 1994 Nuclear Posture Review, see Janne Nolan, *An Illusive Consensus* (Brookings Institution Press, 1999). For a review of U.S. Strategic Command force structure studies during the 1990s, see Hans M. Kristensen, "The Matrix of Deterrence," The Nautilus Institute, May 2001, URL <<http://www.nukestrat.com/pubs/matrix.pdf>>.

¹²⁵ *The Washington Post* report on September 22, 1994, that part of the NPR decision was to retain 480 nuclear bombs in Europe. R. Jeffrey Smith, "Clinton Decides to Retain Bush Nuclear Arms Policy," *Washington Post*, September 22, 1994, p. A1.

¹²⁶ John Deutch, Deputy Secretary of Defense, Hearing Before the Committee on Armed Services: Briefing on Results of the Nuclear Posture Review, September 22, 1994, S. HRG. 103-870, U.S. Government Printing Office, 1994, p. 27.

Deutch apparently got this information from an NPR briefing slide that stated that the "NATO stockpile [was] cut by 91%" since 1988. U.S. Department of Defense, Briefing, "Nuclear Posture Review," September 22, 1994, slide 29.

¹²⁷ John Deutch, Deputy Secretary of Defense, statement before House Foreign Affairs Committee, Hearing on United States Nuclear Policy, October 5, 1994, *Reuter Transcripts* 10/05/94, p. 30.

¹²⁸ NATO Press Communiqué M-DPC/NPG-2(94)126, "Final Communiqué," December 15, 1994, paragraph 19.

¹²⁹ *Ibid.*

¹³⁰ Department of the Air Force, HQ USAFE Office of History, "History of United States Air Forces in Europe, Calendar Year 1994," Volume I, July 11, 1995, p. 252. Partially declassified and released under FOIA.

¹³¹ Department of Defense, OSD/PA, "Press Conference [re. Nuclear Posture Review]," News Release 545-94, September 22, 1994; Michael R. Boldrick, "The Nuclear Posture Review: Liabilities and Risk," *Parameters: US Army College Quarterly*, Volume XXV, No. 4, Winter 1995-96, 100.

Seven years later, in December 2001, the subsequent Nuclear Posture Review conducted by Bush administration would also claim to have abolished MAD.

¹³² Mission termination for the 7401 MUNSS at Rimini AF was March 1, 1993. HQ USAFE/XP, "Rimini AB PROTAF I, 15-20 Feb 93," September 14, 1998, p. 4. Released under FOIA.

¹³³ "Two Air Force Detachments in Turkey Close," *AirForceLINK* News Article, May 20, 1996; Department of the Air Force, HQ USAFE Office of History, "History of United States Air Forces in Europe, Calendar Year 1994," Volume I, July 11, 1995, p. 9. Partially declassified and released under FOIA.

The nuclear weapons withdrawal from Nörvenich AB was completed in December 1995. After this, it took a week to deactivate all WS3 vaults. U.S. Air Force, 604th Munitions Support Squadron, "Semi Annual History July-December 1995," p. 1. Released under FOIA.

Both the 604 MUNSS at Nörvenich AB and the 605 MUNSS at Memmingen AB were scheduled for closure by September 30, 1996. HQ USAFE, Organizational Charts, n.d. [1995], slide 30. Released under FOIA.

¹³⁴ Department of the Air Force, HQ USAFE Office of History, "History of United States Air Forces in Europe, Calendar Year 1994," Volume I, July 11, 1995, pp. 72-74. Partially declassified and released under FOIA.

The MUNSS were tasked by the USAFE commander through the HQ USAFE staff or numbered air forces for support of contingencies or war. The operational chain of command did not run through Regional Support Groups (RSGs) commander for purposes of contingency and wartime tasking. *Ibid.*, p. 73.

¹³⁵ Department of Defense/OASD(PA), "Additional U.S. Overseas Bases to End Operations," News Release No. 228-95, April 27, 1995.

¹³⁶ "Two Air Force Detachments in Turkey Close," *Air Force News*, May 20, 1996.

¹³⁷ Department of the Air Force, "The History of 16 Air Forces, 1 January-31 December 1996," n.d. [1997], pp. 29-31. Partially declassified and released under FOIA.

¹³⁸ NATO Press Communiqué M-DPC/NPG-1(95)57, "Final Communiqué," June 8, 1995, paragraph 23.

¹³⁹ The deactivation of the WS3 vaults is mentioned in: Paul Sparaco, WS3 Program Manager, Electronic

Systems Center, “Weapons Storage and Security System (WS³) Status Briefing to AF/ILM, December 16, 1997, p. 4. Released under FOIA to Joshua Handler.

The reorganization in Europe also led to the rumor in 1996 that U.S. nuclear weapons had been withdrawn from RAF Lakenheath. This was not the case, with 110 weapons remaining at the base. For a report of this rumor, see: Christopher Bellamy, “Wing of Change as US Removes Last Nuclear Bombs From Britain,” *Independent*, October 28, 1996, p. 3.

¹⁴⁰ NATO Press Communiqué Press Communiqué M-DPC/NPG-1(95)57, “Final Communiqué,” June 8, 1995, paragraph 23.

¹⁴¹ Department of Defense, OASD(PA), News Release, “Contract Number: No. 446-94,” July 26, 1996.

¹⁴² NATO Press Communiqué M-DPC/NPG-1(96)88, Meeting of the Defence Planning Committee in Ministerial Session, “Final Communiqué,” June 13, 1996, paragraph 8.

¹⁴³ Air Combat Command, “History of the Air Combat Command, 1 January-31 December 1995,” n.d. [1996], p. 83. Partially declassified and released under FOIA.

¹⁴⁴ SSS, Almeida, Lt Col, ACC/DONP, “Reassigning CONUS-based Dual Capable Aircraft (DCA) Taskings,” May 10, 1996, p. 2. Partially declassified and released under FOIA.

¹⁴⁵ Message, Almeida, R., Lt Col, ACC/DONP, to HQ ACC, “CONUS-Based Dual Capable Aircraft Readiness Posture,” May 15, 1996, p. 1; Message, Almeida, R., Lt Col, ACC/DONP, to HQ ACC, et al., “CONUS-Based Dual Capable Aircraft Readiness Posture,” May 10, 1996, pp. 1, 2. Both documents partially declassified and released under FOIA.

¹⁴⁶ Air Combat Command, “History of the Air Combat Command, 1 January-31 December 1998,” n.d. [1999], p. 45. Partially declassified and released under FOIA.

¹⁴⁷ Air Combat Command, “History of Air Combat Command, 1 January –31 December 1998,” n.d. [1999], pp. 45, 46; IOI (S/DECL X-4), ACC/DONP to ACC/CC, “Dual Capable Aircraft (DCA) Fighter-Nuclear Readiness Change (U),” 13 Apr 98. Both documents partially declassified and released under FOIA.

This adjustment coincided with NATO lowering the readiness level of its DCAs from a response time of “hours/days” to “weeks/months.” In 2002, NATO placed all its aircraft on “months” readiness. NATO, “NATO’s Nuclear Forces in the New Security Environment,” NATO Issues, June 3, 2004, p. 6.

¹⁴⁸ NATO Press Release M-DPC/NPG-1(97)70, “Final Communiqué: Ministerial Meetings of the Defence Planning Committee and the Nuclear Planning Group,” June 12, 1997, paragraph 11.

The wording of the paragraph addressing Russian non-strategic nuclear weapons was: “Russia still retains a large number of tactical nuclear weapons of all types. We renew our call upon Russia to bring to completion the reductions in its tactical nuclear weapons announced in 1991 and 1992, and to further review its tactical nuclear weapons stockpile with a view towards making additional significant reductions.”

¹⁴⁹ Msg (S/DECL x4), 121705Z Dec 97, USCINCEUR/ECDC to JCS/J3 et al., “CONUS-based Dual Capable Aircraft (DCA) Readiness Requirements (U), pp. 1-2. Partially declassified and released under FOIA.

¹⁵⁰ *Ibid.*, p. 2.

USCINCEUR’s claim about the accuracy of DCA is in stark conflict with internal assessments made by DOD personnel as part of the current updating of the Doctrine for Joint Nuclear Operations (Joint Pub 3-12). According to the Joint Staff, “[n]uclear capable aircraft may have many advantages. Accuracy (as compared to other systems) is not one of them.” European Command (EUCOM) added that, “there is no current precision nuclear strike capability in the inventory.” Department of Defense, “Joint Staff Input to JP 3-12, *Doctrine for Joint Nuclear Operations* (Second Draft),” April 28, 2003, p. 43. Italics in original.

¹⁵¹ *Ibid.*

¹⁵² NATO, “Study on NATO Enlargement,” September 1995, p. 20.

¹⁵³ *Ibid.*

¹⁵⁴ Department of the Air Force, HQ Air Force Safety Center, “Operational Safety Review of the F-15E and F-16C/D Weapon Systems,” April 1997, pp. 6-11; SSS (U), ACC/DONP, “Operational Plan Data Document (OPDD) for Dual Capable Aircraft,” February 18, 1997. Both documents partially declassified and released under FOIA.

¹⁵⁵ Department of the Air Force, HQ Air Force Safety Center, “Operational Safety Review of the F-15E and F-16C/D Weapon Systems,” April 1997, p. 1. Partially declassified and released under FOIA.

- ¹⁵⁶ Ibid., pp. 1, 2.
- ¹⁵⁷ Ibid., pp. 39-40.
- ¹⁵⁸ Ibid., p. 41.
- ¹⁵⁹ U.S. Department of the Air Force, Air Force Instruction 91-113, "Safety Rules for Non-US NATO Strike Aircraft," May 1, 2000, p. 1.
- ¹⁶⁰ NATO Press Release M-DPC/NPG-1(2000)59, "Final Communiqué: Ministerial Meeting of the Defence Planning Committee and the Nuclear Planning Group on 8 June 2000," June 8, 2000, paragraph 7.
- ¹⁶¹ Walter Slocombe, "Is there Still a Role for Nuclear Deterrence," *NATO Review* (web edition), Vol. 45, No. 6, November/December 1997, pp. 23-26.
- ¹⁶² Air Combat Command, "History of Air Combat Command, 1 January –31 December 1998," n.d. [1999], p. 47. Partially declassified and released under FOIA.
1998 was a busy year for the 4th Fighter Wing in support of regional nuclear war planning. In June of that year, the wing's F-15Es simulated a similar nuclear strike against North Korea. See: Hans M. Kristensen, "Preemptive Posturing," *The Bulletin of the Atomic Scientists*, September/October 2002, pp. 54-59, URL <<http://www.thebulletin.org/issues/2002/so02/so02kristensen.html>>.
- ¹⁶³ Memo/1 Atch (U), ACC/DONP to ACC/AD), Question on Gen Marcottes Note, 3 Jul 97. Released under FOIA.
- ¹⁶⁴ For a review of how proliferation has affected U.S. nuclear strategy and doctrine, see: Hans M. Kristensen, "Changing Targets II," Greenpeace International, April 2003, URL <<http://www.nukestrat.com/pubs/ChangingTargets2.pdf>>; Hans M. Kristensen, "Proliferation of Weapons of Mass Destruction and U.S. Nuclear Strategy," British American Security Information Council (BASIS), Washington, DC, March 1998, URL <<http://www.nukestrat.com/pubs/nfuture2.pdf>>; Hans M. Kristensen, "Targets of Opportunity," *The Bulletin of the Atomic Scientists*, September/October 1997, URL <<http://www.bullatomsci.org/issues/1997/so97/so97kristensen.html>>.
- ¹⁶⁵ William S. Cohen, U.S. Defense Secretary, DoD News Briefing, Monday, November 23, 1998 - 10 a.m.
- ¹⁶⁶ NATO Press Release NAC-S(99)65, "The Alliance's Strategic Concept Approved by the Heads of State and Government participating in the meeting of the North Atlantic Council in Washington D.C. on 23rd and 24th April 1999," April 24, 1999, paragraphs 46, 62-64.
The Strategic Concept ended with the statement that, "sub-strategic nuclear weapons will...not be deployed in normal circumstances on surface vessels and attack submarines." Tactical nuclear weapons were removed from U.S. Navy and Royal Navy warships in 1991-1992 and both countries later denuclearized their surface vessels. France is the only NATO nuclear power that has retained a nuclear capability for surface vessels (aircraft carriers), so the statement suggests that the current French aircraft carrier (Charles de Gaulle) does not carry nuclear weapons under normal circumstances.
- ¹⁶⁷ NATO Press Release NAC-S(99)65, "The Alliance's Strategic Concept Approved by the Heads of State and Government participating in the meeting of the North Atlantic Council in Washington D.C. on 23rd and 24th April 1999," April 24, 1999, paragraph 63.
- ¹⁶⁸ NATO Press Release M-DPC/NPG-1(2000)59, "Final Communiqué: Ministerial Meeting of the Defence Planning Committee and the Nuclear Planning Group," June 8, 2000, paragraphs 2, 7.
- ¹⁶⁹ NATO Press Communiqué M-DPC/NPG-2(2000)115, "Final Communiqué: Ministerial Meeting of the Defence Planning Committee and the Nuclear Planning Group," December 5, 2000, paragraph 8.
- ¹⁷⁰ Department of the Air Force, HQ USAFE, Special Order GD-17, April 6, 2001. Released under FOIA.
The 731 MUNSS at Araxos was formally removed from the Pentagon's Defense Acquisition Regulation Supplement and announced on the Federal Register on April 30, 2003. U.S. Department of Defense, "DFARS Change Notice 20030430," April 30, 2003.
- ¹⁷¹ "Gov't on Removal of US Nuclear Weapons From Western Greece Base," *BHMA.net* (ANA), January 18, 2001; "The Greek Government did not Comment on the Nuclear Arms in Araxos," *Macedonian Press Agency*, January 17, 2001.
- ¹⁷² Rear Admiral Craig R. Quigley, U.S. Deputy Assistant Secretary of Defense, Public Affairs, Department of Defense News Transcript, January 30, 2001.
- ¹⁷³ Robert S. Norris and William M. Arkin, "U.S. Nuclear Weapons Stockpile, July 1994," NRDC Nuclear Notebook, *The Bulletin of the Atomic Scientists*, July/August 1994, p. 62.
- ¹⁷⁴ Department of the Air Force, Headquarters United States Air Forces in Europe, Special Order GD-17, April 6, 2001. Released under FOIA.

¹⁷⁵ “Gov’t on Removal of US Nuclear Weapons From Western Greece Base,” *BHMA.net* (ANA), January 18, 2001; “Araxos Air-Base Closed in May. NATO Disassociates Cases of Leukemia From the Use of Depleted Uranium Weapons,” *Hellenic Radio* (ERA), January 17, 2001.

¹⁷⁶ One media report stated that Araxos AB would be closed down at the end of May 2001. “Araxos Air-Base Closed in May. NATO Disassociates Cases of Leukemia From the Use of Depleted Uranium Weapons,” *Hellenic Radio* (ERA), January 17, 2001.

¹⁷⁷ This flexibility permits would permit a return of the Araxos weapons (and those from Memmingen AB) to the United States without requiring a change to the NWDP. Whether this happened is not known.

¹⁷⁸ See for example: “Greece: Hellenic Air Force – HAF,” *F-16.net*, 2003 (downloaded September 10, 2004).

A contract awarded by the U.S. Air Force in July 2004 for upgrade of the WS3 system involves work at 12 sites, which suggest that the vaults at Araxos Air Base may be maintained, at least for now, in a caretaker status.

¹⁷⁹ Incirlik AB is the only base in Turkey that stores nuclear weapons. Most of these are for U.S. fighters, but the base also stores the 40 bombs that moved from Akinci and Balikesir in 1995.

¹⁸⁰ The 20 weapons from Memmingen AB may have been returned to the United States following the closure of the base in 2003.

¹⁸¹ The 604 MUNSS at Nörvenich AB and the 605 MUNSS at Memmingen AB closed on September 30, 1996. HQ USAF, Organizational Charts, n.d. [1995], slide 16. Released under FOIA.

¹⁸² “Tornado IDS des jaboG 34 im Abshiedslack,” *fliegerrevue.de*, n.d. [2001].

¹⁸³ The new structure plan for the Luftwaffe was issued on January 29, 2001. Otfried Nassauer/BITS, “In our [sic] Out? – Nuclear Weapons in Germany,” n.d. [2001].

¹⁸⁴ U.S. Air Force, 52nd Fighter Wing, “Semi-Annual Historical Report: 817th Munitions Support Squadron, 01 January 1996 to 30 June 1996,” n.d. [1996], p. 1. Partially declassified and released under FOIA.

Between 1985, when the JaboG 33 Tornados first assumed the NATO nuclear strike mission, and 2000, the squadron has undergone at least 19 nuclear related inspections for certification for its nuclear strike mission.

¹⁸⁵ U.S. Air Force, 52nd Fighter Wing, “Semi-Annual Historical Report: 817th Munitions Support Squadron, 01 January 1996 to 30 June 1996,” n.d. [1996], p. 1. Partially declassified and released under FOIA.

¹⁸⁶ Deutscher Bundestag, “Schriftliche Fragen mit den in der Woche von 12. Juli 2004 eingegangenen Antworten der Bundesregierung,” Drucksache 15/3609, July 16, 2004, pp. 27-28; “Germany Launches Wide-Ranging Defense Reform,” *nationaldefensemagazine.org*, December 2003.

¹⁸⁷ Reprinted with permission.

¹⁸⁸ NATO Press Release M-DPC/NPG-1(2001)87, “Final Communiqué: Ministerial Meeting of the Defence Planning Committee and the Nuclear Planning Group,” June 7, 2001, paragraph 5.

¹⁸⁹ NATO, “The Alliance’s Strategic Concept agreed by the Heads of State and Government participating in the meeting of the North Atlantic Council,” November 8, 1991, paragraph 55.

¹⁹⁰ NATO Press Release M-DPC/NPG-1(2001)87, “Final Communiqué: Ministerial Meeting of the Defence Planning Committee and the Nuclear Planning Group,” June 7, 2001, paragraph 4.

¹⁹¹ The White House, Office of the Press Secretary, “Remarks by the President to Students and Faculty at National Defense University,” May 1, 2001.

¹⁹² NATO Press Release M-DPC/NPG-1(2001)87, “Final Communiqué: Ministerial Meeting of the Defence Planning Committee and the Nuclear Planning Group,” June 7, 2001, paragraph 6.

¹⁹³ U.S. Department of Defense, Office of Secretary of Defense, “Nuclear Posture Review Report,” December 31, 2001, p. 44.

¹⁹⁴ *Ibid.*, pp. 38, 44.

¹⁹⁵ NATO Press Release 2002-071, “Final Communiqué: Ministerial Meeting of the Defence Planning Committee and the Nuclear Planning Group,” June 2, 2002, paragraphs 6, 7; NATO Press Release M-DPC/NPG-1(2001)87, “Final Communiqué: Ministerial Meeting of the Defence Planning Committee and the Nuclear Planning Group,” June 7, 2001, paragraph 8.

¹⁹⁶ “New Group,” *Eifel Times* (Spangdahlem AB) June 4, 2004, p. 3.

¹⁹⁷ NATO Issue Paper, “NATO Nuclear Forces in the New Security Environment,” June 3, 2004, pp. 4, 5.

¹⁹⁸ *Ibid.*

¹⁹⁹ NATO Press Release 2003-64, “Ministerial Meeting of the Defence Planning Committee and the Nuclear Planning Group: Final Communiqué,” June 12, 2003, paragraph 14.

- ²⁰⁰ NATO Issue Paper, “NATO Nuclear Forces in the New Security Environment,” June 3, 2004, p. 6.
- ²⁰¹ NATO Press Release 2003-64, “Ministerial Meeting of the Defence Planning Committee and the Nuclear Planning Group: Final Communiqué,” June 12, 2003, paragraph 10.
- ²⁰² NATO Press Release 2004-147, “Final Communiqué: Ministerial Meeting of the Defence Planning Committee and the Nuclear Planning Group,” December 1, 2003, paragraphs 9, 10.
- ²⁰³ Tech. Sgt. Tammy Brubaker, “39th SFS Gear Up For Surety Inspection,” 39th Wing Public Affairs, April 25, 2003.
- ²⁰⁴ “Engineer of the Week,” *HENAAC*, December 15, 2003.
- ²⁰⁵ “General Says Russia Won’t Destroy Tactical Nuclear Weapons,” *Interfax*, November 26, 2003.
- ²⁰⁶ U.S. Department of State, “Press Roundtable at Interfax: Stephen G. Rademaker, Assistant Secretary of State for Arms Control,” October 6, 2004, p. 5.
- ²⁰⁷ U.S. Department of State, “Press Roundtable at Interfax: Stephen G. Rademaker, Assistant Secretary of State for Arms Control,” October 6, 2004, p. 5.
For an overview of the status of U.S. and Russian reductions in tactical nuclear weapons since 1991, see: Joshua Handler, “The 1991-1992 PNIs and the Elimination, Storage, and Security of Tactical Nuclear Weapons,” chapter two in Brian Alexander and Alistair Millar, *Tactical Nuclear Weapons* (Washington, D.C.: Brassey’s Inc., 2003), pp. 20-41.
- ²⁰⁸ Ministry of Foreign Affairs of the Russian Federation, “Alexander Yakovenko, the Spokesman of Russia’s Ministry of Foreign Affairs, Answers a Russian Media Question at Press Conference at IRA Novosti Concerning Russia’s Initiatives for Reducing Tactical Nuclear Weapons,” October 7, 2004 (unofficial translation).
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- ²³⁴ A satellite image of Büchel Air Base was not available. The map used is from the German website Military Airfield Directory (<http://www.mil-airfields.de/>) and is reprinted with permission.
- ²³⁵ A satellite image of Volkel Air Base was not available. The map used is an excerpt from a detailed base map provided online by the Dutch organization Onkruit (<http://www.contrast.org/onkruit/axies/vokelmap.html>).
- ²³⁶ Commander in Chief (CINC) has formally been changed to Combatant Commander (CC).