



## THE EVOLUTION OF AIR FORCE TARGETING\*

Capt John R. Glock, USAF

*The choice of enemy targets is the most delicate operation of aerial warfare.*  
—Giulio Douhet, 1921

*The key to air power is targeting and the key to targeting is intelligence.*  
—Col John Warden, 1990



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**F**ROM THE ALPHA to the omega, targeting has been the essence of air power.<sup>1</sup> People who have written about or employed aerospace power have long recognized the importance of targeting. They have understood that successful application of air power depends on targeting. This article examines three themes. First, it traces the evolution of Air Force targeting. Second, it shows that Air Force targeting has been a driving force in the development of air intelligence. The final theme is the Air Force's leadership in air targeting.

### World War I

From their earliest days, aerospace planners have pursued the idea of the “strategic” application of air power. German Zeppelin raids on London in 1917 are probably the first known uses of air forces beyond direct support of ground operations.<sup>2</sup> While the material effects of these raids were minimal, the effects on the conceptual role of air power were tremendous. During this period, the US developed its concept for strategic bombing against commercial centers and lines of communications. In November 1918, then-Maj Edgar S. Gorrell developed (and had approved) the first strategic bombardment plan for the Air Service, American Expeditionary Forces (AEF).

Gorrell's objective was to “drop aerial bombs upon commercial centers and the lines of communications (LOC) in such quantities as will wreck the points aimed at and cut off the necessary supplies without which the armies in the field cannot exist.”<sup>3</sup> To achieve this result, planners required targets. To determine these targets, airmen systematically analyzed critical enemy industrial centers and LOCs to ascertain which should become targets.<sup>4</sup>



However, the war ended before the AEF could fully execute the plan.<sup>5</sup> The [World War I] US Bombing Survey concluded that the Air Service needed to identify critical targets to support a systematic plan for air operations. The survey stated that

the greatest criticism to be brought against aerial bombardment . . . as carried out in the war of 1914–1918 is the lack of a predetermined program carefully calculated to destroy . . . those industries most vital in maintaining Germany’s fighting force.<sup>6</sup>

It recommended that

a careful study should be made of the different kinds of industries and the different factories of each. This study should ascertain how one industry is dependent on another and what the most important factories of each are. A decision should be reached as to just what factories if destroyed would do the greatest damage to the enemy’s military organization as a whole.<sup>7</sup>

Another lesson from the war was that dedicated, trained individuals (knowledgeable of air power) are needed to undertake this careful study. The Intelligence Section of the General Staff (G-2) created an Air Intelligence (A-7) subsection. Then—1st Lt Alfred T. Bellinger, a G-2/A-7 staff officer, reported that there were some who believed that the “work of air intelligence belonged properly to the Air Service. . . . Supporters of this theory [believed] it was necessary for an intelligence officer to have technical knowledge of aviation for the proper performance of his duties.”<sup>8</sup> Immediately following World War I, Gen William (“Billy”) Mitchell identified the need for (target) intelligence officers at the staff and unit level. He saw the need for these officers “to compile and maintain all information of value in the preparation of bombing missions, an indexed file of photographs, and a stock of maps and charts showing bombing targets and intelligence concerning them.”<sup>9</sup>



*Immediately following World War I, Gen William (“Billy”) Mitchell (first row, center) identified the need for target intelligence officers at the staff and unit level.*



World War I taught us that successful application of air power requires a predetermined plan calculated to destroy the enemy's will and war-sustaining capability. Achieving this goal requires systematic analysis to determine which targets if destroyed would do the greatest damage to the enemy. An organization with a constant focus on air targeting is needed to undertake this kind of systematic study. This organization needs to maintain files of information about potential targets as well as requisite target materials. From the beginning, the Air Service took the lead in air targeting. It not only developed the first concepts for the offensive use of air forces, but also for the intelligence support required.

### Interwar Years

As a result of the lessons from World War I, the Air Service (later the Air Corps) recognized it needed to more fully develop its concepts for the employment of air power. Through the interwar period, the Air Service Tactical School (ASTS)—later the Air Corps Tactical School (ACTS)—continued to develop the concept of strategic bombing. The instructors recognized targeting as an integral part of bombardment.<sup>10</sup> By 1926 many airmen considered bombardment the most important role for air power. The predominance of bombardment led to an increasing emphasis on targeting. Then-Maj Donald Wilson, an instructor at the ACTS, believed that attacking a few critical targets would disrupt an enemy's economy. These targets, if successfully destroyed, would have a twofold effect. First, the enemy's industrial complex could not sustain its fielded forces. Second, the effect on the day-to-day lives of the civilian population would be so disruptive that they would lose faith with their government and military and force the national leadership to



sue for peace.<sup>11</sup> According to then-Lt Haywood Hansell (one of two officers assigned to help Major Wilson), one of the principal tenets upon which the school based its strategic doctrine stated:

Proper selection of vital targets in the industrial/economic/social structure of a modern industrialized nation, and their subsequent destruction by air attack, can lead to fatal weakening of an industrialized enemy nation and to victory through airpower.<sup>12</sup>



*Through the interwar period, the Air Corps Tactical School continued to develop the concept of strategic bombing and recognized that targeting was an integral part of bombardment.*



*Prior to World War II, the Air Corps made no provision for air intelligence training. Gen Ira C. Eaker, commander, Eighth Air Force, reported that "intelligence represents the section of activity in which we are weakest."*



By the 1930s the Air Corps had developed a doctrine based on the belief that air power could achieve victory by breaking the enemy's will and capability to fight. It would accomplish this by

destroying organic industrial systems in the enemy interior that provided for the enemy's armed forces in the field; and paralyzing the organic industrial, economic, and civic systems that maintained the life of the enemy nation itself.<sup>13</sup>

This doctrine led to an even greater need for target intelligence. According to Hansell, the ACTS believed strategic intelligence was "vital to the planning and conduct of strategic air warfare."<sup>14</sup> He continues,

Much of the value of the bombing offensive, should there be one, would of necessity rest on intelligence data and the conclusions planners gleaned from it. In truth these specific questions were beyond the competence of the Tactical School. Strategic air intelligence on the major world powers would demand an intelligence organization and analytical competence of considerable scope and intelligence and complexity.<sup>15</sup>

Yet during the lean years of the "all-pilot Air Corps," when the Air Corps was struggling for its survival, there was no time or inclination to train officers in combat intelligence.<sup>16</sup> Despite the clear lessons of World War I, the Air Corps entered the Second World War without an intelligence organization capable of conducting systematic studies of potential enemies and recommending vital targets whose subsequent destruction would lead to victory. The Air Corps still relied on Army G-2 to maintain sufficient data and target materials to support both the planning and conduct of air operations.



## World War II

On the eve of World War II, the Army Air Corps had a well-developed doctrine, but Army G-2 was not providing the intelligence support needed to turn doctrine into operations.

The American airman entered the war with a rather well-developed body of doctrine on how the airplane should be employed . . . but it was evident from an early date that the AAF [Army Air Forces were] poorly prepared for waging a strategic campaign against Germany, or any other enemy, because of the paucity of organized intelligence on the target itself.<sup>17</sup>

In 1940 Gen H. H. Arnold recognized that the Air Corps was not receiving the intelligence it needed to establish requirements or to plan operations. He requested and received permission to establish an air intelligence organization under the chief of the Air Corps. Then-Major Hansell was the first chief of the Strategic Air Intelligence Section, A-2. His section performed economic-industrial-social analyses. It analyzed and described the vital and vulnerable systems, selected targets, and prepared target folders.<sup>18</sup> In July 1941 General Arnold assigned Major Hansell to the new Air War Plans Division (AWPD). The initial effort of the division was to prepare the Army air section of the “Joint Board Estimate of United States Over-All Production Requirements.”<sup>19</sup>

However, when war began, the Army Air Forces (AAF) still had inadequate intelligence to plan and conduct combat operations and lacked a systematic method for selecting targets. Prior to World War II, the Air Corps made no provision for air intelligence training.<sup>20</sup> Gen Ira C. Eaker, commander of the Eighth Air Force, reported in March 1942 that “intelligence represents the section of activity in which we are weakest.”<sup>21</sup> Then-Col George



C. McDonald, chief of Eighth Air Force intelligence, recalled that no one provided intelligence “in any useful form at the beginning of the war—we went into the field empty handed in this respect.”<sup>22</sup> While there was an Air Intelligence Section, there was still no organization capable of doing the systematic analysis required for proper targeting. There were no trained target intelligence officers. Just as important, we still had not developed the data base of potential targets and built the target materials needed to support our air forces.

During the fall of 1942, AWPD-42, Requirements for Air Ascendancy, was under discussion at the highest level, and as the discussion progressed, the plan’s limitations in the field of target analysis became the more readily apparent. The AAF had accumulated a vast amount of data on Germany. However, no rational system for target selection existed. General Arnold established the Committee of Operations Analysts (COA) in December 1942 to overcome this shortfall. For the first time the United States had a single organization responsible for the collection and analysis of intelligence for the purpose of air target selection.<sup>23</sup> Air planners used the target selection done by the COA as the basis for the Combined Bomber Offensive against Germany and for the strategic campaign against Japan. This group eventually evolved into the first Joint Target Group. The deputy assistant chief of the Air Staff for targeting headed this organization. Also in 1942, the AAF created a school to train air intelligence officers. Another outgrowth of the attempt to find a systematic approach to target selection was the creation of a data base of potential targets. It was called the Bombing Encyclopedia,<sup>24</sup> and was the forerunner of the Basic Encyclopedia (discussed later) that we use today.



By 1944, most planners in the AAF recognized the importance of intelligence to air operations. General Hansell, in his memoirs, stated:

I believed foreign industrial analysis and targeting was the sine qua non of strategic air warfare. Without such intelligence and analysis there could be no rational planning for the application of airpower. Douhet's statement to [the] effect that the selection of objectives and targets was the essence of air strategy was patently true.<sup>25</sup>

General McDonald, USAF director of intelligence, was even more specific about what type of intelligence when he said that "target intelligence is the basic requirement because a Strategic Air Force is nothing more than a large collection of airplanes unless it has a clear conception of what to use its planes against."<sup>26</sup> Just as the (World War I) bombing survey had done, the United States Strategic Bombing Surveys (USSBS) emphasized the importance of target selection to the planning and conduct of operations. The USSBS stated:

The importance of careful selection of targets for air attack is emphasized by [our] experience. Our strategic intelligence . . . at the outset of the war was highly inadequate. . . . [I]f a comparable lack of intelligence should exist at the start of a future national emergency, it might prove disastrous. . . . The present shortage of trained and competent intelligence personnel give[s] cause for alarm and require[s] correction.<sup>27</sup>

Two world wars showed that the proper selection of vital targets is critical to the successful application of air power. Selection of targets is dependent on a systematic study of available intelligence. Without such intelligence and its systematic analysis there can be no rational planning for the application of air power. An organization with a high degree of analytical competence is required to perform this targeting function. It requires competent,



trained personnel who understand the capabilities and limitations of intelligence as well as aerospace forces. These individuals must have access to a current data base and the knowledge to use it. Finally, as the USSBS states, the lack of this ability at the beginning of a future national emergency might prove disastrous!

### Korean War

Five years after World War II, the prophetic words of the USSBS were realized. Despite the lessons of two world wars and the warnings contained in the [World War I] Bombing Survey and the USSBS, we did not possess the organization, intelligence personnel, data base, or target materials needed to support the application of aerospace forces on the Korean peninsula.<sup>28</sup> We were even less prepared to target North Korea in the opening moments of the Korean conflict—the precise time when air power may have proven most decisive—than we were for Germany before World War II.

Prior to the outbreak of war, there was no organization in the Air Force maintaining and analyzing the North Korean target base. The existing data base on North Korea was inadequate. In part, this was due to the Far East Command's (FEC) lack of contingency plans for war with North Korea.<sup>29</sup> A Far East Air Forces' (FEAF) report highlights these shortfalls:

The probability of fighting in Korea largely had been overlooked in the years following World War II. As a result, we had practically no ready target intelligence. . . . [We] found [ourselves] without a targeting system capable of fulfilling the requirements. . . . However, an even more serious deficiency was the small amount of Korean targeting which had been accomplished. . . . The latter stemmed from several basic causes, the most obvious of which was the small number of intelligence personnel who had been assigned to FEAF.<sup>30</sup>



Only 53 targets in North Korea had target folders, and these were out of date. In addition, there were no current target materials on Korean targets. There was even a lack of basic imagery products. The FEAF Bomber Command stated that the available imagery, when it did exist, was of poor quality.

The problem of inadequate numbers of trained intelligence personnel to support the targeting function continued throughout the war. Two separate studies were conducted to evaluate the effectiveness of the Air Force in Korea. Both reports indicated that the outbreak of the war had created an immediate shortage of intelligence personnel. They also pointed out that inadequate training made these shortages more acute. The shortage was so acute that FEAF had to draft flying officers to perform intelligence functions. As late as July 1952, the FEAF Bomber Command “lacked sufficient personnel to handle any large day-to-day quantity of targets.”<sup>31</sup> The FEAF report states that

the Korean campaign provided more than enough evidence to bolster the contention that neglect of intelligence training during peacetime is a serious mistake, if that point had not already been made powerfully clear at the outset of World War II. The FEAF was woefully lacking in competent Combat Intelligence Officers.<sup>32</sup>

General Headquarters Far East Command (GHQ FEC) assumed responsibility for targeting. The chief of staff established the GHQ Target Group on 14 July 1950 and made it responsible for target nominations. However, the GHQ Target Group was not capable of performing this task. The work of this group was neither systematic nor thorough. It resulted in information of questionable value. Of the 220 primary and secondary targets that the group nominated, 20 percent did not even exist.<sup>33</sup> The remaining targets were often unsuitable for attack by aircraft. Finally, of the



targets that did exist and that were suitable for attack by aircraft, many were not supported with adequate imagery or information. Eventually, FEAF took on a greater portion of the target-nomination process, and gradually became the theater-targeting body. It was responsible for nominating targets that were the basis for air campaigns meeting the needs of the FEC.<sup>34</sup> However, it was two years before there was a fully integrated joint targeting effort.

The lack of trained analysts affected two additional areas: combat assessment and weapon recommendations. The FEAF Report on the Korean War indicates that there were very few studies conducted on the results obtained from our bombing. It states, “If a more extensive effort had been devoted to [combat assessment], a more accurate appraisal of the value of [our] target plans would have resulted.”<sup>35</sup> The report also indicates that there was little effort made to make weapon recommendations. Just 10 days before the armistice, the FEAF director of intelligence was finally able to establish a Vulnerability Division.

The mission of this Division was to provide effective and economical weapon recommendations. If this Division had been established earlier it undoubtedly would have contributed to a more efficient accomplishment of FEAF’s mission in the Korean War.<sup>36</sup>

FEAF lessons learned stated:

Although we had failed to stockpile targeting materials on Korea prior to the outbreak of hostilities, a greater initial deficiency was a lack of a targeting system. . . . Our hastily improvised targeting program . . . suffered from a lack of trained and experienced intelligence officers. . . . [This] resulted in a lack of sufficient enemy reaction studies, and an inability to provide complete weapon recommendations. . . . The inability to perform these vital targeting functions caused us to over-estimate the results of several air campaigns.<sup>37</sup>



It went on to say that

good target research must include physical vulnerability studies and weapons selection recommendations [and that] a truly effective targeting program must . . . be initiated before fighting starts.<sup>38</sup>

Our experiences gained during the Korean conflict reinforced the lessons learned in both world wars. Once again we saw that the proper selection of vital targets is critical to the successful application of air power. Selecting these targets requires an organization with trained, experienced personnel, who must be familiar with both the operations and intelligence worlds. In an effort to correct deficiencies existing at the start of the Korean conflict, the Air Force created the targets officer career field in 1954. It also enlarged the scope of the data base of potential targets to include many more potential enemies. Also, at the request of the Joint Chiefs of Staff, the Air Force became the executive agency for the Department of Defense's (DOD) Air Target Materials Program (ATMP) in 1953. This was done to ensure the adequacy of air targeting materials. The Air Force's ability to do targeting had made great progress since the days of Gorrell.

### Vietnam Conflict

Unfortunately, much of the progress the Air Force made in the fifties was lost in the early sixties. One of President John F. Kennedy's first acts was to restructure the DOD. Kennedy and Secretary of Defense Robert S. McNamara wanted to make the department more efficient and flexible. One way of doing this was to centralize functions that were not service-specific. One of these functions was intelligence. In 1962 the Defense Intelligence Agency (DIA) took over much of the intelligence work previously



done by the services. One of these areas was the maintenance of the targeting data base. DIA also became responsible for the ATMP and the Tactical Target Materials Program (TTMP). Unfortunately DIA (and the Air Force) largely ignored conventional targeting applications in the nuclear age. The Air Force would soon feel the results of both the centralization of intelligence and the neglect of conventional operations.

Some believe the centralization of the targeting functions within a national agency was imprudent. Maj Gen George Keegan, the Seventh Air Force deputy chief of staff for intelligence in 1968–69, said, “Years ago, the mission of targeting was taken away from the Department of the Air Force and passed to the Defense Intelligence Agency, where it simply died.”<sup>39</sup> At the beginning of our involvement in Vietnam, the Air Force did not have an adequate targeting organization to support our combat operations. As one lesson learned states:

The targeting function is an essential element in the effective employment of fighting forces. . . . [T]he Second Air Division intelligence organization could not provide adequate planning and execution support to the rapidly escalating air operations.<sup>40</sup>

The situation was very similar to that of the Korean Conflict. The Basic Encyclopedia provided targeteers and planners with basic infrastructure and industrial installations. Pacific Command (PACOM) planners were able to identify 94 targets in North Vietnam. PACOM Operation Plan 37-64 contained a Strike Plan Target List with these targets arranged into four attack options. Each option provided for escalation of the conflict. The objectives of the war being constrained as they were, the US was forced to attack “in-country” targets. Because the Air Force did not have a target-



ing organization capable of supporting this, “[Military Assistance Command, Vietnam] MACV J-2 developed its own organization, the Target Research and Analysis Center (later renamed the Combined Intelligence Center, Vietnam [CICV]), to accomplish the in-country targeting task.”<sup>41</sup>

During the battle for Khe Sanh (Operation Niagara), MACV relinquished control of targeting. The Air Force created an ad hoc targeting organization to effectively use air assets. The Seventh Air Force deputy chief of staff for intelligence (DCS/I), augmented by TDY personnel, established an intelligence control center. This center represented the first major Air Force contribution to the in-country targeting effort. In March 1968 the Air Force recalled the TDY personnel. This recall terminated the operation of the intelligence control center, effectively conceding de facto control of targeting back to MACV. This again limited the Air Force to providing on-call fire support to the ground forces in Vietnam, just as we had in Korea.<sup>42</sup> “The Air Force quickly found itself woefully short of targeting personnel. By 1969 [the] Air Force had just about exhausted its cadre of experienced targeteers fighting the war. The void was filled with ‘CBPO’ targeteers with little or no experience.”<sup>43</sup>

The war effort was negatively impacted by a shortage of intelligence personnel and their lack of training.

Although the Air Force had been in SEA [Southeast Asia] since late 1961, adequate intelligence personnel resources were still unavailable when the rapid buildup began. . . . The buildup began at a time when the Air Force was actually reducing manpower resources in response to budgetary and gold flow constraints. . . . [T]he lack of adequate formal and technical training for intelligence personnel adversely affected the intelligence missions in SEA.<sup>44</sup>



There were many positive lessons from Vietnam. Air Force doctrine recognized that target intelligence is essential to aerospace operations.

The role of intelligence support in the effective employment of tactical air forces is of critical importance. Targeting is the key function and includes exploitation of all intelligence sources for target development, material production, target analysis, recommendations for strike and strike assessment.<sup>45</sup>

Sixty-three percent of the intelligence chapter in AFM 2-1 is devoted to targeting. Air Force intelligence also learned critical targeting lessons. It realized that it was not sufficient to just assign intelligence officers to targeting positions. Intelligence officers needed formal targeting training. In 1974 the Air Force again took the lead by establishing the Armed Forces Target Intelligence Training Course. This course trained Army, Navy, and Air Force officers in the capabilities and limitations of all services' weapons systems supporting air operations. It also trained students in analytical methodologies for selecting, prioritizing, and recommending targets meeting the commander's objectives and guidance. Graduates of this course were unique because they possessed an understanding of air operations, as well as intelligence operations. They provided the critical link between the two communities.

### The Gulf War

The Gulf War was the first operational test of this link. Building on nearly eight decades of history and lessons learned, the Air Force entered the Gulf War more prepared to apply aerospace forces than at any time in the past. Even with these preparations there were problems. Air Force targeting officers did not provide



the support that decision makers, planners, and aircrews required. Some of these problems were institutional, some resulted from changing concepts of air power employment, and others were systemic within the intelligence bureaucracy. We will examine a few of these. The purpose is not to provide apologies or to lay blame. Rather, it is to identify the unique capability trained targeting officers can bring to the application of aerospace forces.

In 1990 an Air Force targeting element supported each unified command. In February 1990 Central Command (USCENTCOM) directed its Air Force component (Ninth Air Force/CENTAF [US Air Forces, Central Command]) to update the air plan for Operational Plan (OPLAN) 1002-90. In support of this request, the 9th Tactical Intelligence Squadron (TIS) Target Intelligence Division<sup>46</sup> began target development for the draft OPLAN. Air Force targeting officers took the objectives that the air planners provided and identified target systems to meet them. These targeting officers researched known installations and developed lists of potential targets. They used these lists to produce the *Iraqi Target Study*, which was published on 15 June 1990.

Two recurring problems hampered these targeting officers. First was the inadequacy of the installation data base. DIA maintains a worldwide installation data base known as the Automated Installation File (AIF). This file is a system used to store, manipulate, and retrieve target intelligence. Ideally it has information on every installation or place of potential military significance. However, 40 percent of the targets struck during the Gulf War were not in this data base in July 1990. The number of targets in some critical categories grew by several hundred percent. In addition to listing installations, the AIF should contain vital



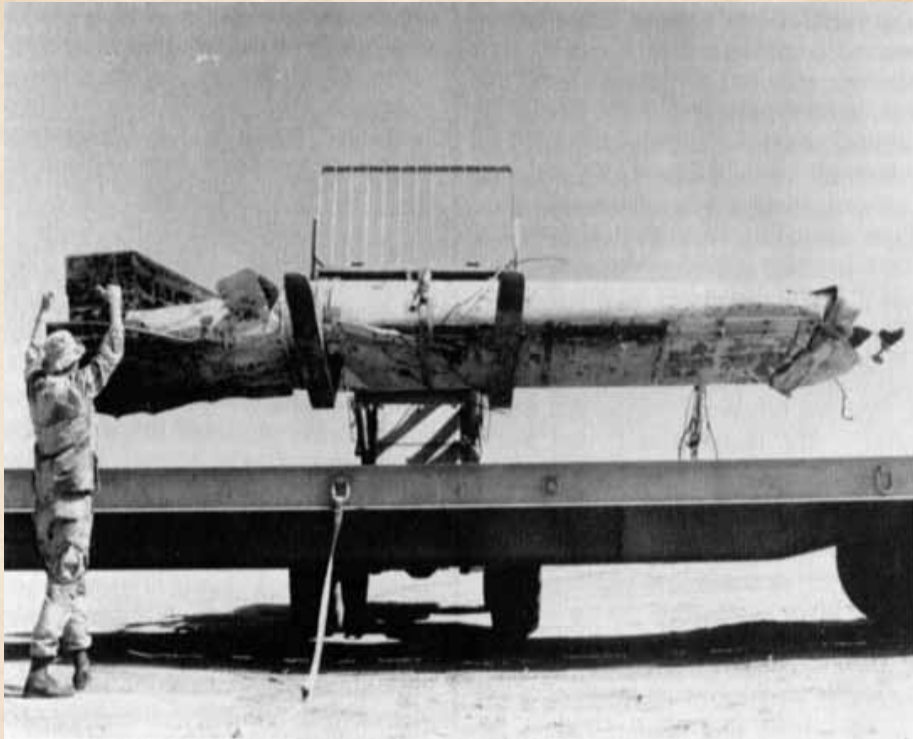
targeting information such as construction data and identification of critical components. Unfortunately, many of the AIF records fell far short of providing the information necessary for accurate targeting.<sup>47</sup>

The second problem that the 9th TIS targeting staff encountered was the lack of necessary imagery and supporting target materials. Of the 218 targets that the 9th TIS identified, there was imagery of only 90. Of these 90, only 30 had target materials. At the initiation of the crisis 24 percent of the installations identified in Iraq had target materials. Of the targets actually struck during the war, only 11 percent had target materials on 2 August 1990. In a 29 August 1990 DIA memo to the deputy director for foreign intelligence, the DIA chief of targets acknowledged that DIA had “issues to resolve and problems to fix [with availability of target materials] after the crisis.”<sup>48</sup> In addition to the basic shortage of target materials at the beginning of the crisis, many were of questionable utility due to their currency.<sup>49</sup> The average date of production was 1982, with the oldest produced in June 1973—17 years before the crisis.<sup>50</sup>

Despite these problems, the contributions of Air Force targeteers should be apparent. Ninety-seven percent of the targets in the 9th TIS *Iraqi Target Study* (produced a month and a half prior to the Iraqi invasion) were struck during Desert Storm. By comparison, 93 percent of the 12 August 1990 Air Staff target list and only 30 percent of the targets in the July 1990 CENTCOM Joint Target List were struck during the war.<sup>51</sup> More than four months prior to the invasion, the 9th TIS identified information and imagery shortfalls that would impact combat operations if not satisfied.



Air Force targeting officers were also available to support planners in the area of weapon recommendations and critical element analysis. They recommended the optimum mix and number of weapons, fuzing, and critical elements throughout the war. In some cases, strategic planners chose to disregard this information. The planners often thought the recommendations were too conservative. Three examples should illustrate this point.<sup>52</sup> In August 1990 CENTAF targeting personnel recommended that bridges only be attacked by aircraft using precision guided munitions (PGM). Initially, this advice was ignored. Based on unacceptable results, planners shifted to using PGMs against bridges. Also in August, targeting officers estimated that a particular target would require more PGMs than planners thought it should. This target type was struck but never penetrated during the war. At the end of the war it was fully functional. (In January 1993, as part of Operation Southern Watch, this same target was struck using the number of weapons recommended by the targeting staff. The result this time was the functional destruction of the facility.) Finally, on 19 January 1991, a targeting officer recommended using CBU-89s and CBU-87s against mobile Scuds. Following the recommended strike, there was a break of 60 hours before the Iraqis launched another Scud against Israel and more than five days before there was another mass launch. We will never know if this was a result of this strike or not. Planners switched back to PGMs in an effort to achieve physical destruction instead of using an area denial strategy to achieve a functional kill.



*Following the strike by CBU-89s and CBU-87s against mobile Scuds (above) recommended by a targeting officer, there was a significant break in time before another mass launch. We will never know whether or not this hiatus was the result of the strike since planners returned to the use of PGMs.*

Targeting officers were not as successful in providing essential combat assessment information. One reason for this was a lack of training. The former Armed Forces Targeting Course provided only five hours of instruction on combat assessment. Exercises also provided little training. Usually there was no poststrike imagery to work with; scripting cells had no model to generate combat



assessments; and briefers failed to realistically account for limited collection assets, weather, and the general fog of war.

Desert Storm raises fundamental questions about the effectiveness of targeting. Were targeting officers always right? No. Did they provide the best support possible? No. Is there significant room for improvement before the next war? Emphatically yes! Vietnam helped forge targeting as the critical link between operations and intelligence. The lessons from Desert Storm should be used to further temper and strengthen this vital linkage.

### Today

Unfortunately, the prevailing trend is not to strengthen this linkage, but to eliminate it. The global geopolitical situation has changed. One result is the downsizing and restructuring of the military services. The Air Force decided, after much thought, to eliminate the targeting officer career field. This decision was based on budgetary and manpower constraints. Part of the rationale was that it appears more cost-effective to maintain generalists at the expense of trained specialists. One question may remain unanswered until the next war: Is it more effective? The Navy has reached far different conclusions about the need for targeting. The Navy, which prior to the Gulf War did not teach targeting at its intelligence school, now teaches more hours on targeting than does the Air Force.

Since the end of the Gulf War, many have written about the war's lessons. Most authors have addressed how precision weapons and stealth platforms have altered the nature of warfare. This masks another more critical lesson—the importance of targeting.



Not only have most authors failed to address the significance of targeting, they have also failed to see how greater precision requires even greater and more detailed target analysis. In each conflict we have seen our weapons accuracy improve. We have gone from Saint-Mihiel, France, to Ploesti, Rumania, to the Wonsan locomotive shops in North Korea, to the Paul Doumer bridge in North Vietnam, to the ventilation shaft of the Iraqi air force headquarters. An enduring lesson learned about delivery accuracy during the last eight decades is that the greater the accuracy of our weapons, the more accurate we need our targeting to be.

In 1992 Congress encouraged the Secretary of Defense, heads of military services, the chairman of the Joint Chiefs of Staff, and the director of the DIA to make resources available for a Joint Target Training Program. For the first time since 1918, the Air Force has not taken the lead in a targeting program. Although the Air Force has the greatest experience in joint air targeting and the preponderance of air assets, it has taken a backseat in the future of joint targeting. The Navy is the executive agent for the new Joint Target Training Program, which is located at the Navy and Marine Intelligence Training Center.

### Conclusion

This article has presented three themes. First, air targeting is fundamental to the application of aerospace forces. Second, the evolution of Air Force targeting has in part driven the development of air intelligence. Finally, the Air Force has historically taken the lead in air targeting.



We have seen that from the very beginning of aerospace planning, there was a need to systematically identify critical targets based on the wartime objectives. World War II validated the views of the Air Corps Tactical School and led to the creation of a single, wartime organization responsible for the collection and analysis of intelligence for the purpose of air target selection. The Korean War dramatically emphasized that a truly effective targeting program must be initiated before the fighting starts. It also reinforced the lesson that the requirement is not for generic intelligence personnel but for trained and experienced professionals capable of making target and weapon recommendations and then analyzing the results of these strikes. After the Korean War, Air Force intelligence created the target intelligence career field, and the DOD made the Air Force the executive agent for the ATMP. The Vietnam conflict reconfirmed the lessons of previous wars. Further, it highlighted the need for specialized training in targeting functions. Following the Vietnam conflict, the Air Force took the lead in target training by establishing the Armed Forces Target Intelligence Course—the first course ever developed to train personnel in essential targeting functions.

The Air Force offers the quickest, longest-ranged, and most flexible force available to the nation. As we continue to draw down, our power-projection capabilities will become even more vital in protecting US interests.<sup>53</sup> While efficiency may be a peacetime measure of merit, effective targeting remains crucial to applying aerospace power. Targeting remains one of the easiest and most cost-effective means of preserving our diminishing resources before the first weapon is committed.<sup>54</sup> Yet the Air Force is in danger of forgetting that targeting is a unique, critical function. It has al-



ready eliminated the only comprehensive course in the DOD dedicated to air targeting and relinquished the lead in the development of the Joint Target Training Program.<sup>55</sup> Future application of aerospace power will likely suffer. As we draw down, these decisions will have a negative impact on our country's ability to respond to regional conflicts in a timely and decisive manner. The inherent range and speed of aerospace forces provide "global reach"; however, *without "global targeting," we will greatly reduce our "global power!"*

We stand at a crossroads in the development of aerospace power. The path we choose will have as profound an effect on its future as did the early debates on the fundamental roles of aerospace power. We can continue to build on the lessons of the past and reestablish Air Force targeting before our current expertise fully erodes. Or we can ignore these lessons, only to learn them again at the expense of aircrew lives. We need only look to our predecessors—the Gorrells, Mitchells, Arnolds, Hansells, Stratemeyers, Momyers, and Glossons to find the direction we should go at the operational level. "*AIR POWER IS TARGETING AND TARGETING IS INTELLIGENCE!*"<sup>56</sup>

#### Notes

1. The contributions of all the services are included in the collective terms *air power* and *aerospace power*.

2. The first military use of powered aircraft for bombing was in 1911. Italian pilots threw 4.4-pound bomblets from their aircraft against Libyan forces. Besides resulting in the first claim of collateral damage to a hospital, the need for better bombs and target materials was identified. Robin Higham, *Air Power: A Concise History* (New York: St. Martin's Press, 1972), 21–23.



3. Edgar S. Gorrell, "Early History of the Strategical Section," ed. Maurer Maurer, in *The U.S. Air Service in World War I* (Washington, D.C.: Government Printing Office, 1978), vol. 2, 143.
4. Given the accuracy of bombing at this point, only installations needed to be identified. The ability to identify critical elements at installations would not be needed until the Vietnam War.
5. Between 12 June 1918 and 11 November 1918, US bombers dropped 275,000 pounds of bombs on railyards, factories, bridges, command posts, troop concentrations, lines of communication (LOC), and so forth.
6. "U.S. Bombing Survey," in Maurer, vol. 4, 501.
7. *Ibid.*, 502.
8. *Ibid.*, vol. 3, 215.
9. "Mitchell: Provisional Manual of Operations," in *ibid.*, vol. 2, 279.
10. Maj T. D. Milling, "The Air Service Tactical School: Its Function and Operation," Langley Field, Va., Air Service Tactical School, 1924.
11. Robert T. Finney, *History of the Air Corps Tactical School, 1920-1940* (Maxwell AFB, Ala.: Air University, 1955), 31.
12. Haywood Hansell, *The Strategic Air War against Germany and Japan* (Washington, D.C.: Office of Air Force History, 1986), 10.
13. *Ibid.*, 11.
14. *Ibid.*
15. *Ibid.*, 19.
16. Harold B. Hinton, *Air Victory: The Men and the Machines*, with a foreword by Barton K. Yount (New York: Harper & Brothers Publishers, 1948), 145-46.
17. William A. Goss, "The AAF," in Wesley Frank Craven and James Lea Cate, eds., *The Army Air Forces in World War II*, vol. 6, *Men and Planes* (Washington, D.C.: Office of Air Force History, 1983), 40.
18. Hansell, 21-22.
19. The AWPD input was known simply as AWPD-1. While technically a requirements document, it was really a blueprint for our air operations plan against Germany.
20. Thomas H. Greer, "Other Training Programs," in Craven and Cate, vol. 6, 687.
21. Alfred Goldberg, "Establishment of the Eighth Air Force in the United Kingdom," in *ibid.*, vol. 1, *Plans & Early Operations, January 1939 to August 1942*, 624.
22. Robert Frank Futrell, "US Army Air Forces Intelligence in the Second World War," in Horst Boog, ed., *The Conduct of the Air War in the Second World War* (New York: St. Martin's Press, 1988), 539.
23. Arthur B. Ferguson, "The CBO Plan," in Craven and Cate, vol. 2, *Europe: TORCH to POINTBLANK, August 1942 to December 1943*, 352-54.
24. The Bombing Encyclopedia was the first effort to automate the handling of the vast amount of information needed to provide target recommendations for every country in the world. See James Lowe, "Intelligence in the Selection of Strategic Target Systems," lecture, Air War College, Maxwell Field, Ala., 1946, 13-15.
25. Hansell, 22.
26. George C. McDonald, "The U.S. Air Force Intelligence Prior to and During World War II and Today," lecture, Air War College, Maxwell Field, Ala., 1947, 5.
27. *The United States Strategic Bombing Surveys (European War) (Pacific War)* (Maxwell AFB, Ala.: Air University Press, 1987), 39, 117.



28. The advent of nuclear weapons led many to believe that targeting was not a required discipline. There was no need to analyze the enemy target sets when we were going to bomb whole cities. According to Futrell, there was a belief in the USAF Directorate of Intelligence during the late 1940s that “targets should be working for the Directorate of Plans.” Much of the intimate relationship of air intelligence and air operations was lost during the rapid demobilization of the wartime intelligence force. Futrell, “US Army Air Forces Intelligence in the Second World War,” 547–48.

29. *United States Air Operations in the Korean Conflict, 25 June–1 November 1950* (Maxwell AFB, Ala.: Air University, 1952), 84.

30. *FEAF Report on the Korean War*, Far East Air Forces report, 26 March 1954, vol. 2, 141.

31. *United States Air Operations in the Korean Conflict, 25 June–1 November 1950*, 52–53.

32. *FEAF Report on the Korean War*, vol. 2, 142.

33. *United States Air Operations in the Korean Conflict, 1 July 1952–27 July 1953* (Maxwell AFB, Ala.: Air University, 1956), 10.

34. *FEAF Report on the Korean War*, vol. 2, 142.

35. *Ibid.*, 144.

36. *Ibid.*, 146.

37. *Ibid.*, 147.

38. *Ibid.*

39. Robert Frank Futrell, *Ideas, Concepts, Doctrine: Basic Thinking in the United States Air Force*, vol. 2, 1961–1984 (Maxwell AFB, Ala.: Air University, 1989), 304.

40. *USAF Intelligence Activities in Support of Operations in Southeast Asia, 1 January 1965–31 March 1968* (Maxwell AFB, Ala.: Air University, 1972), 8.

41. *Ibid.*

42. *Ibid.*

43. Thomas E. Lee and Samuel M. Taylor, “Air Force Intelligence Enhancement Program,” technical note, Bolling AFB, D.C., Air Force Intelligence Service, 1985, 4.

44. *Ibid.*, 29–31.

45. Air Force Manual (AFM) 2-1, *Tactical Air Operations—Counter Air, Close Air Support, and Air Interdiction*, 1969, 8-1.

46. In wartime, 9th TIS (now the 609th AIS) became CENTAF Intelligence.

47. John Heidrick, “9TIS/INT Planning Procedures for Internal Look-90 and Operation Desert Shield,” undated paper provided to the author for the Gulf War Air Power Survey (GWAPS); and memorandum for record, Col James R. Blackburn, USAF/INT, subject: Targeting/MC&G Support to DESERT SHIELD (U), 17 October 1990. (Secret) Information extracted is unclassified.

48. DIA memo from chief, Target Intelligence Directorate, to deputy director, Foreign Intelligence, subject: Overall Perspective on Target Materials Available at Crisis Initiation, 29 August 1990.

49. The ATTG was the basic target material at this time. Figures taken from CENTAF, 15 June 1990, and CENTCOM, 27 June 1990, target list and the *Consolidated Tactical Target Materials Catalog*.

50. *Consolidated Tactical Target Materials Catalog (TTMC)* (Langley AFB, Va.: 480 Tactical Intelligence Group, 1990).

51. Looking at the issue from the standpoint of what percentage of the total targets struck was identified in various lists prior to the war, one finds that the percentages for 9th TIS, CENTCOM, and the Air Staff were 43, 22, and 19, respectively.



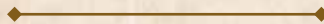
52. All examples are based on the author's experiences. The second example is corroborated by Col David Deptula, one of the air campaign planners for Desert Storm, in an interview conducted by Dr Barry Watts, and the third is recounted in DOD's *Final Report to Congress on the Conduct of the Persian Gulf War* (Washington, D.C.: Government Printing Office, 1992), 166.

53. Secretary of the Air Force Donald B. Rice, *The Air Force and U.S. National Security: Global Reach—Global Power*, white paper (Washington, D.C.: Department of the Air Force, June 1990).

54. Thomas E. Lee, "Targeting—The Key to Effective Air Power" (Thesis, Armed Forces Staff College, 1975), 47.

55. According to the draft memorandum of agreement for the Joint Target Training Program (JTTP), it is intended to ensure that all DOD targeting personnel serving in joint and service targeting positions will have a common knowledge base reflecting current joint targeting terms, tactics, techniques, and procedures. *It is not intended to train targeteers.*

56. Buster C. Glosson, "Impact of Precision Weapons on Air Combat Operations," *Airpower Journal* 7, no. 2 (Summer 1993): 8.



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