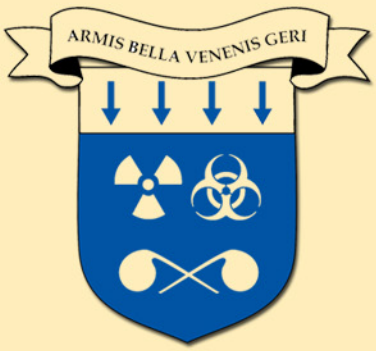
The Unauthorized Movement of Nuclear Weapons and Mistaken Shipment of Classified Missile Components: An Assessment

Michelle Spencer, Aadina Ludin, and Heather Nelson
Advisor: Colonel Larry Chandler, USAF, ret.



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The USAF Counterproliferation Center was established to provide education, research and analysis to assist the understanding of the U.S. national security policy-makers and USAF officers to help them better prepare to counter the threat from weapons of mass destruction. The USAF Counterproliferation Center is funded jointly by the Defense Threat Reduction Agency and the United States Air Force.

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USAF Counterproliferation Center

Air University

Maxwell Air Force Base, Alabama 36112-6427

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Michelle L. Spencer
Aadina Ludin
Heather Nelson

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EXECUTIVE SUMMARY

Background

- On August 31, 2007, a U.S. Air Force B-52 plane with the call sign "Doom 99" took off from Minot Air Force Base (AFB), North Dakota, inadvertently loaded with six Advanced Cruise Missiles loaded with nuclear warheads and flew to Barksdale AFB, Louisiana. After landing, "Doom 99" sat on the tarmac at Barksdale unguarded for nine hours before the nuclear weapons were discovered. Below you will read the details of that 36-hour period with six primary mistakes highlighted.

- While the Air Force was reeling from the investigations of the unauthorized movement of nuclear weapons, it was revealed that Taiwan had received classified forward sections of the Minuteman III intercontinental ballistic missile rather than the helicopter batteries it had ordered from the U.S., bringing to light a second nuclear-related incident.

- These two incidents resulted in six major investigations and studies:

    1. Air Combat Command Commander Directed Investigation (CDI)

    2. Blue Ribbon Review of Nuclear Weapons Policies and Procedures

    3. Defense Science Board Report on the Unauthorized Movement of Nuclear Weapons

    4. Report of the Investigation into the Facts and Circumstances Surrounding the Accountability for, and Shipment of, Sensitive Missile Components to Taiwan (Admiral Donald Report)

    5. Report of the Secretary of Defense Task Force on DoD Nuclear Weapons Management, Phase I: The Air Force's Nuclear Mission and Phase II: Review of the DoD Nuclear Mission (Schlesinger Commission Report)

    6. Headquarters Air Force Report: Reinvigorating the Air Force Nuclear Enterprise

- The studies cited, "a failure of leadership" and a significant "erosion of nuclear expertise" as primary causes of these incidents. Even after the 2007 incidents, the Air Force continued to experience senior leadership failures culminating with the Secretary of the Air Force (SECAF) and the Chief of Staff of the Air Force (CSAF) being forced to resign and six other senior officers either being fired or reprimanded.

- This report is the result of a year-long Air University research project funded by Headquarters Air Force (HAF), Strategic Deterrence and Nuclear Integration (A10). The study team was tasked with "researching and writing a case study to investigate how the Air Force can reinvigorate the handling, operation, and maintenance discipline of nuclear weapons that characterized nuclear operations standards and culture at the height of the Cold War."

- The goal of the study was to provide a deeper understanding of the context of internal and external forces that led to the unauthorized movement of nuclear weapons and mistaken shipment of classified forward sections. The methodology was to: conduct a literature review of existing studies, reports, policies, and procedures; hold workshops to review direction and findings, both at the operational and senior leadership levels; and conduct interviews with senior Air Force, Department of Defense (DoD) and national security experts who played a role in our nuclear mission between 1986 to the present.

- Our research led to the conclusion that while the events of 2006-2007 are significant in and of themselves, the unauthorized movement of nuclear weapons and mistaken shipment of classified forward sections are merely symptoms of greater institutional problems. The Air Force nuclear enterprise has been in a state of decline and has been for most of the last two decades. With the standup of Air Force Global Strike Command (AFGSC) and HAF/A10, the Air Force is working to reestablish the enterprise on positive footing. It is clear from our interviews and research that the leadership has a long and challenging path ahead of them and some significant adjustment in the current course needs to be considered.

- Through workshops and interviews with numerous senior leaders and experts from the nuclear enterprise, five factors were identified as the most significant "root causes" that set the stage for the two events. Unfortunately, a true root cause analysis cannot be completed; it is not possible to return to the past and change key decisions to determine new outcomes. Thus, historical root cause analysis relies on logic and inference from experts in the field.

Root Cause 1: Policy and Oversight Changes

- The evolution of national nuclear strategy and policy had a dramatic effect on the Air Force nuclear enterprise in four key areas: a lack of focus at the policy and strategy level; an aging and shrinking scientific community responsible for nuclear weapons development; a lack of awareness or understanding on nuclear-related issues in Congress; and the impact of arms control measures.

- The linkage between the perceived lack of national-level commitment to a "robust nuclear deterrent" by senior national security officials and its detrimental effect on the nuclear workforce was identified by previous studies.

- The problem was compounded by the integration and evolution of nuclear issues into the broader spectrum of weapons of mass destruction and growing requirement for the conventional wars being waged.

- The role of nuclear weapons in the national security strategy underwent a gradual evolution, which was highlighted in strategy documents after the events of September 11, 2001 changed the focus of security and deterrence. Terrorism and rogue state concerns ascended as the primary threats to the United States, dramatically altering the perceived utility of nuclear weapons in our national strategy.

- The political advocates of nuclear weapons programs are retiring from the scene and have been replaced in the Pentagon, Capitol Hill, and White House by leaders who do not focus on nuclear preparedness and nuclear deterrence as the most important issues of the day. This decline in the number of nuclear advocates and the clout they hold has reflected itself in the Air Force's lax approach that led to the unauthorized movement of nuclear weapons and mistaken shipment of classified forward sections. A 1998 report by AF/XON noted many of the same issues that were cited a decade later. The report also noted that Airmen in the nuclear field maintained adherence to high standards.

Root Cause 2: Organizational Change and Operational Evolution

- Lack of attention, clarity, and financial support by the Office of the Secretary of Defense has been detrimental to the Air Force's nuclear enterprise.

- In addition to command and control of U.S. strategic forces, the Commander of U.S. Strategic Command was assigned numerous non-nuclear missions.

- Operation Desert Storm highlighted American dominance in conventional weapons, specifically in the areas of weapons-guidance and communications technologies.

- General McPeak was Chief of Staff at a time when the economy was in decline and the services were being forced to make dramatic budget cuts. General McPeak's vision was a streamlined, flat organization that moved power out of headquarters and into the hands of commanders in the field.

- The Strategic Air Command (SAC) construct fit with the Cold War, but the inflexible, "checklist-following" nature of SAC and thus the Air Force, did not mesh with the dynamic conflicts in Iraq and the Balkans.

- In 1986, Congress passed the Goldwater-Nichols Act to address the issue of service interoperability. The legislation forced the services to take meaningful steps to improve joint operational capability. Goldwater Nichols changed the services role in combat and non-combat operations. Under the new law, the armed services became force providers to joint commanders. While this addressed the problem of inter-service rivalry, it changed the mission construct of the services.

Root Cause 3: Institutional Focus

- While the decline in nuclear competence occurred steadily, many red flags were raised, but ignored. Conscious decisions were made to alter training and education requirements to the point that most airmen did not receive any nuclear-related training. Policies were ignored or revised to meet new challenges, in the ever-flattening Air Force organization.

- There were numerous signals for the Air Force that the nuclear mission was failing. Even internal reports warned of diminished standards of nuclear weapons security.

- The Air Force allowed local changes to the once standardized practices that were consistent throughout SAC and other commands for nuclear-related activities. Officially, these were to be reviewed at command headquarters; but in practice few requests for change were sent to higher headquarters or sister units because neither the command staff nor the unit staff was held accountable for changes. This issue is highlighted in the unauthorized movement of nuclear weapons when the load crew failed to follow their checklist and perform the missile safe status check; however, the loading checklist no longer required the load crew to check the missile safe status. The step had been removed sometime during the past 10 years. There is no indication whether this change was shared with headquarters personnel.

- Both the CDI and Schlesinger Reports noted a dramatic change in Air Force nuclear education and training. The use of strategic bombers in conventional roles in conflicts in Kosovo and Iraq highlighted the ascendency of conventional forces and the declining relevance of the nuclear mission to the operational Air Force, reflecting changes not only on the platform and its mission, but also on training requirements.

Root Cause 4: Failure of Leadership

- The most prominent finding from this study was that of leadership failure.

- Air Force leadership waited to relieve anyone of command until after the 30 day CDI investigation. This is usually interpreted one of two ways: Air Force senior leaders waited for all the facts before making their decision, or senior leader demonstrated a lack of focus on the issue.

- Interviewees suggested the events and the ramifications of Air Force senior leader decisions throughout the years were cumulative in effect, building one upon another, forcing additional harmful decisions.

- In the SAC era, experience and expertise were developed through years of technical training, practice and documented on-the-job training under experienced supervision. However, General McPeak's flat organization method changed such a practice of strict compliance and clear guidance.

- There are some leaders with little, no, or dated nuclear experience who hold key positions in the United States Air Force nuclear enterprise, including supervisors and senior enlisted members as well as squadron, group and wing commanders.

- One study found that the lack of "visible leadership" at senior levels makes maintaining rigor and focus at all levels "to meet demanding proficiency standards" all but impossible.

- The merging of Air Force Specialty Codes and merging of major commands significantly reduced the Air Force's overall focus on nuclear force capability.

Root Cause 5: Failure to Focus on Expertise

- Structural changes affected the development of officer technical expertise in operations and logistics maintenance. Through reductions in the force, several officer career fields were merged, and leadership positions required "generalists" rather than "specialists." Rather than train officers for what were becoming considered "niche" jobs such as nuclear munitions officer, career paths within combined AFSCs were designed to make officers able to perform adequately the wider set of jobs subsumed within these new "generalist" AFSCs.

- The message to nuclear-capable Airmen was both subtle and direct. There were numerous instances following the September 11th attacks when troops at nuclear bases were told directly by Air Force and joint commanders that they were in a sunset business that would not provide career enhancement and most importantly, that they were not contributing to the fight that mattered.

- There is an expectation; both by the individual and organization that every Airman should strive to reach the highest position of which he is capable. Air Force education and training requirements support the idea that all Airmen should strive to be leaders. The problem with this expectation is that it diminishes the value of, or even punishes those who choose to develop a depth of expertise by remaining in a single career, functional specialty (such as the nuclear enterprise) or location(s) (the nuclear enterprise is concentrated at just a few bases and largely precludes deployment "downrange.") or

- The manpower cuts that occurred across the Air Force had a dramatic impact on many career fields, especially those smaller pools that generally required higher levels of expertise.

- As one interviewee explained, "people from the highest ranks down were 'making the system work' instead of demanding that it be fixed.

- While it is an accepted fact that the Air Force nuclear knowledge and experience pool had been drained, nuclear career fields were not protected from personnel cuts through reductions in force or selective early retirement boards.

- The Air Force personnel assignment system is perceived to be based on fairness and equity or individual career needs rather than on assigning the most qualified officer to support mission requirements.

Recommendations in Four Focused Areas: Expertise, Management, Leadership, & Culture

Expertise

The foremost issue is declining technical competence and expertise in Air Force ranks. That expertise, along with nuclear leadership, management and culture, are central to the Air Force's ability to execute its nuclear mission.

- ***Put the Nuclear Mission Back into the Hands of the "Experts"***

    - Airmen must have faith in a system that values (that is, promotes) competent experts.

    - One of the results of downsizing the force is that nuclear experts currently are not in the most mission-essential billets. Instead, the best and the brightest are placed in jobs that are "great for their career but terrible decisions for the Air Force." Most significantly, they are unable to influence the culture of their specialty, leaving it to founder.

    - The "right" people must make the manpower decisions in order to grow expertise in the field, who will then grow to be competent leaders.

    - In the past commanders handpicked their staff and major commands had more control over the upward mobility of officers. This model needs to be recreated.

- ***Reestablish Operational Competence***

    - Nuclear units must do more than prepare for inspections; they must return to a level of competence that sustains and enhances their contribution to national security.

    - The Air Force needs to determine how to grow specific and particular competencies for its future officers.

    - The Air Force should provide and encourage an educational and experiential path that leads to technical competence for Airmen who are then likely to become better nuclear commanders in the days ahead.

- ***Incentivize Change and Ensure Retention***

    - Just as leadership is not the right metric for career advancement, neither is deployability the best measurement for nuclear readiness. The concept that nuclear competence is a distinct and necessary skill must be reinstituted in Air Force personnel and supported through training and education.

Leadership

As long as the Air Force has a nuclear mission, the service needs to focus on how to develop and even inspire its leaders to advocate for the mission's fulfillment. Good leaders require technical competence in their craft. Without competence, a leader cannot have the respect of his subordinates nor will he be able to extract superior results from those under his command.

- ***Reinstitute Core Principles: Communication and Responsibility***

    - Former CSAF General Fogleman explained the importance of communication to leadership skills, "Good leaders are people who have a passion to succeed…To

become successful leaders, we must first learn that no matter how good the technology or how shiny the equipment, people-to-people relations get things done."

- ***Motivate Managers to Be Leaders***

    - Air Force commanders must to be taught the principles of leadership and management; then held accountable for both.

    - The Air Force needs to delineate between management and leadership skills, then foster and support the development of both.

- ***Require Responsibility at the Highest Levels***

Leadership requires responsibility and accountability –factors that the Air Force nuclear enterprise has lacked for the past two decades.

Management

Air Force leaders need to move stewardship into the hands of subordinates with their full understanding of responsibility, accountability and authority.

- ***Enable Nuclear Staff to Learn From Past and Focus on the Future***

    - Airmen must be required to follow checklists and procedures rigorously and without deviation until changes are approved by the respective headquarters. However, senior officers must still be open to innovative suggestions and change procedures that can be improved. Subordinates should not be discouraged from offering innovative ideas for change.

    - The Air Force needs to make the nuclear-incident investigation reports available to officers in nuclear essential billets, as most have not yet read the investigation reports. In order to learn from the past commanders need to understand what happened and what actions have been taken to correct the errors.

- ***Re-Institute Unity of Command***

    - The split between AFGSC command and control of nuclear forces and Air Force Material Command responsibility for maintenance, storage, sustainment and custody of nuclear weapons was viewed as a violation of unity of command. This split was considered by most study participants as untenable and requiring change.

- ***Make Change Work***

    - Over the last two decades people from the highest ranks down were "making the system work" despite its flaws, instead of demanding that it be fixed.

- Determining appropriate metrics to measure success has always been challenging. This is even more true for nuclear organizations. The Air Force must determine the correct ways to measure success or failure as it continues to make changes to the nuclear enterprise.

Culture

A successful organization requires three elements for its people, and thus the organization itself: 1.) People need to believe in their work which is a product of inspirational leadership and self motivation; 2.) People need to see visible progress toward the organization's stated goal, no matter how incremental the improvement; and 3.) People need recognition and appreciation for their contributions toward the goal. Without these the organization will fail.

- ***Reestablish the Culture of Excellence***

  - Clarity of mission is a requirement and would go a long way in buttressing the Air Force's efforts to re-establish a culture capable of executing the mission.

  - The Air Force must analyze the culture that is being developed and shape by the current environment and determine what must be changed through the organizational development process. This may include making changes above those required in AFGSC.

- ***Explain Why the Mission is Vital***

  - The SECAF and the CSAF have made a concerted effort to show a level of continued interest not seen since the end of SAC and foster the concept of an engaged leadership. It is this level of continued support that will help shape the culture surrounding the nuclear mission.

- ***Inform Up; Educate Down***

  - The lack of understanding of nuclear deterrence, a core Air Force mission, is at the heart of the problem. Air Force leaders need to understand and explain why the nuclear mission remains core to the Air Force. The service needs to educate Airmen on this mission and its criticality to the nation.

In addition, the Air Force needs to educate personnel at all levels in order to influence the attitudes and actions of personnel. Additionally, the Air Force must make the most of the opportunity to influence how nuclear weapons are viewed at the national level.

Conclusion

- The Air Force must be committed to valuing and sustaining its nuclear enterprise as long as nuclear weapons are part of the U.S. arsenal.

- Personnel in the nuclear enterprise cannot be told that their work is valued as billets go unfilled, resources continue to wane and their supervisors continue to focus on

deployments in conventional wars. This study found that resoundingly, Air Force nuclear personnel believed in their work, but they need inspiration to focus their efforts and improve their capabilities. They need advanced training, deliberate placement, leadership, and competent management.

- Without a true root cause analysis of the systemic problems, much of what the Air Force has accomplished has been movement without direction or focus. Without determining the fundamental questions that need to be answered, the capability of the Air Force to sustain its nuclear capability remains in question.

PROLOGUE

On August 31, 2007, a U.S. Air Force B-52 plane with the call sign "Doom 99" took off from Minot AFB, North Dakota, inadvertently loaded with six Advanced Cruise Missiles loaded with nuclear warheads and flew to Barksdale AFB, Louisiana. After landing, "Doom 99" sat on the tarmac at Barksdale unguarded for nine hours before the nuclear weapons were discovered. Below you will read the details of that 36-hour period with six primary mistakes highlighted.

The Unauthorized Movement of Nuclear Weapons

As part of an Air Force re-positioning program, B-52 flights were scheduled to move 12 Advanced Cruise Missiles with nonnuclear Tactical Ferry Payloads (TFPs) from the 5th Bomb Wing (BW) at Minot Air Force Base (AFB), North Dakota to the 2 BW at Barksdale AFB, Louisiana. This process is called "tactical ferry." In preparation for the move, the 5th Munitions Squadron personnel at Minot prepared two cruise missile pylons, with each pylon to be loaded with six TFPs in the Minot weapons storage area. Prior to the planned shipment, the munitions control section changed the selection of cruise missiles to be ferried but failed to coordinate the change with the nuclear weapons maintenance shop responsible for preparing the missiles for the move. Standard preparation for the cruise missiles required removing nuclear warheads and installing TFPs. There were two trailers of missiles containing two pylons each scheduled to be transferred but due to poor coordination, only one trailer of missiles had been prepared and placarded with the verbiage "Ready for Tac Ferry." The remaining trailer of missiles still had nuclear warheads that had not yet been replaced with TFPs. At the time, limited storage capacity required co-mingling nuclear and nonnuclear warhead cruise missiles in the storage structures even though visually recognizing the difference between nuclear and nonnuclear requires close inspection. The only way to identify a nuclear from a nonnuclear payload in a cruise missile is to look through a small observation window to check for the appropriate markings. Intermingling of nuclear and nonnuclear weapons was prohibited until at least 1992. At the time of this incident, there was no written policy prohibiting intermingling of weapons and there was no record of when the policy had changed.

> ***"This was an unacceptable mistake and a clear deviation from our exacting standards. We hold ourselves accountable to the American people and want to ensure proper corrective action is taken."***
>
> *- Michael Wynne, Secretary of the Air Force*

The Minot munitions control section issued a work-order to move the two pylons to the flightline and to load the missiles on the aircraft. However, the munitions crew changed one of the two scheduled pylons for reconfiguration with another to eliminate an upcoming periodic inspection on that pylon but did not formally coordinate the schedule change. The handling crew entered the storage structure but did not to perform the missile safe status check as required by technical orders to verify the missiles TFPs. The crew drove the two trailers, one with TFP loaded missiles and, unknowingly, the other with nuclear warhead loaded missiles to the flightline where the B-52 aircraft crew chief accepted the load. The aircraft crew chief, unlike the weapons loaders, was not trained to work with nuclear weapons but local procedures called for

the aircraft crew chief to sign for the missiles. At Barksdale, the procedure was to have a nuclear-knowledgeable load team chief sign for the load. The reason for having two separate procedures for the same function at different bases is unclear. The Minot crew chief did not check the status of each missile, but there was no technical order requirement to do so as this mission was expected to be nonnuclear, thus having far less stringent requirements. The weapons load crew loaded the two pylons of missiles for the flight to Barksdale.

Technical Order procedures dictate that both the Radar Navigator and Navigator are responsible for verifying the status of the missiles during preflight inspections of the aircraft when dealing with nuclear weapons. However, only the Radar Navigator on "Doom 99"performed preflight inspections on the missiles. The Radar Navigator continued to ignore the checklist by only checking one missile on one pylon, which happened to be the nonnuclear pylon, and assuming that all the missiles were nonnuclear. "Doom 99" arrived at Barksdale and sat on the tarmac unguarded for nine hours before the aircraft maintenance squadron personnel downloaded the missiles. When the handling crew came to transport the missiles to the storage area, they correctly followed their checklist and looked through the small access window in each missile. They discovered the nuclear warheads on the missiles and immediately alerted leadership. While the weapons were secured on the flightline, the incident was reported up the Air Force chain of command.

Mistakes were made by numerous personnel on August 31, 2007. Each assumed that since the task was mundane – moving Advanced Cruise Missiles with TFPs from one base to another – and that no special effort was required. The *first mistake* was the simple oversight to label a trailer with weapons appropriately. This mistake, while clearly at the individual level, can be tied to the loosening of procedures regarding the storage of nuclear and nonnuclear weapons together. Thus, even at the first step, both an individual and the institution were at fault. The *second mistake* was the "scheduling error" where the munitions personnel did not coordinate with the maintenance shop to assure that the correct weapons were chosen for transfer. This too highlights both personal and institutional errors. Airmen at Minot did not use the published squadron maintenance schedule. The decision not to use the schedule was made in order to avoid complexity and to work around possible classification issues. In the end, however, Airmen at Minot ignored important details and failed to properly coordinate last minute changes. This resulted in oversimplification and reliance on a single inexperienced Airman to provide complex information via a PowerPoint slide. Several interviewees noted that "management via PowerPoint" has become commonplace throughout the Air Force.

The *third and fourth mistakes* occurred when the munitions personnel did not monitor the move nor did the handling crew follow the checklist and confirm that the weapons they were moving were indeed nonnuclear. The weapons were driven past a security checkpoint, but again since the weapons were presumed to be nonnuclear, no one checked them as they passed. The *fifth mistake* took place on the flightline when the aircraft crew chief signed off on the weapons without confirming their status. The *sixth and final mistake* occurred when the radar navigator checked only one of the nonnuclear missiles and considered that spot check acceptable for all weapons loaded on the plane.

The Mistaken Shipment of Classified Missile Components to Taiwan

While the Air Force was reeling from the investigations of the unauthorized movement of nuclear weapons, it was revealed that Taiwan received classified forward sections used on the Minuteman III intercontinental ballistic missile rather than the helicopter batteries it had ordered from the U.S., bringing to light a second nuclear-related incident.

Twice a year, the Air Force supply system automatically conducts Air Force-wide adjustments to level supply inventory using a computer-based process called Readiness Based Leveling. In February 2005, the system identified a requirement for 11 forward sections of MK-12 reentry vehicles used on Minuteman III intercontinental ballistic missiles (ICBM) at F.E. Warren AFB, Wyoming. As there was only one at F.E. Warren, the supply system generated an automatic transaction to ship 10 units. When the shipment arrived via Federal Express special ground service in March 2005, the MK-12 forward sections were properly received and stored in segregated storage due to their controlled-item status.

Four days later, an inexperienced (three months on the job) Air Force Item Manager at the 526th ICBM Systems Group at Hill AFB, Utah determined that F.E. Warren had too many MK-12 forward sections and notified its base personnel to ship four of the forward sections to the Defense Logistics Agency (DLA) warehouse at Hill AFB. The F.E. Warren Traffic Management Office prepared the forward sections for shipment, placing the shipping documents inside the shipping container but failing to properly mark the exterior with the stock number per the Special Packaging Instructions (SPI). These classified items are shipped with all documentation packed inside the container. Procedures require the recipient to open the container, review the shipping documents, verify the contents, sign a receipt and return that receipt to the shipper.

The F.E. Warren personnel did not properly mark the outside of the shipping container and shipped the hazardous, classified forward sections to Hill AFB. When the shipping container arrived at the warehouse, personnel did not open it, review its shipping documents, or return the receipt to F.E. Warren; nor was there follow-up on the missing return receipt at F.E. Warren as is required. They were delivered to the unclassified warehouse instead of the classified storage area. At some later time, DLA warehouse personnel attempted to scan the barcode on the unopened shipping container to identify the contents. When the scan failed (for no known reason) to produce a stock number, warehouse personnel simply used the hazard classification for the nomenclature and the number they arbitrarily selected was for a helicopter battery. They marked the unopened shipping container accordingly and shelved it in the warehouse.

In 2005, as part of the Foreign Military Sales Program, the government of Taiwan requested 135 helicopter batteries. In June 2006, the DLA warehouse at Hill AFB shipped the mismarked MK- 12 forward sections as helicopter batteries. The error was noted by the Taiwanese government in January 2007, but only after repeated requests by Taiwan did the U.S. government acknowledge the error (fourteen months later).

An investigation immediately ensued. It was determined that although the errors were made by a junior civilian item manager and government warehouse personnel, the major general

in command of the Hill AFB Air Logistics Center, the colonel who was the ICBM system program office director, and the lieutenant general Deputy Chief of Staff for Logistics, Installations and Mission Support at Headquarters Air Force (HAF/A4/7) were disciplined and/or retired. These actions stand in stark contrast to the unauthorized movement of nuclear weapons where no general officers were disciplined, although numerous personnel with the rank of enlisted through colonel were held accountable.

As in the unauthorized movement of nuclear weapons, individual mistakes were compounded by institutional complacency and lackadaisical attitude toward the mission. The *first mistake* was the mismarking of the shipping container by personnel at F.E. Warren. The *second mistake* occurred upon arrival at the warehouse at Hill AFB where the container was never opened so that the paperwork could be examined and the contents effectively managed. The *third, related mistake* was that when the bar code on the outside of the package could not be properly identified, staff simply made up a determination as to its contents rather than opening the container to confirm the contents. The *fourth mistake* was that personnel at F.E. Warren who had shipped the forward sections did not follow up when no return receipt was received. The *fifth and final mistake* was that the error was confirmed only after numerous efforts by the Taiwanese government to rectify the situation.

The Response: Investigations

> ***"The Air Force is currently investigating an error made last Thursday in the transfer of munitions … from Minot Air Force Base to Barksdale Air Force Base aboard a B-52 Stratofortress…"***
>
> *– Pentagon Press Briefing*

Initially Air Force senior leaders believed there would be no public interest in the incidents. This fact indicates the decline in understanding and acceptance of the nuclear mission by Air Force leadership. As the Washington Post summarized:

> The Air Force decided at first to keep the mishap under wraps, in part because of policies that prohibit the confirmation of any details about the storage or movement of nuclear weapons. No public acknowledgment was made until service members leaked the story to the Military Times, which published a brief account Sept. 5. Officials familiar with the Bent Spear report say Air Force officials apparently did not anticipate that the episode would cause public concern. One passage in the report contains these four words: 'No press interest anticipated.'[1]

With hindsight, it is difficult to imagine why Air Force leadership would assume there would be no interest in a flight during which, according the Air Force Chief of Staff (CSAF), "at no time was the public in danger."[2] However, this was not the first nuclear weapon related incident for the Air Force.[3] There had been other mishaps, both in the Air Force and the Navy,

[1] Joby Warrick and Walter Pincus, "Missteps in the Bunker," *The Washington Post*, September 23, 2007.
[2] *Ibid.*
[3] A book published in early 2011, *15 Minutes: General Curtis LeMay and the Countdown to Nuclear Annihilation* [New York, NY: St. Martin's Press, 2011] details numerous accidents early in the U.S. nuclear program. The book relies heavily on recently declassified information. A recently declassified example can be found at

for which little attention was paid. Some received minor local press coverage and an occasional inquiry by the representative from the congressional district. In 2003, commanders at the Navy's Strategic Weapons Facility, Pacific at Bangor, Washington, were fired after a ladder was left in a Trident missile tube. The local paper carried a story and the respective congressional office was briefed on the incident and Navy remediation.

In August 2009, the Navy fired the commander at the same base because his superiors had "lost confidence is his ability to lead." Unlike the Air Force, the Navy has maintained steadfast willingness to hold its nuclear sailors accountable. However, within the Air Force, the limited talent pool sometimes determines the outcome of the incident investigations.[4]

> ***"…lack of attention to detail, a lack of effective leadership and supervision"***
>
> *-Pentagon Press Briefing, describing the findings of the Minot investigation*

Air Force senior leaders clearly believed that unauthorized movement of nuclear weapons was a onetime event of little consequence. The immediate investigations reaffirmed the U.S. Air Force (USAF) position that there was no institutional problem but rather localized issues at the Minot and Barksdale bases. The events surrounding the mistaken shipment of classified forward sections to Taiwan were considered basic logistics errors.

As a result of the unauthorized movement of nuclear weapons and mistaken shipment of classified forward sections, six separate investigations or reviews were conducted:[5]

1. Air Combatant Command, *Commander Directed Report of Investigation,* September 2007

General Ronald Keys, Air Combat Command (ACC) commander, tasked Major General Douglas Raaberg to lead an investigation of the unauthorized movement of nuclear weapons to determine how events transpired and to identify personnel who should be held accountable. The investigation began on August 31, 2007 and was completed by the end of September 2007.

2. Headquarters U.S. Air Force, *Air Force Blue Ribbon Review Of Nuclear Weapons Policies and Procedures,* February 2008

On 9 October 2007, the CSAF appointed Major General Polly Peyer to chair an Air Force Blue Ribbon Review (BRR) of nuclear weapons policies and procedures. The CSAF tasked the team to take an enterprise-wide look at Air Force nuclear responsibilities. Specifically, the CSAF highlighted a need to examine organizational structure, command authorities and responsibilities, personnel and assignment policies, and education and training associated with the operation,

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http://www.gwu.edu/~nsarchiv/nsa/NC/nh4_1.gif which details a B-47 crash into a missile storage area in 1956 at RAF Lakenheath, UK.

[4] Following the unauthorized movement of nuclear weapons and misshipment of sensitive missile components, two of the general officers who were reprimanded were kept in essential nuclear leadership positions because of their knowledge and experience. Walter Pincus, "4 Colonels Lose their Air Force Commands," The Washington Post, October 20, 2007, Warrick and Pincus, "Missteps in the Bunker," *op cit*, and Michael Hoffman, "Minot Nuke Handlers Still Not Ready for Inspection," *Military Times*, January 14, 2008.

[5] For more detail on the investigations see Appendix 2.

maintenance, storage, handling, transportation, and security of Air Force nuclear weapons systems.

3. The Defense Science Task Board Permanent Task Force on Nuclear Weapons Surety, *Report on the Unauthorized Movement of Nuclear Weapons,* April 2008

The Secretary of Defense commissioned General Larry D. Welch, retired Air Force Chief of Staff, to lead a team of senior officials to conduct an independent and objective review of nuclear surety practices. The task force re-examined the circumstances and systematic causes of the unauthorized movement of nuclear weapons from Minot.

4. Admiral Kirtland Donald, *Investigation into Shipment of, Sensitive Missile Components to Taiwan,* May 2008

Secretary of Defense Robert Gates expressed his lack of confidence in the Air Force's ability to self-assess these nuclear weapons related problems. As a result, he appointed Admiral Kirtland Donald, Director of Navy Nuclear Power and Nuclear Reactors to lead a new investigation.

5. Secretary of Defense Task Force on DoD Nuclear Weapons Management, *Phase I: The Air Force's Nuclear Mission,* September 2008 and *Phase II: Review of the DoD Nuclear Mission,* December 2008

After the Defense Science Board and Admiral Donald reports, Secretary Gates asked Dr. James Schlesinger, former Secretary of Defense and Energy to provide an independent review of Department of Defense (DoD) organizational, procedural and policy improvements necessary for the stewardship and operation of nuclear weapons. The review was conducted in two parts: the first part focused on the Air Force nuclear mission; the second reviewed the nuclear mission in DoD as a whole.

6. Headquarters U.S. Air Force, *Reinvigorating the Air Force Nuclear Enterprise,* October 2008

In the summer of 2008, shortly after the ACC Commander Directed Investigation (CDI), BRR and Admiral Donald reports were completed, the Secretary of the Air Force (SECAF) and CSAF directed the establishment of a 90-day Air Force Nuclear Task Force to "develop a strategic roadmap to rebuild and restore capabilities and confidence in our stewardship of the Air Force nuclear enterprise." The resulting strategic plan synthesized recommendations from internal and external investigations that occurred following the two nuclear-related events.

INTRODUCTION

This report is the result of a year-long Air University research project funded by Headquarters Air Force, Strategic Deterrence and Nuclear Integration (A10). The project included researching and writing an academic case study reviewing the unauthorized movement of nuclear weapons and mistaken shipment of classified forward sections. Specifically the study team was asked to:

> [R]esearch and write a case study to investigate how the Air Force can reinvigorate the handling, operation, and maintenance discipline of nuclear weapons that characterized nuclear operations standards and culture at the height of the Cold War. The study should compare and contrast past and current world affairs and how the present Air Force can re-establish an environment that will revive Air Force nuclear operations standards and culture in the mid-term to long-term, beyond what has been or is being done already in the wake of the Schlesinger report.[6]

In the conduct of these studies, we did not attempt to reinvestigate the events surrounding the nuclear-related incidents that occurred in 2006-2007, but sought a deeper understanding of the context of internal and external forces that led to those events. Since 2008, the Air Force has done much in reinvigorating the nuclear enterprise and sustaining the posture of nuclear forces. This study is a review of the status of the nuclear enterprise as it existed at the time of the unauthorized movement of nuclear weapons and mistaken shipment of classified forward sections and includes recommendations for the Air Force to consider as it continues to strengthen the nuclear enterprise.

Methodology

The methodology was to:

1. Conduct a literature review of existing studies, reports, policies, and procedures.

2. Hold workshops to review direction and findings, both at the operational and senior leadership levels.

3. Conduct interviews with senior Air Force, DoD and national security experts who played a role in our nuclear mission between 1986 to the present.[7]

4. Condense the views of the interviewees into a "root cause analysis" of the nuclear incidents. A true root cause analysis of historical events is difficult, since it is impossible to go back and show what would have happened had alternate decisions been made. However, the insights of the interviewees have been consolidated into

[6] GSA Mobis Task Order GST0408BF0076.

[7] 1986 was chosen as a starting point for the review given the influence of the Goldwater-Nichols Act and the political events that followed in 1989-1991.

five "root cause" areas that need to be addressed in order to improve the Air Force nuclear enterprise.

This study relied heavily on previous research and studies, building upon what has been written and applying it to the current situation. Thus, we did not limit our review to the investigations following the unauthorized movement of nuclear weapons and mistaken shipment of classified forward sections, but looked at research on Air Force culture, leadership, and organization. The reader will see numerous quotes from Air Force sources, particularly research papers conducted at Air University, The RAND Corporation, and other academic sources. Also, new archival information from the Cold War era is being declassified and published almost daily. This information helps to provide a context for the past previously not publicly available.

Two workshops provided an early foundation for the interviews and research that followed. The first event was held in late January 2010, at Air University with students and faculty from several Air Force schools resident at Maxwell AFB. This group provided an initial "vector check" for the direction of the project. We queried the views of the participants, each of whom had relevant nuclear expertise. The results contributed both to the depth and breadth of the project.

For the second event and to more broadly support this effort, Northrop Grumman organized a Nuclear Advisory Board and held a workshop with participants in the Washington, D.C. area in April 2010. Six retired general officers who commanded nuclear forces or held strategic leadership roles, five from the Air Force and one from the Navy, met for six hours to discuss their views and experiences. Participants offered a number of ideas during the workshop focusing on issues such as: the core missions and relevance of the Air Force; the involvement of the Office of the Secretary of Defense (OSD) in Air Force nuclear matters; the understanding of the United States' current deterrence posture; and Air Force leadership, expertise and personnel management.

For each event, a brief overview of the research project was followed by discussion of the two primary questions: How could these two nuclear related incidents have occurred? What do you consider to be the primary root causes?

Finally, the study team conducted more than 100 interviews with U.S. personnel who played a role in the nuclear mission between 1986 and the present. The purpose of the interviews was to capture and incorporate the collective knowledge and insight developed over years of performing the strategic nuclear deterrence mission. While the focus was on the Air Force, we also engaged former and current officials from OSD, the Department of Energy's (DoE) National Nuclear Security Administration (NNSA), the Defense Threat Reduction Agency (DTRA), the DoE national laboratories, the Navy, and staff and members of Congress to gain a perspective not previously included in a single document.

The study looked at how oversight affected the Air Force's nuclear mission, both from inside its leadership ranks and from OSD and Capitol Hill. Several of the congressional staffers interviewed had previous relevant military or government experience, which increased the depth and breadth of their knowledge and insight.

The study team chose interviewees specifically in order to compare experiences and views on the evolution of national level policy and strategy which drove the Air Force decision-making processes. We confirmed that the institutions addressed have an influence on each other, both through the classical forces of legislation and oversight, but also in reverse where Air Force experiences and presence influenced policy decisions.

We talked to many individuals who contributed to the post-incident investigations to get an idea of the circumstances in which they were conducted and to ask the participants' views on the choices the Air Force has made in its effort to reinvigorate the nuclear mission. It is important to understand that the Air Force's internal reviews and plans – the CDI, BRR and Nuclear Enterprise Roadmap – were created with very specific guidelines, scope and generally with only 30-90 days for each effort. The Defense Science Board (DSB) report, as well as the Donald and Schlesinger reports focused on specific aspects of the incidents, albeit from an outside perspective. None of the earlier reports had the benefit of drawing on so many of the key U.S. leaders and their hindsight that this study captured.

Our not-for-attribution interviews were candid discussions that contributed greatly to this report. Those we interviewed spoke in great detail about the cultural roadblocks that exist within the Air Force and the challenges that arise from them. Current Air Force leaders were very frank about the challenges they face, some admitting that they themselves were in part culpable for the current state of the nuclear enterprise. Many telling anecdotes were shared about problems of the past and the uncertainty of whether the corrective actions will truly address the health and welfare of the nuclear mission and support those that execute it each day. What was clear is that there is no shortage of opinions on the problems or solutions. We believe we were able to capture most of the excellent ideas we heard along the way. While we understand the Air Force has only started on the path of "reinvigorating the nuclear enterprise," one interviewee put it very succinctly: "Don't let mere movement, even in what is perceived as a positive direction, give us a false illusion that it is directly proportionate to progress or eventual success."

Study Findings

Our research led to the conclusion that while the events of 2006-2007 are significant in and of themselves, the unauthorized movement of nuclear weapons and mistaken shipment of classified forward sections are merely symptoms of greater institutional problems. The Air Force nuclear enterprise is in a state of decline and has been for the last two decades. With the standup of Air Force Global Strike Command (AFGSC) and A10, the Air Force is working to reestablish the enterprise on positive footing. It is clear from our interviews and research that the leadership has a long and challenging path ahead of them and some significant adjustment in the current course needs to be considered.

In 1986, events and senior Air Force leader decisions began shaping the contextual setting for the unauthorized movement of nuclear weapons and mistaken shipment of classified forward sections. There was a consensus among those with whom we spoke on the cumulative detrimental effect of various events and decisions, building one upon another, forcing other decisions that were only relevant because of the decisions made previously. Participants believed the cumulative effects were well known throughout the service and that a major incident was not unanticipated. Many interviewees wondered openly why no one in senior leadership had

opposed the continuous onslaught of personnel reductions, reorganizations, and concurrent addition of new missions, tasks, and deployments. Comments from the most senior flag rank officers suggested the Air Force had immediately launched into major corrective actions before they understood the underlying problems or how to address them. Those same officers stated they did not believe there had been rigorous root cause analysis because the most significant corrective actions did not address the most clearly documented failures.

All of the issues added to the complex contextual background in which the unauthorized movement of nuclear weapons and mistaken shipment of classified forward sections occurred. The lack of a clearly articulated national nuclear strategy and policy allowed the Air Force to neglect the nuclear mission in order to focus on the urgent counterterrorism and conventional warfare requirements without oversight or criticism. With little legislative or executive branch interest in nuclear forces, Air Force senior leadership followed in the same path until they were forced to accept responsibility for the events. If one or two of the external factors had not existed, their absence would likely have not prevented either the unauthorized movement of nuclear weapons or the mistaken shipment of classified forward sections. However, these conditions had a corrosive effect on the nuclear culture of strict compliance that was so fundamental to daily activity during the Cold War. The effects were factors at all three levels of organization: tactical, operational, and strategic.

Through the workshops, interviews, and research, the following factors were identified as the most significant underlying areas, or "root causes" that set the stage for the two incidents:

1. Policy and oversight changes
2. Organizational and operational evolution
3. Institutional focus
4. Leader accountability
5. Failure to maintain and foster expertise

It is on these areas which we focused our attention. Many of the issues discussed in this study are complex and do not readily lend themselves to being easily organized. You will see the issues of institutionally favored missions, leadership, management, and expertise repeatedly arise throughout the root cause analysis sections. Some issues were placed in one section while they might have easily been in another. The best example of this is CSAF General Merrill McPeak's organizational changes, which we grouped under "Organizational and operational evolution." It could also be grouped in "Institutional focus," given the dramatic role it played in changing the culture of the Air Force.

Following the analysis of the root causes, we offer recommendations for the Air Force to consider as it continues to address the problems facing the nuclear enterprise. Our recommendations are organized into four areas:

1. Expertise
2. Management
3. Leadership
4. Culture

It is hoped these recommendations will help re-establish an environment that will revive Air Force nuclear operations standards and culture.

One anecdote highlights the problems of the Air Force nuclear enterprise prior to the unauthorized movement of nuclear weapons and mistaken shipment of classified forward sections: in the spring of 2007 the 5th Bomb Wing at Minot AFB had identified the possibility that a nuclear warhead could be mistaken for a nonnuclear one. Staff present at the meeting dismissed the issue outright saying there were too many safeguards in place for that to ever occur. That was true in the days of a "compliance culture" before Strategic Air Command (SAC) was disbanded in 1992. Since that time, the world has changed and along with it Air Force policy, procedures and attitudes. What has not happened was a marrying of political, economic, and cultural realties of the present with the unchanged requirements demanded by nuclear weapons.

DEFINING THE PROBLEM

Following the unauthorized movement of nuclear weapons and mistaken shipment of classified forward sections there were hearings before the Senate and House Armed Services Committees. During the Senate hearing Lieutenant General Daniel Darnell, Deputy Chief of Staff, HAF Plans and Operations, was asked to explain why the events had occurred. According to General Darnell:

> The root causes identified for the specific incident were *unit-level leadership and discipline breakdown at Barksdale AFB and Minot AFB*. These breakdowns were due to leadership failures and a declining focus on the strategic nuclear bomber mission. Over time, the breakdown of leadership and discipline *among a small group of Airmen at Barksdale AFB and Minot AFB* fostered an environment which eroded the strict adherence to established procedures.[8]

Through our research we have found the problems to be far more systemic than the Air Force leadership admitted in 2008. The problems were at all levels of the Air Force and institutionalized through years of change at the strategic, operational and tactical levels. The post-incident investigations identified two major causes of unauthorized movement of nuclear weapons and mistaken shipment of classified forward sections:

1. A lack of senior Air Force leadership focus on the nuclear mission as a result of the end of the Cold War and intense demand for conventional mission capabilities over the course of over 20 years of consistent deployments.

2. The Air Force had not effectively addressed the previously identified and continuing decline in nuclear weapons expertise.

From our research, we see the problem in three areas: leadership, management, and expertise. Each of these elements is critical to the other and without improvement in all three the nuclear mission will likely fail again.

Leadership

One of the inherent issues in any complex problem is how to define it. How well a problem is defined determines how well it will be solved. This report along with those that preceded it state that the Air Force had a failure in leadership, but we have not adequately defined what that means. The fundamental issue is that there is a difference between leadership and management. One definition of leadership is the process of social influence to obtain the cooperation of other people in the attainment of a goal."[9] Leadership requires a vision to inspire a team and having the credibility to back it up. It is effective leadership and team building, together with excellent management that forms a solid organizational culture.

[8] U.S. Senate Committee on Armed Services, Hearing on Air Force Nuclear Security, [transcript], February 12, 2008, p. 8.
[9] Martin Chemers and Roya Ayman, ed., *Leadership Theory and Research: Perspectives and Directions*, p. 295.

The Schlesinger Commission noted that there was a failure of leadership at the national level to inform the Air Force of the continuing importance of nuclear weapons in U.S. national security. The report concluded that there was also a failure of leadership at the highest levels of the Air Force and at the component level to do the same. This failure will be discussed in detail in later chapters, but the lack of leadership direction created a void in Air Force strategic culture that will require significant attention and time to fill.

We will talk in the next section about General Curtis E. LeMay and his leadership of SAC. General LeMay had a distinct leadership style based on principles that became the bedrock of SAC, and as CSAF, he instilled these principles across the whole Air Force. His leadership tenets persisted until there was a generational shift from bomber generals in primary Air Force leadership positions to fighter pilots – a move that began in the 1960s with the Vietnam War. When fighter pilots took the helm, they instilled their culture on the Air Force, resulting in massive changes. For those in the nuclear enterprise, the change was detrimental to their culture and institutions, especially as the Cold War ended and the articulated relevance of nuclear weapons was declining. Those who understood the nuclear value to national security were fading into the background.

The institutional change from the bomber to the fighter culture was fundamental to the ability of the Air Force leadership to continue to espouse the concept that the nuclear mission remained a core mission of the service. The result was a generation of Airmen without inspirational leadership that could motivate an organization to believe in the deterrent value of the nuclear forces.

Management

Management includes planning, organizing, staffing, leading or directing, and controlling an organization. Much of what was described as a lack of leadership by previous studies we have grouped under management. The wings may have been badly led, and thus uninspired; however, poor management is the cause of the lost of institutional focus on nuclear weapons. This loss of focus – even within the nuclear community -- was often demonstrated by personnel who did not follow or understand the need to follow regulations or technical orders. Units were allowed to create their own procedures and processes; which meant that not only were operations locally specialized, but those transferring between bases were likely to have a significant learning curve to accomplish the same mission.

Confusion as to what background or preparation officers need to lead and manage nuclear weapons organizations has long been a controversial issue and workshop participants expressed strong opinions on this topic. The CDI report, the BRR, and Admiral Donald's report determined that the Air Force had "leaders with little, no or dated nuclear experience who held key positions in the Air Force nuclear enterprise, including supervisors and enlisted members as well as squadron, group and wing commanders."[10] The CDI observed that the munitions maintenance squadron commander and operations officer were disengaged from day-to-day weapons storage

[10] Schlesinger, James R. Report of the Task Force on DoD Nuclear Weapons Management, Phase I: The Air Force's Nuclear Mission. Arlington, VA: Secretary of Defense, September 2008, p. 22, Air Combatant Command (ACC) Commander Directed Investigation (CDI), September 2007, p. 44, US Air Force Blue Ribbon Review Nuclear Weapons Policies and Procedures, February 12, 2008, App. H.

area work and were "focused up the chain of command" instead of down on the squadron's mission work.

Effective leadership and management remain critical in repairing the cultural issues as well as the operational ones. In addition to the issues of leadership and management is one that goes to the very heart of the decline of the nuclear enterprise: expertise.

Expertise

Just as leadership and management required definitions so does expertise. The Air Force had tried to lump significantly different specializations into a single unit labeled as "nuclear expertise;" however, through our research we found that the best operational definition of expertise is *technical competence*. This term includes knowing your craft so well that you can pass it to others –to sustain or even grow the knowledge base. "Expertise" therefore, requires experience. In the Air Force that means time in a specific job. Many interviewees felt that the Air Force had lost the focus on technical competence in favor of career progression. There are several reasons for this that we will address in the following chapters.

One of the key reasons for the loss of expertise was the Air Force decision to compensate for decreased total manpower by "generalizing" the officer corps. Rather than train officers for niche jobs such as nuclear munitions officer, career paths were designed to make officers able to perform adequately in a wider set of jobs. Many of the underlying problems that led to the incidents were management responsibilities of the munitions officer career field.

The logical foundation for this strategy is that of the "whole-person" concept that officers who are identified as "good leaders" can succeed in any leadership position. This strategy has been largely discredited based on both scholarly research and repeated failures of the whole-person concept in practical application.[11] From 1986 through 2007, the gradual effect of the whole-person officer model of professional development and assignments was to align the entire wing's senior leadership with officers who were good leaders, but not expert enough in nuclear weapons functions to recognize continual substandard performance before the wing underwent what could have been catastrophic failure.

The decision to adopt the whole-person officer model was based on the need to compensate for reduced manpower availability. Since less than one percent of the officer corps are generals, it is logical these officers would be generalists and possess skills and knowledge required to perform successfully in positions of high command over a broad spectrum of functional specialties. However, their success and the success of the entire Air Force depend on marshalling the efforts of the most expert officers available in every key specialty under their command. As Peter Drucker, renowned management expert, explained, "The idea that there are

[11] See John J. Gabarro, *The Dynamics of Taking Charge*, [Boston, MA: Harvard Business School Press, 1987] and "When a New Manager Takes Charge," *Harvard Business Review*, 85(1), 104-117, Diane Vaughn, *The Challenger Launch Decision: Risky Technology, Culture, and Deviance at NASA*, [Chicago, IL: The University of Chicago Press, 1996], Admiral Kirkland Donald, *Report of the Investigation Into The Facts And Circumstances Surrounding The Accountability For, And Shipment Of, Sensitive Missile Components To Taiwan*, (Report N00N/08-0051), Washington DC: Department of the Navy, 2008.

well-rounded people, people who have only strengths and no weaknesses (whether the term used is the *whole-person* or the *generalist)* is a prescription for mediocrity if not incompetence."[12]

Would the unauthorized movement of nuclear weapons and mistaken shipment of classified forward sections have occurred if the Air Force had not altered the existing officer leader/manager model? There is no absolute answer to this question. However, according to Air Force munitions officers we interviewed, if the 5th Munitions Squadron commander, operations officer, and squadron officers had been deeply expert in munitions and missile maintenance, it is unlikely they would have allowed nuclear and nonnuclear cruise missiles to be co-mingled in storage. They would not have allowed an inexperienced airman to be the only squadron member relaying the formal maintenance schedule. It is unlikely they would have allowed the daily, weekly, and monthly scheduling meetings to be conducted as a "loose confederation of shop non-commissioned officers who never used the formal schedule during planning meetings" as described in the CDI.[13] It is also unlikely they would have allowed munitions control to be manned by non-commissioned officers (NCO) who had never even been inside the facility and who were not knowledgeable of the munitions operations they were supposed to be controlling.

> ***"Individuals in leadership positions lacked the technical and professional experience necessary to effectively analyze problems and develop solutions."***
>
> *- 2008 Admiral Donald Report*

If one or two people make a serious mistake, it may be written up as personal error, but when an entire organization fails there must be more fundamental systemic causes in organization, training, equipment, management, and leadership. If the real problem is supervision, management or leadership, then Air Force policy for the development of these skills must be examined.

An important conclusion is that officers and senior NCOs at the unit level must be expected to become *technically competent*. All officers cannot be generalists and some have to be responsible for managing technical functions. These officers managing and leading munitions and nuclear weapons technicians, weapons loaders, at the section, flight, and squadron levels must be sufficiently expert to ensure the safety, security and reliability of these technical operations and, if necessary, to intervene effectively to prevent organization or mission failure.

Lack of expertise and specifically a depth of the knowledge base is one of the biggest considerations for repairing the nuclear enterprise. This dearth flows upward and affects the ability of managers and leaders to effectively lead and manage an organization whose processes and procedures are unfamiliar to them.

The Air Force failed in all three aspects, leadership, management, and expertise in the newly termed "nuclear enterprise." While the service has spent significant time and resources to address reorganization, and thus, management, all three issues still remain inadequately addressed.

[12] Peter F. Drucker, *Managing in the Next Society*, [New York, NY: Truman Talley Books], 2002, p. 72.
[13] CDI, p. 15.

HISTORY

In this section we will explore some of the underpinnings of the Air Force nuclear enterprise. Specifically, we will review SAC, both from the role it played in deterrence, but also the influence its culture and organization had on the Air Force as a whole. Comparisons will be drawn between Navy and Air Force nuclear foundations, most notably in their respective leaders, Admiral Hyman Rickover and General Curtis E. LeMay. These two individuals, more than any others, laid the foundation for nuclear forces in their service, but a differentiating question is why the Navy has been seemingly more capable of retaining its culture of nuclear excellence. We will also review the evolution of organizational culture in the Air Force and set the stage for the in-depth discussion of organization and operations in later chapters. Finally, we will assess the impact on the end of the Cold War on the manner in which the Air Force conducted its nuclear business.

The Deterrence Mission

The Air Force was established as a separate service in 1947 with three commands: SAC, Air Defense Command (ADC), and Tactical Air Command (TAC). A primary reason for an independent Air Force was that the nation needed alternatives to having to fight the Soviet Union conventionally. An alternative was to deter the Soviet Union from attacking with the threat of nuclear retaliation. Thus, the primary reason for an independent Air Force was SAC's strategic bombing mission. According to some historical reports, CSAF General Carl "Tooey" Spaatz did not want to have TAC. He wanted to leave TAC in the Army; however, General Dwight D. Eisenhower disagreed, telling General Spaatz that TAC would provide a link between the SAC mission and the Army.[14]

SAC was created in 1946, a year before the formal establishment of an independent Air Force. General Spaatz, who would later serve as the Air Force's first Chief of Staff, chartered SAC with the following missions in support of the U.S.'s strategic deterrent: "conduct long range offensive operations in any part of the world, either independently or in cooperation with land and naval forces; conduct maximum range reconnaissance over land or sea, either independently or in cooperation with land and naval forces; provide combat units capable of intense and sustained combat operations employing the latest and most advanced weapons; train units and personnel for the maintenance of the strategic forces in all parts of the world, and; perform special missions as the command general, Army Air Forces may direct."[15]

In effect, the original mission of SAC was to disrupt the ability of the Soviet Union to wage war. A February 1947 Joint Planning staff assessment concluded that if the Soviet Union attacked, they would be able to overrun Europe.[16] Joint Staff planning documents from later in 1947 assumed Soviet aggression against the U.S. within three years, a move that placed great

[14] Lt Col. James Slife, *Creech Blue: Gen. Bill Creech and the Reformation of the Tactical Air Forces, 1978-1984*, [Maxwell AFB, AL: Air University Press], p. 7-8.
[15] Herman Wolk, *The Struggle for Air Force Independence 1943-1947*, [Washington, DC: Air Force History and Museums Program, 1997].
[16] http://www.nti.org/e_research/official_docs/labs/prim_us_nuc_pol.pdf, page 28

reliance on long range strategic bombardment.[17] So while SAC's primary mission was deterrence, its secondary mission was to prevail in conflict should deterrence fail. SAC Commander General Curtis E. LeMay's goal was to build a force "so professional, so strong, so powerful, that we would not have to fight."[18] However, were deterrence to fail, SAC "could win war at any level through relentless strategic bombing. Furthermore, a force designed to defeat the Soviets…would provide a 'strategic umbrella' under which limited wars could be controlled."[19]

The creation of SAC was a response to the existential threat of the Cold War and it became an Air Force within the Air Force. The Eisenhower Administration felt that nuclear weapons were the low-cost defense alternative to a more balanced, capable, and robust national security force. The creation of SAC was a continuation and confirmation of the leadership decisions observed in World War II, where bomber pilots, having commanded the most powerful combat units and consistent with air power doctrine, were viewed as the natural and preeminent embodiment of airpower and strategic bombardment philosophies.

Organization and Culture of SAC

In 1948, General Curtis E. LeMay assumed command of SAC and instituted a "culture of accountability." Standardization became the hallmark of SAC's ability to ensure the viability of the nuclear deterrent mission. General LeMay informed its members that they were no longer planning for war, rather they were at war.[20] This comment was meant to reshape an organizational culture that had so far yielded poor results. General LeMay noted organizational problems with high accident rates, poor aircrew procedures, lack of realistic training missions, and, excessive temporary duty assignments and extra-curricular flying activities that interfered with the primary mission of training for nuclear operations (similar to what is happening now).

General LeMay instituted regulations, policies, and procedures that brought much-needed discipline to the fledgling command. He also reorganized maintenance functions for improved efficiency. Standardization, which became a SAC hallmark, meant that everyone followed standard operating procedures and performed their jobs quickly and with precision. The SAC method of doing business was based on checklists and redundancy in order to minimize accidents and avoid unintended actions that could be misinterpreted and generate a devastating response from the Soviet Union. It also ensured SAC readiness if called upon to go to war. General LeMay instituted the no-notice Operational Readiness Inspection as well as realistic training exercises. These served to produce bombing crews that were more effective, efficient, and drilled to preparedness. Under General LeMay's command, bombing accuracy increased

[17] *Ibid.*
[18] Col Mike Worden, USAF, *Rise of the Fighter Generals*, [Air University Press: Maxwell AFB, AL, 1998] pg. 59. Worden is quoting Richard H. Kohn and Joseph Harahan, eds. Strategic Air Warfare: An Interview with Curtis E. LeMay, Leon W. Johnson, David A. Burchinal, and Jack J. Catton [Washington, DC: OAFH, 1988], p. 75.
[19] *Ibid.*, p. 61.
[20] As LeMay described it, "We had to be ready to go to war not next week, not tomorrow, but this afternoon, today…We had to operate every day as if we were at war." *Ibid.*, p. 59.

dramatically and accident rates dropped to the lowest levels they had been in the Air Force for a decade. [21]

SAC gave airmen enormous responsibilities. They and their bombers and later, missiles stood between the country and foreign threats that otherwise could have caused the nuclear extinction of the United States. SAC held officers accountable for their actions and those of their subordinates. The accountability, responsibility, and authority for nuclear weapons were clear as were the consequences of failure. It was understood that a commander would lose his job if there was a mistake, even if that mistake was beyond his direct control.

SAC airmen knew they were an elite cadre whose mission was vital to U.S. national security. Most SAC personnel did not complain about the stringent requirements. They understood the nature of the work they were doing, and the command continually fostered a team ethic and a sense of community. General LeMay explained,

> If you removed the plate from the body of SAC, you could look in and see people and instruments. They would be as the intricate electronic physiology of an airplane today; each functioning, each trained, each knowing his special part and job—knowing what he must do in his groove and place to keep the body alive, the blood circulating. Every man a coupling or a tube; every organization a rampart or transistors, battery of condensers. All rubbed up, no corrosion. Alert.[22]

Air Force Organization and Missions

When General LeMay was appointed CSAF in 1961, he promoted SAC personnel to all major operational commands and most Air Force leadership positions, including TAC. General Walter Sweeney, newly in charge of TAC, initiated a program of "high standards to professionalize the command including a centralized management control system which quantified, measured, and evaluated every element of TAC's supply, maintenance, and operations."[23] The SAC way became the Air Force way. General LeMay's methods did not win him friends among the tactical fighter community. As one expert described the relationship among the operational commands during the early 1960s, "SAC and TAC were like rattlesnakes."[24] However, "might equaled right" and General LeMay and SAC held all the cards. Given the emphasis placed on the nuclear mission and the consequences should the United States be unprepared, "The SAC-dominated Air Force consumed itself so much with its chief challenges—the growing nuclear target list, the missile threat, alerts, and dispersals—that it had little time for conventional or nonstrategic considerations."[25] The opposite can be said about the Air Force today. The weight of fighting (and winning) two conventional wars outstrips nuclear requirements in every way—in budgetary, operational, and doctrinal terms.

[21] When Gen. LeMay took over SAC it had an accident rate of 65 per 100,000 flying hours. When he left it was 3. Barrett Tillman, *LeMay: Lessons in Leadership* [New York: NY, Palgrave MacMillan, 2007] p. 102.
[22] Ibid, p. 62
[23] Worden, p. 105.
[24] *Ibid.*, p. 104.
[25] *Ibid.*, p. 108.

As we will describe in future chapters, the evolution between the bomber and fighter generals had a profound effect on the leadership and execution of the nuclear mission. Much has been written about tribal competition inside the Air Force; however, SAC had a loyalty as a command, not as a tribe.[26] This loyalty affected the ability of the Air Force to address organizational changes. In 1992, General Merrill McPeak explained,

> While I can't prove it, I suspect the absence of a clear mission statement contributed to our reluctance to organize ourselves properly. People built loyalties around their commands – intense loyalties in fact rather than loyalties to air and space power as a whole…so the commands enjoyed support that made it difficult for us to think clearly about our purposes and hence, our organization.[27]

Doctrinally, SAC was very narrowly focused, which worked to prevent its leaders from pondering the complexities of limited war. Today's Air Force leaders have no experience with the regimental culture of SAC and the requirements demanded by that mission. They are so far removed from the nuclear mission and its lack of technological advancement that it is difficult to place the strategic mission in a modern context given political, operational and budgetary realities.

Comparing Air Force and Navy Nuclear Operations

In assessing the welfare of the Air Force nuclear enterprise, it is instructive to look at two of the most influential leaders of the Navy and Air Force nuclear programs. General LeMay's name is virtually synonymous with SAC. The same can be said of the "father of the nuclear navy" Admiral Hyman G. Rickover. Both men had similar personalities: smart, decisive and determined. They understood the vital nature of their respective nuclear missions and were able to institutionalize safety and security standards. Both maintained ultimate control over personnel and made it their responsibility to grow expertise. General LeMay was known for spot promotions while Rickover's detailed interviews for the nuclear Navy are legendary.

General LeMay was the definitive combat operator. "He knew his profession literally from the ground up, and he seldom if ever allowed his ego to interfere with the results.[28] He continually educated himself on every minute detail of his organization and every tool at SAC's disposal. He demanded nothing less that perfection from his staff. "[T]o ensure nothing ever went wrong, SAC wrote manuals for every job, demanded strict adherence to checklists, and drilled aircrews in a rugged routine of training and alerts that created a body of 'perfect specialists' who were consumed with executing their mission flawlessly…"[29]

Admiral Rickover had similar personal qualities. Rickover was the consummate professional and did not accept "stupidity." He had congressionally mandated authority over the navy's nuclear capabilities which gave him the ability to remove a submarine or warship from active service –a power he did not hesitate to use.[30] Rickover created his own job and in 1949,

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[26] See Worden, *op cit.*
[27] CSAF Merrill McPeak letter to OSD, Nov 1992, as quoted in Worden, p. 235.
[28] *Ibid.*, p. 178.
[29] *Ibid.*, p. 61.
[30] December 1964 60 Minutes Interview, accessed at www.people.vcu.edu/~rsleeth/Rickover.html.

he "made a deal" with the Navy and the Atomic Energy Commission to create a new division for naval reactor development, placing him at the helm of both the technical and military sides of the equation.[31] From that point on in his 63-year naval career, he commanded the U.S. Naval nuclear program. By 1984, one out of every four admirals commanding ships had been trained by Rickover.[32] His influence on the Navy's nuclear program was at least the equivalent of General LeMay's on the Air Force. General LeMay held command of SAC from 1948-1957, the longest any officer presided over an Air Force command in the 20th century.[33]

> ***"I have little tolerance for mediocrity, none for stupidity."***
>
> *- Admiral Hyman G. Rickover*

Admiral Rickover developed the underlying principles in naval nuclear propulsion organization in the early 1950s. Rickover managed the development and operation of the first nuclear powered submarine, the Nautilus.[34] Admiral Rickover's focus was on preventing a nuclear reactor accident, and this singular focus pervaded the nuclear Navy organizational culture during his 33-year tenure as the head of naval nuclear programs. He was aboard almost every nuclear submarine as it was being completed, placing his personal stamp of approval on the ship. Rickover instituted a safety program founded on officer experience, expertise and human redundancy.[35] There were, and are today, extremely demanding officer selection standards for the nuclear propulsion program. While he led the nuclear propulsion command he personally interviewed and selected every candidate.[36] The nuclear propulsion organization is responsible for managing high-risk, complex, technical, and highly interdependent processes. The Navy's nuclear propulsion organization has retained Rickover's stringent standards and today remains error-intolerant and operates virtually accident and incident-free.[37]

> ***"I don't have time to distinguish between the unfortunate and the incompetent, the end result is always the same."***
>
> *- General Curtis E. LeMay*

Given that General LeMay and Admiral Rickover had so much in common, why was the Navy able to institutionalize Admiral Rickover's standards long-term, while the Air Force allowed General LeMay's SAC standards to decline? Both men were equally reviled by some in their respective services, and yet Admiral Rickover's standards

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[31] See: "Science: The Man in Tempo 3," *Time*, January 11, 1954, http://www.time.com/time/magazine/article/0,9171,819338,00.html#ixzz1FVlKasee

[32] December 1964 60 Minutes Interview, *op cit.*

[33] Air Force Magazine, October 2008.

[34] For a detailed account see Clay Blair Jr., *The Atomic Submarine and Admiral Rickover* [New York, NY: Holt, 1954].

[35] P. Bierly, and J.C. Spender. "Culture and High-Reliability Organization: The Case of the Nuclear Submarine." Journal of Management 21(4), (1995): 639-656.

[36] Some of the most telling Rickover anecdotes come from his selection process. See http://bubbleheads.blogspot.com/2009/02/rickover-stories-needed.html

[37] Statement of Admiral F. L. "Skip" Bowman, U.S. Navy Director, Naval Nuclear Propulsion Program before the House Committee on Science, 29 October 2003, Accessed February 28, 2011. http://www.navy.mil/navydata/testimony/safety/bowman031029.txt

remain the hallmark of the Navy nuclear program.[38] One of the fundamental differences between Navy and Air Force is that the nuclear mission was never a core mission for the navy; however, it was a core capability. Propulsion ensured that the nuclear mission would remain stable because it played an inherent role in naval capabilities.

According to interviewees, the perception is that the Navy is not perfect but it maintains high standards with less generous budgets. The naval nuclear enterprise was deemed fundamentally sound partially due to the fact that the Navy's strategic stewardship model stayed distinct. The Air Force made conscious choice to de-emphasize the nuclear mission, reduce manpower and cut budgets.[39]

The Demise of the Soviet Union and SAC

The collapse of the Soviet Union changed the primary national security dynamic around which the U.S. Armed Services, especially the Air Force, had been structured since World War II. Throughout most of the Cold War the Warsaw Pact outnumbered NATO conventional forces in Europe. The West countered the Soviet conventional superiority with strategic nuclear weapons provided by SAC and tactical nuclear weapons deployed in NATO countries. After the collapse of the Soviet Union and establishment of more friendly relations with Russia, the United States had less of a rationale to maintain the large number of deployed weapons. There was tremendous public pressure for a peace dividend. The U.S. military forces and their costs had to be reduced. In June 1989, the Chairman of the Joint Chiefs of Staff General Colin Powell unveiled "The Base Force" concept. The Base Force required a 20 percent reduction in personnel, a 25 percent reduction of force structure and a 10 percent budget reduction. In the midst of these rapidly changing world and domestic events, Iraq invaded Kuwait on August 2, 1990.

Although SAC had dominated the Air Force for most of its 46-year tenure from 1946-1992, SAC was inactivated a year after the dissolution of the Soviet Union. SAC was the initial raison d'être for an independent air force and that fact drove the early culture and organization of the service. When political realities changed, SAC lost its dominance in Air Force hierarchy. Dominance, however, was a large part of its identity and thus, the identity of the service. With the absence of a nuclear foe, the mission of the Air Force changed from preventing war through deterrence to fighting and winning the nation's wars.[40] SAC's responsibilities and assets were divided between ACC (missiles and bombers), Air Mobility Command (tankers) and U.S. Strategic Command (a unified command which replaced SAC which had been a specified command). The ICBM mission would transfer from ACC to Air Force Space Command a few years later.

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[38] Rickover truly hated by many of his fellow officers and was twice passed over for Admiral and only received it after congressional and presidential intervention."Unsinkable Hyman Rickover," *Time*, May 23, 1977, http://www.time.com/time/magazine/article/0,9171,911955,00.html?iid=chix-sphere.

[39] Schlesinger I, *op cit*, p. 26

[40] See Secretary of Defense, Report of the Commission on Roles and Missions of the Armed Forces, [Washington, DC: Department of Defense, 1995], www.dod.gov/pubs/foi/reading_room/734.pdf. Also CSAF McPeak repeatedly used the "fly, fight, and win" terminology in his speeches. See *Selected Works of the CSAF Merrill McPeak, 1990-94*, [Maxwell AFB, AL: Air University Press, 1994] pp. 66, 261, 270 & 273.

ROOT CAUSE 1: POLICY AND OVERSIGHT CHANGES

In this section we discuss the effects of strategy and policy evolution on the Air Force nuclear enterprise in four key areas: a lack of focus at the policy and strategy level; an aging and shrinking scientific community responsible for nuclear weapons development; a lack of awareness or understanding of nuclear-related issues in Congress; and, the impact of arms control measures. Strategically, one of the most detrimental factors to the perceived value of nuclear weapons was the rise of terrorism and rogue states seeking weapons of mass destruction (WMD) as the primary threats to U.S. national security. Additionally, the cadre of nuclear scientists, strategists and experts who experienced Hiroshima, the Cuban Missile Crisis and the Cold War decreases every day. Their expertise and interest affects the entire nuclear enterprise - in the halls of Congress, across DoD and in Air Force decisions on missions, manpower, and money. Finally, the influence of arms control treaties and reductions in the numbers of nuclear weapons and their delivery vehicles impact the Air Force's ability to retain the required expertise and focus is explored.

Workshop participants and interviewees agreed that too little top-level guidance was provided on which to base an effective nuclear strategic policy, and advocacy at all levels was not sufficient to support the modernization and sustainment of nuclear forces and the deterrent mission. Participants and interviewees pointed out that neither the executive branch nor OSD appeared to be involved or interested in the nuclear mission until *after* the unauthorized movement of nuclear weapons and mistaken shipment of classified forward sections.[41] This lack of engagement by DoD and Air Force leadership was perceived by those interviewed as a significant contributing factor to the lack of diligence that led to the unauthorized movement of nuclear weapons and mistaken shipment of classified forward sections. It was noted that some DoD leaders who were demanding that Air Force leadership be held accountable for their inattention to nuclear matters had themselves been disinterested until the nuclear incidents occurred.[42] The linkage between the perceived lack of national-level commitment to a "robust nuclear deterrent" by senior national security officials and its detrimental effect on the nuclear workforce was identified in a 2008 Defense Science Board report.[43] The report expressed the concern that "adequate nuclear competency… [would not]…be sustained to meet future challenges."

The problem was compounded by the integration of nuclear issues into the broader spectrum of WMD. The threat of nuclear attack was no longer treated differently than the threat of chemical or biological attack from terrorists or rogue states. This change was a result of several events. First, the collapse of the Soviet Union created fifteen new countries, many of which contained elements of the Soviet WMD infrastructure. As former scientists left the Soviet

[41] See conclusions from both the Welch, Larry D., *The Defense Science Task Board Permanent Task Force on Nuclear Weapons Surety: Report on the Unauthorized Movement of Nuclear Weapons* (DSB), April 2008 and Herman Wolk, *The Struggle for Air Force Independence 1943-1947*, [Washington, DC: Air Force History and Museums Program, 1997], and Schlesinger, Phase II reports.
[42] This fact was noted in the DSB and Schlesinger, Phase II reports.
[43] *The Defense Science Task Board Permanent Task Force on Nuclear Weapons Surety: Report on Nuclear Deterrence Skills*, September 2008, p. 10, http://www.defense.gov/npr/docs/DSB%20Nuclear%20Deterrence%20Skills%20Chiles.pdf

Union, the extent of its chemical and biological programs were shown to be much greater U.S. intelligence had discovered. Second, investigations after Desert Storm showed that Iraq's WMD capabilities, especially its nuclear program, were more advanced than previously thought. Additionally, WMD incidents such as the Aum Shinrikyo use of sarin gas in Tokyo and the anthrax mailings in 2001 highlighted the effects that WMD use by small groups could have on society. All of these events led to increased focus and funding on homeland defense against chemical and biological weapons, to the neglect of the nuclear deterrent mission that was also included in the WMD spectrum.

Strategy and Policy

After the end of the Cold War, the U.S. nuclear force structure changed dramatically – bombers and tankers were taken off alert, Minuteman II ICBMs were deactivated and all Army and surface Navy nuclear weapons were removed from service. George W. Bush's Administration moved away from arms control treaties that had been the centerpiece of nuclear policy since Richard Nixon was in the White House, but continued to reduce the nuclear weapons arsenal.

The role of nuclear weapons in the national security strategy was gradually evolving, but changed dramatically after the events of September 11, 2001 changed the focus of security and deterrence. Terrorism and rogue state concerns ascended as the primary threats to the United States, altering the perceived utility of nuclear weapons in our national strategy. The first major change was contained in the 2001 Nuclear Posture Review released in December 2001, which stated that

> [P]lanning for America's strategic forces [is moving] from the *threat-based approach of the Cold War to a capabilities-based approach…. Terrorists or rogue states armed with weapons of mass destruction will likely test America's security commitments to its allies and friends*. In response, we will need a range of capabilities to assure friend and foe alike of U.S. resolve …U.S. strategic forces need to provide the President with a range of options to defeat any aggressor.[44]

The 2002 National Security Strategy further articulated the Administration's focus on WMD. It is this change from threats to "capabilities" that led those in policy circles to question the ability of the government to counter WMD threats with the U.S. nuclear arsenal. Nuclear weapons went from an existential greatest threat to United States national security to being one of a spectrum of a potential aggressor's WMD capabilities. Traditional nuclear deterrence was not likely to work against an adversary that has no known fixed location, no major assets at immediate risk, and who may have an inclination toward martyrdom.

Although President Bush's Administration focused largely on responding to the terrorist attacks of September 11, 2001 and toppling of Saddam Hussein's regime in Iraq, nuclear force sustainment was not ignored. The Administration developed a "New Nuclear Triad" concept and

[44] Nuclear Posture Review, [excerpts] emphasis added. Document submitted to Congress, 31 December 2001 accessed at www.globalsecurity.org/org/news/2001/010302-npr.htm.

pushed Congress to fund both the Reliable Replacement Warhead and the Robust Nuclear Earth Penetrator programs. The Bush Administration also withdrew from the ABM Treaty and modernized U.S. ballistic missile defenses out of concern for possible future nuclear missile attacks. President Bush also signed the Strategic Offensive Reduction Treaty (SORT) early in his administration.[45]

The focus of the United States and its national security teams was first and foremost on the Global War on Terror (now called Overseas Contingency Operations) in Iraq, Afghanistan, and elsewhere, and where nuclear weapons and deterrence were seen as largely irrelevant. Thus, DoD and Air Force budgets went most heavily in the direction of improving and sustaining conventional capabilities relevant to current operations, and not on strengthening or even maintaining nuclear forces.

The Power of the Atom and the Aging Scientific Community

A serving U.S. general or admiral who started his career in the 1970s and served 30+ years was born shortly after World War II ended. They would have had no personal knowledge of Hiroshima and Nagasaki. They were likely too young to have political knowledge of the 1962 Cuban Missile Crisis. Many would have not seen or even heard of any nuclear weapon tests in the atmosphere, even though they served through the height of the Cold War. Thus, a significant majority have forgotten or never understood the power of the atom. Former Secretary of Defense Harold Brown, who once worked on nuclear weapons testing at Lawrence Livermore National Laboratory, stated that you could read a newspaper at three AM from fifty miles away at the Nevada Test Site when the United States tested a nuclear weapon above ground. His view was that it might be useful for all world leaders to witness such tests from time to time to impress upon them the extraordinary power of nuclear weapons and bring home to them that these were indeed weapons that could inflict almost unimaginable levels of damage and needed to be treated as such. It is likely that this appreciation has been somewhat lost and may account for some the diminished attention paid to nuclear matters since the end of the Cold War.

During the interviews we heard numerous harrowing stories of personnel making operational changes to nuclear weapons from using the wrong type of gas to stabilize the weapon to generally ignoring detailed tasks and safety measures in the presence of nuclear warheads. While the safety of nuclear weapons has dramatically improved since the early days of the U.S. nuclear program, one need only to read some of the stories about "mistakes" or errors in calculations from those days to be cognizant of their power while in the presence of nuclear weapons.[46]

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[45] SORT is also known as the Moscow Treaty.

[46] In his book *15 Minutes: General Curtis LeMay and the Countdown to Nuclear Annihilation*, [New York, NY: St. Martin's Press, 2011], L. Douglas Keeney describes numerous accidents and incidents during the early days of the U.S. nuclear program. One story is particularly germane: the chapter on the runaway bomb. The "runaway bomb" is not what we think of in the present day—a weapon that has been stolen, rather it represents one whose explosion was significantly greater than scientists expected and caused great damage to the Bikini Islands test site. It is the lack of understanding of nuclear weapons capabilities that existed in the early days of development that is now seen in the Air Force.

Most of the scientists who have conducted nuclear tests are no longer working, and many, like the World War II generation, have passed. No such tests have been conducted since 1992, when the United States unilaterally chose to discontinue testing.[47] Similarly, the political advocates of such nuclear weapons programs are retiring from the scene and have been replaced in the Pentagon, Capitol Hill, and White House by leaders who do not focus on nuclear preparedness and nuclear deterrence. This decline in the number of nuclear advocates and the clout they held was reflected in the Air Force's lax approach that led to the unauthorized movement of nuclear weapons and mistaken shipment of classified forward sections.

The leadership cadre at the executive, legislative and military levels has changed from one with direct experience in the Cold War to one whose war experience is in conventional wars in Iraq and Afghanistan where nuclear weapons played no role. This generational shift plays a significant part in the relevance of nuclear weapons in U.S. national security strategy today. The same has been true in the Air Force. During the Cold War, leaders with World War II "total war" combat experience relinquished control to Vietnam-era generals with only "limited war" experience. The Vietnam generation has now given way to those whose experience is based on conventional operations, not nuclear deterrence.

Congress

Generally, congressional interest in a particular issue is driven by constituents in a member's district and current events. From 1945 to 1991, there were many members of Congress who focused on nuclear weapons and their role in U.S. national security, a reflection in some cases of their experience or of the large military installations resident in their districts. Throughout the Cold War there were many hawks and doves in the halls of Congress who paid close attention to nuclear weapons. The Armed Services and Foreign Relations Committee and related appropriations committees in the Senate and House of Representatives have always been coveted positions, and thus, increased the requirement to be knowledgeable on national security affairs. Committee members required personal as well as committee staff expertise in national security issues and many times the staff consisted of retired or active duty military.

Over a span of almost two decades (1991-2008) the field of national security evolved from a focused bi-polar struggle to a multi-polar world with a wide range of existing and potential security issues including terrorism, the wars in Iraq and Afghanistan, regional instability in the Balkans and the Middle East, as well as the rising power of China. This evolution made it difficult for members of Congress to maintain in-depth national security expertise on nuclear issues given the sheer range of topics and interests they and their staffers must cover. Today, it is rare for committees to hold lengthy hearings about nuclear weapons and their deterrent value, in which Congressional members ask detailed and sometimes pointed questions of those testifying.[48] Instead today's members usually focus on the terrorist threat to the U.S. homeland and issues relating to the wars in Iraq and Afghanistan.

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[47] The Clinton Administration made this decision after the Comprehensive Test Ban Treaty failed Senate ratification.

[48] Kay King argues that Congress has abdicated its oversight responsibility in the national security realm. See Kay King, *Congress and National Security*, Council Special Report No 58, Council on Foreign Relations, November 2010.

Adding to the declining attention and expert focus on nuclear matters by the Congress was the fact that fewer military officers with nuclear backgrounds were assigned to the legislative branch as legislative fellows or liaison officers. First, this was because deployments to Iraq and Afghanistan made fewer military available to Congress. Second, those that were assigned to Capitol Hill were now predominantly from the Air Force fighter pilot community with little or no nuclear understanding or experience.

As membership in both chambers evolved, fewer members of Congress now have experience or perhaps even concerns regarding nuclear weapons as an element of national security . Instead, members' formative war experiences are increasingly from the era of the Persian Gulf, Balkan, Iraq and Afghanistan conflicts. Terrorism and the wars in Afghanistan and Iraq are the dominant issues of today; nuclear weapons concerns are mostly seen as something from a bygone era. The result is a decline in the number of Congressional hearings and decreased individual member attention towards maintaining U.S. nuclear weapons preparedness in the two decades after the collapse of the Soviet Union.[49]

Compounding the already diluted nuclear expertise or interest, is the fact that congressional oversight of nuclear issues are governed by multiple committees in the House and Senate which may serve to diminish the total focus needed for the nation's nuclear enterprise. Nuclear policy and legislation does not reside in a single executive branch department, as weapons design, development and maintenance is managed by DoE and its corresponding oversight committees while delivery systems and manning of weapons systems falls under the purview of DoD and the Armed Services Committees. Both have related defense and energy appropriations subcommittees. This split oversight affects the ability of policymakers to see the interconnectedness between stockpile sustainment and how the DoE and DoD programs affect the overall capability of the nuclear deterrent.

As our interviewees stressed, this is not to suggest that committee staff are unconcerned with nuclear issues. The Senate Armed Services Committee, for example, spent a significant amount of time reviewing Air Force organizational changes, specifically with regard to strategic forces and space. Hearings were held and comparisons made between the Air Force and Navy nuclear operations. Following the unauthorized movement of nuclear weapons and mistaken shipment of classified forward sections, both chambers held hearings on the events and as one staffer explained, it became clear that "no one was watching the store" and that Air Force training and discipline had suffered from overzealous cutbacks and damaging reorganizations. However, the erosion of congressional oversight is obvious to the services and has direct ramifications on their budgets.

Arms Control Reduces Bureaucratic Clout

During the past four Administrations, the U.S. government has signed arms control agreements including the Strategic Arms Reduction Treaty (START), START II, SORT and New START. The U.S. has also has undertaken unilateral actions that have dramatically

[49] An exception to this was seen in the fall 2010 Senate debates that preceded the new START treaty ratification. Several members demanded that the Administration move forward with modernization of the nuclear warheads and their delivery systems precisely due to their concern over the health of the U.S. nuclear deterrent.

reduced the number of strategic nuclear forces.[50] For example, U.S. nuclear delivery vehicles will have shrunk from approximately 2,200 in 1991 to approximately 800 in 2010.[51]

In 1992, the United States signed the Comprehensive Test Ban Treaty (CTBT) and declared a moratorium on further nuclear testing. Ratification of the CTBT failed in October 1999, but the Obama Administration promises to bring the treaty up for another vote. Meanwhile the unilateral U.S. moratorium is in effect.

The overall effect of such arms control and disarmament is to reduce U.S. nuclear forces and the resources available to sustain them. However, direct economies of scale are not realistic and some amount of nuclear government-industrial base is required even with a very low weapons count. Part of the literal price the Obama Administration paid for New START ratification was to agree to support approximately $80 billion worth of additional modernization and maintenance of U.S. nuclear infrastructure than previously planned or approved by the Bush or Obama Administrations.[52]

These arms control reductions have been paralleled by the 2010 Nuclear Posture Review that reduced the role of U.S. nuclear weapons to largely, but not completely, a retaliatory role against any nuclear aggressor, reversing the Bush Administration's intentional ambiguity regarding use of a nuclear weapon in response to a WMD attack. The Nuclear Posture Review also declared the United States would not use or threaten to use nuclear weapons against non-nuclear weapons states that are party to the Nuclear Non-Proliferation Treaty who were in compliance with nuclear non-proliferation obligations.

The effect of arms control has been to shrink the size of U.S. nuclear forces, and thereby reduce its bureaucratic clout in the Air Force, DoD, and congressional budgetary process. Interviewees spoke of the struggle to get appropriate attention to nuclear issues by their superiors and Congress. Staff in the Pentagon could see that the notion of the nuclear deterrent and its value for national security was undergoing changes. The evolution of the strategy was a contributing factor especially with budget dollars scarce and emphasis on winning the wars of today versus deterring the wars of tomorrow.

Terrorism and rogue state concerns have ascended as the primary threats to the United States, dramatically altering the perceived utility of nuclear weapons in our national strategy. These perceptions affect doctrine, policy and structures across DoD and the Air Force. Taken together the changes in oversight, strategy, and policy have had a dramatic effect on the Air Force. One interviewee summed it up by saying:

> It became clear officers and enlisted men have interpreted that there is a lack of care for nuclear matters. If I was a new officer I would really think do I want to make a career of this when there is a lack of interest in the Pentagon and White

[50] The first START treaty was proposed by President Ronald Reagan in 1982.
[51] These numbers include ICBMs, SLBMs and heavy bombers, http://www.fas.org/nuke/control/start1/news/strtdata.htm. For a total number of Russian and U.S. warheads 1945-2010 see www.airforce-magazine.com/MagazineArchive/Magazine%January%202011/0111chart.pdf
[52] The fact that funding for the early stages of the modernization programs was not in President Obama's 2012 budget submission to Congress did not go unnoticed by Senators who had voted for ratification on that promise.

House? There is a response to that stimuli or lack of stimuli. For years the only issues that came up were warhead life extension, delivery, and scientific expertise.[53]

[53] Several studies have looked at the demise of nuclear expertise at DOE labs. See for example, Department of Energy, *Commission on Maintaining United States Nuclear Weapons Expertise*, March 1999, http://www.doeal.gov/LLNLCompetition/ReportsAndComments/chilesrpt.pdf and Defense Science Board, *Nuclear Deterrence Skills*, *op cit.*, September 2008.

ROOT CAUSE 2: ORGANIZATIONAL CHANGE AND OPERATIONAL EVOLUTION

In this chapter we will discuss how DoD and Air Force organizational changes moved the focus away from nuclear deterrence missions, including the influence of the aforementioned role of the fighter pilots to senior leader positions as conventional wars and counterterrorism took priority over nuclear weapons. During our discussions, interviewees consistently referred to several important historical events, including the fall of the Berlin Wall, the implementation of the Goldwater-Nichols Act, and CSAF General Merrill McPeak's dramatic organizational changes, which led to a "lean organization" that prioritized some missions at the expense of others, as having dramatic affect on Air Force organization and operations.

The 1986 Goldwater-Nichols Department of Defense Reorganization Act was viewed as a massive inhibitor to service progress. Participants mentioned that Goldwater-Nichols' effects are still being felt today, especially in the role change of the services from planners to programmers, requiring them to focus on the funding programs, rather than planning and executing the mission. The other impact of Goldwater-Nichols was the Air Force's perceived requirement to rush officers through to command billets quickly so that all of the mandatory general officer joint experience requirements could be attained before promotion boards determined future careers. The result has been that officers are not in squadron, group, or wing command long enough to learn their jobs or to be properly tested to ensure they are ready for more senior command. Similarly, for the purpose of career development, a number of officers have been placed into nuclear leadership roles that are ill-matched to their experiences and background.

The OSD level of involvement in the Air Force's nuclear mission was another major factor mentioned by the workshop participants. All contributors concurred that without increased financial support and greater attention given by OSD to clarify and advocate for a strong U.S. deterrence posture and the associated role of the Air Force's nuclear enterprise, the service's nuclear capabilities will continue to deteriorate. Though the participants also believe that the capability to fight a nuclear war is critical to ensure deterrence, they believe most Air Force personnel no longer understand the importance of the nuclear mission or believe that nuclear war is a realistic possibility. One general stated that deterrence has become synonymous with maintenance and sustainment rather than the capability to execute the nuclear mission. Another participant questioned whether the Air Force should maintain its current strategy. All agreed that if the answer is yes, Air Force personnel should understand the deterrence mission, know it in depth, and demonstrate competence consistently and frequently to be credible. All agreed that these major questions of what deterrence means for the Air Force must be answered to effectively maintain the capability to execute the Air Force nuclear mission.

Office of the Secretary of Defense

After the Berlin Wall fell in October 1989 and the Soviet Union crumbled in December 1991, DoD was finalizing its Annual Report to Congress for fiscal year 1993. Then-Secretary of Defense Richard Cheney made the decision to remove discussion of the nation's nuclear capabilities from the document. There were two reasons for this decision. First, the United

States did not want to flaunt its power before the collapsing Soviet empire. Second, the annual report details programs the Pentagon wants to highlight to either maintain or increase congressional funding. Nuclear weapons were no longer in that category. This seemingly minor decision initiated a cascade of changes for nuclear weapons in U.S. policy.

The Department of Defense and the Nuclear Mission in the 21st Century, a study at the Center for Strategic and International Studies led by Clark Murdock, found that organizationally, nuclear weapons had been relegated from a position of preeminence to its new place as just one of so many missions for most commands and offices in OSD.

> In Washington, effective policy representation of any issue requires organizational and bureaucratic stature. Over the past 15 years, the bureaucratic actors focused on nuclear weapons have either disappeared or been incorporated (aka "mainstreamed") into other agencies. Moreover, the time and attention of senior policymakers—the scarcest resource in official Washington—has precipitously declined when it comes to nuclear issues.[54]

As threats to U.S. national security evolved, so too did the missions of the offices within OSD. However, given increasing budget constraints the expanding missions rarely came with a commensurate increase in staff. Instead, existing staff were expected to expand their mission and expertise areas. For example, within the Undersecretary of Defense for Policy, space and information operations were added to the Deputy Assistant Secretary of Defense (DASD) for Forces Policy office, although they have since been separated out again under the current Administration. Mergers between offices required a broadening of mission for each office. Another example is the 2006 reorganization that created the DASD Office for Counternarcotics, Counterproliferation, and Global Threats.

From 1951 until 1982 the Assistant to the Secretary of Defense for Atomic Energy (ATSD [AE]) focused on the U.S. nuclear weapons arsenal. It was in 1982, under the Reagan Administration, that the mission of the office began to change. As one study summarized:

From 1982-1996, the role of the ATSD (AE) expanded to include issues associated with chemical and biological weapons, implementation of arms control treaties and agreements, counterproliferation programs, and the Cooperative Threat Reduction program to assist in the elimination of WMD in the former Soviet states. In addition, the ATSD (AE) was given control over the Defense Nuclear Agency (DNA) in 1994. (DNA was one of several defense organizations that were merged to form DTRA in 1998)…Between 1997 and 2001, the Administration declined to nominate anyone to serve as the ATSD for Nuclear , Chemical and Biological (NCB) programs, having determined, as part of the Defense Reform Initiative, that the position should be eliminated. Congress, however, continued to maintain during this time that the position was necessary to ensure appropriate senior-level policy oversight and implementation guidance within the Department.[55]DoD changes in policy, structure, and most importantly emphasis under the Clinton and G.W. Bush Administrations clearly sent a message to the

[54] Clark Murdock, *The Department Of Defense And The Nuclear Mission in the 21st Century*, Center for Strategic and International Studies, March 2008, p. 24-25.
[55] "Nuclear Matters History," Office of the Deputy Assistant to the Secretary of Defense for Nuclear Matters, accessed September 26, 2010 at http://www.acq.osd.mil/ncbdp/nm/nmhistory.html

services that nuclear weapons were on the back burner. While a mission requirement remained, little effort was exerted to preserve the capability within the civilian DoD or military force structure. The 2008 Schlesinger Commission recognized this fact and stated that OSD senior leadership needed to be more involved with nuclear-related decision making and that oversight be consolidated and unified. The panel recommended that the responsibility of the NCB Defense Programs be brought under a newly created Assistant Secretary of Defense for Deterrence (ASD [D]), saying that:

> The Secretary of Defense should establish an ASD (D) in the Office of the Under Secretary of Defense for Policy (OUSD [P]). The Principal Deputy Assistant Secretary for Deterrence should be an acquisition professional and should be dual-hatted within the OUSD (AT&L). All existing OUSD (P) offices that deal with nuclear, chemical, biological and missile defense issues should be realigned under the new ASD; similarly, the functions of the ATSD (NCB) (to include oversight of DTRA should be assumed by the new ASD.[56]

For all the changes that occurred, it seems that the term "nuclear" is back in vogue in organizational nomenclature. Under the Obama Administration, an Under Secretary of Defense for Policy and Assistant Secretary of Defense for Global Strategic Affairs offices include a DASD for Nuclear and Missile Defense Policy. The mission of the office includes "developing strategies, policies, and oversight of national nuclear policy, treaty negotiations, and missile defense policy," although much of the focus is on arms control implementation and supporting missile defense.

DoD oversight of DTRA highlights the challenges. DTRA falls organizationally under ATL; however, most of its programs are monitored by offices within OSD Policy. This lack of unity of effort hinders execution. When OSD oversight offices disagree on a policy or program, it stagnates until a compromise can be reached. Sometimes a deadlock can exist for years. Finally, it is not clear how much oversight of military programs has changed or what if anything OSD is doing to affect the deteriorating nuclear culture internally or in the services.

There are many other examples of "mainstreaming" of nuclear weapons within DoD and military command structures. Here DTRA provides another good example. DTRA began as the DNA in 1971. It was renamed in 1996 when the word "nuclear" was no longer in vogue. The newly named Defense Special Weapons Agency's (DSWA) — also a descendant of the Armed Forces Special Weapons Project — was the first move away from the "uniqueness" of nuclear weapons; although it was seen as a way of consolidating all of the nuclear-related threat reduction agencies under one roof. DSWA's mission was expanded to include "advanced conventional weapons support programs." The organization struggled for effectiveness. In 1998, DSWA, the On-Site Inspection Agency, the Defense Technology Security Administration, and selected elements of OSD were combined to form DTRA. Today, DTRA's mission is to act as DoD's "official Combat Support Agency for countering weapons of mass destruction." DTRA is co-located with the U.S. Strategic Command (USSTRATCOM) Center for Combating Weapons of Mass Destruction.

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[56] Schlesinger, James. R. *Report of the Task Force on DOD Nuclear Weapons Management, Phase II: Review of the DOD Nuclear Mission*. [Arlington, VA: The Mitre Corporation, McLean, VA., 2008], pg. v.

USSTRATCOM and Headquarters Air Force

More evidence of the DoD inattention to nuclear affairs is the addition of new missions to USSTRATCOM. Shortly after the end of the Cold War in 1992, the U.S. Strategic Air Command, a specified command whose sole responsibility was the nuclear deterrence mission, was inactivated and its responsibilities redistributed. In the same year, a unified command, U.S. Strategic Command, was created. Unfortunately, in addition to command and control of U.S. strategic forces, the commander of USSTRATCOM was later assigned numerous non-nuclear missions. Clark Murdock explains:

> The recent history of USSTRATCOM illustrates how far the nuclear mission has declined in organizational status. On October 1, 2002, U.S. Space Command was merged into USSTRATCOM, and, since that time, USSTRATCOM picked up many new responsibilities, global strike, computer network operations, information operations, global intelligence, surveillance and reconnaissance (ISR), strategic warning and intelligence assessments, and combating weapons of mass destruction. In the summer of 2002, the highest-ranking individual at USSTRATCOM who thought about nothing but nuclear issues was its four-star commander; today, it is a retired lieutenant colonel who heads up the Nuclear Command and Control office. This loss of bureaucratic status has been mirrored in OSD and the military services.[57]

While General Ronald Fogelman was CSAF, he created an office in Headquarters Air Force specifically focused on nuclear weapons (XON). However, that mission expanded over time. When Major General Roger Burg took over the office in 2004, the title had changed to "Strategic Security," and the mission included nuclear arms control, space issues, and counter-chemical, biological, radiological, and nuclear issues including the Air Force's detailed concept of operations for dealing with chemical and biological attacks. The office was realigned in 2006 as A5XP as part of the air staff restructuring.[58]

Nuclear Goes Conventional

Operation Desert Storm highlighted American dominance in conventional weapons, specifically in the areas of precision weapons guidance and communications technologies, especially command and control. This movement was accelerated in the next decade in conflicts in the Balkans (specifically Kosovo) and the post-September 11th attacks on the Taliban in Afghanistan. Most significantly, the U.S. military and the Air Force in particular, was evolving its role in national security.

During the Cold War, the mission was to maintain the peace, as evidenced in the SAC motto: "Peace is our Profession." The emphasis after the end of the Cold War was on fighting and winning limited conventional wars as quickly and as bloodlessly as possible. This was a fundamental change for the Air Force and its hierarchy. Those who upheld the importance of the nuclear mission became less important and those who commanded or fought in contemporary

[57] Clark Murdock, *op cit.*
[58] U.S. Department of Defense News Release, "Air Force Reorganizes Staff Structure," No. 082-06, January 30, 2006. www.defense.gov/releases/release.aspx?releaseid=9268

wars rose to preeminence. The lopsided success of American combat forces in Iraq in 1990-91 led to theorizing that stealth technology, precision conventional weapons, and information technology were creating a "revolution in military affairs" that would require changes in organizations, culture and expertise to sustain. This led to a shift in the bomber community's focus to becoming conventional mission experts. Leadership in the B-52 community made this their priority and the crews followed their leaders. The focus on the B-52's nuclear mission received much less emphasis.

The expanding role for conventional weapons and decrease in the perceived utility of nuclear weapons continues today. Precision guided conventional bombs and missiles can effectively strike a whole class of targets without the political and physical costs of using nuclear weapons. Further, under the Prompt Global Strike concept, conventional warheads have been considered that could be delivered by missiles and strike so quickly and accurately that even time-critical targets can be destroyed. Improvements in hardened target penetrators may allow conventional warheads to be used against targets previously reserved only to the nuclear forces. This is not to suggest that nuclear weapons will be completely replaced in their mission to deter nuclear attacks but rather that conventional weapons may further erode the perceived utility of nuclear weapons.

General McPeak's Revolution

Much like the current economic conditions, General McPeak was Chief of Staff at a time when the economy was in decline and the services were being forced to make dramatic budget cuts. General McPeak's vision was a streamlined, flat organization that moved power out of headquarters and into the hands of commanders in the field.

> We redistributed power inside our Air Force—shoved it down and out from the headquarters. We empowered the people who were working on the actual problem. To support this initiative, we started replacing regulations with policy guidance—the "what and why" of something that needs to be done. We leave the "how" part to the people who know the mission best—and we provide metrics to help measure operational performance.[59]

General McPeak replaced Air Force Regulations (AFRs) with what was intended to be a broader, less prescriptive set of Air Force Instructions (AFIs) to give commanders more flexibility. AFIs were limited to less than 10 pages. Interviewees told us stories of personnel simply cutting and pasting one section of an old AFR into the "new" document so that it would pass the test. Then, the knowledgeable Airman would retain the AFR in his own personal file for reference. This held true in many units across the service for many years. However, eventually the "old guys" who had understood why the AFRs were necessary for the nuclear mission were gone. A new generation moved in and "old files" disappeared or were no longer used as reference. Today, many in the service do not know the full extent of the "LeMay" regulations nor how to execute their mission according to such prescriptive methods. Continuous change in itself became a culture.

[59] "The Quest for Quality," Speech, First Quality Air Force Symposium, Montgomery, Alabama, 21 October 1993,*Selected Works of the CSAF Merrill McPeak 1990-94*, p. 265

General McPeak's goals were clear: "By restructuring, we seek to better integrate Air Force functions. ACC integrates combat squadrons, ending the artificial strategic-tactical division of our forces. Air Mobility Command (AMC) integrates the airlift and tanker units that deploy and sustain our forces, enhancing the mobility we need to defend America's interests around the globe." By 1992, General McPeak declared his Air Force was "a more streamlined, agile organization. Most important, we have created a more operational, more combat-oriented Air Force."[60]

One of the unforeseen consequences of the flat organization, according to our interviews was the "erosion of the authority of the NCOs." As one retired Airman explained, "Lieutenants took over jobs previously held by Technical and Master Sergeants, taking the NCOs out of the management chain of command, experience they required."[61] Another stated, "It also created a generation of Senior NCOs that were trained not to think, get their hands dirty or take responsibility."[62]

To some at the time, General McPeak's efforts to streamline the Air Force seemed necessary. The Air Force budget was being slashed and the end strength declining from 607,000 in 1987 to 371,000 in 1994.[63] General McPeak correctly identified that the organizational structure had outgrown the mission. The Air Force was top heavy and needed to cut organizations and dollars. He knew he had to change the culture as well. The SAC construct fit with the Cold War, but the inflexible, "checklist-following" nature of SAC and thus, the Air Force, did not mesh with the dynamic conflicts in Iraq and the Balkans. The CSAF needed a thoughtful, nimble force able to execute expeditionary missions. According to one source, General McPeak was successful in his goal.

> [His] skillful management of these two Air Force cultures allowed him to make sweeping changes and begin altering the basic assumption of the Air Force—strategic bombing. It opened the door to his vision '*…the world's most respected air and space force-global power and reach for America.'* His vision requires a culture that is innovative, flexible, able to operate in dynamic environments, and responsive to operators in the field, all elements of the TAC culture.[64]

What General McPeak and Air Force senior leaders did not consider was the distinct nature or needs of the nuclear mission. While, the CSAF was correct that nuclear weapons are no longer central to the fight, deterrence—which includes, nuclear weapons — remained a core Air Force mission. As another former CSAF we interviewed stated, "Nuclear is THE mission we can't screw up." While General McPeak intentionally changed the culture—for what he

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[60] "Air Force Materiel Command Stand-Up," Speech, Official Activation, Wright-Patterson AFB, Ohio, 1 July 1992 from *Selected Works of the CSAF Merrill McPeak, 1990-94,* p. 163.
[61] "General Merrill McPeak destroyed the Air Force," *Military Times* [poll], July 2010.
[62] *Ibid*.
[63] William S. Cohen, *Annual Report to the President and Congress*, "The FY 1999 Defense Budget And Future Years Defense Program," Washington, DC: U.S. Department of Defense, 1998, http://www.dod.gov/execsec/adr98/chap21.html
[64] Charles H. McGuirk (LTC), USAF, "Two Air Force Subcultures Collide as General McPeak Sets a New Course for the Air Force, Strategic Research Project, U.S. Army War College, 15 April 1996, p. 19-21.

thought was the better — he did not consider the long-term unintended consequences that would lead to failure of the nuclear mission.

Goldwater-Nichols Overhauls Service Structure

One of the greatest challenges for the armed services is operating in concert with one another. As the Vietnam War showed, inter-service rivalry affected operational effectiveness. This fact was also highlighted in the 1980 ill-fated attempt to rescue American hostages from Iran and the 1983 U.S. invasion of Grenada. The latter operation, and in particular anecdotal stories such as soldiers having to use calling cards to talk to other services because of incompatible radio systems, proved to be the last straw in allowing services to plan and operate independently. After retiring as the Chairman of the Joint Chiefs of Staff, Air Force General David Jones detailed the conflicts of interest and history of service rivalries that encouraged the practice of placing service priorities ahead of those of the nation.[65]

In 1986, Congress passed the Goldwater-Nichols Act to address the issue of service interoperability. The legislation forced the services to take meaningful steps to improve joint operational capability. The successful results of Operations Desert Shield and Desert Storm provided evidence the Goldwater-Nichols Act had met its objectives. However, there were some unintended consequences. One significant effect was that the armed services had to move officers more quickly through a series of positions, including a joint service assignment, to meet the mandated requirement that officers complete at least one joint position before promotion to brigadier general. This forced the Air Force to identify high potential officers much earlier in their careers and to move these officers quickly through command assignments and in-residence Professional Military Education courses prior to their brigadier general board. Shorter command tours did not allow officers to become experts in their unit's mission. Some commanders even completed their tours without ever becoming combat qualified in their unit's aircraft.

The Air Force continued to perform well as legacy officers and NCOs who had been trained and developed under the "pre-1990" policies continued to serve, but as they retired problems began to surface.[66] The time period 1986-2007 is approximately the length of an officer's career. According to at least one theory, this is also a reasonable time horizon for institutional-level executive decisions; the results of decisions made often have a 20 year incubation period before the consequences are fully evident.[67]

According to several interviewees, the joint requirement played a direct role in the demise of the Air Force's nuclear mission. In 2008, the 5th Bomb Wing at Minot was commanded by Colonel Joel Westa, a rising star in the Air Force. Col. Westa was expected to be on the next brigadier general promotion list. However, he had yet to accomplish the joint training and education requirement specified in the Goldwater Nichols Act. Against his own

[65] David C. Jones, "Why the Joint Chiefs of Staff Must Change," *Armed Forces Journal International*, March 1982, pp. 68, 72.
[66] T. Kluntz, Wanted: Nuclear Officers. Exceptional Release, (12). Arlington, VA: Maintenance Officer Association, October 12, 1984 and J. Trebon, Can Somebody Tell Me What Happened at Minot? *The Munitions Insider*. Issue 1, September. Alexandria, VA, 2009.
[67] E. Jacques, "The Development of Intellectual Capability: A Discussion of Stratified Systems Theory," *Journal of Applied Behavioral Science*, 22(4), 362-383. Arlington, VA: NTL Institute, 1986.

wishes, Col. Westa was sent to a 10-week joint officer training course at a crucial time - the wing was preparing for its Nuclear Surety Inspection recertification. [68] The wing failed the inspection and Col. Westa was relieved for "failure to develop a culture of excellence." While anecdotal evidence can lead to overstating facts, this suggests that the Air Force valued career objectives over the mission of the wing, at least in this particular case. This example is but one of many tales of the Air Force's nuclear cognitive-dissonance that interviewees relayed to the Study Team.

In addition to addressing joint operations, Goldwater Nichols changed the services role in combat and non-combat operations. Under the new law the armed services became force providers to joint commanders. While this addressed the problem of inter-service rivalry, it changed the mission construct of the services. They moved from direct involvement in planning and executing the mission to focusing on the budgetary requirements to organize, train, and equip forces for combat. One workshop participant explained:

> Goldwater-Nichols finally happened… [the] services are force providers [with the primary task of] train, organize, and equip… It put the services, particularly the service planners, in an entirely different role. Now you are busy worrying about the bottom line and who is going to defend what on the hill, which begs the question, "What are we trying to do here?" This is a cultural change that is very large…it has finally come to fruition…

The changes from above, both from the legislative and executive bodies have had a profound effect on the way the Air Force does business. Many of the consequences have taken years to be realized; however, the service must now try to address the problems within a context that is largely beyond its control.

[68] At least two interviewees corroborated the fact that the AF denied Col. Westa's request to delay his 10-week joint officer training, until after the inspection. The reason, according to our sources, was that the previous Brigadier General promotion list was delayed due to several candidates not having their joint requirements fulfilled and AF leadership did not want that situation repeated.

ROOT CAUSE 3: INSTITUTIONAL FOCUS

While the decline in nuclear competence occurred steadily, many red flags were raised, but ignored. Conscious decisions were made to alter training and education requirements to the point that most Airmen did not receive any nuclear-related training. Policies were ignored or revised to meet new challenges in the ever-flattening Air Force organization.

Signs of Nuclear Enterprise Decline Were Ignored

There were numerous signals for the Air Force that the nuclear mission was failing. Internal reports warned of diminished standards of nuclear weapons security.[69] In 2001, the Advanced Systems and Concepts Office at DTRA released a study on DoD staff nuclear expertise. While it focused primarily on the ICBM community, the report pointed to several aspects of concern within Air Force programs, specifically the dilution of nuclear expertise due to career field mergers. It stated that the end users of the Air Force personnel (USSTRATCOM and others) were satisfied with the skills and knowledge of Air Force officers, but there was a great concern that the nuclear career field was a dead end career. Therefore the best and the brightest were moving to other fields in order to advance.[70] In 2003, the Air Force's inspector general found that half of the nuclear surety inspections conducted that year resulted in failing grades – the worst performance since inspections of weapons-handling began. Minot's 5th Bomb Wing was among the units that failed, while the 2nd Bomb Wing at Barksdale garnered an unsatisfactory rating in 2005.[71]

> ***"I think that now we have seen, with the event between Minot and Barksdale, that we took our eye off the ball with the nuclear mission…I don't think that any unit on the 29th of August or the 30th of August [2008] would have said their nuclear mission was not job 1, but I think that the tempo of their conventional mission had an adverse consequence on their nuclear mission."***
>
> *- Maj. Gen. C. Donald Alston, Assistant Chief of Staff, Strategic Deterrence and Nuclear Integration (A10)*

Between 2001 and 2007 more than 235 nuclear safety deficiencies were reported by ACC.[72] Many of the deficiencies were routine issues with personnel or equipment; however, it is noteworthy that of the 237 reported almost 100 were at Minot or Barksdale. At the very least, it was clear that the "culture of compliance" was seriously impaired and that leadership was aware of the fact. In 2003, Air Force pass rates for nuclear inspections were at an all time low, but by 2006 and 2007 bases were receiving 100 percent ratings. Many have questioned why there was such an improvement. Did inspectors lessen the intensity or scope? Interviewees have denied that accusation. They explain the change instead as a function of personnel changes that not only had an impact on the 2006-07 ratings, but on those following

[69] Warrick and Pincus, *op cit.*
[70] Thomas Neary, John Preisinger, Lisa Ludka, Joseph Sutter, *Nuclear Deterrence Issues and Options Study: A Baseline Assessment of DOD Staff Experience*: *Final Report*, DTRA Advanced Systems Concepts Office, December 21, 2001.
[71] *Ibid.*
[72] Michael Hoffman, "237 Nuke Handling Deficiencies Cited since 2001," *Military Times*, February 12, 2008 accessed September 9, 2010.

the events at Minot. Commanders realized that often personnel were being moved shortly before inspections, leaving less experienced personnel to be tested after only days or weeks on the job. Subsequently, trained personnel were retained for the inspection periods, and only permitted to move after an inspection occurred. This raised the rate of inspection passage, but the inspection results did not necessarily represent the true capability of a unit across time.

The Defense Science Board reported that the major command (MAJCOM) inspector general (IG) nuclear surety inspection teams failed to identify the types of problems that caused the unauthorized movement of nuclear weapons, but it did not address the expertise of the inspectors. One interviewee told us of his experience briefing inspection teams before they conducted an inspection. He noticed that he did not recognize a single person on the team. When asked, the IG staff stated that it was impossible to get access to qualified Air Force personnel; instead the IG had reached out to other agencies with "nuclear experts" to fill gaps.

Additionally, there is a DoD IG report on the oversight of nuclear weapons which states that OSD had "abdicated" leadership of nuclear policy and that both the Air Force and Navy were failing in their respective missions on numerous fronts. According to our interviews, the Chief of Naval Operations made several changes to address the Navy's problems. OSD and the Air Force did nothing. In June 2003, the President released National Security Presidential Directive 28 titled "United States Nuclear Weapons Command and Control, Safety, and Security," which further raised the bar on nuclear security. The National Security Council followed the directive with an instructional memo. However, OSD did not respond. Interviewees told us that Secretary of Defense Rumsfeld declared that if the President wanted him to change something, he would tell him to do so directly.

President Bush was briefed on the Air Force and Navy nuclear inspection failures by DoD staff, but Secretary of Defense Rumsfeld did not address the issue. Anyone who worked in the Rumsfeld Pentagon lived in fear of the "snowflake" missive sent down from above requiring an immediate response. Rumsfeld snowflakes required in-depth, thoughtful, time-consuming answers to difficult questions. However, not one Pentagon official we spoke with could remember addressing a single snowflake on a nuclear issue during Rumsfeld's six-year tenure as Secretary, although he was known to send as many as 60 a day.[73]

Air Force Cultures of Compliance and Self-Assessment Are Gone

The Air Force allowed local changes to the once standardized practices that were consistent throughout SAC and other commands for nuclear-related activities. Officially, these were to be reviewed at command headquarters (ACC for the nuclear bomber units); but, according to study participants, in practice few requests for change were sent to higher headquarters or sister units, because neither the command staff nor the unit staff was held accountable for changes. Local deviations became normal and were even encouraged through the Air Force Smart Operations 21 (AFSO 21) initiatives designed to spur best practices. For example, the decision to intermingle nuclear and nonnuclear weapons in the weapons storage

[73] Robin Wright, "From the Desk of Donald Rumsfeld . . .," *The Washington Post*, November 1, 2007, accessed September 25, 2010.

structure at Minot AFB was a local procedure adopted because storage space was limited. This policy was not challenged by the headquarters staff, although according to interviewees, senior leaders were aware the change had been made.

Several interviewees told us that the Minot load crew failed to follow their checklist and perform the missile safe status check; however, others clarified that the loading checklist did not have a step requiring the load crew to check the missile safe status and that the step had been removed sometime during the past 10 years. There is no indication whether this change was shared with headquarters personnel.

In answer to the question of how the unauthorized movement of nuclear weapons could have happened, one interviewee explained that NCOs did not follow technical data and the organizational culture that allowed the mistakes was "a very loosely managed operation" and had been for years. Another described his amazement that when he assumed command of a nuclear unit prior to the unauthorized movement of nuclear weapons there were no checklists (e.g. storage structure door opening checklists, towing checklist, munitions control checklists, etc.). Procedures and processes were not written; or if they were written they were outdated or inadequate. Therefore, people had become accustomed to not using them.

Yet another former commander at a nuclear wing detailed his efforts to change the noncompliance culture. He shared his frustration that even after he had worked at changing the culture for two years many of the NCOs "did not get it." One story was particularly telling; a maintenance team sergeant found a "ding" in a nuclear weapon during a maintenance inspection and rightly began to prepare an unsatisfactory report. His supervisor told him there was no need to submit a report because it was clear that this was "not a serious problem and you don't have to report every little thing." The reason this anecdote resonated with our team was that the incident occurred at Minot in 2010, two years after the unauthorized weapons movement. Incidentally, the sergeant did not accept his supervisor's direction and went around him to the next person in command, who agreed that an unsatisfactory report should be submitted.

These stories show the depth of the problem facing the Air Force in addressing its organizational culture. However, our interviewees cautioned that simply stating the Air Force should have a "culture of compliance" will have little effect on personnel performance of daily requirements. All jobs are not equal; nuclear tasks require exact compliance. Though none of the participants suggested a return to SAC, they acknowledged SAC's discipline and culture of strict compliance and agreed that the concerted effort by the tactical operators to kill the SAC culture hurt the Air Force's ability to properly sustain the nuclear enterprise.

Interviewees confirmed that the Air Force had little tolerance for bad news. Commanders did not encourage reporting failures; no matter how small or insignificant. Examples from our interviews included a case where self-reported missile crew sleeping was punished; in contrast to the intent of the self-reporting system that is geared toward identifying warning signs in time to devise a process, and procedure to prevent problems, such as crews not getting enough sleep before an alert shift. Another example was the punishment of crews who reported lost tools. The effect was the discouraging of reporting an incident. Interviewees stated they experienced many instances of commanders trying to demand compliance but without understanding of the intent of self-reporting programs, and the negative consequences of punishing an honest admission.

Another interviewee explained that a lack of compliance and self-reporting has led to a culture of complacency – people *chose not to learn* or execute the things they know are vital to the mission. Why? Because they do not comprehend the ramifications of failure of the nuclear mission; "deterrence" has become only a theory and not a mission in the eyes of many Airmen.

Nuclear Education and Training De-emphasized

Both the CDI and Schlesinger Reports noted a dramatic change in Air Force nuclear education and training.[74] The use of strategic bombers in conventional roles in conflicts in Kosovo and Iraq highlighted the ascendency of conventional forces and the declining relevance of the nuclear mission to the operational Air Force. This was reflected in changes not only to the platforms and their mission, but also in training requirements. Conventional missions utilizing, for example, precision guided munitions, required additional training and acumen. However, with funding restrictions and the need to prepare for a diversity of missions, the Air Force reduced training hours allocated to the nuclear missions in order to increase hours for pressing conventional missions.

A few decades ago, many young captains and majors who were to become general officers were either attending or instructing at the USAF Weapons School at Nellis AFB, Nevada where nuclear operations and weaponeering were a significant part of the coursework. However, nuclear curriculum at the USAF Weapons School had been removed, a change that required four-star approval. Steven Covey's "The Law of the Farm" says you reap what you sow: it is noteworthy that the instructor pilot who flew the "Doom 99" mission from Minot to Barksdale did not receive any nuclear training during her USAF Weapons School training.[75] If the Air Force is increasingly focused on preparing generalists with broad range of experiences, the price to be paid is a corresponding loss of experiential depth within a given field. There is significant anecdotal evidence of this detriment to the nuclear mission. Between 1999 and 2001, seventy to eighty percent of officers in the crew force at F.E. Warren were on their first "nuclear" assignment; by 2007 that number had risen to 98 percent. In 2008, eighty percent of Minot security forces were in their first assignment. As requirements rose for overseas deployments, security forces were undermanned at nuclear posts. In at least one instance, a lieutenant general approved a memo declaring ICBM security forces need only be manned at the sixty percent level, given the strain of expeditionary requirements.

Just as previous investigations found, the study team came to the conclusion that choices were made by senior Air Force and other national security officials that dramatically altered the state of the Air Force nuclear enterprise. At times the signs were clear that expertise and culture had declined to the point that the enterprise was in danger of catastrophic failure. But even among the most senior level officers we interviewed, none had openly raised the alarm to their superiors. Most officers said they "just made do" with the circumstances.

[74] CDI, p. 44, Schlesinger, p. 44-45.

[75] CDI, p. 44. Although the instructor pilot did not receive any nuclear training at the USAF Weapons School, she had received training periodically throughout her B-52 qualification and upgrade training. Nuclear training has been added back into the USAF Weapons School curriculum.

ROOT CAUSE 4: FAILURE OF LEADERSHIP

The most prominent finding from this study was that of leadership failure. While this finding is in agreement with previous investigations, it must also be stated that this failure was not one of omission. Conscious, corporate-level decisions were made by senior leadership at national and Air Force levels to lessen the importance of nuclear weapons and focus resources on other priorities.[76] Consensus from study interviews and workshop participants was that in today's Air Force everyone wants to be in charge, but few want to take responsibility or to be held accountable for the nuclear mission. Workshop participants clearly identified that one of the greatest problems for the Air Force is that that the requirements of leadership are not well defined. This study earlier defined leadership as the "process of social influence in which one person can enlist the aid and support of others in the accomplishment of a common task."

Many Airmen thought that "killing" the SAC culture was a step forward for the expeditionary Air Force. The nuclear career field, where one worked where one's weapon system was based, was thought to be unrewarding, while the rise of the fighter generals showed that deployability was more essential for a successful Air Force career. Mantras supporting these facts reverberated across the Air Force. Missileers were told, "If you aren't in Space, you aren't in the race" and the entire force was repeatedly reminded by senior leaders, "If you aren't deployed, you are not in my Air Force." The changes in the Air Force nuclear mission were organizationally driven and culturally institutionalized.

Nuclear Weapons Lose Their Advocates

Between 1990 and 1994, Air Force personnel, doctrine, and procurement shifted to focus on conventional forces. Leadership was the logical next step. In a 1990 study at Air University's School of Advance Air and Space Studies that characterized 36 senior Air Force leadership positions, 53 percent had fighter experience, an increase of 29 percent from 1975 and a dramatic 382 percent from 1960. Meanwhile, only 18 percent of the senior staff and major command slots were filled by bomber generals, a decline of 58 percent from 1975 and 77 percent from 1960. Also remarkable was the rise in non-rated leadership which rose 127 percent from 1975, and 108 percent from 1960.[77] This change in leadership not only altered the structure and organization of the Air Force, but also the culture. The fighter pilot world viewed U.S. conventional supremacy as making nuclear weapons all but obsolete.

The 2010 U.S. Nuclear Posture Review restricts the role of nuclear weapons by stating that the U.S. will not use nuclear weapons against a non-nuclear state or one that is a signatory and in compliance with the 1973 Non-Proliferation Treaty.[78] Since nuclear weapons have not been used in conflict since 1945, their relevance has been called into question by some military leaders. As one observer noted:

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[76] Schlesinger, p. i.

[77] Maj. James M. Ford, *Air Force Culture and Conventional Strategic Air Power* (thesis), School of Advanced Air and Space Studies, [Maxwell AFB, AL, Air University, 1993], p. 47-48.

[78] Department of Defense, *Nuclear Posture Review Report*, Washington, DC: The Pentagon, April 2010, www.defense.gov/npr/docs/2010%20nuclear%20posture%20review%20report.pdf

> The predominant view in today's military, where the operational perspective of the 'warfighter' is dominant, is that nuclear weapons lack utility because they are not 'useable.' Nuclear weapons are not 'interesting' (particularly from a career perspective) because they are not needed (since the United States is the world's only conventional superpower) and will not ever be used (by a U.S. president).[79]

Interviewees described Air Force leaders' views on nuclear weapons as ranging from "outright contempt" to simply having a complete "lack of interest." One CSAF is remembered for saying, "if you are not deploying, you are not in my Air Force." Another openly expressed his view that the U.S. should not have nuclear weapons in Europe. As one interviewee explained, "if you are a missile wing commander and you are being told that your guard force are volunteering to go to Iraq and is seen as important; but oh by the way you have just made your contribution to the cause and you are not going to get a back fill for his position. It sends a message that whatever you are doing is not important."

We were told by one participant, "The nuclear mission in the Air Force became the mission you did not want. Many are willing to give up nuclear and other areas because it is too much of a headache." Another interviewee told us that at one point ACC was considering direct management of all nuclear weapons storage areas in the U.S.; all but one local commander chose to give up responsibility for weapons storage areas in order to avoid nuclear command, as the perception was nuclear errors are more dangerous to one's career.

There are some leaders with little, no, or dated nuclear experience who hold key positions in the USAF nuclear enterprise, including supervisors and enlisted members as well as squadron, group and wing commanders. Only half of the 22 commanders and vice commanders (0-6 and above) at the pertinent operational, engineering and maintenance commands had a background in a missile-related field.[80] Only those interviewees working at AFGSC and A10 could discern a positive change. Those not in HAF or AFGSC felt this situation had actually worsened since 2008.

The DSB study on nuclear deterrence skills found that the lack of "visible leadership" at senior levels, makes maintaining rigor and focus at all levels "to meet demanding proficiency standards" all but impossible.[81] Put simply, you cannot have the required level of nuclear competence without the commensurate level of leadership and management of the enterprise. The Air Force has expended a great deal of effort to recover the management of its nuclear mission. However, what remains to be accomplished is a leader-established vision and the expertise growth to sustain a healthy nuclear enterprise.

Inaction Can Be As Harmful As Action

The inaction of senior Air Force leaders immediately following the unauthorized movement of nuclear weapons was seen by some as a clear sign of leadership failure. No one was relieved of command until after the CDI was completed. Investigators had to request that the 5th Bomb Wing at Minot be de-certified while they conducted the review. While these

[79] Clark Murdock, *op cit.*
[80] Adm. Donald Report, *op cit,* p. 47.
[81] DSB, Nuclear Deterrence Skills, Sept. 2008, p. vii.

inactions can be explained as wanting to get the full story before acting, it sent a signal to some Airmen that the nuclear mission was not fully understood or valued as highly as it once had been. As one interviewee stated, the "strategic inflection" was unmistakable. The harm this indecision caused to the nuclear culture of the Air Force is incalculable. It did not go unnoticed. Many in nuclear career fields saw it as the final indication that the nuclear mission was no longer valued.

Approximately 70 U.S. Air Force personnel were disciplined, fired, and/or retired as a result of this single event. Many of those lost their certification in the Personnel Reliability Program. However, not a single general officer lost his job over the unauthorized movement of nuclear weapons, a fact that many in and outside of the Air Force questioned. Several of the retired general officers we interviewed for this project felt that the reason was simply favoritism of certain individuals and a lack of will by Air Force leaders to "upset" the retired four star generals who exert significant influence over Air Force decisions long after they are out of service.

As the details of the unauthorized movement of nuclear weapons and mistaken shipment of classified forward sections were unveiled, Secretary of Defense Robert Gates said he had lost confidence in the leadership of the Air Force and asked Secretary of the Air Force Michael Wynne and Chief of Staff General Moseley to resign. During the press conference Gates said:

> [I]ndividuals in command and leadership positions not only fell short in terms of specific actions, they failed to recognize systemic problems, to address those problems, or – where beyond their authority to act – to call the attention of superiors to those problems.

One strong criticism of the Air Force from interviewees was that current leadership focus is to "not make history" by repeating mistakes and highlighting errors rather than addressing the inherent problems that led to both of the nuclear-related events. The response from those currently in command is that they are trying to fix the problems at hand. The Air Force Roadmap guiding current initiatives focuses almost exclusively on governance of the amorphous "nuclear enterprise." Thus, many of the core issues related to personnel, expertise, deployment pressures, and training were not addressed by the investigations and few effective recommendations have been provided. The leadership does not seem to know how to address the lack of expertise and dearth of qualified personnel. Instead, the focus is on inspections and requiring those in place to give their very best effort, adhering to the new DoD motto of "Do more without more."[82]

[82] A phrase coined by Dr. Ashton Carter, Under Secretary of Defense for Acquisition, Technology and Logistics. Carter first used this term in June 2010 and made it his theme for "obtaining efficiency and productivity in defense." See Carter's Memorandum to acquisition professionals from September 14, 2010 his speech at the Cowen Investment Conference, February 9, 2011, as well as the recent Center for a New American Security keynote address, Feb 22, 2011, http://www.cnas.rsvp1.com/node/5871?mgh=http%3A%2F%2Fwww.cnas.org&mgf=1.

ROOT CAUSE 5: FAILURE TO FOCUS EXPERTISE

In the SAC era, experience and expertise were developed through years of technical training and practical and documented on-the-job training under experienced supervision. Commissioned officers and NCOs were instructed not to memorize anything; "we want you to use the book," learn how to find the right regulation, manual, or technical order, and then always "use the book." As one interviewee described, "A young officer had no ambition to become the squadron commander but he knew more about that B-52 than Orville did and he was the role model at the tactical level. He didn't pretend to be a great strategist, he didn't even want to be great strategist, but he knew what that [B-52] could do and he encouraged young guys who were coming up 'hey you can really learn how to do this stuff and let me show you.'"

However, the General McPeak flat organization method changed the strict guidance to a platitude: "Tell them what to do but not how to do it and they will surprise you with their innovation." In the nuclear weapons mission this loosely controlled culture was not well received. Given all the changes, officers and NCOs in nuclear units began to flounder due to lack of guidance, experience and training. Like new recruits, they no longer knew how to find the right regulation, manual or technical order. Their lack of knowledge and proficiency in their jobs hampered their own performance and in teaching those under their supervision.

Career broadening has been identified as a primary cause of the dilution of expertise in munitions and missile maintenance, officer nuclear maintenance, and logistics—the lack of which accounted for five of the six major mistakes made during the unauthorized movement of nuclear weapons. The initial decision to merger the career fields was not supported by many Air Force leaders. Major General Lew Curtis, San Antonio Air Logistics Center wrote a letter to Brigadier General Philip Metzler, Air Force Headquarters Director of Maintenance and Supply, on April 21, 1987 arguing that merging the career fields would produce only superficially qualified officers. He called the merger "dangerous."

Interviewees suggested there had been a marked change in how senior officers are leading their operations. Too many senior leaders appear to have little background, knowledge or preparation for the organizations they manage and lead, as reported in the investigations. The requirement for joint assignments in order to make flag officer rank, while broadening senior leaders' experience, further decreases their expertise. The perception exists that senior officers stay too busy to make informed decisions. This issue seemed related to the manpower, continual deployments and mission growth that perhaps drive senior leaders to depend on short bursts of condensed and highly filtered information, leading them to make poor decisions.

Nuclear Weapons are a "Sunset Business"

There were numerous unintended consequences of the Air Forces organizational changes, many of which were not visible to Air Force leadership until more than a decade later. One of the most significant was that it structurally changed how officer technical expertise was developed in both operations and logistics maintenance. Through reductions in the force, several officer career fields were merged as requirements for "generalists" rather than "specialists" increased.

The transition from SAC to ACC moved quickly; smart officers and NCOs were looking for ways to excel and they noticed which missions were rewarded and thus acted in their best career interests. The message to those in the nuclear field also was clear, as SAC personnel transitioned to the "TAC-like" ACC, senior leaders began encouraging career broadening. Especially in the munitions maintenance field, the message was constant and seemed accurate, "get to the flightline if you want to get promoted…don't get stuck behind the fence (in a weapons storage area) or in munitions." Critics characterized the Air Force reorganizations as making the entire Air Force a big fighter squadron. In flying units, it was common for commanders to be brought in to "get their command ticket punched" for promotion requirements, but not stay long enough to get qualified in the squadron's assigned aircraft.[83] This significantly reduced the commander's operational credibility with their pilots. In support officer career fields, some senior leaders encouraged officers to broaden into other Air Force Specialty Codes (AFSC) as they championed the "generalist" officer model.[84] General McPeak was quoted as saying there were only two officer AFSCs, "fighter pilots and shoe-clerks," and one of the reorganizations based on that philosophy was to realign the aircraft maintenance function under operations squadrons. This organizational structure discouraged "growing" or developing deeply expert maintenance officers.[85] Instead of a 20-yearmaintenance expert, maintenance officers began working directly for pilots who had little interest or expertise in maintenance.

The message to nuclear-capable Airmen was both subtle and direct. There were numerous instances following the September 11th attacks when troops at nuclear bases were told directly by Air Force and Joint Commanders that they were in a sunset business that would not provide career enhancement and most importantly, that they were not contributing to the fight that mattered. There also were more subtle messages. Given the day-to-day requirements of executing the missions in Iraq and Afghanistan, many interviewees told us that the nuclear mission was "placed on auto-pilot" by the Air Force. Personnel that deployed from nuclear units to the desert were often not backfilled while those who were left behind were encouraged to step up to the task as best they could. Many saw this manpower attrition as intentional to further reduce the significance of the nuclear mission.

Given the clear signals from leadership, many highly skilled NCOs and officers left the nuclear field. The elite of the USAF must have joint positions on their resume. Therefore, every effort is made to fill joint billets, often to the detriment of the nuclear career fields. Nuclear billets, including those in the Air Force Inspector General or the DTRA inspections team were at the bottom of the list and were certainly not career-enhancing.

Study participants cited the overall Air Force culture as a source of disruption in not only the nuclear mission but in many other Air Force mission areas. Careerism was a widely held concern. Participants expressed the belief that Airmen are being taught to focus on what is best

[83] C. Evans, *Growing Tomorrow's Leaders in Today's Environment.* [Maxwell AFB, AL: Air War College, Air University, 1998].
[84] M. Zettler, *Air Force Logisticians: Generalist or Specialist?* Industrial College of the Armed Forces (ICAF), Washington, DC: National Defense University.
[85] C. Webb, *Why a Ph.D. in Maintenance?* Maxwell Air Force Base, Al: Air War College, 2002.

for their personal career rather than what is best for the mission, the Air Force, or the nation as a whole.

Loss of Intellectual Capital

Reorganizations and budget cuts have reduced the number of personnel. As a result, there are fewer officers and enlisted personnel, and the smaller force is far less experienced in the organization as a whole, bringing the greater concepts of "nuclear expertise" and collective competency into question. Therefore commanders and supervisors are reluctant to de-certify incompetent officers or enlisted because there will be no one to replace them.

The manpower cuts that occurred across the Air Force have had a dramatic impact on many career fields, especially those smaller pools that generally required higher levels of expertise. The Air Force has recognized its decrease in qualified personnel, but as of yet has no solution to the problem. For now, personnel are being asked to accomplish jobs for which they often lack the requisite experience. Junior nuclear crew members are covering more of the tasks, which increases the risk of incidents. They are attempting to offset these deficiencies by constant inspections to review performance. This process of "buying down" the risk, leaders admit, does not set the airman up for success because they are not being provided with any method to "accelerate their experience" through additional education, training, mentoring or developmental assignments. Perhaps the main skill being learned is in how to pass an inspection.

As one interviewee explained, "people from the highest ranks down were 'making the system work' instead of demanding that it be fixed. Sometimes we try hard to be good team members and things happen." The Air Force has added "2300 new positions to the nuclear enterprise;" mostly at HAF, AFGSC and the Air Force Nuclear Weapons Center (AFNWC), all of which oversee the nuclear mission. Few positions were added to nuclear operations, even though severe personnel shortages were identified by the Schlesinger panel in 2008. According to the Phase I report, "B-52 and Minuteman ICBM forces are suffering from severe shortages of experienced personnel in key nuclear mission areas." The report continued,

- Nuclear squadrons and wings are significantly undermanned, especially in numbers of qualified maintenance personnel and missile wings' security forces.
- Maintenance manpower shortages at B-52 wings:
    - One wing commander said he was short 300 maintenance personnel; another was short 100.
    - One wing commander cannot generate all its aircraft due to maintenance crew shortages.
    - One wing only has 66 percent of its assigned crew chiefs; the wing is 130 personnel below its authorized manning level.[86]

[86] Schlesinger Report Phase 1, *op cit.*, p. C-1.

The merging of AFSCs and merging of major commands significantly reduced the Air Force overall nuclear force capability. Two participants noted that by merging AFSCs, the knowledge base has been diluted, with one function always dominating the other. However, another suggested that it was not the merging of AFSCs but rather assigning those merged AFSCs as interchangeable parts that resulted in officers being placed in positions/jobs for which they have little or no background, experience, or expertise. At the same time, it is clear that the merging of commands created unintended consequences, such as the dilution of ICBM expertise as missileers spent more time in space assignments. From either perspective, participants acknowledged that the significant reduction in specialization and moving toward generalist officers and NCOs is a major challenge to the Air Force's nuclear enterprise, which requires great specialization in order to achieve mission success.

Many will argue that the merger between space and missile career fields has been as detrimental to space as it has to missileers. The 2000 Congressionally mandated Space Commission reported that USAF senior leadership was unqualified to command vital space missions due to a lack of depth of expertise.[87] Specifically, the Space Commission found that "the Air Force treats space as a supporting capability that enhances the primary mission of the Air Force, which is to conduct offensive and defensive air operations."[88] The report also stated that the "current career path does a poor job of developing technical or operational depth within any of the four space mission areas.[89] Conversely, an officer trained mostly in space operations has a lot to learn in a short time if given a missile command or other missile assignment.

While it is an accepted fact that cumulative Air Force nuclear knowledge and experience pool has been drained, nuclear career fields are not being protected from personnel cuts through reductions in force or selective early retirement boards. Commanders are recognizing that they do not have the experienced personnel to fill all essential billets, but they are powerless to change that fact. In the past, major commands had more control over the upward mobility and promotion of officers. However, now the Air Force Personnel Center, acting with limited MAJCOM input, has the power to place individuals into billets. Requirements are often deployment-driven and thus, filling an empty billet "in the desert" trumps filling requirements at home, even if they support the nuclear mission. Many nuclear experts remain in the contractor world, but those with the greatest knowledge are likely to be out of the workforce in the next 5-10 years and their knowledge will be lost. Those that come behind them do not have the same depth in nuclear matters.

The Air Force personnel assignment system is perceived to be based on fairness and equity for individual career needs rather than on assigning the most qualified officer to support mission requirements. Interviewees stated that one of the main reasons there was a significant decline in nuclear expertise was that officers were intentionally assigned to other duties to

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[87] Rumsfeld, Donald H. *Report of the Commission to Assess United States National Security Space Management and Organization*, in accordance with the National Defense Authorization Act for Fiscal Year 2000 (P.L. 106-65), the commission submitted the report of the Commission to Assess United States Security Space Management and Organization. December 2000.

[88] Lt Col J. Kevin McLaughlin, "Military Space Culture," Space Commission Background Papers, Appendix to the *Report of the Commission to Assess United States National Security Space Management and Organization*, op cit, December 2000.

[89] *Ibid.*

develop breadth instead of depth of technical expertise. One of the long-term results of this assignment concept is that after several assignments, officers said they found themselves working for a commander who was not knowledgeable in the unit's mission area. The officers themselves might be in a career broadening assignment and not particularly knowledgeable with their subordinates in the same situation. This was the case at Minot in August 2007, where the munitions squadron commander had not been on a nuclear weapons base since he was a lieutenant and the group commander rotated all the company grade officers from job to job throughout the maintenance complex to broaden their experience. The result is there were no experienced officers in the weapons storage area.[90]

According to one of the senior leaders we interviewed, the Air Force has "adjusted the personnel system for the convenience of the personnel system." He added that some career fields were merged to avoid the "additional management challenge" of managing several smaller career fields. Another retired general officer had assisted in the creation of a Human Capital Management plan to address many of the nuclear personnel issues, but it languished at HAF for more than a year. There is a "lack of understanding of our own capabilities and expertise because the system is not set up to make sure the right people are in the right position."

Every Airman a Leader?

One of the personnel challenges is that every new recruit is told that he, too, one day can become the Air Force Chief of Staff. This is a bit of an exaggeration but there is an expectation, both by the individual and the organization that every Airman should strive to reach the highest position of which he is capable. This phenomenon is not new or original to the Air Force. Admiral Rickover chided the Navy over his perception of careerism in 1961. Admiral Rickover cynically declared, "We should at once knock off this infernal rotation of military people. The character of warfare has changed. It is becoming more and more scientific. The Navy seems to exist for officer career planning, to make certain that every naval officer has exactly the same chance to become the Chief of Naval Operations."[91] His point was that especially in the nuclear realm, experience is a requirement for technical proficiency. It is a point that may not be well understood or embraced in the Air Force today.

Air Force education and training requirements support the idea that all Airmen should strive to be leaders. The problem is that conceptually it diminishes the value of (or even punishes those who are) remaining in a single location or career and developing a depth of expertise. This is particularly true when promotion boards seem to reward a breadth of experience, rather than recognize that nuclear career fields have limited locations for personnel to develop their expertise and restricted opportunity to deploy overseas.

Interviewees told us that the personnel system is structured and operates in the same manner it did when the Air Force was comprised of over 600,000 personnel. It is not agile enough to manage today's requirements. Air Force Personnel refuses to treat any career specialization as a "boutique" that requires different execution from rest of the force. In

[90] Both the CDI and Admiral Donald investigations noted the absence of experience in the Weapons Storage Area.
[91] Rickover testimony before the House subcommittee on defense appropriations, June 1961 as quoted in *Time*, 30 June 1961. http://www.time.com/time/magazine/article/0,9171,895416,00.html#ixzz1FVo5Aj7O

addition, personnel tend to change positions every two years, which research proves, is not enough time to solidify expertise.

RECOMMENDATIONS

As one retired general officer interviewed stated, "It's not a complicated story; the issue is how to restore the culture of accountability for everything that has to happen for your mission to succeed." If this is true, the Air Force must be committed to valuing and sustaining its nuclear enterprise as long as nuclear weapons are part of the U.S. arsenal. In his report, Admiral Donald suggested the Air Force, "Re-examine the Chief of Staff Recommendation Matrix that resulted from the August 2007 Minot/Barksdale nuclear weapons transfer incident to gain a more thorough understanding of the underlying systemic issues, and revise the actions accordingly."[92] The study team agrees. We believe the foremost issue is declining technical competence (expertise) in the Air Force ranks. That expertise, along with leadership, management, and cultural factors, are central to the Air Force's ability to execute its nuclear mission. Thus, we offer recommendations in the four areas of expertise, management, leadership, and culture. There are no simple solutions to these complex problems. Instead, the Air Force will need to think through the problems to determine the best avenues to mitigate them. The first step is to acknowledge that the issues remain real and urgent.

Expertise

Put the Nuclear Mission Back into the Hands of the "Experts"

According to our interviewees, one of the results of downsizing the force is that nuclear experts currently are not in the most mission-essential billets. Instead, the best and the brightest are placed in jobs that are "great for their career but terrible decisions for the Air Force." Most significantly, they are unable to influence the culture of their specialty, leaving it to founder. One of the biggest problems noted by interviewees was the practice of allowing people to volunteer for jobs. They stated that it "sounds good" but should not be the basis for assignments. Instead, interviewees stressed the importance of "deliberate" assignments in order to guarantee that the right officer with the required expertise is assigned to critical nuclear weapons posts. Rotations must be determined by the mission and those who can fulfill it, rather than the current focus on what is best for an officer's individual career. One senior participant acknowledged that due to force reductions, leadership has been placed in a position where they must compromise on getting the right officers in place, but all participants agreed that the Air Force needs to determine which missions are the priority and not compromise on those.

This is not easy. Headquarters Air Force Manpower, Personnel and Services (A1) must keep in mind that their job is to fulfill the Air Force mission and not to keep people happy, as has been perceived in the past. This is especially true for the demanding requirements of the nuclear mission. As one interviewee stated, "what you owe [Airmen] is that you are faithful to them; giving them the opportunity to gain mission-essential knowledge they can pass to their subordinates. If you are faithful to that, the perception by the troops is that your institution is credible."

[92] Adm. Donald, *op cit.*, p. 54.

In the past, commanders handpicked their staff and MAJCOMS had more control over the upward mobility of officers. This model needs to be recreated. Specifically, Airmen must have faith in a system that values (that is, promotes) competent experts. The Air Force must determine how to foster nuclear expertise by managing single individuals and small numbers of people. Who are the best and the brightest in a given specialty? In which jobs are they needed? How do you foster the growth and development of more like them? Unless the Air Force moves to institutionally value and perhaps 'set aside' the skills and knowledge required for success in the nuclear enterprise, senior leaders must recognize that the nuclear mission may fail again, perhaps much more catastrophically.

We were told by study participants that AFGSC and A10 have been frustrated with the lack of change in A1's assignment processes. The "right" people must make the personnel decisions in order to grow expertise in the field, who will then grow to become competent leaders. One example told to us is the three ICBM wing commanders, the Hill AFB depot commander, and AFGSC leadership periodically meet to review personnel decisions and to try to steer the "right people in the right slot." It was not clear yet how much influence they have, but it is a move in the right direction.

Reestablish Operational Competence

The Air Force needs to think about how to grow specific competencies for its future officers; leadership cannot be the only metric. One interviewee put it succinctly, "In all Air Force careers except for pilots, the professional requirements for competency, skills, and attention to detail are sacrificed in favor of leadership. Yet the Air Force seems to understand and accept that to be a pilot, leadership skills are secondary to technical skill." It is this statement that codifies the fundamental issue. Expertise (technical competence), management, and leadership are not the same things. The nuclear enterprise requires all three and even profound leadership skills cannot serve as a substitute for an absence of the other two. Expertise, acquired initially through knowledge but matured through experience, is the most essential tool leading to effective management of a complex organization.

During the SAC era there was a concerted effort to grow nuclear weapons knowledge through experience. Educational advancement through fellowships at U.S. nuclear laboratories and degrees from educational institutions such as Massachusetts Institute of Technology and the University of California, Berkeley, was encouraged. Through this effort, Airmen were able to gain hands-on experience with the weapon and the design process. It is this type of knowledge that is required today of Air Force leaders.

That is not to say that every wing commander need be a nuclear physicist. Rather, it is recommended that the Air Force provide and encourage an educational and experiential path that leads to technical competence for Airmen who will then become better nuclear commanders in the years ahead. The ability to place those with high levels of knowledge and experience in each of the relevant wings will increase the overall knowledge level, and thus capability, of the units.

As earlier stated, during a 2001 survey military, "end users" of the Air Force nuclear staff were satisfied with the force's skills and knowledge level.[93] The end users, as well as the nuclear-focused Directorate of Nuclear and Counterproliferation (XON, now A5XP) were able to guide essential nuclear personnel to the billets where their knowledge and expertise was required. Additionally, early in the decade the office had encouraged the growth of nuclear expertise through fellowships and providing the proper experience.[94] However, as the deployment requirements for war increased, those decisions were no longer under the control of those that understood what the requirements were.

Headquarters Air Force Manpower, Personnel and Services has the responsibility to fulfill deployment requirements, and those took precedence over all other needs. Even fellowship slots were allotted based on the views of A1, not of end users, which meant the best and the brightest went to the Iraq or Afghanistan wars where their nuclear skills were not utilized, a move that further diluted the expertise pool. Several end users interviewed were concerned over the lack of nuclear contenders for the billets they currently had empty, or would have open over the next 16 months, and they have no power to address the shortage.

Nuclear career fields continue to face personnel cuts, with little or no reference to the requirements to fulfill the mission. At best, end users are trying to assure those in the nuclear career fields are not disadvantaged during force reductions, as they have been in the past. Still, A1 has yet to adopt the perspective of the end users. The view, according to interviewees, is that "one offs" threaten the system that supports the 332,000-man force. However, to succeed, the nuclear mission needs to be seen as not just "viable," but "special."

Incentivize Change and Ensure Retention

Many interviewees suggested that Airmen need added rewards for doing the necessary nuclear jobs at home, just as those in battle abroad are rewarded, in order to sustain their morale and retention. While it is unlikely the Air Force will reinstate special monetary incentives to draw personnel into nuclear positions, AFGSC has reinstituted competition for promotion to leadership positions, which it believes is necessary to promote excellence. In addition, it has programs to support nuclear officer education both in and outside of the Air Force, including educational fellowships at the National Defense University and the Los Alamos and Oak Ridge National Laboratories, among others.

Just as leadership should not be the only metric for career advancement, neither can conventional deployments be a measurement for nuclear readiness. In fact the two are diametrically opposed. However, promotions, and selection for leadership positions seem to reward those who deploy. Equivalent "deployment" credit should be given to the Airmen who maintain the nuclear deterrent. This will allow nuclear units to maintain a level of competence

[93] Thomas Neary, *op cit.*

[94] According to BGen. Robert L. Smolen, the Nuclear Technology Fellowship Program, a 21-month Air Force program at Sandia National Laboratory, gave younger officers a "fairly significant amount of nuclear experience working with some of the gray beards ... the fathers of the nuclear business in the U.S. ... those who have done underground testing." Geoff S. Fein, "U.S. Needs to Preserve Nuclear Expertise," *National Defense Magazine*, August 2003.

that sustains their contribution to national security while ensuring equal opportunities for advancement across the Air Force.

Leadership

General LeMay understood leadership. He knew that a good leader required technical competence in his craft. Without competence, a leader could not have the respect of his subordinates nor would he be able to extract superior results from those under his command. In Table 1 below there are three variations of the traits expected of a leader. There has been a change in leadership traits. Technical competence has decreased in importance over the years.

Principles for General LeMay's Leadership Success[95]	**Air Force Pamphlet 35-49, 1985, p. 5**	**Air Force Leadership Development Model, 2004**
• Thoroughly mastering his craft • Leading by example • Providing accountability • Identifying and producing subordinate leaders • Communicating with his people • Encouraging teamwork • Responsibility.	Former Chairman of the Joint Chiefs of Staff General Maxwell D. Taylor stated, "One expects a military leader to demonstrate in his daily performance a thorough **knowledge of his own job** and further an **ability to train his subordinates** in their duties and thereafter to supervise and evaluate their work."	Leadership competencies are: Personal – **Exercise sound judgment**, adapt & perform under pressure, Inspire trust, lead courageously, assess self & foster effective communication Leading people/teams – drive performance through shared vision, values & accountability, **influence through win-win solutions**, mentor & coach for growth & success, promote collaboration & teamwork, partner to maximize results.

Table 1. Comparison of Air Force Leadership Traits

The 2006 version of AFDD 1-1 adds that leadership qualities can be innate; however, they are built upon a solid foundation of "experience, education, and training" and improved with "deliberate development."[96] The Air Force has placed a premium on leadership qualities. However, what this study shows is leaders require technical competence gained through experience in order to have credibility to lead an organization.

[95] Tillman, p. 187-88, 191.
[96] *Op cit.*, p. vi.

Reinstitute Core Principles: Communication and Responsibility

Many current senior Air Force leaders interviewed were cynical about the nuclear mission, its future, and its true (versus publicly stated) priority to the Air Force. As long as the Air Force has a nuclear mission, the service needs to focus on developing and inspiring its leaders to advocate for the mission's fulfillment. Study participants made it clear that commanders must listen to those around them, even if they are being told things they do not want to hear. One interviewee pointed out that communication between squadron and group commanders is minimal because the former does not want to give bad news and the latter does not want to receive it. These filters continue to the highest ranks of the Air Force, which receive false or distorted information about the reality on the ground. The misinformation allows small problems to fester into larger issues. Bad news, as the saying goes, seldom ages well.

Former CSAF General Fogleman explained the importance of communication to leadership skills, "Good leaders are people who have a passion to succeed…To become successful leaders, we must first learn that no matter how good the technology or how shiny the equipment, people-to-people relations get things done." In the case of nuclear weapons it may be the "dull sheen" of communication skills that requires additional emphasis.

Nuclear leadership requires continuous responsibility and accountability – factors that had been lacking in the Air Force nuclear enterprise up to the time of the unauthorized movement of nuclear weapons and mistaken shipment of classified forward sections. In the Navy, a 4-star admiral with 8-year tenure, who reports directly to the Chief of Naval Operations, oversees the nuclear mission. The mission is his responsibility and he is held accountable for its success. The Air Force should consider implementing similar tour lengths for senior leaders in the nuclear enterprise, rather than moving individuals every year or two.

Motivate Managers to Be Leaders

Three of the investigations found that the Minot munitions maintenance squadron commander and the maintenance operations officer were *disengaged* from the squadron's nuclear weapons management. Such lack of involvement could have resulted from the officers viewing their roles as "leadership" exclusive of the requirement to actively manage nuclear weapons maintenance. Air Force commanders must to be taught the principles of leadership and management; then held accountable for both. Officers must be capable of inspiring their subordinates, stimulating a team environment and earning trust through personal accountability. They also must be capable managers which require an in-depth understanding of the task and a level of expertise that is not currently widely available. It would help if time in nuclear jobs was extended by a year or more beyond traditional Air Force rotations. This would allow for less time spent in the "on-the-job-training" and transition modes and the nuclear enterprise would likely be better as a result.

The events of the unauthorized movement of nuclear weapons and mistaken shipment of classified forward sections are management failures, wherein the Air Force failed to properly manage the nuclear mission. However, it was also a failure of leadership at all levels. At the most senior levels, the U.S. government has failed to communicate the importance of nuclear stewardship and its importance to national security, even while we were fighting conventional

wars and preventing terrorism. DoD failed to maintain its own expertise and did not adequately foster a culture of expertise and compliance within the Air Force. In turn, the Air Force failed to inform Airmen why the nuclear deterrence mission was still important, not simply for those directly involved in the nuclear enterprise, but more importantly, in the conventional and dual-tasked forces.

In several of the studies, ours included, we were reminded of the chain of command and how it affects the mission. The clearest explanation for this concept is an anecdote that in various forms was repeated to us many times during interviews. When General Larry D. Welch led the Defense Science Board investigation, the group visited several Navy and Air Force installations. While on a nuclear capable submarine, General Welch asked a sailor if the President was aware of what he did. The sailor responded, "No Sir!" General Welch followed up by asking, "If the President does not know what you do, how do you know what you do is important?" In reply the sailor said, "Because my skipper does, sir." The same is true in every wing, squadron and base across the Air Force. Enlisted and junior officers care about what concerns their immediate supervisors. They know their jobs are reliant on what their commanders think. This study found that most dual-tasked Air Force officers do not understand or do not place value in the nuclear mission. This must change.

Require Responsibility at the Highest Levels

One of the most contentious decisions in structuring the nuclear enterprise was deciding the appropriate grade of the AFGSC commander. As recently as July 2010 the Chief of Staff named the nuclear mission as his top priority. However, when it came to organizational structure, the Air Force chose to stand up the new command with a three-star commander. With the exception of the unity of command question, this was the most contentious decision among those we interviewed. The decision was viewed by many as proof that the Air Force is not serious about the nuclear mission, and that the service will, at some point, fold the nuclear mission back under another command.

Those currently in senior leadership positions state that the SECAF and CSAF are focused on the nuclear mission and engaged in its progress, as are the commanders of AFGSC and USSTRATCOM. All the interviewees currently holding senior leadership positions spoke of the high level of personal interaction and respect among the leadership team. However, the question remains: What will happen two CSAFs from now when all of the current personnel are out of the Air Force? Is it possible to create such institutional focus that will sustain the high level of commitment? With the current move by Defense Secretary Gates to reduce the number of general officers, it is unlikely the Air Force will acquire another 4-star billet. In fact it is far more likely there will be fewer four stars. For the Air Force nuclear enterprise, this is likely to be an advantage if the other MAJCOMs are downgraded to three stars. However, regardless of the numbers, the Air Force must change the way it does business. Four-star generals are in a club all their own, making decisions as a group on promotions, requirements and even force structure. This club needs to open its members to three stars, specifically major command commanders to truly make decisions that affect the Air Force today and long into the future.

Most importantly for AFGSC is the challenge of any new organization. Its charter must be recognized and accepted by the rest of the Air Force community. Simply stated, not only the

CSAF and SECAF, but also the conventional Air Force must accept and support AFGSC and its vital nuclear mission.

When we asked workshop participants their views on Air Force leadership development one participant answered, "We have created a generation of officers who did not learn how to be leaders." The question remains, have recent mission changes outstripped the Air Force's attention to Doctrine, Organization, Training, Materiel, Leadership, & Personnel in the development of its leaders? This study did not definitively answer this question, but it is one that the USAF leadership needs to consider.

Management

While the newly established Nuclear Oversight Board, led by the SECAF and CSAF, was founded on a quarterly schedule, the fact it has met 18 times in 12 months highlights two things. The first is that the executive leadership of the Air Force is very interested in how the mission is being executed and will continue their close scrutiny of the process. However, it also sends the message that the senior leaders do not yet trust their subordinates to accomplish the tasks at hand. As AFGSC and A10 move into their third year, Air Force leaders will need to move stewardship into the hands of subordinates with their full understanding of responsibility, accountability and authority. One of the most significant problems with this concept is that it remains unclear who "owns" which issues. While A10 was formed to shepherd the nuclear mission, it does not have clear authority over some of the most significant aspects of the problem, namely personnel and manpower issues. Until there are clear lines of authority, Air Force senior leaders will continue to attend regular meetings in the Pentagon without a means to resolve the primary issues facing the nuclear enterprise: how to "fix" the lack of expertise.

<u>Enable Nuclear Staff to Learn From Past and Focus on the Future</u>

Numerous participants stated that most officers currently in nuclear essential billets have not yet read the investigation reports due to a variety of reasons. The reasons may include that the Admiral Donald report has very limited access and all the reports have classified sections. It is understandable that the Air Force does not want to rehash its mistakes publicly, but in order to effectively manage commanders need to truly understand what happened in the past and how current policies and procedures are trying to address the failures. How can commanders learn and not continue to repeat mistakes? Currently they are being asked to learn from the past by intuition, not study and the warning is: "don't make history." This needs to change.

Airmen must be required to follow checklists and procedures rigorously without deviation until changes are approved by the respective headquarters. However, senior officers must still be open to innovative suggestions and change procedures that can be improved. Subordinates should not be discouraged from offering innovative ideas for change. Airmen at Minot were trying to improve their ability to execute the mission under difficult circumstances. While this led to failure, other innovations such as the scheduling system that had been instituted at Barksdale AFB were successful. Neither Minot nor Barksdale shared their experiences. AFGSC should initiate a process to allow innovative ideas to be shared with others, vetted by experienced commanders and approved by the chain of command. New ideas should be carefully

processed and not instituted until vetted. Finally, AFGSC should ensure that the best ideas are operationalized, no small task for a substantial bureaucracy.

Since we have delineated between management and leadership, we must also realize that both concepts must be supported and fostered. Field grade commanders need to be encouraged and trained to recognize problems, and then taught to manage them through their team's personal skills and experience. One possibility that was raised was that of outside help.

The AFNWC currently has a team that supports units that are struggling either due to manpower or experience shortages. Nuclear units need broader options for asking for and getting assistance without being punished. Outside teams can take advantage of contractor, retired or other government expertise in a teaching environment. A fresh set of eyes assessing without judgment can do wonders for team building and learning. However, such an approach needs to be seen as not as putting yourself or your team on report, but as being a proactive leader and asking for help before a problem exists.

Reinstitute Unity of Command

One of the biggest disagreements with the choices Air Force leaders made was the division of command between AFGSC and AFNWC under the Air Force Materiel Command (AFMC). Air Force Doctrine Document 1 states that:

> Unity of command ensures concentration of effort for every objective under one responsible commander. This principle emphasizes that all efforts should be directed and coordinated toward a common objective. Air and space power's operational-level perspective calls for unity of command to gain the most effective and efficient application. Coordination may be achieved by cooperation; it is, however, best achieved by vesting a single commander with the authority to direct all force employment in pursuit of a common objective.[97]

Study participants viewed the split as a violation of the age old "principle of unity of command" represented by placing the command and control of nuclear forces under AFGSC and the maintenance, storage, sustainment and custody of the nuclear weapons under the commander of AFMC. The concept of unity of command is a hallmark U. S. military principle of war. We were told by interviewees involved in the process that a group of approximately 10 general officers with the relevant leadership roles met to discuss how the nuclear enterprise would be organized. All, according to our interviewees, agreed that command and control of nuclear weapons should not be split between two commands. However, when CSAF General Schwartz briefed the new structure to the Corona meeting in the fall of 2008, many were surprised to discover that their decision had been reversed by the CSAF.[98]

Why then, was this founding Air Force principle of unity of command rejected? When AFMC was established by General McPeak in 2002, its goal was to "provide seamless life-cycle management for our equipment." The idea was to have that cradle to grave sustainment, the

[97] www.au.af.mil/au/awc/awcgate/afdc/afdd1-chap3.pdf
[98] This statement was corroborated by three of the meeting's participants.

result, however, in this case is to take control out of local commander's hands. According to interviewees the Air Force made the decision to allow AFMC to have this role as it seemed to follow the Navy Strategic Systems Programs model by leaving the maintenance and sustainment of the weapons in the acquisition chain to provide end–to-end stewardship of the weapon. However, the Air Force model does not take into account the lack of command and control by the commander on whose base the nuclear weapons storage areas lay. He will be held accountable, yet, officially what happens inside the facility is not his responsibility.

Only one interviewee for this study defended the decision to separate the responsibilities. In that discussion we learned that although AFMC does not allow AFNWC to communicate directly with AFGSC, it has taken ownership of the weapon and therefore is more adept at meeting milestones that are the organization's own requirements. That said, most of our participants said they expect the Air Force nuclear enterprise to fail again and thought it would most likely be related to the "broken chain of responsibility" for nuclear weapons between AFMC and AFGSC.

Many of the investigations cited that an "end-to-end nuclear sustainment enterprise does not exist" within the Air Force. Given the current split of unity of command, many argue that this division still exists. Virtually everyone we interviewed strongly suggested that the Air Force reexamine the decision, which prevents direct communication between the maintainers/sustainers (AFNWC) and the end users (AFGSC). While no one wants to interrupt a process that seems to be working, the question still stands: In the end, who will be accountable?"

The Air Force needs to determine whether the existing unity of command split is maintainable. Is there a point in the near future where transition from AFNWC to AFGSC is feasible? One interviewee suggested that the AFNWC director be dual-hatted as the Vice Commander of AFGSC with a dotted line to AFMC. One interviewee stated, "…at least we know where the seam is and we watch it closely." Whatever the answer, innovative solutions need to be considered.

Make Change Work

Over the last two decades people from the highest ranks down were "making the system work" despite its flaws, instead of demanding that it be fixed. Sometimes individuals tried too hard to be good team members rather than speaking out for change. That said, holding officers "accountable" for mistakes will not alone solve the enterprise problems. Structural problems need to be corrected.

AFGSC has rewritten 195 Air Force documents on nuclear procedures and processes in one year. The changes were meant to update the documents for relevance. However, AFGSC will now stand up an AFSO 21 office to look at all aspects of the nuclear enterprise, including efficiencies within the updated regulations. The Air Force should proceed with caution. Part of the reason for the devolution of the nuclear mission was the alteration of guidance. While some instructions and regulations were seemingly randomly changed for brevity, others that were in need of review were not altered for years. Now that AFGSC has had the opportunity to examine the regulations, it should move forward with highly experienced veterans to understand requirements and avoid another unauthorized movement of nuclear weapons.

The Air Force must determine: "How do we measure success?" Success can be measured by the inspection results, a lack of incidents, the number of "green" items on a PowerPoint slide, or even by the number of boxes checked in a database. Progress against the roadmap can be audited, but what cannot be seen are the root causes identified in this study, some of which are beyond the control of the Air Force. Nonetheless, the Air Force needs to place the highest priority on the personnel and expertise issues and attempt to mitigate those factors beyond its purview.

Culture

Few of the Airmen interviewed, who experienced the transition to SAC's successor organizations, agreed with the handling of the nuclear forces by the generation of fighter pilots who ascended to lead the USAF and decimated the SAC's "culture of perfection." SAC was far from perfect. Indeed, there are many documented mishaps during its almost 50 year history, particularly in early years; however, SAC provided the organizational basis for a culture of responsibility and accountability. It is this culture the Air Force would like to rebuild, but without the monolithic structure. Instead, the Air Force believes that it can re-create the "good" aspects of the organization while leaving behind those that don't fit today's threat environment. The question is, however, can a SAC-like culture of accountability be re-generated, nurtured and maintained in today's conventional deployment-focused Air Force?

AFGSC stood up in thirteen months with a workforce of 800. The speed at which tasks were accomplished required a significant amount of attention. However, standing up large organizations quickly focuses attention on funding and billets. In the view of interviewees, these changes have all happened at the strategic level when the investigations and the Air Force agreed that the primary problems were at the squadron level and lower. Standing up the additional headquarters staff, according to interviewees, has actually damaged operational units by taking the most qualified officers and Senior NCOs away from the units. Since the command is new, there are no mentors, no predecessors, no grey beards from which to learn. Through AFGSC's stated values - individual responsibility, adherence to procedures, pride in your work, respect and safety – the organization is trying to reestablish responsibility and accountability. What is unclear in this nascent organization is what culture will be established over time and whether AFGSC will be capable of spreading that culture beyond the headquarters at Barksdale AFB.

The early years of SAC provide yet another example of an Air Force case relevant to today's challenges. In its heyday under General Curtis LeMay, SAC was the best operation in the Air Force. However, this was not how SAC began; initially SAC was ill-prepared for war under its first commander, General George C. Kenney, as Major General Mike Worden describes in *Rise of the Fighter Generals*. In 1946-47 SAC was "purged" of non-flying officers and aircrews were forced "to absorb those non-flying duties, as well as to cross-train into other crew duties, often before they were adequately trained in their primary duty."[99] Following the end of World War II, the newly minted organization was downsizing, much as the Air Force did at the end of the Cold War.

[99] Col Mike Worden, USAF, *Rise of the Fighter Generals,* [Air University Press: Maxwell AFB, AL, 1998] pg. 56.

The goal then was to do more with less and increase efficiencies. Support staff and organizations were consolidated at the headquarters further increasing demands on crews. After learning that only two of SAC's 11 groups were combat ready in 1947, the CSAF asked Charles Lindbergh to investigate. Lindbergh reported that standards for professionalism were low, that there was "low morale, low proficiency, personnel disruptions, and command training policies that 'seriously interfered with training in the primary mission of the atomic squadrons."[100]

If the names and dates were removed one might think that Lindbergh's report could have followed the unauthorized movement of nuclear weapons and mistaken shipment of classified forward sections. The same problems are cited, and to some extent the same solutions have been proffered. Even under the command of General Curtis LeMay, SAC had serious mishaps and organizational problems. However, the underlying difference between then and the post-SAC era was the role that Air Force culture played. Pride and loyalty were encouraged, as were being accountable and responsible. No one questioned the importance or even relevance of the mission. The question is, can the Air Force rebuild the culture of accountability and excellence in today's environment?

Reestablish the Culture of Excellence

The Air Force must analyze the culture that is being developed and shaped by the current environment and determine what must be changed through the organizational development process. There may need to be changes above those required in AFGSC. Respect for the nuclear mission, a stated value of AFGSC, must be developed across the board in the Air Force, and not just today. Those in the nuclear field are hearing leaders verbally support the nuclear mission; however, outside the direct line of command there is still significant grousing about "much ado about nothing." This lack of understanding of nuclear deterrence, a core Air Force mission, is at the heart of the problem. The Air Force needs to educate personnel at all levels in order to influence the attitudes and actions of personnel. Additionally, the Air Force must make the most of the opportunity to influence how nuclear weapons are viewed at the national levels. For years, fighter pilots pushed the F-22 through virtually every discussion Air Force leaders had with Congress or DoD personnel. They should adopt the same stance with nuclear weapons. Congressional delegations like to travel to interesting places – including missile and bomber wing bases. These trips provide the Air Force the opportunity to show members of Congress and their staffs not only how the weapons operate, but also explain their role in national security.

In any organization–particularly in the military—the "why" is important. Understanding the "what" is easy, but the "why" can be a greater challenge. At SAC, as one participant explained, "the sign outside the main gate said, 'Peace is our profession' and every kid on that base from kindergarten up to the wing commander understood what that meant." Today in the era of ever declining budgets and pressing conventional requirements, Air Force leaders need to understand and explain "why" the nuclear mission remains core to the Air Force. Several interviewees admitted that few Air Force leaders can articulate strategic deterrence policy of the U.S. The Air Force needs to reclaim the issue and elevate deterrence back to a core mission in the eyes of the force.

[100] *Ibid*, pg. 56.

Explain Why the Mission is Vital

In order to accomplish this recommendation, information has to flow downward. Over the last two years Air Force senior leadership has maintained a level of direct participation and interest not previously demonstrated since the late 1980's. As one interviewee stated, they are focused on the "ministry of presence" which goes a long way in proving they believe in what the CSAF calls the Air Force's "number one priority."[101]

Both the SECAF and CSAF have made a concerted effort to show a level of continued interest not seen since the end of SAC and foster the concept of an engaged leadership. At the 2010 change of command for the 20th Air Force at F.E. Warren AFB, the CSAF and the commanders of USSTRATCOM and AFGSC were all in attendance. It is this level of continued support that will help shape the culture surrounding the nuclear mission. What has not changed is the vision and understanding of the value of the nuclear mission by the conventional Air Force.

One general officer we interviewed said, "We still need to educate our people on this mission and its criticality to the nation – we are STILL not there yet." Several interviewees questioned whether the Air Force is currently creating the notion that the nuclear mission is vital, or simply a required task that must be accomplished correctly to avoid the embarrassment and penalties of a similar incident. They explained the Air Force should focus on leadership and in detailing the value of the mission, not simply "Nuclear 101." Anyone can become a better leader with proper instruction and practice. However, effective management and command requires skills, knowledge and experience. Both enlisted and officer need to be taught how to make sure mission areas are not neglected just because they are not central to today's fight or they won't be inspected next week.

There are numerous examples of drastic cultural changes that have succeeded. Within the military, the Navy's decision to deploy women on ships and now submarines is worth exploration. It has not been an easy transition for many, but it has happened successfully. It is an interesting question why the Navy never suffered from the nuclear cultural struggles that plagued the Air Force. As discussed earlier, some argue that nuclear propulsion guaranteed that the Navy would have a nuclear component for the foreseeable future, regardless of the status of weapons. However, according to interviewees, the Navy as a whole never looked down upon the nuclear mission or those within their ranks that executed it.

Inform Up; Educate Down

Defense Secretary Gates has made a concerted effort to visit the nuclear forces and reaffirm their vital role in U.S. national security. However, the legislative branch and the Obama Administration are virtually silent on the issue, as was the Bush Administration. During a two-year follow up hearing on the USAF nuclear enterprise at the House Armed Services Strategic Forces Subcommittee, few substantive questions were asked of the Air Force. Several bases had recently failed their surety inspections, but not a single question was raised about the issue.

[101] Gen. Norton A. Schwartz, Chief of Staff, USAF, "Chief of Staff's Vector: The Way Ahead," July 4, 2010. http://www.af.mil/information/viewpoints/csaf.asp?id=603

The President has been focused on ridding the world of nuclear weapons, while stating that as long as the United States possesses weapons we want them to remain safe, secure and effective. The phrase "effective weapons" denotes not only a warhead that is capable, but also corresponding delivery systems and a military force that is capable of execution, as described in the 2010 Nuclear Posture Review. This concept needs to be institutionalized and supported with policy and resources. Clarity of mission is a requirement and would go a long way in buttressing the Air Force's efforts to re-establish a culture capable of executing the mission.

CONCLUSION

The study team was tasked with identifying how the Air Force can "re-establish an environment that will revive Air Force nuclear operations standards and culture in the mid-term to long-term, beyond what has been or is being done…" To a great degree the study found that Air Force senior leadership understands the problems it faces. The Air Force has gone to great lengths to address the management and oversight of nuclear weapons, but the efforts in leadership and expertise have been underwhelming. Additionally, the problems have not been prioritized, yet efforts are underway to fix the problems writ large. It is essential that Air Force leadership understands that expertise continues to decline and that if this key area is left unaddressed all of the other substantive efforts will be undone. Addressing the expertise issue requires senior leadership to take significant action that includes spreading the vision and a willingness to drive the discussion up to OSD and Capitol Hill and down to the youngest enlisted Airmen.

According to General LeMay a successful organization requires three characteristics:

- People need to believe in their work; a product of inspirational leadership and self motivation.
- People need to see visible progress toward the organization's stated goal, no matter how incremental the improvement.
- People need recognition and appreciation for their contributions toward the goal.[102]

It is these three concepts which the future of the Air Force nuclear enterprise must aspire to attain. Personnel in the nuclear enterprise should not be simply "told" that their work is valued, as billets go unfilled, resources continue to wane, and their supervisors continue to focus on deployments in conventional wars. This study found that resoundingly, Air Force nuclear personnel believed in their work, but they need inspiration to focus their efforts and improve their capabilities. They need advanced training, deliberate placement, leadership, and competent management.

According to the 2010 National Security Strategy (NSS), one of our top national security priorities is "reducing our nuclear arsenal and reliance on nuclear weapons, while ensuring the reliability and effectiveness of our deterrent." At the same time, the NSS tasks the military to "maintain its conventional superiority and, as long as nuclear weapons exist, our nuclear deterrent capability, while continuing to enhance its capacity to defeat asymmetric threats, preserve access to the global commons, and strengthen partners." That seems like a tall order for a military that does not appear to believe in the necessity of the nuclear deterrent or hold it in esteem.

[102] Tillman, p. 102, quoting Maj. TJ Crowley, *Curtis E. LeMay: The Enduring Big Bomber Man*, [U.S. Marine Corp Command and Staff College, Quantico, VA: 1986].

The nuclear mission requires a culture of compliance and dedicated focus by the Air Force, even as nuclear weapons numbers continue to be reduced. The two things are not in opposition. One interviewee described the atmosphere in the Reagan years as schizophrenic. While some high-level Administration officials had moral issues about the dramatic build up of weapons, they were able to deal with those issues at the personal level while maintaining their full professional commitment to implementation of Reagan's nuclear strategy. In looking to the future, the Air Force must adopt the same approach. While it is clear that the U.S. Government is drawing down its nuclear capabilities, we must be able to execute the mission. In order to have that capability, leadership must reinforce the understanding that regardless of the number, working with nuclear weapons is a tremendous responsibility, and requires special leadership, management, and accountability at the personal, unit, and national level.

Since 2008, the Air Force has conducted numerous investigations, established new organizations, and re-structured nuclear forces. However, without a root cause analysis of the systemic problems, much of what the Air Force has accomplished has been movement without direction or focus. The questions surrounding expertise - how to recognize it, to grow it, maintain it, and value it - have not been addressed. Without answers to these fundamental questions, the Air Force nuclear enterprise remains on the same trajectory as it has been for the last two decades –in ever-increasing decline—which places the capability of the Air Force to sustain its nuclear capability at risk.

APPENDIX A

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APPENDIX B

INTERVIEW STATISTICS

Overall Interview Statistics	
Air Force	72
Navy	4
DoD	22
DoE	6
Congress	11
Department of State	3
Exec Level (SES or Above)	12
Total	107*

Air Force Interview Statistics	
SecAF	1
CSAF	4
General officer	28
Colonel	29
Field grade officer	5
Enlisted	10
Total	**72**

***The numbers add up to more than 107 individuals because some participants counted in more than one category (e.g. retired Navy officer who is a congressional staffer)**

APPENDIX C

INVESTIGATIONS RESULTING FROM THE NUCLEAR INCIDENTS

1. Air Combat Command, *Commander Directed Report of Investigation,* September 2007

The Commander of Air Combat conducted an investigation on August 31, 2007, immediately following the unauthorized movement of nuclear weapons, in order to precisely determine how events transpired and to identify personnel who should be held legally accountable. The CDI report was completed by September 2007. The investigation found the following:

The weapons were stored in a weapons storage area at Minot Air Force Base under the management of the 5th Munitions Maintenance Squadron, commanded by a lieutenant colonel. The squadron had a total of five authorized munitions and missile maintenance officers, four of whom were in management positions subordinate to the squadron commander. The operations officer was a major; the remaining officers were lieutenants and a captain. The senior captain served as the weapons maintenance flight commander. Subordinate to the maintenance operations officer, one of the lieutenants was serving as the Munitions Accountable Systems Officer. The flight commanders (lieutenants) were each responsible for 20 to 30 enlisted maintenance personnel. The weapons maintenance flight commander was responsible for managing the weapons storage area and oversaw the maintenance, storage, and handling of the nuclear cruise missiles.

The unwritten nuclear weapons storage policy of the 5th Munitions Maintenance Squadron allowed co-mingling of nuclear and nonnuclear missiles in the same storage structure. A trailer loaded with six nuclear warhead cruise missiles was stored side by side with an identical trailer loaded with six inert warhead cruise missiles. A fairing covered the warheads, so the only way to differentiate a missile with an inert warhead from a missile with a nuclear warhead was to climb up on the trailer and visually inspect each missile through an observation window the size of a U.S. quarter for a unique marking.

The storage management system used to differentiate nuclear from nonnuclear missiles consisted simply of a piece of paper identifying the trailer as "prepared for logistics tactical ferry." The 8.5x11 inch placard was affixed to the trailer by tape, which subsequently fell off, removing any visible difference between the missiles with inert warheads and those with nuclear warheads. The tow team of weapons handlers was required to verify each missile-safe status by looking through the quarter-size observation window in the missiles' fairings, but the team members did not complete this verification, because the procedure was thought to be "too time consuming."

Most weapons storage area handling, storage, and flightline delivery tasks are performed by 2W0 conventional munitions technicians. The 2W2 weapons maintenance technicans are trained to perform weapons maintenance that requires extensive nuclear weapons knowledge. The 2W2 job was considered a higher status position than the conventional munitions job. The

2W2s assigned to the breakout trailers from storage structures to perform tow team duties, transferring the trailers of missiles out to the flightline, might have considered this to be an unimportant and time-consuming task compared to performing actual nuclear weapons maintenance operations.

In addition, the investigation found that the training and exercise program at Minot had been changed. Those involved considered exercises as merely "going through the motions." Often significant players were "exempted" from participation to avoid overtaxing essential personnel. This training modification varied from the regimen at Barksdale and had been approved by ACC.

In summary, the CDI report found that a series of mistakes occurred. First, due to a poorly coordinated scheduling change, munitions control gave the weapon handlers/tow crew an incorrect trailer number, and the trailer had not been prepared for "logistics tactical ferry."

Second, the weapons handlers/tow crew selected the wrong missiles from storage because of scheduling, storage and mislabeling errors. They also did not check the missile-safe status through the visual access window as written directives required.

Third, the aircraft crew chief signed for the two trailers of missiles without checking their serial numbers or the missile-safe status. There was no written guidance for the custody transfer of missiles without nuclear warheads, and that is what the crew chief expected, inert warheads.

Fourth, the weapons load team loaded the pylons/missiles onto the B-52 aircraft without checking the serial numbers or missile safe status verification because their checklist did not require such a check. This was a staff officer policy-procedure writing mistake, as this verification had previously been required in the loading checklist. This missile safe status check requirement had been removed at some point, for reasons unknown.

Finally, the radar navigator failed to check each missile's status as required by the checklist.

What the CDI does not conclude is that with the exception of the radar navigator's failure to perform the required missile-safe status verifications, all of the mistakes made during the unauthorized movement of nuclear weapons were the management responsibility of a single officer AFSC, the 21M munitions and missile maintenance officer. However, this officer career field was not examined during any of the investigations as a potential root cause. A quote from the CDI report was particularly revealing: "The catalyst for the failures began in the scheduling process. It further broke down because the supervisors, predominantly the non-commissioned officers and the senior non-commissioned officers, did not do their jobs."

In the same report, CDI investigators described the officers as dependent on the non-commissioned officers for information on work performed by the squadron. For example, "The squadron commander, operations officer, and the superintendent were not given the correct information." This statement implies that, since the enlisted personnel did not provide the correct mission-related information to the officers, the officers could not take the initiative to obtain the required mission-related information or to provide mission oversight, which is a management responsibility.

2. Headquarters U.S. Air Force, *Air Force Blue Ribbon Review Of Nuclear Weapons Policies and Procedures,* February 2008

On 9 October 2007, the Chief of Staff of the Air Force (CSAF) appointed Major General Polly Peyer to chair an Air Force Blue Ribbon Review (BRR) of nuclear weapons policies and procedures. The CSAF tasked the review to take an enterprise-wide look at United States Air Force nuclear responsibilities. Specifically, the CSAF highlighted a need to examine: organizational structure; command authorities and responsibilities; personnel and assignment policies; and education and training associated with the operation, maintenance, storage, handling, transportation, and security of Air Force nuclear weapons systems.

The report contained 36 observations which lead to 5 general conclusions:

- Nuclear surety in the USAF is sound, but needs strengthening
- USAF focus on the nuclear mission has diminished since 1991
- The nuclear enterprise in the USAF works despite being fragmented
- Declining USAF nuclear experience has led to waning expertise
- USAF nuclear surety inspection programs need standardization

Of significance, the BRR team observed that "solid nuclear expertise exists with the 21M officers who are in missile maintenance positions. But 21M munitions officers serving in aircraft units do not, as a whole, have the same degree of nuclear expertise as those in missile maintenance units."

However, that does not mean that officers from one unit or another have more or less expertise – simply different. Nuclear expertise relevant to the unauthorized movement of nuclear weapons included managing munitions control, plans and scheduling, maintenance, storage, handling, transportation, and weapons loading. Unless officers at an ICBM wing are assigned to manage the weapons storage area, they do not develop expertise in nuclear weapons storage, handling, maintenance, plans, and scheduling (in which critical mistakes were made at Minot in 2007), transportation/towing, and weapons loading.

The investigation report, finalized in only 30 days, concluded that while risks exist, "the USAF has a sound nuclear surety program." Additionally, the Blue Ribbon Review team stated that it was "confident that it has highlighted the relevant areas for improvement. The way ahead must reaffirm the Air Force long-standing commitment to the nuclear enterprise and prove an unequivocal dedication to supporting both deterrence and response."

3. The Defense Science Task Board Permanent Task Force on Nuclear Weapons Surety, *Report on the Unauthorized Movement of Nuclear Weapons,* April 2008

The Secretary of Defense was not confident that the Air Force could critically examine itself, and he commissioned General Larry Welch, retired Air Force Chief of Staff, to lead a team

of senior officials to re-examine and investigate the circumstances surrounding the unauthorized movement of nuclear weapons. General Welch led the Defense Science Board team that produced a report focusing on the organizational and institutional shortcomings.

The Defense Science Board investigation identified two primary causes of the unauthorized movement of nuclear weapons. First, Air Force senior leaders had not sufficiently focused on the nuclear mission, and second, the Air Force had not effectively addressed the overall decline in officer and enlisted nuclear weapons expertise. This decline in nuclear weapons expertise was attributed to the prevailing assumption that nuclear weapons duty was a low-priority mission that lacked promotion potential.

The Defense Science Board task force identified deficient weapons-loading checklists and a lack of clear technical guidance to prohibit storing nuclear weapons in the same storage structure as training, inert, and test systems, but failed to examine the headquarters staff members' role or expertise in these problems. There is no consideration of the fact that before the 1991 career field merger, munitions officers had to have previously managed munitions functions successfully and be technically competent in developing Air Force-level policies on technical nuclear weapons storage procedures, loading checklists, and technical orders before they could get a "selectively manned unit" assignment as an Air Staff officer. The decline in munitions officer nuclear expertise in managing critical nuclear weapons logistics and maintenance functions also degraded the headquarters staff members' ability to produce effective policy and procedures.

The Defense Science Board also reported that the major command inspector general (IG) nuclear surety inspection teams failed to identify the types of problems that caused the unauthorized movement of nuclear weapons, but it did not mention the expertise of the inspectors. One interviewee told us of his experience briefing inspection teams before they conducted an inspection. He noticed that he did not recognize a single person on the team. When asked the IG staff stated that it was impossible to get access to qualified Air Force personnel; instead the IG had reached out to other agencies with "nuclear experts" to fill gaps.

4. Secretary of Defense Task Force on DoD Nuclear Weapons Management, *Phase I: The Air Force's Nuclear Mission,* September 2008 and *Phase II: Review of the DoD Nuclear Mission,* December 2008

In addition to the Defense Science Board investigation, Secretary Gates asked Dr. James Schlesinger, former Secretary of Defense and Energy to lead a review of both Air Force and Department of Defense nuclear efforts. In examining the Air Force actions, Dr. Schlesinger reported that "Air Force leaders failed in their leadership responsibilities to shift priorities and adjust policies and resources in ways needed to maintain robust nuclear stewardship, resulting in the inattention that led to the unauthorized movement of nuclear weapons and mistaken shipment of sensitive missile components." The task force report specifically mentioned the ICBM operations officer and space officer career field mergers but failed to examine the munitions/maintenance career field which had significant responsibility in the unauthorized movement of nuclear weapons. The list of task force membership yields a possible explanation: there was no experienced munitions officer on the task force, and thus no one may have even been aware of the 1991 officer career field merger and its impact.

The unauthorized movement of nuclear weapons sparked an international incident because the United States' nuclear deterrent that had been the foundation of security for U.S. allies since the end of World War II, suddenly seemed in question. The Secretary of the Air Force and the Air Force Chief of Staff were forced to talk publicly of the mistakes, airing the dirty laundry of the Air Force and emphasize corrective actions taken. However, before the investigations had been completed, it was revealed that Taiwan had received sensitive components used on the Minuteman III intercontinental ballistic missile rather than the helicopter batteries it had ordered from the U.S., bringing to light a second nuclear-related incident.

The Task Force determined that that the Air Force needed to update Air Force deterrence doctrine and restore pride in the nuclear mission. To date, A10 and Air Education and Training Command (AETC) have reviewed all nuclear-related doctrine; however, changing doctrine will not change how Air Force personnel or their leaders view the mission.

The task force reaffirmed that it would take a concerted and sustained commitment by the Air Force leadership at all levels to restore the culture and ethos of nuclear excellence. Interviewers found the Air Force reticent about the events, but more importantly dismissive of the nuclear mission altogether. Air Force officers saw the nuclear requirements as a waste of their time; taking time and resources away from their true mission to support the wars in Iraq and Afghanistan. Repeatedly, interviewers for this study and the Schlesinger panel were told that the unauthorized movement of nuclear weapons and mistaken shipment of classified forward sections were insignificant and overblown and that there were no real national security ramifications, with the exception of the resulting reallocation of resources.

5. Admiral Kirtland Donald, *Investigation into Shipment of, Sensitive Missile Components to Taiwan,* May 2008

Secretary of Defense Robert Gates appointed Admiral Kirkland Donald, Director of Navy Nuclear Power and Nuclear Reactors, a four-star admiral position with eight-year tenure to lead the investigation. Donald's tenured position precluded any perception of promotion or political pressure that might affect an incumbent's willingness to manage critical nuclear functions on technical merit alone. The Air Force offers no such position. As a result, the nuclear mission has to compete for resources with special operations and other missions during a post-Cold War time, when the nuclear mission is seen as much less relevant to current defense requirements.

Admiral Donald used a Navy team of nuclear experts to investigate. The Navy staff of officers and civilians averaged over 20 years of nuclear experience, working in essentially the same organization and with the same coworkers. They had deep expertise, continuity, and strong credibility.

Donald observed that the Air Force had a complex command and control network with many overlapping and dispersed responsibilities. Although Admiral Donald examined ICBM sustainment organizations (to include the Defense Logistics Agency) and logistics actions, he commented on the similarities between the unauthorized movement of nuclear weapons and mistaken shipment of classified forward sections. Donald identified the specific marking,

shipping, and logistics procedures and practices that were either ineffective or not followed, and he also identified a systemic lack of technical competence.

The Donald Report, more than any of the other studies, highlighted the issue of declining nuclear expertise. Donald identified that "there are some leaders with little, dated, or no nuclear experience who hold leadership positions in the Air Force nuclear enterprise, including supervisors and enlisted members as well as squadron, group, and wing commanders."[103] Additionally, "a lack of wing, group, and squadron leadership on the floor of the Weapons System areas where build-up and disassembly of reentry systems occurs" was identified. The same observation was made during maintenance operations at the depot level. Essentially, Admiral Donald identified the lack of senior leader's technical competence as a systemic problem for the Air Force.

6. Headquarters U.S. Air Force, *Reinvigorating the Air Force Nuclear Enterprise,* October 2008

In the summer of 2008 shortly after the CDI, BRR and Donald reports were completed, the Secretary and the Chief of Staff of the Air Force directed the establishment of an Air Force Nuclear Task Force to "develop a strategic roadmap to rebuild and restore capabilities and confidence in our stewardship of the Air Force nuclear enterprise." The resulting strategic plan synthesizes recommendations from both the internal and external investigations that occurred following the two nuclear-related events.

The reports converged on six recurring themes reiterated in the Schlesinger Task Force Report: 1) underinvestment in the nuclear deterrence mission is evident, undercutting the nation's deterrence posture - no comprehensive process exists to ensure sustained investment advocacy; 2) nuclear-related authority and responsibility are fragmented; 3) processes for uncovering, analyzing, and addressing nuclear-related compliance and capability issues are largely ineffective; 4) nuclear-related expertise has eroded; 5) a critical self-assessment culture is lacking; and 6) Air Force nuclear culture has atrophied resulting in a diminished sense of mission importance, discipline, and excellence.

The primary goal of the roadmap was to correct *governance* of the newly termed "nuclear enterprise" of the Air Force. Most of the tasks identified in the roadmap were divided among the three new nuclear organizations: Headquarters Air Force Assistant Chief of Staff for Strategic Deterrence and Nuclear Integration (A10); AFGSC; and AFNWC. All told, the Air Force nuclear enterprise received 2,500 billets and millions of dollars to refocus the mission.

Assessment of the Investigations and Reports

Although the investigations generated numerous recommendations, dismissals and reorganizations, most of this study's workshop participants and interviewees remained skeptical of the investigative process and the results. Many of those interviewed had much to say about the conduct and results of the investigations. The most significant objection was that they did not explore how and why the incidents occurred.

[103] Donald, p. 47.

One interviewee suggested that the Defense Science Board report was the clearest in pointing the Air Force in the proper direction. Others suggested the Blue Ribbon Review did the opposite, providing a superficial checklist-focused assessment that stated the Air Force was doing the job correctly but could use some improvement in certain areas. The BRR claimed that only minor issues existed, but the Air Force nuclear enterprise was sound. Not a single interviewee had a positive word for the BRR. The kindest words were that it was not a "courageous document" and that it represented a "failed opportunity" for the Air Force to address issues it had known to exist for some time.

Many of those interviewed had participated in the different reviews and found that the primary motivation within the Air Force was to finish the reviews as quickly as possible, with as little further embarrassment as possible and move on. This mood was palpable and noted among study and review team members, as well as investigators. The two internal Air Force reviews were given only 30 days to complete their tasks. Participants suggested that the organizational climate was so tense immediately after the unauthorized movement of nuclear weapons that no one dared question findings or oppose the suggested "improvements" – even those within Air Force senior leadership. Interviewees shared their concerns that the investigations' findings were never validated. The Air Force task force had 90 days to produce the nuclear roadmap from the recommendations of the other studies. Staff officers quickly discovered there was to be no questioning the sometimes conflicting findings; rather they were told, "Just do it." There was a conspicuous sense of urgency to be seen making significant changes in organization, personnel and policy, and it was made clear that funding was readily available.

None of the investigations examined the management functions of the munitions and missile maintenance officer career field (21M); nor did they specifically address what actions or inactions constituted "a failure of leadership." The ACC Commander Directed Investigation, Defense Service Board, and Air Force Blue Ribbon Review study teams indicated that the Minot Air Force Base 5th Munitions Maintenance Squadron commander and the maintenance operations officer were *disengaged* from the squadron's nuclear weapons maintenance management. Such lack of involvement could have been a result of these officers viewing their roles as "leadership" exclusive of actually managing nuclear weapons maintenance and being able to recognize poor NCO performance before that poor performance resulted in major organizational failure.

The investigations did not define nuclear expertise in operational terms. There is considerable literature to suggest that career broadening and the whole-person, general manager concept reduces the depth of expertise.[104] However, the Blue Ribbon Review recommended expanding career broadening as a corrective action even though there was no supporting evidence to conclude that this would help. Admiral Donald explained that only about half of the 22 senior leaders involved had the technical background and experience for the positions they held and that these leaders were seldom present where the nuclear weapons work was being completed in the weapons system areas, depots, or missile sites.

Such findings highlight the fundamental issue of the generalist versus expert question. Officers may believe their role to be that of the titular organization head and assume that all the

[104] Drucker, 2002.

information they need to manage the organization will be provided by subordinates. If so, they must be sufficiently knowledgeable and technically competent to recognize whether the information they are provided is correct. Alternatively, officers may believe that their role requires active management of their organization. This active officer role would require sufficient functional competence to differentiate between good and poor organizational performance.

A final definitive comment came from a member of one of the outside reviews. The interviewee suggested that it was clear to the investigators that the Air Force as a service no longer valued its nuclear role and mission. Nuclear capable wings were undermanned, over-taxed (over tasked?) and complained about having to conduct the nuclear mission in a time when conventional war was so prevalent and vital to the nation's security.

APPENDIX D

ACRONYMS AND ABBREVIATIONS

A1	Headquarters Air Force Manpower, Personnel and Services
A4/7	Headquarters Air Force Logistics, Installations and Mission Support
A5XP	Headquarters Air Force Strategic Plans and Policy
A10	Headquarters Air Force Strategic Deterrence and Nuclear Integration
ABM	Anti Ballistic Missile
ACC	Air Combat Command
ADC	Air Defense Command
AETC	Air Education and Training Command
AFB	Air Force Base
AFDD	Air Force Doctrine Document
AFGSC	Air Force Global Strike Command
AFI	Air Force Instruction
AFMC	Air Force Materiel Command
AFNWC	Air Force Nuclear Weapons Center
AFR	Air Force Regulation
AFSC	Air Force Specialty Code
AFSO	Air Force Smart Operations
AMC	Air Mobility Command
ASD (D)	Assistant Secretary of Defense for Deterrence
ATL	Acquisition, Technology and Logistics
ATSD (AE)	Assistant to the Secretary of Defense for Atomic Energy
ATSD (NCB)	Assistant to the Secretary of Defense for Nuclear, Chemical and Biological
BRR	Blue Ribbon Review
BW	Bomb Wing
CDI	Commander Directed Investigation
CSAF	Chief of Staff of the Air Force
CTBT	Comprehensive Test Ban Treaty
DASD	Deputy Assistant Secretary of Defense

DLA	Defense Logistics Agency
DNA	Defense Nuclear Agency
DoD	Department of Defense
DoE	Department of Energy
DSB	Defense Science Board
DSWA	Defense Special Weapons Agency
DTRA	Defense Threat Reduction Agency
HAF	Headquarters Air Force
ICBM	Intercontinental Ballistic Missile
IG	Inspector General
MAJCOM	Major Command
NATO	North Atlantic Treaty Organization
NCO	Non-Commissioned Officer
NNSA	National Nuclear Security Administration
NSS	National Security Strategy
OSD	Office of the Secretary of Defense
OUSD (AT&L)	Office Under Secretary of Defense for Acquisition, Technology and Logistics
OUSD (P)	Office of the Under Secretary of Defense for Policy
SAC	Strategic Air Command
SECAF	Secretary of the Air Force
SORT	Strategic Offensive Reduction Treaty
START	Strategic Arms Reduction Treaty
TAC	Tactical Air Command
USSTRATCOM	United States Strategic Command
USAF	United States Air Force
WMD	Weapons of Mass Destruction
XON	Air Force Directorate of Nuclear and Counterproliferation