

AIR WAR COLLEGE

AIR UNIVERSITY

FUSION INTELLIGENCE:  
ESTABLISHING A RELIABLE CAPABILITY

by

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## **Biography**

Lt Col Holmes enlisted in the United States Air Force in 1990, serving as an Intelligence Operations Specialist with assignments at the 496<sup>th</sup> Reconnaissance Technical Squadron, RAF Alconbury, U.K.; the EUCOM Joint Analysis Center (JAC), RAF Molesworth, U.K.; and, the 337<sup>th</sup> Bomb Squadron, Dyess AFB, Texas, supporting numerous named operations and exercises. In 1994, he joined the Indiana Air National Guard, 181st Operations Support Flight, 181st Operations Group, 181st Fighter Wing, continuing to serve as an Intelligence Operations Specialist supporting F-16C operations. In 1997, Lt Col Holmes was commissioned, becoming an Intelligence Officer supporting F-16C operations. Lt Col Holmes deployed several times in support of Operations NORTHERN WATCH, IRAQI FREEDOM, and ENDURING FREEDOM as well as other named operations and exercises. He attended the Combat Targeting Course at Goodfellow AFB, TX, in 2003. In 2008, Lt Col Holmes became the Director of Operations at Distributed Ground Station-Indiana (DGS-IN), standing up this core DGS site. Concurrently, Lt Col Holmes was the T-10 Detachment Commander at DGS-IN. Lt Col Holmes qualified as a combat mission ready FMV and U-2 Mission Operation Commander as well as an Instructor Rated Operator. He has chaired the ANG DCGS Operations Standardization Working Group multiple times; has been a contributing author to the DCGS 3-1; and, he has participated in drafting multiple DCGS AFIs. In 2013, Lt Col Holmes deployed serving as the U-2 LNO at the AFCENT CAOC, Al Udeid Air Base, Qatar. In 2014, Lt Col Holmes was appointed as the Commander, 181st Operations Support Squadron (DGS-IN), Hulman Field, Terre Haute, IN. In 2015, Lt Col Holmes assumed command of the 137<sup>th</sup> Intelligence Squadron (DGS-IN), Hulman Field, Terre Haute, IN. Lt Col Holmes is currently assigned to the Air War College, Air University, Maxwell AFB, AL.

## Abstract

The Air Force Future Operating Concept (AFFOC) identified Globally Integrated Intelligence Surveillance and Reconnaissance (GIISR) as one of five core missions in 2035.<sup>1</sup> The AFFOC called for “ISR professionals, with deep expertise in information fusion.”<sup>2</sup> However, when exploring current intelligence specialties and their respective training and preparation to execute fusion intelligence, rather than moving toward professionals with “deep expertise in fusion intelligence,” intelligence specialties currently receive limited formal training regarding fusion intelligence, leaving the bulk of training and preparation to perform fusion intelligence to field units. This results in intelligence personnel with disparate baseline knowledge and abilities with an unpredictable and unreliable capability. Additionally, there is evidence that rather than creating personnel with “deep expertise,” the Air Force is creating generalists or *jacks-of-all-trades*. To develop the desired “ISR professionals, with deep expertise in information fusion,” the Air Force should establish a program to purposefully train select personnel who possess experience in intelligence and aptitude for advanced intelligence work in multi-source fusion intelligence, and then staff positions requiring the production of fusion intelligence with this cadre of trained personnel.

## Introduction

*How do you fuse that information in ways that allow us to be able to get decision quality information to decision makers faster than our opponents.*<sup>3</sup>

-General David Goldfein, CSAF

The Air Force Future Operating Concept (AFFOC) 2035 envisioned a “fully developed cadre of Air Force ISR professionals, with deep expertise in information fusion, that has revolutionized analysis and exploitation processes.”<sup>4</sup> The AFFOC maintains, “ISR Airmen work with operators and outside agencies to integrate Big Data processes and human cognition as part of *performance-optimized teams*.”<sup>5</sup> Ultimately, the goal of ISR is to compress the Observe, Orient, Decide, Act (OODA) loop(s), producing “actionable intelligence needed to complete kinetic or non-kinetic equations.”<sup>6</sup> Given the vision of Globally Integrated ISR in 2035, is the Air Force preparing ISR personnel to respond to the vision of the AFFOC? The trend in Intelligence Officer training and development over the recent past has leaned toward breadth rather than depth while enlisted intelligence training and development tends toward their respective INT, such as signals intelligence (SIGINT), geospatial intelligence (GEOINT), etc.<sup>7</sup> There have been some modest efforts to address the issue of preparing personnel to execute multi-source fusion intelligence such as blocks of instruction at primary technical training; however, preparing intelligence personnel to perform multi-source fusion intelligence remains largely at field units when personnel are assigned to positions requiring the production of fusion intelligence. This ad hoc process, while well-intended, presents several concerns. First, there is no common manner or method of preparing personnel to execute fusion intelligence, resulting in varied capabilities not based on individual performance factors but rather based on particular intentions and capabilities of the field unit to train and prepare personnel in addition to executing their tasked mission. Next, there is no predictable or reliable capability to execute fusion

intelligence by intelligence personnel -- the Air Force cannot reasonably expect a particular career field to meet the staffing requirements at a unit because there is no standard regarding the knowledge, skills, and abilities of an airman assigned to perform the function of multi-source fusion intelligence. Additionally, while personnel execute fusion intelligence at their present assignment, their primary intelligence skill-set likely atrophy resulting in the unpredictable necessity of remediation training and preparation at their next duty assignment. Lastly, independent of their training and preparation, personnel executing fusion intelligence are not necessarily well-suited to this aspect of the mission. Fusion intelligence has been an “add on” to their primary function, and as a result, it is not clear personnel executing this critical capability are well-suited to perform such duties.

### **Thesis**

The AFFOC called for “fully developed” ISR professionals with “deep expertise in information fusion.”<sup>8</sup> Further, the Joint Operating Environment 2035 postulated potential adversaries will likely develop advanced ISR capabilities and “data fusion capabilities . . . from high-end states to lower-end insurgent and irregular forces.”<sup>9</sup> However, the Air Force has no intelligence discipline dedicated to multi-source fusion intelligence. Multi-source fusion intelligence is generally an add-on capability trained and prepared by field units addressing the necessities of their particular situation and limited by their capabilities. Thus, there is a need for personnel specifically and uniquely trained to execute fusion intelligence across the Air Force. Therefore, in order to develop a repeatable and reliable capability to execute multi-source fusion intelligence, the Air Force should establish standardized formal training in multi-source fusion intelligence preparing select intelligence personnel to produce multi-source fusion intelligence

and then assign this trained cadre of personnel to key positions requiring the production of fusion intelligence.

**Reliable capability?  
or  
“Good thing SSgt Smith was working...”**

In the middle of the night at DGS-5, SSgt Smith prepares the commander’s daily intelligence briefing. He reads the previous day’s COMINT-based report from a U-2 mission noting indications of a fighter aircraft conducting an exercise -- a routine event. Last week, SSgt Smith briefed the commander on an ELINT-based report concerning an unusual signal collected in a similar area. SSgt Smith searched for imagery in the area of concern and discovered about two weeks ago, DGS-IN reported the presence of shipping crates at the same airfield. SSgt Smith reasoned the crates likely contained equipment used for the routine exercise. Following his curiosity, however, SSgt Smith calls a friend from a previous assignment, SSgt Jones, who is now assigned to the NTI cell in Denver. The NTI cell relays there has been a recent increase of unusual activity during the time frame in the same location. SSgt Smith then turns to RQ-4 Blk 40 reporting on the airfield and discovers there is a pattern of traffic between the munitions loading area, the shipping crates, and two aircraft parking locations. The next day, SSgt Smith contacts NASIC regarding a report he recalled reading concerning the development of a new weapon for aircraft of the same type assigned to the concerned airfield. He discovers the weapon in question is being developed by a third party and there is no known proliferation.

By connecting the dots, did SSgt Smith discover the possible proliferation of a new weapon? Perhaps; however, the question for this paper is: does the Air Force train and assign personnel like SSgt Smith in this simplified scenario with the maturity, experience, drive, and

knowledge to reliably fuse disparate pieces of information telling a story that otherwise might remain silent?

The AFFOC predicted “speed” will characterize future conflict suggesting, “by 2035, the correlation of disparate bits of data will be even more critical to provide decision makers with the required information to make key decisions rapidly for operations.”<sup>10</sup> While some intelligence personnel may be able to connect the dots as SSgt Smith did in the slow-moving simple vignette, Air Force intelligence training inconsistently prepares personnel for fusion intelligence analysis, leaving to chance the “so what” of intelligence and what former Director of Central Intelligence Richard Helms called, “the mainstay of the process.”<sup>11</sup>

### **Background**

The Air Force tends to fill enlisted positions demanding fusion intelligence work with 1N0X1 and 1N4X1B personnel.<sup>12</sup> Using sample data collected regarding intelligence positions in the Air National Guard, approximately 50% of 1N0X1 personnel are assigned to positions in units likely requiring fusion intelligence in the performance of their duties.<sup>13</sup> The data regarding 1N4X1B personnel is more ambiguous without comprehensive exploration of specific duties performed because nearly all 1N4X1B personnel in the data sample are assigned to ISR units such as a DGS where 1N4X1B personnel fill operational collection, reporting, and analytical duties.<sup>14</sup> Nevertheless, while more refined data is necessary to establish the actual percentage of 1N0X1 and 1N4X1B personnel likely required to perform fusion intelligence in the performance of their duties across the Air Force, the data collected is sufficient to indicate 1N0X1 and 1N4X1B personnel are the primary enlisted personnel assigned to positions requiring fusion intelligence. The Air Force has one career field for all Intelligence Officers, 14NX. Therefore,



all intelligence officer assignments requiring multi-source fusion intelligence are filled by 14NX personnel.

### **Current Training**

Historically, 1N0X1 personnel have been trained primarily to execute intelligence in support of operations such as a flying unit. However, in September 2016, the 1N0X1 career field title was changed from the long-held Intelligence Operations Specialist to All Source Intelligence Analyst. The Plan of Instruction for 1N0X1 personnel was updated effective 30 January 2017 and consists of thirteen blocks of instruction at Goodfellow AFB, Texas. A review of the Plan of Instruction reveals students participate in 100 days of instruction of which about 13 days involve a degree of basic multi-source intelligence analysis training. The difference of instructional time consists of intelligence fundamentals such as handling classified material; adversary threat systems; presentations; cyber basics; and, other traditional operations intelligence subjects. There is a major exercise and evaluation block at the end of the course incorporating all aspects of the course including multi-source intelligence analysis.

With the renaming of the 1N0X1 career field, there was also a corresponding change to the 1N0X1 Career Field Education and Training Plan (CFETP).<sup>15</sup> A review of the new 1N0X1 CFETP reveals approximately 30% of the training items are indicative of fusion intelligence work.<sup>16</sup> The remaining 70% of the CFETP tends toward the historical roots of the 1N0X1 career field requirement for operations intelligence.<sup>17</sup>

1N4X1B personnel participate in 93 academic days of intelligence training at Goodfellow AFB, TX. Of the 93 days of training, approximately 10 training days consist of instruction in intelligence fusion.<sup>18</sup> However, while there is some instruction regarding multi-source fusion, the fusion instruction focuses heavily on the fusion of SIGINT.<sup>19</sup>

The CFETP for the 1N4X1B career field is classified and can only be addressed broadly in this paper. A review of the CFETP for Network Intelligence Analysts (1N4X1B) reveals an overwhelming percentage of training requirements supporting the collection of single source intelligence rather than fusion intelligence. The 1N4X1B CFETP indicates 1N4X1B personnel are not trained in a significant way preparing personnel to execute fusion intelligence. Thus, 1N4X1B's enjoy a limited look at fusion intelligence as part of their formal training.

Therefore, based on an assessment of the CFETP's for both 1N0X1 and 1N4X1B personnel as well as the corresponding Plans of Instruction for 1N0X1 and 1N4X1B personnel, there is data suggesting neither career field is wholly trained to support fusion intelligence work even though the 1N0X1 and 1N4X1B career fields are the primary enlisted personnel assigned to execute fusion intelligence in the Air Force. Both career fields enjoy exposure to multi-source intelligence fusion during formal training; however, it is not clear that personnel are in fact well-prepared or well-suited to execute multi-source fusion intelligence.

During an interview with an intelligence instructor currently at Goodfellow, she noted the inherent tension between the desire of field units to receive well-trained personnel ready to contribute versus the mission of formal training schools preparing personnel to demonstrate a "basic understanding" of course curriculum.<sup>20</sup> Additionally, she noted personnel require on-the-job training as well as the completion of CDCs as part of their baseline training. She went on to say in a recent visit to a DGS site by Goodfellow staff to assess field requirements, the DGS unit maintained its requirement for trained personnel who are prepared and ready to assume their multi-source fusion intelligence duties without extensive field training as is currently necessary. The instructor noted that the level of preparation through basic technical training will not meet the relatively advanced skill requirements expressed by the unit. In fact, the instructor offered an

anecdote suggesting that even with more appropriate training during tech school meeting the advanced requirements of the field, junior airmen are not well-suited for such training based on their lack of maturity and inability to appreciate the subject matter. The instructor recalled that upon her return from visiting field units that expressed the desire for mature well-trained personnel able to execute fusion intelligence with limited field training, she was required to address three airmen in her class for adolescent misconduct more likened to freshman in high school rather than personnel preparing to provide decision advantage. The instructor maintained that while it is perhaps desirable to train 18-19 years old airmen to perform multi-source fusion intelligence consistent with field requirements, the typical student lacks the maturity and experience to benefit from curriculum more demanding than currently exists.

Intelligence Officers participate in 130 days of intelligence training at Goodfellow AFB, Texas.<sup>21</sup> A review of the current training curriculum reveals that approximately 16 days of research or analysis training forms the foundation of multi-source fusion intelligence training received by an intelligence officer of the allotted 130 training days for initial 14NX training.

Air Force Intelligence Officers present a similar challenge as their enlisted counterparts regarding fusion intelligence training. However, unlike their enlisted counterparts, officers by design do not have a specialization within the discipline of intelligence. Nevertheless, intelligence officers not only lead intelligence analysis organizations, but also junior officers, especially, are called upon to perform fusion intelligence in a manner similar to their enlisted counterparts. While officers have the benefit of at a least bachelor's degree, their degree is not necessarily beneficial in the execution of fusion intelligence. While there may be preferred degrees for an Intelligence Officer, there is no requirement for a particular discipline such as social science, engineering, liberal arts, etc. Therefore, much like enlisted personnel, formal

technical training is typically the primary source of intelligence training officers receive followed by disparate training by field units creating similar problems as with their enlisted counterparts.

1N0X1, 1N4X1B, and 14NX personnel are the primary career fields performing multi-source fusion intelligence in the Air Force. However, these career fields receive limited formal training to perform multi-source fusion intelligence resulting in field units addressing training requirements based on the particular needs of the unit rather than a common standard across the intelligence discipline. The result is widely varied preparation of personnel and unreliable capability.

*Numbers aside, all the persistent surveillance in the world buys us nothing if we can't expedite the collected data to operational processing and analysis elements in a timely manner, and then get the finished intelligence into the hands of America's warriors when and where they need it.*<sup>22</sup>  
-Lt Gen (ret) Deptula, Former DCS ISR

While each intelligence discipline represents a meaningful source of intelligence, a single source of information is generally insufficient to warrant a decision advantage.<sup>23</sup> Actionable intelligence generally mandates fusing multiple sources of information leading to decision advantage.<sup>24</sup> Air Force intelligence personnel tend to train, process, exploit, and disseminate intelligence in a “stove pipe” manner focusing on their respective INT often leaving end users with incomplete intelligence.<sup>25</sup> While some intelligence personnel produce worthwhile fused products, these products tend to be as a result of individual initiative and insightfulness rather than as a result of purposefully

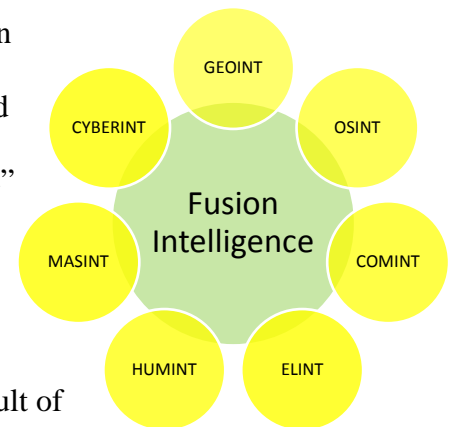


Figure 1

trained personnel capable of continued and reliable contribution.<sup>26</sup> As depicted in Figure 1, fusion intelligence must not focus on one source of intelligence; rather, fusion intelligence benefits from multiple sources of information resulting in a diversity of information and more accurate analysis compared to single source reporting. In 2015, Lt Gen Otto, former DCS ISR,

commissioned RAND to identify, “key lessons from past operations” and identify “additional challenges” Air Force intelligence will face in the future.<sup>27</sup> The RAND research concluded the “pace of future conflicts could stress needs for foundational intelligence and challenge readiness to conduct analysis during phase 2/3 operations” and “the volume of data and limitations on collection that anti-access and area-denial developments impose will challenge analysts.”<sup>28</sup>

RAND offered several recommendations to mitigate these concerns including: “update doctrine to better reflect analysis for operations in addition to IW; train and develop analyst airmen; create an intelligence-analyst professional development program spanning multiple USAF specialty codes; institutionalize mentorship and exchange of knowledge between analysts; and, increase the priority of select assignments within the joint and national communities.”<sup>29</sup>

*The vast majority of ISR professionals, both junior and senior, are largely unprepared for the tidal wave of synthesized information fusion warfare will demand in the years to come.*<sup>30</sup>

-Lt Gen Jamieson, DCS ISR, &  
Lt Col Maurizio Calabrese

Interviews with personnel currently working in positions requiring the production of multi-source fusion intelligence revealed they do not believe their formal intelligence training prepared them to execute multi-source fusion intelligence. A 1N0X1 Master Sergeant, assigned to a DGS core site, maintained 75% of his duties directly involve either supervising the production of or personally producing multi-source fused intelligence.<sup>31</sup> He stated formal training did “very little” to prepare him for multi-source fusion intelligence; furthermore, he said he is able to perform his duties as a result of mentoring by more experienced personnel and personal interest in intelligence.<sup>32</sup> A Technical Sergeant who cross-trained from the former 1N6 career field to become a 1N0X1, also assigned to a DGS core site and performing fusion intelligence, maintained formal training did “a little” to prepare him to perform his duties.<sup>33</sup> He

went on to say he benefited from mobile training teams but in general he is largely “self-taught” to perform fusion intelligence.<sup>34</sup>

A Staff Sergeant, 1N4X1B, assigned to a Distributed Mission Site (DMS), stated he performs multi-source fusion intelligence daily in his duties.<sup>35</sup> He maintained formal training provided the foundation to work as a SIGINT reporter, but he did not understand or appreciate the value of other sources and types of intelligence until his current assignment. Further, he maintained on the job training and working “side-saddle” with other personnel taught him to perform multi-source fusion intelligence. Another Staff Sergeant, 1N4X1B, who is assigned to a DGS core site, is qualified as a Technical Reporter, Correlation Analyst, and Data Link Operator.<sup>36</sup> He maintained formal training provided him with a baseline understanding of intelligence as a whole; however, through on-the-job training and experience, he has become familiar with the idea of fusing multi-source intelligence. A Technical Sergeant, 1N4X1B, assigned to a DGS core site and qualified as a Fusion SIGINT Analyst, maintained his unit has a “good” process to prepare personnel to perform multi-source fused intelligence.<sup>37</sup> However, he maintained, formal intelligence training did not prepare him to perform multi-source fusion intelligence. He went to offer that when engaging with his counterparts at similar units, there is little commonality to prepare personnel to perform essentially the same function.

A Captain, 14NX and former enlisted 1N0X1, assigned to a DGS core site, is the OIC of a multi-source fusion intelligence work center.<sup>38</sup> She stated, 1N0X1 formal training did not prepare her to perform fusion intelligence in any way while 14NX training offered “a little more” preparation to perform multi-source fusion intelligence. She stated 14NX school offered some multi-source fusion intelligence preparation, but as with 1N0X1 formal training, the “overwhelming majority” of the training focused on operations intelligence.

Air Force enlisted intelligence personnel are primarily trained based on their respective intelligence discipline or INT, except 1N0X1s, who are largely trained in the application of intelligence relating to the execution of operations. Positions staffed with Air Force enlisted intelligence personnel requiring fusion intelligence in the performance of their duties, such as at a DGS Analysis & Reporting Team (DART) or Air Operations Center (AOC), tend to be filled with 1N0X1 or 1N4X1B personnel. However, neither career field is primarily trained to perform fusion intelligence even with recent modifications to training curriculum adding fusion intelligence as an element of their training.<sup>39</sup> In fact, rather than creating a meaningful capability to perform fusion intelligence, 1N0X1 and 1N4X1B personnel may be diluting their primary training without achieving a meaningful baseline to perform fusion intelligence. And, there remains a need for personnel trained as 1N0X1s and 1N4X1Bs to perform their primary duties of operations intelligence and network intelligence, respectively. For example, fusion warfare and 5<sup>th</sup> generation aircraft will increase the demands of operations intelligence making 1N0X1s with advanced operations intelligence knowledge and skills more significant than ever.<sup>40</sup> “In the past, a pilot could be satisfied with basic intelligence information, such as knowing a current SAM disposition and a brief on adversary air-to-air tactics, or perhaps just having a recent image outlining a target.”<sup>41</sup> Fusion warfare will demand more of operations intelligence -- 1N0X1 should not be thought of as a *jack-of-all-trades* career field.

Air Force Intelligence Officers (14NX) are initially trained in a plethora of topics ranging from fundamental intelligence administration, to geo-political issues, to analysis, to operations intelligence, to the various INTs, with a few exercises reinforcing academics. A 14NX is trained to fill requirements ranging from working at a fighter squadron, to a tanker squadron, to a DGS, to a national level intelligence agency, etc. The duties at the various assignments vary widely,

no doubt challenging 14NX course managers. By design, Air Force Intelligence Officers are generalists; however, creating generalists is arguably at odds with the AFFOC regarding GIISR.

There is data indicating a significant percentage of 1N0X1s and 1N4X1Bs fill positions requiring fusion intelligence; there is anecdotal evidence from personnel currently performing fusion intelligence in the field indicating they do not believe they were well-trained to perform multi-source fusion intelligence; multiple senior officers opined fusion intelligence is essential, and; at the request of the former DCS ISR, RAND published a study concluding fusion intelligence is critical to future operations and the Air Force is not postured to deliver this essential capability. Therefore, in order to produce a reliable capability to produce multi-source fusion intelligence, the Air Force should develop a training program specifically to prepare personnel to perform multi-source fusion intelligence and then assign those personnel to select positions requiring fusion intelligence.

### **Recommendation**

*We must revamp and update today's ISR training....*<sup>42</sup>  
-Lt Gen Jamieson, DCS ISR, &  
Lt Col Maurizio Calabrese

Multi-source fusion intelligence executed on a reliable basis by well-trained and capable personnel is as important to the intelligence process as is equipping fighter aircraft with effective weapons -- one without the other is unlikely to accomplish the mission. Fusion intelligence is demanding work across multiple disciplines of intelligence.<sup>43</sup> Personnel well-suited for the conduct of multi-source fusion intelligence should be selected from previously trained intelligence personnel, of all intelligence career fields, possessing a strong background in their primary intelligence discipline and understanding of intelligence. This background in intelligence would likely truncate a training timeline compared to training of entry level



personnel while adding diversity of thought and breadth of experience to the pool of multi-source fusion analysts. Personnel considered for this training program should be at the 3- to 6-year point of their intelligence career, essentially 2<sup>nd</sup> and 3<sup>rd</sup> term enlisted personnel and 1<sup>st</sup> Lieutenants through Captains for officers. Additionally, training should be measured in weeks rather than months. Training should consist of types and sources of intelligence; leveraging sources of intelligence; logic and argument; critical thinking; and, written and oral presentation.

Similar to the Air Force's approach to developing Weapons Officers, there should be the potential for meaningful career benefit for personnel selected for this training program; and, as with Weapons Officers, personnel should not remain assigned to multi-source fusion intelligence positions for the duration of their career. Rather, after 2-3 assignments as a multi-source fusion intelligence analyst, personnel should return to a typical developmental career path for their respective discipline but better suited as a result of this select experience. Multi-source fusion intelligence requires sharp personnel rendering meaning to an array of information -- fused intelligence is intellectually demanding. In order for this program to succeed, personnel must see the potential for reward by accepting the challenge of this critical training program. Lastly, this program presents an excellent process for developing well-rounded intelligence professionals with vision beyond the scope of their specific intelligence discipline, ultimately better shaping Air Force intelligence and senior leaders.

There will likely be concerns raised by the proposal in this paper. Concerns will likely fall into three categories: current training is available and sufficient, there is no need or requirement for a specific multi-source fusion intelligence training program, and costs. The Department of Defense (DoD), various organizations in the Intelligence Community (IC), as well as private organizations offer various training courses available to airmen concerning multi-

source fusion intelligence. In many cases, courses offered are likely beneficial; however, this patchwork process of training fails to address the underlying issue of generating a reliable capability. An analyst assigned to one location may benefit from a well-managed training program and unit funding enabling the participation in purchased training whereas a similar analyst at another location may not enjoy the same benefit resulting in disparate capabilities. Further, well-mentored personnel may benefit from engaged development while the less fortunate analyst may not reap the same benefit, again resulting in disparate capability. Lastly, courses offered by the DoD, the IC, and industry generally are designed to augment baseline training. Relying on this method of “piece-meal” training to prepare analysts for the critical function of multi-source fusion intelligence results in disparate capability ultimately prone to failing to deliver repeatable success. This dependence on the DoD, various organizations in the IC, as well as private organizations offering random training courses concerning multi-source fusion intelligence to prepare personnel to perform the critical function of multi-source fusion intelligence has not, and will not, generate a repeatable and reliable capability to provide multi-source fused intelligence.

It may be argued, there is no requirement for enlisted or officer personnel to perform multi-source intelligence analysis beyond current capability. However, General Welsh maintained, “the Air Force’s ability to continue to adapt and respond faster than our potential adversaries is the greatest challenge we face over the next 30 years.”<sup>44</sup> Lt Gen Jamieson argued, in order to address the former CSAF’s concerns, ISR must apply “multi-‘INT’ fusion to inform tactical, operational, and strategic consumers in a near real-time operating environment.”<sup>45</sup> Lt Gen Jamieson also maintained, “the vast majority of ISR professionals, both junior and senior, are largely unprepared for the tidal wave of synthesized information fusion warfare will demand

in the years to come.”<sup>46</sup> Therefore, while it may be argued there is no *requirement* for multi-source fusion intelligence, there is clear indication from senior leaders regarding the necessity of multi-source fusion intelligence.

There will likely be concerns regarding costs -- real monetary expense as well as manpower. Assuming no increase in Air Force end strength authorization for intelligence, re-training or additional training requirements may result in field vacancies or absence from positions for a period of time while undergoing multi-source fusion intelligence training. While multi-source fusion intelligence trained personnel will eventually fill positions previously designated for 1N0X1 and 1N4X1B personnel, there will likely be a period of transition that must be functionally managed. Additionally, offering this new training program to high-demand disciplines such as linguists (1N3) may seem ill-advised. However, as often retention tends to be a concern for high-demand career fields, perhaps an opportunity to serve in a select discipline and in a geographic location otherwise not available would entice retention of well-trained personnel albeit in a different capacity for a period of time. Lastly, with any restructure of forces, there are associated support costs such as training, management, and related issues beyond the scope of this paper but nevertheless worthy of recognition.

## **Conclusion**

*Know the enemy and know yourself, and you can fight a hundred battles  
with no danger of defeat.*<sup>47</sup>  
-Sun Tzu

Multi-source fusion intelligence is a critical capability bringing deeper meaning to single-source intelligence -- “the product of the entire ISR enterprise is actionable knowledge, and that knowledge is most useful if it aids decision-makers in deterring or winning conflicts.”<sup>48</sup> This critical capability is currently left to chance based on a patch-work of site-specific preparation

and training of personnel rather than a well-defined program resulting in a reliable capability. Lt Gen (ret) Deptula rightly predicted, “we are going to find ourselves in the not too distant future swimming in sensors and drowning in data.”<sup>49</sup> While there are no doubt costs associated with creating a multi-source fusion intelligence training program, the growth of data and the criticality of this discipline as outlined in the AFFOC makes creating multi-source fusion intelligence training even more critical, ensuring meaningful and relevant intelligence provides decision advantage and is a reliable and repeatable capability. Therefore, the Air Force should establish a multi-source fusion intelligence training program and then assign this cadre of trained personnel to positions requiring the production of multi-source fusion intelligence.

- <sup>1</sup> *Air Force Future Operating Concept, A View of the Air Force in 2035*, September 2015, 23.
- <sup>2</sup> AFFOC, 23.
- <sup>3</sup> General David Goldfein, Chief of Staff, USAF (address, Air Force Association Convention, National Harbor, MD, 20 Sep 2016).
- <sup>4</sup> AFFOC, 23.
- <sup>5</sup> AFFOC, 23.
- <sup>6</sup> AFFOC, 23.
- <sup>7</sup> Gregory F. Treverton & C. Bryan Gabbard, *Assessing the Tradecraft of Intelligence Tradecraft*, RAND Report TR 293 (Santa Monica, CA: RAND, 2008), 39.
- <sup>8</sup> AFFOC, 23.
- <sup>9</sup> *Joint Operating Environment 2035, The Joint Force in a Contested and Disordered World*, Joint Chiefs of Staff, 14 July 2016, 18.
- <sup>10</sup> AFFOC, 9.
- <sup>11</sup> Mark M. Lowenthal, *Intelligence: From Secrets to Policy* (Thousand Oaks, CA: CQ Press, 2015), 149.
- <sup>12</sup> Interview with CMSgt – National Guard Bureau A2/3/6/10 by author, 15 October 2016.
- <sup>13</sup> Ibid.
- <sup>14</sup> Ibid.
- <sup>15</sup> Department of the Air Force, *AFSC 1N0X1 All Source Intelligence Analyst Career Field Education and Training Plan*, Washington, D.C., Career Field Education and Training Plan 1N0X1, parts I and II, 26 September 2016., 1-41.
- <sup>16</sup> Ibid.
- <sup>17</sup> Ibid.
- <sup>18</sup> Interview with TSgt - 1N4X1B Course Instructor, Goodfellow AFB, TX, by author, 2 Feb 17.
- <sup>19</sup> Ibid., 2 Feb 17.
- <sup>20</sup> Ibid., 2 Feb 17.
- <sup>21</sup> Interview with Capt - 14NX Course Instructor, Goodfellow AFB, TX, by author, 3 Feb 17.
- <sup>22</sup> House Armed Service Committee, Subcommittee on Air and Land Forces, *Air Force Intelligence, Surveillance and Reconnaissance (ISR) Programs*, 19 Apr 2007, 7.
- <sup>23</sup> Maj John M. Minear, USAF. *Chasing Relevance: Building Actionable Intelligence Analysis*. The Mitchell Forum – Mitchell Institute for Aerospace Studies, No. 5, June 2016, 1-7.
- <sup>24</sup> Ibid., 1-7.
- <sup>25</sup> Brien Alkire, et al., *Leveraging the Past to Prepare for the Future of Air Force Intelligence Analysis*, Santa Monica, Ca.: RAND Corporation, RR-1330, 2016., 31.
- <sup>26</sup> Interview with SSgt - 1N4X1B; SSgt - 1N4X1B; TSgt - 1N0X1; Capt - 14NX3 (former 1N0X1); MSgt - 1N0X1; SMSgt - 1N2X1C/1N4X1B, TSgt - 1N4X1B, by author, Aug – Nov 2016.
- <sup>27</sup> Brien Alkire, et al., *Leveraging the Past*, xiii.
- <sup>28</sup> Ibid., xvi.
- <sup>29</sup> Ibid., xvi.
- <sup>30</sup> Maj Gen VeraLinn “Dash” Jamieson, USAF, & Lt Col Maurizio “Mo” Calabrese, USAF. *An ISR Perspective on Fusion Warfare*. The Mitchell Forum - Mitchell Institute for Aerospace Studies, No 1, October 2015, 4.
- <sup>31</sup> Interview with MSgt - 1N0X1, by author, 4 Oct 16.
- <sup>32</sup> Ibid.

- <sup>33</sup> Interview with TSgt - 1N0X1, by author, 12 Oct 16.
- <sup>34</sup> Ibid.
- <sup>35</sup> Interview with SSgt - 1N4X1B, by author, 4 Oct 16.
- <sup>36</sup> Interview with SSgt - 1N4X1B, by author, 4 Oct 16.
- <sup>37</sup> Interview with TSgt - 1N4X1B, by author, 12 Oct 16.
- <sup>38</sup> Interview with Capt - 14NX3, by author, 4 Oct 16.
- <sup>39</sup> Department of the Air Force, *1N0X1 CFETP*, 1-41.
- <sup>40</sup> Maj Gen VeraLinn “Dash” Jamieson, *An ISR Perspective*, 2.
- <sup>41</sup> Ibid., 4.
- <sup>42</sup> Ibid., 6.
- <sup>43</sup> Christopher G. Pernin, et al, *The Knowledge Matrix Approach to Intelligence Approach*, Santa Monica, Ca.: RAND Corporation, TR-416, 2007., 1.
- <sup>44</sup> AFFOC, 5.
- <sup>45</sup> Maj Gen VeraLinn “Dash” Jamieson, *An ISR Perspective*, 4.
- <sup>46</sup> Ibid., 5.
- <sup>47</sup> Mao Tse-tung, “*On Protracted War*,” in *Selected Military Writings of Mao Tse-Tung* (Peking: Foreign Language Press, 1963), 15
- <sup>48</sup> AFFOC, 16.
- <sup>49</sup> House Armed Service Committee, 7.

## Bibliography

- Air Force Future Operating Concept, A View of the Air Force in 2035*, USAF, September 2015
- Alkire, Brien, et al., *Leveraging the Past to Prepare for the Future of Air Force Intelligence Analysis*, RAND Corporation, RR-1330 (Santa Monica, CA: 2016).
- Department of the Air Force, *AFSC INOXI All Source Intelligence Analyst Career Field Education and Training Plan*, Washington, D.C., Career Field Education and Training Plan INOX1, parts I and II, 26 September 2016.
- Goldfein, David, General, Chief of Staff, USAF (address, Air Force Association Convention, National Harbor, MD, 20 September 2016).
- House Armed Service Committee, Subcommittee on Air and Land Forces, *Air Force Intelligence, Surveillance and Reconnaissance (ISR) Programs*, 19 April 2007.
- Jamieson, VeraLinn “Dash”, Maj Gen, USAF, & Calabrese, Maurizio “Mo”, Lt Col, USAF. *An ISR Perspective on Fusion Warfare*. The Mitchell Forum - Mitchell Institute for Aerospace Studies, No 1, October 2015.
- Joint Operating Environment 2035, The Joint Force in a Contested and Disordered World*, Joint Chiefs of Staff, 14 July 2016.
- Lowenthal, Mark M., *Intelligence: From Secrets to Policy* (Thousand Oaks, CA: CQ Press, 2015).
- Mao Tse-tung, “*On Protracted War*,” in *Selected Military Writings of Mao Tse-Tung* (Peking: Foreign Language Press, 1963).
- Minear, John M., Maj, USAF. *Chasing Relevance: Building Actionable Intelligence Analysis*. The Mitchell Forum – Mitchell Institute for Aerospace Studies, No. 5, June 2016.
- Pernin, Christopher G., et al, *The Knowledge Matrix Approach to Intelligence Approach*, RAND Corporation, TR-416 (Santa Monica, CA: 2007).
- Treverton, Gregory F., Gabbard, C. Bryan, *Assessing the Tradecraft of Intelligence Tradecraft*, RAND Corporation, TR 293 (Santa Monica, CA: 2008).