

**The September 1991 PNIs
and the Elimination, Storing and Security Aspects of TNWs**

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Overview¹

Presidential Nuclear Initiatives (PNI) and TNW²

- Not treaties, but also not empty promises -- Public pledges, for the most part unconditional
- Key Commitments -- Removal of TNW from deployments, elimination and consolidation

Status of Implementation of PNIs

- United States and Russia -- -- Removals, Elimination, Consolidation

Conclusions from the NGO Perspective

Elimination

- Verification -- Quite a bit known, but need more openness -- could substitute for more rigorous verification measures and underscore utility of unilateral initiatives
- U.S. inactive nuclear stockpile and Russian TNW build capacity underscore still need an answer to reversibility problem

Security

- Now TNW security problem approximately same as for Strategic Nuclear Weapons (SNW)

Future of TNW

- Uncertain -- Some pressure to keep, some pressures to reduce, e.g. WTC attack
- As fulfill Nuclear Non-Proliferation Treaty Article VI commitments, a world of low-numbers of TNW preferable to a world of low-numbers of SNW

1 The author would like to thank the Ploughshares Foundation and the John Merck Fund in conjunction with the Natural Resources Defense Council for support for research involving satellite imagery.

2 In terms of the choice of which TNWs to include in the U.S. PNI, the historical context was important. Brent Scowcroft wrote that: -The reunification of Germany made short range TNW "undesirable"; South Korea was suggesting the removal of U.S. TNW; "A number of countries," including Japan and New Zealand, had problems with the U.S. Navy carrying nuclear weapons into their ports and the U.S. neither confirm nor deny policy; Nuclear ASW weapons were no longer the "preferred" way to attack submarines. As a result, he then recommended the U.S. get rid of all TNW except air-delivered ones; George Bush and Brent Scowcroft, *A World Transformed*, (Knopf, 1998), pp. 536-547.

In regards to naval TNW, this is an interesting frank admission by a high policy-maker that public protests (of which there were many in the 1980s against U.S. nuclear-capable and armed vessels) and foreign concerns led directly to their withdrawal and the elimination of most.

For more on the genesis of President Bush's 27 September proposals see: John E. Yang, "Bush Plan Emerged After Failed Coup: White House Wanted to Take Advantage of Timing, Officials Say," *The Washington Post*, 28 September 1991; Andrew Rosenthal, "Bush's Arms Plan: Arms Plan Germinated in Back-Porch Session," *The New York Times*, 29 September 1991; Doyle McManus, "Bush Acted to Help Gorbachev Control A-Arms," *The Los Angeles Times*, 29 September 1991; Michael Beschloss and Strobe Talbott, *At the Highest Levels*, (Little Brown, 1993); Colin L. Powell, *My American Journey*, (Ballantine, 1995), James Baker, *The Politics of Diplomacy*, (Putnam, 1995).

For Gorbachev's reaction see: interview with Gorbachev, "Gorbachev-Bush Proposals 'A Serious Advance Towards a Nonnuclear World'," *Central Television, First All Union Programme*, 28 September 1991. For background on Gorbachev's reaction, see Pavel Palazchenko's description of the initial response of Gorbachev and his advisors; Pavel Palazchenko, *My Years with Gorbachev and Shevardnadze*, (The Pennsylvania State University Press, 1997). Also, One of Gorbachev's key advisors, Anatoly Chernyaev mentions the Kremlin's positive reaction briefly in regards to strategic nuclear weapons, saying Gorbachev's response to Bush did not meet with the "usual resistance and delays on the part of the military;" Anatoly Chernyaev, *My Six Years with Gorbachev*, English and Tucker, trans, (The Pennsylvania State University Press, 1997).

**Removal, Elimination and Consolidation of TNWs:
 Presidents Bush, Gorbachev and Yeltsin's September 1991, October 1991, January 1992
 Respective Commitments and President Clinton's September 1994 Nuclear Posture Review**

	Presidents Bush and <i>Clinton</i> ¹	Presidents Gorbachev and <i>Yeltsin</i> ²
Army	- Eliminate All -- missiles, artillery. -Proposed to eliminate mines. -U.S. no longer deployed.	- Eliminate All -- missiles, artillery, "mines" -Confirm.
Navy	- Remove All -- from ships, submarines and land-based aircraft. -Eliminate "many." -- Store rest centrally. -Propose USSR to do same. -1994 NPR denukes surface fleet. -Keep SLCMs.	- Remove All -- from ships, submarines and land-based aircraft -Eliminate Some -- Store rest in central bases. -Proposed to eliminate all if U.S. agreed. -Eliminate 1/3.
Air Force	- Remove from Korea. -Eliminate "many."-- Store rest centrally. -Propose USSR to do same. -Keep weapons in Europe. -Keep weapons in Europe and U.S. DCA.	-Proposed to transfer to central storage sites if the U.S. agreed to do the same. -Eliminate 1/2. -Repeats transfer proposal.
Air Defense	-Proposed to USSR to eliminate all. -U.S. no longer deployed.	- Remove All -- from operational forces -Eliminate Some -- Store rest in central bases. -Eliminate 1/2.

1 President George Bush, "New Initiatives to Reduce U.S. Nuclear Forces," *U.S. Department of State Dispatch*, 30 September 1991, Vol. 2, No. 39; U.S. Department of Defense, "DOD Review Recommends Reduction in Nuclear Forces," Press Release and accompanying "Nuclear Posture Review" briefing, 22 September 1994.

2 M.S. Gorbachev, "Gorbachev Proposals on Nuclear Arms Control," *Central Television, First All Union Programme*, 5 October 1991; President Yeltsin's Disarmament Statement, 29 January 1992, *Moscow Teleradiokompaniya Ostankino Television First Program Network*, 29 January 1992; "Boris Yeltsin's Statement on Arms Control," *ITAR-TASS*, 29 January 1992.

1991 -- U.S. Weapon Systems to be Removed, Eliminated under the PNIs¹

Army (Marine Corps) -- Eliminate all ~2,150 missile and artillery weapons Lance missile -- Eliminate 850 Lance warheads (~150 ER in U.S.) Artillery -- Eliminate ~1,300 artillery shells 3 types -- two 8 in and one 155 mm W-33 8 in ~500 to be returned to U.S. W-48 155mm ~ 500 W-48s to be returned to U.S. W-79 8 in -- (W79-1ER in U.S.) -- all to be eliminated
Navy -- Remove ~500 TNW usually at sea aboard surface ships and submarines B-57 Depth Bomb -- Eliminate all ~900 land and sea-deployed SLCM ~100 usually at sea; returned to the U.S.
Air Force (Navy/Marine Corps*) Strike Bombs B-57 Strike bomb* -- Keep, but some eliminated Tactical bomb -- B61-2* -5* / B61-3,-4,-10 -- Keep B-61

-1,700 of 2,150 Lance and artillery warheads are deployed overseas - 450 in U.S.

-At least 3,050 warheads in total to be eliminated - 850 Lance, 1,300 Artillery, 900 Depth bombs

-1994 Nuclear Posture Review denuclearizes U.S. surface ships.

- Nuclear SLCM (sea-launched cruise missile) capability removed.

- **U.S. aircraft carriers no longer to carry B61 bombs for strike aircraft -- -2 and -5 mods are dismantled.**

Note: Other TNW systems -- such as Army Atomic Demolition Munitions (ADM), Ground-launched Cruise Missile (GLCM), Honest John and Pershing 1a and 2 missiles and Navy AAW missiles, ASROC and SUBROC anti-submarine warfare (ASW) rockets -- retired prior to September - October 1991 PNIs and thus not included in PNIs.

Their warheads were dismantled during 1980s and 1990s, except for GLCM W84 warhead which is retained in the inactive stockpile.²

1 Defense Secretary Dick Cheney, Chairman of the Joint Chiefs of Staff Gen. Colin Powell, "Defense Department Briefing: Details of President Bush's Arms Proposal," 27 September 1991; Pete Williams, "Defense Department Briefing," 1 October 1991; Cochran et al, *U.S. Nuclear Forces and Capabilities, Nuclear Weapons Databook, Volume I*, (Ballinger, 1984); Natural Resources Defense Council (NRDC) Nuclear Notebook, "U.S. Nuclear Weapons Stockpile," *Bulletin of the Atomic Scientists*, June 1991 and June 1992.

2 In addition to sources cited in elimination section below, see: Andrew Weston-Dawkes, U.S. DOE, Office of Declassification, "Enduring Stockpile -- 1998," 2 October 1998 FAX, released under the Freedom of Information Act (FOIA) to Princeton University's Program on Science and Global Security (PSGS).

Implementation of PNIs -- A. U.S. TNW Removals

Accomplished By:

	1991	1992	1993	1994
Army				
Europe		Y ¹		
Korea	Y ²			
U.S.				Y ³
Navy				
Surface Ships		Y		
Submarines		Y		
Aircraft		Y		
Air Force				
Europe			Y ⁴	
Korea	Y			

1 "Today I can tell you that all of the planned withdrawals are complete. All ground-launched tactical nuclear weapons have been returned to U.S. territory, as have all naval tactical nuclear weapons. Those weapons designated to be destroyed are being retired and scheduled for destruction," President George Bush, "Statement on the United States Nuclear Weapons Initiative," 2 July 1992.

According to the U.S. Air Force's 6th Airlift Squadron history, the removal of U.S. nuclear weapons from Europe during 1991-1992, was "the largest nuclear weapons movement in United States' history." The 6th Airlift Squadron conducted Prime Nuclear Airlift Force (PNAF) missions, i.e. it had the main responsibility for airlifting U.S. nuclear weapons to and from Europe, while based at McGuire AFB, NJ. Over 1,600 PNAF missions were conducted between 1971 and 1993; McGuire AFB website, downloaded 8 November 2000.

2 South Korean President Roh Tae Woo announced on national television that no nuclear weapons were now in South Korea; James Sterngold, "Seoul Says It Now Has No Nuclear Arms," *The New York Times*, 19 December 1991.

3 "No nuclear weapons remain in the custody of US ground forces;" U.S. Department of Defense, "DOD Review Recommends Reduction in Nuclear Forces," Press Release and accompanying "Nuclear Posture Review" briefing, 22 September 1994.

4 "On the basis of President Bush's 1991 Nuclear Initiative, NATO took the decision to reduce the number of nuclear weapons available for its sub-strategic forces in Europe by over 85 percent. These reductions were completed in 1993;" Press Release M-DPC/NPG-1(2001)87, "Final Communiqué: Ministerial Meeting of the Defence Planning Committee and the Nuclear Planning Group," 7 June 2001.

Implementation of PNIs -- B.1 Elimination of U.S. TNWs¹

Warhead	System	Phase VII Retirement	Eliminated		Dismantled FY97 - FY00	Nos. Dismantled FY90-FY97	1991 PNI Commitment to Eliminate
			From	To			
Army (Marine Corps)							
W-70	Lance	FY 92	Feb 92	Nov 96		1,170	850
W-33	8in	FY 92	?	?			500 at least
W-48	155mm	FY 93	Apr 92	Apr 96		759	500 at least
W-79	8in		Jun 98²	FY 2003	Y	3	~300 ?
Total Army						1,932	2,150
Navy							
B-57*	ND/SB	FY 93	Nov 89	Mar 95		2,242	900 NDB
W-80-0	SLCM				Y		
Total Navy						2,242	900 NDB
Total Army + Navy						4,174	3,050
Air Force (Navy/Marine Corps*) Strike Bombs							
B-57	See Navy						
B61-2*	Bomb		Jun 96	Mar 97		1,159 all B61 mods	
B61-5*	Bomb		Mar 97	Aug 97			
B61-3, -4, -10	Bomb				Y		

Some Questions:

- More Lance missile warheads eliminated than stated to exist to be eliminated in 1991.
- Number of W-33 artillery warheads eliminated and the dates of starting and completing elimination.
- How many W-79 artillery warheads were to be eliminated and what will be total Army warheads eliminated.
- Does the 2,242 B-57 bomb warheads equal all the B-57 depth bomb and strike variants?
- What portion of the 1,159 B-61 bomb warheads dismantled are B61-2 and -5 mods?

1 C. Bruce Tarter, Director, University of California, Lawrence Livermore National Laboratory, "The Department of Energy's Budget Request for FY 1998," Hearing of the Subcommittee on Strategic Forces Committee on Armed Services U.S. Senate, 19 March 1997; U.S. Department of Energy, "Nuclear Weapons Disassembly (by Weapons Program) at Pantex Plant," "Pantex Plant Nuclear Weapons Disassembly History by Weapons System," "Nuclear Warhead Dismantlement 1997-1999 and 2000," and "Retired/Cancelled Weapons," all released under FOIA or from DOE Public Affairs to Princeton University's PSGS.

2 U.S. Defense Nuclear Facilities Safety Board, *Tenth Annual Report to Congress*, February 2000. According to this report there were "many difficulties encountered by DOE while readying the W79 for dismantlement." Also see: John Gordon, Undersecretary for Nuclear Security and Administrator, National Nuclear Security Administration, U.S. Energy Department, Statement before the Senate Appropriations Subcommittee on Energy and Water Development, 26 April 2001.

Implementation of PNIs -- B.2 Elimination of U.S. TNWs

Total Number of U.S. TNW and SNW Nuclear Weapons Dismantled and Eliminated 1990-1999¹										
1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	Total
1,154	1,595	1,303	1,556	1,369	1,393	1,064	~498	~1,062	~207	11,201

1 U.S. Department of Energy (DOE), "Nuclear Weapons Disassembly History FY1980 through FY1997," and "Nuclear Warhead Dismantlement 1997-1999 and 2000," released under FOIA or from DOE Public Affairs to Princeton University's PSGS.

After FY 1996, DOE stopped releasing specific information about the number of dismantled warheads which were eliminated (i.e. not being re-assembled and returned to the stockpile). Thus the numbers for 1997-1999 are for the total number of dismantled warheads. However, only approximately slightly more than 5 percent of all dismantled warheads during the 1990s were re-assembled and returned to the stockpile. If the same situation pertained during 1997-1999, then the total number of eliminated warheads during 1990-1999 is approximately 11,100.

NOTE: After 1999, the DOE has stopped releasing the numbers of warheads dismantled, making it even harder to verify the status of the implementation of the PNIs.

Implementation of PNIs -- C.1 Consolidation of U.S. TNWs

"Nuclear weapons storage locations have been reduced by over 75 percent, between 1988 and 1994"¹

-Recent reductions/consolidation -- Navy sites from four to two.

- **Atlantic:** Naval Weapons Station Yorktown, VA, transfers SLCMs to Strategic Weapons Facility Atlantic summer of 1997. Stored with Trident warheads near King's Bay, GA, Trident SSBN base.²
- **Pacific:** NAS North Island, San Diego, CA, transfer SLCMs to Strategic Weapons Facility Pacific. Stored with Trident warheads near Bangor, WA, Trident SSBN base.³

Number of U.S. Nuclear Weapon Storage Sites 1985, 1992, 2001⁴			
	1985	1992	2001
Storage Sites			
Domestic	39	34	12
Overseas	125	16	10
Total	164	50	22
Number of U.S. States with nuclear weapons		25	12
Number of U.S. States with TNW			4
Europe -- 10 Bases in 7 Countries with U.S. TNW (B61 bombs)			
Kleine Brogel AB, Belgium; Buchel AB, Germany; Ramstein AB, Germany; Spangdahlem AB, Germany; Araxos AB, Greece; Aviano AB, Italy; Ghedi Authorization Bill, Italy; Vokel AB, The Netherlands; Incirlik AB, Turkey; RAF Lakenheath, U.K.			

1 U.S. Department of Defense, "DOD Review Recommends Reduction in Nuclear Forces," Press Release and accompanying "Nuclear Posture Review" briefing, 22 September 1994.

2 Naval Surface Warfare Center, Indian Head Division, Detachment McAlester, "War Reserve Weapons Maintenance and Logistics: Nuclear Weapons Consolidation," *Navy Nuclear Weapons Digest*, Third/Fourth Quarters 1997; released under the FOIA to Princeton University's PSGS.

3 E.g. Director, Strategic Systems Programs, "Completion Inspection at Strategic Weapons Facility Pacific," letter 5 March 1998 to the Chief of Naval Operations (N41); released under the FOIA to Princeton University's PSGS.

4 William Arkin and Richard Fieldhouse, *Nuclear Battlefields: Global Links in the Arms Race*, (Ballinger, 1985); Greenpeace/NRDC, *Taking Stock: U.S. Nuclear Deployments at the End of the Cold War*, (1992); William Arkin, Robert Norris, Joshua Handler, *Taking Stock: Worldwide Nuclear Deployments, 1998*, (NRDC, March 1998); Hans Kristensen and Joshua Handler, "Appendix 6A. Tables of Nuclear Forces," *SIPRI Yearbook 2001*; Electronic Systems Center, Hanscom AFB, "WS3 (Weapons Storage and Security System) Sustainment Program," Program Management Review Briefing for USAFE LG, 3 March 2000, released under the FOIA to Princeton University's PSGS.

Implementation of PNIs -- C.2 Consolidation of U.S. TNWs

U.S. TNW Consolidation from 1991 to 2001¹		
	1991 TNW Locations	2001
Army/Marine Corps		
Lance	Europe, CA, NM, NY, TX	---
Artillery	Europe, Korea, CA, NM, NY, TX	---
Navy		
B-57 depth bomb	Eur, Pacific, AK, CA, FL, HI, ME, TX, VA	---
SLCM	Europe (IT), Pacific (Guam), CA, HI, NJ, SC, VA	GA, WA
Air Force (Navy/Marine Corps*) Tactical Bombs		
B-57 bomb*	Europe, Pacific, NM, NV	---
B61-2* -5* bombs	Europe, Pacific, Korea, CA, FL, HI, NM, NV, VA	---
B61-3,-4,-10 bombs	Europe, Pacific, CA, FL, HI, NM, NV, VA	Europe, NV, NM

1 William Arkin and Richard Fieldhouse, *Nuclear Battlefields: Global Links in the Arms Race*, (Ballinger, 1985); Greenpeace/NRDC, *Taking Stock: U.S. Nuclear Deployments at the End of the Cold War*, (1992); William Arkin, Robert Norris, Joshua Handler, *Taking Stock: Worldwide Nuclear Deployments, 1998*, (NRDC, March 1998); Hans Kristensen and Joshua Handler, "Appendix 6A. Tables of Nuclear Forces," *SIPRI Yearbook 2001*; Electronic Systems Center, Hanscom AFB, "WS3 (Weapons Storage and Security System) Sustainment Program," Program Management Review Briefing for USAFE LG, 3 March 2000, released under the FOIA to Princeton University's PSGS.

Implementation of PNIs -- C.3 Consolidation of U.S. TNWs

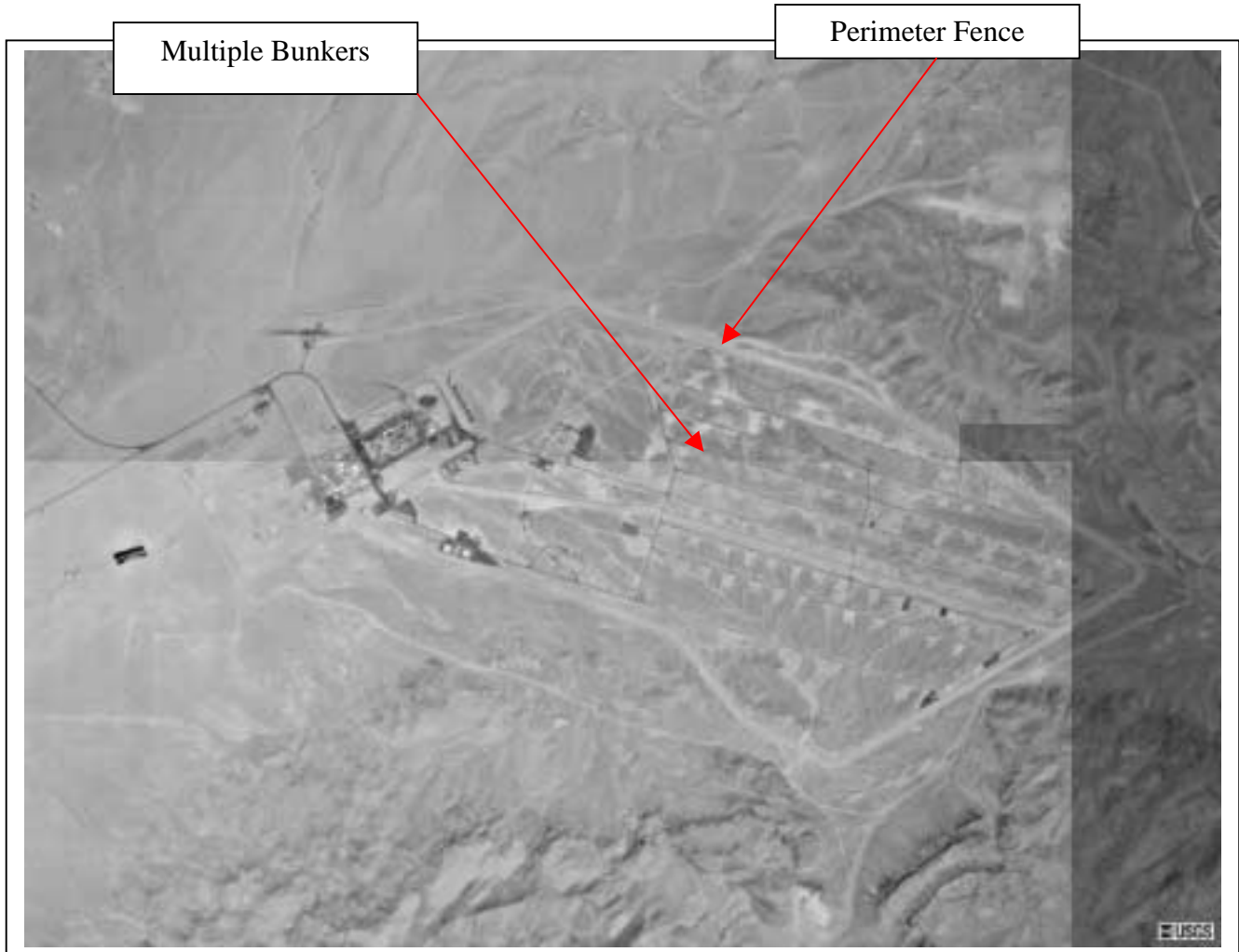
U.S. Nuclear Weapons Storage Complex The Kirtland Underground Munitions Storage Complex near Albuquerque, New Mexico¹



¹ USGS Black and White Aerial photo taken 6 October 1996 available from Microsoft Terraserver.
Color cut-away drawing from: U.S. Army Corps of Engineers' Protective Design Center.

Implementation of PNIs -- C.4 Consolidation of U.S. TNWs

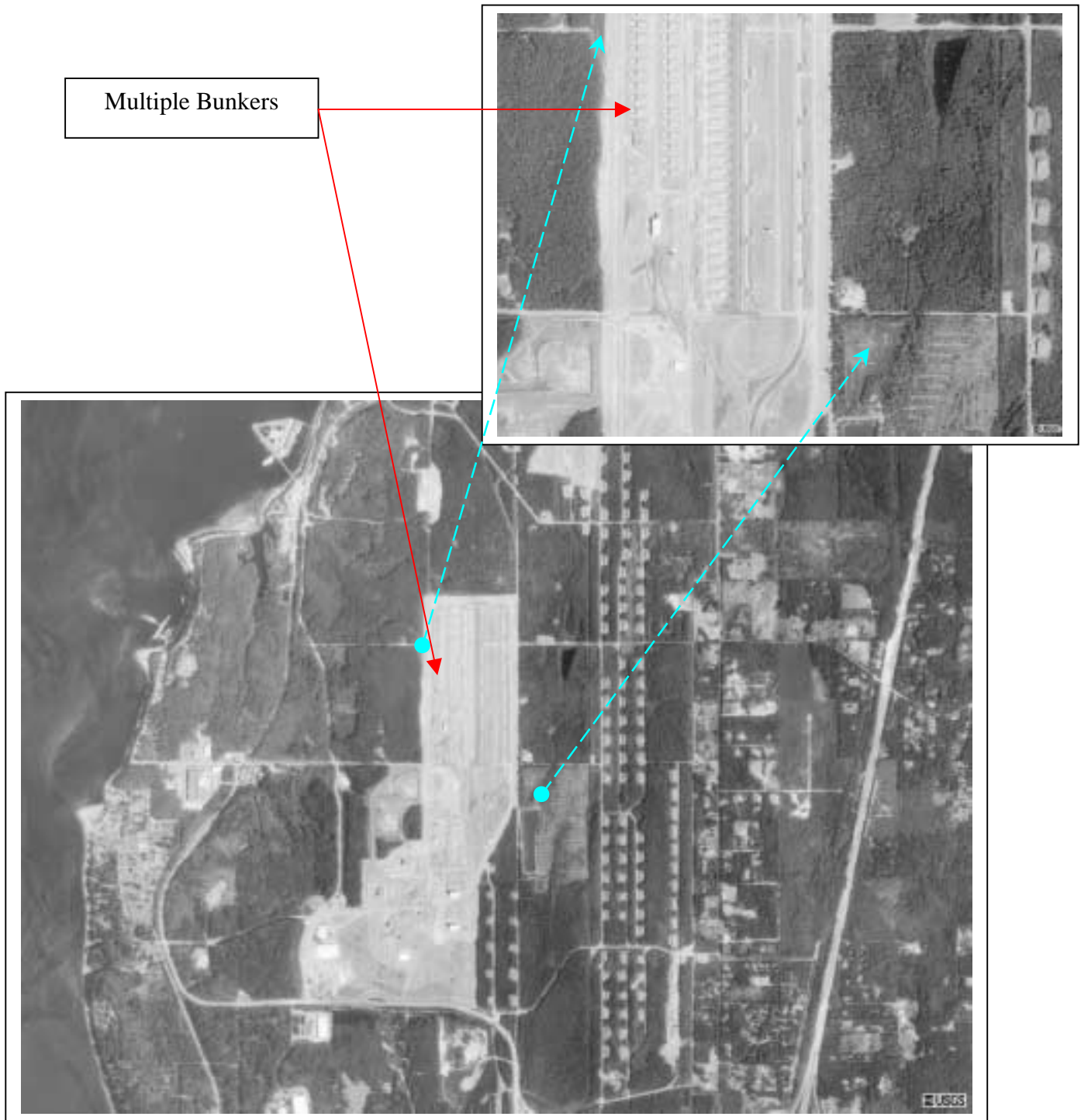
Nuclear Weapons Storage Area (WSA) at Nellis AFB, Nevada¹



¹ USGS Black and White Aerial photo taken 2 May 1990 available from Microsoft Terraserver.

Implementation of PNIs -- C.5 Consolidation of U.S. TNWs

Strategic Weapons Facility, Pacific,
near the Bangor Trident Submarine Base, Washington¹



¹ USGS Black and White Aerial photo taken 7 July 1994 available from Microsoft Terraserver.

Implementation of PNIs -- D. Decline in Number of U.S. Nuclear Certified Military Units

Number of Nuclear Weapons Certified Units in the U.S. Military by Service 1989-2000¹												
	CY89	CY90	FY91	FY92	FY93	FY94	FY95	FY96	FY97	FY98	FY99	FY00
Army	141	139	139	1	1	1	1	0	0	0	0	0
Navy	187	200	200	81	31	29	34	36	38	38	38	38
Air Force	49	44	44	35	35	30	26	22	27	21	21	21
Marines	17	18	18	0	0	0	0	0	0	0	0	0
Total	394	401	401	117	67	60	61	58	65	59	59	59

Dramatic decline:

Army/Marines -- No more nuclear units.

Navy -- Reflect denuclearization of surface ships, support ships, naval air stations, and weapons stations.

Note: Also many U.S. nuclear-attack submarines (SSNs) not nuclear-certified, only ~20 of some 50 SSNs in fleet.

Air Force -- Missile, Bomber and Fighter/bomber wings, support units.

¹ Information obtained under the FOIA from DSWA and from U.S. Defense Threat Reduction Agency Public Affairs by Princeton's PSGS.

1991 -- Soviet/Russian Weapon Systems to be Removed and Eliminated under the PNIs

	Eliminated By	
Army ¹	2000	-All nuclear warheads on three types of shorter-range missiles
	2000	-All nuclear warheads for six types of artillery guns of 152mm, 203mm, and 240mm caliber
	1998	-All nuclear "mines"
Navy	1995 ² or <i>End of 1996</i> ³	-One-third.
Air Force	By 1996 or <i>End of 1997</i>	-One-half.
Air Defense	By 1996 or <i>End of 1996</i>	-One-half.

1 Vladimir Lobov, General of the Army, "The Motherland's Armed Forces Today and Tomorrow," *Krasnaya Zvezda*, 29 November 1991; Gen. Vitally Yakovlev, "Realization of Reduction and Limitation Programs for Nuclear Weapons and the Opportunity of an Information Exchange on Amount of Produced Fissile Materials and Their Localization," Talk prepared for the U.S.-Russian Workshop on CTB, Fissile Material Cutoff and Plutonium Disposal," 15-17 December 1993, Washington, DC, Natural Resources Defense Council, Federation of American Scientists, Moscow Physical-Technical Institute.

2 Vladimir Lobov, General of the Army, "The Motherland's Armed Forces Today and Tomorrow," *Krasnaya Zvezda*, 29 November 1991; Gen. Vitally Yakovlev, Talk Prepared for the U.S.-Russian Workshop of CTB, Fissile Material Cutoff and Plutonium Disposal," 15-17 December 1993.

3 U.S. Department of Defense, *Proliferation: Threat and Response*, November 1997, p. 44.

Implementation of PNIs -- A.1 Removal of Soviet TNWs¹

TNW Removals From E. Europe and FSU Republics	
Accomplished by:	
Central Asia/Kazakhstan/Baltics	December 1991 ²
Ukraine	5/6 May 1992 ³
Belarus	Early 1992/Spring 1992 ⁴

Note: TNW removed from Eastern Europe and Transcaucasus before September-October 1991 PNIs⁵

1 In addition to sources cited below, for a lengthier review of Soviet TNW removals from E. Europe and FSU republics see: Joshua Handler, *Russian Nuclear Warhead Dismantlement Rates and Storage Site Capacity: Implications for the Implementation of START II and De-Alerting Initiatives*, 1999, CEES Report No. AC-99-01.

Note: unclear if Soviet TNW were deployed in Bulgaria.

2 In 1992, Gen. Zelentsov of the 12th Main Directorate of the Russian MOD said there were "no tactical nuclear weapons in the Central Asian republics or in Kazakhstan. The last warhead had been withdrawn from their territories last year;" Victor Litovkin, "Generals in Moscow Categorically Deny Sales of Nuclear Weapons," *Izvestia*, 17 March 1992; Gen. Zelentsov said that, "The process of the transfer of tactical nuclear weapons from other CIS states began as early as last year [1991]. Gradually their numbers were reduced and they were evacuated first from the states which are the farthest from Russia. Their number has gradually decreased as they were withdrawn first from the countries that are geographically most distant from Russia, and then from the countries that are closer to it;" "Press Conference on Withdrawal of Tactical Nuclear Weapons from the Ukraine by Members of CIS and Ukraine Military," Official Kremlin International News Broadcast, 6 May 1992, (Federal News Service). Gen. Gely Batenin, an advisor to the Russian Foreign Ministry said that all tactical nuclear weapons had been removed from the Baltic States, Transcaucasia, and Central Asia; Alexander Rahr, "Batenin on Nuclear Weapons," *RFE/RL*, No. 236, 13 December 1991.

3 Gen. Zelentsov said, "They [tactical nuclear weapons] were withdrawn from Belarus some time ago, and from Ukrainian territory they were pulled out, in fact, yesterday. To be more exact, it happened last night." Gen. Yakovlev added that in the "course of the last transfer, some 1,000 nuclear units have been evacuated -- tactical nuclear weapons." These were mostly air defense weapons, tactical aviation bombs, and naval tactical weapons; "Press Conference on Withdrawal of Tactical Nuclear Weapons from the Ukraine by Members of CIS and Ukraine Military," Official Kremlin International News Broadcast, 6 May 1992.

4 Mikhail Shimansky, "First Interview with First Defense Minister of Byelarus," *Izvestia*, 24 April 1992.

5 From 1990 to 1991 all TNW were removed from the former Warsaw Pact countries with, the last train "loaded by tactical warheads" leaving Germany during the summer of 1991; Gen. Vitally Yakovlev, U.S.-Russian Workshop on CTB, Fissile Material Cutoff and Plutonium Disposal," 15-17 December 1993.

Lt. Gen. Vladimir Korotkov, deputy chief of the Main Department of the CIS Armed Forces, said all nuclear weapons were removed from the Transcaucasian republics in the summer of 1990; "General: No Nuclear Arms in Caucasus," *Interfax*, 12 March 1992.

Implementation of PNIs -- A.2 Removal of Soviet TNWs

TNW Removals from Armed Service	
Accomplished By:	
Army	September 1997 ¹
Navy - Surface ships, submarines and land-based naval air	February 1993 ²
Air Defense	September 1996 ³

Note: Number of nuclear capable platform declines due to break-up of Soviet Union and accelerated retirement of platforms due to aging and/or lack of maintenance.

E.g.: Number of nuclear-capable ships in the Soviet/Russian Navy declines from some 400 in 1990 to approximately 140 in 2001.⁴

1 "All the warheads of the ground forces, artillery shells and tactical nuclear warheads, have been removed and the units which maintained nuclear warheads have been disbanded;" Press Conference with Lt. Gen. Igor Valynkin, Chief of the 12th Main Directorate of the Russian Ministry of Defense, regarding the nuclear security in Russian Federation armed forces, Russian Ministry of Defense, Official Kremlin International News Broadcast, 25 September 1997, (Federal News Service).

2 "All tactical nuclear weapons have been removed from vessels, multi-purpose submarines, and aircraft of the naval forces, and placed in centralized storage." Information from the Russian Ministry of Defense reported in: Vadim Byrkin, "Tactical Nuclear Weapons Removed from Vessels," *ITAR-TASS World Service*, 4 February 1993.

3 Foreign Ministry spokesman Mikhail Demurin reportedly said that, "The nuclear warheads of anti-aircraft missiles have been withdrawn. "Disarmament Initiatives to be Fulfilled by Year 2000," *Interfax*, 26 September 1996.

4 Hans Kristensen and Joshua Handler, "Appendix 6A. Tables of Nuclear Forces," *SIPRI Yearbook 2001*.

Implementation of PNIs -- B. Elimination of Soviet/Russian TNWs

Army	Sep 1996 -- being eliminated ¹ Dec 1997 -- mines and TNW from FSU republics being eliminated ² Oct 1998 -- being eliminated ³ Nov 1998 -- being eliminated ⁴ April 2000 -- About to complete elimination⁵
Navy	By June 1996 -- 1/3 eliminated ⁶
Air Force	By April 2000 -- 1/2 eliminated
Air Defense	By June 1996 -- 1/2 eliminated ⁷

1 "Disarmament Initiatives to be Fulfilled by Year 2000," *Interfax*, 26 September 1996.

2 By December 1997, Gen. Valynkin said that 60 percent of the TNW removed from the Ukraine, Byelorussia and Kazakhstan had been destroyed. Moreover, mines would be destroyed by the year 2000; Vladimir Georgiev, Igor Frolov, "A Storm in a Bottle," *Nezavisimaya Gazeta*, 12 December 1997.

3 Mikhail Shevtsov, "Russia Strictly Fulfilling Nuclear Test Ban Treaty," *ITAR-TASS*, 9 October 1998. Gen. Valynkin noted in an interview that the elimination of "expired nuclear weapons" was ongoing and nuclear mines and shells were also being dismantled; Vladimir Karpenko, "Emergency Situations Will Never Occur at Nuclear Facilities Thanks to Special Security Regime," *Rossiiskiy Vesti*, 28 October 1998.

4 [Interviewer] Do the Missile and Artillery Troops remain a means of employing tactical nuclear weapons? [Mukhin] The Missile and Artillery Troops still remain a means of employing them. But in today's conditions, when there is a gradual elimination of tactical nuclear weapons going on, we no longer have them in storage; Sergey Sokut, Interview with Lt. Gen. Nikolay Mukhin, Deputy Chief of the Missile and Artillery Troops of the RF Armed Forces, "The Primary Weapon to Defeat the Enemy: That Is How Lt-Gen Nikolay Mukhin, Deputy Chief of the Missile and Artillery Troops of the RF Armed Forces Characterizes the Role of the 'God of War'," *Nezavisimoye Voyennoye Obozreniye*, 13-19 November 1998.

5 "Russia also continues to consistently implement its unilateral initiatives related to tactical nuclear weapons. Such weapons have been completely removed from surface ships and multipurpose submarines, as well as from the land-based naval aircraft, and are stored at centralized storage facilities. One third of all nuclear munitions for the sea-based tactical missiles and naval aircraft has been eliminated. We are about to complete the destruction of nuclear warheads from tactical missiles, artillery shells and nuclear mines. We have destroyed half of the nuclear warheads for anti-aircraft missiles and for nuclear gravity bombs;" Igor S. Ivanov, Minister of Foreign Affairs of the Russian Federation statement at the Review Conference of the Parties to the Treaty on the Non-Proliferation of Nuclear Weapons New York, April 25, 2000

6 Col. Gen. Yevgeny Maslin remarks on U.S. and Russian Perspectives on the Cooperative Threat Reduction Program, made at the U.S. Defense Special Weapons Agency conference, "Walking the Walk: Controlling Arms in the 1990s," in "Summary of the Fifth Annual International Conference on Controlling Arms, 3-6 June 1996, Norfolk, VA.

7 Maslin remarks at, "Walking the Walk: Controlling Arms in the 1990s."

Implementation of PNIs -- C.1 Consolidation of Soviet/Russian TNWs

-By 1995, number of nuclear-capable bases reduced by over 250.¹

-By 1996, number of nuclear storage facilities declined to one-third of their 1991 levels.²

-November 1997: "80 protection areas around nuclear installations."³

-2000: U.S. DOD is helping to improve facilities at 123 nuclear weapons stores, 23 Strategic Rocket Forces (SRF) sites and 48 Navy and Air Force facilities.⁴ -- Some of these are contained within a smaller number of facilities/bases, e.g. See next slide.

Number of Nuclear Weapons Storage Facilities	1990	1995	2001	With TNW
Eastern Europe	Y	N	N	N
Soviet/Russian National Storages	Y	Y	15	Y
ICBM bases	Y	Y	19+	N
Strategic Bomber bases	Y	Y	3	?
Air Force and Navy	Y	Y	30+	Y
Air Defense/Army	Y	?	N?	N?
Total	500-600+	<100⁵	~67⁶	~45?

1 Col. Gen. Yevgeny Maslin, "Summary of the Proceedings of the U.S. Defense Nuclear Agency's 4th Annual International Conference on Controlling Arms," 19-22 June 1995, Philadelphia, PA.

2 Col. Gen. Yevgeny Maslin, "Cooperative Threat Reduction: The View from Russia," in Proceedings of the NATO Advanced Research Workshop on Dismantlement and Destruction of Chemical, Nuclear and Conventional Weapons, Bonn, Germany, 19-21 May 1996, (Dordrecht, The Netherlands: Kluwer Academic Publishers, 1997); Col. Gen. Yevgeny Maslin, "Walking the Walk: Controlling Arms in the 1990s," 3-6 June 1996, Norfolk, VA.

3 Interfax, "Sergeyev on Use of Russian 'Suitcase' Nuclear Weapons," 15 November 1997.

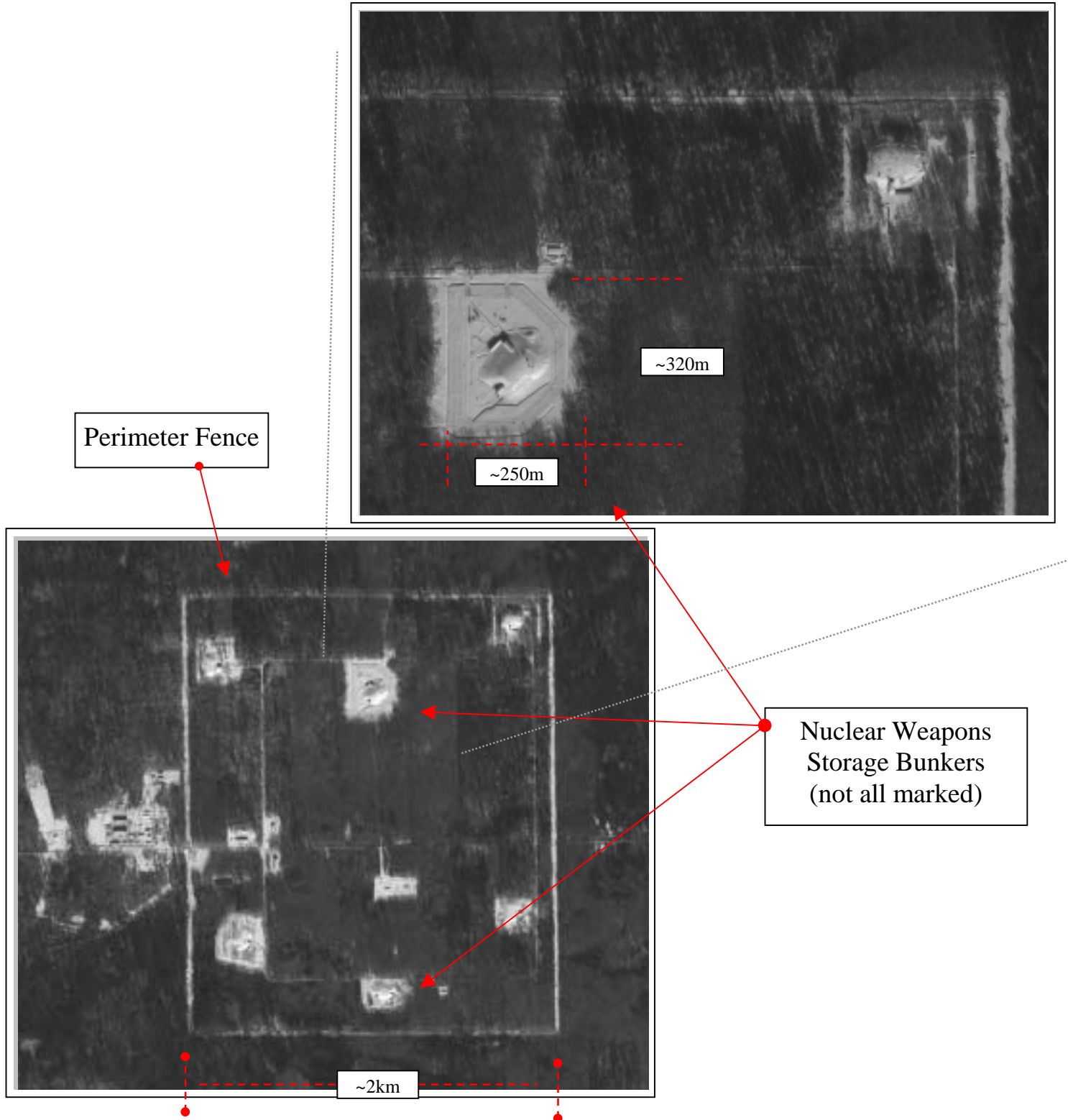
4 "USA Installing Automated Nuclear Weapons Monitoring System in Russia," *ITAR-TASS*, 5 December 2000. The 23 SRF sites may be 19 ICBM bases plus some SRF Army storages.

5 John Deutch, Director, Central Intelligence, statement before the Senate Permanent Subcommittee on Investigations, hearing on "Global Proliferation of Weapons of Mass Destruction," Part II, 22 March 1996, S. Hrg. 104-422, Pt. 2; Gordon Oehler, Director, Non-Proliferation Center, CIA, testimony before the Senate Armed Services Committee, on "Intelligence Briefing on Smuggling of Nuclear Material and the Role of International Crime Organizations, and on the Proliferation of Cruise and Ballistic Missiles," 31 January 1995; Gloria Duffy, testimony before the HFAC, Subcommittee on Europe and the Middle East, Hearings on "FY 1995 Foreign Aid Requests for Russia and the Other New Independent States (NIS) of the Former Soviet Union," 24 March 1994; U.S. Department of Defense, *Proliferation: Threat and Response*, November 1997.

6 For analysis of Russian nuclear weapons storage system see: Joshua Handler, "Lifting the Lid on Russia's Nuclear Weapons Storage," *Jane's Intelligence Review*, August 1999.

Implementation of PNIs -- C.2 Consolidation of Soviet/Russian TNWs

Spaceimaging Ikonos Satellite Photograph taken 1 March 2001 of:
Russian National-level Nuclear Weapons Storage Facility
Near Bryansk, Russia

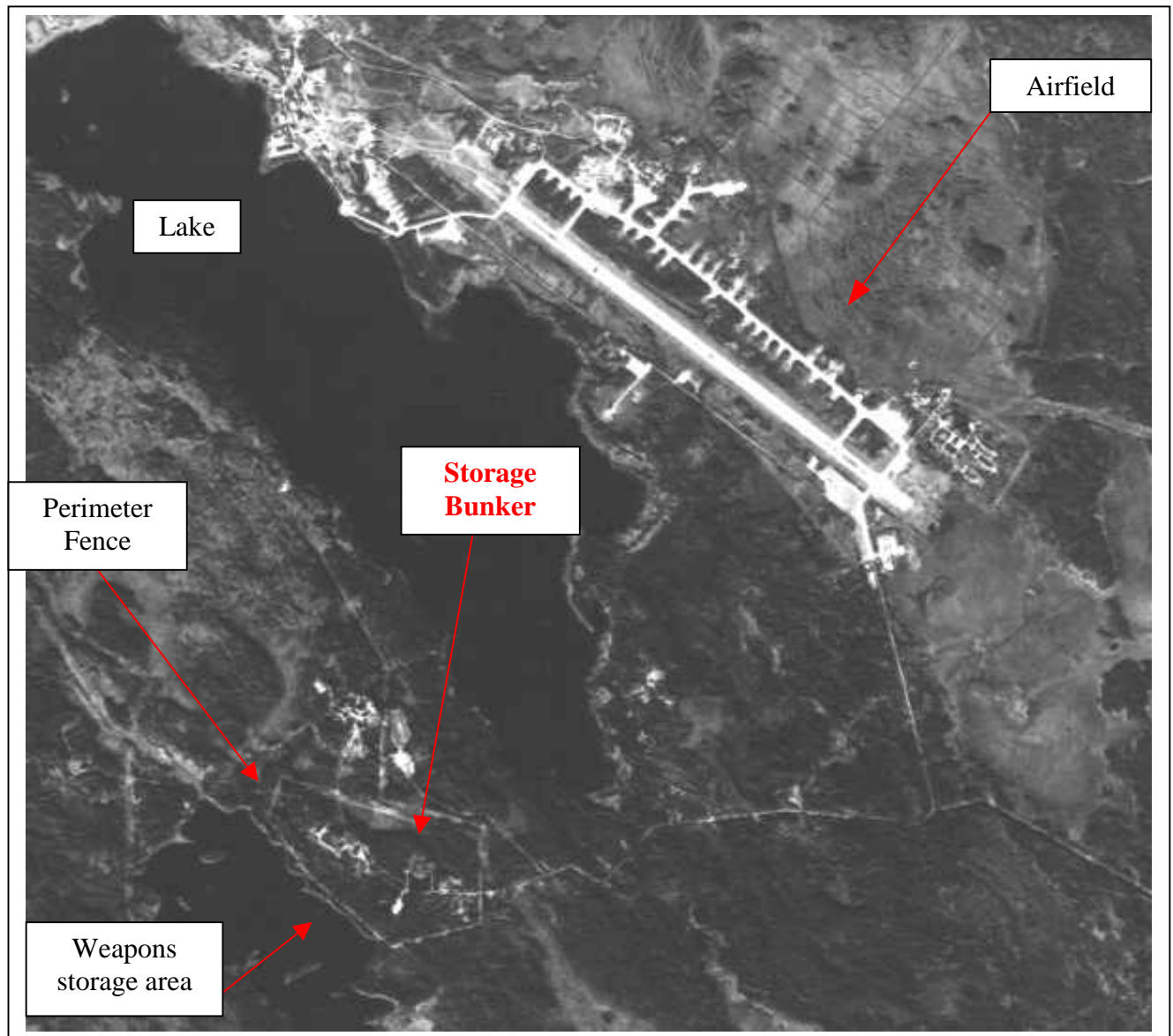


Implementation of PNIs -- C.3 Consolidation of Soviet/Russian TNWs

U.S. Declassified Corona Reconnaissance Satellite Image from
Mission No. 1115-2, 18 September 1971

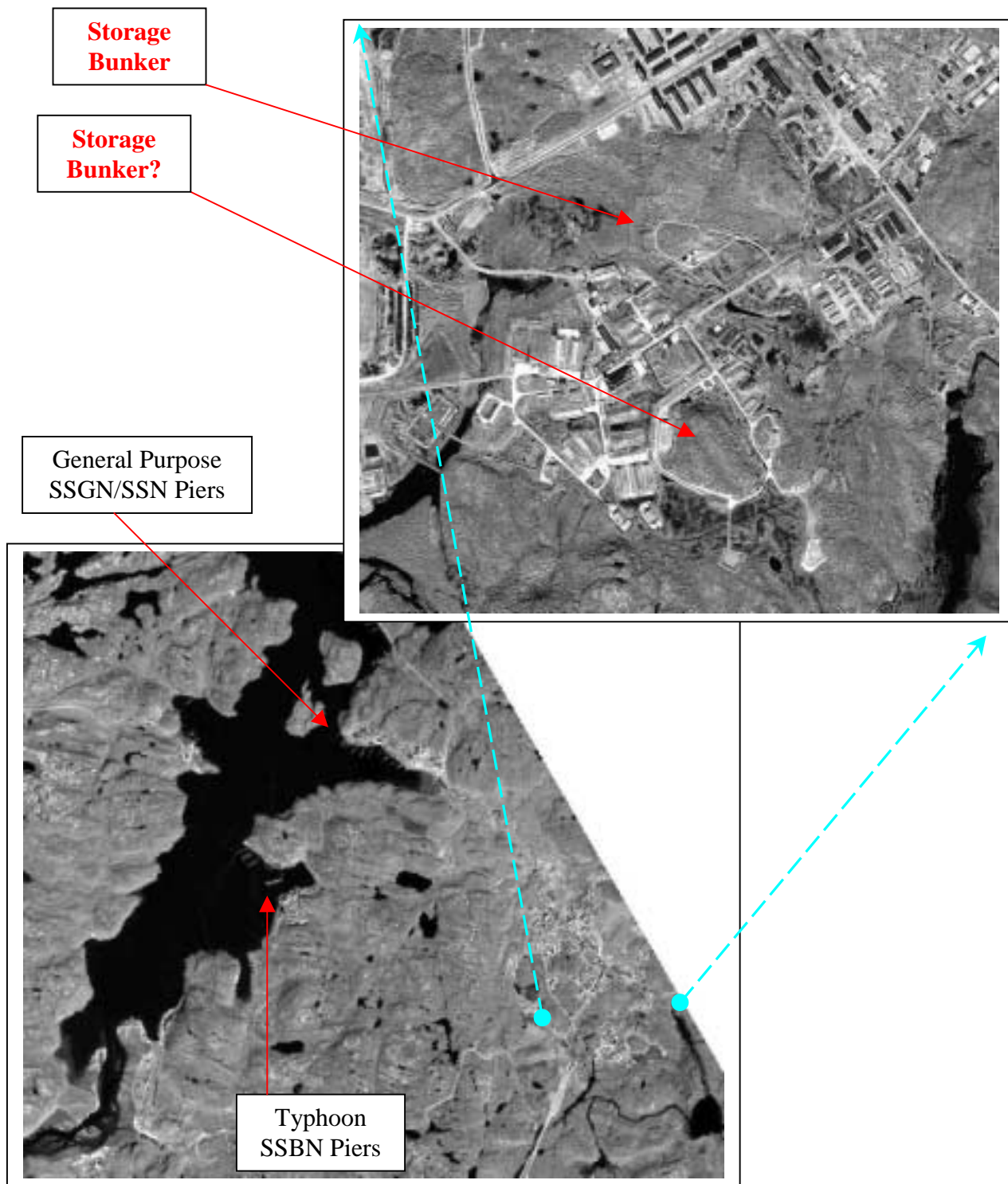
Kholm Air Base and nearby Service-level RTB Nuclear Weapons Storage Facility, near Arkhangelsk, Northern Russia

Example of possible current storage arrangement for Russian air-delivered TNW nuclear weapons: i.e. neither "forward-deployed" next to aircraft on the air-strip, nor kept at national-level storage sites, but held at secure bunker in separate weapons storage area in vicinity of airfield.



Implementation of PNIs -- C.4 Consolidation of Soviet/Russian TNWs

Spaceimaging Ikonos Satellite Photograph taken 28 June 2000 of:
Russian Navy Nuclear Weapons Storage Site
near Zapadnaya Litsa Submarine Base, Northern Fleet¹



¹ U.S. Defense Intelligence Agency, "Soviet Kola Peninsula Missile Submarine Bases: Two Decades in the Making," August 1978, released under FOIA to Princeton University's PSGS; U.S. NPIC, "Guba Litsa Probable Naval Missile Storage Facility, USSR," December 1964.

Conclusions -- Elimination -- what result?

"The US has reduced its non-strategic nuclear weapons by 80 percent since the fall of the Berlin Wall."¹

Estimated U.S. TNW		
	1991²	2001³
Army/Marine Corps	3,040	0
Navy	1,150	320 SLCMs
Air Force	2,975	1,350 B-61 bombs
Air Defense	0	0
Total	7,165	1,670

Estimated Soviet/Russian TNW		
	1991⁴	2001⁵
Ground Forces	4,800 - 6,700	0
Navy	3,400 - 5,000	850
Air Force	4,000 - 7,000	1,540
Air Defense	2,800 - 3,000	1,200
Total	15,000-21,700	3,590

In December 2000, the Russian nuclear stockpile "was estimated to be well under 25,000 warheads, a reduction of over 11,000 warheads since 1992"⁶

1 U.S. Ambassador Robert Grey, Statement to the Main Committee I, The 2000 Review Conference of the Treaty on Non-Proliferation of Nuclear Weapons, 27 April 2000.

2 Robert Norris and William Arkin, Natural Resources Defense Council (NRDC) Nuclear Notebook, "U.S. Nuclear Weapons Stockpile," *Bulletin of the Atomic Scientists*, June 1991 and June 1992.

3 Hans Kristensen and Joshua Handler, "Appendix 6A. Tables of Nuclear Forces," *SIPRI Yearbook 2001*.

4 Robert Norris and William Arkin, "Nuclear Notebook: Estimated Soviet Nuclear Stockpile (July 1991)," *Bulletin of the Atomic Scientists*, July/August 1991; Alexei Arbatov, "Deep Cuts and De-alerting: A Russian Perspective," in Harold Feivson, ed., *The Nuclear Turning Point: A Blueprint for Deep Cuts and De-Alerting of Nuclear Weapons* (Washington, DC: Brookings), 1999.

5 Hans Kristensen and Joshua Handler, "Appendix 6A. Tables of Nuclear Forces," *SIPRI Yearbook 2001*.

6 U.S. Department of Defense, *Proliferation: Threat and Response*, January 2001.

Conclusions -- Elimination from the NGO Perspective

- **We know quite a bit, but need more openness** -- Openness could substitute for more rigorous verification measures, underscore the utility of unilateral initiatives, and reassure the world that the U.S. and Russia have finished implementing most of the PNIs and will soon finish the rest.

- **United States** could provide more consistent information on eliminations and the number of weapons eliminated.
 - Explain discrepancies in numbers released.
- **Russia** could provide more information on types of weapons eliminated, numbers dismantled and start and end dates weapon eliminations.
- **And, importantly, if finished destruction of ground forces weapons.**
- Former Minister of Defense, Igor Sergeyev, and current advisor to President Putin, refused to affirm that Russia had completed implementing the PNIs in his appearance at the Carnegie Endowment's annual Non-Proliferation conference in June 2001.¹

-Both U.S. and Russia could give overall numbers on TNW in 1991 and the present.

- Need to solve the reversibility problem.

- U.S. inactive stockpile and Russian TNW build capacity show reversibility of elimination.
 - E.g., U.S. W-85 Pershing II warheads withdrawn under the INF treaty were turned into B-61-10 bombs.²
- Also, capability -- wouldn't want nuclear capability restored to units.

1 <http://www.ceip.org/files/projects/npp/resources/Conference%202001/sergeyev.htm>

2 Robert Norris and William Arkin, "Beating Swords into Swords," *The Bulletin of the Atomic Scientists*, November 1990.

Conclusions -- Security

- TNW security now approximately same as Strategic Nuclear Weapons (SNW) Security -- as good or as bad. A change from 1990-1991, when there were greater concerns about security of TNW.¹

- Since 1991, no forward deployment of TNW outside of borders, no deployment on ships or submarines, no dispersal next to platforms -- Except in case of U.S. nuclear weapons in Europe which are now kept in buried vaults in hangers where aircraft can be located.

- TNW not deployed and co-located with SNW in many regional or centralized storages.

- Ease of theft -- Size and weight of TNW in stored configuration may not be dramatically different from a SNW warhead -- Moreover many smaller TNW variants possibly eliminated.²

- Desirability -- Perhaps more difficult to initiate an unauthorized nuclear detonation of TNW which has been placed in a stored configuration or retired than for a SNW warhead.
 - Stored TNW and SNW equally desirable for the amount of fissile material they may provide if disassembled, SNW perhaps more so if they are larger.

- Vulnerability -- Perhaps even less movement of TNW than SNW now -- SNW may be more vulnerable as they are transported more often from remote base areas.

1 Despite the many concerns raised since 1989-90 about the security of Soviet tactical nuclear weapons, the Soviet and then Russian military has consistently denied reports that any nuclear weapons are missing and that nuclear weapons in storages are insecure. The only attempt to filch a Soviet tactical nuclear weapon about which any details are known was made by environmental group Greenpeace. In the summer of 1991, Greenpeace tried to "borrow" a Soviet nuclear weapon from its storage site in E. Germany in order to show it to the world's press for an anti-nuclear weapons protest in Berlin. The weapon was to be returned after the action. The plan fell apart when the remaining Soviet nuclear weapons were removed from E. Germany in July-August 1991. See: William Burrows and Robert Windrem, *Critical Mass: The Dangerous Race for Superweapons in a Fragmenting World*, (New York: Simon and Schuster), 1994, pp. 246-251.

2 In the event, Gen. Valynkin claimed in an interview that: "Nuclear mines are transported only on specially-designed vehicles." Two people could, "simply could not lift," one; Vladimir Georgiev, Igor Frolov, "A Storm in a Bottle," *Nezavisimaya Gazeta*, 12 December 1997.

Conclusions -- Security

Relative sizes of:

U.S. Strategic Warheads, Russian Nuclear Bombs, Artillery Shells and Missile RVs.



Munitions specialists from the 90th Maintenance Squadron at F.E. Warren Air Force Base, WY, work on the 3 RVs of a Minuteman III ICBM (USAF Photo, August 2001)



Russian nuclear artillery shell, tactical aviation bomb and early multi-megaton bomb.



Collection of Russian nuclear warheads, nose cones and RVs

Both photos: Chelyabinsk-70 Museum.

Conclusions -- Future of TNW

1. **Lost opportunity** that Bush did not take up Gorbachev offer to eliminate all naval TNW.

- Complete elimination would have been good disarmament step and further eased burden of verifying PNIs.

2. **Future of TNW Uncertain**

- **Pressures to keep and augment**

In U.S., worries about proliferation and the enthusiasm for stopping or countering proliferation has created political pressures and the political space for the conception of new missions for TNW and for new TNW.

- E.g. B61-11 earth-penetrating bomb and discussion of need for new low-yield bombs.

TNW still seen as important in general and the U.S. actively maintains its capability.

- U.S. SLCM regeneration exercises.¹
- U.S. TNW in Europe - political unity and new NATO missions.

In Russia, reports about the need for TNW -- at the same political level as in the U.S. -- hawks and people from the weapons laboratories are advocating them. Not official policy to acquire new types of TNW -- yet.

Also, Russia exercises its TNW capability.

- Of note: Russian General described a Russian tactical nuclear weapons exercise in March and June 1999.²
 - Involved a "rocket brigade" -- not clear if ground force or air defense unit.
 - Former would be disturbing in light of PNI pledge to denuclearize Ground Forces -- should have been almost completed in 1999.
- Reports about Russian TNW in Kaliningrad in January 2001 may be indications of Russia exercising its allowed TNW capability.³
 - Movement of TNW to airbase storage or exercise of same, or exercise with Navy similar to U.S. (Although TNW movement to or exercise in Kaliningrad goes against Gorbachev-era pledge to denuclearize the Baltic).

1 Twice a year, the Navy selects an attack submarine for a "regeneration" exercise to evaluate the ability to redeploy nuclear armed-cruise missiles on submarines. The exercise tests the ability of the crew to reestablish nuclear capability in a "relatively short time;" U.S. Office of the Secretary of Defense, *Nuclear Weapons Systems Sustainment Programs*, May 1997.

2 Interview with General Igor Valynkin, Head of the 12th GUMO by Alexander Dolinin and Nikolai Poroskov, "The Nuclear Genie of Russia Sleeps," *Krasnaya Zvezda*, 31 August 1999.

3 Bill Gertz, "Satellites Pinpoint Russian Nuclear Arms in Baltics," *The Washington Times*, 15 February 2001.

Pressures to Reduce

- U.S. SLCMs could be reduced or eliminated
 - U.S. nuclear SLCMs could decrease as a result of the WTC attack.¹
 - SSNs over-extended² and some in sub-community concerned about the added burden of keeping a nuclear SLCM capability.
 - Some debate in submarine community over whether to keep nuclear SLCMs or give them up.³
 - Russian Navy is interested in eliminating long-range SLCMs and possibly shorter-range naval TNW too.
- U.S. may end up with only TNW aircraft bombs -- thus have "strategic" TNW arsenal in any event as many have noted.

3. Low-numbers of "TNW" preferable to low-numbers of SNW missiles?

- Defensive stability the same as for low numbers of SNW ICBMs or SLBMs -- TNW could be slightly more dispersed if necessary to decrease vulnerability from attack.
- Offensive stability better than for ICBMs and SLBMs -- There would be no hair-trigger alert launch, TNW would be recallable, better C3 than with SLBMs.
- It would cost less to maintain some dual-capable aircraft (or bombers in general) for carrying TNW than ICBM wings and SSBNs and their bases.
- Security and safety concerns about the same for small numbers of SNW or TNW, if the TNW are kept in storages (or vaults).
- Also eliminate STRATCOM overhead.
- In essence, return to world of a few number of nuclear-capable bombers.

1 "In addition to accelerating the acquisition of Tactical Tomahawk, the Navy also wants Raytheon to begin remanufacturing in "large numbers" the nuclear-tipped TLAM-Ns, which have been in storage and out of the deployment arsenal since the early 1990s;" Hunter Keeter, "PGM Funding May Top List For Short-Term Military Spending Increase," *Defense Daily*, 20 September 2001.

2 E.g. see: Rear Admiral Albert H. Konetzni, U.S. Navy Commander, Submarine Force United States Pacific Fleet, Statement before the House Armed Services Committee Procurement Subcommittee Submarine Force Structure and Modernization Plans Hearing, 27 June 2000.

3 Capt. William Norris (Ret.), "What is TLAM/N and Why Do We Need It?"; Lt. Michael Kostiuk, "Removal of the Nuclear Strike Option from United States Attack Submarines," and LCDR David DiOrio, USSTRATCOM, "The Role of Nuclear Sea-Launched Cruise Missiles in the Post Cold War Strategy," all in *The Submarine Review*, January 1998; Capt. Howard Venezia (Ret.), "The Sub Launched Nuclear Cruise Missile Debate," letter in *The Submarine Review*, April 1998.