TWENTIETH AIR FORCE - FROM B-29s TO ICBMs
A Proud Past…A Bright Future

by
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THE TWENTIETH AIR FORCE LEGACY

As I come to work each day, I pass a picture gallery of the former Commanders of Twentieth Air Force. From it, the faces of great leaders like Hap Arnold, Curtis LeMay, and Nathan Twining remind me of the rich heritage of this numbered air force. The great warfighting organization these magnificent Air Force pioneers organized and led during World War II lives on today as *"America's ICBM Team"* -- modern day professionals carrying on the legacy of air power excellence born in the South Pacific in 1944.

We remain linked to the original Twentieth Air Force in many ways. Pictured are Lieutenant Fiske Hanley, WW II veteran, and Captain Keith McCartney, 341st Space Wing, Malmstrom AFB MT. They

Lt Fiske Hanley as he looked in 1944.

are past and present representatives of the thousands of courageous airmen who founded, formed and now carry on our superb legacy. Although separated by five decades of history, Hanley and McCartney understand full well how crucial their missions were, and now are to the security of America.

Capt Keith McCartney in command at a Minuteman III launch control console

They also share another important linkage in history. While Fiske Hanley's Twentieth Air Force of 1945 employed nuclear weapons to stop a horrible world war, Captain Keith McCartney stands alert in today's Twentieth Air Force committed to preventing war through nuclear deterrence and professional stewardship of America's nuclear arsenal.

With our legacy as a preface, I invite you to join me on a journey through Twentieth Air Force--from the South Pacific in 1944, to the ICBM fields of rural America today, and on to our bright future as a relevant and important part of America's national security team.

THE EARLY DAYS--WORLD WAR II

As the powerful B-29 "Superfortress" rolled off America's production lines in the midst of World War II, General "Hap" Arnold, then Commanding General of the Army Air Forces, understood the need to bring the B-29's unique strategic bombing capabilities to bear against the Japanese homeland. Thus, in April 1944, he created Twentieth Air Force and gave it the daunting mission of conducting one of the largest--and ultimately most successful--air campaigns in history. Arnold's B-29s first flew in Operation MATTERHORN, which called for India-

based Superfortresses to bomb Japan from forward bases in China. As allied forces advanced in the South Pacific "Island Hopping" campaign, Twentieth Air Force expanded its B-29 operations to bases in the Marianas Islands. Flying more than 1,500 miles one way, more than 1,000 bombers and 250 fighters conducted 28,000 combat sorties against Japan in the brief span of 16 months.

In August 1945, two Twentieth Air Force B-29s, the Enola Gay and Bock's Car, flew missions over Hiroshima and Nagasaki, dropping atomic bombs on these cities and forcing the Japanese to surrender. Out of this massive and devastating air campaign, the stalwart airmen of Twentieth Air Force built an enduring legacy of decisive, long-range air power--a legacy which lives on today in the form of America's ICBM Team.

The B-29 Superfortress provided this country with a tremendous long-range capability to project air power in the Pacific.

Lt Hanley was present at the beginning, flying as an engineer in the 398th Bombardment Squadron of the 504th Bombardment Group. In March 1945, on his 7th mission, Hanley's aircraft was shot down. Captured by the Japanese, he spent more than 150 days in a POW camp in Tokyo. As Lt Hanley related after the war, "…all prisoners were to be immediately executed the moment Japan was invaded. All POWs knew that was a standing order. It was not a good feeling! …We knew we [POWs] would be killed if America had to invade Japan to stop the war. The atomic bombs saved thousands of American lives, including my own."[1]

After World War II ended, Twentieth Air Force remained in service as the long-range air arm of the Far East Air Forces. During the Korean conflict, Twentieth Air Force B-29s flew combat interdiction and reconnaissance missions. Although direct Twentieth Air Force participation in Korean combat operations lasted for only the first few weeks of the conflict, B-29s detached from Twentieth Air Force continued flying combat missions until the end of the war in 1953. By 1955, with the situation in Korea stabilized and intercontinental-range bombers entering service, the need no longer existed for a B-29 numbered air force in the Pacific, so Twentieth Air Force was inactivated in March of that year.

Although the systems we operate have, over the last 55 years, evolved from B-29s to ICBMs, many bedrock mission principles remain unchanged. The old French saying, "plus ca change, plus c'est la meme chose"--the more things change, the more they stay the same--applies here. Thus, a challenge for Twentieth Air Force today is to adjust to the changes of the post-Cold War world and keep our focus on the "basics" of our long-range air power heritage.

REBIRTH AND A DECADE OF CHANGE

After 36 years of inactivity, Twentieth Air Force was reestablished in 1991 as a component of the Strategic Air Command. Operationally responsible for all land-based ICBMs, Twentieth Air Force's rebirth came at a time when America's nuclear forces were entering a decade of unprecedented force reductions and changes. Spawned by the Cold War's end and the breakup of the Soviet Union, these changes reshaped the basic fabric of this nation's nuclear deterrent forces. For the men and women of America's ICBM Team, it proved to be a period of sustained, dramatic change!

In the nine short years since its rebirth, Twentieth Air Force experienced three major command identities. After one year in Strategic Air Command and another year in Air Combat Command, Twentieth Air Force found a permanent home in Air Force Space Command in 1993. Twentieth Air Force Headquarters' location also changed in 1993, moving from Vandenberg AFB CA to its current home at Francis E. Warren AFB WY. ICBM force structure was reduced radically as well during the 1990s, downsizing from six wings to three, and from 1,000 alert ICBMs to 550. These drawdowns posed major leadership challenges for airmen at all levels of command. To me, there is no tougher peacetime job than leading a unit through drawdown and closure. Those who have experienced it understand just how demanding, and often emotionally charged, these tasks proved to be from both the units' and surrounding communities' perspectives. In each case, we performed the deactivations professionally, safely, and ahead of schedule.

Along with the highly visible force reductions, perhaps the most significant change (and challenge) for the ICBM business was that "nuclear" was no

longer the preeminent Air Force mission as it once had been during the Cold War. The mere fact it no longer needed to be the top priority represented significant progress in the international arena and opened the door for new Air Force mission priorities, e.g., space, force protection, the Expeditionary Aerospace Force, and others. However, by the mid-90s, this change in mission priorities had evolved into a corporate loss of focus on "things nuclear" within the Air Force. It took a concerted effort by then Air Force Chief of Staff, General Ron Fogleman, to revitalize Air Force institutional support for its nuclear mission and the ICBM force. This decade also saw substantive changes to the organization of US nuclear forces and in our relationship with our Russian counterparts.

At the heart of the organizational changes was the creation of United States Strategic Command (USSTRATCOM) in 1992 as the unified command responsible for all of America's strategic nuclear forces. Since that time, operational control of all three legs of America's Strategic Triad of nuclear forces now resides with the Commander in Chief of USSTRATCOM in Omaha NE. Consequently, the Commander, Twentieth Air Force, inherited a "second hat" as Commander of STRATCOM's ICBM Task Force 214. Ultimately, the creation of USSTRATCOM not only reorganized and improved the command structure for America's strategic nuclear forces, it enabled CINCSTRAT to be an advocate for nuclear forces' budget and policy issues in Washington DC.

One of the most exciting and positive steps in our post-Cold War relations was the advent of USSTRATCOM's Military-to-Military Exchange Program. The "Mil-to-Mil" program established a forum for members of both US and Russian strategic nuclear forces to visit each other to develop understanding, cooperation and trust. I was involved with three exchanges with the Russian Strategic Rocket Forces (SRF)--each one exceeding any dream of openness and cooperation conceivable during the Cold War.

A remarkable event, which happened during my summer 1996 exchange visit in Russia, stands out as an example of this openness. On day four of our seven-day tour, we visited an SS-18 ICBM regiment at Dombarovskiy, on the steppes of southern Russia near the Kazakhstan border. At a regimental launch complex, the one-star SRF division commander escorted me 12 levels down to the launch control center (LCC) and, during the tour, directed the alert missile crew to remove the launch keys from the safe. When

A Minuteman III is launched during an operational test from Vandenberg AFB California. Tests like this are routinely performed to help monitor the operational reliability of the weapon system.

the general put the keys in my hand "for inspection," I remember experiencing two distinct feelings. First, I was thankful our two nations had progressed forward enough in trust to allow this event. Second, I felt a sense of irony--that an American Air Force general officer, and missileer, who spent his career deterring the former Soviet Union, could now stand inside a Russian SS-18 LCC and hold the launch keys? Trust me, I considered pinching myself to be sure I was not dreaming!

Although on hold for the past year, these exchanges have yielded much in terms of cooperation, trust and friendship between former adversaries. My hope is for a quick return to an expanded exchange program--it is a "win-win" situation for both nations.

TWENTIETH AIR FORCE TODAY

The Mission--Geography--People. Fifty-five years after its beginning, the legacy built by the Twentieth Air Force of Fiske Hanley's era lives on in America's ICBM Team. This team of talented, committed professionals, assigned to three Air Force Space Command wings controlling missile complexes located in five states, performs the nation's core mission of nuclear deterrence quietly and without fanfare. Their "job one" is to provide America with a safe, ready, and credible force of 500 Minuteman and 50 Peacekeeper ICBMs. Today's ICBM force also provides the visible, homeland-based deterrent umbrella for America's expeditionary commitments abroad--a major component of our nation's national security framework.

Maintenance is performed in some of the most austere weather conditions around. Here a transporter erector inserts a Minuteman ICBM into its underground silo.

Arrayed across more than 45,000 square miles of rural America, the geography of today's Twentieth Air Force presents special challenges to the men and women who operate, maintain, secure and support the nation's 550 ICBMs. Not unlike the geographical problems facing our World War II predecessors in the South Pacific, our modern-day challenges involve distance, time and weather. For example, while operations at most Air Force installations occur on a collocated flight line, ICBM maintenance technicians, site support personnel, security forces and combat crews can travel up to 150 miles one way to reach their ICBM launch and alert facilities. With tasks that must be performed at all hours of the day, every day of the year, the weather in locations like North Dakota, Montana, Nebraska, Colorado and Wyoming adds to the difficulty and danger of the mission. In terms of distance alone, it is not uncommon for an ICBM wing to drive more than 7 million miles in one year.

The 9,500 men and women of Twentieth Air Force share special training and personal accountability requirements for participation in the nuclear deterrent mission. As a safeguard to ensure that the officers and airmen who operate, maintain and secure nuclear assets are physically and mentally ready, a high percentage of our people are certified under the Personnel Reliability Program (PRP).

More than 750 officers operate 55 launch control centers with two-person crews 365-days a year. Each alert crew commands a flight of ten Minuteman or Peacekeeper ICBMs, undergoes rigorous training and intense evaluation, and is capable of responding to any peacetime or wartime contingency. This day-to-day mission is a magnificent leadership training ground.

Additionally, 2,600 Security Forces (SF) warriors provide around-the-clock protection for this nation's most sensitive and important assets, our "Priority A" nuclear resources. Tough training, high stakes/high stress work, and the remote duty locations make this a difficult business. The "can-do" attitudes of these highly trained professionals, along

with their superb training, make them a formidable force.

ICBM maintainers, with their specialized training and equipment, travel across our 45,000 square mile "flight line" daily to maintain a fleet-wide alert rate of over 99 percent. The 1,500 skilled technicians assigned to Twentieth Air Force work in functional teams and, along with associated security forces, visit an average of 65 sites per day in all kinds of weather conditions to perform essential maintenance.

ICBM mission success also depends on the vital services provided by civil engineers, communicators, chefs, facility managers and other support personnel. These mission-oriented warriors must deal with the same distance, time and weather obstacles as our operators, maintainers and security forces. Their efforts remain crucial to the mission.

Russia still maintains a credible and modern strategic nuclear capability with systems like this SS-25 mobile ICBM.

The Threat. Surprisingly, I am often asked, "Why does America still need nuclear weapons?" Questions like this come from a public whose perception is that strategic threats holding America at risk vanished when the former Soviet Union dissolved. However, in reality strategic threats to our nation's security did not go away with the end of the Cold War. Nations possessing weapons of mass destruction (WMD), and the long-range means to deliver them, still exist and the number is, in fact, growing! As such, the threat has evolved from the Cold War scenario of a massive nuclear exchange between two superpowers, to one consisting of several nations with weapons of mass destruction capable of attacking the United States and causing grave damage.

Under Secretary of Defense for Policy, Walt Slocombe, puts it in perspective: "Two classes of threats [exist] to which nuclear weapons remain important as deterrents.

- Russia continues to possess substantial strategic forces and an even larger stockpile of tactical nuclear weapons. And because of deterioration in its conventional military capabilities, Russia [is] placing even more importance on its nuclear forces."[2]

- Second, even if we could ignore the Russian nuclear arsenal, there are…other potential threats to which nuclear weapons are a deterrent…Indeed, the knowledge that the US has a powerful, ready nuclear capability is, I

believe, a significant deterrent to proliferators …[like] the Kaddafis and Kim Jong Ils of the world."[3]

My response to those who question the need for our nuclear mission today is this. The context of the threat facing America has changed. Our post-Cold War security concerns are no longer solely focused on the former Soviet Union. US forces are deployed to a number of expeditionary commitments abroad and we face a growing threat from at least two dozen states armed with WMD. Additionally, the uncertainties posed by Russia's political future and the modest but steady growth of China's strategic capabilities only serve to further complicate our national security equation. The significance of today's threat to America's security is crystal clear, and due to these growing and more unpredictable threats, the United States continues to rely on a Triad of nuclear weapon systems that are unquestionably reliable and credible and also continues to develop a National Missile Defense.

Security plays a vital role in the ICBM business. Here, Security Forces are "at the ready" after insertion into a simulated threat area by a helicopter.

National Security and Nuclear Deterrence. Our national defense policy, based in part on the international threat landscape, reaffirms that nuclear weapons are indispensable to the security of America. In other words, a credible nuclear deterrent force is still critical in our world today because it continues to cause leaders and planners in adversary nations to think twice before employing weapons of mass destruction. As stated by President Clinton, America's national security strategy is clear: "…our nuclear deterrent posture is one of the most visible and important examples of how US military capabilities can be used to deter aggression and coercion. [Our] nuclear weapons serve as a hedge against an uncertain future, a guarantee…to Allies, and a disincentive to those who would contemplate developing or…acquiring…nuclear weapons."[4]

The Value of ICBMs. Since the end of the Cold War, the relevancy of America's ICBM force as a deterrent has been questioned and debated. Many believed, as I did, that the recommendations of the 1994 Nuclear Policy Review (which retained 500 Minuteman III ICBMs in a START II force structure) would end the discussion. Despite this bipartisan endorsement, disarmament advocates continued to argue that ICBMs were vulnerable and destabilizing, and that US deterrent needs could be better met by other means, e.g., a few hundred "survivable" nuclear weapons.

Two nationally recognized studies changed the tenor of the debate over ICBMs and reaffirmed their current and future relevancy to US security. The first was a prestigious Defense Science Board Task Force on Nuclear Deterrence chaired by former Air Force Chief of Staff General (Ret) Larry Welch. Widely briefed and endorsed in DoD and government circles, the 1998 "Welch Report" found that land-based ICBMs provide increasing stability and value to America's nuclear deterrent: "…the change in the relative value of the ICBM force is important and not adequately understood. This is the leg [of the US nuclear Triad of forces] whose value increases the most with declining forces…the single warhead silo-based ICBM becomes highly stabilizing."[5]

The Welch report also concluded: "Significant numbers of ICBMs deny any adversary the benefit of a limited attack. Without the ICBMs, surprise attacks against a handful of bomber bases and SSBN facilities, with plausible deniability, could drastically alter the correlation of forces."[6]

The second study, "The Commission to Assess the Ballistic Missile Threat to the US", was chaired by former SECDEF Donald Rumsfeld. Mandated by Congress, this 1998 effort included three conclusions appropriate to the ICBM relevancy discussion:

First, "Concerted efforts by a number of overtly or potentially hostile nations to acquire ballistic missiles with biological or nuclear payloads pose a growing threat to the US, its deployed forces and its friends and allies."[7]

A credible nuclear deterrent is dependent in part on a skilled maintenance force. Here a maintenance team installs a reentry system on top of a Minuteman III.

Additionally, "The threat to the US posed by these emerging capabilities is broader, more mature and evolving more rapidly than has been reported in estimates and reports by the Intelligence Community."[8]

Finally, the "Rumsfeld Report" concluded, "Emerging powers therefore see ballistic missiles as highly effective deterrent weapons and as an effective means of coercing or intimidating adversaries, including the United States."[9]

I believe these two landmark studies gave American defense planners a "wake-up call" in terms of an emerging threat, and led to a new way of viewing ICBMs and their deterrent value.

Reality for the men and women of America's ICBM Team is that they will continue to play a central role in this nation's national security policy. Whether providing a ready "enabler" for our Expeditionary Aerospace Forces or acting as a stabilizing factor in our relationships with Allies and adversaries alike, these visible and powerful nuclear forces underwrite and add significant value to America's strength and security.

Space and Missile Careers. As I mentioned earlier, in 1993 the Air Force found a permanent home for Twentieth Air Force in Air Force Space Command (AFSPC). Now, six years later the wisdom of this decision is clear. Not only were the missions and equipment a good match, the subsequent combining of the space and missile operations career fields was a near-perfect union. This merger blended together the ICBM legacy of checklist discipline and rigor in operations and maintenance processes with the highly technical and diverse opportunities offered by the exciting new frontier of space. Today, ICBMs are fully integrated as one of five space operations career field mission areas.

Captain Keith McCartney is a success story from this career field merger. After establishing his expertise as a "satellite driver" at the 50th Space Wing, Schriever AFB CO, he elected to cross over into the ICBM arena for the leadership and broadening challenges it promised. While serving as an ICBM flight commander responsible for 18 officers, 8 enlisted, as well as the security forces personnel who operate and secure 10 Minuteman III ICBMs capable of carrying 30 nuclear warheads, Keith competed in GUARDIAN CHALLENGE--the command's premier space and missile competition. He led his crew to the second highest operations score ever in the history of the competition. Capt McCartney is now an Emergency War Order instructor. Having spent the first half of his career building technical expertise in two important space operations mission areas, Capt McCartney will now be ready to assume leadership positions across a career field that has a bright future--one connected to key national security missions for the foreseeable years to come.

Nuclear Expertise. The quiet success of America's nuclear mission yesterday and today can be

largely attributed to the excellence and expertise of our people. However, the requirement to identify, manage and ultimately preserve nuclear expertise across all specialties presents a looming challenge for both the Air Force and the larger US nuclear community. Amid growing concerns about the availability of this expertise to train, lead and perform key staff functions, the causes of the problem are clear: smaller force structures/career fields; the loss of mission preeminence; and perceptions that nuclear experience is of declining value in an Air Force career.

Several high-level DoD and congressionally mandated studies addressed the nuclear expertise problem because of its impact across the military services and the Department of Energy. The Air Force aggressively moved forward, identifying the "pool" of AF people (officers, NCOs and civilians) who possess nuclear expertise and validating/filling field and worldwide staff billets requiring Air Force people with nuclear expertise. Other steps taken involve managing the career flow of nuclear personnel to ensure the right expertise is cultivated and applied to the right positions inside and outside of the Air Force.

We are also working hard to change the perception that nuclear experience is of declining value in an Air Force career. I believe we've been successful for a number of reasons--the opportunities created by the combination of space and missile career fields, the national commitment to sustain ICBMs through at least 2020 and steps taken by the Air Force to highlight the military-wide need for nuclear expertise. Captain Keith McCartney's career decision to take on the leadership and technical challenges of ICBM duty is a good example of the progress being made in changing a negative perception to positive.

TWENTIETH AIR FORCE TOMORROW

The future for the men, women and continuing mission of Twentieth Air Force is bright and promises to be challenging and extremely busy.

National Commitment. I base this optimism on my confidence that the ICBM deterrent mission will remain relevant and viable through 2020. Importantly, America's military and civilian leaders understand the unique and stabilizing value of the land-based ICBM against a growing international threat landscape. As a result, Congress and the Air Force have made a $5.7 billion commitment to the sustainment of the Minuteman III fleet as a credible deterrent force for the next two decades. Already under way, this effort includes replacing Minuteman III guidance sets and solid booster propellant, sustaining Rapid Execution and Combat Targeting (REACT) consoles in launch control centers (LCCs) and replacing support vehicles, handling equipment and launch facility (LF) environmental control systems.

In addition, we continue to operate and maintain the Peacekeeper ICBM as a key element of our land-based ICBM deterrent. The flexibility to either sustain or deactivate the Peacekeeper is important to the Twentieth Air Force and the nation. Both missions are linked to appropriate long-term funding and are high interest items at both Air Force Space Command and US Strategic Command.

We are equally committed to developing a long-term ballistic missile replacement for Minuteman and substantive cooperation is taking place with the Navy to develop common propulsion, guidance and reentry vehicles. These significant modernization and sustainment programs are in concert with the Department of Energy's Stockpile Stewardship Program--a ten-year $45 billion investment toward ensuring our weapons remain safe, reliable and credible.

High Operations Tempo. Translating America's commitment to ICBM sustainment into systems on alert will mean a very full plate for Twentieth Air Force professionals over the next decade. For example, each of the six key modification programs, e.g., guidance set and propulsion replacement, requires major maintenance (including nuclear weapons convoys) to be performed at all 500 Minuteman LFs. Compliance with strategic arms control treaties is another important task to complete over the next decade. Already under way at the 90th Space Wing (SW), F. E. Warren Air Force Base, Wyo, the Single Reentry Vehicle (SRV) program will "DE-MIRV" the wing's Minuteman IIIs from three warheads to one, allowing compliance with the START I national warhead ceiling. Those involved with the SRV program at the 90th SW feel an extra sense of pride because of the historical and international significance of this arms control activity. Should Russia ratify START II, our "arms control ops tempo" will grow even more as we "DE-MIRV" the remaining Minuteman III force and deactivate the Peacekeeper system.

These tasks would be difficult enough on their own, but normal constraints of distance, weather and security plus day-to-day alert maintenance requirements will make execution, scheduling and deconfliction of these programs as challenging as any in the history of our business. And I can assure you Twentieth Air Force professionals welcome the challenge!

Focus on the "Basics." As stewards of a large portion of America's nuclear arsenal, we place a great deal of emphasis on the professionalism and seriousness with which we approach our mission. I view our professional stewardship as an "implied contract" we have with the American public, i.e., that the public has a right to expect Twentieth Air Force can safely, securely and credibly operate its nuclear weapons systems to provide a credible deterrent against possible enemies.

Our leadership team also understands the importance of teaching and reminding our people about the "basics" of the nuclear business--personal accountability, checklist discipline, safety and airtight security. We periodically set aside time at each ICBM unit to review the bedrock tenets of nuclear stewardship, reaffirm the importance of each person's role and recommit to the "basics." As we discuss the nuclear "basics" with our people, we emphasize how important our mission is to the citizens of America today--from providing the deterrent backbone for US expeditionary commitments around the globe, to deterring WMD use, to providing a security hedge for the uncertain futures of Russia and China.

Keeping the Legacy Alive. As a nation and an Air Force, we owe a great debt to men like Fiske Hanley and other heroes of the World War II Twentieth Air Force--they built a magnificent legacy of courage and excellence in air operations for us to follow. It is so important to preserve and build on this legacy within our organization. With each opportunity I have to meet the men and women of Twentieth Air Force today, I tell them how proud all of us are of their contributions to America's security. There is no doubt our heroes from the past are watching and are just as proud!

ABOUT THE AUTHOR

Major General Thomas H. Neary is Commander, Twentieth Air Force, Air Force Space Command, and Commander, Task Force 214, US Strategic Command, Francis E. Warren Air Force Base, Wyo. He is responsible for the nation's ICBM force, including three operational space wings with more than 9,500 people.

The general grew up in Idaho and entered the Air Force as a graduate of the Reserve Officer Training Corps program at the University of Idaho. After five years of missile operations duty at Malmstrom Air Force Base, Mont., he began a varied staff career in nuclear planning and missile force development. He held positions at Headquarters Strategic Air Command and the Joint Strategic Target Planning Staff in Omaha, as well as Headquarters U.S. Air Force, the Pentagon, and Supreme Headquarters Allied Powers Europe in Mons. While in Europe, he was deputy commander of operations for the 485th Tactical Missile Wing at Florennes Air Base. He has commanded two intercontinental ballistic missile wings--the 341st Missile Wing at Malmstrom Air Force Base, and the 90th Missile Wing at Francis E. Warren. Prior to his current assignment, he served as the director of nuclear and counterproliferation with the Deputy Chief of Staff for Air and Space Operations at the Pentagon.

NOTES

[1] Fiske Hanley, *History of the 504th Bomb Group (VH)*, (Enfield, CT: 504th Bomb Group Association, 1992), p. xii.
[2] Walter Slocombe, Undersecretary of Defense for Policy, Governmental Affairs Subcommittee on International Security, Proliferation and Federal Services, *Hearing on Nuclear Weapons and Deterrence*, 105th Congress, 1st session, 12 Feb 97, pp. 10-11.
[3] Ibid, pp. 10-11.
[4] President William Jefferson Clinton, White House, *Report to Congress: A National Security Strategy for a New Century*, Oct 98, p. 16.
[5] General Larry Welch, USAF (Ret), Chairman, Defense Science Board Task Force on Nuclear Deterrence, Department of Defense, Defense Science Board, *Final Report of the Defense Science Board Task Force on Nuclear Deterrence*, Jul 98.
[6] Ibid.
[7] House, National Security Committee, *Executive Summary of the Report of the Commission to Assess the Ballistic Missile Threat to the United States*, 105th Congress, 2nd session, 15 Jul 98, section II-A.
[8] Ibid.
[9] Ibid, section II-C-1.