

AIR WAR COLLEGE

AIR UNIVERSITY

CONSIDERATIONS FOR U.S. NUCLEAR FORCE STRUCTURE

BELOW A 1,000 WARHEAD LIMIT

by

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## Biography

Lieutenant Colonel David “DJ” Baylor was born in Sunbury, Pennsylvania. He graduated from Warrior Run High School in Turbotville Pennsylvania and continued his education at the Pennsylvania State University. In 1989 he graduated with a Bachelor of Science Degree in Mechanical Engineering with a commission through the Air Force Reserve Officer Training Corps (AFROTC) as a Distinguished Graduate. He went to Mather AFB, California for Undergraduate Navigator Training and then to Cannon AFB, New Mexico, where he trained as an F-111 Weapon Systems Officer (WSO), finally arriving at the 79<sup>th</sup> Fighter Squadron. RAF Upper Heyford, United Kingdom in 1991.

Lieutenant Colonel Baylor spent two years as a Weapons and Tactics Officer and scheduler at RAF Upper Heyford before the base closed. From there he was assigned to the 522<sup>th</sup> Fighter Squadron at Cannon Air Force Base, New Mexico where he served as an Instructor WSO, Training Officer and Wing Scheduler. Upon retirement of the F-111, Lt Col Baylor was assigned the B-1 aircraft at Dyess AFB, Texas where he was a Distinguished Graduate. Following completion of his training, he was assigned to Mt. Home AFB, Idaho as part of the 34<sup>th</sup> Bomb Squadron. While at Mt. Home, Lt Col Baylor was the Squadron Chief of Plans, responsible for the development of a “light strike” deployment package that became the standard for deployment of all B-1 units. To prove his concept, Lt Col Baylor led two deployments to Shaikh Isa, Air Base Bahrain. For his innovative solutions to deploying the B-1, 12<sup>th</sup> Air Force twice nominated Lt Col Baylor and his crew for the Curtis E. LeMay Trophy, winning the Trophy for ACC’s Outstanding Bomber Crew in 1998. Lt Col Baylor was then assigned to Dyess AFB, Abilene Texas where he served as an Instructor Weapon Systems officer and flight commander at the B-1 schoolhouse. Lieutenant Colonel Baylor served as the 7<sup>th</sup> Operations Group Executive Officer and later as an Assistant Director of Operations for the 9<sup>th</sup> Bomb Squadron, where he participated in Operation Enduring Freedom in 2002.

Later in 2002, Lieutenant Colonel Baylor attended Air Command and Staff College at Maxwell AFB, Alabama where he was a Distinguished Graduate. He was then assigned to U.S. Northern Command, where he served as the Commander’s Nuclear Strike Advisor, and Mobile Consolidated Command Center Chief. In 2006, he was selected to be the Commander and Professor of Aerospace Studies at the University of Georgia. While there, he helped to revamp AFROTC field training, with his teams work being recognized as an Air Force Best Practice. In 2009, Lieutenant Colonel Baylor was selected to attend the Air War College, Maxwell AFB, Alabama, where he is currently a student.

His awards and decorations include the Defense Meritorious Service Medal, the Meritorious Service Medal (one oak leaf cluster), the Air Medal, the Aerial Achievement Medal, the Air Force Commendation Medal (one oak leaf cluster), the Air Force Achievement Award (one oak leaf cluster).

## Introduction

On April 5, 2009 in Prague, Czech Republic, President Obama committed the United States to seeking “the peace and security of a world without nuclear weapons.”<sup>1</sup> This move toward a world free of nuclear weapons is not a new idea. In January 2008, George P. Shultz, William J. Perry, Henry Kissinger and Sam Nunn, authored an article in *The Wall Street Journal* entitled “Toward a Nuclear Free World” where they suggested steps to “dramatically reduce nuclear dangers.” More than a dozen former senior U.S. officials from the past six administrations endorsed these suggestions.<sup>2</sup> While these officials offered “suggestions”, they realized the challenge of achieving a nuclear free world would be difficult. In fact, the President recognized this challenge in his Prague speech when he stated, “This goal will not be reached quickly – perhaps not in my lifetime.”<sup>3</sup> Just as importantly, the President went on to state “As long as these weapons exist, the United States will maintain a safe, secure and effective arsenal to deter any adversary, and guarantee the defense of our allies.”<sup>4</sup>

As the President moves toward a nuclear free world, we must ask some very important questions about that journey: 1) Are there different negotiation considerations and dynamics in play when Russia and the United States go below 1,000 strategic warheads? 2) What are the implications of non-strategic or tactical nuclear weapons in the world security environment? 3) Finally, what are some potential implications for the

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<sup>1</sup> Office of the Press Secretary, The White House, Remarks by President Barack Obama, Prague, Czech Republic, 5 April, 2009. [http://www.whitehouse.gov/the\\_press\\_office/Remarks-By-President-Barack-Obama-In-Prague-As-Delivered/](http://www.whitehouse.gov/the_press_office/Remarks-By-President-Barack-Obama-In-Prague-As-Delivered/)

<sup>2</sup> Shultz, George, William J. Perry, Henry A. Kissinger, and Sam Nunn, “Toward a Nuclear-Free World,” *Wall Street Journal*, 15 January 2008. [http://online.wsj.com/public/article\\_print/SB120036422673589947.html](http://online.wsj.com/public/article_print/SB120036422673589947.html)

<sup>3</sup> Office of the Press Secretary, The White House, Remarks by President Barack Obama, Prague, Czech Republic, 5 April, 2009. [http://www.whitehouse.gov/the\\_press\\_office/Remarks-By-President-Barack-Obama-In-Prague-As-Delivered/](http://www.whitehouse.gov/the_press_office/Remarks-By-President-Barack-Obama-In-Prague-As-Delivered/)

<sup>4</sup> Ibid

United States nuclear force structure, and the impact on the role of nuclear deterrence as our national arsenal moves below 1,000 strategic warheads?

### **New Negotiation Dynamics Below 1,000 Warheads**

A world free of nuclear weapons is a noble goal and a commitment we have as a nation in accordance with Article VI of the Nuclear Non-proliferation Treaty (NPT) as ratified by the United States in March 1970<sup>5</sup>. Over the past 40 years, the United States has negotiated directly with the Soviets, and now the Russians, to reduce their nuclear arsenals. While negotiations were difficult, viewed from a distance these talks were very similar to Newton's Third Law of Motion: "For every action there is an equal and opposite reaction."<sup>6</sup> This is not to say there was a one for one reduction in warheads between the two nations, but as one nation proposed an action to reduce weapons, the other responded with what they saw as an equal reduction while always maintaining the status quo balance of power. As we move into a period where the United States and Russian arsenals are perhaps reduced below 1,000 warheads, we leave Newtonian physics of equal and opposite actions and enter a new quantum physics<sup>7</sup> world of negotiations with additional actors affecting strategic stability and crisis stability with implications we don't yet completely comprehend.

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<sup>5</sup> U.S. Department of State, *Treaty on the Non-Proliferation of Nuclear Weapons (NPT)*, Washington D.C. 2009. Treaty entered into force, March 5, 1970. <http://www.state.gov/t/isn/trty/16281.htm>

<sup>6</sup> Asimov, Isaac, *Understanding Physics*, Barnes and Noble, 1966, pp 34.

<sup>7</sup> The Hiesenberg Uncertainty Principle simply states you can't know the position and momentum of an atom at the same time, similarly under the current international environment no country or entity completely knows the "Nuclear Position" or the "Direction and Speed" (momentum) a country is moving with regards to nuclear weapons. Rhodes, Richard. *The Making of the Atomic Bomb*. Simon & Schuster, New York, NY, 1986, pg 130.

In this quantum physics view of nuclear arms reduction, we must look at numerous additional actors and forces, great and small that will play important roles. These actors include current nuclear weapons states, aspiring nuclear weapon countries, other states with some nuclear technology and U.S. allies operating under the cover of our “nuclear umbrella.”<sup>8</sup> To understand the impact these countries will have on the negotiation process as we move toward a world free of nuclear weapons, we must first have a general understanding of their current position in the world security environment and the direction these countries are moving. While it is impossible to know everything about each of these nations, or do justice to the complexity of these countries, we will look at some important factors to consider as the United States and Russia move towards nuclear arsenals below 1,000 warheads and fewer associated strategic delivery vehicles.

To start our examination of these players in the new world of ever-deeper cuts, we will first look at those countries currently possessing nuclear weapons. There are only five recognized nuclear weapons nations who have signed and ratified the NPT,<sup>9</sup> the United States, Russia, China, France and Great Britain. Russia with its large nuclear arsenal poses the greatest potential threat to U.S. national security. It is therefore against the Russian threat that the United States deterrent forces must be capable and properly sized, since this force poses the greatest existential threat to the United States. The Russian Government no doubt is concerned with deterring what they may perceive as a US threat to their existence. With maintaining this deterrent capability in mind, the United States and Russia are currently negotiating a follow-on agreement to START that

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<sup>8</sup> Schlesinger, James. Report of the Secretary of Defense Task Force on DoD Nuclear Weapons Management Phase I: The Air Force’s Nuclear Mission, p 18. September 2008

<sup>9</sup> U.S. Department of State, *Treaty on the Non-Proliferation of Nuclear Weapons (NPT)*, Washington D.C. 2009. Treaty entered into force, March 5, 1970. <http://www.state.gov/t/isn/trty/16281.htm>

expired on 5 December 2009,<sup>10</sup> with the goal of significantly reducing the size of each long-range nuclear arsenal.

Recent press releases show Russia is working closely with the United States to reduce both countries' strategic nuclear warheads to around 1,500-1,675, while limiting their delivery systems for those warheads to 500-1,000<sup>11</sup>. If negotiations are successful, the two countries would be at their lowest number of strategic nuclear weapons and delivery vehicles since the early 1950s for the United States and 1960s for Russia, (See Table 1) bringing both country's arsenals much closer in number to the Chinese and other nuclear armed nations.

While publicly committing to a world free of nuclear weapons, Russia continues to replace their strategic nuclear warheads with new designs and delivery systems.<sup>12</sup> In recent defense budgets they have allocated resources to procure new dual capable strategic bombers,<sup>13</sup> while attempting to reinvigorate their fleet of nuclear submarines.<sup>14</sup> In addition they are building new land based RS-12M1/2 Topol-M Inter- Continental Ballistic Missiles (ICBMs) with a multiple reentry vehicle capability.<sup>15</sup> Most importantly, Russia is placing more emphasis on their large stockpile of tactical nuclear weapons in their national defense strategy.<sup>16</sup> Their shift to a "first use" strategy is a counterbalance and cost savings move while they are downsizing and modernizing their

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<sup>10</sup> U.S. Department of State, *START II Treaty* (hyper text version), Washington D.C. 1997.  
<http://www.state.gov/www/global/arms/starthtm/start2/st2intal.html>

<sup>11</sup> RIA Novosti, *Russia, U.S. to slash nuclear delivery vehicles-Medvedev*, United Nations, September 24, 2009. <http://en.rian.ru/world/20090924/156243233.html>

<sup>12</sup> Schlesinger, James, p. 18

<sup>13</sup> RIA Novosti, *Russia Air Force to get new TU-160 Strategic Bomber in April, April 2008*.  
<http://en.rian.ru/russia/20080422/105640820.html>

<sup>14</sup> RIA Novosti, *Russia to start construction of 4<sup>th</sup> Borey-class sub in December*, October 2009.  
<http://en.rian.ru/russia/20091005/156357397.html>

<sup>15</sup> *SIPRI*, 2009, p. 353

<sup>16</sup> An in depth study of U.S. and Russian Nonstrategic or tactical weapons. Woolf, Amy F. *Nonstrategic Nuclear Weapons*, Congressional Research Service, p. 14-17, 2009

conventional military forces.<sup>17</sup> With this increased reliance on nuclear weapons in a first use capacity, it will be difficult for the Russians to reduce their nuclear arsenal below START Follow-On levels until they feel their conventional forces are equal or greater in capability to NATO and Chinese conventional forces on their borders.

According to open sources, China possesses approximately 240 nuclear warheads, with approximately 186 operationally ready for employment on aircraft and ballistic missiles.<sup>18</sup> With such a small force, they appear to have adopted a minimum deterrence strategy. Of these warheads, approximately 20 CSS-4 ICBMs are able to reach the United States.<sup>19</sup> The remainder of their warheads are programmed to be delivered by aircraft along with short and medium-ranged missiles.<sup>20</sup> The Chinese have publicly declared a “no first use” policy, with a self-defense nuclear strategy.<sup>21</sup> China has taken the route of defense against attack by developing underground facilities to house their nuclear weapons,<sup>22</sup> providing for maximum survival of their arsenal from a first strike, guaranteeing a robust retaliatory capability. Maintaining a secure second-strike retaliatory force rather than an insecure and vulnerable nuclear force is also better for crisis stability.<sup>23</sup>

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<sup>17</sup> Cimbala, Stephen J. *The Journal of Slavic Military Studies*, 1556-3006, Volume 22, Issue 1, 2009, Pages 68 – 86 Forward to Where? U.S.-Russia Strategic Nuclear Force Reduction <http://www.informaworld.com/smpp/ftinterface~db=all~content=a909097059~fulltext=713240928>

<sup>18</sup> Stockholm International Peace Research Institute. *SIPRI Yearbook 2009, Armaments, Disarmament and International Security*, Oxford University Press, Oxford U.K., p 364, 2009.

<sup>19</sup> Ibid

<sup>20</sup> Ibid

<sup>21</sup> Office of the Secretary of Defense, *Annual Report to Congress, Military Power of the People's Republic of China 2009*, P 24. (Online link can be found at <http://www.cfr.org/publication/18943/>)

<sup>22</sup> Kristensen, Hans M., *Estimated Nuclear Weapons Locations 2009*, Federation of American Scientists, FAS Strategic Security Blog, November 2009. <http://www.fas.org/blog/ssp/2009/11/locations.php>

<sup>23</sup> States with vulnerable nuclear forces may be tempted to launch their forces on warning (LOW) or under attack (LUA) and this could put a hair trigger on their weapons to prevent their being destroyed by surprise attack. The Chinese seem to have solved this “use or lose” dilemma by deploying nuclear arms underground.

When we include the Chinese at the arms control negotiation table, we must first consider their strategic situation of being surrounded by such nuclear-armed countries as the United States, Russia, India, North Korea, Pakistan and within striking distance of Iran. While China has formidable conventional forces, as long as surrounding countries have nuclear weapons, the Chinese are unlikely to reduce their nuclear arsenal. Indeed, all countries with nuclear arms need to be included in future nuclear arms control treaty negotiations, including the United Kingdom and France.

The United Kingdom currently maintains approximately 160 nuclear warheads configured to be delivered by Submarine Launched Ballistic Missiles (SLBMs) from four Vanguard Class Trident Ballistic Missile Submarines (SSBNs).<sup>24</sup> The United Kingdom currently only has the ability to deliver nuclear weapons from their submarines.

Researchers at the Stockholm International Peace Research Institute believes some of the U.K. missiles only contain one warhead and are configured for a “low yield” by using only the “fission primary”<sup>25</sup>. The U.K. Ministry of Defense believes this “provides a ‘sub-strategic’ role to the Trident Fleet.”<sup>26</sup> Britain has reduced their reliance on nuclear weapons since the end of the Cold War and, from recent comments made by Prime Minister Gordon Brown, it appears they are willing to reduce their number of new nuclear submarines purchased by 25%, from 4 to 3.<sup>27</sup>

France possesses approximately 300 nuclear weapons that are widely dispersed on four SSBNs and 84 tactical aircraft.<sup>28</sup> While the French have recently rejoined NATO’s

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<sup>24</sup> *SIPRI*, 2009, p. 359

<sup>25</sup> *SIPRI*, 2009, p. 360

<sup>26</sup> *SIPRI*, 2009, p. 360

<sup>27</sup> Elliott Francis and Michael Evans, “Britain’s Nuclear Overture-We Will Cut Trident Fleet,” *Timesonline*, September 2009. <http://www.timesonline.co.uk/tol/news/politics/article6845247.ece>

<sup>28</sup> *SIPRI*, 2009, p. 360

Integrated Military Command after 43 years, they still pride themselves on a nuclear capability that could be used independently of the NATO command structure.<sup>29</sup>

While the United Kingdom, France, Russia and China are all important players as nuclear powers and permanent members of the United Nations Security Council, when the United States goes below 1,000 strategic nuclear warheads, they and all other states that possess nuclear weapons will need to be included at the negotiations table. These additional countries, India, Pakistan, North Korea and Israel are not signatories to the Nuclear Non-proliferation Treaty, but already have, or in the case of Israel, are believed to have, nuclear weapons.

India currently maintains an arsenal estimated at approximately 60-70 tactical nuclear weapons delivered by aircraft along with short and medium-ranged missiles.<sup>30</sup> India and its rival, nuclear-armed Pakistan, have fought three wars and continue to threaten each other, suggesting these two states must, at some point in the near future, be included in multi-lateral non-proliferation and nuclear arms control talks.

Pakistan is estimated to possess 60 tactical nuclear weapons along with enough plutonium and Highly Enriched Uranium to produce 40 more.<sup>31</sup> Pakistan sees India's larger and technologically more advanced conventional military as an existential threat.<sup>32</sup> Pakistan will not give up its nuclear weapons, seen as their equalizers, as long as it sees India as a threat. In addition, as the only Muslim nation with nuclear weapons, Pakistani leaders and citizens take pride in the prestige conferred by their nuclear arsenal. While

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<sup>29</sup> Cody, Edward, "After 43 Years, France to Rejoin NATO as Full Member," *The Washington Post*, March 2009. <http://www.washingtonpost.com/wp-dyn/content/article/2009/03/11/AR2009031100547.html>

<sup>30</sup> SIPRI, 2009, pp. 367, 370

<sup>31</sup> SIPRI, 2009, p. 367, 372

<sup>32</sup> Mowatt-Larssen, Rolf. *Nuclear Security in Pakistan: Reducing the Risks of Nuclear Terrorism*. Arms Control Association, Arms Control Today, July/August 2009. [http://www.armscontrol.org/act/2009\\_07-08/Mowatt-Larssen](http://www.armscontrol.org/act/2009_07-08/Mowatt-Larssen)

India and Pakistan should be essential players in future negotiations, we must also consider crafting agreements to take into account and limit other states that have or are pursuing nuclear weapons such as North Korea, Iran and Israel.

North Korea has twice demonstrated the ability to detonate a nuclear weapon while they refine their intercontinental ballistic missile capabilities. Iran, already with a proven short and medium range missile capability, continues to defy U.N. mandates as they develop their Uranium enrichment technologies. Israel has chosen a non-declaratory policy towards nuclear weapons but some analysts estimate Israel maintains approximately 100 nuclear warheads.<sup>33</sup> These three states with their nuclear ambitions influence and threaten the security of countries around them that either already have some nuclear technology or have the funding to acquire nuclear technology and weapons.

For example, North Korea's nuclear ambitions affect the Republic of Korea and Japan. These are two of 30+ countries under the United States nuclear umbrella.<sup>34</sup> Japan has the technological knowledge to build nuclear weapons if they chose.<sup>35</sup> On the other side of Asia, Iran's drive to acquire nuclear weapons has inspired other Middle Eastern countries such as Saudi Arabia, Egypt and Turkey to consider pursuing their own enrichment capabilities.<sup>36</sup>

Prestige is another important consideration in future nuclear negotiations. Many countries like the United Kingdom, France, India, Pakistan, Iran and North Korea not only see nuclear weapons as part of their national security policy, they are also important

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<sup>33</sup> *SIPRI*, 2009, p. 375

<sup>34</sup> Schlesinger, James. Report of the Secretary of Defense Task Force on DoD Nuclear Weapons Management Phase I: The Air Force's Nuclear Mission, p. 18. September 2008.

<sup>35</sup> Federation of American Scientists, *Nuclear Weapons Program*, April 2000. Available online at <http://www.fas.org/nuke/guide/japan/nuke/>

<sup>36</sup> Cirincione, Joseph. *Bomb Scare; The History & Future of Nuclear Weapons*, (New York: Columbia University Press, 2007), p. 103.

status symbols providing these countries influence in the international community and a seat at the table with the United States, Russia and China. Asking these countries to give up their nuclear weapons and perceived political status in international relations will complicate all future nuclear arms negotiations directed toward that end.

While prestige is a factor to consider, ironically democracy will add one of the biggest unknown variables to all future negotiations. With elections held at periodic intervals throughout the various democratic countries around the world, internal politics of the moment can almost instantly change the direction that country takes concerning nuclear weapons. Some examples include the United States election with the change in direction between Bush and Obama administrations. The various NATO allies can easily change their stance on nuclear weapons and forward deployment of U.S. nuclear weapons within their country. The recent Japanese election demonstrates how an administration can take a significantly different approach to nuclear weapons as demonstrated by their recently launched probe into reported “secret nuclear pacts” with the United States.<sup>37</sup> While all states, democratic and autocratic, can be reversed by their opponents taking power, this is more likely to occur within democracies.

Another potential problem is that verification of compliance by 9 to 10 different nuclear-armed countries will slow the progress and complicate nuclear disarmament talks. Current bilateral United States and Russian negotiations have yielded an accepted inspection protocol that works in the current negotiation environment. However, future multinational negotiations may present numerous new questions:

- Can 10 different states agree upon a rigorous and adequate verification regime?

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<sup>37</sup> Hongo, Jun, “Probe Launched Into Four Secret Pacts with U.S.,” *The Japan Times Online*, September 2009. <http://search.japantimes.co.jp/cgi-bin/nn20090926a2.html>

- What kind of international inspectorate can be formed?
- Will each be willing to open their country to adequate types of inspections?
- What is the role that the UN will play in treaty execution?
- How does the United States manage and verify stockpiles to ensure other nuclear states do not re-weaponize?
- How do we prevent countries from nuclear weapons breakouts from their treaty obligations and, thereby, gaining strategic advantages denied to others?
- As we disarm further, can we ensure the protection to our allies currently under our nuclear umbrella?
- Will these countries pursue their own nuclear weapons as the U.S. nuclear force shrinks?
- Will their foreign policies change in favor of nuclear neighbors making us less secure?
- Is there some alternative other than nuclear protection, that the United States can substitute?

This discussion identifies some of the players and future questions that must be considered in forging new nuclear arms reduction agreements, along with the dynamics in play within and among these nations. It is easy to understand why President Obama does not see a world free of nuclear weapons as happening within his lifetime. With the rapid spread of nuclear energy and weapons technology, we are about to enter a new world of arms negotiations much different from those we have practiced with the Russians. What this means is we may be on a path to reduce our weapons and delivery systems to numbers closer to other nuclear-armed countries around the world in the next decade or so. If this happens, we will then enter a period in history with multiple countries possessing relatively equal numbers of nuclear weapons, while others still seek to acquire nuclear weapons.

When we negotiate with these multiple nuclear powers in the future bringing our warhead numbers below 1,000 to around 500, we will be negotiating less from the position of superior numbers and relative strength, and more from relative parity. This

will require a dramatic shift in our national security outlook. Indeed, should such deep cuts be taken, we will have fewer warheads and fewer delivery vehicles than we have had since the 1950s and more countries will possess or be seeking to acquire nuclear weapons.

### **Significance of Tactical Nuclear Weapons**

While most other nuclear nations around the world are upgrading their delivery systems and replacing their old warheads, the United States has placed a self-imposed freeze on the replacement of our nuclear stockpile.<sup>38</sup> In addition, due to our geographic location in the world, and historical context we are sitting on a stockpile of what are considered strategic nuclear weapons, while the preponderance of other nuclear weapons around the world are considered tactical. This is an important factor to consider as the START Follow On talks with the Russians only address strategic nuclear weapons, allowing Russia to retain an advantage in tactical nuclear weapon inventory to defend their borders.<sup>39</sup>

The simple difference between strategic and non-strategic or tactical nuclear weapons, as defined by the United States and Russia, is the difference in the range of delivery vehicles. ICBMs, SLBMs and long-range bombers with the intercontinental range to destroy military, industrial and leadership targets in each other's homeland are considered strategic nuclear weapons. Nuclear weapons that do not have the ability to reach the United States or Russian heartlands when launched from their homelands are

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<sup>38</sup> Lewis, Jeffrey. After the Reliable Replacement Warhead: What's Next for the U.S. Nuclear Arsenal, Arms Control Association, December 2008. [http://www.armscontrol.org/act/2008\\_12/Lewis](http://www.armscontrol.org/act/2008_12/Lewis)

<sup>39</sup> Woolf, Amy F. *Nonstrategic Nuclear Weapons*, Congressional Research Service, p. 14-16, 2009.

considered tactical nuclear weapons.<sup>40</sup> While there are some exceptions to this definition, it is important to realize under SALT I, SALT II, START, START II, SORT and START Follow-On Treaties, only strategic warheads and delivery systems (ICBMs, SLBMs, long range bombers) are considered. This leaves out of the negotiations Russia's large non-strategic weapons arsenal estimated at 2,000 to 6,000<sup>41</sup> tactical nuclear weapons.

The actual number of Russian non-strategic or tactical nuclear weapons is difficult to pinpoint. The Stockholm International Peace Research Institute in its *SIPRI Yearbook 2009: Armaments, Disarmament and International Security* places Russian operational numbers at the low end of 2,047 deployed tactical warheads. 701 of these tactical nuclear weapons are assigned to missile defense interceptors. The remainder of the non-strategic weapons are offensive, including 648 weapons for delivery by land-based bombers like the Tu-22M Backfire and Su-24 Fencer. Further, the Russian Navy possesses 237 tactical nuclear weapons to be delivered by naval aircraft and 276 on sea-launched cruise missiles to be launched from ship platforms. Another 185 tactical nuclear weapons are dedicated to anti-submarine warfare and surface-to-air missiles.<sup>42</sup>

These numbers are in contrast to the 400 U.S. operational non-strategic weapons, all B61 gravity bombs delivered by fighters and bombers.<sup>43</sup> Excluding missile defense warheads, the Russians have a 3-to-1 numerical advantage over the United States in tactical nuclear weapons. However, these shorter-range weapons, if based on Russian

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<sup>40</sup> Ibid, P. 5

<sup>41</sup> Woolf, Amy F. *Nonstrategic Nuclear Weapons*, Congressional Research Service, p. 17, 2009.

<sup>42</sup> *SIPRI*, 2009, p. 354.

<sup>43</sup> *SIPRI*, 2009, p. 348.

soil, cannot reach the continental United States. Tactical nuclear arms would primarily be the concern, therefore, of states along Russia's periphery in Asia and Europe

While the United States and Russia have their understanding and definition of strategic nuclear weapons worked out by negotiations, it is difficult for most countries in Europe and Asia to distinguish between Russia's strategic and tactical nuclear weapons. To countries like Estonia, South Korea or Japan, one low yield 'tactical' nuclear weapon delivered by a missile or fighter aircraft would have devastating strategic implications.

These tactical nuclear weapons present additional challenges to negotiations and proliferation. First, tactical nuclear weapons are, on average, smaller than strategic weapons. Yields can vary anywhere from sub-kiloton to the strength of a strategic nuclear weapon. Smaller sized weapons present multiple challenges. First, these weapons are easier to hide, complicating verification of treaty limits. In addition, unlike a bomber, ICBM, or SLBM force, tactical nuclear weapons are easily moved, contributing to counting and verification problems. Finally, the relatively low yield of some of these weapons may increase the likelihood of use in certain crisis contingencies. In some cases, this can improve deterrence effects versus an adversary, but also might tempt decision-makers to use them more readily. These tactical nuclear weapons spread around the world will put the United States in a difficult strategic position. If moved forward nearer the USA either clandestinely or on mobile platforms, these "tactical" weapons could become "strategic."

## **Impact on the United States and the Air Force in the Near Future**

As START Follow-On Treaty negotiations continue and as we strive for a nuclear free world in perpetuity, the United States will find itself in a unique situation. Unlike Russia and China who have chosen to modernize their nuclear arsenals, or countries like India, Pakistan and Iran who have recently developed or are developing new weapons, the United States has chosen a path of “life extension”<sup>44</sup> for their weapons. This life extension approach can be complicated, as some components originally developed for the weapon are no longer manufactured.<sup>45</sup> This new paradigm of parity in numbers, more nuclear nations around the world and an aging U.S. arsenal will present numerous challenges to the United States over the next few decades.

First, as we move below 1,000 strategic warheads, and towards 500 or fewer delivery systems the Department of Defense will be forced to make difficult force structure decisions.<sup>46</sup> Just a reduction to the numbers Russian President Medvedev proposed in September 2009,<sup>47</sup> would force the United States to look seriously at re-configuring its current strategic nuclear weapons triad of ICBMs, SLBMs and long-range bombers of B-52s and B-2s, while considering the inefficiencies of maintaining three separate weapon systems in small quantities.

There are numerous approaches the United States might take when apportioning its nuclear weapons and delivery systems. An in-depth study will be required to optimize

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<sup>44</sup> Perry, William J. Chairman and Schlesinger, James R. Vice Chairman, *America's Strategic Posture*, The Final Report of the Congressional Commission on the Strategic Posture of the United States, Washington, D.C., April 2009. p. 40. [http://www.usip.org/files/America's\\_Strategic\\_Posture\\_Auth\\_Ed.pdf](http://www.usip.org/files/America's_Strategic_Posture_Auth_Ed.pdf).

<sup>45</sup> Ibid.

<sup>46</sup> American Physical Society. *Nuclear Weapons in 21<sup>st</sup> Century U.S. National Security*, Report by a Joint Working Group of AAAS, and the Center for Strategic and International Studies, Dec 2008. P..8 <http://www.aps.org/policy/reports/popa-reports/upload/nuclear-weapons.PDF>.

<sup>47</sup> President Medvedev stated on 24 September that the U.S. and Russia were discussing the possibility of slashing nuclear weapon delivery vehicles by 67%, from U.S. State Department report in April the U.S. has 1198 delivery vehicles, this cut would reduce U.S. delivery vehicles to below 500. RIA Novosti, *Russia, U.S. to slash nuclear delivery vehicles-Medvedev*, United Nations, September 24, 2009. <http://en.rian.ru/world/20090924/156243233.html>.

deterrence effects of the U.S. nuclear arsenal following any future arms treaties, but two general approaches will most likely be considered. The first is an across-the-board reduction in all weapon systems to include ICBM's, Bombers and SLBMs. Another more likely approach will be to completely eliminate one leg of the triad. Each leg of the triad possess strengths and weaknesses, each adds a certain element of deterrence that translates into retaliatory strength. If we look at other nations, such as Great Britain, that have trimmed their nuclear arsenals over the years for an indication of the direction we may go, it appears SLBMs would be the weapon systems of choice to maintain. The primary advantage of the SLBM force is its likely survivability from a rival's surprise first strike. The downside is the 'all of your eggs in one basket' syndrome. Advances in anti-submarine warfare by our adversaries may materialize in the future, threatening the survivability of our submarines. If so, then the preponderance of our nuclear capability could be lost. Indeed, a single submarine malfunction might instantaneously bring its 24 missiles off alert.<sup>48</sup> If there were a defect in a missile or warhead type, then all U.S. SLBMs could possibly be rendered useless. Therefore, it would be prudent, for the United States to maintain some semblance of diversity in its nuclear arsenal.

Unfortunately, the Air Force, as has been documented in several recent studies, for a time had neglected its maintenance, security, funding, and advocacy for nuclear weapons, thereby somewhat eroding its ability to carry out its mission of strategic deterrence.<sup>49</sup> Atrophy of our capabilities over the past 17 years has produced a generation of leaders who are not well versed in the nuclear mission and who are unable to advocate properly the advantages and necessity of the Air Forces' role in nuclear

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<sup>48</sup> Pike, John, Trident II D-5 Fleet Ballistic Missile, GlobalSecurity.org, 2009.  
<http://www.globalsecurity.org/wmd/systems/d-5-recent.htm>

<sup>49</sup> Schlesinger, p. 51.

deterrence.<sup>50</sup> As a service, we continue to look to the future for the next new thing, while sometimes forgetting our heritage.

Unfortunately, this loss of mission focus may cause the Air Force to lose much of the nuclear mission it fought the Navy so hard for.<sup>51</sup> As the Air Force revitalizes the nuclear enterprise, part of the price of neglect might be the eventual loss of the nuclear strategic bombing mission. United States bombers are dual capable and can easily be used in conventional only missions, much like the B-1 transition made in the early 1990s. This would be an easy force structure modification, leading to a dyad of US nuclear weapons rather than a triad. Removal of the bombers from our nuclear arsenal would remove an important signaling capability. Unlike other legs of the triad, bombers can be both launched and recalled. By scrambling our bomber forces, getting them airborne poised to strike, the country can signal its willingness (an important part of deterrence) to use nuclear weapons. Yet U.S. decision makers can still recall the bombers once launched. Without bombers to put on alert, this traditional signaling mechanism could be lost.

Recent revitalization of the nuclear enterprise is not limited to the bomber force; it also includes the ICBM career field. As the Air Force strives to provide those who work with ICBMs a sense of purpose and mission in a post cold war era, they will be faced with increased reductions, as the ICBMs will be the second most likely delivery system in the U.S. nuclear arsenal to be reduced, if not eliminated.

These reductions in U.S. Air Force resources and missions, if taken, would exacerbate the nuclear culture problems the Air Force currently faces. With fewer

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<sup>50</sup> Schlesinger, p. C-1.

<sup>51</sup> Boyne, Walter J. *Beyond the Wild Blue; A History of the U.S. Air Force*, (New York: St Martin' Griffin, 1997).

nuclear billets in the Air Force at fewer locations, there would be an even smaller numbers of officers and senior NCOs to call upon to fill important command and control and critical nuclear-related staff and leadership positions. With a continued decrease in emphasis within the Air Force on the nuclear mission, it would be even more difficult to draw the best and brightest young airmen into this dying career field, causing many to pursue other career opportunities. On the other hand, while it looks like there may be a reduction in Air Force strategic nuclear weapon delivery systems, there may be an associated increase in the deterrence role for the Air Force's fighter community.

To maintain some semblance of a triad in order to provide the necessary deterrence effects and security for our allies, the fighter community could ultimately pick up more of the aircraft nuclear weapons delivery mission, formerly provided by heavy bombers. With the new Joint Strike Fighter becoming the Air Forces weapons system of choice, its mandated nuclear weapons delivery capability will be a vital part of its mission.<sup>52</sup>

With a world moving toward a preponderance of tactical nuclear weapons (See Table 2), it will be important for the United States to demonstrate its tactical nuclear capability. This capability could be a critical element of our future deterrence posture. It can be used in a show of force and national resolve when the aircraft are forward deployed and placed on airborne alert.

F-35s picking up the nuclear deterrence role from the bombers will present its own set of problems to the Air Force. Tactical nuclear weapons may not be regularly deployed to Asia and Europe, due to the constantly changing political environments. However, if the F-35s are to play a nuclear deterrent role it would be wise to continue to

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<sup>52</sup> Hebert, Adam J., "New Nukes, Old Nukes," *Air Force Magazine*, October 2009, p. 20.

deploy most of the estimated 200-350 forward based nuclear bombs and air-to-ground missiles in NATO countries (See Table 3).<sup>53</sup> Otherwise, the F-35 community will face the challenges of keeping fighter crews, maintainers, security forces and support personnel associated with nuclear weapons fully qualified and capable of completing the nuclear mission while not actually having nuclear weapons at their forward locations. This shift to the F-35 as the primary airborne delivery system would provide enhanced deterrence for our nation at the cost of a cultural shift among the fighter community as they take on this important role.

## **Conclusion**

In April 2009, President Obama set the nation on the path towards the eventual long-term goal of zero nuclear weapons. Nuclear disarmament has been a worldwide goal since the Nuclear Non-proliferation Treaty was opened for signature in 1970. Over the years, states have taken numerous positive steps towards that end. Now the United States finds itself in negotiations with Russia to further reduce our nuclear arsenal. Perhaps in later rounds, after the current START Follow-On negotiations, the sides may agree to levels below 1,000 warheads. Once we cross the 1,000 threshold, we will be entering a new more complicated world of nuclear arms negotiations.

As previously noted, it will take time to understand the different players, motives and issues that each of the new players bring to the negotiation table. The challenge is to coordinate the step-by-step disarmament of the nine current members of the nuclear weapons state club, while simultaneously attempting to persuade others from “going

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<sup>53</sup> Anthony, Ian, “The Future of Nuclear Weapons in NATO” (Stockholm, Sweden: SIPRI, 4 February, 2008), p. 28.

nuclear.” New challenges on the path to zero may emerge as allied nations consider acquiring nuclear weapons to make up for a perceived loss of U.S. umbrella protection, or as other nations see an opportunity to increase their relative military/political power and prestige.

In order to counter these unintended consequences, it is important to bring into negotiations all of the world’s nuclear armed nations as soon as possible. However, even if we were to bring all other nuclear-armed nations into negotiations today, it would likely be a long time, if ever, before all parties will be able to agree on total disarmament or even on the next steps to be taken. During this protracted period of negotiations, we are going to find ourselves in a world with a group of countries that possess a relatively large and growing number of nuclear weapons.

The preponderance of weapons in this new environment will be so-called non-strategic nuclear weapons, which will present a different dimension to our national security posture and force structure. The United States will have to make some tough choices as negotiations further limit delivery vehicles and warheads. With the most likely losses to the strategic retaliatory forces being, first the bombers and then, possibly later, a reduction of ICBMs, there will be a need for the Air Force to focus more on its tactical nuclear mission. This proposed shift to tactical nukes would have a dramatic impact on the Air Force’s efforts to re-invigorate its nuclear enterprise.

As the Air Force endeavors to recapture the pride and discipline of Strategic Air Command (SAC) without actually resurrecting SAC, it will be faced with the additional challenges of a nuclear force structure that is so small it will be even more difficult to maintain and inspire those to join and work with high energy and commitment. In

addition, if the United States shifts to F-35s as the foundation of its nuclear airborne arsenal, the service will experience a cultural shift among aircrews as fighter pilots more fully join the nuclear enterprise by taking on the traditional role of the bombers.

The United States is committed to a path to a nuclear free world. Meanwhile, the Air Force is committed to reinvigorating its nuclear enterprise. The first is a noble goal fraught with unknown challenges, numerous new actors and dynamics that will yield surprises. The latter, will re-invigorate its nuclear force while simultaneously downsizing that arsenal, reducing the role of nuclear weapons in the U.S. national security strategy. This downsizing may ultimately result in a shift of focus on the Air Force's nuclear deterrence role from the strategic bomber community to the tactical fighters.

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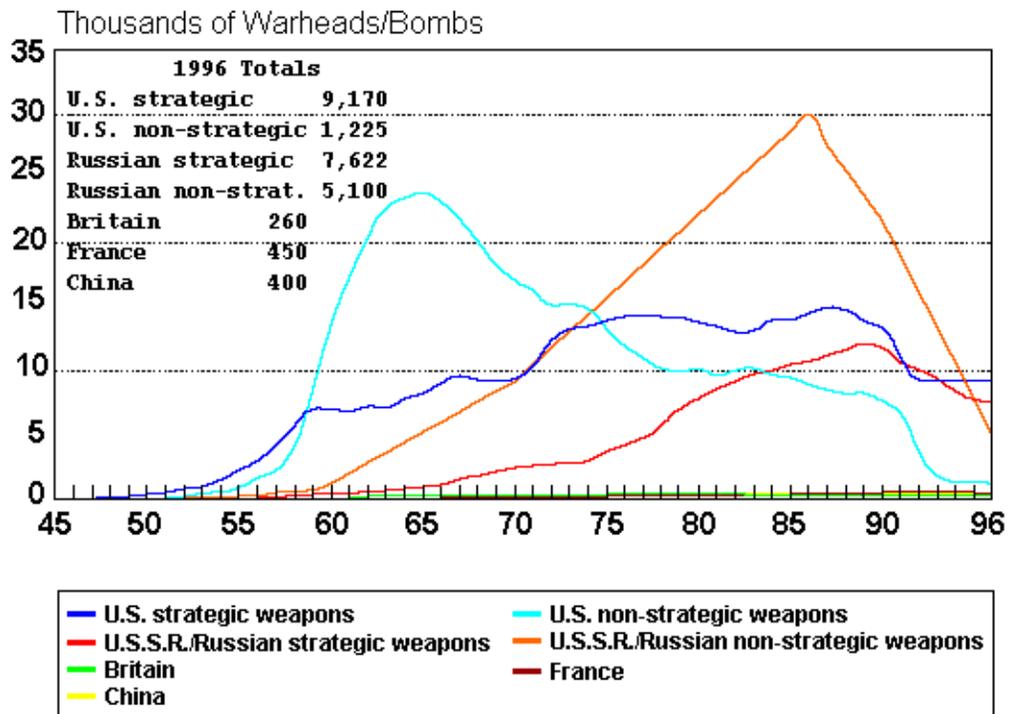
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## Global Nuclear Stockpiles, 1945-1996



**Notes:** These figures show active nuclear weapons. They do not include inactive but intact weapons awaiting dismantlement. For the U.S., these warheads are estimated as follows: 241 (1988), 642 (1989), 752 (1990), 2,330 (1991), 5,261 (1992), 5,789 (1993), 4,916 (1994), 3,635 (1995), and 2,542 (1996). For the U.S.S.R./Russia, these are estimated as follows: 4,277 (1986), 4,141 (1987), 3,670 (1988), 3,183 (1989), 3,485 (1990), 5,394 (1991), 6,744 (1992), 8,215 (1993), 9,933 (1994), 11,385 (1995), and 12,278 (1996). It should be noted that there is a great deal of uncertainty as to the exact number of U.S.S.R./Russian non-strategic nuclear weapons. South Africa (not shown) secretly built six nuclear

weapons between 1979 and 1989; these were subsequently dismantled between July 1990 and July 1991. Israel (not shown) is assumed to have at present approximately 100-150 nuclear weapons.

**Sources:** Robert S. Norris and Thomas B. Cochran, *US and USSR/Russian Strategic Offensive Nuclear Forces, 1945-1996*, Nuclear Weapons Databook Working Paper 97-1 (Washington, D.C.: Natural Resources Defense Council, January 1997); Robert S. Norris, "Nuclear Arsenals of the United States, Russia, Great Britain, France and China: A Status Report," Presented at the 5th ISODARCO Beijing Seminar on Arms Control, 12-15 November 1996; Robert S. Norris, Andrew S. Burrows, and Richard W. Fieldhouse, *Nuclear Weapons Databook Volume V: British, French, and Chinese Nuclear Weapons* (Boulder, CO: Westview Press, 1994); Robert S. Norris and William M. Arkin, "NRDC Nuclear Notebook (Global Nuclear Stockpiles, 1945-1997)," *Bulletin of the Atomic Scientists*, November/December 1997, p. 67

Table 1.

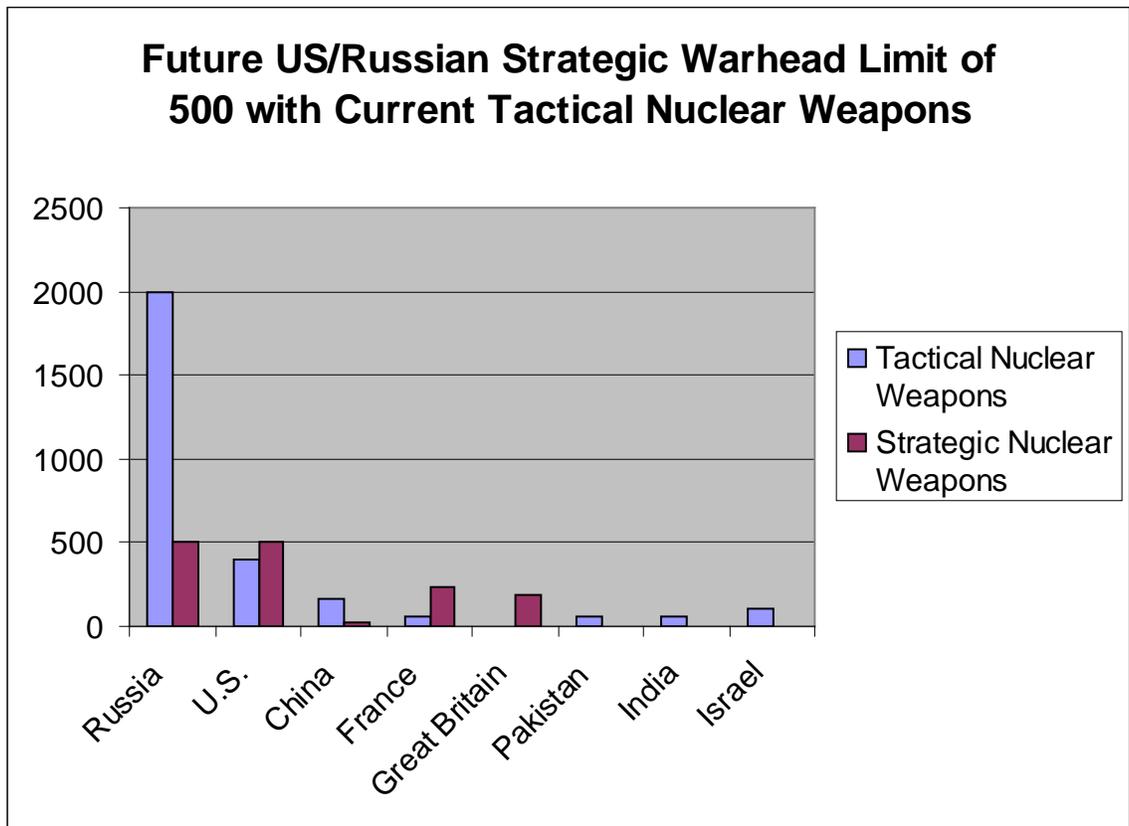


Table 2

Strategic numbers are based on any future agreement between Russia and U.S. that limit strategic nuclear weapons to 500 warheads each. Strategic nuclear weapons for China, France and Great Britain along with all Tactical Nuclear Weapons Numbers are based on current strategic nuclear weapons and Tactical Nuclear Weapons as reported in (Stockholm International Peace Research Institute. *SIPRI Yearbook 2009, Armaments, Disarmament and International Security*, Oxford University Press, Oxford U.K).

### Status of US Nuclear Weapons in Europe, 2008

Country	Air Base	Custodian	Delivery	Deployment	
				W53 vaults	Est. Weapons
Belgium	Kleine	701 MUNSS	Belgian F-16s	11	10-20
Germany	Brogel	702 MUNSS	German Tornados	11	10-20
	Büchel				
Holland	Volkel	703 MUNSS	Dutch F-16s	11	10-20
Italy	Aviano	31st Fighter Wing	US F-16s	18	50
Turkey	Ghedì <sup>a</sup>	704 MUNSS	Italian Tornados	11	20-40
	Incirlik <sup>b</sup>	39 Air Base Wing	Rotational US aircraft from other wings	25	50-90
United Kingdom	Lakenheath	48th Fighter Wing	US F-15Es	33	50-110
					Total 200-350

*Notes: a* Rumoured decision to withdraw 704 MUNSS and consolidate weapons at Aviano

*b* No permanent Fighter Wing at base. National Turkish nuclear strike mission in doubt.

*Source:* Hans M. Kristensen, USAF Report: 'Most' Nuclear Weapons Sites in Europe Do Not Meet U.S. Security Requirements, June 19 2008.

Table 3