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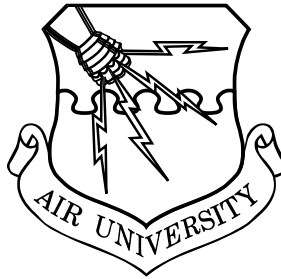
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Air Force Intelligence Role in Combating Weapons of Mass Destruction

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Air War College
Maxwell Paper No. 39

Air University Press
Maxwell Air Force Base, Alabama

November 2006

This Maxwell Paper and others in the series are available electronically at the Air University Research Web site <http://research.maxwell.af.mil> and the AU Press Web site <http://aupress.maxwell.af.mil>.

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Foreword

After the United States and coalition forces failed to find weapons of mass destruction (WMD) stockpiled after Operation Iraqi Freedom, the president charged a congressional commission with examining US intelligence capabilities regarding WMD. No great surprise, the commission found that the intelligence community had been “dead wrong” in many of its prewar estimates. Air Force intelligence is part of that intelligence community and shares responsibility for that failure. Air Force intelligence professionals play important combating-WMD roles at combatant commands, components, national intelligence agencies, and in operational units.

In this paper Lt Col Cristina M. Stone argues that the Air Force does not adequately prepare its intelligence analysts; targeteers; intelligence, surveillance, and reconnaissance (ISR) operators; and unit-level and air and space operations center (AOC) personnel with the knowledge and expertise required to fill these positions. She examines the current status of the Air Force intelligence WMD expertise and proposes recommendations for improvement, utilizing Air Force intelligence-distinctive capabilities (predictive analysis, targeting, ISR operators, and unit-level and AOC operations) as a framework for discussion. To get to ground truth on the current status, the author conducted interviews with current and former WMD analysts and targeteers. Colonel Stone believes that in the areas of predictive analysis, targeting, and unit-level and AOC operations, Air Force intelligence training courses do not currently provide the requisite WMD expertise. The author recommends that the Air Force leverage its technical and scientific core and expert organizations across the government to improve training for intelligence personnel requiring WMD expertise. Regarding ISR operations, she proposes that the Air Force develop enhanced collection capabilities. This paper recommends changes to Air Force intelligence training, technical WMD expertise, collection capabilities, and marketing to improve the nation’s ability to combat WMD.

As with all other Maxwell Papers, this study is provided in the spirit of academic freedom and is open to debate and serious discussion of issues. We encourage your response.

A handwritten signature in black ink, appearing to read 'Stephen J. Miller', with a stylized flourish at the end.

STEPHEN J. MILLER
Brigadier General, USAF
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About the Author

Lt Col Cristina M. Stone, USAF, is the deputy commander, 55th Operations Group, Offutt AFB, Nebraska. She is a career intelligence officer with unit, air and space operations center (AOC), and headquarters intelligence experience. She has served as a flying squadron intelligence officer in Korea, Central Air Force AOC intelligence analyst, US Air Force Weapons School instructor, Checkmate strategist, and Air Combat Command intelligence squadron commander.

She graduated from the US Air Force Academy with a bachelor of science degree in military history in June 1988 and received a master of arts degree in human resource management from Troy State University in 1995. She also graduated from the US Air Force Weapons School in 1993, Squadron Officer School in 1994, Air Command and Staff College in 2003, and Air War College in 2006.

Abstract

Air Force intelligence professionals play key roles in combating weapons of mass (WMD) destruction at combatant commands and components and national intelligence agencies. The Air Force, however, does not adequately prepare its intelligence analysts, targeteers, ISR operators, and unit-level and air and space operations center (AOC) personnel with the knowledge and the expertise required to fill these positions. This paper examines the current status of Air Force intelligence WMD expertise and proposes recommendations for improvement, utilizing Air Force intelligence-distinctive capabilities (predictive analysis, targeting, ISR operations, and unit-level and AOC operations) as a framework for discussion. In the areas of predictive analysis, targeting, and unit-level and AOC operations, Air Force intelligence training courses do not provide the requisite WMD expertise. The Air Force must leverage its technical and scientific core and expert organizations across the government to improve training for intelligence personnel requiring WMD expertise. In the area of ISR operations, the Air Force requires enhanced collection capabilities and better marketing of existing capabilities across the intelligence community. This paper also recommends changes to Air Force intelligence training, technical WMD expertise, and marketing and collection capabilities to improve the nation's ability to combat WMD.

Combating Weapons of Mass Destruction

The gravest danger our nation faces lies at the crossroads of radicalism and technology. Our enemies have openly declared that they are seeking weapons of mass destruction, and evidence indicates that they are doing so with determination. The United States will not allow these efforts to succeed. . . . History will judge harshly those who saw this coming danger but failed to act. In the new world we have entered, the only path to peace and security is the path of action.

—Pres. George W. Bush
*National Security Strategy of
the United States of America*
17 September 2002

Shortly after the *National Security Strategy* was published, the United States and coalition forces entered Iraq to depose Iraqi dictator Saddam Hussein. One of the key arguments for taking this action was that Saddam posed a threat due to stockpiled weapons of mass destruction (WMD), which he might use or provide to terrorists. After Saddam was toppled and the Iraq Survey Group conducted a thorough search for these weapons, no stockpiles were found. Recognizing a national intelligence failure, President Bush charged a congressional commission with examining United States intelligence capabilities regarding WMD. The commissioners concluded that the intelligence community was “dead wrong in almost all of its prewar judgments about Iraq’s weapons of mass destruction.”¹ As one of 16 members of the intelligence community,² Air Force (AF) intelligence shares the burden of this grave failure and must improve its processes to preclude future failure in this critical area of analysis. One of the key AF intelligence contributions to combating WMD is in the area of “human capital”—providing intelligence professionals to combat WMD at combatant commands and components and national intelligence agencies; however, the Air Force does not adequately prepare its intelligence analysts, targeteers, and intelligence, surveillance, and reconnaissance (ISR) op-

erators; and unit-level and air and space operations center (AOC) personnel with the knowledge and the expertise required to fill these positions.

This paper examines the current status of AF intelligence WMD expertise and proposes recommendations for improvement, utilizing AF intelligence-distinctive capabilities³ as a framework for discussion. These distinctive capabilities include predictive analysis, targeting, ISR operations, and unit and AOC operations. The author interviewed current and former WMD analysts and targeteers to derive the data on current status of AF WMD intelligence and capture recommendations for improvement. The paper begins with defining baseline terms of reference. It proceeds to examine each AF intelligence-distinctive capability, discussing current status and existing intelligence gaps. The paper concludes with recommendations for improvement.

Terms of Reference

I will first define key terms: weapons of mass destruction, Air Force intelligence, Air Force intelligence-distinctive capabilities, and combating WMD. Once defined, these terms help to establish a baseline for understanding weapons of mass destruction.

Weapons of Mass Destruction

Joint Publication (JP) 1-02, *Department of Defense Dictionary of Military and Associated Terms*, defines *weapons of mass destruction* as “weapons that are capable of a high order of destruction and/or of being used in such a manner as to destroy large numbers of people. Weapons of mass destruction can be high explosives or nuclear, biological, chemical, and radiological weapons, but exclude the means of transporting or propelling the weapon where such means is a separable and divisible part of the weapon.”⁴ These weapons are also referred to as weapons of mass destruction/effect (WMD/E); chemical, biological, radiological, and nuclear (CBRN); and chemical, biological, radiological, nuclear, and high-yield explosives (CBRNE). For the purpose of this paper, the term *weapons of mass destruction* includes chemical, biological, radiological, nuclear, and high-yield explosives.

Air Force Intelligence

The term *Air Force intelligence* is used throughout this paper to describe appropriate military and civilian intelligence professionals in the Air Force. The Directorate of ISR, deputy chief of staff for Air and Space Operations (AF/A2), Pentagon, Washington, DC, is the staff organization that is responsible for policy and for organizing, training, and equipping Air Force intelligence. The Air Force office for intelligence analysis is the National Air and Space Intelligence Center (NASIC), located at Wright-Patterson AFB, Ohio; however, Air Force analysts proliferate throughout the Department of Defense (DOD)—from the flying units up to such national intelligence centers as the Defense Intelligence Agency (DIA) and the National Security Agency (NSA).

AF Intelligence-Distinctive Capabilities

The January 2006 AF/A2 “Intelligence, Surveillance, and Reconnaissance Force Development Semi-Annual Newsletter” identified the AF intelligence-distinctive capabilities as predictive analysis, targeting, ISR operations, and unit-level and AOC operations.⁵ Definitions for these terms follow.

Predictive Analysis. The DIA white paper, “Implementing Predictive Analysis Technology within DIA/DS-RRA,” defines *predictive analysis* as “predicting the intentions and probable courses of action of human beings, either as individuals or as populations. Understanding intentions requires analysts to first understand cultural context, history, behavioral patterns, incentives, and ethnicity in order to understand how the threat has evolved and exists.”⁶ Within the context of this research paper, *predictive analysis* refers to Air Force intelligence efforts to understand, determine the capabilities of, and predict courses of action of an enemy and its military forces. The terms *predictive analysis* and *analysis* are being used interchangeably.

Targeting. JP 1-02 defines *targeting* as “the process of selecting and prioritizing targets and matching the appropriate response to them, taking account of operational requirements and capabilities.”⁷ This definition is also accepted in AF doctrine.⁸ In layman’s terms, *targeting* is linking the right weapons to the right targets to achieve the desired strategic, op-

erational, or tactical effect. The intelligence professionals who conduct this important mission area are called targeteers.

ISR Operations. JP 1-02 defines *ISR* as “an activity that synchronizes and integrates the planning and operation of sensors, assets, and processing, exploitation, and dissemination systems in direct support of current and future operations. This is an integrated intelligence and operations function.”⁹ Examples of *ISR* operations include imagery and signals intelligence collection. For the purpose of this paper, when referencing AF *intelligence ISR operations*, the term refers to collection, processing, and exploitation operations.

Unit and AOC Operations. This distinctive capability refers to intelligence activities at operational AF units (such as flying and ground-based air control units) and AOCs.¹⁰ Analysis, targeting, and *ISR* operations all apply to unit and AOC operations. It is a separate category as a distinctive capability because of the unique tactics, techniques, and procedures that exist within these organizations. This essay addresses the WMD-related issues that impact unit-level and AOC operations.

Combating WMD

The December 2002 issue of the *National Strategy to Combat Weapons of Mass Destruction* identifies three pillars to the US strategy to combat WMD: counterproliferation, nonproliferation, and consequence management.¹¹ Counterproliferation consists of actions taken to “deter and defend against the full range of possible WMD employment scenarios.” Nonproliferation includes “those actions (e.g., diplomacy, arms control, multilateral agreements, threat reduction assistance, and export controls) taken to prevent the proliferation of weapons of mass destruction that seek to dissuade or impede access to, or distribution of, sensitive technologies, materiel, and expertise.”¹² The final pillar, consequence management, is the response to the use of WMD on US soil or against US citizens and the actions taken to become operational again after an attack.¹³

Combating WMD is a government-wide enterprise, but the Air Force and AF intelligence play key roles in each pillar of the strategy. Intelligence professionals provide the analytical underpinning for counterproliferation, nonproliferation, and consequence-management operations. AF *ISR* operations

provide the data analysts need to reach their conclusions on adversary WMD capabilities. Additionally, intelligence professionals provide the requisite targeting expertise for striking WMD targets should the situation require it.

Background of the WMD Commission Report

Taken together, the Intelligence Reform Act and the WMD Commission's recommendations constitute a powerful force for change in the Intelligence Community.

—Amb. John Negroponte
Director of National Intelligence
29 September 2005

On 6 February 2004, President Bush signed Executive Order 13328, establishing the Commission on the Intelligence Capabilities of the United States Regarding Weapons of Mass Destruction. The president charged the commission with assessing whether the intelligence community is “sufficiently authorized, organized, equipped, trained, and resourced”¹⁴ to support the US counterproliferation efforts. Specifically, they were tasked to examine “. . . the capabilities and challenges of the Intelligence Community to collect, process, analyze, produce, and disseminate information concerning the capabilities, intentions and activities of such foreign powers relating to the design, development, manufacture, acquisition, possession, proliferation, transfer, testing, potential or threatened use, or use of Weapons of Mass Destruction, related means of delivery, and other related threats of the 21st Century.”¹⁵ Although the impetus for establishing the commission was the intelligence failure regarding Iraq’s WMD before Operation Iraqi Freedom, the president asked the team not only to look at Iraq, but also to look at intelligence capabilities versus other state and nonstate actors.

The Findings

The commission team interviewed experts from inside and outside the intelligence community and reviewed thousands of documents.¹⁶ With regards to Iraq, they found that the

primary causes of intelligence failure included the “inability to collect good information about Iraq’s WMD programs, serious errors in analyzing what information it could gather, and a failure to make clear just how much of its analysis was based on assumptions, rather than good evidence.”¹⁷ In its review of intelligence performance versus other state and nonstate threats, the team discovered that although the intelligence community had achieved some significant successes, it still knows “disturbingly little about the weapons programs and even less about the intentions of many of our most dangerous adversaries.”¹⁸ The following summarizes the major findings from the report:

- **Poor target development: not getting intelligence on the issues we care about most.** The intelligence community lacks the coordinated collections strategy required to penetrate some of today’s difficult target sets (emphasis in original).
- **Lack of rigorous analysis.** The intelligence community must improve “analytical tradecraft,” to include techniques, communication skills and subject matter expertise (emphasis in original).
- **Lack of political context—and imagination.** Technical analysis should be weighed against political context (emphasis in original).
- **Overemphasis on and underperformance in daily intelligence products.** Daily CIA-produced intelligence products tended to be alarmist and misleading (emphasis in original).
- **Inadequate information sharing.** Although progress has been made since 9/11, much work still needs to be done in the area of counterproliferation (emphasis in original).
- **Poor human intelligence.** Innovation is needed to develop sources in closed societies. Additionally, care should be taken not to rely too heavily on uncorroborated, single-source human intelligence (emphasis in original).
- **The challenge to traditional signals intelligence.** Advances in telecommunications [have] resulted in

some loss of access. Technological innovation[s] are required to keep pace with technology developments in the civilian sector (emphasis in original).

- ***Declining utility of traditional imagery intelligence against unconventional weapons programs.*** Adversaries are improving denial and deception techniques to counter traditional imagery collection (emphasis in original).
- ***Measurement and signature intelligence (MASINT) is not sufficiently developed.*** Capabilities are not widely understood or marketed (emphasis in original).
- ***An absence of strong leadership.*** Turf wars continue to make coordination and intelligence integration difficult and the Director of Central Intelligence was unable to resolve the difficulties.¹⁹ (emphasis in original)

The commission team made 74 recommendations for correcting these shortcomings in their report; the president accepted 71 for implementation. The recommendations leverage the directives of the Intelligence Reform and Terrorism Prevention Act (IRTPA) of December 2004. This legislation established the director for national intelligence position, the National Counterterrorism Center, and directed information sharing between intelligence community members.²⁰ The commission's recommended areas for improvement included leadership/management (utilizing the IRTPA to integrate the intelligence community better), collection, analysis, information sharing, integrating domestic and foreign intelligence, counterintelligence, and covert action.²¹ The areas of improvement that directly impacted AF intelligence include collection and analysis (including target analysis or targeting).

Combating WMD and Existing Gaps

I believe we can do better . . . to grow intel officers that are even more flexible and adaptive in this long war, this Global War on Terrorism.

—Gen T. Michael Moseley
Chief of Staff of the United States Air Force
10 October 2005

As addressed earlier, the intelligence community requires significant improvements in the ability of its members to combat WMD. To examine AF equity in, and current status of, AF intelligence efforts in combating WMD, this paper utilizes the AF intelligence-distinctive capabilities as a framework: predictive analysis, targeting, ISR operations, and unit and AOC operations.

Predictive Analysis

Intelligence plays a vital role in ensuring that potential adversaries do not acquire WMD or, if they already have it, that they do not expand it. The AF intelligence role in this mission area is to provide the analytical human capital to feed the major DOD intelligence analysis agencies that watch potential enemy capabilities and advise policy and decision makers. The WMD commission cited “analytical tradecraft” as a current weakness in the intelligence community. Specifically, the commission report recommended that tradecraft, “the way analysts think, research, evaluate evidence, write, and communicate,” be improved.²²

AF/A2 recently asked major command senior intelligence officers to review the WMD commission report and to recommend areas for improvement for AF intelligence. In the results compiled by the AF/A2 staff, all 11 respondents remarked that AF intelligence analysis needed improvement.²³ Some of the more critical remarks follow:

- Pacific Air Forces: “Technical analysis lacking; USAF intelligence community does not routinely verify WMD intel assessments through [the] technical review process conducted by knowledgeable subject matter experts with actual WMD experience” and “Need more USAF Intel resources smart on WMD analysis. . . .”²⁴
- Air Force Materiel Command: “AF [must] reconstitute strategic analysis ability and address need for technical collection expertise” and “Provide training/education to develop greater skills in analytic ‘tradecraft.’ . . .”²⁵
- Air Mobility Command: “We need to return to organizing around specific mission sets and developing [*sic*]

specialists with [a] high degree of proficiency in that mission set. . . .”²⁶

- National Air and Space Intelligence Center: “Strengthen strategic, science and technology, and weapons research/analysis. . . .”²⁷

These comments reflect the need to strengthen AF capabilities to conduct more rigorous analysis and, specifically, WMD analysis. To get to ground truth on the current status of WMD analysis in AF intelligence, the author interviewed current or former WMD analysts by way of e-mail.

The resulting comments were compiled to provide a qualitative rather than quantitative look at the status of Air Force WMD intelligence. Although the number of interviews was relatively small, the responses were generally consistent. The focus was to answer the questions “Do AF WMD analysts have the requisite training and expertise for the analytical positions in which they serve?” and “How do they gain the expertise if they don’t have it?” The interview questions included:

- What is your duty title?
- What is your background for WMD analysis or targeting?
- Did you attend any training courses before arriving on station?
- What did you do for in-house spin-up²⁸ training?
- Who do you go to if you have questions?
- What resources did you find helpful in doing your job?
- Do you have any recommendations for anyone moving into your job?

The author selected individuals to interview by obtaining a list of intelligence personnel currently serving in WMD analyst positions from the Air Force Personnel Center, located at Randolph AFB, Texas. To increase the quantity of collected data, the author asked intelligence peers for recommendations of personnel with WMD analysis experience. One hundred percent of individuals contacted responded to the interview questions.

Table 1 captures the answer to the first question. The locations represent a good cross section of the kinds of organizations AF intelligence professionals can serve in as WMD

analysts, including intelligence agencies, combatant commands, subordinate components, and intelligence school. The backgrounds of the individuals ranged from second lieutenants straight out of intelligence school to a scientist cross-trainee who had done WMD-related research during his studies at the Joint Military Intelligence College.²⁹

Table 1. Interviews with current and former WMD analysts

<i>Duty Title</i>	<i>Location</i>
Deputy chief, Estimates Division	Air Force Intelligence Analysis Agency, Pentagon, Washington, DC
Deputy chief, Weapons of Mass Destruction Team	US Central Command, MacDill AFB, FL
Chief, TBM/WMD analyst	607th Air Intelligence Squadron, OSAN AB, Republic of Korea
NCOIC, Asymmetric Threat Analysis	607th Air Intelligence Squadron, OSAN AB, Republic of Korea
Weapon system intelligence integration officer (hard and deeply buried targets analyst)	497th Intelligence Group, Bolling AFB, Washington, DC
Section chief, International Officers Applications Course (WMD course instructor)	315th Training Squadron, Goodfellow AFB, TX

Source: E-mail interviews conducted by author with Capt Stefanie S. Peterson, 18 November 2005; 2d Lt Sean R. Tucker, 15 November 2005; NCOIC, Asymmetric Threat Analysis, 15 November 2005; Maj James Gehringer, 2 December 2005; 1st Lt Tanya Silvio, 15 December 2005; Maj Lourdes Duvall, 10 February 2006; and MSgt Timothy Dukes, 14 February 2006.

In answering the third question, Did you attend training before arriving on station? none of the respondents answered yes with regards to specific intelligence training courses, although several had attended courses (either in residence or through a mobile training team course) after arriving on station. These courses included the Oakridge Nuclear Fuel Cycle Operations Course and the Lawrence Livermore National Labs Counterproliferation Analysis and Planning System (CAPS) Course. The respondents did not appear to be aware of the significant curriculum offered by the Central Intelligence Agency (CIA), Joint Military Intelligence Training Center, or the Defense Threat Reduction Agency (DTRA) on a wide range of WMD-related topics.³⁰ The *Intelligence Com-*

munity Proliferation Training Catalog provides a consolidated list of courses offered and is available on the Joint Worldwide Intelligence Communications System (JWICS).³¹

The only “standard” answer to the fourth question (What did you do for in-house spin-up training?) was that all respondents had to do a large amount of self-initiated study to get “up to speed” for their jobs. The 607th Air Intelligence Squadron had a more robust spin-up that included turnover with the incumbent and review of significant desk briefings. Others gained requisite knowledge through the “fire-hose effect” of learning while doing.³²

The answers to the fifth and sixth questions regarding contacts and resources were as varied as the respondents. This makes sense since the WMD target set is not the same for all analysts in all areas of responsibility. For example, the US Central Command analysts focused on nuclear issues, while the Korea analysts focused more on Scud missile capabilities and North Korean chemical and biological agents. The most popular resource on the JWICS is the ATHENA Shared Counterproliferation Information Space, a Web site managed by the DIA. This Web site includes any “hot” WMD information and provides links to WMD analysts across the government. It acts as a digital clearinghouse for WMD intelligence, but unless an analyst was specifically directed to it, he or she might not become aware of it during his or her tenure. Within the AF, no central human intelligence clearinghouse is available to help analysts obtain WMD-related intelligence, direct analysts to available training opportunities, or connect them with experts within a field of study. This is a significant gap since AF WMD analysts are currently left to train themselves.³³

In response to the final question regarding recommendations for people who would replace them, respondents recommended several options. These recommendations included attending training en route, finding replacements with a technical background or affinity, and a good turnover with incumbents. The recommendation of a technical background is worth further elaboration. The WMD analyst for the Air Force Intelligence Analysis Agency was a chemist who cross-trained into the intelligence career field. Since WMD-related analysis is highly technical, having a technical or scientific background is extraordinarily valuable, especially given the lack

of AF-specific training in WMD analysis.³⁴ The 497th Intelligence Group analyst recommended that individuals new to a WMD analyst position build relationships with subject-matter experts early on. She remarked, "I often trolled org charts and cold-called to find the right person for my specific info deficits. Not ideal, but I found people to be very willing to help."³⁵

In summary, interview results revealed that, with the exception of the cross-trained scientist, AF personnel serving in WMD analyst positions lacked training and experience. In-house training and formal courses attended after arriving on station were critical in getting these analysts "up to speed." The reference sources and contacts varied greatly from one organization to another, and some individuals were not aware of the important intelligence community WMD resources. The interview responses support the WMD commission report finding on "lack of rigorous analysis," highlighted in this paper.³⁶

The AF falls short in training for WMD analytical expertise. The AF does not offer specialized training for their WMD analysts. A review of the Goodfellow Air Force Base plans for instruction for basic officer and enlisted intelligence courses reveals that students receive seven and eight hours of WMD threat instruction, respectively.³⁷ In an interview with the enlisted intelligence course manager, the author discovered that the WMD course instructor does not receive any additional formal training beyond what was provided when he or she attended the fundamentals courses. What happens then is that the eight-hour planned block of instruction usually becomes much shorter due to the instructor's lack of expertise. The situation for the officer course is considerably better, since the instructor has been teaching the WMD block for two years. The instructor admits, however, that he did not feel comfortable teaching the subject matter when he first started.³⁸ As a positive note, the enlisted course has a computer-based training "workbook" that instructors can use to review the WMD block for study. This tool is not currently available for use to personnel outside of the training wing.³⁹

In addition to providing better baseline WMD training for all intelligence personnel, AF intelligence must also look at providing follow-on training for individuals who end up serving as WMD analysts in various intelligence agencies, combatant commands, and components. Since the AF does not have a large number of positions that require this kind of ad-

vanced expertise and understanding, it is not feasible to create an in-residence course. However, a computer-based training course made available to the entire analyst community would be helpful for any analyst who requires a refresher. This provides an answer to current intelligence questions by giving a background for a project. Additionally, analysts requiring advanced knowledge could attend any number of courses offered throughout the WMD intelligence community and the national laboratories. The Air Force Institute of Technology at Wright-Patterson AFB is also currently developing two graduate-level academic programs on combating WMD: a 10-week overview course designed to meet “immediate educational needs” and an 18-month master of science degree in combating WMD Technology.⁴⁰

Another challenge these AF WMD analysts face is determining who to turn to when they have a question. There are many different players in the WMD analysis community, each with a different “piece of the analytical pie.” To bring the WMD analytical players together as a community of interest, the director of national intelligence stood up the National Counterproliferation Center (NCPC) in the Washington, DC, area. The NCPC is not an analytical agency. The primary charter for the organization provides a community-wide vehicle for strategic planning and oversight. As the organization matures, coordination and intelligence sharing among the different intelligence organizations and understanding of what each player contributes to the fight will likely improve. One of the NCPC’s current initiatives identifies all the different formal training opportunities across the intelligence community. A decision has not yet been made as to how the NCPC will market these opportunities to intelligence community members.⁴¹

On a positive note, AF/A2 is examining several possibilities to improve basic analysis and to include partnering with universities to enhance analyst training. AF/A2 is also evaluating officer analyst force development.⁴² At Goodfellow AFB, the 315th Training Squadron (TRS) is revamping the basic courses to introduce additional analytical rigor and to create more of a building-block approach. The 315th TRS is also establishing a completely new analysis, correlation, and fusion training course that will target individuals who will be working in AOC analysis, correlation, and fusion flights. In the future such individuals as the Korean Theater Ballistic Missile (TBM) and the

WMD analysts referred to above will have the opportunity to attend the analyst training course before arriving on station. Finally, the 315th TRS is also creating a correspondence course, the Predictive Battlespace Awareness Baseline Course. This course is intended to provide an analytical “baseline” for those individuals attending any of Goodfellow’s advanced intelligence courses, but it could be available to other analysts also.⁴³

Targeting

Counterproliferation, as described in the *National Strategy for Combating Weapons of Mass Destruction*, consists of actions taken to “deter and defend against the full range of possible WMD employment scenarios.”⁴⁴ For the Air Force, one of the key roles within the broad area of counterproliferation is counterforce targeting. The *Air Force Counter-Chemical, Biological, Radiological, Nuclear, and High-yield Explosive (C-CBRNE) Master Plan* describes counterforce as defeating enemy WMD capabilities before they can be brought to bear, while minimizing the potential for collateral damage.⁴⁵ Air Force intelligence is an important enabler in this mission, contributing to assessment of the threat target set and providing targeting expertise.

Air Force intelligence officers serve as targeting experts in combatant commands, air operations centers, air-to-ground units, and in intelligence organizations; yet the AF does not have specialized training for WMD targeting expertise. Basic training for targeting is conducted in the Combat Targeting Course (CTC) at Goodfellow AFB. Future targeteers will be taught to analyze a target as a “system of systems,” analyze critical nodes, and determine the appropriate weapons to create desired effects. The CTC focuses primarily on conventional targets and conventional weapons, although discussion of WMD is included in two of the blocks of instruction.⁴⁶

WMD targeting requires specialized expertise—the targeteer is not only concerned with the blast effects of the weapons dropped, but the effect of the WMD agents once targeted is also a concern. The analyst must be able to project the potential dispersal of the agents into the atmosphere and to harness possible collateral damage caused by this release.⁴⁷ The expertise for planning against WMD targets resides primarily within the DTRA and the Armed Forces Medical Intelligence Center (AFMIC). DTRA has fielded several software tools, such

as the Munitions Effects Assessment, Integrated Munitions Effects Assessment (IMEA), and Hazard Prediction and Assessment Capacity (HPAC). Even though these tools assist targeteers in conducting prestrike and hazard effects analysis, training in the basic course on these tools is extremely limited.⁴⁸ Improved partnerships with DTRA and AFMIC in syllabus development would enhance training at Goodfellow and improve AF targeting expertise for WMD.

To gain an understanding of the specific requirements for WMD targeting expertise, interviews were conducted of targeteers who are currently serving or have served in targeting positions at combatant commands and air and space operations centers. The author used the same methodology for the selection of participants and to conduct the interviews as she utilized for the WMD analysts. Additionally, she asked the same questions to WMD analysts (listed in the Predictive Analysis section) that she asked to current and former targeteers with AOC or combatant command experience. The duty titles and locations included combatant commands and subordinate components and are listed in the table below:

Table 2. Interviews with current and former targeteers

<i>Duty Title</i>	<i>Location</i>
Chief of targets	32d Air Operations Center/ISR Division, Ramstein AB, Ger.
Chief of target development	European Command, Stuttgart, Ger.
Target duty officer	607th Air Intelligence Squadron, OSAN AB, Republic of Korea
Chief of Target Materials Branch	US Strategic Command, Offutt AFB, NE
Operations officer of Target Materials Branch	US Strategic Command, Offutt AFB, NE
Counter-Scud targeting officer	Combined AOC, Prince Sultan AB, KSA

Source: E-mail interviews conducted by author with Maj Derek Gardner, 2 December 2005; Capt Kasandra T. Traweek, 14 November 2005; and Lt Col Charles Owen, 5 December 2005.

These individuals varied in background from those with no WMD experience to one with a doctorate in virology. Of

note, the chief of targets in the 32d AOC/ISR Division (the doctoral degree recipient) was selected for her assignment under the acquisition intelligence experience exchange tour (AIEET). This program recruits 10 scientists and engineers a year into the intelligence career field, and it could provide a viable way to fill WMD analysis positions that have technical requirements.⁴⁹ This exchange program also benefits the science and technology community through a more thorough understanding of intelligence and the intelligence community. When questioned about the value of having a scientist as chief of targets, the 32d AOC/ISR Division chief remarked, “Awesome—she delivers info with impact in so many ways. You never know where the next WMD threat or question arises, and I think every AOC needs a WMD expert.”⁵⁰

In answering the question about training courses, all the individuals had attended the Combat Targeting Course at Goodfellow AFB; however, only the 32d AOC chief of targets had attended WMD-related training courses. For spin-up, all the individuals learned through self-study and contacts in the field. With regard to contacts, the cross-flow scientist had a vast network of contacts and resources that she brought into the job from her previous work as a scientist.⁵¹ The counter-Scud targeting officer developed a worldwide network of experts in preparation for Operation Iraqi Freedom combat operations.⁵²

The recommendations these individuals provided included having a technical or scientific background and familiarity with DTRA, HPAC, and IMEA models.⁵³ DTRA offers courses for these models, but DTRA could also provide familiarization training as required. In mid-2005, a DTRA contractor visited Goodfellow AFB to familiarize Combat Targeting Course instructors with these models.⁵⁴ DTRA also provides “flyaway teams” that could provide training in forward operating areas. The AF targeteers, especially those in an AOC, would likely not run the models themselves; however, awareness of their existence and the ability to speak intelligently with the experts would provide an enhanced capability within the AOC to understand the WMD target set.

In summary the targeteer interviews yielded results similar to the WMD analyst interviews. With the exception of the scientist on the Acquisition Intelligence Exchange Tour, the targeteers interviewed did not have formal WMD training or

experience, but rather they had learned “on the job,” as required. Instead of relying on an existing network of contacts and resources, a few of the respondents were forced to create their own network of experts to fill expertise gaps. The interview results support the WMD commission’s findings of “poor target development” and “lack of rigorous analysis.”⁵⁵

Another targeting challenge is keeping pace with the development of specialized weapons for targeting such WMD as thermobaric and agent-defeat weapons. These weapons attack and destroy the agents before they can cause extensive collateral damage.⁵⁶ The development of two such weapons was put on the fast track following the attack of 11 September 2001, expediting the normal test and development process.⁵⁷ While the actual weapons were rapidly fielded to the flying community, instruction on these weapons has not been fully incorporated into the CTC syllabus.⁵⁸ Instruction in the CTC must keep pace with the rapid weapons development to ensure that graduates are prepared to weaponeer for these weapons when they are asked to do so.

Intelligence, Surveillance, and Reconnaissance Operations

The data required for analysis and targeting is obtained through intelligence collection. The disciplines that play the most critical role in combating WMD, as identified in the commission report, are human intelligence (HUMINT), measurement and signature intelligence (MASINT), signals intelligence (SIGINT), and imagery intelligence (IMINT).⁵⁹ The role of AF intelligence within these disciplines and the utility for combating WMD is described below. Due to classification constraints, the following discussion of each discipline will be general.

HUMINT. JP 1-02 defines *HUMINT* as “a category of intelligence derived from information collected and provided by human sources.”⁶⁰ The WMD commission report specifically highlighted HUMINT as a shortcoming. According to the commission report, when the October 2002 *National Intelligence Estimate* was written, the intelligence community had “little human intelligence on Iraq’s nuclear, biological, and chemical weapons programs and virtually no human intelligence on leadership intentions.”⁶¹ Acquiring

human sources for information on WMD is difficult at best. Countries that pursue WMD or have active programs guard their secrets closely. The more egregious problem in Iraq, however, was putting complete trust in an untested, single source provided by another country.⁶² If a source is questionable or not independently confirmed, intelligence analysts must make it clear to policy makers what is known and what is assumed.

In AF intelligence the HUMINT business had all but fallen to the wayside before Operation Iraqi Freedom. The AF ceded all of its responsibility for this mission to the Defense HUMINT Service in October 1995.⁶³ AF intelligence is currently resurrecting an organic HUMINT capability.⁶⁴ The focus of this capability is to generate intelligence of particular value to AF customers. In combating WMD, AF HUMINT personnel could conduct interrogations and work informants on the airborne part of the WMD equation: delivery platforms. They could also become a resource pool for the Department of Defense HUMINT Service, which produces human intelligence for other WMD analysis areas.

To have a viable HUMINT capability, AF intelligence is working to determine what the force will look like later, possible mission focus areas, and how HUMINT positions will fit into officer and enlisted force development paths. Instead of discouraging young intelligence officers and enlisted personnel from taking HUMINT assignments, Air Force intelligence leadership is working vigorously to define a track to keep people in the field and ensure they get promoted (a problem area in the past).⁶⁵

MASINT. *MASINT* is “technically derived intelligence that detects, locates, tracks, identifies, and describes the unique characteristics of fixed and dynamic target sources. Measurement and signature intelligence capabilities include radar, laser, optical, infrared, acoustic, nuclear radiation, radio frequency, spectroradiometric, and seismic sensing systems as well as gas, liquid, and solid materials sampling and analysis.”⁶⁶ While sometimes referred to as “a batch of unrelated technical intelligence tools, better developed and funded separately rather than under a single label,” *MASINT* capabilities can be used to identify WMD presence, especially when analyzed in conjunction with the other intelligence disciplines.⁶⁷ The commission report found that currently *MASINT* is not

sufficiently developed or understood across the intelligence community. MASINT played a “negligible role” in Iraqi WMD analysis, despite its capabilities.⁶⁸

The Air Force plays a key role in the MASINT arena through such aircraft and sensor capabilities as the RC-135 Cobra Ball. MASINT assets could contribute to combating WMD through “detecting the construction of underground facilities, monitoring the activities at hard-to-find chemical and biological warfare sites, and coping with increasingly sophisticated denial and deception measures directed at conventional imagery and signals intelligence systems.”⁶⁹ Another AF contribution comes through producing the analysts who interpret the data. In fact, this is a growth field for the Air Force that is expanding its capabilities in this realm. Air Intelligence Agency (AIA) and NASIC are important intelligence center partners in the MASINT arena.

Secrecy shrouds much of what is done in this realm, adding to the intelligence community’s mistrust of the intelligence produced. The capabilities of MASINT sensors are not marketed well in the Air Force, let alone across the DOD and government. A marketing effort would enhance both understanding and utilization across the intelligence community.

SIGINT. SIGINT is “a category of intelligence comprising either individually or in combination all communications intelligence, electronics intelligence and foreign instrumentation signals intelligence, however transmitted.”⁷⁰ SIGINT is the realm of the National Security Agency, although all intelligence community members play a role. It can play a critical role in combating WMD because it provides some insight into what is “being said, planned and even considered.”⁷¹ SIGINT has limitations, however, as the enemy can intentionally provide false or misleading information or a smart enemy can move to a communications capability that is more difficult to exploit. According to the commission report, the SIGINT community lost access to key aspects of Iraqi communications.⁷²

As is the case with MASINT, the Air Force plays a key role in SIGINT through such assets as the RC-135 Rivet Joint and analytical capability. The primary AF repository for SIGINT expertise and management is AIA. AIA plays a key role in capabilities development and oversight of the SIGINT mission across the AF. It also plays a key role in developing

capabilities and fielding assets that can overcome the challenges discussed earlier.

IMINT. *IMINT* is “intelligence derived from the exploitation of collection by visual photography, infrared sensors, lasers, electro-optics, and radar sensors such as synthetic aperture radar wherein images of objects are reproduced optically or electronically on film, electronic display devices, or other media.”⁷³ Although imagery plays an important role in identifying movement of military equipment and large numbers of personnel, it can have a limited utility against a target that the enemy is determined to hide. Enemy denial and deception techniques utilized at sensitive target areas can limit the utility of imagery.⁷⁴ Another problem with imagery is that it may only provide a “snapshot” in time, and analysts cannot always determine what happened before or after the shot was taken.⁷⁵ Imagery is especially limited against a suspected chemical or biological facility, as activity and storage takes place inside a building and may give no additional visual signature that would distinguish the facility from normal industrial activity.⁷⁶ Transshipment activity sometimes can be caught, but imagery may not be able to tell you exactly what’s going on.

AF platforms such as the U-2, Predator, and Global Hawk are key imagery collection platforms. As in the other “ints,” the AF also produces the personnel who analyze and interpret the imagery. The processing, exploitation, and dissemination of imagery products occurs at such national agencies as the National Geospatial-Intelligence Agency and at AF Distributed Common Ground System sites. Imagery analysts at these sites provide analysis in near real time to support combat operations. AF assets and analysts also play a critical role in consequence management, as was evidenced in the aftermath of Hurricanes Katrina, Rita, and Wilma in 2005. The Air Force provided imagery coverage of the impacted areas to assist the federal government in determining the scope of the damage.⁷⁷ This type of coverage can play a similar role after a nuclear or high-yield explosive WMD attack.

In the combative WMD arena, AF sensors and analysts suffer from the shortcomings of traditional ISR collection addressed in the WMD commission report.⁷⁸ The NCPC chief of staff commented that the best way to counteract

the shortcomings of traditional assets is to develop new technologies and, more importantly, to use “existing technologies in creative ways.”⁷⁹ ISR operators must remain flexible and creative when conducting operations against the difficult-to-penetrate WMD target set. They must also work to fuse knowledge obtained from all the different collection disciplines to build the true picture of a potential adversary’s WMD capability.

Unit and AOC Operations

Predictive analysis, targeting, and ISR operations are all crucial to unit and AOC operations. Planning and executing air, space, and information operations occur at units and AOCs and include operations against WMD targets. As such, intelligence personnel at units and AOCs must have a good baseline understanding of the WMD threat, and certain individuals within these organizations need a more detailed understanding. Within the AOC, intelligence personnel must put the entire threat picture together. They will pull from each of the AF intelligence-distinctive capabilities for the expertise needed to accomplish this task. The WMD expertise requirements addressed in the predictive analysis, targeting, and ISR operations sections apply to the personnel at the AOC.

Unit personnel also have a requirement for WMD expertise driven by the potential for counterforce targeting and support for air base survivability. If the unit has an air-to-ground mission, unit aircrews may be asked to deliver thermobaric or agent-defeat weapons. Unit intelligence personnel support these missions and should have an understanding of both the target components and the weapon’s capability.⁸⁰ Currently, such DTRA effects tools as HPAC and IMEA are not included in the suite of intelligence-automation tools available at the unit level.⁸¹ These tools would be helpful for combat mission planning and for training. When aircrews drop such munitions in training as the EGBU-15 Thermobaric weapon, effects models help to build an understanding of delivery requirements and weapon-performance characteristics.⁸²

Unit intelligence personnel also play a key role in air base survivability by training base support personnel on adversary WMD capabilities. Understanding the threat is

an important aspect of preparation for and execution of consequence-management operations. Consequence management is the response to the use of WMD on US soil or against US persons and the actions taken to become operational again after an attack.⁸³ AF intelligence has equity in the area of consequence management at the unit level through base-level intelligence support to decision makers, emergency responders, and force protection. As discussed in the other two pillars of the strategy, the lack of specialized training on the WMD threat negatively impacts the ability of unit-level intelligence personnel to provide the support required before, during, and after an attack. For example, an intelligence officer who has attended the basic intelligence officer course received seven hours of instruction on the WMD threat. Once the intelligence officer arrives on station, he or she will also receive the required CBRNE defense class along with the remainder of the base populace. At that point, the individual could be assigned as the intelligence representative to the force protection working group and may be considered the WMD threat expert for the wing.⁸⁴ The training received to date would be inadequate for this responsibility. One possible solution would be to provide training opportunities, training materials, or some online resources to fill the gap in expertise.

What role does this expertise play in consequence management? When the base is preparing for a potential attack, intelligence personnel can prepare medical personnel and leadership and emergency responders on what to expect. This benefit extends to in-garrison training for medical personnel. The more detailed understanding they have of threat capabilities and intent, the better prepared they will be for conflict. The model already exists for this kind of “external” training: aircrew and security forces training. Medical personnel intelligence requirements likely would not be as robust as those of aircrew or security forces; however, the requirement should be formalized and incorporated into AF intelligence instructions.⁸⁵

As part of the wing threat working group (TWG), intelligence also plays a key role in force protection before, during, and after an attack. Intelligence personnel act in an advisory role to unit leadership with the Office of Special Investigations (OSI) and Security Forces. OSI and security forces pro-

vide the “local intelligence,” and intelligence personnel are able to link into higher headquarters and national agencies to dig for “special intelligence” on the threat. The intelligence contribution to threat characterization includes understanding of types of agents; delivery methods; and enemy tactics, techniques, and procedures. These insights can provide a forecast for future enemy activity, including the possibility of follow-on attacks.⁸⁶ Two unit senior intelligence officers interviewed for this paper indicated advanced training would be helpful for intelligence TWG representatives.⁸⁷

Both AOC and unit intelligence personnel would benefit from tailored, focused WMD analytical support. The numerous agencies that produce WMD intelligence do not create air or Air Force–centric products. As a result, unit and AOC personnel resort to wading through the existing body of data to find what they need. A WMD-focused analytical applications branch (or shop) at NASIC could provide tailored support and an AF spin to already existing products. The branch could help point AF personnel to the community experts and identify training opportunities. This shop would be beneficial for NASIC analysts also, and it could integrate the delivery vehicle knowledge, which already exists, with knowledge of the WMD agents and warheads.

Recommendations

How then do we teach and mentor and grow and mature and expose our folks and develop an intel cadre that is something beyond where we've been in the past?

—Gen T. Michael Moseley
Chief of Staff of the United States Air Force
13 October 2005

This paper addressed Air Force intelligence areas for improvement in predictive analysis, targeting, ISR operations, and unit and AOC operations. It also introduced the issue of reforming AF WMD intelligence in the aftermath of Operation Iraqi Freedom, established the baseline terms of reference for discussion throughout the paper, provided background information on the WMD commission report and relevance for AF intelligence, stepped through the AF intelligence-

distinctive capabilities, and provided analysis of the status of AF WMD intelligence in each of these areas. Interviews of current and former WMD analysts and targeteers provided the baseline data to support the recommendations.

The United States must continue to deal with potential state and nonstate WMD threats. To prepare our policy makers and war fighters, intelligence professionals must be properly trained to understand and assess threat capabilities and intent. Although AF intelligence does not have the primary responsibility for WMD analysis within the Department of Defense, AF analysts, targeteers, and ISR operators play a key contributory role to nonproliferation, counterproliferation, and consequence-management operations. To meet the challenges of the global war on terrorism and improve the country's ability to combat WMD, AF intelligence should consider the following recommendations for AF intelligence areas for improvement:

1. Partner with other intelligence community members and academia to provide a more robust analytical trade-craft course of study in the intelligence fundamentals courses. Provide follow-on training at the midcareer level on managing and teaching analysis.
2. Improve the WMD training currently provided in the intelligence fundamentals courses. Send course instructors to a one-week WMD overview course provided by CIA or DIA.
3. Identify all AF intelligence WMD analyst positions across DOD and determine training requirements. Ensure that reporting instructions reflect the requirement for WMD threat courses offered by government agencies.
4. Leverage as much as possible from the existing AF scientist and engineer pool to fill technical analysis positions through programs such as the AIEET. In the long term, increase the number of intelligence officer initial hires with such technical undergraduate degrees as science and engineering.
5. Partner with DTRA and AFMIC to teach weapons effects models (such as IMEA and HPAC) familiarization to the Combat Targeting Course attendees. Send

course instructors to advanced training in these models and in WMD fundamentals.

6. Modify the existing Combat Targeting Course to cover emerging thermobaric and agent-defeat weapons effects.
7. Build a primer (to include training support materials) on the WMD threat for different threat countries for unit-level intelligence personnel. Coordinate with DTRA and AFMIC to ensure level of fidelity required for medical personnel.
8. Reinvigorate AF HUMINT. Provide a force development road map for HUMINT to include command positions.
9. Work with the rest of the intelligence community to develop IMINT, SIGINT, and MASINT capabilities.
10. Market currently existing MASINT capabilities to increase understanding across the intelligence community.
11. Create a WMD applications shop at NASIC to tailor the existing body of WMD intelligence to air, space, and information operations customers.

The AF should seize the opportunity created by the post-commission interest in WMD intelligence to address some of its long-standing problems in this vital area. To highlight the significance of this requirement, we once again turn to the findings of the commission: “There is no more important intelligence mission than understanding the worst weapons that our enemy possesses, and how they intend to use them against us. These are their deepest secrets, and unlocking them must be our highest priority.”⁸⁸

Notes

1. Commission on the Intelligence Capabilities of the United States Regarding Weapons of Mass Destruction, *Report to the President of the United States* (Washington, DC: WMD Commission, 31 March 2005, forwarding letter to the president).

2. *Ibid.* The intelligence community includes the Central Intelligence Agency (CIA), Defense Intelligence Agency (DIA), National Security Agency (NSA), National Geospatial-Intelligence Agency (NGA), National Recon-

naissance Office (NRO), Army Intelligence, Navy Intelligence, Air Force Intelligence, Marine Corps Intelligence, Department of State/Bureau of Intelligence and Research (INR), Department of Justice/Federal Bureau of Investigation (FBI), Department of Homeland Security/Directorate of Information Analysis and Infrastructure Protection, Department of Homeland Security/US Coast Guard Intelligence, Department of Energy (DOE)/Office of Intelligence (IN), and Department of Treasury/Office of Terrorism and Financial Intelligence (INF).

3. See Air and Space Operations (AF/A2), "Air Force Intelligence, Surveillance, and Reconnaissance Semi-Annual Newsletter," January 2006, Pentagon, Washington, DC, n.p.

4. Joint Publication (JP) 1-02, *Department of Defense Dictionary of Military and Associated Terms*, 12 April 2001 (as amended through 31 August 2005), 577.

5. AF/A2, n.p.

6. JP 1-02, *Department of Defense Dictionary*, A-63.

7. Defense Intelligence Agency, *Implementing Predictive Analysis Technology within DIA/DI*, http://www.cia.ic.gov/ciau/ProliferationCatalog/2006_proliferation_training.pdf, n.p.

8. JP 1-02, *Department of Defense Dictionary*, 531.

9. Air Force Doctrine Document 2-5.2, *Intelligence, Surveillance and Reconnaissance Operations*, 80.

10. In JP 1-02, the air and space operations center is referred to as the Air Force air and space operations center and is defined as "the senior agency of the Air Force component commander that provides command and control of Air Force air and space operations and coordinates with other components and Services." See JP 1-02, *Department of Defense Dictionary*, 19.

11. White House, "National Strategy to Combat Weapons of Mass Destruction," December 2002, 2.

12. Headquarters United States Air Force, *Air Force Counter-Chemical, Biological, Radiological, Nuclear and High-yield Explosive Master Plan*, 30 June 2004, 15.

13. *Ibid.*

14. Executive Order 13328, Commission on the Intelligence Capabilities of the United States Regarding Weapons of Mass Destruction, 6 February 2004, <http://www.whitehouse.gov/news/releases/2004/02/20040206-10.html> (accessed 19 November 2005).

15. *Ibid.*

16. *Report to the President*, 19.

17. *Ibid.*

18. *Ibid.*

19. *Ibid.*, 12-17.

20. US House, *Intelligence Reform and Terrorism Prevention Act of December 2004*, 108th Cong., 2d sess., 8 December 2004, n.p.

21. *Report to the President*, 17.

22. *Ibid.*, 12.

23. AF/A2, *Compilation of MAJCOM SIO WMD Commission Report Feedback*, n.p.

24. *Ibid.* This remark came from Pacific Air Forces.

25. Ibid. This remark came from Air Force Materiel Command.
26. Ibid. This remark came from Air Mobility Command.
27. Ibid. This remark came from the National Air and Space Intelligence Center.
28. Spin-up training is the formal or informal position training conducted once an individual reports for duty.
29. E-mail interviews conducted by author with Capt Stefanie S. Peterson, 18 November 2005; 2d Lt Sean R. Tucker, 15 November 2005; NCOIC, 15 November 2005; Maj James Gehringer, 2 December 2005; 1st Lt Tanya Silvio, 15 December 2005; Maj Lourdes Duvall, 10 February 2006; and MSgt Timothy Dukes, 14 February 2006.
30. Ibid.
31. Central Intelligence Agency, *Intelligence Community Proliferation Training Catalog*, 2006, available on JWICS, http://www.cia.ic.gov/ciaui/ProliferationCatalog/2006_proliferation_training.pdf.
32. Ibid.
33. Ibid.
34. Ibid.
35. Maj Lourdes Duvall, interview by the author, 10 February 2006.
36. *Report to the President*, 2–13.
37. 17th Training Wing, *Operations Intelligence Apprentice Plan of Instruction*, 15 March 2005, 45; and 17th Training Wing, *Intelligence Officer Plan of Instruction*, 5 May 2004, 41.
38. MSgt Timothy Dukes, 315th TRS/DOCB, interview by the author, 16 February 2006.
39. Enlisted Intelligence Course manager, interview by the author, 3 November 2005.
40. Col Patricia Coomber, PhD, senior military professor, Department of Engineering Physics, Air Force Institute of Technology; interview by the author by way of e-mail, 19 April 2006.
41. Sandi Zielinski, National Counterproliferation Center chief of staff, interview by the author, 13 February 2006.
42. Maj Tim West, AF/A2XFM, interview by the author by way of e-mail, 3 October 2005.
43. Col Igor Gardner, 17th TRG/CC, “State of Your Schoolhouse 2005: Building Future Intelligence Professionals” (address, Senior Intelligence Officer Conference, Goodfellow AFB, TX, 2 November 2005).
44. White House, *National Security Strategy*, 17 September 2002, 2.
45. Headquarters United States Air Force, *Air Force Counter-Chemical, Biological, Radiological, Nuclear and High-yield Explosive (C-CBRNE) Master Plan*, 30 June 2004, 1.
46. 17th Training Wing, *Combat Targeting Course Plan of Instruction*, 9 January 2004, 9 and 15.
47. Col Barry R. Schneider, *Counterforce Targeting Capabilities and Challenges*, The Counterproliferation Papers: Future Warfare Series no. 22 (Maxwell AFB, AL: Air University Press, August 2004), 2.
48. Maj Derek Gardner, interview by the author, 2 December 2005. Capt Kasandra T. Traweek, interview by the author, 14 November 2005; Lt Col Charles Owen, interview by the author, 5 December 2005; Capt Don Jones, interview by the author, 16 February 2006; Capt Richard Glade, in-

terview by the author, 16 February 2006; and Maj Will Hastings, interview by the author, 16 February 2006.

49. Maj Suzanna McNabb, AFPC/DPASA, interview by the author, 5 November 2005.

50. Lt Col Phillip Pratzner, 32d AOC/IRD, interview by the author, 4 December 2005.

51. Maj Derek Gardner, interview by the author, 2 December 2005; Capt Kasandra T. Traweek, interview by the author, 14 November 2005; Lt Col Charles Owen, interview by the author, 5 December 2005; Capt Don Jones, interview by the author, 16 February 2006; Capt Richard Glade, interview by the author, 16 February 2006; and Maj Will Hastings, interview by the author, 16 February 2006.

52. Hastings, interview.

53. Gardner et al., interviews.

54. Capt Dana Laclair and Roy Langston, 315th TRS/DOBF, interview by the author, 3 November 2005.

55. *Report to the President*, 12–13.

56. *Ibid.*, 25–26. Thermobaric weapons are high-temperature incendiary weapons that are designed to burn the chemical/biological agents in storage areas. Agent-defeat weapons use nontraditional destruction mechanisms (such as puncturing agent canisters instead of blowing them up) to minimize collateral damage.

57. *Ibid.*, 24.

58. Capt Richard Glade, USSTRATCOM/J2223, interview by the author, 16 February 2006.

59. *Report to the President*, 366–90. The commission report also addresses open-source intelligence or OSINT. For the AF, OSINT is an essential part of all-source analysis, but it is not as robust as a separate AF intelligence mission area and is therefore not included in this paper.

60. *Department of Defense Dictionary*, 245.

61. *Report to the President*, 15.

62. *Ibid.*

63. Deb Dewey, AF/A2XA, interview by the author, 15 February 2006.

64. *Ibid.*

65. *Ibid.*

66. *Department of Defense Dictionary*, 330.

67. *Report to the President*, 376–77.

68. *Ibid.*, 16.

69. Jeffrey T. Richelson, “MASINT: The New Kid in Town,” *International Journal of Intelligence and Counterintelligence* 14 (2001): 149–92.

70. *Department of Defense Dictionary*, 488.

71. Mark W. Lowenthal, *Intelligence: From Secrets to Policy* (Washington, DC: CQ Press, 2000), 65.

72. *Report to the President*, 15.

73. *Department of Defense Dictionary*, 250.

74. *Report to the President*, 16.

75. Lowenthal, *Intelligence*, 63.

76. *Report to the President*, 16.

77. Col Joe Pridotkas, NASIC/CC, interview by the author, 28 February 2006.

78. *Report to the President*, 16.
79. Sandi Zielinski, National Counterproliferation Center chief of staff, interview by the author, 13 February 2006.
80. Maj Brian Kravitz, 4th OSS/IN, interview by the author, 10 February 2006.
81. Ibid.
82. Angleat Shelikoff, 86th FWS/OA, interview by the author, 8 February 2006.
83. Headquarters United States Air Force, *Air Force C-CBRNE Master Plan*, 30 June 2004, 15.
84. Dave Coffey, Air Combat Command IS/FPI, interview by the author, 2 February 2006.
85. Col Michael Ainscough, MD, AF/CPC, interview by the author, 3 February 2006.
86. Coffey, interview.
87. Kravitz, interview; and Maj John Maneri, 20th OSS/IN, interview by the author, 9 February 2006.
88. *Report to the President*, n.p.

Abbreviations

AF	Air Force
AF/A2	Directorate of Intelligence, Surveillance, and Reconnaissance, Deputy Chief of Staff for Air and Space Operations
AFB	Air Force Base
AFIAA	Air Force Intelligence Analysis Agency
AFMIC	Armed Forces Medical Intelligence Center
AIA	Air Intelligence Agency
AIEET	acquisition intelligence experience exchange tour
AIS	Air Intelligence Squadron
AOC	air and space operations center
CAPS	Counterproliferation Analysis and Planning System
CBRN	chemical, biological, radiological, and nuclear
CBRNE	chemical, biological, radiological, nuclear, and high-yield explosives
<i>C-CBRNE</i>	<i>Counter-Chemical, Biological, Radiological, Nuclear, and High-yield Explosive Master Plan</i>
CIA	Central Intelligence Agency
CTC	Combat Targeting Course
DIA	Defense Intelligence Agency
DOD	Department of Defense
DTRA	Defense Threat Reduction Agency
HPAC	Hazard Prediction and Assessment Capacity
HUMINT	human intelligence
IC	Intelligence Community
IMEA	Integrated Munitions Effect Assessment
IMINT	imagery intelligence
IRTPA	Intelligence Reform and Terrorism Prevention Act
ISR	intelligence, surveillance, and reconnaissance
JMEM	Joint Munitions Effectiveness Manual
JWICS	Joint Worldwide Intelligence Communications System
MASINT	measurement and signature intelligence
NASIC	National Air and Space Intelligence Center
NCPC	National Counterproliferation Center
NRO	National Reconnaissance Office

NSA	National Security Agency
OSI	Office of Special Investigations
SIGINT	signals intelligence
TBM	theater ballistic missile
TRG	training group
TRS	training squadron
TWG	threat working group
USCENTCOM	United States Central Command
WMD	weapons of mass destruction
WMD/E	weapons of mass destruction/effect